

THE LSAT TRAINER

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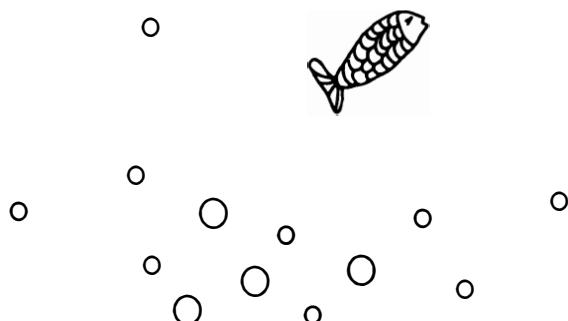
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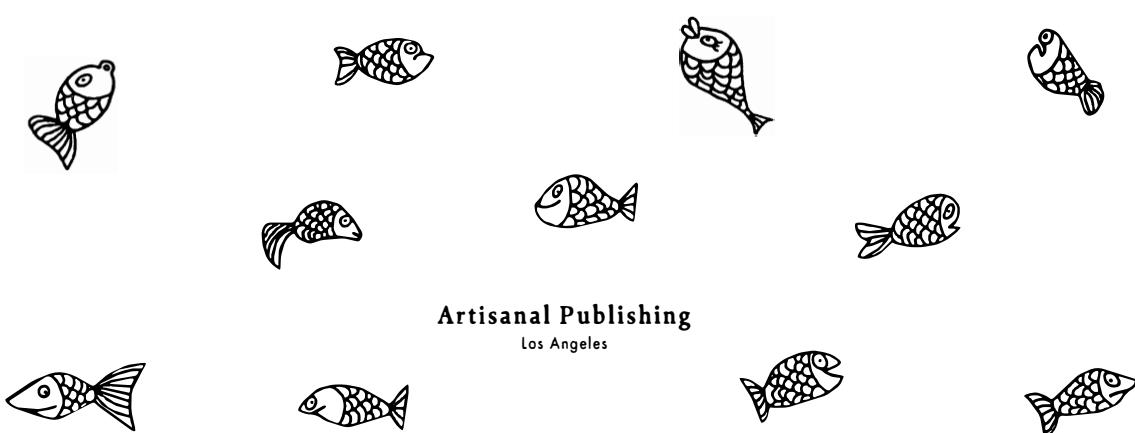
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THE LSAT TRAINER

a remarkable self-study system for
the self-driven student



by mikekim



Artisanal Publishing
Los Angeles

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● Set up a study routine using one of the various schedules available at theLSATtrainer.com.

● Facts: This book contains over thirty drills and over two hundred real LSAT questions. Lists of drills and questions can be found in the appendix.

● Ideally, you will use this book in conjunction with practice exams put out by the makers of the LSAT. This will be discussed further in lesson one.

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 Stay organized and keep track of your work by using the notebook organizer tools available on the Trainer website.

May your curse in
life be that your hard work
is constantly mistaken
for talent.

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Ready?



1

introduction

The LSAT is the most significant part of the law school admissions process. It is unique among all of the major American standardized exams in that respect. Your SAT score carried far less weight when you applied for college, and if you were to apply to business school, your GMAT score would also be of far less importance. Furthermore, there is a strong correlation between the law school that you attend and your future career success, much more so than in other fields such as medicine or education. All that is to say that your performance on the LSAT can have a significant impact on the future trajectory of your legal career. In particular, a top LSAT score can open doors for you that would be very difficult to open otherwise.

But you already knew all of that. Or, if you didn't, you would have soon enough, whether or not you ever came in contact with *The Trainer*. What you really want from this book is to figure out how to get a top score.

Guess what? I have the answer for you. It's not a trick answer and it's not a gimmick. In fact, it's an answer that you will likely agree with. I'm going to give it to you right at the end of this first lesson (please, don't peek). By the way, I also guarantee you that this first lesson will be the easiest lesson in the book—all it involves is you reading some words and thinking about some ideas. All of the other lessons will require you to do *work*. So, find yourself a comfortable chair, sit back, relax, and please continue...

The LSAT is specifically designed to judge your ability to succeed in law school. Keeping in mind what you know about law school classes and being a law student, if it were your job to design the LSAT, how would you design it? More specifically, what are the characteristics of the potential law student that you think the LSAT should be designed to test?

LSAT Basics

Before we move further, let's lay out a few basic facts about the exam.

The Test Sections

Logical Reasoning

When you take the official LSAT, you will sit for six sections, only four of which will be relevant to your score. The four scored sections will include two Logical Reasoning sections, a Logic Games section, and a Reading Comprehension section. You will also have one experimental section, which will be an additional Logical Reasoning, Reading Comprehension, or Logic Games section. The experimental section is used to test questions for future administrations of the LSAT, and your performance on that section does not count toward your score. You are given thirty-five minutes for each section, and these five sections can come in any order (historically, the experimental section was consistently one of the first three sections of the exam, but since students figured that out, it has been less consistently true). Your sixth and final section will always be the essay section. The essay is not a part of your 180 score, and carries negligible weight in the admissions process, but it is sent to schools along with your score (so don't write anything immature or offensive). When you sit for the exam, you will be given the first three sections without breaks in between, then a fifteen minute break, then the remaining three sections.

Two of your four sections will be Logical Reasoning sections, and Logical Reasoning questions will account for roughly half of your overall score. For that reason, Logical Reasoning questions are the most important questions to study for the LSAT. Each Logical Reasoning section will typically contain about twenty-five questions, which averages out to a little more than 1:20 per question. Each Logical Reasoning question consists of a stimulus, which is typically a short two or three sentence statement; a question stem, which presents the task at hand; and five answer choices, one of which will be absolutely correct, and four of which will be absolutely incorrect.

Your success on the Logical Reasoning section depends on an equal combination of your reading ability and your reasoning ability. Logical Reasoning also requires a significant amount of mental discipline, in large part because the different question stems often present similar, yet slightly different tasks.

Logic Games

The Logic Games section, more formally known as Analytical Reasoning, consists of four different games. Each game presents a scenario and some rules, then asks five to seven associated questions. The section will typically have twenty-three questions in all.

All games center on organizing elements relative to positions. For the majority of games, these positions relate to one another in some sort of order (for example, five kids stand in positions one through five, numbered from left to right). Your ability to diagram, or visually organize, the situation is crucial for success in this section.

Reading Comprehension

The Reading Comprehension section consists of four different passages. Each passage will have between five and eight associated questions, and the section will typically have about twenty-seven questions total. The four passages will cover four different subject areas: law, history, science, and social science, one passage per general subject. You don't need to have any prior knowledge of the subjects discussed in these passages. Certain questions require general understanding of the passage, and others require detailed understanding of specific components, but taken as a whole, Reading Comprehension questions are designed to test your ability to read for reasoning structure.

Sample Logical Reasoning Question

Although the charter of Westside School states that the student body must include some students with special educational needs, no students with learning disabilities have yet enrolled in the school. Therefore, the school is currently in violation of its charter.

The conclusion of the argument follows logically if which one of the following is assumed?

- (A) All students with learning disabilities have special educational needs.
- (B) The school currently has no student with learning disabilities.
- (C) The school should enroll students with special educational needs.
- (D) The only students with special educational needs are students with learning disabilities.
- (E) The school's charter cannot be modified in order to avoid its being violated.

PT 34, S 2, Q 10

All Logical Reasoning questions involve a stimulus, a question stem, and five answer choices, one of which will be correct. Most stimuli involve arguments—reasons given to justify a point. Depending on how you count them, there are about sixteen common varieties of question stems. They are all related, but unique in their own way. For this question, we are looking for an answer that allows the conclusion to follow logically. To follow logically is a big deal on the LSAT—we need an answer that, when added to the argument, guarantees that the support given leads us to the conclusion reached.

The author's point is that the school is in violation of its charter. The reason he gives? The charter states that the student body must include some students with **special educational needs**, and no students with **learning disabilities** have yet enrolled in the school.

The author has made a flaw of reasoning here—he has assumed that those with learning disabilities are the only ones with special needs. It could be that students have special needs for other reasons. In order for this argument to work, we need to know that those with learning disabilities are the only ones with special educational needs, and answer choice (D) gives us that information. (D) is therefore correct. No other answer choice gives us the information we need to guarantee the author's conclusion.

This is a question from a previously administered LSAT, and so I've noted where it is from, as I will all official LSAT questions we will use in this book. The notation below the question means that the question is from "Practice Test 34, Section 2, and it is Question 10."

Sample Logic Games Scenario, Rules, and Question

A bus travels to five cities—G, H, I, J, and K. It will visit each city exactly once. The following conditions apply:

- The bus visits H before it visits K.
- The bus either visits I first or second.
- The bus visits exactly one city in between its visits to I and G.
- If the bus visits G third, it must visit H before G.

Each of the following could be true EXCEPT:

- (A) The bus visits H first.
 - (B) The bus visits J second.
 - (C) The bus visits K fourth.
 - (D) The bus visits J before G.
 - (E) The bus visits J last.
-

All games begin with a scenario and rules, and all games involve placing elements—in this case the five cities—into a set of positions. In this example, we can imagine the positions being defined by the order in which these cities were visited. About two out of every three games place the positions in a similar sort of order. A typical game will have between five and seven associated questions. The right and wrong answers to these questions will generally not be determined directly by the rules as they are written, but rather by the inferences that can be made when the rules are brought together.

For this question, we are told that each of the answers could be true except for one. Our job is therefore to find the one answer that must be false. The answer that must be false is answer choice (B). Looking at the given rules, we know that the bus must visit I first or second. If it visits I first, it must visit G third, and thus H second. If it visits I second, of course it can't visit J second. Therefore, the bus must visit either I or H second, and there is no way J can be second. (B) can't be true.

It is virtually impossible to consistently answer Logic Games questions by doing all of this type of work in your head, and all top scorers that I have worked with depend heavily on diagramming techniques to help make the task of keeping track of all rules easier and to help see how they go together. Developing effective diagramming techniques is the key to Logic Games success, and it will be a big focus of our training.

Note that we have not included an example of Reading Comprehension here, but if you would like to take a quick look at an example you can do so by jumping to page 56.

How Is the LSAT Scored?

The four scored sections will typically contain a total of 100 or 101 questions. The LSAT is scored using a simple system that tallies up the number of questions you got right (your raw score) and compares that with how other people perform on the same exam (or, to be more specific, compares that with a *prediction* of how other people will perform on the same exam, a prediction based on data from experimental sections of previously administered exams). How you do relative to others then determines

your overall score on the 120–180 scale. There is no scoring difference between getting questions wrong or leaving them blank, and each question is worth the same amount. The raw score-to-scaled score conversion rates are slightly different from exam to exam. Over time, however, the scoring scales, and the exam itself, have stayed remarkably consistent. The consistency of the exam is a testament (one of many) to its fine quality.

Misses	2	6	12	19	27	44	60	75
Percentile	99.9	99.5	97.5	92	80	44	13.5	2
Score	180	175	170	165	160	150	140	130

The statistics on this chart represent the average performance-to-score conversion rate for Exams 57–61, reported in terms of the total number of questions missed. The percentile represents how the test taker did relative to other test takers, and the overall score is on a 120–180 scale.

How Effective Are Traditional Study Methods?

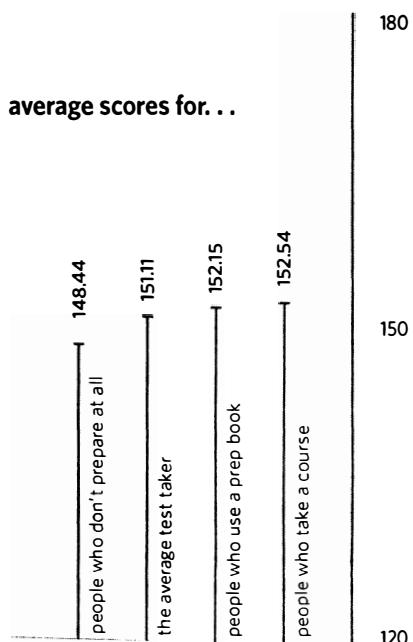
Not very.

The numbers speak for themselves: the common study methods have not been particularly effective for most people. Taking a course or using a guide does not, in and of itself, raise scores significantly over the average, even though that average includes a large number of people who choose to do nothing at all to prepare for the exam.

Still, the fact that *most* students do not improve significantly does not mean that there aren't *some* students who do figure out how to improve significantly. These are the students who get the high scores.

The emperor wears no clothes. In order to improve at the LSAT, it's helpful to know that you *shouldn't* study how most other people study.

All statistics in this book are based on information published by LSAC. The numbers on this table represent test takers from the 2010 – 2011 academic year.



What Is the LSAT Designed to Test?

The LSAT is designed to gauge your ability to succeed as a law student. What do law students have to do?

First of all, law students have to read a lot of very dense text—sometimes, they have to read and critically evaluate cases that are hundreds of years old. Typically, the key to correctly reading these passages as a law student is not the ability to absorb every single detail of everything that you read (that would be pointless and impossible) but rather, being able to prioritize the important information that is relevant to your purpose.

Secondly, law students have to think about what they read. They have to constantly think about how ideas relate to one another (say, for example, how state and federal laws come together) and they have to think about how reasoning leads to a conclusion (for example, whether the evidence provided is enough to convict someone of a crime).

The LSAT is designed to test these types of reading and thinking abilities. But, of course, the LSAT is a multiple-choice, 100-question, standardized exam, so at its best, it can only test these skills in a very limited and abstract sort of way. The LSAT is thus primarily designed to test four very specific skills, two of which we will think of as reading skills, and two of which we will think of as reasoning skills.

Your Ability to Read for Reasoning Structure

The reading skill that is most consistently tested and rewarded on the LSAT is your ability to read for reasoning structure. Reasoning structure refers to the organization of a passage relative to its purpose; to understand reasoning structure is to understand why the author has included the various parts of a passage. Your ability to read for reasoning structure will be relevant to the vast majority of Logical Reasoning questions, and it will also be the primary skill that is tested by the Reading Comprehension section.

Your Understanding of Certain Words

Of course, a necessary and integral part of one's reading ability is an expansive and correct vocabulary, and the LSAT does test your ability to understand and use certain words. However, they are not the words that you might expect. LSAT writers are not particularly interested in testing the sophistication or depth of your vocabulary. They are much more interested in testing your exact understanding of certain commonly used words. The words they care about are the words we all use when we create reasoning relationships, words like "or," "only," "therefore," "must," and "unless." Your specific understanding of these words will be put to the test in both the Logic Games and Logical Reasoning sections.

Your Ability to Bring Two or Three Ideas Together

One of the two ways in which the test writers will test your reasoning ability is by creating situations in which two or three given statements can, when taken together, yield additional inferences. That is, the exam presents situations in which you have to figure new things out by bringing information together. This skill is most important for the Logic Games section, for which these inferences will be what typically differentiate right answers from wrong ones. This skill is also necessary for certain Logical Reasoning questions.

Your Ability to See Why Reasons Don't Justify a Conclusion

The flip side of being able to see when two or three ideas come together to form a valid conclusion is being able to see when two or three ideas do not come together to form a particular conclusion. In fact, this ability—the ability to see why reasons given do not justify a conclusion reached—is the key reasoning issue that is tested. This will be central to your success in both the Logical Reasoning and Logic Games sections.

Simple Examples to Illustrate Issues

reasoning structure	word meaning	inferences	reasoning flaw
Why are these two statements different? A: Jane went to college, so she must be a good student. B: Since Jane is a good student, she must have gone to college.	What does "or" mean, exactly? A: You can pick a boy puppy or a girl puppy. B: To check in at the airport, you must have a driver's license or a passport.	Every day, Sarah eats either eggs or toast for breakfast. When she eats toast, she always eats jam. Sarah did not eat any jam with her breakfast this morning. What can you infer?	Going back to the two examples for reasoning structure, if you wanted to counter both of those statements respectively, what might you say?

The Five Mantras of LSAT Preparation

solutions for
examples on previous page

Reasoning Structure

In the first argument, the author's point is that Jane must be a good student. Her reasoning is that Jane went to college.

In the second argument, the author's point is that Jane must have gone to college. His reasoning is that Jane is a good student.

Word Meaning

In real life, the meaning of "or" changes based on context.

In the first instance, the "or" implies exclusivity—in real life, this statement likely means that the person can pick a boy puppy or a girl puppy, but not both.

In the second instance, the "or" does not imply exclusivity—in real life, you would likely still be able to check in at the airport if you had both a driver's license and a passport.

The LSAT requires an absolute rather than contextual understanding of words like "or." On the LSAT, the *or* is inclusive, not exclusive, unless otherwise noted.

1. And you should remember to come back and re-read some of these essays later in your studies.

When we first start to think about the LSAT, and when we begin our studies, there are a lot of reasonable predictions that we can make about how it might be designed—it's probably going to reward good reading skills, require attention paid to random details, reward a large vocabulary, require some cleverness or creativity, require mental discipline...all of these predictions are reasonable, but only some of them are actually true. The LSAT is not designed to test all of those issues.

For most LSAT students, it typically takes a lot of studying—a lot of fumbling around—until they can develop some sort of big picture, macro-understanding of exactly what the LSAT tests, and how it is designed. Most students actually do not get a very clear sense of this until they are near the end of their studies, if they ever get it at all.

This puts these students at a huge disadvantage—a disadvantage that virtually guarantees that they will underperform relative to their abilities on test day. For one, it will mean that they invariably waste their study time. If you don't know exactly what you need to improve on and why, it's going to take you longer to improve.

More importantly, what will happen is that, before these students truly understand what type of thinking is rewarded and what type of thinking is not, before they develop proper instincts about the LSAT, they will have already been practicing at the exam for months, and they will have already developed habits—habits based on some vague or perhaps even flawed understanding of the test. This is a fatal issue because habits will, in large part, determine how well you perform on test day, and you cannot change habits simply by learning something new. Most students form their habits before they have the instincts to form good ones.

You can get a huge head start on your competition if you begin your studies with a clearer understanding of the exam, and more importantly, if you begin with a clearer understanding of exactly how you ought to prepare and what you ought to think about as you study. To that end, I want to begin with five short essays that together express what I think is most important for you to consider when you first begin preparing for your exam. These essays discuss what to think about, and more importantly, how to think about these things. The points I make here serve as a summary of much of the wisdom I've gained from working with thousands of students, some of whom drastically improved their scores, and some of whom, unfortunately, did not.

Since you've had no exposure to the test yet, some of this will seem like we are jumping the gun a bit, and it's certainly true that the points I make will ring far truer once you have more LSAT experience under your belt.¹ However, I include these points here so that you can start off with as clear an understanding of your task as possible, and so that some of what I mention will serve as a framework that you can use as you organize and prioritize the things that we will be learning in future lessons.

One: Equate Smart with Simple

We are all used to taking exams based on what we *know*. This is particularly true in elementary school, junior high school, and high school. For whatever reason, the exams we're given at these levels are almost always designed to test our ability to repeat back

the things that our teachers have taught us, and at their worst, some are even designed to most reward those students who are best at mimicking the way their teachers think.²

These experiences shape how we all think about tests, and about preparing for tests. A fundamental aspect of this mindset is that we equate *knowing more* with *being more prepared* for exams. When it comes to the LSAT, this is a dangerous misconception to have.

This mindset tends to have its biggest impact on high achievers, people who are used to succeeding academically by *working harder to know more*. These students are commonly focused on developing as specific an understanding of each type of LSAT question as they possibly can, and these students are commonly drawn to learning systems that are technical and (seemingly) sophisticated.

Let me be clear—you do need to know some things to do well on this exam. Of course. And in this book we will discuss everything that you need to know, at great and sufficient depth. However, success on the LSAT depends on the quality, rather than the quantity, of your understanding and your abilities. Success does not favor those who think they will get better by learning a thousand different details about every type of problem that can appear.

The LSAT is designed to be a test of how you think, not what you know. The people who write the problems have little interest in gauging your understanding of advanced logic principles, and they have little interest in testing the expanse of your vocabulary. The test writers actually have an obligation to create an exam that does not (at least on the surface) give an advantage to people of a certain background or life experience, and so they cannot create an exam that rewards, for example, an understanding of formal reasoning that only a philosophy major might have, or rewards those who know the meaning of technical terminology that is unique to a particular scientific field. Like the writers of Seinfeld, their *job* is to create a product that is about *nothing in particular*. Their job is to create an exam that determines right and wrong based on the most fundamental elements of public human interaction—our basic ability to understand and organize what we read, and our basic ability to gauge reasoning—that is, our ability to see when the reasoning given justifies a point that is being made, and when it doesn’t—what most of us think of on a day-to-day basis as *common sense*.

I am not suggesting that the LSAT is easy. The LSAT is not easy! However, it’s important to know that harder questions are generally not more difficult because they test more challenging concepts or require you to know unusual words. Harder questions test exactly the same things easier questions do, but in a more challenging manner. Your job is not to be a master of details, but rather a master of the fundamentals. To that end, I want to encourage you to equate *smart* with *simple* when you think of this exam.

On a practical level, this means that as you learn new concepts and strategies, and as you practice problems and review them, you want to always work toward attaining as simple and clean an understanding as possible, and you want to get in a habit of equating a simple understanding with a complete one. If you truly know what’s wrong with an argument, you shouldn’t need an official name or formal language to describe it—you should be able to describe it using your everyday language. If you truly feel comfortable with a type of question, you shouldn’t have to remind yourself to keep ten things in your mind—you should be able to intuitively focus on just two or three fundamental concerns. Thinking about the LSAT in a simple way has numerous advantages, and will pay off with great effect both in your studies and on test day.

2. Did you ever get points taken off on a math exam for getting the right answer but “not showing your work,” or for seeing a different theme in a book than the one your teacher told you to see?

**the LSAT is a test
of reading
ability and
common sense**

**solutions for
examples on page 13 (continued)**

Inferences

Since Sarah did not eat jam, she must not have eaten toast. Since she didn’t eat toast this morning, she must have eaten eggs.

Reasoning Flaw

For the first argument, the author is flawed in assuming that having gone to college ensures that Jane is a good student—maybe she got into college because of connections, never studied, and didn’t do so well.

For the second argument, the author is flawed in assuming that because Jane is a good student, she must have gone to college—maybe she chose instead to join a start-up company.

When you understand things simply, it is far easier to organize what you know. You make it easier on your brain to see how this new thing that you are learning is related to everything else that you've just learned, and by being better able to relate ideas, you can take your thinking ability to greater depths. In the next few months, we are going to be learning a lot of concepts, and developing a lot of strategies. A simple understanding will make it far easier for you to bring together everything that you learn.

Thinking simply also makes it far easier to utilize your own natural intelligence and real-life understanding. When you make your studies more complex and formal, it works as a barrier between you and your mental power—instead of using your own good sense to understand a situation, you end up trying to understand a situation in terms of how you understand certain technical terms or abstract concepts. Some LSAT teaching systems even encourage this type of disconnect,³ but you do not want anything to get in the way of using the talents of your own mind. A simple understanding, as opposed to a technical one, gives you the best chance to utilize your thinking abilities to their fullest. In my experience, when students are able to do this, most have the natural ability to score at a very high level.

Finally, a simple understanding will be the one that you can apply best on test day. Human beings are only capable of consciously thinking about one thing at a time. *Trying* to think of a hundred things at once does you no good, and an overly complicated understanding will put you in a place where you end up trying to do just that. A simple understanding will help you best apply what you know under pressure.

Two: Focus on What to Think About (Not What to Think)

Imagine riding an elephant.

You can just sit on top of the animal and choose not to do anything. If so, the elephant will do as it chooses, and you will go along for the ride. But if you have the understanding and motivation, you can train this elephant to do what you would like—you can train it to take you where you want to go, for example, or you can train it to lift heavy things for you. This is of great benefit because—and this is very important—you are not capable of doing the work that the elephant does. The rider who is happiest and wisest is the one who understands how to control the elephant, and does not try to do the work himself.

The analogy of a rider and an elephant is commonly used in educational circles to discuss the relationship between our conscious mind and our unconscious mind. If you don't control your unconscious, it can drift. If you train it, it can do amazing things for you.

This analogy is particularly relevant to how we perform during standardized exams. Our conscious mind is the rider. It gets all of the notoriety and attention because it is what we most notice and because it *seems* to be in control. But once that timer starts, your unconscious—your instincts and habits for what to think about and how—takes over.

Let's talk more specifically by discussing just one important skill that you are going to have to showcase on test day: your ability to evaluate the reasoning in an argument. Most Logical Reasoning questions require you to evaluate the reasons that an author

3. "Don't trust yourself!" these books tell you, "Think exactly as we tell you to!" These systems aren't particularly effective.

gives in order to justify his point, and your success on the entire Logical Reasoning section hinges, in large part, on your ability to do this.

So, you know this is going to be a big part of the LSAT—how do you prepare your rider and your elephant to perform at their best?

The wrong way to go about it would be to place the burden of the work on the rider. We do this when we try to memorize a list of fifty things that could be wrong with arguments, and we do this when we use tips and tricks, “markers,” or “keywords,” to make our decisions on a technical and conscious level. We do this when we focus on what we need to know rather than what we need to think about. And of course, we do this when we fail to train our elephant.

The right way to go about doing this is to give your “elephant” everything that it needs to properly prepare—a simple and intuitive *understanding* of the issues that will appear on the exam, logical and usable *strategies* for handling all of these issues, and most importantly, plenty of *experience* putting this understanding and these strategies to good use (more on understanding, strategies, and experience in just a bit).

Don’t spend your time training your rider. Do not think that by hearing about some clever strategy or memorizing some trick, you can do the heavy lifting needed for success on the LSAT. Invest your energy into training the elephant and becoming a good rider. You can do this by focusing on what to think about rather than what to think, by focusing on the decisions to be made rather than the right way to make them, and by making sure you get plenty of experience with the types of situations that you are likely to face on test day.

Three: Utilize the Power of Compound Learning

An understanding of addition and subtraction properties is useful and necessary in life, but an understanding of multiplicative properties, when applied properly, is far more valuable. To explain why, I want to start with a simple fable about twin brothers Wilbur and Wallace.

Both Wilbur and Wallace were taught from an early age to save for their retirements. Wilbur loved addition, and Wallace loved multiplication. For the sixty years that Wilbur worked, he added \$1,000 each year to a retirement savings account. At the end of his work years, he retired with \$60,000.

Imagine if Wallace, who loved multiplication, put \$1,000 into an investment account after his first year of work, and *never put another dime into that account for the rest of his work years*. The account paid him about ten percent interest per year, which is roughly what the U.S. stock market has paid historically, on average (until the past few years, anyway). Multiplying that \$10,000 with the 10% growth each year, when he retired in sixty years he would do so with just a tad over \$300,000.

Of course, in reality, Wallace had no reason not to keep adding \$1,000 to this account each year, and so he did while continuing to earn that ten percent. And he ended up retiring with a little over \$3,000,000. Compare that with Wilbur’s \$60,000. What drove the expansion of Wallace’s wealth? The same thing that allows us to calculate the distance to stars—the exponential power of multiplication.

If you’d like, you can use these extra wide margins throughout the book to take notes.

The way in which we build our skills is analogous to the way that we build up our wealth, and in both endeavors, multiplication is a far more powerful force than addition. Simply put, when we learn by multiplying what we know, by *connecting* ideas, and by *building upon* the skills we've already developed, we learn far faster and far more effectively than when we learn in pieces—when we try to learn one thing at a time and when we try to simply *add up* the things we learn into some kind of whole. As we make our study plans, and as we think about the path that we are going to be taking toward mastery, one of the best things that we can do is recognize the value of compound learning. To that end, let's use the Wilbur and Wallace analogy to think about how we can effectively utilize our study time in order to get the maximum return. How would addition-loving Wilbur and multiplication-loving Wallace think to study for the LSAT?

How to Study Like Wilbur (1.0 & 2.0)

Wilbur 1.0 studies by learning about one question type at a time. He gives himself a certain amount of time to study each type of question, game, or passage to the best of his ability, then moves on the next. Then, a few weeks before the exam, he reviews everything that he's learned. This study situation is a fairly common one, especially among those students who are part of a class and are following some sort of class schedule. Almost all classes are designed around a one-question-type-at-a-time system, and the timing of the classes determines the start and stop of when you study different types of questions.

The consequences of studying like Wilbur 1.0 are mixed. You will definitely get some question-specific learning, and over time you will definitely develop skills that you can apply to a wide range of challenges. On the negative side, you will also have a more difficult time than necessary growing and organizing these skills, and you'll make it more difficult on yourself than it needs to be to create sharp and effective instincts.

To illustrate exactly why, imagine that in your first week of studying Logical Reasoning, you work on “Identify the Conclusion” questions—questions that require you to identify the main point the author is trying to make in an argument, and the next week you study “Find the Assumption” questions—questions that require you to figure out what the author is assuming in thinking that his point is justified. On a conscious level, it’s easy for you to keep the two types of questions apart, and so you don’t think much about studying them one right after another, and you don’t think too much about starting your studying this way. But remember, the goal of your training is not to prepare your rider, it’s to prepare your elephant. What does this sort of preparation do for your elephant?

Well, in that first week, your elephant is learning to develop ways to think about and solve Logical Reasoning questions in general, and it’s also developing specific systems for Identify the Conclusion questions. Some of what it learns is relevant to all of Logical Reasoning, and some of it is specific to the question type. Some of the processes that it starts to habitualize pertain to all Logical Reasoning questions, and others pertain, again, just to Identify the Conclusion problems. For the most part, your elephant is left to make most of these determinations on its own, for, at the beginning of your studies, even the rider—your conscious mind—doesn’t yet really know how to organize everything that you are learning.

Now comes the next week and the next type of question, and your elephant has to get used to a similar but slightly different task. It has to learn concepts and strategies that apply to that particular question, while reconciling what it is learning with what it learned in the first week. The process continues week after week, new question type after new question type, until the very end of your process, at which point you take a few practice exams and go into your test. Notice the lack of review, the minimal organization, and most importantly, the lack of multiplication.

Now you run into an Identify the Conclusion question on the exam. You have about a minute to arrive at an answer. Will you be able to utilize what you learned back in your first week of studying in order to get the question correct?

Chances are, you very well might. The human mind is simply incredible, and it's very possible that you are able, in that moment, to wade through the months and months of LSAT information you've absorbed in order to find that one particular piece of knowledge that is relevant to the question at hand. But—I think you can agree—you haven't made it easy on yourself to get that question correct, and you certainly haven't made it so that you give yourself the best chance to correctly utilize what you have learned.

Wilbur 2.0 studies primarily by doing full sections and entire practice exams. Afterwards, he checks his work and reviews carefully the questions that he missed.

Wilbur 2.0 gets to a point where each explanation makes one hundred percent complete sense. He understands exactly why he is missing questions. Does this help? Yes, a little bit, but it likely won't lead to significant and fundamental improvement. Even though Wilbur 2.0 knows why he misses questions, every test presents a dozen different issues to study and the list never seems to end, and what he learns never seems to help on the next exam. By not providing himself with any sort of organizational framework, he limits his ability to grow his skill set to its fullest.

How to Study Like Wallace

Wallace is very interested in growing his understanding, and he knows that strong growth always begins with a solid foundation. So, he spends some time thinking about what is most important to success for each of the sections, and he develops a learning schedule that allows him to grow his skills out from this foundation.

Of course, I want you to study like Wallace, and to that end I have carefully designed this training guide to be one that helps you multiply your talents as you develop new skills. Here is what that means more specifically...

For Logical Reasoning

Logical Reasoning questions present you with a short—typically two to three sentences—scenario, and then ask you to respond to that scenario in some way; perhaps the author will make a point in the scenario and your job will be to select an answer that strengthens that point or weakens it.

We will begin by investing a great amount of time and energy into the one macro-skill that is most important for success on the Logical Reasoning section: your ability to criti-

cally evaluate arguments. A strong majority of LSAT questions hinge on your ability to understand arguments, and more specifically, almost all such questions hinge on your ability to see the *faults* in arguments. With that in mind, we will start our training by working at becoming expert at finding faults in arguments. We will study every type of argument flaw that can appear on the exam, and we will break down, and practice again and again, the processes necessary for you to recognize and understand them clearly.

An argument consists of a point and reasons given to justify that point.

With that foundation built, we will next move on to develop question-specific strategies, starting first with those questions that most directly ask you about the faulty reasoning (Identify the Flaw questions), and gradually panning out to other question types. At each point we will carefully point out and differentiate the characteristics and issues that are generally relevant to many different types of questions, versus those specific to the question type that we are studying.

Finally, we will discuss and practice bringing together all the various skills that you have developed, so that by the time you go into the test, you can be confident you can represent all of your abilities at their best.

For Logic Games

Logic Games are relatively unique to the LSAT. Logic Games present you with a short scenario and a set of rules—this scenario and rules will always involve assigning certain elements into certain positions—and then ask you anywhere from five to seven questions to test your understanding of the given situation.

We will begin by focusing on the one macro-skill set that is most important to your Logic Games success: your ability to diagram Logic Game scenarios and rules. The challenge of Logic Games—the thing that makes them so hard—is keeping track of the rules, and more importantly, being able to see, very clearly, exactly how these rules come together—the questions will gauge your understanding of this again and again.

The complexity of these Logic Games is such that pretty much everyone needs to write the information down in order to track it—it's simply too much to keep in our heads. And this ability to write things down—to diagram—in an effective way is what differentiates top scorers from average scorers from below average scorers. Your ability to diagram is the key to your Logic Games success.

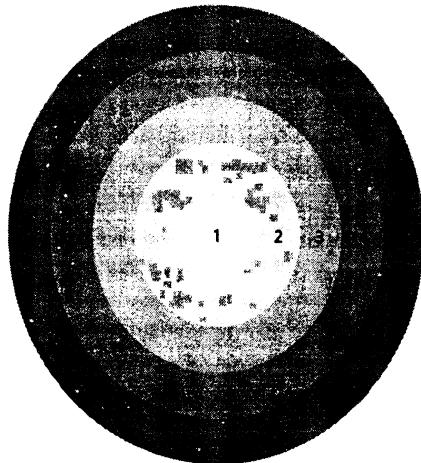
So, we will spend a great amount of time (think Karate Kid) building up your fundamental diagramming skills. We will thoroughly and systematically break down every single significant diagramming challenge that you are likely to face on test day, and work on developing effective strategies and habits to combat each of those challenges.

Once we are comfortable with our ability to translate scenarios and rules into diagrams, we will dive into full official LSAT games and shift our focus to question-specific strategies. As you'll see, the questions require a different aspect of our diagramming skill—an ability to *utilize* our diagram. We will break down all of the different types of questions that can be asked, and develop optimal strategies for those specific challenges.

Lastly, we will work on bringing all of our skills together on full sections, and work to habitualize the processes that will lead to guaranteed success on test day.

multiplication

trumps addition



$$\begin{array}{ccccccc} 1 & + & 2 & + & 3 \\ + & & + & & 5 \end{array}$$

Many students think of their preparation in terms of individual steps. For example, they prepare for the Logic Games section by trying to completely master one “type” of game, and then another type of game, and so on. Or they prepare for Logical Reasoning by trying to master just one question type at a time. Most LSAT preparation systems conform to this learn-by-addition design approach.

While learning by addition certainly can be effective, and has been for thousands of students, learning by multiplication is always *more* effective, and more efficient. For Logical Reasoning, we will start with the one skill that is most important for your success: your ability to critically evaluate the reasoning in an argument. For Logic Games, we will start with diagramming ability—diagramming ability is the key skill that differentiates the different levels of test takers. For Reading Comprehension, we will begin by focusing on understanding and recognizing reasoning structure. As you’ll soon see, the vast majority of Reading Comprehension questions will either directly or indirectly test your understanding of reasoning structure, and reading for organization, rather than details, will put you in the best position to answer questions. Once we have developed these strong core abilities, we will use them to sprout out a deep and varied skill set.

For Reading Comprehension

Reasoning structure refers to the roles that various parts of the passage play relative to one another. Main point, opinion, and background are examples of the types of roles that are relevant to reasoning structure. An effective way to think about reasoning structure is to ask, "Why has the author written this part?" If you can answer that question successfully, you can feel confident that you understand the reasoning structure.

4. Here is a riddle that I guarantee will stump almost all of your friends and family:

A father and his son get into a car accident. The man dies instantly, and the son gets taken to the emergency room. The surgeon takes one look down at him and says, "I can't operate on him, he's my son!" How is this possible?

Having read the main body text, hopefully you are in a better position to see the right answer: the surgeon is the boy's mother. However, give this riddle to others, and you are far more likely to hear answers about gay parents and priests than you are about a mother who is a surgeon.

Of course, we all know that in real life there are plenty of female surgeons, but we shouldn't feel ashamed for getting tricked by such riddles. What it does show us is that our brains commonly make incorrect associations (such as *surgeon=man*). The key to certain difficult LSAT questions is an ability to "disassociate" such false associations.

Most of us have some familiarity with Reading Comprehension from previous standardized exams. Most of us have a general sense of what the reading challenges will be, what the questions will ask for, and so on. Of course you might expect, and it's important to know, that LSAT Reading Comprehension test writers *do not* have a general sense of how to create questions—they have a very specific sense of exactly what it is they are testing, and they have very specific ways of going about it.

LSAT passages do not test your knowledge of the world or of history, nor do they test the expanse of your vocabulary. The test makers also care very little for your ability to critically evaluate what you read (in this section at least). What the test writers care most about is your ability to read for structure, specifically **reasoning structure**. The majority of questions hinge on this ability. If you are consistently able to see correctly the reasoning structure of passages, you should have great success in Reading Comprehension.

So, we will begin our Reading Comprehension preparation by building up and strengthening our ability to read for reasoning structure. We will discuss in depth the types of structures you are likely to see on the exam (LSAT passages are very consistent in their structure), and get plenty of practice at seeing those structures accurately.

Once we've gotten ourselves in the habit of reading passages effectively, we will break down the various types of questions that can be asked of us in the section. We'll relate what we understand about structure to what is being asked of us in each of these questions, and we will work on developing effective problem-solving strategies. Lastly, we will work on bringing it all together for full sections.

Four: Understanding, Strategies, and Experience Are Necessary (But Not Enough)

What determines whether someone is a great surgeon?

Is it her *understanding* of surgery? That's certainly a big part of it, but just because someone knows a lot about surgery doesn't mean that she'll be a good surgeon. Is it the *strategies* that she chooses to employ? Again, good strategies are certainly necessary, but a good strategy poorly executed won't give the patient the result he hopes for. Is it *experience*? Most surgeons need years of experience to reach a high level of competency, but experience alone doesn't make you a good surgeon—especially if you are consistently bad at surgery.

Fortunately, the LSAT is far less challenging and far less stressful than surgery. Still, there are some similarities and takeaways. What defines a great surgeon? It's not how much she knows, and it's not her strategies nor her experience. What best defines a great surgeon is her ability to *utilize* her understanding, her strategies, and her experience to make decisions and to act correctly *in the moment*. And this is true of the LSAT as well. You need understanding, you need effective strategies, and you need experience, but ultimately your result will be based on how well you are able to use all of this in the moment. There is a better way to think about what makes for a good LSAT test taker: a good LSAT test taker is one that has *skills* and *effective habits*.

Five: Use Skills and Habits to Gauge Your Readiness

We can define skill as your ability to *utilize* your understanding, talents, and experience. It's helpful to think of understanding, strategies, and experience as means to an end—they are useful when they combine to form and grow your skill set. As you invest time into preparing for the exam, you want to think about your improvement in terms of skills ("I am now *able* to do X," and "I am now *able* to recognize Y," and so on) and you want to gauge your readiness for the LSAT in terms of your skill set ("I am ready for this Logic Games challenge because I am comfortable *doing* X," or "I am not confident about this Logical Reasoning question because I don't think I am accurate at *doing* Y," and so on).

Thinking about your preparedness in terms of skill set will have numerous benefits for you along your training process, but here are two benefits that you should be aware of from the get-go:

Using Your Skill Set as Your Gauge Will Help You Get Rid of That "Am I Ready?" Uncertainty

For some exams that we take in life, it's very easy for us to tell if we are "ready" for that test. If we go back to high school, if you knew how to spell the words that could show up on a spelling test, then you felt ready. However, let's imagine that you are preparing for a job interview. At what point would you feel "ready"? Do you think you could ever feel "ready" for, say, an I.Q. test?

If you think of the LSAT as being some sort of undefinable abstract exercise (like an I.Q. test) then you inevitably come up with arbitrary and indirect ways of gauging your preparedness. You say to yourself that you are ready because you've studied as hard as you can, or because you've done every practice exam, or finished a course, or gotten the best strategies from the most expensive guru. As you get closer and closer to the test, you will find yourself feeling more and more nervous, because those are not objective and honest ways of gauging whether you are truly ready.

U.S.E. (or S.U.E.)

Here is a very general breakdown of the understanding, strategies, and experience that are all necessary for high-level success.

Understanding of...

- ...the issues that underlie the questions
- ...the design of the test as a whole

Strategies for...

- ...handling specific challenges
- ...completing entire sections

Experience with...

- ...focused study on specific issues
- ...taking entire sections and full exams

The only honest gauge of your preparedness is your skill set and your habits (more on habits in just a bit). If you think about your prep in terms of your skills—I need to be *able* to find the conclusion of an argument, I need to be *able* to identify what's wrong with the author's reasoning, I need to be *able* to diagram ordering rules, etc.—then there will be far less mystery in terms of whether you are truly ready or not. Thinking in terms of a skill set doesn't mean that you'll be perfect at the test, of course, but it will mean that you will have a much clearer sense of what you are good at and what you are not, what you need to skip and where you need to slow down, and it will greatly increase the chances that the exam will go "as you expect." This is a big deal. Most test takers suffer at least a small bit because of nervousness, and it is human nature to be more nervous when we are uncertain. You bring more certainty into the equation when you use your skill set as your gauge, and this will boost your confidence and give you a leg up on your competitors.

Using Your Skill Set as Your Gauge Will Help You Make More Effective Use of Your Study Time

We are far better at learning when there is a goal at the end of our learning process. This is true for all of us, and it's not an issue of willpower. It's an issue of human nature. That is part of the reason that babies are so good at learning—they learn because they want to be able to do things that are critically important, like walking and talking. I'm sure you see the truth of this in your own life—when you are eager to accomplish something, and set off to learn in order to accomplish that thing, you are a far better student than when you learn simply for the sake of learning (a point that our primary schools consistently miss).

Thinking of the LSAT, let's say that you learn how to correctly understand a particular reasoning issue, and you give yourself a pat on the back and stop there. That understanding may or may not translate to better test performance. Same as if you happen to come upon a very effective way to diagram a challenging Logic Games issue—knowing this "system" may or may not translate to better test day performance. Learning about a

connection leads to success

understanding	strategies	experience	We develop skills and habits when we account for all necessary components of the mastery process, and when these critical components come together: when we understand the theory behind strategies, and when our strategies help us understand the exam better; when we get experience utilizing our strategies in a variety of contexts, and when we use our experience to shape and define our strategies; and when we get the most out of our experiences because of our understanding, and use our experiences to add to that understanding.
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particular issue, or learning a particular strategy, and then *using* that understanding or strategy to deal with test-specific challenges—*applying your understanding*—this is what will ensure long-lasting improvement.

When you learn concepts for the exam but don't apply them, or learn strategies but don't understand exactly how or why they work and don't practice applying them, you end up a far less efficient learner. The same goes for if you work on problem after problem, but don't think about the underlying structure of them, or fail to figure out the most efficient and effective strategies for solving them correctly. Make the development of a skill set your end goal. Don't learn a concept just for the sake of learning it, or do a problem set just to get it done—keep in mind that the purpose of what you are doing is to develop skills.

Habits

Your skills have a direct impact on your performance, and you can think of your skill set as representing your *ability* at taking the exam. The stronger your skill set, the more potential you have for a higher score.

Now the question becomes, “How can you ensure that you reach this potential?”

Strong habits. Simply put, your skills determine how high you can score, and your habits determine whether you will reach that potential or not. You can get better at the exam by carefully developing solid skills, layer after layer, and by working to develop consistent and useful habits. And if you focus on these two things, and if you work diligently, something magical will happen: the test will get easier. I absolutely promise you of that. Questions will start making a lot more sense, you'll be able to predict answers more and more, and you'll find yourself far less reliant on me or any other teacher to tell you what is right or wrong. And this is going to start to happen quickly.

The Key to Success

I started this lesson by promising that I would reveal the key to success on the LSAT, and here it is:

the best way to ensure success is to deserve it

Your skills and your habits will determine how well you perform on test day. These skills and habits do not come cheap—they require a great deal of desire and effort. You cannot beat the LSAT by learning clever tricks, and you cannot make up for months of not studying by cramming for a couple of weeks. This test is simply too well constructed and challenging.

The LSAT is not, as many commonly believe, simply a test of certain natural abilities, in the way that an I.Q. test is arguably meant to be. The LSAT is actually an exam that almost anyone can get much better at; it is a test that rewards those who make the effort to get better at it. I've seen this to be true again and again with the students that I've worked with personally. Getting really good at the LSAT is not that different from getting into great shape by working out—some of us naturally start off in better shape than

Over my years of teaching standardized exams, I've heard over and over again variations of the following statements:

I think I know everything there is to know, but I just don't feel ready.

I know all of the best strategies, but I just don't feel ready.

I've been studying for months and months, but I just don't feel ready.

I thought I was ready because I finally understood everything, but the test felt much harder than I expected.

I thought I was ready because I finally learned all of the best strategies, but the test felt much harder than I expected.

I thought I was ready because I've been studying for months, but the test felt much harder than I expected.

Don't let this happen to you! Using your skill set to gauge your preparation will help you feel more certain about your abilities, and it will make it more likely that the exam will go as you expect it will.

The Five Mantras

- 1. equate smart with simple**
- 2. focus on what to think about (not what to think)**
- 3. utilize the power of compound learning**
- 4. understanding, strategies, and experience are necessary (but not enough)**
- 5. skills and habits determine outcome**

others, but in time, those with better habits and perspective generally not only make up for any lack of natural ability, they commonly end up with just as high a ceiling as those who started out a bit ahead. For the LSAT, you can start off at 140 and get to 170, or you can start off at 160 and end up at 160. You can't determine where you begin, but what you do (or don't do) to prepare *will* determine where your score ends up. There is no magic formula to getting in shape—you have to do the physical work. There is no magic formula to getting better at the LSAT either. The best way to ensure success is to deserve it.

What does it mean to be deserving of success? I'm sure you have a very good idea, and I'm sure it's similar to what's in my head—it involves hard, earnest work and honest self-reflection.

You can master the LSAT. I know you can. But it's not easy, and it requires the right mindset. Work on developing the right skills and the right habits, and be consistent in your study efforts. Ensure that you get the most out of your prep, and that your prep is truly getting you ready for the exam.

This book is unique among the LSAT systems that are available, in that it is built upon the five fundamental tenets that we've just discussed. This book is designed to help you learn concepts simply and correctly, to relate these concepts to the optimum strategies, and most importantly, to help you turn your understanding and strategies into skills and habits. *The Trainer* will lead you to do the smart, earnest, dedicated work that will leave you far more prepared and far more deserving of success than just about anyone else on test day.

The Road Ahead

Now that we have discussed the five basic tenets that should shape your thinking about how to prepare for the LSAT, let's briefly discuss the road that lies ahead of us.

This book is organized into forty different lessons, each meant to take between an hour and an hour and a half. These lessons are, ideally, meant to be done in conjunction with the *10 New Actual LSATs* book. Using clear, simple instruction, effective drills, and carefully chosen sample questions, we will work to develop a skill set that will leave you feeling confident and in control when you take the LSAT.

We will use the next three lessons to introduce each of the three types of sections that appear on the exam: Logical Reasoning, Logic Games, and Reading Comprehension. Following that, we will focus for a few lessons on just one section type at a time—we'll start by spending five lessons discussing Logical Reasoning. We'll conclude the book with some lessons that will bring together everything that we have learned.

As I just mentioned, this book is designed to be used in conjunction with the *10 New Actual LSATs* book, which is published by the LSAC. *The 10 New Actuals* contains ten previously administered LSAT exams—Practice Tests 52-61. We will be using these tests to do specific drill work, and we will also use them for our full practice exams.

At the beginning of your studies, your emphasis will be on developing your understanding and your strategies, and so you will be spending the bulk of your time in *The Trainer*. Later in your studies, when your emphasis will be on firming up effective habits, the bulk of your study time will be spent practicing and reviewing questions from the *10 New Actuals* book. Your study schedule (to be discussed shortly) will detail how to use the two books together.

Let's Get Ready to Study

I hope you enjoyed the relaxing read that this lesson presented. The truth is, the next three introductory lessons will also be mostly reading. After that, however...you better be ready to exercise those mental muscles. The rest of this book is going to be about you doing the work necessary to build up those skills and habits.

Preparing for the LSAT—just getting through this book, in fact—is going to take a whole lot of effort on your part. Let's make sure you are well organized as you begin

The LSAT Trainer ♥ 10 New Actuals

Why have I designed this book to be used in conjunction with the *10 New Actual LSATs* book? It's simple: you need to experience a large volume of practice questions in order to get in LSAT-taking shape, and the *10 New Actuals* book represents the most cost-effective way for you, as a student, to get copies of the most recent and relevant published LSAT questions. The LSAC charges licensing fees for books like *The Trainer* to publish official questions, and the fees that they charge publishers are significantly higher than what students pay for questions in the *10 New Actuals* book. If I were to include the volume of questions you should be doing as part of your preparation, you would be paying far more for those extra practice questions than you need to (or I would be losing a lot of money). On the other hand, using *The Trainer* in conjunction with *The 10 New Actuals* book is an extremely cost-effective way to prepare for the exam. Many students will feel that they need even more practice questions than what the *10 New Actuals* presents. If that is the case, you can purchase individual tests published by the LSAC, or opt for the more economical route by purchasing additional *10 Actuals* books. More recent exams are slightly more indicative of what you will see on your exam (most likely reflecting the natural biases of the people who happen to be in charge of putting together particular LSATs), and so you want to give these a higher priority. Still, there is, in general, a great amount of consistency in the LSAT exams that have been administered over the last decade or so, so older exams will also be very useful.

your study process so that you can get off to a good start and stay on track. To that end, here are the two steps for you to take to finish off your work for today.

One: Set Up Your Study Schedule

If you go on to the *Trainer* website, theLSATtrainer.com, and select the study schedule icon, you will see a variety of study schedules available for download. These schedules are set up to account for different study timelines, and they provide specific instructions about how to incorporate your *Trainer* work with the work you do in the *10 Actuals* book. There are also schedules available that offer guidance for students who want to do problems beyond the *10 New Actuals*.

Go ahead and select a study schedule, and fill in the assignments as per the instructions. Every student is different, but in general, I suggest that you limit yourself to one lesson each time you sit down to study. If you do want to study more than one lesson in one day, I suggest that you plan your study periods for different parts of the day—perhaps one lesson in the morning and one in the evening.

Two: Set Up Your Notebook

You are soon going to be absorbing a lot of information, and you are also, throughout this process, going to be constantly re-evaluating how you think about and solve questions. A notebook is a great tool to have for both organizing the new things that you learn, and keeping a record of the thought processes (say, the way you diagrammed a particular game) you've had on various questions.

On theLSATtrainer.com there is a notebook organizer file that you can download. You can, of course, also easily set up your own notebook to your own liking. I suggest that in any case you make sure to:

- 1) Clearly label each page of work, ideally with a date and other information such as question numbers or lesson number, so that you can more easily refer back to previous work if need be.
- 2) Separate your work into Logical Reasoning, Reading Comprehension, and Logic Games sections, or get separate folders for each.
- 3) Use a three-ring binder, or some other system that allows you to move around, add, and get rid of pages.

signing up for the exam

- the LSAT is administered four times a year, typically in February, June, October, and December
- you are allowed a maximum of three scored exams over any two-year period
- most schools only consider your highest LSAT score (but you should check with the individual schools that you are interested in)
- the registration fee is \$160, and the standard deadline is about six weeks before each exam
- find more information and register for the exam at www.lsac.org

2

logical reasoning basics

Half of your score will be based on how you perform on the two Logical Reasoning sections. Logical Reasoning questions are the most important types of questions for you to master.

In this lesson, we'll start getting to know Logical Reasoning questions, define our goals and our gauges, and chart a path to success. In just a couple of pages, we'll take a look at four questions that will give you a taste of what various Logical Reasoning questions feel like. Then we'll dig a bit deeper into the underlying design of those questions. We'll do this by discussing the priorities of the test writers, and the specific skills that Logical Reasoning questions require. These skills, and the habits required to apply them successfully, will also help us define the goals of our study process.

Next, we'll start discussing specific ways to *gauge* our progress. Whether or not we get a question correct is the most objective and blunt way to gauge comfort level and ability. However, the reality is, in order to get any one Logical Reasoning question correct, we need to do several things well, and a wrong turn at any one point can steer us toward the wrong answer. To get any one question right we need *many* skills. Thinking about whether we got questions right or wrong does not give us the type of detailed analysis we need to identify and address specific issues. Maybe we are missing a certain type of question because we don't actually understand exactly what the stem is asking for. Or maybe we misunderstand what we are supposed to be looking for in certain incorrect choices. Maybe there is a reasoning flaw that we consistently have trouble seeing. How, exactly, are we supposed to know?

Hopefully, one of the key benefits of this book will be that it helps you develop a clear, simple, and logical sense of what it is exactly that the exam requires of you at each step along the process. We'll get started on that in this lesson. One way we'll do this is by discussing the specific skills and habits that define top scorers. We'll also, both in this lesson and throughout the book, model the real-time performance of a top scorer, so that you can get a sense of his priorities, and so that you can compare and contrast your experience with his.

Having a clear sense of the end goals, having clear markers that tell you that you are fast on your way, and being able to reliably evaluate your performance on a step-by-step level, will help keep you in firm control of your study trajectory. It will not, unfortunately, mean that you will automatically improve at a certain pace; it will mean that you know what you are good at, and what you need to work on, and that you'll have a very good sense of what you need to accomplish in order to get where you want to be.

In this lesson, we'll start getting to know Logical Reasoning questions, define our goals and gauges, and chart a path to success

We will end this lesson by laying out a three-stage plan for conquering the Logical Reasoning section. We'll plan the work to be done at each stage and also discuss how to incorporate these Logical Reasoning lessons with the work that you do in the *10 New Actuals* book.

details, details

basic facts about logical reasoning

Two of your four scored sections will be Logical Reasoning.

Recently, all Logical Reasoning sections have had 25 (most common) or 26 (less common) questions.

25 questions in 35 minutes works out to about 1:20 per question. However, keep in mind certain questions should take far less time, and others are designed to take more.

Each question consists of a stimulus (or prompt), a question stem, and five answer choices.

The stimulus will typically be two to three sentences in length.

The question types are clearly defined and their frequencies are fairly consistent test to test. Question types are listed on page 36.

Each question has one clearly correct right answer and four clearly incorrect wrong answers.

In past years, occasionally there would be two questions related to one stimulus, but this trait has disappeared in recent years.

About 2/3 of all questions require a subjective approach from the test taker. All of the stimuli for all subjective questions contain arguments—reasons given to justify a point made. For all questions that require us to think critically, our job will be to evaluate the relationship between the conclusion reached and the support for that conclusion.

About 1/3 of all questions require an objective approach from the test taker. These questions require no evaluation of reasoning and are primarily designed to test reading abilities.

Over the course of a section, the difficulty of questions fluctuates according to somewhat consistent and predictable patterns (to be discussed in later lessons).

The average test taker gets anywhere from 10 - 12 wrong per 25-question section..

A 170+ test taker will consistently get anywhere from 0 - 3 wrong per 25-question section.

Sample Questions

Below are four Logical Reasoning questions that have appeared on past LSATs. Set a goal of completing all of them in 6 minutes or less, but take a bit more than that if you need to.

1. Most antidepressant drugs cause weight gain. While dieting can help reduce the amount of weight gained while taking such antidepressants, some weight gain is unlikely to be preventable.

The information above most strongly supports which one of the following?

- (A) A physician should not prescribe any antidepressant drug for a patient if that patient is overweight.
- (B) People who are trying to lose weight should not ask their doctors for an antidepressant drug.
- (C) At least some patients taking antidepressant drugs gain weight as a result of taking them.
- (D) The weight gain experienced by patients taking antidepressant drugs should be attributed to lack of dieting.
- (E) All patients taking antidepressant drugs should diet to maintain their weight.

2. Some statisticians claim that the surest way to increase the overall correctness of the total set of one's beliefs is: never change that set, except by rejecting a belief when given adequate evidence against it. However, if this were the only rule one followed, then whenever one were presented with any kind of evidence, one would have to either reject some of one's beliefs or else leave one's beliefs unchanged. But then, over time, one could only have fewer and fewer beliefs. Since we need many beliefs in order to survive, the statisticians' claim must be mistaken.

The argument is most vulnerable to criticism on the grounds that it

- (A) presumes, without providing any justification, that the surest way of increasing the overall correctness of the total set of one's beliefs must not hinder one's ability to survive
- (B) neglects the possibility that even while following the statisticians' rule, one might also accept new beliefs when presented with some kinds of evidence
- (C) overlooks the possibility that some large sets of beliefs are more correct overall than are some small sets of beliefs
- (D) takes for granted that one should accept some beliefs related to survival even when given adequate evidence against them
- (E) takes for granted that the beliefs we need in order to have many beliefs must all be correct beliefs

3. Several critics have claimed that any contemporary poet who writes formal poetry—poetry that is rhymed and metered—is performing a politically conservative act. This is plainly false. Consider Molly Peacock and Marilyn Hacker, two contemporary poets whose poetry is almost exclusively formal and yet who are themselves politically progressive feminists.

The conclusion drawn above follows logically if which one of the following is assumed?

- (A) No one who is a feminist is also politically conservative.
- (B) No poet who writes unrhymed or unmetered poetry is politically conservative.
- (C) No one who is politically progressive is capable of performing a politically conservative act.
- (D) Anyone who sometimes writes poetry that is not politically conservative never writes poetry that is politically conservative.
- (E) The content of a poet's work, not the work's form, is the most decisive factor in determining what political consequences, if any, the work will have.

4. The higher the altitude, the thinner the air. Since Mexico City's altitude is higher than that of Panama City, the air must be thinner in Mexico City than in Panama City.

Which one of the following arguments is most similar in its reasoning to the argument above?

- (A) As one gets older one gets wiser. Since Henrietta is older than her daughter, Henrietta must be wiser than her daughter.
- (B) The more egg whites used and the longer they are beaten, the fluffier the meringue. Since Lydia used more egg whites in her meringue than Joseph used in his, Lydia's meringue must be fluffier than Joseph's.
- (C) The people who run the fastest marathons these days are faster than the people who ran the fastest marathons ten years ago. Charles is a marathon runner. So Charles must run faster marathons these days than he did ten years ago.
- (D) The older a tree, the more rings it has. The tree in Lou's yard is older than the tree in Theresa's yard. Therefore, the tree in Lou's yard must have more rings than does the tree in Theresa's yard.
- (E) The bigger the vocabulary a language has, the harder it is to learn. English is harder to learn than Italian. Therefore, English must have a bigger vocabulary than Italian.

Logical Reasoning Questions Are Hard

Maybe not for you—maybe you found the four questions on the previous page to be a walk in the park. But keep in mind that, in order to get a 170+ score, you need to consistently be able to get about nine out of every ten of these questions correct, and you need to be able to do so in an extremely time-efficient manner.

Before we go further, let's just vent for a bit about why Logical Reasoning questions can be difficult:

- (1) The stimulus, or statement, contains a significant volume of information—information that seems connected but is also often disorganized. It can be too much information for us to retain all at once.
- (2) This volume of information contains an unusual number of specific details. You can't keep track of them all, but at the same time, it's tough to know which ones are more important, and which ones less so.
- (3) The question stems seem simple enough; but the test writers are actually asking you to do very specific things, and it's tough for you to know, at this point, exactly what they are going for.
- (4) The answer choices are often written in a way that makes it difficult to understand what they actually mean.
- (5) Finally, most of the answer choices are attractive in some way. Most answer choices are such that they could be correct if you thought about the stimulus or your task in a slightly different, slightly incorrect, way.

The worst part of it is that these issues compound one another. If, by the time you get to the answer choices, you have a good but not great understanding of the argument, and a good but not great understanding of the task presented to you in the question stem, it'll be next to impossible for you to anticipate the characteristics of the right and wrong answer choices. Without some sort of compass, your task of selecting the right answer becomes monumentally more difficult. Several answers may look attractive. The question may seem arbitrary, and right and wrong answers somewhat subjective.

How Do Questions Feel for Top Scorers?

They feel hard. However, the difference is that top scorers have the skills and habits necessary to meet the challenges.

Of course, in order to develop these skills and habits, it helps to know exactly what we are up against. Let's take a macro look at exactly what it is that Logical Reasoning questions are designed to test, and discuss how the questions test these issues. We'll return to the questions you just solved and discuss them in more detail later in this lesson.

Know What Matters

Do you remember first learning how to solve word problems in your elementary school math class? Neither do I, but I do know this: if told a story about adding three dogs to two dogs, some children will naturally think about what types of dogs they are, and others will naturally think about what $3 + 2$ is. Guess which ones will have an easier time learning how to solve word problems.

Logical Reasoning questions are very much like mathematical word problems. The math word problem has within it some specific underlying mathematical issue, and the purpose of the word problem is to gauge your mastery over this issue. To the writer of the word problem, the subject matter and the situation are secondary in importance, or at best, a tool to distract students from the math issues that are important.

Logical Reasoning problems have, buried within them, specific reading and reasoning issues, and the purpose of Logical Reasoning problems is to gauge your mastery over these issues. To the writers of these questions, the subject matter is secondary, or at best a tool to be used to distract.

It is, of course, to your advantage to be able to see questions in terms of what is important to the test writers—to be able to see the questions with the “covers off.” If you are consistently able to do so, you will find that the Logical Reasoning section becomes far more understandable and predictable. With that in mind, let’s talk in a basic and fundamental way about the three issues that Logical Reasoning questions are designed to test: your reading ability, your reasoning ability, and your mental discipline.

Logical Reading Questions Test Reading Ability

Reading is fundamental to daily modern human existence—we are all excellent readers, and we all read countless things every day. No standardized exam, certainly not one that only takes a few hours, can gauge something as varied and significant as general reading ability.

Why do I mention that? Because it leads us to something that is really important to understand, something most test takers do not: the LSAT does not test a broad range of reading skills—no standardized test of its type can. The LSAT is designed to gauge very specific reading skills—two such skills to be exact: your ability to read for reasoning structure, and your ability to understand the correct meaning of words that are used in common reasoning and discussion.

The *reasoning structure* of a statement is simply the relationship among the parts of that statement. We all naturally read for reasoning structure—always. When we see two sentences next to each other, without telling ourselves to, we think about, and, in general easily understand, how they are meant to go together.

The writers of Logical Reasoning questions are very interested in gauging exactly how good you are at being able to see how phrases are meant to go together. Most of the time the pieces will come together in order to service an **argument**, which, for the purposes of the LSAT, we can think of simply as a point made and reasons given for that point. If you are consistently able to see arguments clearly, the test writers will offer up reward after reward; for many questions, just seeing the argument clearly is *the key* to making your work far easier and faster.

The LSAT is designed to gauge two specific reading skills: your ability to read for reasoning structure, and your ability to understand the correct meaning of a few commonly used words

**An argument
consists of a
point and reasons
given to support
that point**

We will be discussing reasoning structure quite a bit in both the Logical Reasoning and Reading Comprehension sections. This is because I believe almost anyone can become extremely good at recognizing reasoning structure correctly, and I've seen time and time again that the ability to do so serves as a vital characteristic of all top scorers.

The other reading skill that you will be tested on is your ability to correctly understand the meaning of certain words commonly used in general reasoning and discussion, words like *must*, *because of*, *most likely*, *some*, and *or*. We will discuss all of these important terms in depth in future lessons.

As we briefly discussed in the initial lesson, the challenge of these words is that they are words we use every day without thinking, and in real life, even if we don't realize it, they are words that *change* in meaning per the context. If a waitress asks "Would you like soup or salad?" it's generally rude for you to respond "Both," but if you see a sign that says "To get in the movie you must be over 17 or with an adult," you understand that in this instance being "both" over 17 *and* with an adult is perfectly fine.

Lawyers have to be very careful about the exact meaning of words. The LSAT, as you might imagine, requires that you utilize a specific and consistent (that is, *not* contextual) understanding of words—such as *or*—that define specific reasoning relationships. The word "or" on the LSAT has just one meaning, and it does not change whether we are talking about soup or movies. For LSAT problems, it is essential that you pay the most attention to the words that define reasoning relationships, and that you have a specific and consistent understanding of what these words mean.

Many Logical Reasoning questions are about random or little-known subjects, and they often include terminology that you will not be totally comfortable with. But your attitude toward this should be as it would be toward the subjects in a tough math word problem—you should see the challenging topics and terminology as a distraction, not as keys to your success. The test writers don't expect you to know anything about these subjects, and even if you did know something, it wouldn't matter. They don't care how expansive your vocabulary is, and they don't care about your ability to guess at the meanings of words you don't know. The fact that an LSAT question is about some strange philosophical stance or some new scientific theory is of little consequence; going back to elementary school, whether the dogs in question were greyhounds or pink puppies, your focus should be on more important issues.

Logical Reasoning Tests Reasoning Ability

**When we are asked
to critically evaluate
reasoning in an
argument, our job
will always be to see
why reasons don't
justify a point**

Logical Reasoning questions are also designed to test your reasoning ability—that is, your ability to judge or form an opinion about the information that you are given in the stimulus. By far the most important reasoning relationships for us to judge are those that exist between a point, and the support given for that point, in an argument.

Let's imagine some different ways that they could test our ability to evaluate this relationship within arguments. Perhaps they could sometimes give us arguments that are valid—arguments for which the reasoning does justify the conclusion—and sometimes give us arguments that are not valid, and they could test our ability to decipher which ones are valid and which ones are not. Other questions could be set up much as a case is presented to a jury—we would be given a set of facts, and it would be up to us to determine whether the information proves the conclusion, doesn't prove it, or presents some sort of deadlock.

It's important to know that neither of these scenarios actually represent what will be asked of you on the LSAT.

When we are asked to evaluate the reasoning in an argument, it is always in terms of a very specific task: our job is *always* to evaluate and understand why the reasons given *do not* justify the point that is made. For every one of these questions, your understanding of why the support doesn't justify the conclusion will be your primary gauge for evaluating right and wrong answers.

Logical Reasoning problems do not ever require you to differentiate between valid and invalid reasoning within arguments. Instead, they test your ability to see, in a very specific way, why arguments are not valid. If you are good at this, you will be good at solving Logical Reasoning problems.

Logical Reasoning Tests Mental Discipline

We can define mental discipline as the ability to stay focused on the specific task at hand. Success on the LSAT requires extreme mental discipline, and the test is downright cruel to those who don't have it.

In terms of developing mental discipline, we give ourselves a huge head start when we have a clear understanding of the job, and of the best way to achieve it. But mental discipline takes far more than knowing. It requires sticking to that task—focusing on the argument, rather than the confusing background information; strengthening or weakening that argument, rather than just the point being made; not jumping to conclusions or forming opinions when the questions specifically ask for you not to judge; and remembering exactly what you are looking for in the right answer as you eliminate the wrong ones.

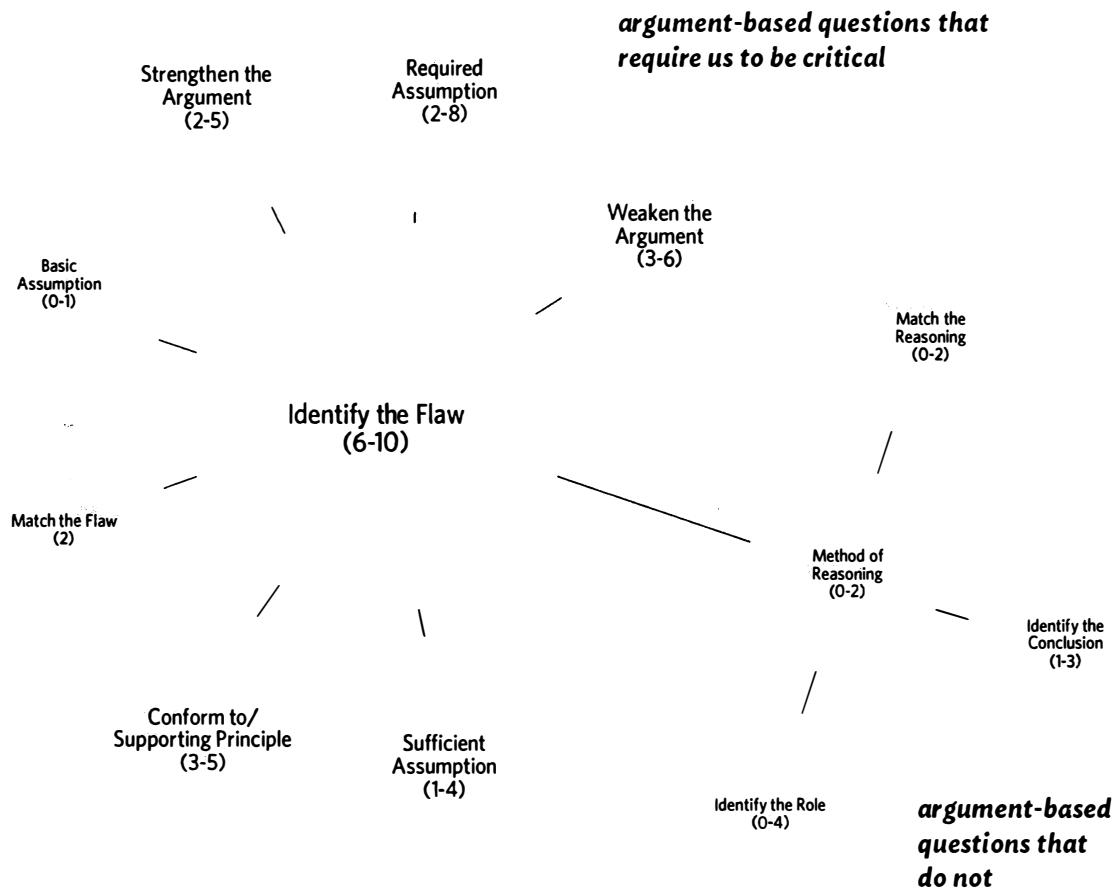
Your mental discipline is a fairly good representation of the power of your brain, just like the ability to lift a certain amount of weight is a fairly good representation of the power in your arms. Exercising those arm muscles is the best way to develop their strength; working questions correctly, over and over again, is the best way to develop mental discipline.

Logical Reasoning
tests reading
ability, reasoning
ability, and
mental discipline

**We can define
mental discipline
as the ability to stay
focused on the
specific task at hand**

The Constellation of Questions

Here is a visual representation of the various types of questions that you are likely to see on the Logical Reasoning section of the exam. We'll discuss these using more formal language later. Each type of question is unique, but, as you can see, they are related. The numbers represent the total of that question type that you are likely to see in the two Logical Reasoning sections combined.



outliers

A minority of questions are not about arguments.

Sample Question Solutions

Next to each of the four questions from before are the hypothetical real-time thoughts of a top-scoring test taker. Keep in mind that many of these thoughts would likely not be as conscious and explicit as I've made them here. In real time, many of these thoughts—for example, how to approach each of the different question types—would be automatic and intuitive, rather than explicitly laid out. Also note that the solutions I write are not meant to be “absolute” ways of thinking. No two test takers will think of every question the same way, and I won’t even think of the same question exactly the same way if I happen to look at it on two different days. Take these solutions to be examples of effective problem-solving. You don’t have to solve problems the same way that they are solved here, but you should be able to use these solutions to reflect on and gauge your own experience.

1. Most antidepressant drugs cause weight gain. While dieting can help reduce the amount of weight gained while taking such antidepressants, some weight gain is unlikely to be preventable.

The information above most strongly supports which one of the following?

- (A) A physician should not prescribe any antidepressant drug for a patient if that patient is overweight.
- (B) People who are trying to lose weight should not ask their doctors for an antidepressant drug.
- (C) At least some patients taking antidepressant drugs gain weight as a result of taking them.
- (D) The weight gain experienced by patients taking antidepressant drugs should be attributed to lack of dieting.
- (E) All patients taking antidepressant drugs should diet to maintain their weight.

Looking at the question stem: need to use stimulus to justify an answer choice.

Stimulus is about relationship between antidepressant drugs and weight gain. Antidepressant drugs cause weight gain, and you can try to do some stuff to combat the weight gain, but sometimes you can't avoid it. Okay, ready for the answers. Going to look for reasons why four answers are not supported by the text in the stimulus.

The stimulus says nothing about what a physician should or should not do (who says weight is more important than emotional health anyway?), so (A) is obviously not provable. (B) is not provable for pretty much the same reason—we’re told of a relationship between antidepressants and weight gain, but the stimulus doesn’t say anything about what anyone should do. (C) seems easy to justify—keep. (D) can’t be proved by the text—dieting helps reduce weight gain, but it’s not the sole contributing factor. (E) is clearly wrong for the same reasons (A) and (B) were—we don’t know what people should do. “All” patients taking such drugs? Maybe weight is not their main priority.

I’ve only got (C)—let’s make sure I can justify it—most drugs cause weight gain, and some of this gain is unlikely to be preventable. So, yes, it does seem that at least some patients taking the drugs gain weight as a result of them. (C) is correct.

Looking at the question stem: need to figure out what’s wrong with the argument. Start by finding the conclusion.

Point: claim that surest way to increase correctness of beliefs is to cut out wrong ones and not add new ones is mistaken.

Why? Because it would leave us with fewer and fewer beliefs, and we need many beliefs to survive.

What does survival have to do with correctness of beliefs? That’s the main problem. The author is using a premise about what we need to survive to try to prove a point about what does or doesn’t lead to overall correctness, whatever that is. Okay, ready to eliminate choices.

(A) looks similar to what I thought about—leave it. Confused as to what impact (B) would have, but know that it’s not the flaw—has little to do with the point and support. (C) also has very little to do with the point/support. (D) is about “beliefs related to survival”—that’s different from needing a lot of beliefs to survive, and it doesn’t relate directly to the issue of increasing correctness of beliefs. And (E) is not what is wrong with the argument either—he’s not saying the beliefs we need must be correct.

(A) is the only possibility—time to take a careful look. The author is saying something isn’t the surest way to increase correctness because it hinders one’s ability to survive, and he’s wrong for thinking that. (A) is it.

2. Some statisticians claim that the surest way to increase the overall correctness of the total set of one’s beliefs is: never change that set, except by rejecting a belief when given adequate evidence against it. However, if this were the only rule one followed, then whenever one were presented with any kind of evidence, one would have to either reject some of one’s beliefs or else leave one’s beliefs unchanged. But then, over time, one could only have fewer and fewer beliefs. Since we need many beliefs in order to survive, the statisticians’ claim must be mistaken.

The argument is most vulnerable to criticism on the grounds that it

- (A) presumes, without providing any justification, that the surest way of increasing the overall correctness of the total set of one’s beliefs must not hinder one’s ability to survive
- (B) neglects the possibility that even while following the statisticians’ rule, one might also accept new beliefs when presented with some kinds of evidence
- (C) overlooks the possibility that some large sets of beliefs are more correct overall than are some small sets of beliefs
- (D) takes for granted that one should accept some beliefs related to survival even when given adequate evidence against them
- (E) takes for granted that the beliefs we need in order to have many beliefs must all be correct beliefs

Sample Question Solutions

3. Several critics have claimed that any contemporary poet who writes formal poetry—poetry that is rhymed and metered—is performing a politically conservative act. This is plainly false. Consider Molly Peacock and Marilyn Hacker, two contemporary poets whose poetry is almost exclusively formal and yet who are themselves politically progressive feminists.

The conclusion drawn above follows logically if which one of the following is assumed?

- (A) No one who is a feminist is also politically conservative.
- (B) No poet who writes unrhymed or unmetered poetry is politically conservative.
- (C) No one who is politically progressive is capable of performing a politically conservative act.
- (D) Anyone who sometimes writes poetry that is not politically conservative never writes poetry that is politically conservative.
- (E) The content of a poet's work, not the work's form, is the most decisive factor in determining what political consequences, if any, the work will have.

Need to fix the hole in the argument and make the argument airtight. First, need to find the point.

Point: It's false to think writing any formal poetry is a conservative act.

Why? Two poets who do so are progressive feminists.

So what if they are feminists? Maybe they are feminists, but they happen to write poems about flowers and fairies. I need an answer that specifically shows formal poetry not being a conservative act.

(A) doesn't give us anything about the poetry. (B) is about other types of poets—doesn't matter here. (C) is interesting—would mean these progressive feminists can't write conservative stuff—leave it. (D) is a bit tricky, but we don't need to prove that these feminists would never write politically conservative poetry, just that they could write some that isn't conservative. (E) does not do nearly enough to make our conclusion air-tight.

That leaves only (C)—time to take a careful look. If (C) is true, since these two poets are progressive, that means they cannot write conservative poetry. That means the formal poetry they write is not conservative, and that is what I need to prove the point, (C) is correct.

4. The higher the altitude, the thinner the air. Since Mexico City's altitude is higher than that of Panama City, the air must be thinner in Mexico City than in Panama City.

Which one of the following arguments is most similar in its reasoning to the argument above?

- (A) As one gets older one gets wiser. Since Henrietta is older than her daughter, Henrietta must be wiser than her daughter.
- (B) The more egg whites used and the longer they are beaten, the fluffier the meringue. Since Lydia used more egg whites in her meringue than Joseph used in his, Lydia's meringue must be fluffier than Joseph's.
- (C) The people who run the fastest marathons these days are faster than the people who ran the fastest marathons ten years ago. Charles is a marathon runner. So Charles must run faster marathons these days than he did ten years ago.
- (D) The older a tree, the more rings it has. The tree in Lou's yard is older than the tree in Theresa's yard. Therefore, the tree in Lou's yard must have more rings than does the tree in Theresa's yard.
- (E) The bigger the vocabulary a language has, the harder it is to learn. English is harder to learn than Italian. Therefore, English must have a bigger vocabulary than Italian.

Need to match arguments.

Argument: Higher = thinner. X higher, therefore thinner. Got it. Time to eliminate mismatches.

(A) has a similar structure—leave it. (B)'s got two conditions—more egg whites and longer beaten—that's different from original—cut. (C) doesn't seem right, but can't quite figure out why—leave it. (D) looks good too—leave it. (E) reverses characteristic and consequence—cut.

Have to look carefully at (A), (C), and (D). (C) looked worst, so start there. The part about Charles getting faster is suspicious—original is about comparing two different places, not same place at different moments. Other problems with (C) too, like I don't know if Charles is one of the fastest runners. (A) actually has a similar problem—the premise is about changes within one person, not differences between people. Both (A) and (C) are actually not great matches.

Okay, down to (D)—older = more rings. That matches. X older, therefore, more rings. That's a good match. It's (D).

The Signs of Mastery

Now that you've gotten a little sample of the problem-solving process, let's broaden things out and define, in general, the characteristics of a top scorer in the Logical Reasoning section.

A top scorer...

- ...has a correct and usable understanding of the task that each type of question presents.
- ...intuitively prioritizes and correctly orders issues that most directly relate to that task.
- ...wastes little time on thoughts and decisions that do not directly relate to the task.
- ...knows when to look for an argument, and when not to.
- ...knows when to critique the argument, and when not to.
- ...is always able to identify the main point.
- ...is always able to identify the support.
- ...is almost always able to figure out why the support doesn't justify the conclusion.
- ...knows how much he's supposed to be able to anticipate about the right answer.
- ...is often able to predict the right answer.
- ...is always able to predict the characteristics of wrong answers.
- ...is able to readjust when an answer tips her off that she's missed something.
- ...has question-type-specific systems for eliminating wrong choices.
- ...has question-type-specific systems for confirming the right choice.
- ...expects a high level of certainty before pulling the trigger on an answer. That generally means knowing at least one absolute reason why each wrong answer is wrong, and having a very strong sense of why the right answer is right.

A top scorer does not need...

...the ability to retain a huge volume of information. This is a common misconception, understandable because at first you don't know where to focus your efforts. It seems you have to be accountable for every random bit of information in the stimulus. You don't. There are clues everywhere that help you prioritize the few things that you need to focus on.

...familiarity with a wide range of random and technical subject matter. As discussed, the subject matter generally serves as the background for more important issues.

...random bouts of creativity. Logical Reasoning questions reward flexibility, but they do not reward creativity. Questions require a very specific and literal understanding of the text and your task, and they reward organized and disciplined thinking. They do not require you to have moments of brilliance, and they do not require you to come up with unexpected ideas.

The Road Map to Mastery

Do you have it in you to gain Logical Reasoning mastery?

I firmly believe, based on what I know about this exam, and based on what I've experienced with students, that almost anyone who has a fairly strong command of the English language, and a good amount of common sense, can get to a high level of mastery with Logical Reasoning questions. The design of these questions has stayed extremely consistent over time, and they are all simple enough to be learnable. They make clear sense, and with practice you can get good at solving them.

Natural aptitude can affect the pace of improvement, but drive and work ethic are of far more importance to overall outcome

Natural aptitude does play a part in how long the learning process takes—for some of you, the design of the exam will just naturally better align with how you think, and so it will be easier to develop and habitualize skills. For others of you, the strategies and habits we discuss will butt against other instincts that you have (instincts that may serve you well in other parts of your life), and the path to improvement will be steeper and less direct.

However, in my experience, natural aptitude does not have as significant an impact on the overall outcome of the study process as you might think. Of far more importance is drive and work ethic. If you want it badly enough, and if you know how to work, you can get there.

We can think of our path to Logical Reasoning mastery in terms of three major stages:

Stage One

We are going to start our Logical Reasoning preparation by focusing on the reasoning and reading issues and strategies that are most critical to the most questions.

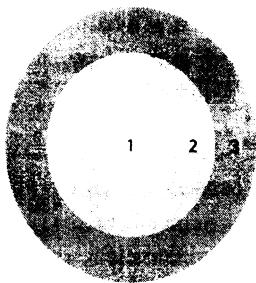
As we just discussed, the primary way in which the Logical Reasoning section tests your reasoning ability is by presenting arguments for which the support given does *not* justify the conclusion reached. The most significant job that your “elephant” must do, again and again, is to figure out exactly why the support given does not justify the conclusion reached. If your elephant is great at doing this, you will have the key skill necessary for Logical Reasoning success.

Getting good at seeing flaws will be the primary goal of our first stage. We will introduce and get experience with all of the different types of flaws that can appear in arguments, and we will work on systems of thought that will help us catch these flaws more consistently and accurately.

And what you will find along the way is that when you are focused on finding the flaw in the argument, you end up naturally *reading* the stimulus the way that you are supposed to—in a way that best matches the design of the questions. Therefore, as we learn more about reasoning flaws and become better at recognizing them, we will also be working on habitualizing the reading strategies that best align with the design of this exam.

Stage Two

The goal of this stage is to round out and solidify our understanding of all important issues, to develop a very clear understanding of the specific tasks that different questions present, and to start to habitualize question-specific approaches.



Stages to Mastery

- one:** get good at reading and critiquing LSAT arguments
- two:** get good at answering different types of questions
- three:** habitualize effective processes

Because the LSAT is largely a test of reading ability, it's understandable that the test writers are not casual with the language that they use—the entire exam is worded in a very specific and careful way. Nowhere is their attention to wording detail more evident than in the construction of their question stems. Each type of question presents a unique type of challenge, and the question stem lays out that challenge very specifically. No words are wasted, and every bit of information in that stem is critical to answering the question as efficiently and effectively as possible.

What complicates the challenge is that these various questions require skills and strategies that in some ways overlap, and in other ways don't. The way you solve a "strengthen" question is similar to how you solve a "required assumption" question; and, to put arbitrary numbers on it, 80% of the work you do for the two types of questions will be pretty much the same, and 20% of the work you do on the questions will be different. In order to develop general mastery, you need to have a very firm sense of that which is common to these questions—the 80%. At the same time, in order to reach the upper echelon of scorers, you also need to have a very clear sense of the *specific* challenges that questions present—the other 20%—and you need strategies that best align with these unique challenges.

Unfortunately, the vast majority of test takers go into the exam without a very clear sense of what each question requires, and consequently, they go in without strategies that best align with the design of each question. Perhaps, without even being conscious of it, they end up solving a required assumption question in pretty much the same way they might a strengthen question. That can work out most of the time, but that lack of specification will prevent them from getting beyond a certain level of accuracy.

The LSAT is designed to reward a specific understanding of task, and it punishes a fuzzy one. Evidence of this, as always, comes in the differentiation between right and wrong choices. The most attractive wrong answer for a Required Assumption question is commonly something that would strengthen the argument, but isn't an assumption that is required. The right answer might be tough to identify, even though it is required, because it doesn't impact or strengthen the conclusion as significantly as we would like.

In this second stage, we will carefully break down and discuss the specific tasks that the different question types present. We will do so with an eye toward how they are similar and how they are unique. We will also lay out and practice specific strategies that best align with the different types of questions.

Each type of question presents a unique type of challenge, and the question stem lays out that challenge very specifically

Stage Three

The final stage will consist of a significant amount of practice that will help solidify all of the skills that we've been working on, and help form them into effective problem solving habits. This work will mostly take place in the *10 Actuals* book.

**If you develop habits
that align with the
exam, you can focus
on the questions
rather than how to
solve them**

Imagine a top surgeon in the midst of surgery. This surgeon does not have to worry that he understands something correctly, and he doesn't have to consciously remind himself of the strategies he needs to use. His complete focus is on the needs of that specific patient, and he is naturally able to utilize his understanding and skills to the best of his ability. For us, the goal is that by the time you go into your LSAT, you won't have any concerns about what you know about the exam, and you won't have to consciously remind yourself of how to approach questions. You will be able to put your complete focus into understanding and getting correct the specific question that is put in front of you, and you will naturally be able to utilize your understanding and skills to the best of your abilities.

U.S.E. (or S.U.E.)

STAGE 1
U

Here is a visual representation of how our priorities evolve at different stages of our Logical Reasoning training. At first we want to pay extra attention to developing our understanding and strategies. As we get deeper in our process, the emphasis will shift toward gaining more and more real test experience.

S E

U = Understanding
S = Strategies
E = Experience



STAGE 3
U

S E

3

logic games basics

When we first begin preparing for the LSAT, we are, in general, far better prepared to tackle the Logical Reasoning or Reading Comprehension sections than we are the Logic Games section. In large part, that is because the things that we have to do and the thoughts we have to have for Logical Reasoning and Reading Comprehension questions don't seem as foreign to us.

Logic games are unique to the LSAT, and they are the most abstract aspect of the exam. They are abstract in that they have very little to do with real life, and playing them well is about handling a series of arbitrary rules. They really are *games*.

The Logic Games section is also commonly the most learnable of all sections. Countless people have started out absolutely lost as to how to solve Logic Games and ended up becoming Logic Games masters. In large part, this is because there is great commonality to all games, and all games questions follow fairly predictable design patterns. The games you see on your exam will be just like the games you see in your practice, if you know what to look for. When you think of most games from real life—Monopoly, Sudoku, poker, and such—you know that you can get better at them by learning and utilizing effective strategies, and by getting experience playing them. That's also absolutely true about Logic Games.

But when you start out it sure can be tough to believe that you will ever conquer the Logic Games section.

You can do it. This book is going to help.

By the time that we are through, there will be nothing about a game that surprises you, and you will have systems to handle every possible situation that can arise.

But we're getting ahead of ourselves. Try your hand at the game that appears on the next page before moving further.

Try This

This is a logic game and full set of questions that appeared on a previously administered LSAT. Do your best to answer the questions per the scenario and the rules given. Try to push the pace, but don't worry about timing for now. If you'd like to try the game again later, make sure to do your work on a separate page.

A messenger will deliver exactly seven packages—L, M, N, O, P, S, and T—one at a time, not necessarily in that order. The seven deliveries must be made according to the following conditions:

- P is delivered either first or seventh.
- The messenger delivers N at some time after delivering L.
- The messenger delivers T at some time after delivering M.
- The messenger delivers exactly one package between delivering L and delivering O, whether or not L is delivered before O.
- The messenger delivers exactly one package between delivering M and delivering P, whether or not M is delivered before P.

1. Which one of the following is an order in which the messenger could make the deliveries, from first to seventh?

- (A) L, N, S, O, M, T, P
- (B) M, T, P, S, L, N, O
- (C) O, S, L, N, M, T, P
- (D) P, N, M, S, O, T, L
- (E) P, T, M, S, L, N, O

4. If T is delivered fourth, the seventh package delivered must be

- (A) L
- (B) N
- (C) O
- (D) P
- (E) S

2. Which one of the following could be true?

- (A) N is delivered first.
- (B) T is delivered first.
- (C) T is delivered second.
- (D) M is delivered fourth.
- (E) S is delivered seventh.

5. If the messenger delivers M at some time after delivering O, the fifth package delivered could be any one of the following EXCEPT:

- (A) L
- (B) M
- (C) N
- (D) S
- (E) T

3. If N is delivered fourth, which one of the following could be true?

- (A) L is delivered first.
- (B) L is delivered second.
- (C) M is delivered third.
- (D) O is delivered fifth.
- (E) S is delivered first.

If that game felt easy for you, then fantastic. You've got a head start on just about everyone else. For most people, Logic Games don't feel as comfortable at first.

As we've mentioned before, the good news is that for most test takers, the Logic Games section is the most learnable of all of the sections. If you do the right type of work, you will get better. If you think you can improve at Monopoly or Sudoku with some practice, there is no reason for you to think you can't get better at Logic Games. *But...*

Of course the truth is that a tough Logic Game is harder than your typical Sudoku game, and of course the stakes are higher, and the competition fierce. To get really good—to feel like you have mastery—it takes hard, consistent, careful work.

In this lesson, we'll discuss the basics of the Logic Games section, the common challenges many test takers face, and the skills that top scorers have. Then we'll lay out a road map for how we're going to ensure that you go into the test ready for any Logic Game that can come your way.

**In this lesson,
we will discuss the
common challenges
that Logic Games
present, the skills
that top scorers
have, and our plan
for mastery**

details, details

basic facts about logic games

One of your four scored sections will be a Logic Games section.

Each Logic Games section has four games, and generally twenty-three questions.

Each game will have between five and seven questions associated with it.

Every game that has appeared on the LSAT this decade can be thought of in terms of elements to be assigned, and positions to be filled.

For two or three games in every four game set, the positions are organized in some sort of order.

For approximately half of all Logic Games, the positions are organized in groups.

Some games have positions organized by group and order. Almost no games have positions organized by neither group nor order.

Games are further complicated due to subgroups, or mismatching numbers issues.

For almost all test takers, a diagram is necessary for organizing the information given, and the ability to diagram well is a big key to success.

The purpose of a diagram is to represent what you know about a game in a clear and usable way, and to help facilitate bringing information together.

Of the twenty-three questions, all but two to four of them will come from a small bucket of basic question types. The remaining few will also come from an equally small bucket of minor question types.

For all Logic Games, there is some information that we can uncover, and some that we can't. All questions test your ability to differentiate between what is known, and what remains uncertain. A minority of questions also test your ability to consider a range of possibilities.

all games relate elements to positions

No matter what the specifics are of a particular game, all games are fundamentally about assigning elements to positions. In creating our diagrams, we will always use variables to represent elements and slots to represent positions. In general, we will begin our diagrams by writing out the elements and the slots.

F
G
H
J
K

The Challenge of Logic Games

So, why are Logic Games difficult? For people starting out, here are a few common reasons:

One: Logic Games are not, in many ways, what we think they are. As we've discussed, these games present a unique situation for our brains. When you first play, it's very easy to incorrectly associate it with other types of situations (e.g., other types of games, or other tests of reasoning ability), and it's also very easy to develop misconceptions about how these games work. Considering that these games require extremely careful and correct analysis, these misconceptions can have a big impact on your learning curve.

Two: Logic games require a lot from us. More specifically, Logic Games require us to juggle a lot of information. Some of this information is simple to understand, but some of it is not. Some of it is easy to diagram, and some of it is not. Regardless, when it comes time to answer questions, we have to somehow bring these disparate pieces together to make inference after inference after inference. Sometimes, a question will require that we make four or five inferences before we get to the one that's relevant to the correct answer. It can feel like juggling a bowling ball, a plastic bucket, and a flaming log, all at once.

Three: You don't have Logic Games-specific skills yet. Logic Games are like the long division you did in school, in that in order to work at our best, we have to utilize tools outside of our brains—we have to be able to write things out to think about them properly. The first few times any of us play games, we don't have any practiced strategies or skills—that means that even if we are writing things down and whatnot, we are not totally able to utilize these “outside of brain” tools. We end up overly dependent on what we can do with no tools, and these games are not designed to be solved that way. Very few of us are any good at long division without our pencil and paper methods for writing things out. The same goes for Logic Games.

The good news is that there is a great similarity to all Logic Games that appear on the exam, and very soon you will have systems that make it much easier for you to think about all of these games correctly. In exactly the same way that learning to do division on paper—as opposed to in your head—increased the range of division issues over which you felt mastery, your ability to diagram will have a drastic impact on your level of comfort and mastery.

How Logic Games Feel for Top Scorers

Top scorers find Logic Games to be challenging, just as everyone else does. Of course, the big difference is that top scorers have the skills to meet these challenges. Here are some characteristics that define Logic Games mastery:

One: Top scorers have the ability to comprehend and lay out a basic setup for any Logic Games scenario.

If you take soy sauce, sugar, sesame oil, and garlic, you can come up with hundreds of different and unique flavors. Something similar happens with Logic Games, but our first experience with them is akin to the person eating the food—what we might first notice is that there seems to be hundreds of different types of Logic Games. Okay, maybe not hundreds, but other strategy guides will divide Logic Games into dozens and dozens of different types for you to master. However, if you look at games from a slightly different perspective, you can see that there is great commonality to all of these games, and actually very little variation from the norm—they are all made of just a few basic ingredients. The simplest, and most effective way to develop a sound ability to “picture” any game is to develop a usable understanding of the fundamental issues that make up the structure of all games. To carry the analogy through, the best way to understand all of the various food dishes quickly and correctly is to develop a simple and usable understanding of the basic ingredients—soy sauce, sugar, sesame oil, and garlic.

Top scorers have a simple and usable understanding of the fundamental issues that underlie all games. This allows them to easily picture the basics of any game situation.

a note of caution

When thinking about improving at Logic Games, it's helpful to have a long-term perspective.

As we've mentioned, it's very natural for people to get better at Logic Games, and it's almost expected that you will make some significant improvement fairly quickly. For a lot of people, just becoming familiar with a few basic tools for diagramming is all it takes to make the first jump. (This is different from Logical Reasoning and Reading Comprehension, where score improvement commonly comes a bit later in the study process).

However, it's important to note here that the manner in which a person improves and thinks about his or her initial improvement can have a significant, often unseen, impact on how much the person can improve. Simply put, this has to do with the development of habits—you can develop sound fundamental habits that are easier to build upon, or you can develop “pretty good” patchwork habits that serve as a poor foundation for adding further

knowledge, and fall apart under the stress of the exam. An analogy can be made here to tennis or golf—you can get “pretty good” while developing bad habits in your form, “trick-shots” and “short-cuts,” but these bad habits can eventually prevent you from becoming awesome.

What are you meant to get out of this warning? Pay attention to your fundamentals—don't be eager to get to the “hard stuff.” I promise that if you understand the fundamentals really well, the hard stuff is actually not going to seem that hard at all. And don't let yourself off the hook when you don't understand something or feel uncomfortable with a strategy, especially in the earlier lessons. You may survive one game not knowing how to do something or not understanding the difference between two very similar rules, but you don't want to go into the test hoping you're going to see the games you feel comfortable with. You want to go into the exam confident that you can handle any game and any issue that they can throw your way.

Being able to start a game with a clear, organized understanding of the game situation makes everything else that you have to do far easier.

Two: Top scorers have the ability to understand all rules in a specific and usable way.

Imagine that you have a game for which you are splitting eight students into two different teams, A and B. Here are two different rules that you could get for this game:

“Mary and Jon will be assigned to different teams.”

“If Mary is assigned to team A, then Jon will be assigned to team B.”

Do you notice the difference in meaning between these two rules? We won’t go into too much detail here, but notice that per the first rule, Mary and Jon have to be on separate teams. Per the second rule, they do not.¹

Most of the rules that accompany Logic Games are not too difficult to understand. But when we think about the difference between the two rules above, you can see how...

1. Notice, per the second rule, that if Mary is on team A, Jon will be on Team B. Also, if Jon is on team A, we know Mary can't be, so Mary must be on team B. However, there is nothing preventing both Mary and Jon from being on team B.

- A. It's a challenge to understand each and every rule exactly.
- B. It's a challenge to notate the rules in such a way so that you don't confuse that meaning with your notation.
- C. It's a challenge to bring together your exact and usable understanding of various rules.

Again, the good news is that the same issues show up again and again in the games, and with practice you can develop the skills necessary to handle all subtleties effectively.

Three: Top scorers have the ability to recognize the keys to a game.

For every game, there is certain information, whether it be particular rules or particular inferences, that is most useful for thinking about the game easily and solving questions quickly. Often, prioritizing this information can mean the difference between a game and questions taking six minutes, or a game and questions taking ten minutes.

Even the best game players are not able to come up with this key thought or inference every single time, but many top scorers are able to do so very frequently, and what this means is that they may be able to get through two or three of the games in a section very quickly. This leaves them a lot more time to get through the other games.

Four: Top scorers rarely make diagramming mistakes, and they are able to recover when they do.

As you become more familiar with Logic Games, they will feel less and less like challenges of intelligence or cleverness, and more and more like challenges of consistency and mental discipline.

Most top scorers make very few diagramming errors, and, if you are going to invest time in Logic Games training, you should expect that your diagramming process will, in general, be error free.

But games are hard, and errors do happen. There will be moments when you misread a rule, or misunderstand a secondary ramification of a rule, or mis-diagram in some way. Again, you shouldn't expect for this to happen, but you've got to expect that it can.

The good news is that with the right experience and perspective, you should be able to quickly recognize when you've made a mistake, in large part because the process of solving questions won't "flow" in the way that you expect it to, and you should be able to recover in time to still get the questions correct.

Five: Top scorers have specific habits for solving specific types of questions.

The truth is that every single person who takes the LSAT wastes time thinking about issues that ultimately are unrelated to arriving at the correct answers. When you first start out, this is true for pretty much every single LSAT question that you try—even when you review a question you got right, you can find things you spent your time thinking about that ultimately didn't matter.

This inefficiency arguably hurts us the most in Logic Games relative to other sections because for most people, Logic Games is the section for which the time pressure is most significant. Top scorers are consistently able to think about the right things at the right time.

Six: Top scorers have confidence.

This is another statement from the "cheesy but true" category. Top scorers have confidence. Confidence is not enough to ensure a top score, but...

A lack of confidence almost always results in underperformance. This is because the games section requires us to make a lot of decisions—a lot of decisions that balance on top of other decisions—and all of us are worse at making decisions when we lack confidence in what we are doing. Students go into the games section lacking confidence if they don't have a simple and clear understanding of what can happen in the section and if they don't trust their skill set. Top scorers have confidence in their skills.

**The games section
requires us to make
lots of decisions,
and we are all worse
at making decisions
when we lack
confidence**

characteristics of mastery

Let's take a look at how the characteristics we've just discussed relate to the game that you played earlier.

1. The ability to comprehend and lay out a basic setup for any games scenario

All games involve placing elements into positions, and about two-thirds of all LSAT games require us to think about these positions in some sort of order. For this game, the seven elements that we must place are L, M, N, O, P, S, and T. The positions represent the order in which these elements are delivered, and we will work under the assumption that order goes from left to right.

2. The ability to understand all rules in a specific and usable way

If each game that appeared on the LSAT was unique, and if you had to consistently come up with ways to notate constraints, diagramming would be a far more difficult endeavor. However, this is not the case. There is great consistency to how games are designed.

Notice that the first rule is about which position a certain element can go in: P can go in first or seventh position. The rest of the rules are all rules that give us more information about the ordering of events. These are all very common types of rules, and we will get plenty of practice with them in the lessons to come. To the side are some effective (though not the only effective) ways to diagram the given rules.

3. The ability to recognize the keys to a game

For an ordering game, the most significant information to know about a game generally has to do with a large grouping of elements. For example, imagine a simpler game with six positions, and you happen to know the relationship between four of the elements that go in those positions. Your understanding of this relationship would certainly be central to your understanding of the game as a whole.

We don't have any such significant rule here, but we do have information about "clusters" of elements, and we can gather this information by bringing various rules together. We'll lay out an effective way to do so on the next page, but before you look, go ahead and think about which rules seem to go together, and think about the significance of the information these clusters give us.

4. The habits necessary to rarely make diagramming mistakes

...and we won't be making any mistakes in this example. We'll discuss ways to recover from such mistakes, if and when they do happen, in later lessons.

5. Specific methods for solving specific types of questions

One of the best ways to combat the significant time pressure that you will face on the exam is to have effective and specific strategies for each type of question. Just like there are no unique rules, there are no unique questions—each question that appears is of a common variety that has appeared on countless exams, and you can habitualize strategies that are most effective for each type of question. On the side are some basic tips on how to handle a sampling of the questions that we saw.

6. Confidence

On the following two pages is a full solution for this game. Note that success does not require brilliance—it does require the consistent execution of a lot of steps. A lack of confidence makes this task much more difficult.

A messenger will deliver exactly seven packages—L, M, N, O, P, S, and T—one at a time, not necessarily in that order. The seven deliveries must be made according to the following conditions:

P is delivered either first or seventh.

The messenger delivers N at some time after delivering L.

The messenger delivers T at some time after delivering M.

The messenger delivers exactly one package between delivering

L and delivering O, whether or not L is delivered before O.

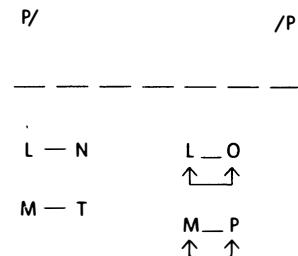
The messenger delivers exactly one package between delivering

M and delivering P, whether or not M is delivered before P.

1.



2.



We will almost always write out ordering games with left to right order. It matters less how we list the elements.

Here are the rules, diagrammed in the order in which they were given. During real games, we will rarely diagram rules in the order given. Rather, we'll diagram them in an order that is best for us.

3.

P is delivered either first or seventh.

The messenger delivers N at some time after delivering L.

The messenger delivers T at some time after delivering M.

The messenger delivers exactly one package between delivering L and delivering O, whether or not L is delivered before O.

The messenger delivers exactly one package between delivering M and delivering P, whether or not M is delivered before P.

Do you notice the overlap of elements in some of the rules? Can you picture how you could draw some of these rules together?

4.

2. Which one of the following could be true?

4. If T is delivered fourth, the seventh package delivered must be

Notice the different approaches that we want to use for these two questions.

If one answer could be true, that means four answers must be false, based on what we should already know about the game. For the first question, we should arrive at the right answer by eliminating the wrong ones.

The second question is conditional, and the expectation is that putting T in fourth determines who must go in seventh. In this case, we should make sure to figure out the right answer before looking at the answer choices.

The Skillful Solution

Let's take a step-by-step look at how a top scorer might solve the game in full.

Notice that this solution requires no brilliance or cleverness. It does require a full complement of skills and habits.

A messenger will deliver exactly seven packages—L, M, N, O, P, S, and T—one at a time, not necessarily in that order. The seven deliveries must be made according to the following conditions:

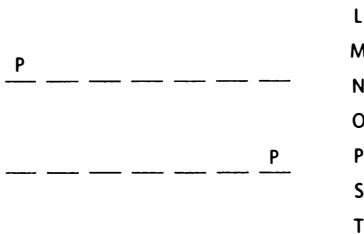
P is delivered either first or seventh.

The messenger delivers N at some time after delivering L.

The messenger delivers T at some time after delivering M.

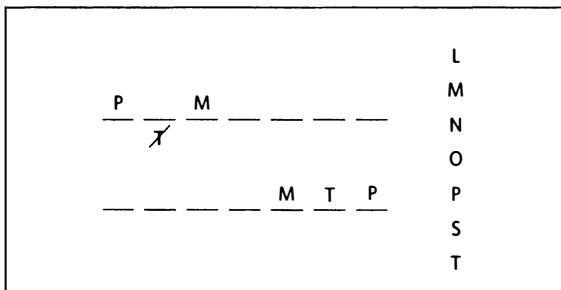
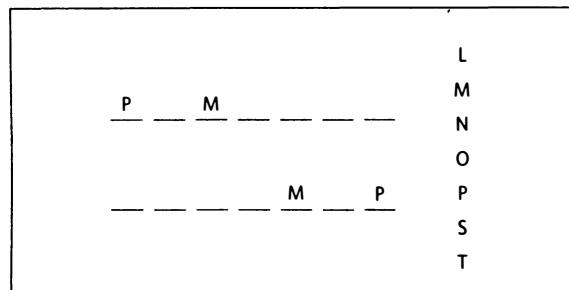
The messenger delivers exactly one package between delivering L and delivering O, whether or not L is delivered before O.

The messenger delivers exactly one package between delivering M and delivering P, whether or not M is delivered before P.



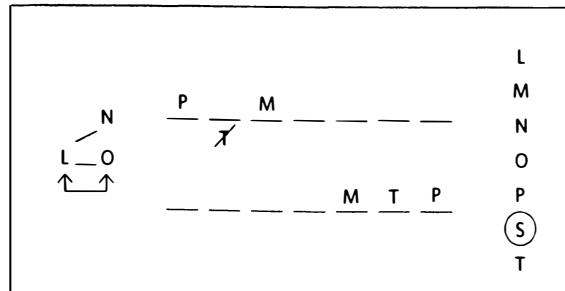
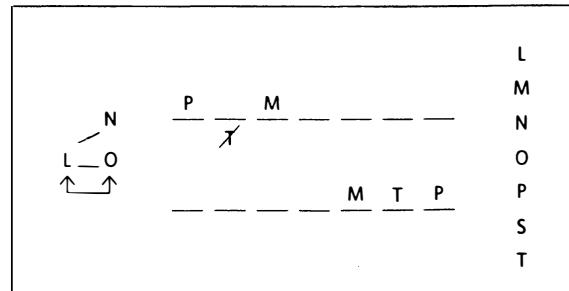
Step one: Notice that P is limited to one of two fixed positions, the last rule links M to P, and the third relates T to M. We can use this significant cluster of elements to organize the game.

Step two: Instead of using one diagram, we can branch off of the first rule and create two diagrams, one for when P is first, another for when P is seventh. This will help us better organize and keep on top of the information.



Step three: Since we've drawn P into the diagram, we can also draw in the rule about M being two spaces away from P. Notice how much better we can see the options for P and M than we would be able to if we had used just one diagram.

Step four: Now we need to incorporate the rule that T is after M. For the first diagram, that puts T in 4, 5, 6, or 7. That just means T is not in 2, and that's a clean way to notate that rule. For the second diagram, we know that T would have to go sixth.



Step five: Now we can diagram the remaining two rules. Notice that these rules also share an element in common, and so we can diagram these two rules together. After diagramming all rules, always check your picture against the rules one last time to make sure you've drawn everything clearly and correctly.

Step six: We want to take note of any elements that didn't get mentioned in the rules. These are “free agents” that can go anywhere. Lastly, we want to take a few more seconds to get very comfortable with our diagram and what it means; we'll need to utilize it quite a bit to answer the questions.

1. Which one of the following is an order in which the messenger could make the deliveries, from first to seventh?
- (A) L, N, S, O, M, T, P
 (B) M, T, P, S, L, N, O
 (C) O, S, L, N, M, T, P
 (D) P, N, M, S, O, T, L
 (E) P, T, M, S, L, N, O

2. Which one of the following could be true?
- (A) N is delivered first.
 (B) T is delivered first.
 (C) T is delivered second.
 (D) M is delivered fourth.
 (E) S is delivered seventh.

3. If N is delivered fourth, which one of the following could be true?
- (A) L is delivered first.
 (B) L is delivered second.
 (C) M is delivered third.
 (D) O is delivered fifth.
 (E) S is delivered first.

L/O S L/O N M T P

Almost all games begin with a question that asks you to identify one possible arrangement of elements. These questions are designed to test your understanding of the rules given, and these questions are very consistent in the way that they are written. Each of the wrong answers must violate at least one rule, and the fastest, most accurate way to arrive at the correct answer is to go down the list of the rules we were given (typically the only time we will use the list of rules instead of our diagram), and to eliminate answers that violate those rules. We can use the first rule (you can see the rules listed on the opposite page) to eliminate (B). We can use the second rule to eliminate (D). We can use the third rule to eliminate (E). We can use the fourth rule to eliminate (A). That leaves us with (C) as the correct answer.

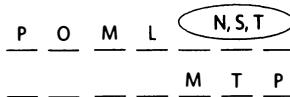
We know, per the way the question is asked, that one answer is something that could be true based on what we know of the game, and four answers are ones that must be false. In this situation, it's generally faster and more accurate to eliminate the four answers that must be false than it is to test out all answers to see which one could be true. We can see that in either of our two diagrams, neither (A), (B), (C), nor (D) can be true. Therefore, (E) is **correct**. To confirm, we can come up with a way that works with S seventh: P, L, M, O, N, T, S.

This question is also asking what could be true, but it also comes with a condition: N is delivered fourth. When we are given a condition, invariably there will be additional information we can figure out from this condition, and this additional information will always be what is key to answering the question. If N is delivered fourth, we know that the first diagram is not an option (no place for L – O / O – L). In the second diagram, if N is fourth, L and O can go in 1 and 3 (in either order) and that leaves S for the second spot. In this case, since we've figured out so much, it's easy to jump to the right answer: (A) is **correct**. It's also very easy to eliminate all the wrong ones, and we can do so to confirm our work.

4. If T is delivered fourth, the seventh package delivered must be
- (A) L
 (B) N
 (C) O
 (D) P
 (E) S

P S M T L N O

5. If the messenger delivers M at some time after delivering O, the fifth package delivered could be any one of the following EXCEPT:
- (A) L
 (B) M
 (C) N
 (D) S
 (E) T



We want to start by placing T fourth, and we know that this should eventually tell us which package is in seventh. If T is fourth, we know the second diagram can't work, so we're just left with the first. With T in that fourth position, the only place for L – O to go is 5 – 7, and, since L needs to go before N and we need a place for N to go, that means L must be in 5, and O must be in 7. The correct answer is (C), and because this was a question for which we identified the answer before looking at the choices, we don't need to worry about eliminating wrong choices.

M can be delivered after O in either of our diagrams. In the first diagram, M can be delivered after O if O is delivered second. That puts L into the fourth spot. That leaves us with N, S, and T for the remaining three spots, and there are no more rules that restrict where these three elements can now go. So, N, S, and T are all possibilities for the fifth package. In the second of our diagrams, M can be delivered after O in any number of ways, but, of course, in all these different options, M must be the fifth item delivered. That leaves us with N, S, T, and M as the possible options for the fifth delivery. Since we are looking for the one answer that can't be our fifth delivery, (A) is **correct**.

The Road Map to Mastery

Our path to Logic Games mastery is going to take us through three main phases:

One: We will work to develop simple and effective diagramming strategies.

The key to Logic Games success is your ability to comprehend and accurately diagram the situations presented. If you are consistently able to do these two things, your outcome will mostly be a matter of execution.

As we've discussed, all games are constructed according to a few fundamental principles. Become comfortable with these principles, and get practiced at utilizing a simple diagramming system that intuitively ties in to your understanding of the game, and you are going to be well on your way to success.

In this first phase, we will work to develop a simple and usable understanding of all the major issues that can arise in Logic Games. We will also lay out basic diagramming strategies for these various issues and begin to get practice at incorporating these strategies into real-time solutions.

Two: We'll work to develop question-specific strategies.

As mentioned before, there are just a few different types of questions that appear in the games section. However, each type of question requires a somewhat unique thought process. Immersing ourselves more and more into full and actual LSAT games, we'll work to develop a simple and correct understanding of the tasks that each question stem presents, and we'll work through exercises that will further help incorporate our understanding and strategies into how we solve questions in real time.

Three: We'll fine-tune our skills and firm up our habits.

Of course, we'll be playing games throughout the learning process, but in this phase the playing of games will take center stage. We'll use these games to finalize and fine-tune our strategies, and to complete the process of making our strategies as intuitive as possible. We'll also use various systems to analyze and isolate any final weaknesses and work to knead out those final issues.

4

reading comprehension basics

It is very hard—next to impossible—for us to change the way that we walk. You can try it if you'd like. We can do it for five minutes, maybe ten, but soon enough, we'll end up walking the same way we always do. The same thing goes for how we drive, and how we talk. Our conscious efforts are no match for such ingrained and instinctual habits.

All of this also applies to how we read. Reading is one of the most amazing things that human beings can do, and it's something we do by habit, because it takes skills that are well beyond our conscious ability. That's why it's very difficult to change, or even just impact, the way that we read. We can't do it on a purely conscious level; that is, we can't read differently just by telling ourselves to read differently.

But here's the thing: your brain knows how to walk differently in different situations. It is incredible at adapting. When you walk by someone you find attractive, the way that you walk literally changes—whether you know it or not. If a tiger is chasing you, you'll change your walk into a really fast version—a *run*—and you won't need to think about this on a conscious level for it to happen.

Your brain also knows how to adapt to different reading situations. It's amazing at it. Your brain reads a newspaper article differently than it does a recipe, or a work e-mail, or a letter from a friend. It knows that sometimes its job is to be critical, and at other times its purpose is to be empathetic. Again, we adapt almost perfectly, without any conscious effort.

The problem is that your brain does not know how to read LSAT passages. It doesn't yet have the information or experience to have correct instincts. What we need to do is supply it with exactly the right information about how to approach LSAT reading passages. We also need to get plenty of experience, with specific and useful reinforcement, so that we can turn these reading instincts into habits.

Take a look at this next passage, and try your best to answer the accompanying questions. Keep track of your time, but don't prioritize timing for now.

We read by
habit, and we
can't change
how we read
just by
wanting to

Sample Passage and Questions

On this page and the next are an LSAT passage and all the questions that accompanied that passage when it originally appeared. Time yourself as you read the passage and solve the questions, but do not, at this point, worry about sacrificing accuracy for speed. We will discuss the passage and questions in detail in just a bit.

Experts anticipate that global atmospheric concentrations of carbon dioxide (CO_2) will have doubled by the end of the twenty-first century. It is known that CO_2 can contribute to global warming by trapping solar energy that is being reradiated as heat from the Earth's surface. However, some research has suggested that elevated CO_2 levels could enhance the photosynthetic rates of plants, resulting in a lush world of agricultural abundance, and that this CO_2 fertilization effect might eventually decrease the rate of global warming. The increased vegetation in such an environment could be counted on to draw more CO_2 from the atmosphere. The level of CO_2 would thus increase at a lower rate than many experts have predicted.

However, while a number of recent studies confirm that plant growth would be generally enhanced in an atmosphere rich in CO_2 , they also suggest that increased CO_2 would differentially increase the growth rate of different species of plants, which could eventually result in decreased agricultural yields. Certain important crops such as corn and sugarcane that currently have higher photosynthetic efficiencies than other plants may lose that edge in an atmosphere rich in CO_2 . Patterson and Flint have shown that these important crops may experience yield reductions because of the increased performance of certain weeds. Such differences in growth rates between plant species could also alter ecosystem stability. Studies have shown that within rangeland regions, for example, a weedy grass grows much better with plentiful CO_2 than do three other grasses. Because this weedy grass predisposes land to burning, its potential increase may lead to greater numbers of and more severe wildfires in future rangeland communities.

It is clear that the CO_2 fertilization effect does not guarantee the lush world of agricultural abundance that once seemed likely, but what about the potential for the increased uptake of CO_2 to decrease the rate of global warming? Some studies suggest that the changes accompanying global warming will not improve the ability of terrestrial ecosystems to absorb CO_2 . Billings' simulation of global warming conditions in wet tundra grasslands showed that the level of CO_2 actually increased. Plant growth did increase under these conditions because of warmer temperatures and increased CO_2 levels. But as the permafrost melted, more peat (accumulated dead plant material) began to decompose. This process in turn liberated more CO_2 to the atmosphere. Billings estimated that if summer temperatures rose four degrees Celsius, the tundra would liberate 50 percent more CO_2 than it does currently. In a warmer world, increased plant growth, which could absorb CO_2 from the atmosphere, would not compensate for this rapid increase in decomposition rates. This observation is particularly important because high-latitude habitats such as the tundra are expected to experience the greatest temperature increase.

15. Which one of the following best states the main point of the passage?

- (A) Elevated levels of CO_2 would enhance photosynthetic rates, thus increasing plant growth and agricultural yields.
- (B) Recent studies have yielded contradictory findings about the benefits of increased levels of CO_2 on agricultural productivity.
- (C) The possible beneficial effects of increased levels of CO_2 on plant growth and global warming have been overstated.
- (D) Increased levels of CO_2 would enhance the growth rates of certain plants, but would inhibit the growth rates of other plants.
- (E) Increased levels of CO_2 would increase plant growth, but the rate of global warming would ultimately increase.

16. The passage suggests that the hypothesis mentioned in the first paragraph is not entirely accurate because it fails to take into account which one of the following in predicting the effects of increased vegetation on the rate of global warming?

- (A) Increased levels of CO_2 will increase the photosynthetic rates of many species of plants.
- (B) Increased plant growth cannot compensate for increased rates of decomposition caused by warmer temperatures.
- (C) Low-latitude habitats will experience the greatest increases in temperature in an atmosphere high in CO_2 .
- (D) Increased levels of CO_2 will change patterns of plant growth and thus will alter the distribution of peat.
- (E) Increases in vegetation can be counted on to draw more CO_2 from the atmosphere.

17. Which one of the following best describes the function of the last paragraph of the passage?

- (A) It presents research that may undermine a hypothesis presented in the first paragraph.
- (B) It presents solutions for a problem discussed in the first and second paragraphs.
- (C) It provides an additional explanation for a phenomenon described in the first paragraph.
- (D) It provides experimental data in support of a theory described in the preceding paragraph.
- (E) It raises a question that may cast doubt on information presented in the preceding paragraph.

Sample Passage and Questions

18. The passage suggests that Patterson and Flint would be most likely to agree with which one of the following statements about increased levels of CO₂ in the Earth's atmosphere?
- (A) They will not increase the growth rates of most species of plants.
(B) They will inhibit the growth of most crops, thus causing substantial decreases in agricultural yields.
(C) They are unlikely to increase the growth rates of plants with lower photosynthetic efficiencies.
(D) They will increase the growth rates of certain species of plants more than the growth rates of other species of plants.
(E) They will not affect the photosynthetic rates of plants that currently have the highest photosynthetic efficiencies.
19. The author would be most likely to agree with which one of the following statements about the conclusions drawn on the basis of the research on plant growth mentioned in the first paragraph of the passage?
- (A) The conclusions are correct in suggesting that increased levels of CO₂ will increase the photosynthetic rates of certain plants.
(B) The conclusions are correct in suggesting that increased levels of CO₂ will guarantee abundances of certain important crops.
(C) The conclusions are correct in suggesting that increased plant growth will reverse the process of global warming.
(D) The conclusions are incorrect in suggesting that enhanced plant growth could lead to abundances of certain species of plants.
(E) The conclusions are incorrect in suggesting that vegetation can draw CO₂ from the atmosphere.
20. The passage supports which one of the following statements about peat in wet tundra grasslands?
- (A) More of it would decompose if temperatures rose four degrees Celsius.
(B) It could help absorb CO₂ from the atmosphere if temperatures rose four degrees Celsius.
(C) It will not decompose unless temperatures rise four degrees Celsius.
(D) It decomposes more quickly than peat found in regions at lower latitudes.
(E) More of it accumulates in regions at lower latitudes.
21. Which one of the following, if true, is LEAST consistent with the hypothesis mentioned in lines 22–25 (*sentence starting “Certain important crops” in paragraph two*)* of the passage?
- (A) The roots of certain tree species grow more rapidly when the amount of CO₂ in the atmosphere increases, thus permitting the trees to expand into habitats formerly dominated by grasses with high photosynthetic efficiencies.
(B) When grown in an atmosphere high in CO₂, certain weeds with low photosynthetic efficiencies begin to thrive in cultivated farmlands formerly dominated by agricultural crops.
(C) When trees of a species with a high photosynthetic efficiency and grasses of a species with a low photosynthetic efficiency were placed in an atmosphere high in CO₂, the trees grew more quickly than the grasses.
(D) When two different species of grass with equivalent photosynthetic efficiency were placed in an atmosphere high in CO₂, one species grew much more rapidly and crowded the slower-growing species out of the growing area.
(E) The number of leguminous plants decreased in an atmosphere rich in CO₂, thus diminishing soil fertility and limiting the types of plant species that could thrive in certain habitats.
22. According to the passage, Billings' research addresses which one of the following questions?
- (A) Which kind of habitat will experience the greatest temperature increase in an atmosphere high in CO₂?
(B) How much will summer temperatures rise if levels of CO₂ double by the end of the twenty-first century?
(C) Will enhanced plant growth necessarily decrease the rate of global warming that has been predicted by experts?
(D) Would plant growth be differentially enhanced if atmospheric concentrations of CO₂ were to double by the end of the twenty-first century?
(E) Does peat decompose more rapidly in wet tundra grasslands than it does in other types of habitats when atmospheric concentrations of CO₂ increase?

* Note that because passages have been reformatted, they are presented here without the original line numbers—questions that reference line numbers will thus include a brief description, in italics, of where to find the relevant information.

LSAT Reading Comprehension

Imagine that you answer a help wanted ad in your local newspaper, and somehow end up writing Reading Comprehension questions for the makers of the LSAT. They supply you the passage and ask you to come up with some questions. What types of questions would you come up with? I imagine that most of you would be able to come up with some very good ones.

**Reading
Comprehension
questions are
carefully
constructed,
and their design
is consistent from
passage to passage,
and exam to exam**

Could the scene above actually play out? The part that's perhaps most suspicious is that the LSAC, the makers of the LSAT, gives you this assignment to write questions without more specific instruction—without far more specific instruction. Keep in mind that the LSAT is a standardized test, a *highly* standardized test, which means that each challenge presented to the test taker has been accounted for and carefully calculated.

LSAT Reading Comprehension questions are not about random reading issues. They are very carefully constructed, and their designs are extremely consistent from passage to passage and exam to exam. LSAT Reading Comprehension passages test us on just a few, very specific skills, and they test us in the same ways over and over again.

Therefore, as I mentioned before, the key to Reading Comprehension success is to train yourself so that your reading strategies and priorities perfectly align to the challenges that are typically present on the LSAT—the challenges the test writers are interested in. You want to read an LSAT reading passage in a very different way than you read other things in your life; in fact, the way that you want to read LSAT reading passages is likely very different from how you've read passages on other standardized tests. We want to make this reading method so habitual that you don't have to consciously control it (because you can't anyway). When your reading habits align with the specific challenges of Reading Comprehension, you will find yourself anticipating certain questions, and you will find the challenge of differentiating between right and wrong answers to be far more clear-cut.

**Your ability
to read for
reasoning structure
will be the
key determinant of
your success**

What Reading Comprehension Tests

In Lesson 1, we broke down all three sections in terms of the two skill sets that they test: reading ability and reasoning ability. Whereas Logical Reasoning tests both skill sets about equally, and the Logic Games section prioritizes your reasoning ability, Reading Comprehension is almost entirely about your reading ability. Two or three questions per section may ask you to use a bit of reasoning—to find an answer to strengthen the author's point, for example—but by and large almost all of the challenges presented in the section are designed to test your reading, rather than reasoning, abilities.

Additionally, there is one particular reading skill that is of the most interest to the test writers: your ability to recognize and correctly understand reasoning structure. We've discussed reasoning structure already in the Logical Reasoning introduction—reasoning structure is the relationship between the various components of a passage. If you understand what parts are meant to be main points, what parts are meant to support those points, and so on, then you have a clear understanding of reasoning structure.

The Challenges of Reading Comprehension

In light of what we've just discussed, let's consider the general challenges that the Reading Comprehension section presents:

One: Passages can be dense and full of complex or subtle details.

Furthermore, the most difficult questions tend to be associated with those passages that have the most complex or nuanced content. Not only are these complex details necessary for answering certain questions, they impact our ability to read for reasoning structure. Most of us are not as good at using our reading ability when we are faced with unfamiliar subject matter.

Two: Central issues or passage structure can be complex or subtle.

When you think about a great piece of clothing, it can be great because of the materials (the substance of it) or the design (the use of that substance). Reading Comprehension passages can be difficult because of the content—the details involved—or because of the reasoning structure—the relationship between those details.

As you'll see with more experience, most reading passages will present two opposing viewpoints on some sort of issue (one opinion versus another on how a certain law should be interpreted, or an old scientific theory versus the one that replaced it). However, the relationship between these two sides is not always clear-cut—in fact, it can be extremely subtle. Furthermore, most passages will inform us of the author's opinion of the content, but often this opinion will be given to us in vague ways, and the opinion can also be somewhat complex. Perhaps a passage will present two sides of an argument, and the author will hint that he somewhat agrees with one side, and feels uncertain about the other.

Three: Questions require us to see the forest and the trees.

That is, in order to answer questions successfully, we need to have a strong sense of the general structure of the passage, and, at the same time, we need to have a very clear sense of the details that are directly relevant to specific questions.

So, many test takers end up trying to focus on both the big picture and the details as they read. In fact, most other preparation books, by giving you a laundry list of thirty specific and general things to notice as you read, indirectly point you toward just that tactic. But here's the thing—we can't do both well at the same time. Trying to see both the forest and the trees turns us into schizophrenic readers, and we end up doing both poorly. The key to success is to focus on the big picture as you initially read the passage, and to utilize specific details during the problem-solving process. We'll discuss this strategy quite a bit more in the lessons to come.

We are not
very good at
reading for the
big picture and for
small details
at the same
time, and there
is no need
for us to try

Characteristics of Top Scorers

Of course, just as no two people walk in exactly the same way, no two test takers, even top scorers, read in exactly the same way. Still, there is great commonality among those who are able to complete Reading Comprehension sections with few or no misses. Here are some of the key ones:

Top scorers...

...naturally and intuitively read for reasoning structure. It's not just that they know it's important—it's what they think about as they read. That is, as they are reading that super-complicated sentence about a physics experiment, they are less concerned with understanding all of the intricacies of the experiment, and more concerned with figuring out *why*, exactly, the author has chosen to tell us this information.

...are able to recognize when to slow down to carefully absorb important details. As we discussed, trying to absorb every single detail in a passage is an exercise in futility. Effective reading is about prioritizing. Top scorers are able to focus in on details when it is important for them to do so. During the initial read, the details most important to absorb are those that tell us of the main point at issue, and those that hint at the author's opinion. During the process of answering questions, other details will become important when they need to be used to confirm right answers and eliminate wrong ones.

...always know to look out for and are able to recognize subtle hints that point toward author bias or opinion. Most passages give us hints as to what the author feels about the issue at hand. Often these hints are subtle and *seemingly* secondary to the more important parts of a passage, but any hint of author bias is extremely important, for it gets to the heart of understanding reasoning structure—understanding why the author wrote a particular passage and structured it the way he did. Though generally very little text in a passage is dedicated to opinions, the opinions discussed in passages are generally central to the questions, and in particular, you can expect at least a question or two that hinges on an understanding of the author's opinion. A top scorer understands how important this opinion is and is always able to dig it out.

...has a clear understanding of what each question is asking. LSAT writers do not mince words. Many Reading Comprehension questions sound similar, but subtle differences in wording (such as “according to the passage” versus “the passage suggests”) can have a significant impact on what is required of the right answers and what defines wrong answers. We will spend several lessons discussing how to think about and solve specific types of questions. A top scorer, by the time she goes into the exam, will have an exact understanding of all the different types of Reading Comprehension questions that can be asked.

...are able to anticipate characteristics of the right answers for most questions. They are able to do so based on what they are given in the question stem. Now, there are some questions that, per their design, do not have answers that are predictable (such as “The passage mentions which of the following?”). However, most question stems give you a more specific sense of what to look for in a right answer, and top scorers are able to use this understanding to perform the next two steps well.

...are able to consistently and confidently eliminate incorrect answers. There are few characteristics that differentiate top scorers more than the ability to eliminate incorrect answers. If you understand the passage and your task well, the characteristics of incorrect answers become much clearer and more obvious. Furthermore, top scorers recognize that eliminating wrong choices first not only increases overall consistency and accuracy, it also helps make the search for the right answer easier.

Finally, top scorers know when they are certain that an answer is correct, and when they are not. Most top scorers will still have at least a couple of Reading Comprehension questions per section for which they cannot feel certain that they got the correct answer (it's really helpful, in these instances, to have strong elimination skills). However, they will rarely, if ever, have a situation in which they feel certain they got a question right, only to find out they did not. Top scorers know the feeling of matching an answer exactly to the task presented in the question stem, and, more importantly, they have systems for confirming their work. You can feel certain of your answer if it matches what you anticipated, and if you are able to verify it based on the relevant text. Top scorers have these skills.

why do we miss questions?

How do you think you did on the sample passage? If you think you nailed all of the questions, great. If you missed some, even better! Early on in your process, misses are fine—they are better than fine; they are really useful, for they show us exactly what we need to improve on to get the score that we want. This test is conquerable, and the best students are the ones who are best at identifying and reacting to challenges (forgive me if I repeat that a few more times throughout the book). We'll talk about assessing our issues in much greater detail in later lessons, but for now, here are a few basic and effective ways to think about your misses. When we miss questions, we do so for one or more of three reasons:

We misunderstand the reasoning structure of the passage

The most significant issues have to do with not recognizing the main points (reading passages very commonly juxtapose two opposing main points about a central issue), and not recognizing the author's opinion about the subject matter. Misunderstanding the reasoning structure of a passage has exactly the same impact that mis-diagramming a Logic Game has: you may just have a small hint that you're doing something wrong as you make your mistake, but the consequences truly reveal themselves at the point of the questions. If you truly understand reasoning structure, most questions will play out as you expect. If you understand it, every question will feel like an uphill battle.

We do not read carefully enough

There is a Catch-22 here. If you try to read the entire passage as carefully as you possibly can, giving each word ample due, chances are you'll do a terrible job of actually understanding what you are reading. Reading is about bringing words together, and you need a certain distance to do that. What you want to do is float like a butterfly and sting like a bee; be a generalist, but zero in on details when it necessary to do so. One such necessary moment is during the evaluation of answer choices. Their challenge is often in the wording, and often right and wrong answers are differentiated by subtle wording issues.

We approach the question incorrectly

LSAT questions ask very specific things, and require very specific steps from us. Sometimes, we miss questions because we don't think about the answer choices in exactly the right way in relation to the question being asked, and sometimes we miss questions because we don't think about the things we should be thinking about per what we are being asked to do. A question stem is an incredibly useful tool—it generally tells us exactly what we need to look for in an answer, and, if you read carefully enough and know what to look for, it also often tells us how to go about getting that answer. As you become more and more familiar with the exam and the questions, you should expect this last one to become less and less of an issue.

Sample Solution

Here is a solution to the passage and questions you tried earlier. Much of the solution is presented in terms of the real-time thoughts a top scorer might have during an exam.

Real Time Thoughts

Experts anticipate that global atmospheric concentrations of carbon dioxide (CO_2) will have doubled by the end of the twenty-first century. It is known that CO_2 can contribute to global warming by trapping solar energy that is being reradiated as heat from the Earth's surface. However, some research has suggested that elevated CO_2 levels could enhance the photosynthetic rates of plants, resulting in a lush world of agricultural abundance, and that this CO_2 fertilization effect might eventually decrease the rate of global warming. The increased vegetation in such an environment could be counted on to draw more CO_2 from the atmosphere. The level of CO_2 would thus increase at a lower rate than many experts have predicted.

However, while a number of recent studies confirm that plant growth would be generally enhanced in an atmosphere rich in CO_2 , they also suggest that increased CO_2 would differentially increase the growth rate of different species of plants, which could eventually result in decreased agricultural yields. Certain important crops such as corn and sugarcane that currently have higher photosynthetic efficiencies than other plants may lose that edge in an atmosphere rich in CO_2 . Patterson and Flint have shown that these important crops may experience yield reductions because of the increased performance of certain weeds. Such differences in growth rates between plant species could also alter ecosystem stability. Studies have shown that within rangeland regions, for example, a weedy grass grows much better with plentiful CO_2 than do three other grasses. Because this weedy grass predisposes land to burning, its potential increase may lead to greater numbers of and more severe wildfires in future rangeland communities.

It is clear that the CO_2 fertilization effect does not guarantee the lush world of agricultural abundance that once seemed likely, but what about the potential for the increased uptake of CO_2 to decrease the rate of global warming? Some studies suggest that the changes accompanying global warming will not improve the ability of terrestrial ecosystems to absorb CO_2 . Billings' simulation of global warming conditions in wet tundra grasslands showed that the level of CO_2 actually increased. Plant growth did increase under these conditions because of warmer temperatures and increased CO_2 levels. But as the permafrost melted, more peat (accumulated dead plant material) began to decompose. This process in turn liberated more CO_2 to the atmosphere. Billings estimated that if summer temperatures rose four degrees Celsius, the tundra would liberate 50 percent more CO_2 than it does currently. In a warmer world, increased plant growth, which could absorb CO_2 from the atmosphere, would not compensate for this rapid increase in decomposition rates. This observation is particularly important because high-latitude habitats such as the tundra are expected to experience the greatest temperature increase.

Why Did the Author Write the Passage?

The author wrote this passage to evaluate a specific theory about the consequences of increasing CO_2 levels on global warming: that increased CO_2 could lead to a more lush world, which would lead to more plants which could absorb CO_2 , thus lowering the rate of global warming. This theory, and the background necessary to understand it, is presented at the beginning of the passage, and the author spends the rest of the passage presenting points and evidence that are meant to challenge and go against the theory.

How Is the Passage Structured?

In paragraph 1, we are given a general scenario (CO_2 levels are rising, and that is known to cause global warming) and a theory about the scenario (increasing CO_2 will actually lead to lushness, which will lead to slower rate of global warming).

Paragraph 2 takes issue with one aspect of the theory (lushness), and presents evidence to challenge that idea.

Paragraph 3 takes issue with another aspect of the theory (increased CO_2 /decreased rate of global warming), and presents evidence to challenge that idea.

- background: passage is about consequences of increasing CO_2 levels

- opinion: increased CO_2 could lead to lush green world, which could lead to decreased rate of global warming. This is probably the central issue.

- author opinion: CO_2 would impact plants differently, and so wouldn't lead to overall lushness

- support

- confirmation of main point from previous paragraph

- CO_2 increase also unlikely to lead to more absorption of CO_2 / decrease in global warming

- support

Sample Solution

15. Which one of the following best states the main point of the passage?

- (A) Elevated levels of CO₂ would enhance photosynthetic rates, thus increasing plant growth and agricultural yields.
- (B) Recent studies have yielded contradictory findings about the benefits of increased levels of CO₂ on agricultural productivity.
- (C) The possible beneficial effects of increased levels of CO₂ on plant growth and global warming have been overstated.
- (D) Increased levels of CO₂ would enhance the growth rates of certain plants, but would inhibit the growth rates of other plants.
- (E) Increased levels of CO₂ would increase plant growth, but the rate of global warming would ultimately increase.

Stem: asking for main point—passage presents theory that increased CO₂ could lead to more lushness, which could lead to slower rate of global warming, then spends majority of text countering that theory.

Answers: you want to always eliminate wrong choices first—(A) is more like the opposite of the main point, so we can cut it. (B) is tempting, but the author does not discuss findings that contradict one another, and (B) does not represent well the main point the author is making, so we can cut it. (C) seems like a good answer, so we can leave it. (D) is a part of the passage, but not the main point—cut. (E) goes beyond the text—nowhere does the author state that the rate of global warming is likely to increase. (C) is the only answer remaining—double check it—the theory in the first paragraph is about a possible benefit of increasing CO₂ levels, and the rest of the passage presents information that indicates that the theory may not be correct. (C) is the right answer.

16. The passage suggests that the hypothesis mentioned in the first paragraph is not entirely accurate because it fails to take into account which one of the following in predicting the effects of increased vegetation on the rate of global warming?

- (A) Increased levels of CO₂ will increase the photosynthetic rates of many species of plants.
- (B) Increased plant growth cannot compensate for increased rates of decomposition caused by warmer temperatures.
- (C) Low-latitude habitats will experience the greatest increases in temperature in an atmosphere high in CO₂.
- (D) Increased levels of CO₂ will change patterns of plant growth and thus will alter the distribution of peat.
- (E) Increases in vegetation can be counted on to draw more CO₂ from the atmosphere.

Stem: asking for a flaw with the theory being challenged—the right answer could be a lot of things, so I should first try to eliminate obvious wrong answers.

Answers: (A) is not something the author states, and we can cut it. (B) looks really good—that's basically what the last paragraph was about. (C) is wrong relative to what the text says, so we can cut that too. (D) seems attractive—I'll leave it. (E) is what the theory proposes, so it's not something the theory fails to take into account.

Down to (B) and (D)—(B) still looks good, but looking at (D) again, it's a bit suspicious—it's not changes in patterns of plant growth that alter “distribution of peat”—rather, the author discusses temperature directly impacting peat. (D) is wrong. The part of the last paragraph starting with “Some studies” and ending with “liberated more CO₂ into the atmosphere” seems to support (B). It's correct.

17. Which one of the following best describes the function of the last paragraph of the passage?

- (A) It presents research that may undermine a hypothesis presented in the first paragraph.
- (B) It presents solutions for a problem discussed in the first and second paragraphs.
- (C) It provides an additional explanation for a phenomenon described in the first paragraph.
- (D) It provides experimental data in support of a theory described in the preceding paragraph.
- (E) It raises a question that may cast doubt on information presented in the preceding paragraph.

Stem: asking for the function of the last paragraph—we know it's meant to counter the theory in the first paragraph.

Answers: (A) is almost definitely correct—it's what I anticipated—leave it. Take a quick scan though the rest of the choices—(B), (C), (D), and (E) clearly misrepresent the reasoning structure. (A) is correct.

Sample Solution

18. The passage suggests that Patterson and Flint would be most likely to agree with which one of the following statements about increased levels of CO₂ in the Earth's atmosphere?

- (A) They will not increase the growth rates of most species of plants.
- (B) They will inhibit the growth of most crops, thus causing substantial decreases in agricultural yields.
- (C) They are unlikely to increase the growth rates of plants with lower photosynthetic efficiencies.
- (D) They will increase the growth rates of certain species of plants more than the growth rates of other species of plants.
- (E) They will not affect the photosynthetic rates of plants that currently have the highest photosynthetic efficiencies.

19. The author would be most likely to agree with which one of the following statements about the conclusions drawn on the basis of the research on plant growth mentioned in the first paragraph of the passage?

- (A) The conclusions are correct in suggesting that increased levels of CO₂ will increase the photosynthetic rates of certain plants.
- (B) The conclusions are correct in suggesting that increased levels of CO₂ will guarantee abundances of certain important crops.
- (C) The conclusions are correct in suggesting that increased plant growth will reverse the process of global warming.
- (D) The conclusions are incorrect in suggesting that enhanced plant growth could lead to abundances of certain species of plants.
- (E) The conclusions are incorrect in suggesting that vegetation can draw CO₂ from the atmosphere.

20. The passage supports which one of the following statements about peat in wet tundra grasslands?

- (A) More of it would decompose if temperatures rose four degrees Celsius.
- (B) It could help absorb CO₂ from the atmosphere if temperatures rose four degrees Celsius.
- (C) It will not decompose unless temperatures rise four degrees Celsius.
- (D) It decomposes more quickly than peat found in regions at lower latitudes.
- (E) More of it accumulates in regions at lower latitudes.

Stem: asking about what Patterson and Flint would agree with (they are mentioned in the second paragraph): showed that important crops may show reductions because of weeds.

Answers: “Most species of plants” in (A) goes well beyond what they discussed—cut. “Most” in (B) helps us cut that too. (C) doesn’t match text (which is about highly photosynthetic plants having trouble) too well—cut. (D) is easy to match with text, and almost definitely correct—leave. (E) clearly goes against the text—cut.

(D) seems to be correct—check it again—weeds growing faster than corn—yup—they would agree with (D), and it’s correct.

Stem: I know that most of the passage is about why the author questions the conclusion reached—let’s see what I can do with these answers.

Answers: (A) is something the author does agree with—it will certainly help rates of certain plants—leave it. (B) is clearly wrong—“abundance of important crops” goes against the stuff about corn. (C) goes against big point the author is making, so we can cut it. (D) is not correct either—the author does think it will lead to abundance of certain plants—cut. (E) is just silly—of course the author believes the theory is correct in this regard.

(A) is the only decent answer—let me confirm with the text—yup—text says that certain crops with higher photosynthetic efficiencies may lose their edge (meaning others plants will increase their photosynthetic rates and catch up). (A) is correct.

Stem: I know that the peat grew at a lot faster rate with higher temperature, and more peat=more CO₂.

Answers: (A) seems to match the text well—leave it. (B) doesn’t match what the text says about the peat—cut. (C) also doesn’t match text—temperature only impacts rate of decomposition. (D) goes beyond text and is too general a blanket statement (all regions at lower latitudes?)—cut. (E) doesn’t match text at all.

(A) is the only attractive answer—let me confirm—text says increase in temperature leads to increase in peat, so it definitely supports (A). (A) is correct.

Sample Solution

21. Which one of the following, if true, is LEAST consistent with the hypothesis mentioned in lines 22–25 (sentence starting “Certain important crops” in paragraph two) of the passage?

- (A) The roots of certain tree species grow more rapidly when the amount of CO₂ in the atmosphere increases, thus permitting the trees to expand into habitats formerly dominated by grasses with high photosynthetic efficiencies.
- (B) When grown in an atmosphere high in CO₂, certain weeds with low photosynthetic efficiencies begin to thrive in cultivated farmlands formerly dominated by agricultural crops.
- (C) When trees of a species with a high photosynthetic efficiency and grasses of a species with a low photosynthetic efficiency were placed in an atmosphere high in CO₂, the trees grew more quickly than the grasses.
- (D) When two different species of grass with equivalent photosynthetic efficiency were placed in an atmosphere high in CO₂, one species grew much more rapidly and crowded the slower-growing species out the growing area.
- (E) The number of leguminous plants decreased in an atmosphere rich in CO₂, thus diminishing soil fertility and limiting the types of plant species that could thrive in certain habitats.

22. According to the passage, Billings’ research addresses which one of the following questions?

- (A) Which kind of habitat will experience the greatest temperature increase in an atmosphere high in CO₂?
- (B) How much will summer temperatures rise if levels of CO₂ double by the end of the twenty-first century?
- (C) Will enhanced plant growth necessarily decrease the rate of global warming that has been predicted by experts?
- (D) Would plant growth be differentially enhanced if atmospheric concentrations of CO₂ were to double by the end of the twenty-first century?
- (E) Does peat decompose more rapidly in wet tundra grasslands than it does in other types of habitats when atmospheric concentrations of CO₂ increase?

Stem: asking about something that goes against hypothesis that with more CO₂, crops with higher photosynthetic efficiencies will lose edge to those with lower efficiencies.

Answers: (A) is tempting, but not clear if trees also had high photosynthetic properties—cut. (B) also is missing high vs low factor—cut. (C) definitely goes against the theory—it’s probably correct. (D) and (E) are both missing the high vs low factor. (C) is correct, for it shows high beating low in an environment rich in CO₂.

Stem: asking about Billings—looking back, in Billings’ study, global warming led to increased plant growth in wet tundra grasslands, but increased CO₂ because of increase in decomposition of peat.

Answers: Billings doesn’t compare areas, so (A) is out. (B) is too specific—cut. Not sure if his study addresses (C) exactly, but it’s tempting—leave it. (D) is also tempting, I guess—leave it. He doesn’t compare areas, so (E) is out.

I don’t love any answer, but I’m down to (C) and (D). Checking (C) against the text, it does seem to match it pretty well—the plants are growing more, but there is also more CO₂ (which the text tells us leads to global warming). Looking at (D) again, it’s just too specific—doubling seems pretty drastic, and his research is about what happens to plant growth with warmer temperatures, not with increased CO₂. (D) is definitely incorrect, and so (C) is correct.

The Road Map to Mastery

Even if you are in terrific physical shape, if you are used to just doing a few particular activities, you will often find that when you switch activities—learning a new sport for example—you’ll end up using certain muscles you’ve been unknowingly neglecting, or you’ll end up using the same muscles you’ve used before but in a slightly different way. You’ll realize you are “in shape” for certain activities but not others, and as a result, you’ll wake up feeling sore the next day.

Most of us are in pretty good reading shape. However, LSAT reading requires more from us, and it requires us to exercise our mental muscles in relatively unique ways. None of us, at first, are in optimal “shape” to read the LSAT. Through practice and drilling, you can drastically improve your reading shape as it pertains to this exam.

How are we going to get there? Our Reading Comprehension training plan is going to take us through three main phases:

Phase one: We’ll learn how to read LSAT passages.

As we mentioned before, the Reading Comprehension on the LSAT is unique, and if you approach it without much of a strategy, or if you approach it with a general understanding of what it is that they are testing, you simply will not be able to represent your abilities at their best. Reading the passage in the right way is the most important aspect of your Reading Comprehension success.

details, details

basic facts about reading comprehension

One of your four scored sections will be a Reading Comprehension section.

Each Reading Comprehension section contains four passages, along with six to eight questions per passage.

Your Reading Comprehension section will most likely contain 27 questions.

Each full section contains one passage on each of the following subjects: law, science, history, and the humanities.

The subjects are chosen to not give an unfair advantage to any particular group. The subjects will either be arcane (e.g., Willa Cather) or very general (e.g., weather patterns).

Questions will be asked about the passage as a whole, particular paragraphs, sentences, phrases, or individual words.

Questions will test your understanding of why the author wrote the passage, and they will test your ability to rec-

ognize and understand the correct meaning of specific components.

The reading ability most tested and most important is your ability to read for reasoning structure. Questions will test that you understand the structure of the passage as a whole, and they will test whether you correctly understand the roles specific components play.

As with the other sections, our job is never to choose between two viable answers. There is always one absolutely right answer and four absolutely wrong answers.

All questions require careful reading. Wrong answers are often wrong because of subtle wording issues. Most questions require very little extrapolation, and most right answers are directly related to the given text.

In general, the first passage will be the easiest passage, but this will not always be true.

The Reading Comprehension section is very carefully designed to test particular skills in particular ways. It's very clear exactly what they are testing, and what they are not. In this phase, we will focus on developing a clear understanding of exactly how LSAT Reading Comprehension is designed, and we'll work on developing reading strategies that align with LSAT passages and questions. We'll practice all of this while working through real LSAT passages.

Phase two: We'll develop question-specific strategies.

Once you feel comfortable with the basic structure of LSAT passages, and once you have a base of understanding in terms of what this section is designed to test, we will delve into question-specific strategies. We'll discuss each of the different types of questions that you can encounter, work through what you can expect in the right answer and four wrong choices, and of course give you plenty of practice to help facilitate the natural flow between your learning, strategies, and experience.

Phase three: We'll work to set final habits.

In this last phase, we will work to ensure that everything we have learned, and all of the strategies that we've derived, can be seamlessly integrated into your performance. Focusing primarily on practicing and reviewing real LSAT passages, we'll make sure that you are ready to go into the exam with a specific skill set that aligns with the exam, and that you go into the exam in awesome reading shape.

We will learn
how to read
passages, develop
question-specific
approaches,
and set
effective habits

Recap of Lessons One through Four

Here is a quick summary of some of the main points that we have discussed in these first four lessons:

The LSAT is a test of reading ability and reasoning ability. It is also a test of mental discipline. The Logical Reasoning section tests both reading and reasoning ability, most commonly by testing your ability to understand and critique *arguments*. The Logic Games section primarily tests your ability to reason, and the Reading Comprehension section, as we've been discussing, is primarily designed to test specific aspects of your reading ability.

Success on the LSAT is most directly dependent on two factors: your skills and your habits. Therefore, the primary purpose of your training should be to develop skills and effective habits. We do so by increasing our understanding, by developing effective strategies, and by gaining more experience with the exam. Our skills and habits grow most quickly and effectively when these three components—understanding, strategies, and experience—influence one another. *The Trainer* is designed to help you first develop the skills and habits that are most *fundamentally* important for success on the exam. From there, we will work to carefully grow out our skill set and habits until we've addressed every specific aspect of the exam.

The Road Ahead

If you are following one of the suggested study schedules, the next step for you will be to take a full-length diagnostic. This will give you a good sense of what the questions feel like in real time, and it will, of course, also give you a good sense of what your initial strengths and weaknesses are. At this point, there is no need to review the exam afterwards in depth (though you are certainly welcome to if you'd like). The reason I mention that is because you will be assigned to do all of the problems from this practice test again as part of your homework, and, when you do these problems again later in your process, it will likely be easier for you to evaluate them more objectively and accurately.

Starting from the next lesson, we are going to focus for several lessons at a time on one section type at a time, so that we can get fully immersed. In time, we will gradually cycle through multiple sets of lessons on Logical Reasoning, Logic Games, and Reading Comprehension lessons.

Here's a look ahead at the next few sets:

Lessons 5 through 9 are going to be our first set of Logical Reasoning lessons. We will use these lessons to develop our ability to understand and critique arguments.

Lessons 10 through 15 will get us immersed into Logic Games preparation. We will use these lessons to lay out all the various possibilities for Logic Games and to develop our ability to diagram any and all such scenarios.

Then, for Lessons 16 through 20, we will go back to Logical Reasoning, and we'll start to discuss more specifically how to apply our assessment of the stimulus to the various tasks that different types of questions present. We'll have our first set of in-depth Reading Comprehension lessons after that.

5

LOGICAL REASONING

flaws

There are many skills that are necessary for success on the Logical Reasoning sections, but there is one particular skill that is of far more importance than all others: the key to Logical Reasoning success is your ability to see what is wrong with arguments. If you are consistently able to do this, questions will become easier—stimuli that seemed impossibly convoluted before will become far simpler to understand and organize, incorrect answers will seem much more obviously so, and correct answers will be far more predictable across a broad spectrum of question types.

The majority of questions that appear in the Logical Reasoning section require you to be critical of the reasoning relationship between a conclusion reached and the reasoning given for that conclusion. If, in some of these situations, the reasoning did just happen to justify the conclusion, this would be a far different exam, and many of the strategies that appear in the following lessons would be completely different. However, this is not the case. Every single time a question requires that you evaluate reasoning critically, the support given will not justify the point made. In every single one of these situations, your ability to see as clearly as possible why the support doesn't justify the conclusion will be fundamental to the task that the question presents.

Furthermore, it just so happens that developing your ability to evaluate critically will make you better at answering questions that have nothing to do with critically evaluating arguments—that minority of questions that require us to be non-judgmental. Reading for reasoning flaws helps you develop certain habits—such as organizing stimuli in terms of argument structure—that naturally align with many of those other questions.

So, as we said before, the key to Logical Reasoning success is your ability to see what is wrong with arguments. That's what we're going to work on now, and that's what we're going to get really, really good at first. Let's start with some basics.

**The key to
Logical Reasoning
success is your
ability to see
what is wrong
with arguments**

Know Where to Look for the Flaw

Reasoning flaws
exist between
the support
and the
conclusion

Imagine you saw the following argument on the LSAT: “Ghosts can only be seen by those with kind hearts. Mother Teresa is revered as a person of great kindness. However, she never saw a ghost in her entire life. Therefore, she does not have a kind heart.”

Terrible argument, I know. But why, exactly? If you heard it in real life, you could come up with a lot of reasons why it is flawed, I’m sure. However, it’s important for you to know that, in terms of the LSAT, not all flaws are important. The LSAT is only interested in a certain type of flaw—a flaw in the relationship between the conclusion reached and the support used:

Perhaps you disagree with the idea that Mother Teresa has no kindness, and perhaps you know of other examples from her life that justify a different conclusion. However, the flaw that you see in the conclusion has nothing to do with reasoning. It’s simply an opinion that you happen to disagree with.

Perhaps you disagree with the idea that ghosts can only be seen by those who have kind hearts. Maybe you don’t believe that ghosts are real. But there is no reasoning in this statement. The flaw you see is again simply based on your opinion of the premise.

The LSAT is not a test of opinions. When we encounter an argument on the LSAT, our job is not to evaluate the truth of the conclusion, nor is it to evaluate the truth of the support. Our job is to focus in on one specific arena—the use of that support to justify that conclusion. If we take the support to be true, is it enough, by itself, to absolutely prove the main point?

If we take it to be true that ghosts can only be seen by those with kind hearts, does this absolutely prove that Mother Teresa did not have kindness? No, it doesn’t. Why not? Because we only know that ghosts *can* only be seen by those with kindness—this does not tell us that everyone with kindness must have seen at least one ghost. Maybe Mother Teresa does have a kind heart, but she simply never had an opportunity to see a ghost. This is what is wrong with the reasoning of the argument.

opinions vs. flaws of reasoning

“Harry Potter is the most popular book series of our time. Therefore, it’s the one book series from our era that will most likely be read by future generations.”

You may disagree with the idea that Harry Potter is the most popular series of our time...
You may disagree with the idea that it will be the series most likely read by future generations...

But the reasoning flaw has to do with the use of that support to justify the conclusion:

Just because it’s popular now doesn’t mean that future generations will read it.

Mindset Is Critical

We are all experts at evaluating arguments—we hear people (and advertisements) make arguments all day, every day. And whether we are aware of it or not, when we evaluate these arguments, we always do so with a little bit of bias. The word “bias” has many negative connotations, but it’s a natural human instinct, and it’s a part of our intelligence. When Stephen King makes an argument about how to write a good horror story, you tend to believe it more than you might if your struggling-writer-neighbor-who-seems-not-so-bright says exactly the same thing.

In terms of the LSAT, the aspect of our bias that is most important is our natural instinct to either try and go along with an argument, or to be critical of it. It is to your great advantage to think about Logical Reasoning questions from the latter of those perspectives. You don’t want to think about arguments in terms of “How could it be that this conclusion is valid?”, and you don’t think about them in terms of “Does this support validate the conclusion?” In every instance it won’t. And in every instance your focus needs to be, “Why doesn’t the support justify the point?” It is to your great advantage to focus on this, and we’ll do a lot of work together in this book to ensure that by test day this is habit. Every time you are asked to be critical of an argument, you want to think to yourself:

- 1) What’s the point?
- 2) How’s it supported?
- 3) What’s wrong with that?

Our goal is ambitious: you are going to get to the point where, for nearly all questions that require subjectivity, you will be able to intuitively, without a lot of forceful or conscious action, come up with a clear understanding of exactly what is wrong with the argument. And mindset is going to be a huge part of it.

**We always want to
think about
why the support
doesn't validate the
conclusion**

mindset determines reaction

Receptive

Imagine: You need a new doctor, and so you ask for a suggestion from a friend of yours, who is a nurse who works with lots of different doctors. She suggests Dr. Anderson, and gives reasons to support her choice. The reasons are quoted to the side.

Your Reaction: You wouldn’t have asked your friend if you didn’t trust her advice, and those seem like very good qualifications—exactly the things you were looking for in a doctor. You decide to go with the suggestion.

Critical

Imagine: Dr. Anderson just botched your routine procedure, and now your body is a mess. And, sure, he sat with you afterward to explain what he did wrong, and he seemed sorry about it, but in talking to him you realized he’s a total fool. You’re up late one night, and you hear this quote on the side in a commercial for Dr. Anderson.

Your Reaction: A great doctor is one that helps keep you healthy. None of those characteristics mean that he is a great doctor.

“Dr. Anderson went to a top medical school, and has years of experience. Plus, he genuinely cares about his patients, and will take the time to answer all of your questions. He is a great doctor.”

The LSAT rewards a critical mindset.

A True Understanding Is a Conceptual One

I want you to get warm and fuzzy for just a minute. I want you to think about someone you really, really love. Imagine writing down how much you love that person and why.

Do you think you can accurately represent what you feel and why? To the point that the person reading what you wrote could understand exactly how you feel? No, not even if you are the greatest writer in the world. It simply has to do with the fact that words are far more limited and black and white than is our true understanding of things.

If you really
know what's wrong
with an argument,
you should be
able to describe the
flaw in a variety
of ways

When we face tough questions and especially when we feel time pressure, many of us feel the temptation to tell ourselves that we know more than we do—in the case of arguments, that we know the flaw, when in fact we don't. This temptation is understandable—after all, we know deep down that knowing the flaw equals getting correct answers. When we want to fool ourselves, we often do so using words. We'll tell ourselves that a flaw fits a certain catch-phrase, such as “oh, it's an ‘unless’ issue” or “that's a sufficient/necessary issue” and think that being able to give a name to a flaw is the same as knowing it. But as we have talked about, knowing something and knowing some phrases to describe it are two different things.

So, don't let yourself off the hook with a catch-phrase for the issue. If you know an issue well, you should be able to describe it in different ways. Furthermore, it's very common for right answers to have the substance that you expect, but in a form that is unexpected or difficult to understand. That is, they will represent the flaw that you saw, but from an unexpected angle, or by using unexpected (often unnecessarily complicated) language. A more flexible and conceptual understanding will help you adapt to these types of answers better.

different words / same flaw

“The last two Sundays, I've worn my team's jersey to watch the game, and they have won. It's definitely because I've worn the jersey.”

Fails to consider that the connection between the jersey and the wins could just be a coincidence.

Takes for granted that there is a direct relationship between what he chooses to wear and how the team performs.

Falsely assumes that a correlation between wearing the jersey and team victories is sufficient to validate a causal relationship between the two.

Two Mantras for Finding Flaws

There are two phrases that epitomize the common faults in Logical Reasoning arguments: “The author fails to consider that...” and “The author takes for granted that...”

Nearly every single flaw that appears in an LSAT argument can be thought of in one or both of these ways; in fact, this is the way that the test writers think about flaws. You’ll see that a great many answer choices are written using these very words.

Put yourself in the mind of the person making the flawed argument. This person thinks that the reasons she gives are enough to validate the conclusion that she reaches. But they are not. You know for sure that they are not. What is she doing wrong?

We’ll talk more specifically about this in the following lessons, but, in general, she’s forgetting to think about something she needs to think about (fails to consider) or she’s assuming some sort of connection that doesn’t actually exist (takes for granted).

You want to get in the habit of having these two phrases run through your head as you read and think about arguments, for they can help you pay attention to, and see better, exactly what the problem is with the way that an argument is presented and justified.

Your Logical
Reasoning mantras:

“The author fails to
consider that...”

&

“The author takes for
granted that...”

Instructions for the drill starting on the following page:

On the following pages is a set of drills meant to help you get into a critical mindset. In each case, a scenario is presented and then various arguments are made. There are spaces underneath these arguments, and you are meant to write in what is wrong with the argument. You may prefer just to think about and not write in the flaw, especially when it is obvious, but do keep in mind that these exercises are in large part designed to help you develop habits, and writing down what you think is wrong is really good for you. The phrases “The author fails to consider...” and “The author takes for granted...” have been provided for you underneath the arguments. If you want to practice seeing argument flaws in terms of one phrase or the other, you can go ahead and circle the phrase you would start with, then write in the rest.

Keep in mind that you definitely don’t have to think about every flaw in one of these two ways (per the comments on the opposite page), and sometimes it’ll make sense for you to word the flaw differently. Check your versions against the solutions after each set. Note that the four sets will increase in difficulty.

Flaw Drill

Scenario one: You are a parent, and the arguments are made by your precocious five-year-old daughter.

Since Billie got a cookie, I should get a cookie.
fails to consider / takes for granted

Candy is healthy because it contains vitamin C, which is good for us.
fails to consider / takes for granted

There is no evidence that the Lock Ness monster is not real. So it probably exists.
fails to consider / takes for granted

Of course *Tangled* is the best movie ever. All of my friends agree.

fails to consider / takes for granted

Last night, I saw a TV show about a Siamese cat that was taught to jump off a diving board. Since our cat Millie is a Siamese cat, I bet we can train her to jump off a diving board.

fails to consider / takes for granted

Did you know Ted is older than Grandma? He must be really old!

fails to consider / takes for granted

Scenario two: You are a teenage girl, and the arguments are made by your very conservative parents.

You should go out with him! He's very smart.
fails to consider / takes for granted

Since it won't help with your homework, you shouldn't watch television.

fails to consider / takes for granted

You can't wear that shirt. It shows your belly button.

fails to consider / takes for granted

This shirt is less formal than my other shirts. So this is my hip shirt.

fails to consider / takes for granted

You can't get a tattoo. Your aunt Barbara got a tattoo, and she is in jail.

fails to consider / takes for granted

You can't stay out after ten. When I was a kid, no one stayed out after ten.

fails to consider / takes for granted

Flaw Drill

Scenario three: You hear the following arguments on the news...

Recent reports that the mayor received illegal campaign contributions seem to be false. It's just been uncovered that a disgruntled former employee has been leaking the stories to the press because of a personal issue with the mayor.

fails to consider / takes for granted

Ironically, in our current general economic state, individuals need to spend more money in order for our general economy to improve. So, go out and spend, spend, spend! It's good for our country.

fails to consider / takes for granted

For the last twenty years, we have consistently enacted systems that have lowered the percentage of income that government collects as tax while also increasing government spending. If we continue to act as we have for the past twenty years, we will continue to increase the amount of debt our nation incurs.

fails to consider / takes for granted

We live under the assumption that the United States is the wealthiest of all nations, but this is not true. Qatar, an Arab country located in Western Asia, has a higher per capita income.

fails to consider / takes for granted

LeBron James is now the most recognized athlete in the world. A recent poll by Sports Illustrated showed that he is by far the most recognized athlete amongst its readers.

fails to consider / takes for granted

As everyone knows, consuming a moderate amount of wine can be part of a healthy diet. Wine contains antioxidants, which have been proven to support good health.

fails to consider / takes for granted

Scenario four: Can you disprove the absolute validity of arguments you may agree with in real life?

Objective journalism is a required component of a well-working democracy. However, we live in an age in which the vast majority of our news is delivered with a great deal of bias and affiliation toward one political ideology or another. If we are to have a well-working democracy, government and media corporations must act to restore more objectivity to news media.

fails to consider / takes for granted

Turns out that chimps are not the smartest of all non-human mammals after all. Recently, it was shown that whales are able to compose and communicate with songs that rival and often surpass songs that humans are capable of composing in terms of complexity and aesthetic elegance.

fails to consider / takes for granted

Underlying much of the violence that exists in the world today are differences of opinion about the true nature of god and religion. It is extremely unlikely that we will get proof, in our lifetime, that one religion is definitely correct, or one religion is definitely incorrect, and without such proof, these differences will invariably exist. Therefore, it is to the general benefit of humanity to promote tolerance towards different religious views.

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For certain careers, the graduate school that you choose to attend has little impact on future career success. Not so for the legal profession. Lawyers who attend top law programs consistently earn the highest salaries, and all members of the Supreme Court either went to Harvard or Yale.

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Good intentions lie the histories of many of our most environmentally harmful products. For example, plastic was invented, at least in part, to combat the wasting of wood and paper products. This proves that good intentions, coupled with limited foresight, can cause negative consequences for our environment.

fails to consider / takes for granted

Flaw Drill Solutions

Scenario one: You are a parent, and the arguments are made by your precocious five-year-old daughter.

Since Billie got a cookie, I should get a cookie.

Takes for granted that she should get everything Billie gets. It could be that Billie did something special to get the cookie, or it could be that the five year-old can't eat the cookies in question for health reasons.

Candy is healthy because it contains vitamin C, which is good for us.

Fails to consider that the other components of candy may make it so that candy is, overall, not good for us. It could be that something else in candy, like sugar, makes it not so healthy.

There is no evidence that the Lock Ness monster is not real. So it probably exists.

Takes for granted that since it has not been disproven, it must be real. It could be true that there is also no proof he does exist.

Of course *Tangled* is the best movie ever. All of my friends agree.

Takes for granted that her friends' tastes present an accurate representation of the quality of movies. Perhaps *Tangled* is a movie that appeals a certain way to a certain age group, but is not, overall, the best movie ever.

Last night, I saw a TV show about a Siamese cat that was taught to jump off a diving board. Since our cat Millie is a Siamese cat, I bet we can train her to jump off a diving board.

Fails to consider that other characteristics could differentiate Millie from the cat on the TV. Perhaps the cat on the TV has a world-class trainer and has been working at the skill since birth.

Did you know Ted is older than Grandma? He must be really old!

Takes for granted that being older than Grandma guarantees that one is old. Perhaps Grandma is in her thirties.

Scenario two: You are a teenage girl, and the arguments are made by your very conservative parents.

You should go out with him! He's very smart.

Fails to consider that being smart may not be the characteristic that defines who you should date. Perhaps he's also a jerk. Or maybe you prefer dating dumb people, and you should date who you want to date.

Since it won't help with your homework, you shouldn't watch television.

Takes for granted that one shouldn't do something unless it helps with homework. Perhaps there are other reasons to watch television.

You can't wear that shirt. It shows your belly button.

Takes for granted that you can't wear shirts that show your belly button. Maybe you are wearing the shirt because it shows your belly button.

This shirt is less formal than my other shirts. So this is my hip shirt.

Takes for granted that being less formal than other shirts makes one shirt hip. Perhaps none of the shirts are hip, or perhaps it's hip to be formal.

You can't get a tattoo. Your aunt Barbara got a tattoo, and she is in jail.

Takes for granted that getting a tattoo had an impact on Barbara going to jail, and takes for granted that Barbara's case is relevant to yours. Perhaps your aunt Barbara is a violent loon.

You can't stay out after ten. When I was a kid, no one stayed out after ten.

Takes for granted that what applied to the parent when he/she was a kid applies to the teenager now. It could be that what was the norm then isn't the norm now. Also, just because others don't do it doesn't mean you can't.

Flaw Drill Solutions

Scenario three: You hear the following arguments on the news...

Recent reports that the mayor received illegal campaign contributions seem to be false. It's just been uncovered that a disgruntled former employee has been leaking the stories to the press because of a personal issue with the mayor.

Fails to consider that even if a disgruntled employee leaked the stories, the mayor could have received illegal contributions. Whether the employee was disgruntled or not doesn't affect whether the stories are true.

We live under the assumption that the United States is the wealthiest of all nations, but this is not true. Qatar, an Arab country located in Western Asia, has a higher per capita income.

Takes for granted that per capita income is enough to make a determination about the wealth of a nation. Perhaps other factors, such as gross domestic revenue, are more important when considering the wealth of a nation as a whole.

Ironically, in our current general economic state, individuals need to spend more money in order for our general economy to improve. So, go out and spend, spend, spend! It's good for our country.

Takes for granted that what is good for our general economy is what is good for our country. Perhaps there are other, more significant considerations that determine what is good for our country.

For the last twenty years, we have consistently enacted systems that have lowered the percentage of income that government collects as tax while also increasing government spending. If we continue to act as we have for the past twenty years, we will continue to increase the amount of debt our nation incurs.

Takes for granted that a lower percentage tax and increased spending must equate to an increase in debt. Perhaps the economy will grow at a rate that offsets, or more than offsets, such changes.

As everyone knows, consuming a moderate amount of wine can be part of a healthy diet. Wine contains antioxidants, which have been proven to support good health.

Fails to consider that there are other aspects that could make drinking a moderate amount of wine unhealthy overall. Perhaps wine has an ingredient that does far more harm than antioxidants do good.

Scenario four: Can you disprove the absolute validity of arguments you may agree with in real life?

Objective journalism is a required component of a well-working democracy. However, we live in an age in which the vast majority of our news is delivered with a great deal of bias and affiliation toward one political ideology or another. If we are to have a well-working democracy, government and media corporations must act to restore more objectivity to news media.

Takes for granted that government and media corporations must do the work of restoring more objectivity to news media. Perhaps some other entity, such as a blogger, could do the work.

Turns out that chimps are not the smartest of all non-human mammals after all. Recently, it was shown that whales are able to compose and communicate with songs that rival and often surpass songs that humans are capable of composing in terms of complexity and aesthetic elegance.

Takes for granted that the ability to compose and communicate with songs is accurately representative of overall intelligence. Perhaps there are other reasons why chimps are smarter than whales.

Underlying much of the violence that exists in the world today are differences of opinion about the true nature of god and religion. It is extremely unlikely that we will get proof, in our lifetime, that one religion is definitely correct, or one religion is definitely incorrect, and without such proof, these differences will invariably exist. Therefore, it is to the general benefit of humanity to promote tolerance towards different religious views.

Takes for granted that tolerance will lead to a decrease in violence, and that a decrease in violence is for the general benefit of mankind. Perhaps general tolerance inflames certain violent tendencies, or perhaps for some crazy reason, violence is part of a "healthy" humanity.

For certain careers, the graduate school that you choose to attend has little impact on future career success. Not so for the legal profession. Lawyers who attend top law programs consistently earn the highest salaries, and all members of the Supreme Court either went to Harvard or Yale.

Takes for granted that the school has a direct impact on future career success. It could be that they are simply correlated; perhaps some other factor, such as personal drive, causes certain people to get accepted into certain schools and to have success in their careers.

Creationism is an idea whose leading proponents are politicians and religious figures. Not a single reputable, well-respected scientist has come out in support of Creationism as a valid scientific theory. Therefore, Creationism is not a legitimate scientific theory.

Takes for granted that the opinion of the scientific community is accurately representative of what is a legitimate scientific theory. Darwin and Galileo were both initially dismissed by the scientific community at large.

Good intentions lie the histories of many of our most environmentally harmful products. For example, plastic was invented, at least in part, to combat the wasting of wood and paper products. This proves that good intentions, coupled with limited foresight, can cause negative consequences for our environment.

Takes for granted that good intentions had a hand in causing these negative consequences. It could be that, even though these items were made with good intentions, what caused them to be harmful was just poor foresight or some other factor.

How Did You Do?

In large part, real LSAT arguments will feel harder because the test writers make it difficult for us to recognize the argument and see it clearly

Maybe you found all four sets to be very simple. Maybe you are sitting there wondering why the answers you came up with are totally different from the ones in the solutions. In either case, the most important thing is that you begin to develop certain habits when it comes to thinking about arguments. Namely, that you evaluate them in terms of how the supporting premises are being used to justify the conclusion, and that you do so with a mindset of trying to figure out exactly why the support does not justify the conclusion reached.

How Does This Work Translate to the LSAT?

LSAT arguments will have flaws that are as clear and significant as the flaws in these simple arguments we discussed in this lesson. However, the hardest LSAT arguments are significantly harder to evaluate than were most of the arguments we practiced here. In large part, LSAT arguments are much harder because the test writers make it a challenge for you to see and understand the argument clearly. They do this in a few different ways:

- (1) They will hide the argument within a lot of clutter. Notice that one of the reasons that Scenario four was a bit more difficult than one & two was that you simply had more information to process. The LSAT writers will commonly form this clutter by giving us bountiful background information or information that may be used against the argument. This information can be important for understanding context but will not be directly relevant to the reasoning issues in the argument.
- (2) They will separate out the conclusion and the support from one another. In addition, also expect that the support will sometimes come split in separate pieces, and that the conclusion will sometimes come split in separate pieces.¹
- (3) They will speak with a tone of authority on subjects about which you are unfamiliar. When we see material written in an “expert” tone, and when we are not ourselves experts in the field, we are often more susceptible to simply accept the reasoning that we are given.

There is plenty of time to become great at cutting through the extraneous challenges the test writers present, and when you are able to do so, you will see that a majority of questions hinge on your obtaining a simple understanding of why the support given doesn’t validate the conclusion reached. Habit and mindset are key. Let’s take a look at two full questions that illustrate how the process might play out during the course of the exam. I suggest you try solving the questions on your own before looking at their respective solutions.

1. Consider these two different ways of writing the same main point:

There has been no credible evidence produced by anyone in the world that vampires actually exist. *Therefore, vampires do not exist.*

Shelley thinks vampires exist. However, there has been no credible evidence produced by anyone in the world that actually shows that. Therefore, she is wrong.

Note that it’s the same point, but the second form just makes it a bit harder for us to identify the point, and a bit harder to retain it in our minds throughout the rest of the problem-solving process.

the process in action

On this page and the next are two examples that illustrate how the ability to recognize the flaw fits into the greater problem-solving process.

Navigation in animals is defined as the animal's ability to find its way from unfamiliar territory to points familiar to the animal but beyond the immediate range of the animal's senses. Some naturalists claim that polar bears can navigate over considerable distances. As evidence, they cite an instance of a polar bear that returned to its home territory after being released over 500 kilometers (300 miles) away.

Which one of the following, if true, casts the most doubt on the validity of the evidence offered in support of the naturalists' claim?

- (A) The polar bear stopped and changed course several times as it moved toward its home territory.
- (B) The site at which the polar bear was released was on the bear's annual migration route.
- (C) The route along which the polar bear traveled consisted primarily of snow and drifting ice.
- (D) Polar bears are only one of many species of mammal whose members have been known to find their way home from considerable distances.
- (E) Polar bears often rely on their extreme sensitivity to smell in order to scent out familiar territory.

Practice Test 32, Section 1, Question 12

ONE: UNDERSTAND THE JOB

I recommend that you begin every problem by reading the question stem. The question stem will give you a clear sense of what you need to accomplish as you read the stimulus. Here, we need to select an answer that most strongly indicates a problem with the evidence used to justify the point. This answer will invariably exploit the flaw in the relationship between the conclusion and its support, and correctly recognizing that flaw will be the key to our success.

TWO: UNDERSTAND THE ARGUMENT

We need to isolate the main point and its support from the rest of the stimulus, and we need to make sure that we completely and correctly understand that point made, the support being used, and the manner in which the support is meant to justify the point.

The point in question is the naturalists' claim: polar bears can navigate over considerable distances. We are given a very specific definition of navigation in the background information: an animal's ability to find its way from unfamiliar areas to areas it knows, with the areas being outside the animal's sensory range. The evidence used is that of a polar bear that found its way home from 300 miles away.

Argument: A polar bear got home from 300 miles away, so it must be true that polar bears can navigate over considerable distances.

THREE: FIND WHAT'S WRONG

To us, 300 miles seems a long distance to walk, but keep in mind that we've been given a very specific definition of navigation, we have a conclusion about navigation, and we don't actually know that, for a polar bear, this journey requires navigation. We don't know that this trip was in territory that was unfamiliar for the bear, and we don't know if 300 miles is beyond a bear's sensory range.

With a clear sense of what is wrong with the conclusion-support relationship, we can head into the answer choices.

FOUR: FINISH THE JOB

Our job is to look for an answer that makes us doubt the use of this evidence to justify this point. The right answer should relate to the fact that the evidence doesn't prove that the bear was in unfamiliar territory or beyond sensory range.

For all Logical Reasoning questions, we want to first work to eliminate answers we know to be incorrect, then confirm the answer that we think is best. (A) may be a sign that the navigation skills are not perfect, but it does not play an absolute role in relation to the conclusion-support relationship (perhaps stopping and changing course is part of their navigation strategy). In any case, since it doesn't weaken the idea that the polar bears were navigating, we can eliminate (A). (B) represents a clear problem with the support-conclusion relationship—if the bear was familiar with the route, he did not have to use navigation skills. Let's leave (B). It's unclear how snow and ice relate to the reasoning in the argument, so we can eliminate (C) easily. The fact that polar bears are one of many animals that travel long distances to find home neither helps nor hurts the argument, so we can eliminate (D). (E) relates to an issue we saw in the argument—we weren't sure they hadn't used their senses over the 300 miles—but it does not directly impact the support-conclusion relationship, for it doesn't give us any actual information about whether the polar bear in the example used its senses to find its way home. That leaves only (B), and (B) is the correct answer.

the process in action

Studies have shown that photosynthesis, the process by which plants manufacture life-sustaining proteins from sunlight and carbon, is actually intensified if the level of carbon dioxide in the atmosphere is increased. Since carbon dioxide levels are increased by the burning of fossil fuels and by other human industrial activities, it is obvious that these industrial activities are purely beneficial to agriculture and those of us who depend upon it.

The flawed reasoning in the argument above is most similar to that in which one of the following?

- (A) Because a high fiber diet has been shown to be more healthful than a low fiber diet, a diet in which foods with a low fiber content have been entirely replaced by foods with a high fiber content is bound to be even more healthful.
- (B) Because exercise has been shown to prevent a number of diseases, injuries, and other human ills, clearly no harm, and a lot of good, can come from exercise.
- (C) Consistently consuming more calories than one expends inevitably leads to excessive weight gain, so if one wishes to avoid the health problems associated with this condition, one ought to fast periodically.
- (D) It has been shown that one can obtain more vitamins and minerals from fresh fruits and vegetables than from processed fruits and vegetables. One ought, therefore, to completely abandon consumption of the latter in favor of the former.
- (E) Excessive use of penicillin tends to increase one's susceptibility to penicillin-resistant infections. The best policy, therefore, is to avoid using penicillin, thereby strengthening the body's innate ability to resist disease.

Practice Test 33, Section 3, Question 18

FOUR: FINISH THE JOB

With a clear sense of the flaw in our argument, we can go into the answer choices. As with the previous question, we want to start by focusing on reasons why wrong answers are wrong. The four wrong answers will all have problems, and there will be markers that make this clear—they may reach different types of conclusions (you can't have the same type of flaw if you end up at a different type of conclusion), or use support in a different way. So, when we notice these characteristics, we can use them to knock off answers.

Notice that the argument in (A) reaches a comparative conclusion—one thing will be better than another. This is a different type of conclusion than what was reached in our argument, and so we know that that argument must have had a different sort of reasoning issue. We can eliminate (A) for that reason. The absolute nature of the conclusion in (B)—“clearly no harm, and

ONE: UNDERSTAND THE JOB

Our job is to find the reasoning flaw in the original argument, then to find an answer that has a similar reasoning issue. For matching flaw questions, it's imperative that we develop a very strong, clear sense of what is wrong with the original argument, because we will have to be able to retain it in our heads as we evaluate the five new arguments that are presented in the answer choices.

TWO: UNDERSTAND THE ARGUMENT

The author's point comes right at the end, and it's a strong one: “it is obvious that these industrial activities are purely beneficial to agriculture and those of us who depend upon it.” What's the support given? These industrial activities increase carbon dioxide, which aids in photosynthesis, which helps plants live.

THREE: FIND WHAT'S WRONG

The support is a bit complicated in that it involves several specific factors and layers (industrial activities related to carbon dioxide related to photosynthesis related to life-sustaining proteins), but the specifics of those links are not necessary for us to see what is wrong with the reasoning here: we're only given one potentially positive benefit of these industrial activities. The author is over-reaching in stating such an absolute and general conclusion. **The author fails to consider that there may be other negative consequences that prevent these activities from being “purely beneficial.”**

a lot of good”—is a great match for our original argument, and in looking at the support, it seems that (B) has very similar reasoning issues. Let's leave it. (C) is very different from our original argument—it mentions something in its conclusion (fasting) that is very different than what is discussed in its premises. We can eliminate (C) quickly. (D) reaches a conclusion about choosing one thing over another, and can be eliminated for that reason. (E) is about the best policy—what we ought to do, which is a very different type of conclusion than we had in the original argument.

Once we've eliminated wrong choices, there is only one attractive answer remaining: (B). (B) reaches the same type of absolute conclusion, and, like our original argument, fails to consider other, potentially negative considerations (such as that exercise can cause injury) in arriving at that conclusion. (B) is a great match, and (B) is correct.

Matching Double-Dip Drill

Here are some of the arguments that you saw in the earlier drill. Draw lines connecting the pairs of arguments that have the most similar reasoning flaws.

Turns out that chimps are not the smartest of all non-human mammals after all. Recently, it was shown that whales are able to compose and communicate with songs that rival and often surpass songs that humans are capable of composing in terms of complexity and aesthetic elegance.

Did you know Ted is older than Grandma? He must be really old!

Objective journalism is a required component of a well-working democracy. However, we live in an age in which the vast majority of our news is delivered with a great deal of bias and affiliation toward one political ideology or another. If we are to have a well-working democracy, government and media corporations must act to restore more objectivity to news media.

For certain careers, the graduate school that you choose to attend has little impact on future career success. Not so for the legal profession. Lawyers who attend top law programs consistently earn the highest salaries, and all members of the Supreme Court either went to Harvard or Yale.

LeBron James is now the most recognized athlete in the world. A recent poll by *Sports Illustrated* showed that he is by far the most recognized athlete amongst its readers.

Creationism is an idea whose leading proponents are politicians and religious figures. Not a single reputable, well-respected scientist has come out in support of Creationism as a valid scientific theory. Therefore, Creationism is not a legitimate scientific theory.

As everyone knows, consuming a moderate amount of wine can be part of a healthy diet. Wine contains antioxidants, which have been proven to support good health.

Good intentions lie the histories of many of our most environmentally harmful products. For example, plastic was invented, at least in part, to combat the wasting of wood and paper products. This proves that good intentions, coupled with limited foresight, can cause negative consequences for our environment.

This shirt is less formal than my other shirts. So this is my hip shirt.

For the last twenty years, we have consistently enacted systems that have lowered the percentage of income that government collects as tax while also increasing government spending. If we continue to act as we have for the past twenty years, we will continue to increase the amount of debt our nation incurs.

Matching Double-Dip Solutions

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In both of these arguments, a specific characteristic (musical ability/antioxidants) is used to validate a more general statement (intelligence/healthiness). In both instances, the author fails to consider that other factors could be relevant.

In both of these arguments, a correlation (two things happening at the same time, to the same person, etc.) is used to justify a statement about causation. Correlation never justifies causation. It could be that, though schools and success are linked, the schools are not part of what causes success, and the same goes for the good intentions.

In both of these arguments, a comparative statement is used to justify an absolute statement. The second argument has an additional flaw of assuming that formal and hip are in some way opposites.

In both of these arguments, the author is failing to consider some other critical factor that may be relevant to the conclusion. The author of the first argument fails to consider that entities other than government and media corporations have the power to impact society, and the author of the second fails to consider that other factors, such as the amount of income Americans make, play a role in government debt.

In both of these arguments, the author takes the opinions of a group to be representative of the truth.

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6

LOGICAL REASONING

a piece ≠ the puzzle

Over the course of the next three lessons, we will further break down common argument flaws into three general categories: a piece ≠ the puzzle, apples ≠ oranges, and 1 + 1 ≠ 3. In this lesson, we will focus on a piece ≠ the puzzle issues.

To mistake a piece for the puzzle is to overreach in trying to justify a conclusion, using supporting evidence that may turn out to be just one part of a bigger picture. This is a prominent issue on a significant number of Logical Reasoning questions, and it's pretty easy to see why piece ≠ puzzle issues would be featured on an exam for future lawyers. Here's a small taste of some basic arguments that contain this type of flaw:

- “Sally is careful about what she eats, so she must be in great health.”
- “Ted is strong, so he must be good at football.”
- “Since the popular girls say I should get a haircut, I should get a haircut.”
- “Since the house is made of very small bricks, the house itself must be small.”
- “Since the restaurant is crowded for breakfast, it must be crowded all day.”
- “Bob has a fancy watch and drives a BMW. He must be rich.”

Certainly there are differences among these arguments, and the flaws that they have can be thought of in a variety of ways, but let's focus on one thing that these arguments have in common: in each case, when we think about the conclusion that the author reaches, we can see that it involves far more factors, or considerations, than those discussed in the premises...

- Being healthy is about more than just what you eat...
- Being good at football is about more than just being strong...
- You don't need to get a haircut just because the popular girls say so, and so on...

We want to develop a bloodhound-like sense as to when arguments are flawed in this manner: arguments in which the author falsely overvalues one consideration at the expense of others. Keep in mind that every time an author makes this leap, he or she does so *incorrectly*. Every. Single. Time. And recognizing that he or she is doing so will pay great dividends when it comes time to eliminating wrong answers and selecting the right ones.

These piece ≠ puzzle flaws can be thought of as generally falling into three broad subsets—overvalues a trait, overvalues an opinion, and overvalues a sample set—and though there is certainly overlap between these various types, each has its defining characteristics. We'll discuss each subset in detail on the pages to come.

Overvalues a Trait

To overvalue a trait is to put too much emphasis on one particular characteristic or one particular “clue” in reaching a conclusion. No matter how compelling that one clue is, if it’s not enough to *guarantee* the outcome the author presents, the argument is flawed. And of course it helps to keep in mind that every argument we are asked to critically evaluate *will* be flawed.

In real life, seeing the value in one particular trait, or seeing that one particular trait is the driving force behind someone or something, is very commonly rewarded. In fact, being able to differentiate significant characteristics from secondary ones is one of the primary functions of our intelligence (and something that we have to do for other parts of the LSAT). Think about the following statements, each of which you’ve probably heard many times before in your life: *hard work leads to success, honesty makes for good leaders, defense wins championships.*

If you are thinking about “primary drivers,” then all of the three statements above are very strong ones. Hard work *is* generally a determining factor of success, honesty *is* a very important characteristic for leaders, and in a variety of sports, defense has been proven to be more important than offense.

Remember, the LSAT is testing your ability to understand absolute proof

However, note that determining whether or not a certain characteristic is a “primary driver” is a completely subjective endeavor (how “important” a characteristic is can only, at best, be an *opinion*) and the LSAT is most definitely *not* a test of our opinions. The LSAT is not testing your ability to judge how much, or how little, one trait (such as hard work) impacts a result (success). Never, ever.

What it is testing is your ability to understand absolute proof. Does that characteristic, no matter how important *you* define it to be, guarantee the outcome? Does hard work guarantee success? No. Does honesty definitely make for good leaders? No.

Every single time that a primary characteristic (or two) is used to justify a conclusion—every single time—you know that that characteristic, while it may be important, is not enough to prove the author’s point. Knowing this is a big key for eliminating wrong answers and selecting the right one.

overvalues a trait

“Customers say that picture quality and screen size are the two factors that they consider most when deciding on a television to purchase. Since the StarView television has a larger screen than the BlackStar, and provides better picture quality, all for the same price, customers will prefer the StarView to the BlackStar.”

The fact that picture quality and screen size are **important** factors does not mean that they are **determining** factors. It could be that the StarView is unreliable, or doesn’t have connections that allow you to get cable television. It’s not important for you to think of such alternatives, but it is critically important to recognize when an author has **overvalued** a trait or traits.

necessary, but not enough

Some of the most difficult arguments to find fault with are those that give us characteristics that are *necessary*, or needed, to reach the conclusion, but are not, by themselves, enough to definitely prove the argument correct. A trait that is enough to justify the conclusion is said to be *sufficient*, and mistaking *necessary* for *sufficient* is one of the most common flaws that appear in LSAT arguments.

Let's think of a fairly basic argument that contains this sort of mistake: "In order to watch the soccer match, one must have a television. Since Ted has a television, he will be able to watch the soccer match."

We are told that one has to have a television in order to watch the match. Having a television is *necessary*, if the conclusion is to be true. Per the premise, though, does having a television guarantee that Ted can watch the game? Is it *sufficient*?

No. We're never told that if he has a television, he will definitely be able to watch the game. Perhaps he doesn't have electricity, or perhaps he doesn't get the channel on which the game is playing because he doesn't have cable or satellite. Note that this author is mistaking something that is *necessary* for the conclusion (Ted needs to have a television if he's going to watch the soccer match) for something that is *sufficient* for the conclusion (the premise would be sufficient if having a television guaranteed that one can watch the match).

Here's another argument where the "necessary" characteristic is much better cloaked as something more important (i.e., "sufficient").

"Company X is required to alert its shareholders with a 'red alert' any time the stock price goes up or down by greater than ten percent in one day. The last red alert occurred in 2008, when the stock price rose by over thirteen percent in one day. Since the company just recently sent out a 'red alert' to shareholders, it must be true that the stock has gone up or down by greater than ten percent."

This one is a bit tougher, but do you see the flaw here? We're told that the company is required to issue a red alert if the price goes up or down by more than ten percent. Does that mean that a red alert guarantees that the price went up or down by more than ten percent? No, not based just on what we are told. The challenge of an argument like this is the "missing information." What if the company also sends out a "red alert" for other incidents, like when the stock splits, or someone important retires, or when it rains! We're not told that "red alerts" are only for these price fluctuations, and so we can't say that a red alert guarantees the conclusion.

To the side are four arguments. For two of them, the conclusion is actually perfectly valid; the premise we are given does guarantee the conclusion reached. For two of the arguments, the author has mistaken a necessary characteristic for a sufficient one. Make sure you understand which arguments are flawed, and which ones are not.

valid?

Here are four arguments, two of which are valid and two of which are not. Cross out the two arguments in which the author has wrongly mistaken a necessary condition for a sufficient one. (Answers on next page.)

1. Every car at the shop gets washed, and every car that gets washed also gets new floor mats. Since Ted's car was at the shop, it got new floor mats.
2. Anyone who wants to become a pilot has to complete a rigorous training process and must get satisfactory scores on both paper exams and real-time flight exams. Every pilot is given access to private parts of airports. Therefore, if one completes the rigorous training process and gets satisfactory scores on both paper exams and real-time flight exams, he or she will get access to private parts of airports.
3. Tom will never wear his leather jacket on a rainy day because he is concerned that the rain will hurt his leather jacket, and he loves his leather jacket. One issue, though, is that it's the only jacket that he owns. On a recent cold night, Tom went out without his leather jacket on. It must have been raining.
4. Wilbur had six children, and he gave a bit of his vast wealth to each of his children one year as a Christmas present. Each of those children invested that money, and in turn got rich themselves. Those that got rich did exactly one of two things: they either gave their money away to charity, or they gave it back to Wilbur. Since Sylvia was a child of Wilbur, she must have gotten rich and given the money either back to Wilbur, or to charity.

Overvalues an Opinion

**The truth is
never the truth be-
cause someone says
it is.**

**The truth is
only the truth
because it's
the truth**

The truth is never the truth because someone says it is. The truth is only the truth because it's the truth. As simple as that concept is, many an LSAT argument will be faulty because the author makes an assumption that something is true *because someone said so*.

"My financial advisor definitely thinks I ought to be putting more money into mutual funds, so that's the smart move to make."

It's not terribly difficult to see what's wrong with this argument, especially if you read it with the goal of figuring out what's wrong, but notice how this argument plays with what we know, or think of, from real life. People go to financial advisors to be given advice about what to do with money, and in general their advice is useful. And for years many of us have associated mutual funds with "smart and safe investing."

However, when we think about whether the financial advisor's opinion *guarantees* that it's a smart move, we can see what's wrong: no, it doesn't guarantee anything. And again, that's our job on the LSAT—to think of every argument in terms of why the support does not guarantee the conclusion (many financial experts, like John Bogle, would argue that mutual funds are the opposite of "smart and safe investing").

The Flip Side

On a related note, just as an opinion cannot prove than an argument is true, an opinion can't prove that an argument is false.

"Sandra says that the new double-bacon-avocado-hash brown-popcorn shrimp-burger at Karlle's isn't delicious, but that's only because she's embarrassed to eat at Karlle's with me. Therefore, she's clearly wrong."

Let's take the premise to be true—let's say the only reason Sandra says this is because she's embarrassed to eat at Karlle's with the author. Does this *prove* that this concoction actually *is* delicious? Of course not. Sandra can have some bias, and it can still taste really bad. Remember: no opinion can *prove* something as subjective as whether or not a burger is delicious.

overvalues an opinion

"I thought my hair looked bad, but when I went in to get it cut, all of the stylists in the salon thought it looked great, and advised me not to cut it. Therefore, I was clearly wrong."

Are stylists professionals who are valued for their opinion? Yes. Are their opinions on style more in tune with culture? Probably. Does that mean that their opinion is the truth? No. It's still just opinion.

Uses a Small Sample Set

This issue is very closely related to the two that we have already discussed. Arguments are flawed when they reach a general consensus based on evidence from a limited portion of whatever group or system that they are discussing. Here is a simple version:

“All my friends love my new sweater vest. I bet everyone at the party will think I am stylish.”

In real life, it may be that your friends are lying to you, but again, on the LSAT, our job is not to question whether the reasoning given is in fact true; if we are told that his friends love his sweater vest, well, we’re supposed to believe it. However, the fact that his friends love it does not mean that everyone at the party will love it.

Maybe his friends have unique taste.

Additionally, having a sweater vest that people love, and having a sweater vest that people find stylish, are, sadly enough, not necessarily the same thing.

Here’s another one that’s a bit more difficult—see if you can figure out what could be wrong with it:

“The new hybrid vehicle from Honda has an engine that weighs fifty percent more than that of a standard automobile. Therefore, it’s unlikely that the car will be a lightweight model.”

Notice that the characteristic discussed in the premise—weight—is the same characteristic mentioned in the conclusion—we’re good there. However, the engine is just one portion of the entire automobile; perhaps having such a heavy engine enables the car to have lower weight overall.

solutions to drill on page 85

1. VALID. We know, since Ted’s car was at the shop, that it got washed, and since it got washed, it got new floor mats.

2. NOT VALID. Completing rigorous training and getting satisfactory scores are required to become a pilot, but they don’t guarantee that one will become a pilot. Perhaps there are other requirements as well.

3. NOT VALID. We do not know if there are other situations (like snow) in which he will not wear his jacket.

4. VALID. We know Sylvia got rich, and we know there were just two consequences to her getting rich, and they match the options in the conclusion.

uses a small sample set

“I’ve heard my friends talk about how difficult Logic Games are, but I just tried three of them and found them to be not too bad. I guess some people just have a knack for solving them, and I’m lucky that way.”

Maybe he really is a natural at Logic Games, or maybe the three he saw fit into his comfort zone. In any case, three games is not a large enough sample size for him to gauge in any significantly valuable way whether he actually has a “knack” for Logic Games.

The Flip Side: the Puzzle ≠ a Piece

The LSAT does not test a million reasoning issues. It tests just a few, but it likes to test each of them from a variety of perspectives in order to get a rounded-out sense of your fundamental reasoning ability. Therefore, it's very common to see "flip-sides" or "reverse-images" of many of the issues that appear on the LSAT. Certain questions require critical thinking, so others require that you *not* be critical; some games have too many elements for the number of spots, and so some games have too few elements for the number of spots; some conclusions are expressed with certainty ("must be true") and so it's important to notice when some are not ("is most likely"); finally, just as some arguments mistakenly use one clue, one "piece," to conclude something about the whole, some arguments are flawed in that they mistakenly assume that something that is true of the whole is true of each component.

Let's look at an argument that is similar to one we just discussed:

"The new hybrid Honda weighs in at less than seventy percent the weight of a conventional automobile. It must be true that they are using a lighter-than-average-weight engine."

In the earlier argument on the previous page, the engine weight did not determine the weight of the entire car. In this case, the weight of the car does not determine the weight of the engine—perhaps the car is light because of other reasons, and actually has a heavy engine.

In life, there are many times when piece=puzzle, and puzzle=piece arguments are completely valid.¹ However, it's essential to remember that when you are asked to be critical of reasoning on the LSAT, you are not being asked to determine whether arguments are valid or not. You are being given arguments that you know are not valid and being asked to determine why they are not. So, when you recognize that the author is claiming that one characteristic, opinion, or sample set is "enough" to prove something more general, or (less commonly) when you notice that the author is using some statement about a group or larger entity to say something about an individual or a part, you know for certain that there is a problem with how the evidence is being used to support the conclusion.

1. Some real life situations in which piece=puzzle and puzzle=piece arguments are valid:

"Since this bag contains a super-heavy bowling ball, it will be heavy."

"Since the entire cake is made of chocolate, each slice will have chocolate in it."

Flaw Drill

For each argument, write in why you feel the support doesn't prove the conclusion.

1. In order to build a desk, one simply needs ample wood, a saw, nails, and a hammer. I have all of those things, so I should be able to build a desk.

2. In a recent online poll about internet dating, sixty-five percent of participants said they preferred going on a first date with someone they had met online, rather than a first date set up by an acquaintance at work. This shows that single people, in general, prefer to go on first dates with people they meet online, rather than people they are set up with by coworkers.

4. Consumer electronics stores make the bulk of their earnings not on the products that they sell, but rather on the insurance that customers often purchase on those products. The stores claim that their service provides a benefit for consumers, but a leading independent consumer magazine recently published statistics showing that a person would earn more income investing their money rather than using it for various such insurance plans, and strongly suggested that smart consumers avoid such insurance that is offered. Therefore, the claim that the stores make is false.

5. In a recent poll conducted among readers of a popular surfing magazine, surfing was ranked as the most popular sport and beach volleyball was ranked third. Therefore, it cannot be true that tennis is more popular than both surfing and beach volleyball.

7. Most people assume that Neanderthals were creatures far less advanced than humans, and one aspect of that was that they were incapable of verbal communication. However, nearly all scientists who are specialists in the field of Neanderthal research now believe that they did indeed communicate verbally with one another, and this view has been supported by numerous articles and research projects. Therefore, in terms of whether Neanderthals could or could not talk, most people hold an incorrect assumption.

8. More than education level, parents' income, or where one was born, the age at which one started working is the greatest statistical indicator of one's future earnings. Therefore, if we want to ensure that our daughter will have a successful earnings future, we should make sure to get her a job as soon as possible.

3. In order to obtain a driver's license, one must prove that he or she is a resident of that state. Since Terry can prove he is a resident of his state, he will be given a driver's license.

6. Every time I see Janice, she is eating one kind of snack or another. If she doesn't change her behavior, I'm afraid she's going to gain some weight.

9. Most successful financial advisors have excellent computer skills, as well as good people skills. Since Sean has excellent computer skills, and since he's terrific with people, there is a good chance he could be a successful financial advisor.

Flaw Drill

10. Everyone who boards the plane has to show his or her ticket to the attendant. Since Tom has shown his ticket, he will be allowed to board the plane.

11. Prosperous towns almost always have two primary characteristics: jobs for its citizens, and homes that can be purchased for reasonable prices. We've spent the last five years improving our community in terms of these two characteristics. We now find ourselves with ample jobs for our citizens, and more than enough homes that can be purchased for reasonable prices. Therefore, it's reasonable to think that prosperous times are ahead.

13. A recently published study claimed that Tat soda contains several chemicals known to sometimes cause unpleasant physical sensations. However, it's important to note that the study was financed by Eager Brands, a direct competitor of the company that produces Tat. Therefore, the study is highly dubious.

14. A successful business must have three characteristics: consistent revenue, low costs, and adequate capital reserves. Since our business has those three characteristics, it must be false that our business is unsuccessful.

16. A recent study on consumer behavior showed that when consumers are deciding on which towels to buy, an evocative name has a far greater impact on buying decisions than does the display design, or the actual quality of the towels. Therefore, if we are able to come up with an evocative name for our new towel collection, it is certain to be a success.

17. You say that Sharon doesn't like soccer, but that can't be true. Sharon is Korean, and Koreans are known to be passionate soccer fans.

12. It is well known that Yatoo Corporation has slashed the amount it pays in salaries by six percent this year. Since Jeff works at Yatoo, his salary was reduced by six percent.

15. Of those who tasted our new ice cream flavor just once, seventy-five percent said that they did not enjoy the taste of it. However, of those who tasted our new ice cream flavor more than five times, ninety-percent of people said they liked it. Therefore, it's likely that most people will eventually like the flavor, which seems to be an acquired taste.

18. There are various tests that scientists can perform to determine whether a planet is suitable for life as we know it. Of the over sixty thousand planets that have been carefully analyzed so far—the sixty thousand planets closest to us—none have come close to containing the combination of elements essential for life to exist. Therefore, it's very unlikely that there are other planets in the universe that contain life as we know it.

Flaw Drill Solutions

1. In order to build a desk, one simply needs ample wood, a saw, nails, and a hammer. I have all of those things, so I should be able to build a desk.

Fails to consider that there are requirements other than these three needed items. Maybe the person doesn't know how to use these items, or doesn't know how to build things.

2. In a recent online poll about internet dating, sixty-five percent of participants said they preferred going on a first date with someone they had met online, rather than a first date set up by an acquaintance at work. This shows that single people, in general, prefer to go on first dates with people they meet online, rather than people they are set up with by coworkers.

Takes for granted that online voters are representative of the population in general. Maybe those who are more frequently online, or more into internet dating, were more inclined to take the survey.

3. In order to obtain a driver's license, one must prove that he or she is a resident of that state. Since Terry can prove he is a resident of his state, he will be given a driver's license.

Mistakes a necessary condition for one that guarantees a result. Maybe there is another reason why he can't get a license, such as that Terry is four years old.

4. Consumer electronics stores make the bulk of their earnings not on the products that they sell, but rather on the insurance that customers often purchase on those products. The stores claim that their service provides a benefit for consumers, but a leading independent consumer magazine recently published statistics showing that a person would earn more income investing their money rather than using it for various such insurance plans, and strongly suggested that smart consumers avoid such insurance that is offered. Therefore, the claim that the stores make is false.

Fails to consider that the insurance can benefit customers, even if it doesn't give the customer a great financial reward. Perhaps some people are willing to trade in a bit of earnings for some peace of mind.

7. Most people assume that Neanderthals were creatures far less advanced than humans, and one aspect of that was that they were incapable of verbal communication. However, nearly all scientists who are specialists in the field of Neanderthal research now believe that they did indeed communicate verbally with one another, and this view has been supported by numerous articles and research projects. Therefore, in terms of whether Neanderthals could or could not talk, most people hold an incorrect assumption.

Fails to consider that these scientists could be wrong. At some point nearly all the scientists in the world agreed that the sun rotated around the earth.

5. In a recent poll conducted among readers of a popular surfing magazine, surfing was ranked as the most popular sport and beach volleyball was ranked third. Therefore, it cannot be true that tennis is more popular than both surfing and beach volleyball.

Takes for granted that readers of a surfing magazine are representative of the population in general. Maybe a poll of tennis magazine subscribers would have turned out differently.

6. Every time I see Janice, she is eating one kind of snack or another. If she doesn't change her behavior, I'm afraid she's going to gain some weight.

Takes for granted that his experience with Janice is enough to determine her overall behavior. Maybe the only time the author sees Janice is during her lunchtime.

9. Most successful financial advisors have excellent computer skills, as well as good people skills. Since Sean has excellent computer skills, and since he's terrific with people, there is a good chance he could be a successful financial advisor.

Fails to consider that Sean may be lacking some of the other skills that successful financial advisors need to have. Maybe Sean doesn't understand the difference between addition and multiplication (and therefore can't take advantage of the beauty of compound interest).

8. More than education level, parents' income, or where one was born, the age at which one started working is the greatest statistical indicator of one's future earnings. Therefore, if we want to ensure that our daughter will have a successful earnings future, we should make sure to get her a job as soon as possible.

Takes for granted that a characteristic that is important to an outcome will guarantee that outcome. In fact, this correlation between early work and earnings success, which could just be a coincidence, is not even enough to prove that early work has any impact on future earnings.

Flaw Drill Solutions

10. Everyone who boards the plane has to show his or her ticket to the attendant. Since Tom has shown his ticket, he will be allowed to board the plane.

Confuses a necessary condition for a sufficient one. Maybe there is some other reason they won't let Tom board the plane, such as that Tom is very drunk.

13. A recently published study claimed that Tat soda contains several chemicals known to sometimes cause unpleasant physical sensations. However, it's important to note that the study was financed by Eager Brands, a direct competitor of the company that produces Tat. Therefore, the study is highly dubious.

Takes for granted that the motivations of those who financed the study impacted the results of the study. Even if the competitor financed the study, that doesn't mean the study must be doubted.

16. A recent study on consumer behavior showed that when consumers are deciding on which towels to buy, an evocative name has a far greater impact on buying decisions than does the display design, or the actual quality of the towels. Therefore, if we are able to come up with an evocative name for our new towel collection, it is certain to be a success.

Takes for granted that because the name is important to success, it will ensure success. If the towels are of obviously terrible quality, chances are that no clever name will make it a success.

11. Prosperous towns almost always have two primary characteristics: jobs for its citizens, and homes that can be purchased for reasonable prices. We've spent the last five years improving our community in terms of these two characteristics. We now find ourselves with ample jobs for our citizens, and more than enough homes that can be purchased for reasonable prices. Therefore, it's reasonable to think that prosperous times are ahead.

Fails to consider that there may be other important factors that will determine whether the town will be prosperous. Perhaps some mysterious bad odor in the town will slow down some of that prosperity.

14. A successful business must have three characteristics: consistent revenue, low costs, and adequate capital reserves. Since our business has those three characteristics, it must be false that our business is unsuccessful.

Fails to consider that there may be other determinants of a successful business. Maybe the managers are incompetent.

12. It is well known that Yatoo Corporation has slashed the amount it pays in salaries by six percent this year. Since Jeff works at Yatoo, his salary was reduced by six percent.

Takes for granted that what is true for a group is true for the individual. We aren't told Yatoo slashed everyone's salary by the same amount.

15. Of those who tasted our new ice cream flavor just once, seventy-five percent said that they did not enjoy the taste of it. However, of those who tasted our new ice cream flavor more than five times, ninety-percent of people said they liked it. Therefore, it's likely that most people will eventually like the flavor, which seems to be an acquired taste.

Takes for granted that those who have tried the ice cream multiple times are representative of the population as a whole. Maybe the ice cream has a unique flavor few people like, and it's only the people who liked it to begin with who eat it over and over again.

18. There are various tests that scientists can perform to determine whether a planet is suitable for life as we know it. Of the over sixty thousand planets that have been carefully analyzed so far—the sixty thousand planets closest to us—none have come close to containing the combination of elements essential for life to exist. Therefore, it's very unlikely that there are other planets in the universe that contain life as we know it.

Fails to consider that the sample set of planets is unrepresentative of the whole. Sixty thousand planets seems like a lot of research, until you realize that so far we've discovered the existence of an estimated 400 billion planets. Sixty thousand is much too small a sample size.

Matching Double-Dip Drill

Here are some of the same arguments again. Draw lines connecting the pairs of arguments most similar to one another.

In order to build a desk, one simply needs ample wood, a saw, nails, and a hammer. I have all of those things, so I should be able to build a desk.

It is well known that Yatoo Corporation has slashed the amount it pays in salaries by six percent this year. Since Jeff works at Yatoo, his salary was reduced by six percent.

Of those who tasted our new ice cream flavor just once, seventy-five percent said that they did not enjoy the taste of it. However, of those who tasted our new ice cream flavor more than five times, ninety-percent of people said they liked it. Therefore, it's likely that most people will eventually like the flavor, which seems to be an acquired taste.

In a recent online poll about internet dating, sixty-five percent of participants said they preferred going on a first date with someone they had met online, rather than a first date set up by an acquaintance at work. This shows that single people, in general, prefer to go on first dates with people they meet online, rather than people they are set up with by coworkers.

You say that Sharon doesn't like soccer, but that can't be true. Sharon is Korean, and Koreans are known to be passionate soccer fans.

A successful business must have three characteristics: consistent revenue, low costs, and adequate capital reserves. Since our business has those three characteristics, it must be false that our business is unsuccessful.

Most successful financial advisors have excellent computer skills, as well as good people skills. Since Sean has excellent computer skills, and since he's terrific with people, there is a good chance he could be a successful financial advisor.

Prosperous towns almost always have two primary characteristics: jobs for its citizens, and homes that can be purchased for reasonable prices. We've spent the last five years improving our community in terms of these two characteristics. We now find ourselves with ample jobs for our citizens, and more than enough homes that can be purchased for reasonable prices. Therefore, it's reasonable to think that prosperous times are ahead.

More than education level, parents' income, or where one was born, the age at which one started working is the greatest statistical indicator of one's future earnings. Therefore, if we want to ensure that our daughter will have a successful earnings future, we should make sure to get her a job as soon as possible.

A recent study on consumer behavior showed that when consumers are deciding on which towels to buy, an evocative name has a far greater impact on buying decisions than does the display design, or the actual quality of the towels. Therefore, if we are able to come up with an evocative name for our new towel collection, it is certain to be a success.

Matching Double-Dip Solutions

In order to build a desk, one simply needs ample wood, a saw, nails, and a hammer. I have all of those things, so I should be able to build a desk.

A successful business must have three characteristics: consistent revenue, low costs, and adequate capital reserves. Since our business has those three characteristics, it must be false that our business is unsuccessful.

It is well known that Yatoo Corporation has slashed the amount it pays in salaries by six percent this year. Since Jeff works at Yatoo, his salary was reduced by six percent.

You say that Sharon doesn't like soccer, but that can't be true. Sharon is Korean, and Koreans are known to be passionate soccer fans.

Most successful financial advisors have excellent computer skills, as well as good people skills. Since Sean has excellent computer skills, and since he's terrific with people, there is a good chance he could be a successful financial advisor.

Prosperous towns almost always have two primary characteristics: jobs for its citizens, and homes that can be purchased for reasonable prices. We've spent the last five years improving our community in terms of these two characteristics. We now find ourselves with ample jobs for our citizens, and more than enough homes that can be purchased for reasonable prices. Therefore, it's reasonable to think that prosperous times are ahead.

Mistakes necessary characteristics for sufficient ones, and fails to consider other factors necessary or potentially important to the conclusion.

Fails to consider that those mentioned in the premise may be an unrepresentative sample of the general population.

Takes for granted that something true of a group must be true of an individual in that group.

Takes for granted that a characteristic important for an outcome will ensure that outcome.

Takes for granted that having characteristics important for an outcome is enough to reasonably expect that outcome.

Of those who tasted our new ice cream flavor just once, seventy-five percent said that they did not enjoy the taste of it. However, of those who tasted our new ice cream flavor more than five times, ninety-percent of people said they liked it. Therefore, it's likely that most people will eventually like the flavor, which seems to be an acquired taste.

In a recent online poll about internet dating, sixty-five percent of participants said they preferred going on a first date with someone they had met online, rather than a first date set up by an acquaintance at work. This shows that single people, in general, prefer to go on first dates with people they meet online, rather than people they are set up with by coworkers.

More than education level, parents' income, or where one was born, the age at which one started working is the greatest statistical indicator of one's future earnings. Therefore, if we want to ensure that our daughter will have a successful earnings future, we should make sure to get her a job as soon as possible.

A recent study on consumer behavior showed that when consumers are deciding on which towels to buy, an evocative name has a far greater impact on buying decisions than does the display design, or the actual quality of the towels. Therefore, if we are able to come up with an evocative name for our new towel collection, it is certain to be a success.

Sample Questions

Here are two LSAT questions that have arguments with piece ≠ puzzle issues. Read the question stem carefully, do your best to identify the flaw in the argument, and select the answer choice you think best addresses that flaw.

24.3.5. Bacteria from food can survive for several days on the surface of plastic cutting boards, but bacteria can penetrate wooden cutting boards almost immediately, leaving the surface free of contamination. Therefore, wooden cutting boards, unlike plastic cutting boards, need not be washed in order to prevent their contaminating food that is cut on them; wiping them off to remove food debris is sufficient.

Which one of the following is an assumption on which the argument depends?

- (A) Washing plastic cutting boards does not remove all bacteria from the surface.
- (B) Prevention of bacteria contamination is the only respect in which wooden cutting boards are superior to plastic cutting boards.
- (C) Food that is not already contaminated with bacteria can be contaminated only by being cut on contaminated cutting boards.
- (D) Bacteria that penetrate into wooden cutting boards do not reemerge on the surface after the cutting boards have been used.
- (E) Washing wooden cutting boards kills bacteria below the surface of the cutting boards.

24.2.5. Altogether, the students in Ms. Tarnowski's Milton Elementary School class collected more aluminum cans than did the students in any of the school's other classes. Therefore, the Milton student who collected the most aluminum cans was in Ms. Tarnowski's class.

Which one of the following arguments contains flawed reasoning that is most parallel to that in the argument above?

- (A) Altogether, more trees were planted by the students in Mr. Kelly's class than were planted by those in Mr. Liang's class and Ms. Jackson's class combined. Therefore, Mr. Kelly's students planted more trees than Ms. Jackson's students planted.
- (B) More than half of Milton Elementary School's students play in the band and more than half of the school's students sing in the choir. Therefore, every student at Milton Elementary School either plays in the band or sings in the choir.
- (C) Mr. Rowe's Milton Elementary School class raised more money by selling candy bars than Ms. Hunt's class raised by holding a raffle. Therefore, the number of candy bars sold by Mr. Rowe's class was greater than the number of raffle tickets sold by Ms. Hunt's class.
- (D) The total number of tickets to the school fair sold by the students in Ms. Ramirez's Milton Elementary School class was greater than the number sold by Milton students from any other class. Therefore, the Milton student who sold the most tickets to the school fair was a student in Ms. Ramirez's class.
- (E) Ms. Ventura's Milton Elementary School class assembled more birdhouses than did any of the school's other classes. Since Ms. Ventura's class had fewer students than any other Milton class, her students assembled more birdhouses, on average, than did the students in any other Milton class.

Sample Solutions

Let's think about these two questions in terms of the task the question stem presents (task), the reasoning issue in the argument (flaw), and the process of selecting an answer that best matches the task and the argument (answers).

24.3.5. Bacteria from food can survive for several days on the surface of plastic cutting boards, but bacteria can penetrate wooden cutting boards almost immediately, leaving the surface free of contamination. Therefore, wooden cutting boards, unlike plastic cutting boards, need not be washed in order to prevent their contaminating food that is cut on them; wiping them off to remove food debris is sufficient.

Which one of the following is an assumption on which the argument depends?

- (A) Washing plastic cutting boards does not remove all bacteria from the surface.
- (B) Prevention of bacteria contamination is the only respect in which wooden cutting boards are superior to plastic cutting boards.
- (C) Food that is not already contaminated with bacteria can be contaminated only by being cut on contaminated cutting boards.
- (D) Bacteria that penetrate into wooden cutting boards do not reemerge on the surface after the cutting boards have been used.
- (E) Washing wooden cutting boards kills bacteria below the surface of the cutting boards.

24.2.5. Altogether, the students in Ms. Tarnowski's Milton Elementary School class collected more aluminum cans than did the students in any of the school's other classes. Therefore, the Milton student who collected the most aluminum cans was in Ms. Tarnowski's class.

Which one of the following arguments contains flawed reasoning that is most parallel to that in the argument above?

- (A) Altogether, more trees were planted by the students in Mr. Kelly's class than were planted by those in Mr. Liang's class and Ms. Jackson's class combined. Therefore, Mr. Kelly's students planted more trees than Ms. Jackson's students planted.
- (B) More than half of Milton Elementary School's students play in the band and more than half of the school's students sing in the choir. Therefore, every student at Milton Elementary School either plays in the band or sings in the choir.
- (C) Mr. Rowe's Milton Elementary School class raised more money by selling candy bars than Ms. Hunt's class raised by holding a raffle. Therefore, the number of candy bars sold by Mr. Rowe's class was greater than the number of raffle tickets sold by Ms. Hunt's class.
- (D) The total number of tickets to the school fair sold by the students in Ms. Ramirez's Milton Elementary School class was greater than the number sold by Milton students from any other class. Therefore, the Milton student who sold the most tickets to the school fair was a student in Ms. Ramirez's class.
- (E) Ms. Ventura's Milton Elementary School class assembled more birdhouses than did any of the school's other classes. Since Ms. Ventura's class had fewer students than any other Milton class, her students assembled more birdhouses, on average, than did the students in any other Milton class.

Task: We need to find an assumption on which the argument depends. That means that we need an answer that must be true for the argument to work. This answer may or may not be important to the argument.

Flaw: The author is saying that wooden cutting boards don't need to be washed to prevent contaminating food cut on them—you can just wipe them off. Why? Because the surface of wooden boards can be free of contamination. But just because the bacteria can penetrate the wood immediately doesn't mean it must, right? And just the surface being free of contamination is still a problem—surely the contamination right under the surface can impact the food to be cut on the board in some way.

Answers: Let's look for an answer that needs to be true for the argument to work, and we'll first start by eliminating those answers that don't. (A) is about the plastic cutting boards, and we can eliminate it quickly. (B) compares plastic and wooden cutting boards—this is not information that is necessary for our argument. We also don't need the information given in (C)—whether food can only get contaminated on cutting boards or whether it can also get contaminated elsewhere isn't relevant. (D) needs to be true for the argument to work—if the bacteria did re-emerge, then the cutting boards would be contaminated. (D) is the correct answer. (E) makes washing cutting boards seem like a good idea, but it doesn't match our task—it doesn't tell us something that needs to be true for us to be able to not wash wooden cutting boards.

Task: We need to find an answer that has the same reasoning flaw as the argument in the stimulus.

Flaw: The author says that the student who collected the most cans is in Ms. T's class. Why? Ms. T's class collected the most cans. But just because the class collected the most cans doesn't mean that the one person who collected the most cans is in the class—perhaps that one person happened to be in another class in which her classmates collected very few cans. This is a puzzle ≠ piece issue: the author is falsely mistaking a characteristic of the group (class) for a characteristic of a part of the group (student).

Answers: We need to find an answer with puzzle ≠ piece issues. A quick look at (A), (B), and (C) makes it clear none of them have the same type of puzzle ≠ piece issues: (A) is about using one mathematical truth to infer another, (B) is about using a percentage to make a (false) inference about all of the various individuals in the group, and (C) is about (falsely) equating money made and candy bars sold. (D) is worded in a slightly twisted fashion, but it has the same type of puzzle ≠ piece problem that the original argument had, and so (D) is correct. (E) is about an average, and it's not about a puzzle ≠ piece issue.

7

LOGICAL REASONING

apples ≠ oranges

In the last lesson, we discussed faulty extrapolation—reasoning issues that arise when the person making the argument places too much significance on one characteristic, one opinion, or an unrepresentative sample set. In each of these cases, the author thought that the one clue was enough to justify his conclusion. In each of these cases, it wasn’t.

In this lesson, we’re going to focus on a different type of faulty argument—not one that falsely extrapolates, but rather, one that falsely transfers, or exchanges. Here are some examples of arguments that are flawed because the author, in his or her thought process, treats two things as if they are the same, or same *enough*, when they clearly are not:

“Since Vivian likes apples, I bet she will like oranges.”

“Ted says he loves Janice. Janice must therefore love Ted.”

“Sam got fit by working out. Since Ruby also got fit, she too must be working out.”

“George makes a lot of money at his job, so we can say he has a successful career.”

Note that each of these arguments has faulty reasoning, and, in each case, the problem is not so much that the author is generalizing from what he or she knows, but more so that the answer is *transferring* information or ideas from one situation to the another in some faulty way.¹ We can think of these types of errors as falling into three common categories:

1) The author falsely equates subject matter: The first example, “Since Vivian likes apples, I bet she will like oranges,” represents this type of error. The author assumes that what is true about apples is true about oranges—but this assumption is unwarranted.

2) The author falsely equates characteristics: The final example, “George makes a lot of money at his job, so we can say he has a successful career,” represents this type of error. The author equates making money with being successful, and as your grandparents would tell you, those two things are not the same.

3) The author falsely equates relationships: The second example, “Ted says he loves Janice. Janice must therefore love Ted,” represents this type of error. The third example does so as well, and it contains a special type of flaw that we will highlight in just a bit.

Let’s start this lesson by discussing each of these three categories in more depth.

Remember, the LSAT is testing your ability to understand absolute proof

1. Of course, keep in mind that there is great overlap between different types of flaws, and that there are many flaws that fall into multiple categories. These categories of flaws are not meant to be exclusive—they are all simply different vantage points from which we can get a better view of the problem within any particular argument. So, if you can see a flaw as being both one of extrapolation and incorrect equating, then great!

Falsely Equates Subject Matter

In everyday life, sometimes we are rewarded for seeing commonalities, and sometimes for seeing differences. The same is true on the LSAT—at times our job is to look for commonalities, and at times for differences. During your initial read of an argument, when your primary concern is to find fault with what the author is saying, it's best to focus on the *differences* in subject matter between the support and the conclusion. Here are a few basic examples for which the author falsely equates subject matter:

“Cheetahs have developed certain instincts for hunting prey. Household cats, which are related to cheetahs, likely have some of these very same instincts.”

Note that underlying this argument is a notion that what is true for the cheetah must be related to what is true for the household cat, just because the two animals are related. However, we know that this does not have to be the case.

“Sitting in and driving a car for long hours has been known to be bad for one’s back. So, it’s likely that flying an airplane for long hours has the same consequences.”

When we picture how a pilot sits, perhaps we notice how similar it is to how we sit when we drive our cars. Many of us are also liable to be influenced by some personal bias, having experienced first-hand how uncomfortable airplane seats are. However, without anything else specifically mentioned in the argument, we don’t know if the consequences of flying an airplane can be equated to those of driving a car.

Unfamiliar Subjects; Similar Subjects

This issue becomes more difficult when the subjects are very similar to one another, or so foreign to us that we don’t have an intuitive way to understand and relate to that topic. Take a look at this example and see if you can figure out what is wrong with the reasoning used to support the conclusion:

“The average salary at the company is currently well over \$17,000. Therefore, most of the employees must make over \$17,000.”

Did you catch the flaw there? If you are rushed in reading this, if you are inappropriately focused on “matching” terms in a mechanical sort of way (*most* with *most*; *over*

falsely equates subject matter

“All of the members of the medical staff at our hospital are required to wear name badges. Since Theron was recently hired to work full time at our hospital, he will be required to wear a medical badge.”

Not all of the employees of a hospital are part of the medical staff. Theron could be in janitorial service or accounting, in which case the requirement likely does not apply to him.

\$17,000 with over \$17,000), or if you are trying to see how the premise *does* support the conclusion, this can be a very easy issue to miss on test day.

However, an average salary is not the same thing as what most employees make. In fact, that average could be well over \$17,000 if, say, nearly all of the employees make \$1 each but the boss pays himself a million bucks. Over and over you will see, in challenging arguments, subjects in the conclusion and support “seem” the same or almost the same. Know that in these cases you need to be very critical of the differences.

“Old Worlde style serif fonts are characterized by having slight angles to their serifs. Therefore, if you are reading a serif font from long ago, it is likely to have serifs that have slight angles.”

Chances are, you haven’t heard of “Old Worlde style” fonts (because I just made it up), and this can make it more difficult to be critical of how the term is being used. However, what we can see is that it *is* some sort of proper term—a name given to a specific type of font—and we can also see that it would be wrong to assume that *any* “serif font from long ago” would necessarily be exactly the same as other fonts from that age. We don’t need to know what Old Worlde serifs are to know what is wrong with the argument.

Falsely Equates Characteristics

In the same way that it’s very easy for LSAT arguments to mistakenly relate subject matter, they can also mistakenly relate characteristics about that subject matter.

“Everyone knows Sarah is a friendly person. Therefore, she must be very social.”

Friendly and social are somewhat related to one another but they are not the same, and so, of course, it is wrong to use the fact that she is friendly to try and justify the idea that she is social.

One of the most common ways in which the LSAT will play with this is through the use of assumed, but not actual, opposites. Consider the following statements:

“Since Chris is not tall, he must be short.”

“John says he is not a Republican. Therefore, he must be a Democrat.”

falsely equates characteristics

“Samantha is obsessed with her work and with rising to the top of her company. It is clear that having a successful career is important to her.”

Being driven and wanting a successful career are often related, but they are not the same characteristic. Perhaps Samantha is obsessed with her work because she believes in its purpose, or because she wants to be able to boss people around all day (something quite different than wanting to be successful).

Don't read until after the drill.

1. VALID. Since Charlie attends the convention, we know he must purchase a ticket, and he must use a personal check to do so.

2. NOT VALID. Being an original owner leads to the consequences that Debra experiences, but that doesn't mean she must have been an original owner. Perhaps she bought into the business a few years after it started, but still kept her stake for a long time and ended up very satisfied.

3. VALID. Since Sean is tallest, he was the winner of the jumping contest.

4. NOT VALID. We are told of one characteristic that is sufficient to deny a credit card. There could be other reasons why they would be denied the credit card.

Notice that in each situation, the author is mistakenly equating *not* being something with being some sort of *opposite* of that thing. However, you don't have to be tall or short—you can be somewhere in the middle. Similarly, not being a Republican doesn't make one a Democrat.

Falsely Equates Relationships

Finally, certain arguments are flawed in that the author falsely assumes that the relationship between elements mentioned in the premise equates to that mentioned in the conclusion. Here are a couple of simple examples:

"Most residents of Hermosa Beach dine at Tom's Diner. Therefore, most of the customers in Tom's Diner must be residents of Hermosa Beach."

"Gerald joined that new exercise class and it helped him get in incredible shape. That's probably how Jill also got in such great shape."

Notice that in each case, there is a very strong connection between the subjects mentioned in the support and the subjects mentioned in the conclusion. However, the relationship has been altered in some way. In the first example, we go from saying most of X is Y to most of Y is X. That's not valid—it could be that Tom's is hugely popular, and most of the residents of other nearby communities dine there too, making Hermosa Beach residents just a small portion of the overall customer base. The second example is a bit more obvious—since Gerald getting in shape is related to his new exercise, the author assumes that Jill's getting in shape has the same association—however, this assumption is not justified—Jill could have gotten in shape in any number of other ways.

falsely equates relationships

"June says she supports Stacy's decision one hundred percent. That must mean that June agrees with what Stacy is doing."

To support something and to agree with something are not the same thing. Maybe June disagrees with what Stacy is doing but supports her anyway.

enough, but not necessary

In real life, a common way in which people falsely equate characteristics is to assume that one way to do something is the only way to do something. Take the following argument:

"If you finish college, you are certain to be financially successful. Therefore, if you want to be financially successful, you must finish college."

Put yourself in the mind of the person making this argument. What reasoning mistake are you making? Perhaps the most basic way to think of it is that you are mistaking one way for the only way. Perhaps the person to whom you are speaking is the greatest tennis player in the world. If that is the case, chances are that there are other ways that he or she can become financially successful.

A slightly different, more formal way of stating that "one way is the only way" is "mistaking sufficient for necessary." What the latter statement means is that the author uses evidence that one element or characteristic (in this case, graduating college) is *enough* to reach the outcome (financial success) to conclude that that element or characteristic *must be involved in the outcome* (one must graduate college to achieve financial success). You may notice that this is a "mirror-flaw" of "mistaking necessary for sufficient," which we discussed in the last lesson.

Here are some basic examples of arguments flawed because the author falsely equates *sufficient* with *necessary*:

"Coffee helps one stay awake. Therefore, if one wants to stay awake, one needs to drink coffee."

"Every student in Mrs. Wilber's class went to the museum. Since Sean went to the museum, he must be in Mrs. Wilber's class."

"Having over \$10,000 in your account entitles you to free checking. Since you have free checking, you must have over \$10,000 in your account."

Even if coffee does help one stay awake, there might be other ways. Even if all of the students in Mrs. Wilber's class went, there might be other students (not in her class) that also went. Even if this one characteristic (having over \$10,000) guarantees free checking, it may be that this person got free checking through some other means (maybe as part of a promotion). In each case, sufficient does not mean necessary.

To the side are four arguments. For two of them, the conclusion is actually perfectly valid—the premise we are given does guarantee the conclusion reached. For two of the arguments, the author has mistaken a sufficient condition for a necessary one. Make sure you understand which arguments are flawed and which ones are not. (answers on page 100).

valid?

Here are four arguments, two of which are valid and two of which are not. Cross out the two arguments in which the author has wrongly mistaken a sufficient condition for a necessary one.

1. Every convention attendee must purchase a ticket, and every person who purchases a ticket must do so by using a personal check. Since Charlie is a convention attendee, he must have purchased his ticket using a personal check.
2. All of the original owners kept their stake in the business over a long period of time, and anyone who kept their stake in the business ended up very satisfied. Since Debra kept her stake in the business for a long time and ended up very satisfied, it must be that she was an original owner.
3. Sean is the tallest student in the class. What we know about the jumping contest is that the tallest student in the class was the winner. Therefore, Sean was the winner.
4. Terry says that our credit request is going to be denied, but that's not true. A credit request is denied when those who are seeking the credit are shown to have insufficient funds to cover the loan in case of default. However, we have plenty of funds to cover the loan in case of default, and the bank will see that this is indeed the case.

Flaw Drill

Directions: For each argument, write why you think the support doesn't prove the conclusion.

1. Sandy is prone to wild emotional fluctuations, but Charlie is not. In fact, Charlie is the picture of serenity, never getting too up or too down. It is Charlie, not Sandy, that is in a healthier emotional state.

2. You say that most people who own smartphones also own laptops, but that must be incorrect, for fewer than half the people who own laptops own smartphones.

3. You say that Tony is more dangerous than Mary, which can't be true, for Mary is clearly the more aggressive of the two.

4. Ms. Wadkins had dinner at Mr. Crary's house on three occasions last week. The first time, she thought the meal was delicious and told him so. She did not find the next two meals to be delicious, and being that she is not one to lie, did not tell Mr. Crary that they were so. Mr. Crary concluded that she disliked those meals, and so chose to never make them for her again.

5. In order to join the finance committee, one must have at least six years of accounting experience. Since Tammy has only four years of accounting experience, she is not eligible to become a financial officer.

6. All librarians enjoy spending time organizing books. Since Teri enjoys spending time organizing books, I imagine she is a librarian.

7. Every time you drink, you end up feeling sick the next day. You say you are feeling sick today. You must have gone drinking yesterday.

8. Though individual human beings almost always claim to prefer peace to war, history has shown again and again that societies that wage war rise in power, whereas those they attack generally lose power. Ironically, therefore, societies that wage war have greater capacity to do good for the world.

9. Between 1980 and 1990, the total number of movie theater tickets purchased per year doubled. Therefore, a movie released in 1990 was likely, on average, to have twice the theater viewership of a movie released in 1980.

Flaw Drill

10. You claim that our company is in a better financial situation than it was seven years ago, but this claim is patently false. Not only have company earnings decreased during this time, they've actually decreased each year for seven years in a row.

13. The positioning of the fingers on a human hand gives us numerous advantages that we are all aware of—such as being able to hold a pencil and write. The positioning of the toes on our feet is as purposeful as the positioning of our fingers, and though we may not generally be aware of the advantages of our foot and toe design, they must invariably exist to a similar degree.

16. The Westwood brand of furniture is made using a process that has been handed down generation after generation. Each piece is made by a member of the Westwood family. Therefore, if your furniture was made by a member of the Westwood family, as you claim, then it must be true that it's Westwood brand furniture.

11. Maxine noticed a particular pattern in her husband: every time he told a lie, he would touch his left ear. On Tuesday she asked him where he was the night before, and touching his left ear, he said he was at his mother's house. She concluded he was lying and threw him out of the house.

14. Your claim that our company is becoming less and less profitable is simply not true. Our gross revenue has grown in each of the last six years, and you have stated yourself that you expect this trend to continue.

17. Before the teacher returned the essays back to the students who had written them, he mentioned the names of the students who received the highest scores. Danielle's name was not called. Therefore, she expected that she did not perform well on the essay.

12. You say that Albert is wiser than Max, but that cannot be true, for Max knows far more than Albert does.

15. How can you say I got a bad deal on these pants? They were on sale!

18. Homes in the area have not been selling for above their asking price. Sharon is expecting bids greater than her asking price for commercial real-estate she owns in the area, but these expectations are clearly unwarranted.

Flaw Drill Solutions

1. Sandy is prone to wild emotional fluctuations, but Charlie is not. In fact, Charlie is the picture of serenity, never getting too up or too down. It is Charlie, not Sandy, that is in a healthier emotional state.

Takes for granted that being less prone to emotional fluctuations equates to being in a healthier emotional state. Perhaps wild emotional fluctuations are signs of a healthy emotional state. Perhaps Charlie is serene because he blocks out his emotions in an unhealthy way.

2. You say that most people who own smartphones also own laptops, but that must be incorrect, for fewer than half the people who own laptops own smartphones.

Takes for granted that if a majority of people with smartphones have laptops, a majority of people with laptops must have smartphones. It could be that 100 people own smartphones, 80 of whom also own laptops; and 1000 people own laptops, 80 of whom own smartphones.

3. You say that Tony is more dangerous than Mary, which can't be true, for Mary is clearly the more aggressive of the two.

Takes for granted that aggression equates to danger. Perhaps Mary is aggressive but doesn't cause a danger to others, and perhaps Tony is not aggressive, but, because he is extremely clumsy, he poses a danger to all those who are around him.

4. Ms. Wadkins had dinner at Mr. Crary's house on three occasions last week. The first time, she thought the meal was delicious and told him so. She did not find the next two meals to be delicious, and being that she is not one to lie, did not tell Mr. Crary that they were so. Mr. Crary concluded that she disliked those meals, and so chose to never make them for her again.

Takes for granted that because Ms. Wadkins did not find the meal to be delicious, she did not like it. Perhaps she found the taste of it to be just okay, but because it was healthy and made her feel good, she liked eating it.

5. In order to join the finance committee, one must have at least six years of accounting experience. Since Tammy has only four years of accounting experience, she is not eligible to become a financial officer.

Takes for granted that being a member of the finance committee is directly related to becoming a financial officer. It could be that she could become a financial officer without joining the finance committee.

6. All librarians enjoy spending time organizing books. Since Teri enjoys spending time organizing books, I imagine she is a librarian.

Fails to consider that people other than librarians could also enjoy organizing books.

7. Every time you drink, you end up feeling sick the next day. You say you are feeling sick today. You must have been drinking yesterday.

Takes for granted that because drinking leads to feeling sick, feeling sick was caused by drinking. Fails to consider that other issues—perhaps catching a cold—could cause someone to feel sick.

8. Though individual human beings almost always claim to prefer peace to war, history has shown again and again that societies that wage war rise in power, whereas those that attack generally lose power. Ironically, therefore, societies that wage war have greater capacity to do good for the world.

Takes for granted that having power equates to having a greater capacity to do good. Power is a general term, and perhaps the type of power gained in many of these wars is not of a sort that can be helpful to others.

9. Between 1980 and 1990, the total number of movie theater tickets purchased per year doubled. Therefore, a movie released in 1990 was likely, on average, to have twice the theater viewership of a movie released in 1980.

Takes for granted that the number of films released per year stayed constant, and takes for granted that tickets sold equates to number of viewers. It could be that twice as many movies were released in 1990, so the average per-movie viewership stayed constant. It could be that movie theaters started offering fewer free tickets or fewer buy-one-get-one-free deals.

Flaw Drill Solutions

10. You claim that our company is in a better financial situation than it was seven years ago, but this claim is patently false. Not only have company earnings decreased during this time, they've actually decreased each year for seven years in a row.

Takes for granted that information about earnings is definitely representative of the company's general financial situation. It could be that yearly earnings are down because the company is investing in a massive program that will bring great financial success down the line.

13. The positioning of the fingers on a human hand gives us numerous advantages that we are all aware of—such as being able to hold a pencil and write. The positioning of the toes on our feet is as purposeful as the positioning of our fingers, and though we may not generally be aware of the advantages our foot and toe design, they must invariably exist to a similar degree.

Even if the positioning of the toes is as purpose-driven as the positioning of the fingers, the fingers can still give us greater advantages.

16. The Westwood brand of furniture is made using a process that has been handed down generation after generation. Each piece is made by a member of the Westwood family. Therefore, if your furniture was made by a member of the Westwood family, as you claim, then it must be true that it's Westwood brand furniture.

Takes for granted that because each piece of Westwood furniture is made by a Westwood family member, any furniture made by a Westwood family member must be Westwood brand furniture. Maybe a rogue son unhappy with his spot in the pecking order went to work for a rival company.

11. Maxine noticed a particular pattern in her husband: every time he told a lie, he would touch his left ear. On Tuesday she asked him where he was the night before, and touching his left ear, he said he was at his mother's house. She concluded he was lying and threw him out of the house.

Fails to consider that there are other issues that cause him to touch his left ear. Perhaps every time he thinks of his mother, he touches his left ear. Maybe he had an itch.

14. Your claim that our company is becoming less and less profitable is simply not true. Our gross revenue has grown in each of the last six years, and you have stated yourself that you expect this trend to continue.

Takes for granted that revenue equates to profit. Perhaps the revenue is increasing, but the costs are increasing at an even higher rate.

12. You say that Albert is wiser than Max, but that cannot be true, for Max knows far more than Albert does.

Takes for granted that knowing more equates to being wiser. As we've all heard all our lives, knowledge and wisdom are not the same thing. We all know people who know a lot but are fools.

15. How can you say I got a bad deal on these pants? They were on sale!

Takes for granted that being on sale equates to being a good deal. Perhaps the pants are a rip-off at any price.

17. Before the teacher returned the essays back to the students who had written them, he mentioned the names of the students who received the highest scores. Danielle's name was not called. Therefore, she expected that she did not perform well on the essay.

Takes for granted that the only people who did well were those who got the highest scores. Perhaps she got a score that she still considers "performing well" even if it was not one of the highest.

18. Homes in the area have not been selling for above their asking price. Sharon is expecting bids greater than her asking price for commercial real-estate she owns in the area, but these expectations are clearly unwarranted.

Takes for granted that there is a connection between the selling of homes and the selling of commercial real estate. Perhaps homes are selling below asking price but a shortage of office space, or incorrect pricing, is causing commercial real-estate to sell above asking price.

Sample Questions

Here are two LSAT questions that have arguments with piece ≠ puzzle issues. Read the question stem carefully, do your best to identify the flaw in the argument, and select the answer choice you think best addresses that flaw.

24.3.2. Advertisement: Anyone who thinks moisturizers are not important for beautiful skin should consider what happens to the earth, the skin of the world, in time of drought. Without regular infusions of moisture the ground becomes lined and cracked and its lush liveliness fades away. Thus your skin, too, should be protected from the ravages caused by lack of moisture; give it the protection provided by regular infusions of Dewyfresh, the drought-defying moisturizer.

The Dewyfresh advertisement exhibits which one of the following errors of reasoning?

- (A) It treats something that is necessary for bringing about a state of affairs as something that is sufficient to bring about that state of affairs.
- (B) It treats the fact that two things regularly occur together as proof that there is a single thing that is the cause of them both.
- (C) It overlooks the fact that changing what people think is the case does not necessarily change what is the case.
- (D) It relies on the ambiguity of the term “infusion,” which can designate either a process or the product of that process.
- (E) It relies on an analogy between two things that are insufficiently alike in the respects in which they would have to be alike for the conclusion to be supported.

24.2.21. Newspaper editor: Law enforcement experts, as well as most citizens, have finally come to recognize that legal prohibitions against gambling all share a common flaw: no matter how diligent the effort, the laws are impossible to enforce. Ethical qualms notwithstanding, when a law fails to be effective, it should not be a law. That is why there should be no legal prohibition against gambling.

Which one of the following, if assumed, allows the argument’s conclusion to be properly drawn?

- (A) No effective law is unenforceable.
- (B) All enforceable laws are effective.
- (C) No legal prohibitions against gambling are enforceable.
- (D) Most citizens must agree with a law for the law to be effective.
- (E) Most citizens must agree with a law for the law to be enforceable.

Sample Question Solutions

24.3.2. Advertisement: Anyone who thinks moisturizers are not important for beautiful skin should consider what happens to the earth, the skin of the world, in time of drought. Without regular infusions of moisture the ground becomes lined and cracked and its lush liveliness fades away. Thus your skin, too, should be protected from the ravages caused by lack of moisture; give it the protection provided by regular infusions of Dewyfresh, the drought-defying moisturizer.

The Dewyfresh advertisement exhibits which one of the following errors of reasoning?

- (A) It treats something that is necessary for bringing about a state of affairs as something that is sufficient to bring about that state of affairs.
- (B) It treats the fact that two things regularly occur together as proof that there is a single thing that is the cause of them both.
- (C) It overlooks the fact that changing what people think is the case does not necessarily change what is the case.
- (D) It relies on the ambiguity of the term “infusion,” which can designate either a process or the product of that process.
- (E) It relies on an analogy between two things that are insufficiently alike in the respects in which they would have to be alike for the conclusion to be supported.

24.2.21. Newspaper editor: Law enforcement experts, as well as most citizens, have finally come to recognize that legal prohibitions against gambling all share a common flaw: no matter how diligent the effort, the laws are impossible to enforce. Ethical qualms notwithstanding, when a law fails to be effective, it should not be a law. That is why there should be no legal prohibition against gambling.

Which one of the following, if assumed, allows the argument’s conclusion to be properly drawn?

- (A) No effective law is unenforceable.
- (B) All enforceable laws are effective.
- (C) No legal prohibitions against gambling are enforceable.
- (D) Most citizens must agree with a law for the law to be effective.
- (E) Most citizens must agree with a law for the law to be enforceable.

Task: We need to figure out what is wrong with the reasoning.

Flaw: The advertisement says that we should use Dewyfresh to protect our skin from the ravages of drought. As reasoning, it uses the analogy of the earth, which cracks and such when there is a drought. Wait a minute—who says our skin is like the earth?

Answers: The problem with this advertisement is not that it treats something that is needed for good skin as being enough to bring about good skin, so we can eliminate (A) quickly. The advertisement doesn’t have a causal flaw, so we can eliminate (B) too. What we think, versus what is, is not the issue, so we can eliminate (C). The term “infusion” is not relevant to the reasoning, and so we can eliminate (D). (E) is an unnecessarily complicated way of describing the flaw we saw initially: the argument uses for its reasoning an analogy (between skin and earth) it has no good reason to use. **(E) is correct.**

Task: We need an answer that allows the argument to be properly drawn—that means we need an answer that makes the conclusion 100% guaranteed based on the reasoning given.

Flaw: The author says that there should be no prohibition against gambling (yay!) Why? When a law fails to be effective, it should not be a law, and gambling laws are impossible to enforce. The author is falsely equating here: a law being enforceable is not the same thing as a law being effective. In order to fill this gap, we need to know that if a law is not enforceable, it won’t be effective.

Answers: (A) may not be exactly what we expected, but what does it tell us about unenforceable laws? Well, if no effective law is unenforceable, that means that laws that are unenforceable can’t be effective. That’s what we needed, and **(A) is correct.** (B) tells us something about enforceable laws, but what about unenforceable laws? It doesn’t help us with that, and so we can eliminate (B). (C) just restates something we had as support already—it doesn’t fix any holes in the argument. We can eliminate (D) and (E) very quickly—what most citizens must agree with doesn’t fill the gap we saw between enforcement and effectiveness.

Tips on Review

How did you do on those two questions? If you felt confident solving both of them, and if your thought process matched the one I outlined in the solution, then great. If you felt confident solving both of them, but your thought process was different from mine, that's great too. If you had trouble with either of the questions, hopefully reading the sample solution helped you see where, exactly, things started to go wrong for you, and hopefully it helped you understand the key facets of the questions.

If your aim is to score at a very high level (and there is no reason it shouldn't be), make it your goal to be able to fully understand, after the fact, every question that you review as part of your practice. To that end, here are guidelines for making sure that your understanding is complete:

(1) Read the question stem again carefully. Make sure you recognize exactly what it is that tips you off that you are supposed to be critical of an argument, and make sure you recognize exactly what your task is relative to that argument.

(2) Read the stimulus to correctly identify the argument. Remember, the argument consists of a point made and the reasoning given to support that point.

(3) Once you have the argument separated out, seek out the flaw in reasoning. Every time we are asked to be critical of reasoning, it will be imperfect in some way.

(4) Make sure you understand why the right answer matches the argument and the task. The right answer will address a flaw in the argument, and it will do so in a way that matches the task presented in the question stem.

(5) Make sure you understand why each wrong answer is incorrect. You should be able to clearly articulate at least one absolute reason why each wrong answer is wrong.

At this point in your process, it's expected that you may have trouble understanding certain questions "fully." Take note of such questions, and continue to recycle through them. In time, as your understanding and experience grows, expect the challenges that once felt impossible to feel more and more manageable.

8

LOGICAL REASONING

1 + 1 ≠ 3

In this lesson, we will discuss arguments that are flawed because the author brings together two ideas, or two pieces of information, to conclude something that those components do not warrant.

Here are some examples of arguments with $1 + 1 \neq 3$ flaws. It should be fairly obvious to you why each argument is flawed, but if you do get tripped up (it happens to all of us), make sure that you review the arguments again before you finish this lesson.

"Ted is the tallest in his family, and Sharon is the shortest in hers. Therefore, Ted must be taller than Sharon."

"In 1996, 2001, and 2004, we publicly unveiled plans to radically restructure our company. Those three years happen to be the worst three years in terms of our company stock's price levels. Clearly, the public was unhappy with our restructuring strategies."

If the flaws in the above arguments remind you of the flaws from Lessons 6 and 7, then great. As we've stated before, there is a natural overlap between categories and it's not something you need to feel rigid about. There is, in particular, a lot of bleed from both Lessons 6 and 7 into this one—the arguments in this lesson will often have the same type of reasoning flaws, but in the context of bringing two premises together.

On the next few pages, we will break down the most common $1 + 1 \neq 3$ arguments and discuss exactly why the reasoning in them is flawed. We'll then wrap up by practicing looking out for such flaws in arguments.

Context Issues

Sometimes, the subjects and characteristics mentioned in the premises will be an almost exact match for those that are in the conclusion, but the argument will still be flawed. Here's an example:

"Seven months ago, Ian's photos took up six percent of his computer memory. Today, they take up four percent of the memory on his computer. Ian must have deleted some photos, or in some other way lessened the amount of memory they are taking up on his computer."

Note that we haven't shifted subjects—we're talking about photos and computer memory throughout. But can you see how this argument could be wrong? Maybe he upgraded his memory to have more of it, or maybe he is on a different computer.

What this argument fails to take account of is *context*—the situation might be different, but the author assumes it has stayed consistent from six months ago to today. We know that's no good. Here's another one:

"Carla earns the average salary of the people who live in her city, and she lives in a home that is of average value relative to the other homes in her city. Nina lives in a neighboring city and the same can be said for her as well—her income and home value match those of the people in her city. It's likely, therefore, that Carla and Nina earn comparable salaries and live in comparably valued homes."

Again, note that there is a great amount of matching between the support and the conclusion: there are no subject shifts and the characteristics we are discussing—salaries and home values—stay consistent. The problem is that the author is making an assumption about context—in order for this argument to work, we'd have to know that the two cities are comparable in terms of average salaries and home values. Knowing that the two cities are neighbors is not nearly enough to prove that to us.

Reasoning Issues

In each of the examples we just discussed, if the context had been the same—that is, the computer in question didn't change in any other way, or if the cities that Carla and Nina lived in were indeed similar in terms of average salary and home value—the reasoning in them would actually have been valid. The failure to consider context is the only reason those arguments are wrong.

Far more commonly, $1 + 1 \neq 3$ arguments are flawed, however, for exactly the same types of reasoning issues that plague other arguments—the author jumps to a conclusion, or equates things that shouldn't necessarily be equated (hey, isn't this what context issues are as well?). A key way to recognize the flaw is to think about changes in subject matter, characteristic, or relationship. Here are three basic examples, one of each:

context issues

"George is the hardest working employee in his division, but the same cannot be said about Karla and her division. So, if we want to promote a hard worker to the upper management position, George is a stronger candidate than Karla."

Perhaps George happens to be the only person who works moderately hard in a division full of lazy employees, and perhaps Karla actually works far harder than George does.

"Coats and scarves sell better in the winter than in the summer, and t-shirts and shorts sell better in the summer than in the winter. It is expected, then, that jeans sell at a consistent rate year-around."

So, if we try to make the reasoning work, maybe we say to ourselves that jeans are neither a summer item nor a winter item, and so maybe it doesn't have these cyclical...but wait—that's not our job! We need to find what's wrong here, and what's wrong is that the premises don't tell us anything about jeans! This is a *subject matter issue*.

"Laptops, on average, are more expensive than desktop computers, but tablet systems are cheaper than desktop computers. It's clear that demand for laptops is far greater than that for tablets."

Note that the premises do prove, when taken together, that laptops are more expensive than tablets. However, thinking about what we can prove is a waste of time. What's wrong here is that price does not tell us anything definite about demand. In this case, the author has incorrectly changed the *characteristic*.

"A recent study of our university's graduates reported that students who paid for at least a part of their education themselves ended up earning more, on average, than did students whose parents paid for all of their expenses. This disparity was consistent across all different majors and periods in our school's history. This shows that contributing to the costs of one's own education can have a positive impact on one's future earnings."

This argument is probably the toughest of all to find fault with, but do you see it? Note that the premises give us a correlation—that is, a statistical connection between students paying for school and earning more afterwards—and the author uses this correlation to make a point about causation—paying impacts earnings. This is a reasoning no-no; no amount of correlation can ever prove a causal relationship—perhaps it's the most motivated students who end up paying for a part of their schooling, and it is this motivation, rather than the actual paying itself, that impacts the future earnings. We'll discuss causation more on the next page, but this would be an example of a *relationship issue*.

reasoning issues

"Most people who watch television now have methods that allow them to skip commercials, and yet most people do not skip commercials. This must mean that people enjoy watching commercials, at least enough to not skip them."

The author adds most people can skip commercials + most people do not to conclude that most people must enjoy the commercials. This does not add up. There could be other reasons people watch commercials even if they don't enjoy them. Maybe people who have these devices don't know how to use them, or perhaps skipping commercials requires one to record shows ahead of time, and people choose not to do that.

Correlation & Causation: The Complicated Relationship

Okay, let's imagine that on Tuesday you drink a Bogo Smoothie and you also get a stomachache. That would be an example of *correlation*—two things that are, through some characteristic (in this case, happening on the same day), related to one another.

Can we say that the smoothie caused your stomachache? We can guess this, but this type of guessing is really not required or rewarded on the LSAT. What we want to focus on is—would that be *enough information to be certain*? No.

Okay, how about this? The last five days on which you drank a Bogo Smoothie, you got a stomachache. Is that enough to prove that the Bogos caused the stomachaches? No. It doesn't prove it. It does make the case a bit more interesting, though, right?

How about this! Every day you drink a Bogo Smoothie you get a stomachache, and every day you don't drink a Bogo Smoothie you don't get a stomachache. This is true for your entire life. Is that enough to prove that the smoothie has at least some causal impact on your stomachaches? No.

It could be true that you get Bogo Smoothies whenever you go to see a movie at the mall, and it could be that sitting in a theater and watching a large bright screen gives you a stomachache. In this case, the smoothies and the stomachaches have nothing to do with one another. Or, it could be that nothing helps your stomachache like a Bogo Smoothie, so you run and get one every time you have a stomach ache—that is, instead of the smoothie causing the stomachache, the stomachache causes you to get the smoothie.

Are those scenarios more likely than the first? Of course not, but that's far beside the point. The bigger issue is that correlation can never, never, ever, ever(!), prove causation.

Now, if that's all there was to it, it would be simple enough, but let's go back to the smoothie and stomachache example. When the two happen to go together more and more—that is, it just keeps happening that these two events happen together, does it increase the likelihood that they are related, and that one might have a causal impact on the other? Yes it does. It doesn't absolutely prove it, but hey, if you just happen to be at every bank that gets robbed, your *likelihood* of being involved is greater than that of someone who lives, say three thousand miles away. So correlation *can* strengthen or weaken.

The flip side is even more convincing—if the correlation proves to not be as strong—let's say the next few days you drank the smoothie you didn't get stomachaches—does that weaken the case that the smoothie causes the stomachaches? Yes, it does.

Hence, the complicated relationship. Evidence of correlation, or lack thereof, can *strengthen* or *weaken* a claim of causation, but it can never, ever *prove* a claim of causation. Only causation proves causation. Let's expand on this and see how this understanding plays out in a variety of potential questions involving a causal argument.

argument & task

Right answers are answers that match the argument and the task. In this first swatch of lessons, we have focused primarily on developing our ability to evaluate arguments. In the next swatch of lessons, we will start discussing how to apply our skills to specific types of questions. Here's a small taste of how our understanding of an argument can relate to the various tasks that question stems can present.

"The last six instances in which our nation has made a public declaration condemning what we felt was an oppressive regime, there was violence in the days that followed that declaration. Therefore, if we want to minimize this type of violence, we should not make such public declarations."

What's Wrong: In this case, the causal claim is not directly stated in the conclusion; rather, it serves as the reasoning that underlies the conclusion reached. The author states that not making declarations would minimize the violence, and this would only be true if we were to assume that the declarations have some impact on the violence. The way the evidence is presented makes it seem pretty damaging, but the premise just provides us with a correlation: these two things—our declaration and the violence—happen to happen in the same place at related times. And, as we've discussed, correlation is never enough to justify a claim of causation. Maybe these other countries don't care at all what we declare, and the matching timing is just coincidence. Maybe we make these declarations in areas that are just about to go to war, and we do this in order to minimize the amount of inevitable violence to come. Your job, of course, isn't to necessarily think about these alternatives; rather, your job is to realize that the correlation is not enough to justify the causation (though correlation can strengthen or weaken the claim).

POTENTIAL QUESTIONS AND ANSWERS

Which of the following most accurately represents the author's main point? If we want to minimize this type of violence, we should not make these types of public declarations condemning oppressive regimes.

The reasoning in the argument is flawed in that it takes for granted that the declarations have some impact on the violence that follows.

The author assumes that not making such declarations will have a minimizing impact on this type of violence.

Which of the following, if true, would most strengthen the argument? Every country in the world pays significant attention to our nation's declarations, and there is rarely any violence when we do not make such declarations.

Which of the following, if true, most seriously weakens the argument? In each of the six instances, the declarations were made after it became certain that there would be violence in those areas.

What principle could be used to support this point? A correlation between such declarations and such violence is sufficient to show a causal impact.

Which of the following is an assumption the argument requires? Our declarations have at least some impact on the violence that ensues in other countries.

Which one of the following, if assumed, enables the argument's conclusion to be properly drawn? It is true that not making declarations will have a direct consequence of reducing the violence that follows.

The questionable pattern of reasoning in which of the following is most similar to that in the argument above? Over the past few years I've made a conscious effort to floss every night. However, each visit to the dentist reveals more gum decay. Therefore, I should stop flossing if I want to minimize gum decay.

Flaw Drill

Directions: For each argument, write why you feel the support doesn't prove the conclusion.

1. On average, students who have graduated from our university have consistently earned far more than have the graduates of our rival school. It must be that the superior quality of our instruction has some impact on our students' future earnings.

2. Musical geniuses are often poor music teachers, for they are often unable to express in words what it is they do so well. By a similar token, it's expected that those who are geniuses in the art of writing are often poor writing instructors.

3. Ted's father was twenty-three when he got married, his grandfather nineteen, and his great-grandfather twenty-one. Since Ted is twenty-five now and not yet married, it is unlikely he will ever be married.

4. In order to get into the club, it is required that one has a pass, and in order to get a pass, it is required that one is a member of a certain secret society. Therefore, if one is a member of the secret society, he or she will be able to get into the club.

5. In a certain local election, it just so happens that both Republicans and Democrats endorse the same candidate: Candidate X. All members of both parties will vote for him. Therefore, Candidate X will easily win the election.

6. Sarah spends a quarter of her monthly income on clothing, whereas Jonathan spends less than ten percent of his monthly income on clothing. So, I imagine Sarah spends a lot more on clothing than Jonathan does.

7. When the nurses at a certain hospital were polled on things about the hospital with which they were unhappy, the quality of the cafeteria food came up third on their list. Doctors polled at the same time listed the quality of cafeteria food as their most common complaint. It's clear, therefore, that the doctors are more upset about the quality of the cafeteria food than the nurses are.

8. Thomas says he cares more about the Montecito branch than he does the Thousand Oaks branch, but he spends far less time at the Montecito branch than he does at the Thousand Oaks branch. Therefore, I don't believe him.

9. Most people in the club support the new measure, and most people in the club support the plan to move to new facilities. Therefore, at least one member of the leadership committee supports the new measure and the plan to move to new facilities.

Flaw Drill

10. Sarah is an incredibly creative person, whereas Jeff is not. Therefore, Sarah will be better able to implement the significant changes that our company needs.

11. Most of the congressmen said that they would vote for the bill, but most of those who stated this said that they would do so with some reservations. It stands to reason, thus, that at least one congressman did not vote for the bill.

12. You agree with me that Terry has better leadership qualities than does Francine. Therefore, I'm sure you'll agree that Terry is better qualified for the job than Francine is.

13. When Sharon wears a knee brace while she plays basketball, her knee hurts a lot more than it does when she does not wear a knee brace while playing basketball. She determined that the knee brace was causing her pain and stopped wearing it.

14. Johnny recently broke one of his grandmother's glass jars, but after he explained to her that he was distracted, she did not get upset with him about the jar. Today, he crashed his grandmother's car. He expects, when he explains to her that he was just distracted, that she will not be upset.

15. Every time Val comes and visits, the house becomes a mess. So how can you say that Val is not messy?

16. Greg is the top soccer player in his league, and his league is the top soccer league in the country. It stands to reason that Greg is the best soccer player in the country.

17. Region A and Region B are both equally prone to dangerous tornados. Region A has a sophisticated warning system, whereas Region B does not. Therefore, Region A is better prepared for dangerous tornadoes than Region B is.

18. Everyone in our extended family tried out for the play, and most of the family members who tried out got parts in the play. So, it must be true that most of the parts in the play will be performed by members of my family.

Flaw Drill Solutions

1. On average, students who have graduated from our university have consistently earned far more than have the graduates of our rival school. It must be that the superior quality of our instruction has some impact on our students' future earnings.

Uses a correlation between attending a certain university and future earnings to justify a causal claim about the quality of instruction. It could be that graduating from that university has nothing to do with future earnings, or it could be that something else about the university other than the quality of instruction is responsible for the impact.

4. In order to get into the club it is required that one has a pass, and in order to get a pass, it is required that one is a member of a certain secret society. Therefore, if one is a member of the secret society, he or she will be able to get into the club.

The argument falsely assumes that since membership in a secret society is required to get a pass, that all in the secret society can get the pass, and that since a pass is required to get into the club, that all who have a pass will get into the club. Perhaps only some society members got passes, and only some of those with passes get into the club.

7. When the nurses at a certain hospital were polled on things about the hospital with which they were unhappy, the quality of the cafeteria food came up third on their list. Doctors polled at the same time listed the quality of cafeteria food as their most common complaint. It's clear, therefore, that the doctors are more upset about the quality of the cafeteria food than the nurses are.

The argument takes for granted that showing up first on one list is more significant than showing up third on another. Perhaps the nurses have other things they are unhappy about, but still care more about the quality of the cafeteria than the doctors do.

2. Musical geniuses are often poor music teachers, for they are often unable to express in words what it is they do so well. By a similar token, it's expected that those who are geniuses in the art of writing are often poor writing instructors.

The argument relates musical and writing genius, and the impact of that genius on teaching, without any warrant to do so. We have no proof that genius in writing has the same impact as genius in music. Perhaps being a genius at writing helps one be able to express ideas in words.

5. In a certain local election, it just so happens that both Republicans and Democrats endorse the same candidate: Candidate X. All members of both parties will vote for him. Therefore, Candidate X will easily win the election.

The argument falsely assumes that two groups of individuals—Democrats and Republicans—will determine the election results. Perhaps voters from other parties, or independent voters, will determine the election.

8. Thomas says he cares more about the Montecito branch than he does the Thousand Oaks branch, but he spends far less time at the Montecito branch than he does at the Thousand Oaks branch. Therefore, I don't believe him.

Takes for granted that time spent is equivalent to the amount that Thomas cares about a branch. Perhaps other reasons force him to stay at the Thousand Oaks branch.

3. Ted's father was twenty-three when he got married, his grandfather nineteen, and his great-grandfather twenty-one. Since Ted is twenty-five now and not yet married, it is unlikely he will ever be married.

The argument falsely relates four generations of a family without a sense of proper context. Perhaps Ted is unmarried because societal norm is to marry later than people once did.

6. Sarah spends a quarter of her monthly income on clothing, whereas Jonathan spends less than ten percent of his monthly income on clothing. So, I imagine Sarah spends a lot more on clothing than Jonathan does.

The argument fails to consider that Sarah and Jonathan may have significantly different incomes. If Sarah makes \$4 a month, and Jonathan \$1,000,000, it could be true that he spends a lot more on clothing than Sarah does.

9. Most people in the club support the new measure, and most people in the club support the plan to move to new facilities. Therefore, at least one member of the leadership committee supports the new measure and the plan to move to new facilities.

The argument fails to consider that those club members who support the measure or the move to the new facilities may not be members of the leadership committee. Perhaps the majority of the leadership committee happens to hold minority opinions on one or both of those issues.

Flaw Drill Solutions

10. Sarah is an incredibly creative person, whereas Jeff is not. Therefore, Sarah will be better able to implement the significant changes that our company needs.

Takes for granted that creativity is the characteristic that defines whether one will be able to implement the necessary changes. Perhaps Jeff isn't creative himself, but is amazing at getting ideas from others and implementing them successfully. Perhaps Sarah is creative but comes up with terrible ideas.

11. Most of the congressmen said that they would vote for the bill, but most of those who stated this said that they would do so with some reservations. It stands to reason, thus, that at least one congressman did not vote for the bill.

Takes for granted that because most who would vote for the bill have reservations, some will vote against the bill. "Most" does not exclude the possibility of "all," and the fact that they have reservations has no impact on the reasoning issues.

12. You agree with me that Terry has better leadership qualities than does Francine. Therefore, I'm sure you'll agree that Terry is better qualified for the job than Francine is.

The argument takes for granted that leadership qualities define the better candidate for the job. Perhaps Terry has certain undesirable qualities that offset his leadership skills, or perhaps there are other reasons that make Francine better qualified for that particular job.

13. When Sharon wears a knee brace while she plays basketball, her knee hurts a lot more than it does when she does not wear a knee brace while playing basketball. She determined that the knee brace was causing her pain and stopped wearing it.

Uses a correlation to justify a claim of causation. Perhaps, when Sharon wears the brace, she plays much harder, and that's why her knee hurts.

14. Johnny recently broke one of his grandmother's glass jars, but after he explained to her that he was distracted, she did not get upset with him about the jar. Today, he crashed his grandmother's car. He expects, when he explains to her that he was just distracted, that she will not be upset.

Fails to consider differences in context. It's perhaps more understandable for one to be distracted enough to break a glass jar than it is to be distracted enough to crash a car.

15. Every time Val comes and visits, the house becomes a mess. So how can you say that Val is not messy?

Uses a correlation to justify a claim of causation. Perhaps, when Val comes, family members have so much fun with her that they forget to do their own chores, and that's why the house becomes a mess.

16. Greg is the top soccer player in his league, and his league is the top soccer league in the country. It stands to reason that Greg is the best soccer player in the country.

Takes for granted that being the best in his league makes Greg the best in the country. Perhaps there is a better player playing in a lower league.

17. Region A and Region B are both equally prone to dangerous tornados. Region A has a sophisticated warning system, whereas Region B does not. Therefore, Region A is better prepared for dangerous tornadoes than Region B is.

Takes for granted that a sophisticated warning system is what determines which region is better prepared. Perhaps there are other reasons, such as a wiser and more prepared populace, or a simpler but more effective warning system, that make Region B better prepared.

18. Everyone in our extended family tried out for the play, and most of the family members who tried out got parts in the play. So, it must be true that most of the parts in the play will be performed by members of my family.

Takes for granted that since most family members have parts, most parts will be performed by the family members. Perhaps the family members only comprise a small portion of the overall cast.

Sample Questions

Here are two LSAT questions that have arguments with piece ≠ puzzle issues. Read the question stem carefully, do your best to identify the flaw in the argument, and select the answer choice you think best addresses that flaw.

23.2.8. The caterpillar of the monarch butterfly feeds on milkweed plants, whose toxins make the adult monarch poisonous to many predators. The viceroy butterfly, whose caterpillars do not feed on milkweed plants, is very similar in appearance to the monarch. Therefore, it can be concluded that the viceroy is so seldom preyed on because of its visual resemblance to the monarch.

Which one of the following, if it were discovered to be true, would most seriously undermine the argument?

- (A) Some predators do not have a toxic reaction to insects that feed on milkweed plants.
- (B) Being toxic to predators will not protect individual butterflies unless most members of the species to which such butterflies belong are similarly toxic.
- (C) Some of the predators of the monarch butterfly also prey on viceroys.
- (D) The viceroy butterfly is toxic to most predators.
- (E) Toxicity to predators is the principal means of protection for only a few butterfly species.

23.2.17. Studies show that the most creative engineers get their best and most useful ideas only after doodling and jotting down what turn out to be outlandish ideas. Now that many engineers do their work with computers instead of on paper, however, doodling is becoming much less common, and some experts fear that the result will be fewer creative and useful engineering ideas. These experts argue that this undesirable consequence would be avoided if computer programs for engineering work included simulated notepads that would allow engineers to suspend their “serious” work on the computer, type up outlandish ideas, and then quickly return to their original work.

Which one of the following is an assumption on which the experts’ reasoning depends?

- (A) Most creative engineers who work with paper and pencil spend about as much time doodling as they spend on what they consider serious work.
- (B) Simulated notepads would not be used by engineers for any purpose other than typing up outlandish ideas.
- (C) No engineers who work with computers keep paper and pencils near their computers in order to doodle and jot down ideas.
- (D) The physical act of working on paper is not essential in providing engineers with the benefits that can be gained by doodling.
- (E) Most of the outlandish ideas engineers jot down while doodling are later incorporated into projects that have practical applications.

Sample Question Solutions

23.2.8. The caterpillar of the monarch butterfly feeds on milkweed plants, whose toxins make the adult monarch poisonous to many predators. The viceroy butterfly, whose caterpillars do not feed on milkweed plants, is very similar in appearance to the monarch. Therefore, it can be concluded that the viceroy is so seldom preyed on because of its visual resemblance to the monarch.

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23.2.17. Studies show that the most creative engineers get their best and most useful ideas only after doodling and jotting down what turn out to be outlandish ideas. Now that many engineers do their work with computers instead of on paper, however, doodling is becoming much less common, and some experts fear that the result will be fewer creative and useful engineering ideas. These experts argue that this undesirable consequence would be avoided if computer programs for engineering work included simulated notepads that would allow engineers to suspend their “serious” work on the computer, type up outlandish ideas, and then quickly return to their original work.

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- (C) No engineers who work with computers keep paper and pencils near their computers in order to doodle and jot down ideas.
- (D) The physical act of working on paper is not essential in providing engineers with the benefits that can be gained by doodling.
- (E) Most of the outlandish ideas engineers jot down while doodling are later incorporated into projects that have practical applications.

Task: We need an answer that will hurt the argument by exposing its reasoning flaws in some way.

Flaw: The author’s point is that the viceroy isn’t preyed on because it looks like the monarch. The reason given? The monarch is poisonous. There are a couple of flaws here (one being that it’s unclear whether predators stay away from monarch butterflies because they are poisonous), but the main one has to do with how the author is bringing information together: predators presumably want to stay away from the monarch, and the viceroy looks like the monarch, so predators must want to stay away from the viceroy because of this resemblance. Maybe there is some other reason predators want to stay away from the viceroy—like maybe they are ugly or smell really bad.

Answers: (A) has no direct impact on the monarch/viceroy connection and can be eliminated. For the same reason, (B) can be eliminated. It’s unclear how (C) would hurt the argument, and we can quickly get rid of it as well. (D) finally gives us information that is relevant—if (D) is true, it provides an alternative reason for why predators might stay away from viceroys (and therefore undermines the idea that they stay away because viceroys look like monarchs). (D) is correct. It’s unclear what impact (E) could have on the reasoning, and we can quickly get rid of it as well.

Task: We need an answer on which the argument depends; that means we need an answer that must be true if the reasoning in the argument is going to work.

Flaw: The experts’ point is that a simulated notepad computer program that allows engineers to doodle would help engineers get useful ideas. Why? Because when engineers doodle on paper it helps them get useful ideas. Wait a minute—I’ve tried doodling and jotting down ideas on a computer screen—it is not the same thing as doing it on a real paper notepad. The author is smashing together two things (notepad and computer) and making assumptions about the consequences:

Answers: The relative amount of time doodling versus working is not something that is directly relevant to the argument, and so we don’t need to know (A) for the argument to work—we can eliminate it quickly. Whether the engineers use the notepads for other things doesn’t impact the reasoning either, so we can eliminate (B). (C) might help the argument a little bit, because it gets rid of another obvious way to fix the problem, but it doesn’t match the task—(C) does not need to be true for the argument to work. (D) does need to be true for the argument to work—if the experts’ suggestion is going to pan out, it needs to be not important to the engineer that the doodling be done on paper, and that is exactly what (D) says. (D) is correct. Finally (E), which helps show the benefits of doodling, has no impact on the reasoning.

More Tips on Review

At the end of the previous lesson, we discussed the importance of fully understanding each and every question that you solve and review as part of your LSAT preparation. For the types of questions that we are currently dealing with, that means understanding the task presented in the question stem, correctly identifying the argument, seeing the flaw in the argument reasoning, being able to match the right answer to the argument and the task, and being able to come up with exact reasons for why wrong answers are wrong.

Now let's talk about how to take it a step further.

In order to get the most out of your review, you want to go beyond understanding; you want to think about your outcome in terms of your performance—how you solved the problem in real time. By linking your review with the actions that you take during a question, you can most effectively impact and change your problem-solving process and habits. We can think of our misses as being the result of one or more *wrong actions*, and we can think of these wrong actions as falling into three general categories:

1) I read it wrong. Take note of the questions you miss because you misunderstand what you read, or don't see the reasoning structure correctly. Perhaps you didn't see the author's point clearly, you weren't able to isolate the supporting evidence, or you overprioritized the background information. Maybe you read everything in the stimulus right, but missed the question because you misread, and quickly dismissed, what ultimately turned out to be the right answer.

2) I thought it wrong. Take note of the questions you miss because you don't see what is wrong with the reasoning in the argument. Finding flaws with arguments is what we've been working on most, and hopefully you already see some of the benefits of the work we've done.

3) I solved it wrong. This is most directly related to the process you used to select an answer choice. Perhaps you weren't diligent about eliminating wrong answers, or perhaps you didn't have a clear sense of exactly what the right answer was supposed to do.

For the questions that you miss in your review, or ones you find more challenging than you think you ought to, try to think about why, and try to do so in terms of the three categories mentioned above. Remember, there is plenty of time to gain mastery in all aspects of Logical Reasoning—a big key is to have a very clear sense of what it is exactly that you need to improve on.

9

LOGICAL REASONING

flaw review

We've started our Logical Reasoning training with four lessons that have focused on one particular aspect of the problem-solving process: recognizing flaws in arguments.

For a majority of questions that appear in the section, your ability to identify the argument and to recognize the problem that exists between the conclusion and its support will be the *key* determinant of your success. This majority becomes even more pronounced when we isolate the hardest questions in the section—that is, the *vast* majority of the most difficult questions will depend on this skill. Furthermore, the *other* skills that we develop in our quest to identify flaws just happen to be some of the same skills that are required for success on minor question types.

As we'll see in future lessons (and in some examples later in this lesson), some questions do not require us to think about whether or not an argument is valid. In such cases when we are asked *not* to judge, forming an opinion is generally a detriment, for these questions are, in part, specifically testing our ability to stay objective.

However, most questions do require that we use our reasoning skills to evaluate an argument. When we are asked to do so, it is important that we not focus on "whether or not" an argument is valid, for in every such situation we will know that the argument is *not* valid. Our job, then, is to understand as correctly and specifically as we can *why* the argument is not valid. Understand that well, and you will see the matrix behind Logical Reasoning questions. Right answers and wrong answers will be far more obvious and clear-cut.

Reading for flawed reasoning is as much habit as it is skill, and hopefully these four lessons have helped start you on the path to the optimal mindset for thinking about arguments critically. In Lesson 5 we discussed two mantras that help put us in this right mindset: "fails to consider" and "takes for granted." These statements accurately generalize the problems with all arguments—the authors of these arguments invariably fail to consider something, or they take for granted something that they should not.

In Lessons 6, 7, and 8, we defined three categories of reasoning flaws—over-extrapolating ($\text{piece} \neq \text{puzzle}$), falsely-associating ($\text{apples} \neq \text{oranges}$), and bringing information together incorrectly ($1 + 1 \neq 3$). As we discussed, there is great overlap between these categories, and it is not our goal to exclusively assign an issue to one category or another. Rather, we want to utilize all that we know about flaws to help us see the flaws that we encounter in accurate, conceptual, and well-rounded ways. If you see a flaw as an $\text{apples} \neq \text{oranges}$ issue *and* a $\text{piece} \neq \text{puzzle}$ issue, well then, great! Our goal is not to understand the flaw in one particular way, but rather to understand it the best we can.

**Recognizing flaws
is the key
reasoning skill,
and recognizing
arguments is
the key
reading skill**

Our understanding of the flaw is the most important tool we have for eliminating wrong choices and identifying the right one. In this lesson, we will start the process of relating the work we've done with flaws to the more general process of solving full questions. We'll do so by talking briefly about the work we need to do in a problem before we start thinking about the flaw (we'll call this "prep work"), the act of finding the flaw in an argument ("the decision"), and finally, the manner in which we want to use this understanding to eliminate wrong answers and select the right choice ("the payoff"). We'll end the lesson by solving and discussing a set of eight Logical Reasoning questions.

Different types of questions will require us to utilize our skills in different ways and we'll go into great detail about this starting in the next swatch of lessons.

Prep Work

Recognizing the flaw in an argument is a *reasoning* skill, and it is the key reasoning skill required for this section. However, it's important to remember that Logical Reasoning is also just as much about your *reading* skills as it is about your reasoning skills. The most significant reading skill is your ability to recognize reasoning structure; that is, your ability to see how various parts of the stimulus are meant to relate to one another.

The reasoning structure with which we need to be most familiar and comfortable is that of an argument. For the sake of the LSAT, we can define an argument simply as a main point, and the reasons given to support that point. Up until now in our studies, I've gone ahead and isolated the argument for you; that is, for the drills that we've done, almost everything in the stimulus was part of the conclusion, or support for that conclusion. Furthermore, for most drill problems, it should have been fairly obvious which component was the conclusion and which parts were meant to support.

**An argument
consists of a main
point, and reasons
given to support
that point**

As you've experienced in your 10 Actuals work and the LSAT questions we've done together in this book thus far, on real LSAT questions, arguments are hidden within stimuli that also contain other types of information—primarily background information and opposing evidence. Furthermore, sometimes the test writers make it a challenge to understand exactly what part is meant to be the conclusion and what part is meant to be the support. This is the key reading challenge that is presented in this section: over and over again, you are going to have to prove that you can correctly identify and focus in on the argument within the stimulus.

In later lessons, we will get plenty of practice in extracting arguments from stimuli. Here's the key tip for now: *do not* try and absorb all parts of the stimulus with equal weight and attention. Rather, as you read through a stimulus, you want to *prioritize*. The main point and the support for it are far more important for you to recognize and understand correctly, and yet to throw you off the scent, the background and opposing points are often written to grab the most attention. For a question that requires us to be critical of argument reasoning, the background and opposing points will not have a direct impact on the differentiation between right and wrong answers. So pay the most attention to the point and the support, and try to push everything else into the background.

Remember: your main job, as you initially read through a stimulus, is to pull out the argument. Do so by first identifying the main point (you can't have an argument without a point). If all you do in your first read through a stimulus is identify the point, that

read is a success. Once you have the point, identify the support. Sometimes, the support will be mixed in with background information—that's okay—it's typically not essential for you to draw a clear line of demarcation between the two. Instead, you want to focus on developing a clear conceptual understanding of exactly what reasoning strategy the author is using—just focus on how he's trying to justify the conclusion.

The Decision

Once we've zeroed in on the conclusion and the support, it's time to do our most important "thinking." We have to figure out, in as specific a way as we can, why the support given is not enough to justify the conclusion reached.

As I've mentioned before, mindset is critical for this task. I've seen many students get "stuck" at a certain level in their training because of their inability to habitualize the correct thought processes. Unfortunately, it becomes harder and harder to change your mindset as you get deeper into your studies. That's why you want to make sure you address your mindset as much as possible at the beginning of your process.

Most of us, especially if we tend to be positive or optimistic people, habitually think about arguments in terms of how they *can* work—that is, we generally read to see how the support given *can* support the conclusion reached. And if something sounds reasonable, well, most of us are not in a mindset to nitpick problems. In life, this is a positive trait, but on the LSAT, this mindset is seriously detrimental.

There is one situation in life in which we don't tend to react to arguments in this way—when the arguments are made by people we strongly mistrust or strongly disagree with. If you know someone who consistently lies to you, and if these lies have a bad consequence on your life, your instinct is to focus on the holes in his or her reasoning. If you're forced to listen to a speech by a political figure with whom you strongly disagree, your instinct will probably be to pick apart his reasoning—to look for reasons why his argument is *not* reasonable. It's tough to go through all of life with this mindset, but this is indeed the optimal mindset for the LSAT. If you can picture arguments as being spoken by the blow-hard radio host you can't stand, or that family member who's always trying to borrow money from you, you'll be in a much better place to think about the issues that affect right and wrong answers.

Lastly, make sure that your understanding of the flaw is conceptual and flexible. Challenging right answers will often word flaws in ways we don't expect, or expose these flaws from an unexpected perspective. If you are tied to a particular way to think about or word the argument flaw, these challenges will trip you up far more than they will if you have a generalized understanding of the issue.

**Pay the most
attention to the
point and the
support, and try
to push everything
else into the
background**

The Payoff

Going into the answer choices with a clear understanding of the argument flaw is like going into a knife fight with a gun—you have a clear advantage, and if you are smart about how you utilize it, you should expect to come out on top.

Each type of question that we see is going to require something different from us; that is, they are going to ask us to utilize, or reach to, our understanding of the argument flaw in different ways. Some may ask that we figure out ways to help fix the issue, or

same flaw / different perspectives

<i>Formula X is an effective treatment for disease Y.</i>	Takes for granted that Formula X is the only effective treatment for disease Y that was available to Carmen.
<i>Since Carmen was recently treated for disease Y, and since her treatment was effective, it must have been Formula X.</i>	Fails to consider that Carmen could have used another effective treatment for disease Y.
	Confuses a condition sufficient for bringing about a certain outcome for one required for that outcome.

that we find another argument with a similar issue. Many questions will simply ask us to state what the problem is with the argument.

Finally, a minority of questions will not ask us to critique the reasoning at all. We think of these as objective questions. They may ask what the author's point was, or why he or she chose to mention a particular phrase in the stimulus. I've scattered a couple in the upcoming drill set for you to get a taste of these questions.

The quick-change act we need to perform for different types of questions requires us to have a significant amount of mental discipline. You want to consistently remind yourself of your job for that particular question. Many of the most tempting wrong answers are answers that would be correct if the task the question stem presented were to be just a little bit different. Remember that the right answer is one that satisfies two conditions: it matches the argument, and it matches the task presented in the question stem.

One more suggestion is to get in the habit of eliminating wrong choices before beginning to look for the right one. If you have a strong sense of the argument and a strong sense of your task, it will be very tempting to just go seeking the right answer. This will work sometimes, but it is not the optimal strategy for a high scorer. Keep in mind that a strong sense of argument and task are also great tools to use for eliminating wrong choices, and in general, the most difficult Logical Reasoning questions are constructed so that the wrong answers are significantly more obvious than the right answer; that is, at the end of the day, it's easier to see why the four choices were wrong than to see why the right answer is right. Focusing on wrong answers will make the section easier. Going through a two-step process of first eliminating wrongs, then searching for the right choice (as opposed to evaluating in one turn whether answers are right or wrong) will increase your overall accuracy, and in time should also help you actually go *faster* than you would otherwise.

QUESTION STEM CHEAT SHEET

For each of the questions on the next two pages...

- (1) Get in the habit of reading the question stem first. It is an important tool for staying better focused on the task.
- (2) Search for the argument in the stimulus. It's best to find the conclusion first, then the support for that conclusion.

... then focus back on the specific task the question stem presents.

Of the following, which one most accurately expresses the main point of the argument?

For this type of question, we want to simply decide on what we think is the conclusion within the argument, then find the answer that best represents that understanding. The right answer should be predictable, and should require very little inference work on your part. Note that this question does not require us to be critical of the reasoning, so we need not waste time figuring out what's wrong with the argument.

Each of the following, if true, would strengthen the argument EXCEPT:

Figure out what's wrong with the argument, then eliminate answers that help fix that issue. Keep in mind that the right answer may or may not weaken the argument—it might actually have no direct impact on the argument. What we do know is that the four wrong answers will strengthen the relationship between support and conclusion, and we want to work to eliminate those answers.

The part about X figures in the argument in which one of the following ways?

We want to decide on the role played by the part in question, then find the answer that best represents that understanding. A component's role is defined by how it relates to the main point. The right answer should be predictable and should require very little inference work on your part. Note that this question type also does not require us to be critical of the argument reasoning in any way.

Which one of the following is an assumption on which the psychologist's argument depends?

Start by figuring out what is wrong with the argument. The key term in this question stem is "depends." That does not mean the right answer needs to be *important* in addressing the argument flaw. It simply means that the answer is something that needs to be true in order for the argument to work.

The argument's reasoning is questionable because the argument

This question is asking us, in a direct way, what is wrong with the argument. So, we want to make sure that we've thought about the argument critically before moving on to the answers. The right answer should be predictable, but may not be worded as you expect.

Each of the following describes a flaw in the game show host's reasoning EXCEPT:

Per this question stem, we know that there are going to be a lot of issues between the support and the conclusion. Get as clear a sense as you can of the problems in that relationship before moving on to the answer choices. Eliminate the four answers you think best describe the problems, and select the answer that remains.

Which one of the following, if true, most seriously weakens the argument?

Figure out what is wrong with the argument, then select the answer that exposes that flaw. Tempting wrong answers will relate to the conclusion or the support, but not the problem that exists between them. Remember to treat each answer choice as being true.

Which one of the following arguments contains a flaw in reasoning that is similar to one in the argument above?

This type of question requires a bit more work from us, so give yourself a bit of extra time if needed. Start by figuring out what's wrong with the argument. Then work to eliminate answers that either reach a very different type of conclusion, use different types of support, or seem to have different problems. Confirm the right answer by matching conclusions, support, and reasoning issues.

— work to eliminate incorrect answers before searching for the right answer —

Argument-Based Question Set

29.1.16. We can learn about the living conditions of a vanished culture by examining its language. Thus, it is likely that the people who spoke Proto-Indo-European, the language from which all Indo-European languages descended, lived in a cold climate, isolated from ocean or sea, because Proto-Indo-European lacks a word for “sea,” yet contains words for “winter,” “snow,” and “wolf.”

Which one of the following, if true, most seriously weakens the argument?

- (A) A word meaning “fish” was used by the people who spoke Proto-Indo-European.
- (B) Some languages lack words for prominent elements of the environments of their speakers.
- (C) There are no known languages today that lack a word for “sea.”
- (D) Proto-Indo-European possesses words for “heat.”
- (E) The people who spoke Proto-Indo-European were nomadic.

29.1.11. It is well known that many species adapt to their environment, but it is usually assumed that only the most highly evolved species alter their environment in ways that aid their own survival. However, this characteristic is actually quite common. Certain species of plankton, for example, generate a gas that is converted in the atmosphere into particles of sulfate. These particles cause water vapor to condense, thus forming clouds. Indeed, the formation of clouds over the ocean largely depends on the presence of these particles. More cloud cover means more sunlight is reflected, and so the Earth absorbs less heat. Thus plankton cause the surface of the Earth to be cooler and this benefits the plankton.

Of the following, which one most accurately expresses the main point of the argument?

- (A) The Earth would be far warmer than it is now if certain species of plankton became extinct.
- (B) By altering their environment in ways that improve their chances of survival, certain species of plankton benefit the Earth as a whole.
- (C) Improving their own chances of survival by altering the environment is not limited to the most highly evolved species.
- (D) The extent of the cloud cover over the oceans is largely determined by the quantity of plankton in those oceans.
- (E) Species such as plankton alter the environment in ways that are less detrimental to the well-being of other species than are the alterations to the environment made by more highly evolved species.

28.1.19. The postmodern view involves the rejection of modern assumptions about order and the universality of truth. The grand theories of the modern era are now seen as limited by the social and historical contexts in which they were elaborated. Also, the belief in order has given way to a belief in the importance of irregularity and chaos. It follows that we inhabit a world full of irregular events, and in which there are no universal truths.

The argument’s reasoning is questionable because the argument

- (A) infers that something is the case because it is believed to be the case
- (B) uses the term “universal” ambiguously
- (C) relies on the use of emotional terms to bolster its conclusion
- (D) uses the term “order” ambiguously
- (E) fails to cite examples of modern theories that purport to embody universal truths

27.1.11. A local chemical plant produces pesticides that can cause sterility in small mammals such as otters. Soon after the plant began operating, the incidence of sterility among the otters that swim in a nearby river increased dramatically. Therefore, pesticides are definitely contaminating the river.

Which one of the following arguments contains a flaw in reasoning that is similar to one in the argument above?

- (A) The bacteria that cause tetanus live in the digestive tract of horses. Tetanus is a highly infectious disease. Consequently it must be that horses contract tetanus more frequently than do most other animals.
- (B) A diet low in calcium can cause a drop in egg production in poultry. When chickens on a local farm were let out in the spring to forage for food, their egg production dropped noticeably. So the food found and eaten by the chickens is undeniably low in calcium.
- (C) Animals that are undernourished are very susceptible to infection. Animals in the largest metropolitan zoos are not undernourished, so they surely must not be very susceptible to disease.
- (D) Apes are defined by having, among other characteristics, opposable thumbs and no external tail. Recently, fossil remains of a previously unknown animal were found. Because this animal had opposable thumbs, it must have been an ape.
- (E) The only animal that could have produced a track similar to this one is a bear. But there are no bears in this area of the country, so this animal track is a fake.

Argument-Based Question Set

28.1.21. Psychologist: Some astrologers claim that our horoscopes completely determine our personalities, but this claim is false. I concede that identical twins—who are, of course, born at practically the same time—often do have similar personalities. However, birth records were examined to find two individuals who were born 40 years ago on the same day and at exactly the same time—one in a hospital in Toronto and one in a hospital in New York. Personality tests revealed that the personalities of these two individuals are in fact different.

Which one of the following is an assumption on which the psychologist's argument depends?

- (A) Astrologers have not subjected their claims to rigorous experimentation.
- (B) The personality differences between the two individuals cannot be explained by the cultural differences between Toronto and New York.
- (C) The geographical difference between Toronto and New York did not result in the two individuals having different horoscopes.
- (D) Complete birth records for the past 40 years were kept at both hospitals.
- (E) Identical twins have identical genetic structures and usually have similar home environments.

29.4.20. Amphibian populations are declining in numbers worldwide. Not coincidentally, the earth's ozone layer has been continuously depleted throughout the last 50 years. Atmospheric ozone blocks UV-B, a type of ultraviolet radiation that is continuously produced by the sun, and which can damage genes. Because amphibians lack hair, hide, or feathers to shield them, they are particularly vulnerable to UV-B radiation. In addition, their gelatinous eggs lack the protection of leathery or hard shells. Thus, the primary cause of the declining amphibian population is the depletion of the ozone layer.

Each of the following, if true, would strengthen the argument EXCEPT:

- (A) Of the various types of radiation blocked by atmospheric ozone, UV-B is the only type that can damage genes.
- (B) Amphibian populations are declining far more rapidly than are the populations of nonamphibian species whose tissues and eggs have more natural protection from UV-B.
- (C) Atmospheric ozone has been significantly depleted above all the areas of the world in which amphibian populations are declining.
- (D) The natural habitat of amphibians has not become smaller over the past century.
- (E) Amphibian populations have declined continuously for the last 50 years.

29.4.15. Ambiguity inspires interpretation. The saying, "We are the measure of all things," for instance, has been interpreted by some people to imply that humans are centrally important in the universe, while others have interpreted it to mean simply that, since all knowledge is human knowledge, humans must rely on themselves to find the truth.

The claim that ambiguity inspires interpretation figures in the argument in which one of the following ways?

- (A) It is used to support the argument's conclusion.
- (B) It is an illustration of the claim that we are the measure of all things.
- (C) It is compatible with either accepting or rejecting the argument's conclusion.
- (D) It is a view that other statements in the argument are intended to support.
- (E) It sets out a difficulty the argument is intended to solve.

28.3.20. Game show host: Humans are no better than apes at investing, that is, they do not attain a better return on their investments than apes do. We gave five stock analysts and one chimpanzee \$1,350 each to invest. After one month, the chimp won, having increased its net worth by \$210. The net worth of the analyst who came in second increased by only \$140.

Each of the following describes a flaw in the game show host's reasoning EXCEPT:

- (A) A conclusion is drawn about apes in general on the basis of an experiment involving one chimpanzee.
- (B) No evidence is offered that chimpanzees are capable of understanding stock reports and making reasoned investment decisions.
- (C) A broad conclusion is drawn about the investment skills of humans on the basis of what is known about five humans.
- (D) Too general a conclusion is made about investing on the basis of a single experiment involving short-term investing but not long-term investing.
- (E) No evidence is considered about the long-term performance of the chimpanzee's portfolio versus that of the analysts' portfolios.

Argument-Based Question Set Solutions

29.1.16. We can learn about the living conditions of a vanished culture by examining its language. Thus, it is likely that the people who spoke Proto-Indo-European, the language from which all Indo-European languages descended, lived in a cold climate, isolated from ocean or sea, because Proto-Indo-European lacks a word for “sea,” yet contains words for “winter,” “snow,” and “wolf.”

Which one of the following, if true, most seriously weakens the argument?

- (A) A word meaning “fish” was used by the people who spoke Proto-Indo-European.
- (B) Some languages lack words for prominent elements of the environments of their speakers.
- (C) There are no known languages today that lack a word for “sea.”
- (D) Proto-Indo-European possesses words for “heat.”
- (E) The people who spoke Proto-Indo-European were nomadic.

Prep Work: We are asked to weaken the argument, and so we want to focus in on the conclusion and the support for that conclusion. The author’s point is clear—these people lived in a cold climate isolated from the sea. The reasoning is also clear—they have words for things that go with cold climates, but they don’t have a word for “sea.”

The Decision: Does the fact that they don’t have a word for sea guarantee they did not live by the sea? No. To give an analogous example, the English language does not have commonly used specific words for “parental love” versus “sibling love,” and yet these things exist in the world, and we all know them to be different. The author takes for granted that they were isolated from the sea because they don’t have a word for it. (By the same token, having words for winter, snow, etc., doesn’t prove they lived by these elements either.)

The Payoff: Knowing what’s wrong with the argument, we can look for an answer that exploits this weakness. (A) does not impact the argument, for fish live in rivers, etc., and tell us nothing about proximity to seas. If we take (B) to be true, the reasoning in the argument falls apart. Let’s keep it. With (C), it’s unclear how the languages of today are relevant, and, besides, information about cultures that know the word for sea tells us little about the cultures that don’t. We can cut out (C). With (D), “heat,” like “fish” from (A), is a universally used word that tells us nothing about proximity to sea. And with (E), whether they were nomadic or not has little impact on whether they lived in a cold climate, and no impact on the problems in the argument. That leaves us with just (B)—again, if it’s true, then it directly counters the reasoning the author uses. (B) is correct.

Prep Work: We’re being asked to identify the main point. We know we don’t have to figure out what’s wrong with the argument for this question; in order to get this question correct, we simply need to identify the argument. Most specifically, we need to identify the point being made.

They’ve made that task a bit of a challenge, and there are two attractive answers: the general statement that the most highly evolved species are not the only ones to alter their environment for survival, and the more specific point about plankton doing this very such thing.

Only one of those two statements can be the conclusion, and in order to figure out which one it is, we have to think about which statement is meant to support the other—is the general statement made to support the point about plankton, or vice versa? The answer might be different had the argument been phrased differently, but in this case we can see that the plankton is meant to be an example (“for example”) of the more general statement.

So, we know that the author’s main point is that the most highly evolved species are not the only ones to alter their environment for survival. We are ready to go into the answer choices.

No Decision: We are not asked to be critical here, and so we want to make sure not to be.

The Payoff: Knowing the conclusion, we want to eliminate the wrong choices. (A), (B), and (D) are specifically about plankton, and so we know they cannot be correct. (E) speaks of something (“detrimental”) that is not relevant to this discussion. That leaves us with (C). It substantively matches what we expected, and it is the correct answer.

29.1.11. It is well known that many species adapt to their environment, but it is usually assumed that only the most highly evolved species alter their environment in ways that aid their own survival. However, this characteristic is actually quite common. Certain species of plankton, for example, generate a gas that is converted in the atmosphere into particles of sulfate. These particles cause water vapor to condense, thus forming clouds. Indeed, the formation of clouds over the ocean largely depends on the presence of these particles. More cloud cover means more sunlight is reflected, and so the Earth absorbs less heat. Thus plankton cause the surface of the Earth to be cooler and this benefits the plankton.

Of the following, which one most accurately expresses the main point of the argument?

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- (D) The extent of the cloud cover over the oceans is largely determined by the quantity of plankton in those oceans.
- (E) Species such as plankton alter the environment in ways that are less detrimental to the well-being of other species than are the alterations to the environment made by more highly evolved species.

Argument-Based Question Set Solutions

28.1.19. The postmodern view involves the rejection of modern assumptions about order and the universality of truth. The grand theories of the modern era are now seen as limited by the social and historical contexts in which they were elaborated. Also, the belief in order has given way to a belief in the importance of irregularity and chaos. It follows that we inhabit a world full of irregular events, and in which there are no universal truths.

The argument's reasoning is questionable because the argument

- (A) infers that something is the case because it is believed to be the case
- (B) uses the term "universal" ambiguously
- (C) relies on the use of emotional terms to bolster its conclusion
- (D) uses the term "order" ambiguously
- (E) fails to cite examples of modern theories that purport to embody universal truths

Prep Work: Wow, a lot of deep information here. It's virtually impossible to absorb it all at once, and that shouldn't be our goal. We can focus in by first finding the conclusion: we inhabit a world full of irregular events, and in which there are no universal truths. It seems that a whole lot of what comes before is meant to support and lead up to that conclusion, but we can just start by focusing in on the part that seems most closely related: the belief in order has given way to a belief in the importance of irregularity and chaos.

The Decision: It seemed like there was a chain of reasoning that led to the point, and if I don't see the gap between this conclusion and the closest support, I will go "up the reasoning chain" to see where else the gap exists. However, we should expect the flaw to be in the closest link to the conclusion for virtually all arguments, so I really want to scrutinize the relationship I've isolated: does the fact that the belief in order has given way to a belief in the importance of irregularity and chaos definitely prove that we inhabit a world full of irregular events, and in which there are no universal truths? No. Who's to say these beliefs are actually correct, and who's to say that believing in the importance of irregularity means believing that there are no universal truths? Since there are such clear flaws already, we need not look elsewhere for issues.

The Payoff: (A) matches our understanding well, and is the correct answer. (B) would certainly be tempting if we didn't know what we were looking for, but the definition of universal is not central to the reasoning issues. (C) would require us to make a very subjective decision about the "level" of emotion in words used, and "regardless" does not describe the problem we saw. (D) gives us much the same feeling that (B) does and can be fairly quickly eliminated. (E) is not required for the argument to work (so what if they don't have examples of this?), and so doesn't represent a flaw.

Prep Work: We need to match the flaw in the stimulus with a flaw in the answer choice. The first order of business is to get a really good understanding of the flaw in the argument. The point is that pesticides are definitely contaminating the river. Evidence? This is a type of pesticide that can cause sterility in animals like otters, and there has been an increase in sterility among otters.

The Decision: Does the fact that sterility among the otters has increased guarantee that pesticides are contaminating the river? No. Perhaps some other reason—some other contaminant, water levels, change in diet, etc.—is causing the problems for the otters. The flaw is that the author assumes a definite cause for an outcome when the justification isn't definite.

The Payoff: Let's knock off answers that don't have the same problem. Often, they easily give themselves away because they reach a different type of conclusion (imagine, say, a conclusion about likelihood, involving the word "probably," as opposed to the type of "definite" conclusion we had here), or use supporting evidence in a different sort of way. With (A), "more frequently" is a comparative statement that is very different from anything we had in the original argument. We can eliminate it. (B) seems to have a similar type of conclusion as the original argument ("undeniably" has some characteristic) and seems to have the same type of reasoning issues. Let's leave it. (C) uses something about undernourished to prove something about not undernourished—a very different reasoning structure from the original and we can eliminate it quickly. (D) also seems to be very similar to the original argument and reaches an absolute conclusion—let's leave it. (E) uses the characteristics of something to conclude that it is not so—very different from our argument, and so we can eliminate (E) quickly.

Down to (B) and (D), let's think more carefully about how they relate to the flaw in the original argument. Comparing (B) to the argument, one thing to notice is the match in terms of "cause." This is actually a defining characteristic of both arguments—they are both falsely attributing a cause. When we look at (D), we see that it doesn't have this causal characteristic. (B) is correct.

27.1.11. A local chemical plant produces pesticides that can cause sterility in small mammals such as otters. Soon after the plant began operating, the incidence of sterility among the otters that swim in a nearby river increased dramatically. Therefore, pesticides are definitely contaminating the river.

Which one of the following arguments contains a flaw in reasoning that is similar to one in the argument above?

- (A) The bacteria that cause tetanus live in the digestive tract of horses. Tetanus is a highly infectious disease. Consequently it must be that horses contract tetanus more frequently than do most other animals.
- (B) A diet low in calcium can cause a drop in egg production in poultry. When chickens on a local farm were let out in the spring to forage for food, their egg production dropped noticeably. So the food found and eaten by the chickens is undeniably low in calcium.
- (C) Animals that are undernourished are very susceptible to infection. Animals in the largest metropolitan zoos are not undernourished, so they surely must not be very susceptible to disease.
- (D) Apes are defined by having, among other characteristics, opposable thumbs and no external tail. Recently, fossil remains of a previously unknown animal were found. Because this animal had opposable thumbs, it must have been an ape.
- (E) The only animal that could have produced a track similar to this one is a bear. But there are no bears in this area of the country, so this animal track is a fake.

Argument-Based Question Set Solutions

28.1.21. Psychologist: Some astrologers claim that our horoscopes completely determine our personalities, but this claim is false. I concede that identical twins—who are, of course, born at practically the same time—often do have similar personalities. However, birth records were examined to find two individuals who were born 40 years ago on the same day and at exactly the same time—one in a hospital in Toronto and one in a hospital in New York. Personality tests revealed that the personalities of these two individuals are in fact different.

Which one of the following is an assumption on which the psychologist's argument depends?

- (A) Astrologers have not subjected their claims to rigorous experimentation.
- (B) The personality differences between the two individuals cannot be explained by the cultural differences between Toronto and New York.
- (C) The geographical difference between Toronto and New York did not result in the two individuals having different horoscopes.
- (D) Complete birth records for the past 40 years were kept at both hospitals.
- (E) Identical twins have identical genetic structures and usually have similar home environments.



Prep Work: When we are asked a strengthen “EXCEPT” or weaken “EXCEPT” question, we know that the argument is going to be heavily flawed, enough so that there are different ways to strengthen or weaken. In this case, the author's point is that the primary cause of the declining population is the depletion of ozone. The evidence? They are more vulnerable to UV-B radiation (which likely has been increasing) and they have eggs that lack the protection of other types of eggs.

The Decision: Do we have proof that the depleting ozone layer actually has any direct impact on the declining amphibian population? No we don't. They may be vulnerable to UV-B radiation, but perhaps it's not life-threatening. Perhaps their eggs, while not giving as much protection as other types of eggs, give enough protection to be just fine, and perhaps the type of protection being discussed has nothing to do with UV-B. Having said all that, we certainly don't have proof that depletion is the primary cause.

The Payoff: We know that four answers strengthen the argument—that is, we should be able to see in a very direct way that four of the answers help address issues in the argument. The one answer that doesn't, the right answer, may weaken the argument, or it may have nothing to do with the argument—the only thing that will define that answer is that it does not strengthen. With (A), does it matter to the argument that UV-B is the only type that can cause damage? It's tough to see how. Let's leave (A). (B) gives us more proof that their egg type and UV-B are related, and that UV-B could be an issue. (B) helps the argument, so we should eliminate it. (C) also helps prove a link between ozone and decline, so let's eliminate it. (D) eliminates another potential cause of the decreasing population, and in so doing helps the argument—let's eliminate it. (E) is probably the toughest of answers to eliminate, but the fact that the decline is continuous does make it seem a bit more likely that it's connected to the depletion of ozone, which has also been “continuous.” (A) is correct.

Prep Work: We are asked to find an assumption on which the argument depends. We want to start by figuring out the support and the conclusion. The author's conclusion is that horoscopes do not completely determine our personalities. What's the support? Two individuals born at the same time in different locations had different personalities.

The Decision: Note that just one example could actually be enough to prove that horoscopes don't completely determine personality, so let's think about why it doesn't here. In what instance would the support used not be sufficient to justify the point made?

What are we expected to know about horoscopes? Do we know that two people born at the same time have the same horoscope? I don't. That seems to be a problem with the argument—the author doesn't actually show that these two people that he uses as evidence had the same horoscope.

The Payoff: The word “depends” in the question stem is important. We need to look for an answer that needs to be true if the argument is ever going to work. As always, we'll work by eliminating incorrect choices. Does (A) need to be true for the argument to work? No. Astrologers could have subjected their claims to experimentation, and the argument could still be true. (B) does not have to be true in order to show that our horoscopes don't completely determine our personalities. (C) does have to be true—let's leave that. (D) does not have to be true—if one record was missing, it would likely not impact the argument too much. (E) does not have to be true for the author's argument to work. (C) is the only attractive answer—let's review it carefully. If (C) were not true, it would mean that the two people mentioned in the support would have two different horoscopes. Then it would make no sense for the author to use this support to make this point. (C) needs to be true for the argument to work, and (C) is correct.

29.4.20. Amphibian populations are declining in numbers worldwide. Not coincidentally, the earth's ozone layer has been continuously depleted throughout the last 50 years. Atmospheric ozone blocks UV-B, a type of ultraviolet radiation that is continuously produced by the sun, and which can damage genes. Because amphibians lack hair, hide, or feathers to shield them, they are particularly vulnerable to UV-B radiation. In addition, their gelatinous eggs lack the protection of leathery or hard shells. Thus, the primary cause of the declining amphibian population is the depletion of the ozone layer.

Each of the following, if true, would strengthen the argument EXCEPT:

- (A) Of the various types of radiation blocked by atmospheric ozone, UV-B is the only type that can damage genes.
- (B) Amphibian populations are declining far more rapidly than are the populations of nonamphibian species whose tissues and eggs have more natural protection from UV-B.
- (C) Atmospheric ozone has been significantly depleted above all the areas of the world in which amphibian populations are declining.
- (D) The natural habitat of amphibians has not become smaller over the past century.
- (E) Amphibian populations have declined continuously for the last 50 years.

Argument-Based Question Set Solutions

29.4.15. Ambiguity inspires interpretation. The saying, “We are the measure of all things,” for instance, has been interpreted by some people to imply that humans are centrally important in the universe, while others have interpreted it to mean simply that, since all knowledge is human knowledge, humans must rely on themselves to find the truth.

The claim that ambiguity inspires interpretation figures in the argument in which one of the following ways?

- (A) It is used to support the argument's conclusion.
- (B) It is an illustration of the claim that we are the measure of all things.
- (C) It is compatible with either accepting or rejecting the argument's conclusion.
- (D) It is a view that other statements in the argument are intended to support.
- (E) It sets out a difficulty the argument is intended to solve.

Prep Work: We're being asked to figure out what role a part of the stimulus plays in the argument. This will be easy to do once we recognize the reasoning structure, and so we want to start, as always, by identifying the main point. It happens to come right at the beginning (the “for instance” tips us off that it is a point that is going to be supported): ambiguity inspires interpretation. What follows is all support for that idea. Looking again at the question, the part in question happens to be our conclusion.

No Decision: Our job is simply to understand the stimulus—we want to make sure not to distract ourselves by thinking about the reasoning or by bringing ideas together. We know that the part in question is the main point, and that is all we need to know to get the right answer.

The Payoff: (A), (B), and (C) all clearly misrepresent the role and can be eliminated quickly. (E) requires a bit more thought, but there isn't a difficulty to be solved here. (D) is the correct answer.

28.3.20. Game show host: Humans are no better than apes at investing, that is, they do not attain a better return on their investments than apes do. We gave five stock analysts and one chimpanzee \$1,350 each to invest. After one month, the chimp won, having increased its net worth by \$210. The net worth of the analyst who came in second increased by only \$140.

Each of the following describes a flaw in the game show host's reasoning EXCEPT:

- (A) A conclusion is drawn about apes in general on the basis of an experiment involving one chimpanzee.
- (B) No evidence is offered that chimpanzees are capable of understanding stock reports and making reasoned investment decisions.
- (C) A broad conclusion is drawn about the investment skills of humans on the basis of what is known about five humans.
- (D) Too general a conclusion is made about investing on the basis of a single experiment involving short-term investing but not long-term investing.
- (E) No evidence is considered about the long-term performance of the chimpanzee's portfolio versus that of the analysts' portfolios.

Prep Work: We are asked to find the answer that doesn't represent a flaw in the argument—that means four answers will represent flaws—and that means we must have a very flawed argument. The game show host's main point comes at the beginning: humans are no better than apes at investing. He supports this conclusion with a study involving five stock analysts and one chimpanzee. The chimpanzee performed best.

The Decision: Do not, as I did, get stuck thinking about the exact mechanism by which an ape picks an investment (does he point to a stock in the newspaper?). We are to take as fact the idea that this chimp did indeed invest, and that the outcome was what it was.

So what? Does it prove humans aren't better than apes? Of course not. It's one study involving just five people and just one month. This is a terrible argument. Let's look for some descriptions of the flaws.

The Payoff: (A) accurately describes a problem—the argument has extrapolated too much (piece ≠ puzzle). (B) is tempting, because we know this to perhaps be a problem in real life, but is this directly related to the relationship between this premise and this conclusion? Not really. Is (B) something that prevents apes from being just as good at investing? No. They can be just as good without understanding stock reports and by being irrational but somehow correct. Let's leave (B). (C) matches a problem we discussed and we can eliminate it quickly. (D) also matches a problem we discussed (one month) and we can eliminate it quickly, and (E) is a variation on (D). We can eliminate (A), (C), (D), and (E) easily, so let's go back to (B). Thinking again, understanding stock reports (people make good investment decisions without understanding stock reports all the time) and reasoned decisions (unreasonable decisions are sometimes the best) are not requirements for investing well, and more importantly, have nothing to do with the premise/conclusion relationship. (B) is the only answer that doesn't describe a flaw with this argument, and (B) is correct.

How to Review

That was a set of eight fairly challenging questions—more difficult than average (but not murderously so). Hopefully, solving those questions and checking your work against the solutions has confirmed for you the importance of recognizing argument flaws, and opened you up to some areas in which you can improve and thus increase your score. At this step in your study process, missed questions are good for you, for they show you exactly what you need to work on. Of course, the manner in which you review your work plays a large role in determining how quickly you improve. To that end, let's summarize some of the advice we've laid out in these first few lessons.

- (1) The primary emphasis of these first few lessons has been on helping you develop your ability to recognize argument flaws in a clear and specific way. For each question that you review, make sure you understand well the reasoning flaw in the argument. You can think about it in terms of what the author is taking for granted, or fails to consider, and you can think about it in terms of the three basic flaw categories: a piece ≠ puzzle, apples ≠ oranges, and $1 + 1 \neq 3$.
- (2) Make sure you understand everything else about the problem that you are meant to understand. We discussed these components at the end of Lesson 7. You want to understand the task presented in the question stem, you want to correctly identify the primary components of the argument, of course you want to specifically understand what is wrong with the argument, you want to see how the right answer addresses the flaw and matches the task presented, and you want to see clear reasons for why each wrong answer is wrong.
- (3) Finally, you want to think about the questions that you miss in terms of the process you used to solve them. Misses are caused by challenges in understanding the task, or in reading the stimulus or answer choices, or in evaluating the reasoning. The more specific you can be about the challenges that questions present, the faster and more easily you can adapt your habits.

The Road Ahead

We will take a small rest from working on Logical Reasoning and switch over to discussing the basics of Logic Games. Then, we will return to Logical Reasoning and start to discuss how to attack specific types of questions.

For extra homework, now would be a good time to go back to the questions that you missed from your diagnostic; you can try your hand at reviewing all such questions using the guidelines discussed above.

10

LOGIC GAMES

diagramming

As we discussed in the introduction to Logic Games in Lesson 3, all Logic Games are based on the relationship between elements and positions. Each game begins with a short scenario¹—a sentence or two that lays out the situation at hand—and each game then gives us a few rules about where particular elements can or cannot go. We are then asked five to seven questions that test our understanding of this situation.

The Key to Logic Games Success

Logic Games require us to keep track of a lot of information, and in order to answer questions successfully, we need to be able to see how this information comes together. This is the primary challenge that Logic Games present. The amount and complexity of the information is such that very few people are able to retain it, with the level of control and understanding that they need, all in their heads. Therefore, in order to be successful at Logic Games, you have to be able to work with a visual representation of the situation—you have to be able to draw out the games. The key to being good at Logic Games is to be good at diagramming Logic Game scenarios. Effective diagramming techniques make it far easier for you to keep a clear understanding of rules and to see how they come together. A lack of diagramming ability makes such tasks nearly impossible.

In these next five lessons, we will work to develop the diagramming skills that will allow you to conquer any and all games. As always, we will start with the fundamentals.

The Three Basic Design Elements

There are three primary characteristics that define the design of the various games that one can expect to see on the LSAT: all games involve relating elements to positions, about two in three games organize these positions in some sort of order, and about half of all games organize these positions into groups. These three characteristics underlie the vast majority of rules, and these are the primary issues behind the inferences² that determine right and wrong answers. In this lesson, we will work on developing a rock-solid understanding of these three fundamental issues.

1. The *scenario* is the situation given at the beginning of a game. Here are some truncated examples of scenarios: "Eight toys are placed in order, from most expensive to cheapest." "Six students are split into three teams, and each team will have a writer and an editor."

**The ability to
diagram is
the key to
Logic Games
success**

2. When it comes to games, *inferences* are the things we figure out when we bring different rules together. Most questions are designed so that inferences, rather than the given rules, differentiate right answers from wrong ones.

All Games Relate Elements to Positions

Suggested Notations

F is assigned to X.
$\frac{F}{X}$
F is not assigned to X.
$\frac{X}{\cancel{F}}$
F or G is assigned to X.
$\frac{F/G}{X}$
F is assigned to X or Y.
$\frac{F/X}{Y}$

For every game, the scenario will present a list of elements, and your task will be to consider how these elements relate to a set of positions.

When you initially read the scenario and rules for a game, your first job is going to be to write out the elements and to lay out the positions in the form of slots. I recommend that you write out elements vertically—this will help you notate certain rules next to these elements. How you lay out the slots will depend on the game, and it can often be an important decision; you likely won’t think twice about it when you lay out the slots correctly, but when you lay them out in an awkward fashion, it’ll make the game far more challenging to manage.

Once in a blue moon, the test writers will get creative with the element-to-position relationship. One way they can do this is to make the elements and the positions one and the same. Imagine a game in which five friends make phone calls to one another, and your job is to figure out who called whom. In this case, the friends make the calls and also receive the calls. The test writers can also make it somewhat unclear what we should think of as the elements, and what we should think of as the positions. Imagine a game in which you have pets owned by different children and you have to figure out which child owns which pet. In certain instances it might make sense to list the children as the elements and the pets as the positions, and in other instances the reverse might work better. These types of complications are extremely rare, especially in recent years. As we’ll discuss further, the key to dealing with such complications successfully is to think about what sort of setup would make it easiest for you to notate the particular rules that you are given.

Below is a sample game and diagram to illustrate some of the issues that we’ve just discussed.

A Super-Simple Example to Illustrate Elements to Positions

Five students—F, G, H, J, and K—will be assigned to five different tasks—R, S, T, U, and W—one student will be assigned to each task.

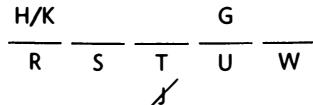
J will not be assigned to T.

G will be assigned to U.

Either H or K will be assigned to R.

F
G
H
J
K

Notes: Keep in mind this is a simplified example. This game is unrealistic in that a real LSAT game would also involve ordering or grouping considerations. In general, we only want to place elements right into the slots when we know for sure that they occupy those positions. Otherwise, we want to put the rules elsewhere, typically below the position, as we’ve done with the “not J” rule.



Most Games Involve Ordering

Two or three of the four games that you see on your exam will involve positions placed in some sort of order. Therefore, it is important to get extremely comfortable handling ordering rules and making ordering inferences.

In general, we will arrange positions horizontally for ordering games, with the default order being from left to right. You can see in the example below how to lay out the base for a typical ordering game. This will be fine for almost all ordering games, but keep in mind that there will be situations (imagine a game involving the six vertical floors of a building) for which you may want to adapt this template.

Let's use an example to discuss ordering further: imagine that a DJ will play six different songs, one at a time and each just once. For the sake of convenience, we'll think of these six songs in terms of the first letters of their names: F, G, H, J, K, M.

Let's just think about two of these songs: F and G. Imagine F and G appearing at various positions in this order, and think about all of the things that you could say about where F and G appear relative to one another. For example, if F is played first and G third, we could say that F is played before G, G is played after F, exactly one song is played between F and G, and so on. Again, imagine F and G appearing at various positions in this order, and see if you can come up with an exhaustive list of the various things that could be said about the ordering relationship between F and G. Afterwards, check your list against the list of suggested notations on this page and on page 138. By the way, page 138 is where we'll pick this discussion back up.

Suggested Notations

F is before G

F — G

G is after F

F is right before G

F G

G is right after F

F is two spots ahead of G*

F ___ G

G is two spots after F

F is at least two spots ahead of G

F ___ ... G

G is at least two spots after F

F is right before or after G

F G
↑↑

There is exactly one position between F and G

F ___ G
↑ ↑

There is at least one position between F and G

F ___ ... G
↑ ↑

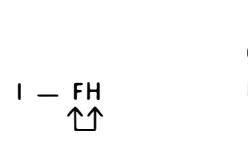
A Super-Simple Example to Illustrate Ordering

Seth will perform five actions—F, G, H, I, and J—during the course of one day. He will perform these actions one at a time and in order. The following conditions apply:

He will do F immediately before or after H.

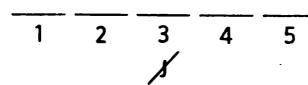
He will not perform J third.

He has to do I before he does F.



Notes: Again, this is a simplified example, though there are some real LSAT games that are not much more complicated than this one.

Note how two of the ordering rules came together to create a three-element link that will take up a large part of the board and also severely limit where I, F, and H can go. The I, F, H link would be the key factor when dealing with the questions for this particular game.



* This and similar rules can also have two spaces between, three between, etc.

Making & Using Diagrams

Your ability to diagram is the key to Logic Games success. Using a sample game and questions, let's lay out the basics of how to make a diagram, and how to use it.

1. DRAW OUT A BASE

Start every game by reading the scenario and the rules. Then return to the scenario and use it to set up the base of your diagram. It is essential that you feel very comfortable with the base of your diagram, because you are going to be doing a lot of work in that space. The good news is that there is great commonality to the basic situations that these scenarios present, and you should expect, fairly early in your study process, to be comfortable picturing the base for just about any type of game.

In this particular game, we are asked to figure out some information about the order in which messages were left. We can think of the people leaving the messages as the "elements," and we can think of the messages as positions. Naturally, we want to arrange the positions in a way that represents the ordering aspect of the game, and we can easily do this by ordering the calls one through six from left to right.

2. TAKE CONTROL OF THE RULES

Once you've laid down your base, you need to represent each rule in a way that accurately reflects your understanding. Keep in mind that your diagram needs to serve two general functions: it needs to serve as a clear and simple representation of the rules, and it needs to serve as a system that helps you see how these rules come together. If your diagramming system is unnecessarily complicated, fragmented, or in some other way unintuitive, it won't be as effective in these roles.

For this particular game, we have four rules. Take a look at the various ways in which we noted these rules. Bringing together the rules leads to an inference about the final position: since F, H, and N can't be last, it will be either G or M. You won't catch every inference every time, nor do you need to, but inferences are what the questions are ultimately about, and inferences made during your setup can save you a lot of time and work.

Kendra comes home from work to find six messages left on her answering machine by five people—her father, her grandmother, her half-brother, her mother, and her niece. Her mother left two messages, while everyone else left just one. The following conditions apply:

- Her half-brother or grandmother left the first message.
- Her niece's message came after one of her mother's messages, but not the other.
- Her father left the third message.
- Her half-brother did not leave the last message.

Step one F
 G
 H
 2 = M
 N

Step two F
 G
 H
 2 = M
M — N — M N

H/G — F — — — G/M
 ✓

1. If her niece left the fourth message, each of the following could be true EXCEPT:

- (A) Her grandmother left the first message.
- (B) Her half-brother left the first message.
- (C) Her half-brother left the second message.
- (D) Her mother left the fifth message.
- (E) Her grandmother left the sixth message.

H/G M F N G/M

We can redraw a simple version of our diagram and place N into the fourth slot. The M-N-M rule forces M into the second slot. We don't know much else about positions 5 and 6 (other than that they are very limited at this point), and so we move on to the answers. (A) and (B) both could be true and don't require a lot of thought (we'll come back to them later and look at them more carefully if we can't find the right answer). (C) must be false and so we can select it and stop there.

2. Which of the following could be true?

- (A) Her niece left the second message, and her mother the fourth.
- (B) Her grandmother left the first message, and her mother the fifth.
- (C) Her half-brother left the second message, and her niece the fourth.
- (D) Her niece left the fourth message, and her grandmother the fifth.
- (E) Her mother left the fourth message, and her grandmother the fifth.

D

We are asked what could be true, so we know that four answers must be false. In this case it's generally easier to see why four answers must be false rather than why one could be true, so we want to arrive at the right answer by eliminating wrong ones.

- Looking at our diagram, we can eliminate
- (A) because N in 2 leaves no place for M before it
 - (B) because it leaves no one for the final message
 - (C) because it leaves no room for M before N
 - (D) because it either squeezes out N or leaves no one for the final message.

That leaves (E) as the correct answer, and to confirm we can come up with one order that works—H, M, F, N, G, M.

You will use your diagram to do the challenging thinking that is required by the questions. Before you step into these questions, check your diagram one final time to make sure you understand your notations, and that your notations represent the rules accurately. You want to be in control of a game as you move on to the questions, and your diagram will help you feel this control.

3. UTILIZE THE QUESTION STEM

Test takers commonly underestimate the importance of the question stem, and they do so at their own peril. Question stems tell you how to think about the problem, and with only a minute per question at your disposal, it's critical that you start off on the right path. When a question stem gives us new information, as the stem for number one does, you can expect that the new information will always—always—allow us to make new inferences. In this case, the new information forces M into the second position. These inferences will always have a significant impact on right and wrong answers—we know, from the fact that M is in the second position, that C must be false. Note that we drew a simple version of the diagram next to the question in order to work in the new information. Also note that the question stem also helps us predict how the answer choices will be split—in this case four answers that could be true and one that must be false, and whether we ought to search for the right answer or eliminate wrong ones (much more on this later).

4. KNOW WHAT YOU KNOW

It's a mistake to think that we have to know everything about a game. Logic Games are designed for us to know part of the picture, and the questions then test what is known versus what isn't—what must be versus what could be. Right and wrong answers split among these lines; for question one, the right answer must be false, and the others are all ones that could be true or false. For question two, the right answer could be true, and the wrong answers all must be false. We'll go into great detail about question strategies later in the book, but in general, focus on the answers you know for certain—if a question asks for an answer that must be true or must be false, prioritize finding the right answer over eliminating wrong ones (it's tough to make absolute calls on "could be" wrong answers). If a question asks for an answer that could be true or could be false, work to eliminate all of the incorrect "must be" answers.

F is not before G*



G is not after F

F is not immediately before G



G is not immediately after F

F is not two spots ahead of G



G is not two spots after F

F is not immediately before or immediately after G.



F and G are not exactly one space apart.



*Note that this will rarely be necessary; unless a game has ties, “F is not before G” can be thought of as “F is after G.”

I want to tell you two things about ordering rules: there are not that many possibilities for what type of rules they can give you, and you have plenty of time to get very comfortable with all of the possibilities. As always, that doesn’t mean that ordering rules are going to be easy. When you go into the exam, the challenge will come from the fact that the rules often have subtle differences, and you will need to understand every rule in an exact and usable way.

One final thing to keep in mind is that many ordering rules link together. For example, if we know that F is played before G, and G is played before H, we can infer, and represent in our notation, that F is before H. It’s beneficial for you to be mindful of such links, and you should do your best to diagram such rules together whenever possible. We’ll discuss this at far greater length in later lessons.

Half of All Games Involve Grouping

...just a tad less than half, actually, and among the games from PT 52 – 61 (those in the 10 Actual Book), seventeen of the forty games involve grouping as a significant characteristic of the game.

“Six players are split into three teams,” “Five cars will have one or more of four accessories,” and “Of eight birds, five are in the forest, and three are out of the forest,” would all be examples of grouping situations. In each of these cases, we can expect to see rules about which elements are meant to be grouped together (for example, “L and M are on the same team”) and which elements are not meant to go together (for example, “T or S, but not both, are in the forest”).

In general, we will want to organize the positions that are meant to be grouped together vertically, as we have done in the example below. We also want to mention that elements are meant to be grouped together, or not grouped together, by lining them up vertically, as we’ve done in the suggested notations on the opposite page.

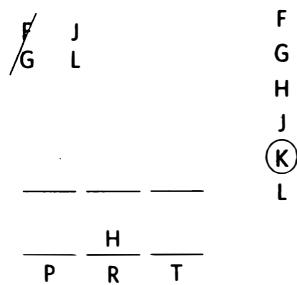
Grouping, like assignment, is a bit too simple a task to make an entire game out of, and grouping games will in general also be defined by having other challenges, such as a

A Super-Simple Example to Illustrate Groupin

Six students—F, G, H, J, K, and L—will be paired up into three teams—the purple team, the red team, and the teal team. The following conditions apply:

- F and G cannot be paired together.
- J and L will be paired together.
- H will be on the red team.

Notes: As mentioned in the body text, this is a simplified example, in that a real LSAT game would likely involve additional challenges. However, keep in mind there are certain grouping games that, though they may have another type of challenge or two, won’t necessarily be too much more difficult than this to set up. Also note a new notation—since K is the only one of the six elements not mentioned in a rule, we want to circle it to remind ourselves it can go anywhere.



series of conditional rules, complicated either/or situations, or subgroup issues. In certain instances, the numbers of elements within each group will be completely defined, and in other instances, figuring out those numbers will be part of the challenge. We will discuss all these issues in specific detail in the next few lessons.

Once in a while, you will run into a game that involves both grouping and ordering; in these instances, the habit of organizing grouping issues vertically and ordering issues horizontally can prove to be especially helpful, for it greatly facilitates keeping track of both issues on the same diagram. We'll see an example of this a bit later in this lesson.

F and G are together

F
G

F and G are not together

F/
G

all games involve assignment, most games involve ordering, and about half of all games involve grouping

Instructions for Basic Setups Drill Starting on Following Page

This drill contains three sets of games; your task is to set up diagrams for each game.

For each set of games, the three games on the right side of the page are “twin” versions of the three games on the left: same games, but with different scenarios and wording. Here are suggestions for how to execute the drill:

Diagram the set of three games on the left side of each page. Afterwards, note how long the set took and assess how comfortable you felt diagramming the games.

If you felt confident in your diagrams, go on to the sister set on the right and try to outdo your speed while perhaps diagramming just a bit better. Then review the provided solutions.

If you don’t feel confident with your diagrams after doing the set in the left column, review the provided solutions before trying out the sister set. Note that the sets are meant to get progressively more difficult.

It might be a good idea for you to revisit this drill later in your studies, to remind yourself of fundamentals and test how much faster and how much more comfortable you have gotten. If you are interested in doing this, you should do your work in a separate notebook.

Basic Setups Drill Set 1

1. Five children—F, G, H, I, and J—are each given one of five toys—M, N, O, P, and R. Each toy is given to exactly one child. The following conditions apply:

N is given to J.

G gets either P or R.

M is not given to H.

4. A chef puts five different types of sauces—T, V, W, X, and Y—on top of five different cuts of steak—filet, hangar, New York, rib eye, and sirloin. Each steak gets one sauce, and each sauce is used once. Additionally...

The hangar steak gets X or Y.

T is not put on the New York.

V is put on the sirloin.

2. Six airplanes—M, N, O, P, R, and S—take off from a runway, one at a time and in order. The following conditions apply:

Exactly one plane departs after N but before R.

Either O or P will depart third.

S departs immediately before or immediately after R.

5. Six children—F, G, H, I, J, and K—each take turns whacking at a piñata. Each child gets one turn, and they go one at a time. The following conditions apply:

K takes a turn immediately before or after J.

Exactly one child goes after G but before J.

Either H or I goes third.

3. Eight friends—M, N, O, P, Q, R, S, and T—will ride in four cars to a concert—two friends per car. The following conditions apply:

M and N ride together.

O and R do not.

S rides with either P or Q.

6. Eight children—F, G, H, I, J, K, L, and M—will be split into four teams of two. Each child will be on exactly one team. The following rules apply:

F and G are on the same team.

L is teamed with either I or J.

H and K are not on the same team.

Basic Setups Drill Set 2

7. Sarah takes seven swings in a batting cage. On four swings, she makes good contact—on the others she either fouls the ball off or misses it. Additionally it must be true that...

She does not foul off two consecutive pitches.

She does not miss any of the last four pitches.

She makes good contact on exactly two of the first four pitches.

10. Judges see seven auditioners for an upcoming reality show. They say yes to four of them, and give maybe's and no's to the rest. The following conditions apply:

None of the last four auditioners get no's.

No two consecutive auditioners get maybe's.

Exactly two of the first four auditioners get a yes.

8. Nine students—F, G, H, I, J, K, L, M, and N—are split evenly into three teams—the purple team, the red team, and the tan team. The following conditions apply:

H is assigned to the red team.

G and I are assigned to the same team.

Either J or M, but not both, are assigned to the purple team.

G and H are not assigned to the same team.

L is not assigned to the tan team.

11. Nine pandas—M, O, P, Q, R, S, T, U, and V—live in three different zones of a jungle—the west, the north, and the east. Three pandas live in each zone. The following rules apply:

O and Q live in the same zone.

T is not in the east zone.

P lives in the north.

Either R or U, but not both, live in the west zone.

O and P do not live in the same zone.

9. Six workers—F, G, H, J, K, and L—work three shifts as pairs. These shifts occur one at a time and in order. The following conditions apply:

H works a later shift than J.

G does not work the first shift.

J and K work the same shift.

12. Six people—M, O, P, R, S, and T—sit in three rows of an airplane—two people per row. The following conditions apply:

P sits in a later row than R does.

O does not sit in the first row.

R and S sit in the same row.

Basic Setups Drill Set 3

13. Five different companies—M, N, O, P, and Q—each occupy one of five floors in an office building. The following conditions apply:

M is on a higher floor than Q, but not the highest floor.
Exactly one company is between O and N.
P is not on the second floor.

14. Seven dancers—F, G, H, I, J, K, and L—perform in a total of three shows. Two dancers perform in the first and second shows, and three dancers in the third. Each dancer performs just once. The following conditions apply:

G dances in the second performance.
Either H or F, but not both, dance in the first performance.
Either J or L dance with G.
K and I dance in the same performance.

15. Seven trains—F, G, H, I, J, K, and M—depart from a train station, one at a time and in order. The following conditions apply:

At least two trains depart after G but before J.
J departs after H but before M.
F departs immediately before or immediately after G.
K departs neither immediately before nor immediately after I.

16. Five different display pieces—F, G, H, I, and J—are placed on the five shelves of a bookcase—one piece per shelf. Additionally...

There is one shelf in between H and J.
F is placed higher than J, but not on the top shelf.
I is not placed on the second shelf from the bottom.

17. Seven cargo shipments—M, N, O, P, Q, R, and S—are loaded onto three different airplanes that depart from a runway. The airplanes depart one at a time and in order; the first and second planes carry two shipments each; the third plane carries three. The following rules apply:

R and P are carried on the same plane.
Either Q or S is carried on the same plane as N.
Either M or O, but not both, are carried on the first plane.
N is carried on the second plane.

18. A certain baseball manager uses seven pitchers—N, O, P, Q, R, S, and T—during the course of a game. The pitchers are used one at a time and in order. Additionally...

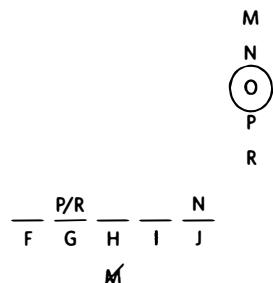
He uses R after P but before T.
S pitches neither immediately before nor immediately after Q.
He uses at least two pitchers after O but before R.
He uses N either immediately before or immediately after O.

Basic Setups Drill Set 1 Solutions

1/4. Five children—F, G, H, I, and J—are each given one of five toys—M, N, O, P, and R. Each toy is given to exactly one child. The following conditions apply:

- N is given to J.
- G gets either P or R.
- M is not given to H.

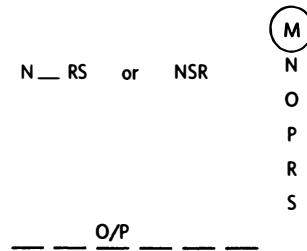
You could have made the presents the base and the children the elements, and it wouldn't make much difference. For most LSAT games, the rules will indicate which base will be easiest to work with.



2/5. Six airplanes—M, N, O, P, R, and S—take off from a runway, one at a time and in order. The following conditions apply:

- Exactly one plane departs after N but before R.
- Either O or P will depart third.
- S departs immediately before or immediately after R.

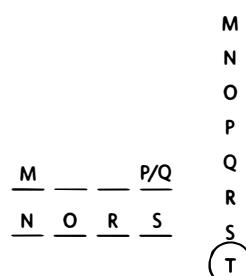
The key to this game is the N, R, S trio. Note that there are only two places that it can go, and placing it determines much of the game.



3/6. Eight friends—M, N, O, P, Q, R, S, and T—will ride in four cars to a concert—two friends per car. The following conditions apply:

- M and N ride together.
- O and R do not.
- S rides with either P or Q.

You may have notated the rules to the side of the diagram, and that's fine. However, note that since the cars aren't themselves named or defined, we can just go ahead and place groups into any of the 4 "cars" we'd like (this game is not about which car each person goes in, but rather what pair each person is a part of). Placing items into the diagram helps us see some inferences we might not be able to see otherwise—if O and R have to be in different cars, and S has to be with either P or Q, we know at least a little something about each of the four friend pairings.



Basic Setups Drill Set 2 Solutions

7/10. Sarah takes seven swings in a batting cage. On four swings, she makes good contact—on the others she either fouls the ball off or misses it. Additionally it must be true that...

She does not foul off two consecutive pitches.

She does not miss any of the last four pitches.

She makes good contact on exactly two of the first four pitches.

There are other ways that we could represent that last rule, but the “cloud” is a very effective tool for showing that you know certain elements go in a general area, but you don’t know the exact spots (we’ll discuss “the cloud” in more detail in a later lesson). The inference we can make from exactly two G’s in the first four spots is that two of the final three must be G’s.

$$4 = G$$

F

M



8/11. Nine students—F, G, H, I, J, K, L, M, and N—are split evenly into three teams—the purple team, the red team, and the teal team. The following conditions apply:

H is assigned to the red team.

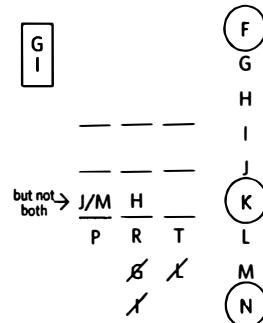
G and I are assigned to the same team.

Either J or M, but not both, are assigned to the purple team.

G and H are not assigned to the same team.

L is not assigned to the teal team.

There is a slight inference to be made that I cannot be on the red team. During the questions, the placement of the G/I grouping would likely be the key to your process.



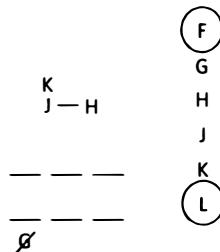
9/12. Six workers—F, G, H, J, K, and L—work three shifts as pairs. These shifts take occur one at a time and in order. The following conditions apply:

H works a later shift than J.

G does not work the first shift.

J and K work the same shift.

In this game we’ve got a combination of ordering and grouping, so we’ll use left-to-right order for the shifts (earliest to latest) and up and down for our groups. Thinking about the placement of the K/J/H combo would be the key to this game.

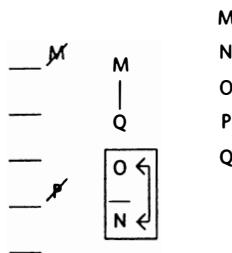


Basic Setups Drill Set 3 Solutions

13/16. Five different companies—M, N, O, P, and Q—each occupy one of five floors in an office building. The following conditions apply:

M is on a higher floor than Q, but not the highest floor.
Exactly one company is between O and N.
P is not on the second floor.

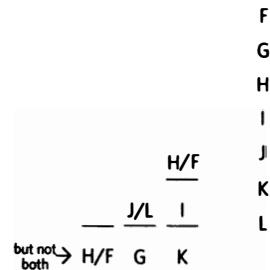
This is an ordering game that it makes sense to draw out vertically; after all, we are used to thinking about the floors of a building as going up and down. Make sure you are comfortable with your notation for the second rule.



14/17. Seven dancers—F, G, H, I, J, K, and L—perform in a total of three shows. Two dancers perform in the first and second shows, and three dancers in the third. Each dancer performs just once. The following conditions apply:

G dances in the second performance.
Either H or F, but not both, dance in the first performance.
Either J or L dance with G.
K and I dance in the same performance.

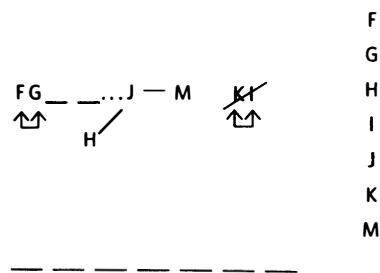
Here's another game that involves both ordering and grouping. The K (and consequently I) inference can be made since it can't go in the first performance, and there is no space in the second performance.



15/18. Seven trains—F, G, H, I, J, K, and M—depart from a train station, one at a time and in order. The following conditions apply:

At least two trains depart after G but before J.
J departs after H but before M.
F departs immediately before or immediately after G.
K departs neither immediately before nor immediately after I.

Note how we linked the first, second, and third rules together as we diagrammed them. Bringing rules together whenever possible will serve you well. We'll discuss such moves in greater detail in future lessons, but hopefully this work seems fairly logical to you.



How Did You Do?

Perhaps you feel like you need to do some games with questions before you can really evaluate yourself, and that's certainly fair. We'll get to some questions soon enough. However, keep in mind that your success on the questions is largely determined by the work you do before you even start them, and as I've said before (and as I'll say again) if you feel comfortable diagramming games—if putting a visual representation of the situation down on your paper feels intuitive for you—you are going to be good at answering Logic Games questions.

Strong diagramming skills are best built off of a sound, fundamental understanding of how Logic Games are designed, and we've laid down a lot of foundational keys in this lesson. Hopefully you felt comfortable drawing out the positions for the various scenarios that you were given, and hopefully you see a lot of commonality among these scenarios—not just within the mirror games (obviously) but from drill set to drill set.

Strong diagramming also requires a firm, comfortable handle on all of the rules, and it is this comfort level with the rules, and with the notations for the rules, that commonly separates top scorers from average ones. You should see a lot of commonality within the rules we've discussed in this lesson, and within the various notations we've chosen to use for these rules.

Being great at diagramming doesn't mean you have some slick notation for every unusual rule that you are going to see. It does mean that you have systems that you are very comfortable using for the common rules, and that you know how to slow down and adapt to the less common situations (more on this as we encounter more of these less common situations).

A great way to check on your notational ability is to double back on the written rule once you are done diagramming; that is, you take a look at each notation you've made, think of what it means to you, then read the written rule that it came from—make sure that what you *think* your notation means matches what it is actually supposed to mean. The time you spend doing this is never time wasted. The more comfortable you feel with the rules, the faster and easier the questions will feel, and doubling back is a great way to firm up your understanding before going into the questions.

The Road Ahead

In this lesson we discussed the central issues that form the foundation of all Logic Games. In the next four lessons, we will discuss the common ways in which games are made more unique. The first two issues we'll discuss—subsets, and numbers issues—have to do with the general setup, or design, of the game. The next two issues—conditional constraints and *or* conditions—are issues brought on by particular types of rules. By the time we're done with these five lessons, we will have covered every diagramming issue that you are likely to face on test day. Of course, we will carefully layer new discussions over what we have already discussed, and in the lessons to come, you will get plenty of additional practice with the assignment, ordering, and grouping rules that we've introduced in this lesson.

11

LOGIC GAMES

characteristics & categories

A common way for test writers to **complicate** Logic Game scenarios is to introduce characteristics or categories that split up, or further define, the elements, the positions, or both.

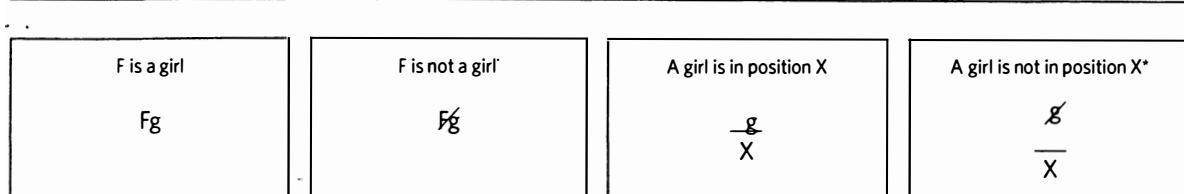
Imagine the difference between a board game for which you use just one color of pieces, versus a board game for which you have some red pieces and some black pieces. Imagine a Scrabble-like game for which each position is worth the same number of points, versus one in which some positions are worth more points. In this lesson, we will discuss how to handle Logic Games that, in the same way, further define the elements or positions.

Let's say we have a game about a physical education class that has eight students. The teacher ranks the students based on how fast they can run a mile. How can we further define these students? Some can be boys, say, and some can be girls. And we can be told which students are boys and which ones girls, or this can be part of the mystery. How can the positions be further defined? Perhaps the top three students will get medals, and the other five students will not get medals. Then, if we are given a rule such as, "Ted received a medal," we know he must have finished in one of the first three positions.

In general, we will notate these characteristics or categories by using lowercase letters. If you are consistent in using lowercase for such subsets, and not for any other situations, it can help you keep organized and at the top of your game. On the following page are some examples of what games with subsets can look like, along with diagramming suggestions and notes. Below are the notations that you will use most commonly for diagramming subsets.

More **complicated** does not necessarily mean more difficult; some of the most difficult games are ones with the most simple situations, and often a lot of complication results in fewer inferences and inference chains.

*If this were a real game, it would be smarter simply to infer that the position will be occupied by a boy. However, I've included the "not girl" notation here instead, just so you can see it. Games with three or more subsets will often require you to be comfortable with "not" notations.



Note that the ordering and grouping rules that we discussed in the previous lesson can be modified to be about subsets. In most instances, replacing the element with the lowercase subset is simple enough, but in some instances it might create confusion. For example, think of how you would notate the rule "F is immediately ahead of a girl." Is it different from how you would notate that F is a girl? What about "F is two spots ahead of a girl"? Any time you worry that a notation might confuse you, it's best to write out what you need to know.

F is immediately ahead of a girl

F—g

F is two spots ahead of a girl

F—g

Subset Scenarios

Let's break down the different ways in which subsets appear in logic games.

One: The Scenario Tells Us Subset Assignments for All Elements

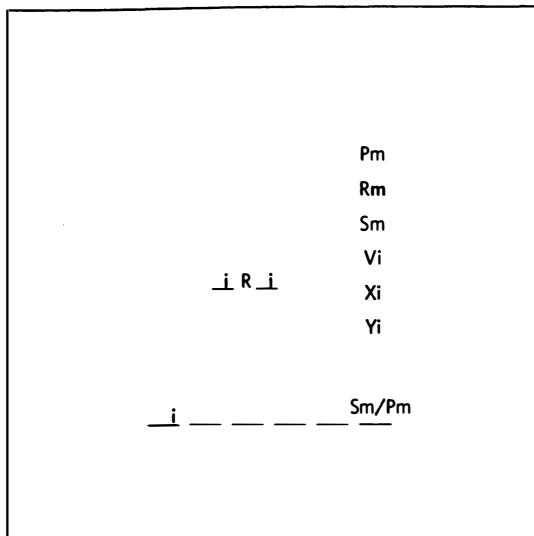
EXAMPLE

Three managers—P, R, and S—and three interns—V, X, and Y—will take turns testing out the new device. The device will be tested by one person at a time. The following conditions apply:

- An intern will test the device first.
- An intern will test the device right before and right after R does.
- Either S or P will test the device last.

NOTES

Notice that for this game, elements are split up into subgroups—managers and interns—and we are told which elements are in which subgroup. We can notate the subgroup right next to the element (rather than, say, creating a T-chart that separates subgroups), and by doing this we can more easily see how the rules come together (for example, it's easy to visualize the Vi, Xi, Yi notations fitting into spots we know have an “i” at the end).



Two: The Scenario Tells Us Subset Assignments for All Positions

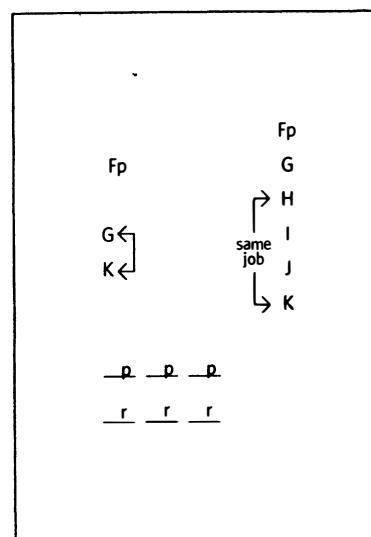
EXAMPLE

Six people—F, G, H, I, J, and K—will be split into three teams. Each team will have two different jobs—someone who plans, and someone who reviews. The following rules apply:

- G and K will be on the same team.
- H and K will have the same job.
- F will not be a reviewer.

NOTES

We've grouped the three pairs vertically, as we always do. We've simply added the information about the two different jobs. The G/K rule is somewhat dangerous in terms of causing confusion later in your process. If this game didn't have subsets, we could represent it simply by lining G and K up vertically. But deep into this type of game, we don't want to get confused into thinking that our notation means that G has to be a planner, and K a reviewer. The double arrow is a nice precaution. You could also have written “same team” next to the G & K notation for the sake of clarification if you felt you needed it.



Three: The Scenario Gives Us Subsets, but No Assignments

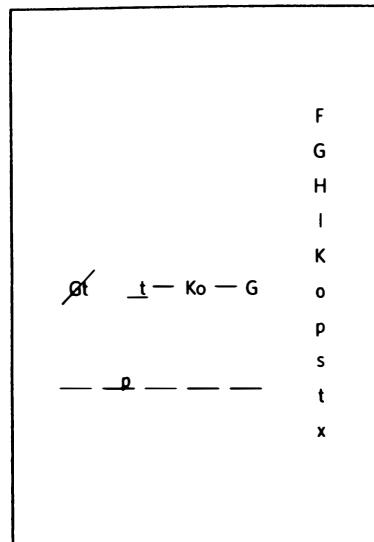
EXAMPLE

A concert will include five bands—F, G, H, I, and K—which will play one at a time and in order. Each band features a different instrument—the Octaban, Piano, Steel Drum, Tom Tom, and Xylophone. The following conditions apply:

- G does not feature the Tom Tom.
- The second band that plays will feature the Piano.
- K, which features the Octaban, will play at some point before G.
- The band that features the Tom Tom will play at some point before K.

NOTES

Most games, when they include subsets, include just two or three subsets, but others, like this one, can have as many subsets (in this case, the instrument played) as there are elements and positions. Since there are so many, it makes sense to go ahead and list them out. Take note of how we combined the third and fourth rules—linking rules that go together is a great way to simplify a game. If this were a real game, the t-Ko-G link would most certainly be the key consideration for solving questions.



*Challenge: The Scenario Gives Us Multiple Subsets

EXAMPLE

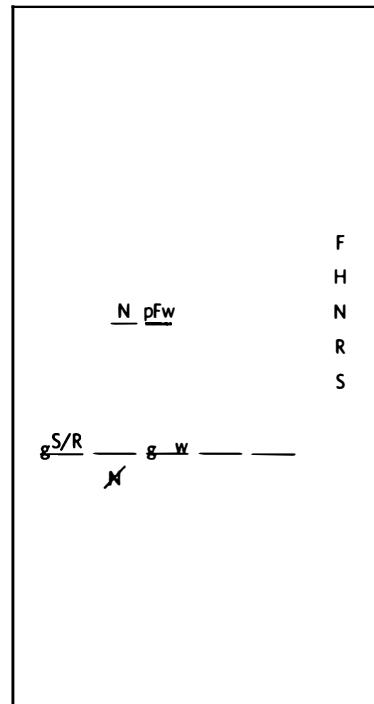
A steak house will bring out five different types of steaks—a filet, a hanger, a New York, a rib eye, and a sirloin—one at a time and in order. Each steak is either grilled or pan-fried, and each steak is served medium rare or well-done. The following conditions apply:

- The third steak brought out is grilled and well-done.
- The filet is neither grilled nor medium rare.
- The filet is served immediately after the new york steak.
- The first steak is either a grilled sirloin or a grilled rib eye.

NOTES

Once in a while, the test writers will include a game that includes more than one subset differentiation—in this case, the steaks are differentiated by their preparation method and level of doneness. We can deal with these different subsets by notating them on the two different sides of the element. You want to be careful notating N and F together; you want to do what you can, including writing it in if you need to, to make sure it's clear that the p goes with F, and not N.

It may feel a bit intimidating to deal with a game with two or more subset differentiations. Take heart in knowing that for games like this one for which the scenario itself involves a significant level of complication, the setup tends to be the primary challenge; that is, once you are finally able to get everything organized, the questions will tend to be relatively straightforward and manageable.



Directions for drills starting on the next page...

Simple Setups Drill Set 1 has four basic games for you to set up, each involving characteristics and categories. Simple Setups Drill Set 2 has the same games, but in a different order, and with different scenarios. Keep track of your time for each set. If you feel comfortable with your setups for each game, move on to the next set and try to be just a bit faster and more efficient. If you feel uncertain about your set ups after Set 1, look through the solutions before trying Set 2. As always, do your work in a notebook if you think you might come back to repeat these exercises later in your studies.

Simple Setups Drill 1

1. Six friends—M, N, O, Q, R, and S—drive in three cars—a Fiat, a Jeep, and a Kia. Each car has a driver and a passenger. The following conditions apply:

M drives the Jeep.
Both S and Q are passengers.
S and N ride in the same car.

2. A band will sing covers of five songs—R, S, T, U, and V—originally sung by one of three bands—Nirvana, Oasis, and Pearl Jam. The order of songs will conform to the following restrictions:

T will be sung immediately after a Nirvana song.
V is a Nirvana song.
A Pearl Jam song will not be first.
They will play exactly one Oasis song.

-
3. Three parents—F, G, and H—and three children—S, T, and W—will take turns playing miniature golf. They will each take one turn, and they will go in order. The following rules apply:

No two parents go consecutively.
S does not go immediately before or after another child.
G goes third.

4. Four different desks, one each made of metal, oak, pine, and teak, sold for four different prices—\$100, \$200, \$300, and \$400—to four different buyers—Mrs. F, Mr. G, Ms. H, and Ms. J. Additionally...

Mrs. F bought the most expensive desk.
The teak desk cost \$300.
Ms. H did not buy the cheapest desk.
Mr. G bought the pine desk.

Simple Setups Drill 2

1B. A television station will air three sitcoms—M, N, and O—and three dramas—X, Y, and Z—during the course of a night. The following rules apply:

X does not air immediately before or after another drama.
No two sitcoms air consecutively.
N will air third.

2B. Six workers—F, G, H, J, K, and L—will be assigned to three different stations—S, T, and U. At each station, there will be a maker and an editor. The following conditions apply:

F is the maker at station T.
G and J work at the same station.
Both J and K are editors.

3B. Four suspects—F, G, H, and J—are brought in for a case. One has the mustache, one the nose, one the piercing, and one the round glasses, that the witness remembers, and each suspect only has one of these characteristics. The suspects are questioned one at a time. Additionally...

The first suspect questioned wears round glasses.
J has the piercing.
H is the second suspect questioned.
The third suspect questioned has no mustache.

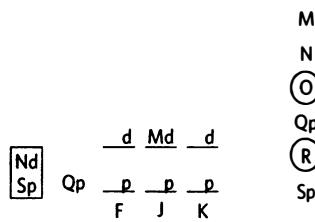
4B. A certain theater will play five movies—M, N, O, P, and Q—made by three different directors—F, G, and H—during the course of a festival. It will play these movies one at a time and in order according to the following:

Q was made by F.
A movie made by H will not play first.
There will be exactly one movie made by G.
O will play immediately after a movie made by F.

Simple Setups Drill 1 & 2 Solutions

1. Six friends—M, N, O, Q, R, and S—drive in three cars—a Fiat, a Jeep, and a Kia. Each car has a driver and a passenger. The following conditions apply:

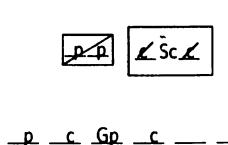
M drives the Jeep.
Both S and Q are passengers.
S and N ride in the same car.



Notes: We noted that Q and S are passengers in two different places to be doubly mindful. We can make a small inference that N drives in the car with S. The N & S grouping, coupled with M driving J, makes this game very easy to manage.

3. Three parents—F, G, and H—and three children—S, T, and W, will take turns playing miniature golf. They will each take one turn, and they will go in order. The following rules apply:

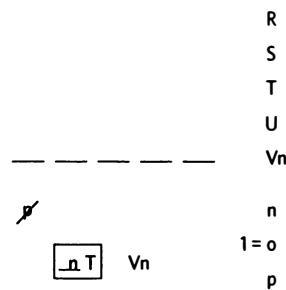
No two parents go consecutively.
S does not go immediately before or after another child.
G goes third.



Notes: We can make some inferences about the second and fourth position once we place G third. Then, because we have two more p's to place and they can't go consecutively in 5 & 6, we know that one of the remaining two parents has to go in the first position.

2. A band will sing covers of five songs—R, S, T, U, and V—originally sung by one of three bands—Nirvana, Oasis, and Pearl Jam. The order of songs will conform to the following restrictions:

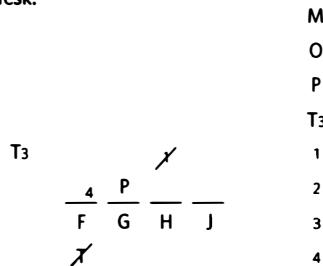
T will be sung immediately after a Nirvana song.
V is a Nirvana song.
A Pearl Jam song will not be first.
They will play exactly one Oasis song.



Notes: We can stay a bit more organized by putting information about the bands above the lines, and the songs below the lines. It's easy to over-infer and think that T must be after V, but that is not the case. Since we know very little about where most elements can go, we don't need to circle outliers in the elements list.

4. Four different desks, one each made of metal, oak, pine, and teak, sold for four different prices—\$100, \$200, \$300, and \$400—to four different buyers—Mrs. F, Mr. G, Ms. H, and Ms. J. Additionally...

Mrs. F bought the most expensive desk.
The teak desk cost \$300.
Ms. H did not buy the cheapest desk.
Mr. G bought the pine desk.



Full Setups Drill 1

directions below

A recruiter will interview six candidates—M, N, O, P, Q, and R—one at a time and in order. Two of the candidates are experienced, and the rest are not. The following conditions apply:

- Neither of the first two candidates interviewed are experienced.
- Either M or N, but not both, is experienced.
- P interviews before both O and R.
- R does not have experience.

Three biologists—R, S, and T—three chemists—U, W, and X—and two doctors—Y and Z—will be split into three teams for a research project. Two teams—F and G—will have two people assigned to them, and team K will have four people assigned to it. The following conditions apply:

- No doctors are assigned to team K.
- No doctors are assigned to the same team.
- R and S are not assigned to the same team.
- U and T are assigned to the same team.

An animal show will feature five different animals—S, T, U, V, and X. One is a frog, one a guinea pig, one a hamster, one an iguana, and one is a jack rabbit. The animals will appear one at a time, according to the following conditions:

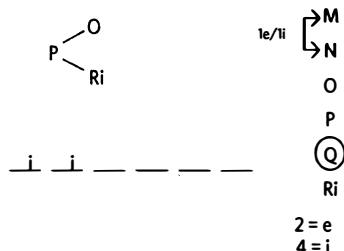
- T will appear at some point after the hamster,
but at some point before the frog.
- The iguana will appear either first or last.
- S is either a hamster or an iguana.
- T is not a guinea pig.

<p>Directions: Here are games that are more representative of the typical level of challenge that you are likely to see on the LSAT. This drill includes three sets of three games each, and the sets get progressively more difficult. Keep track of your time but don't rush.</p>
--

Full Setups Drill 1 Solutions

A recruiter will interview six candidates—M, N, O, P, Q, and R—one at a time and in order. Two of the candidates are experienced, and the rest are not. The following conditions apply:

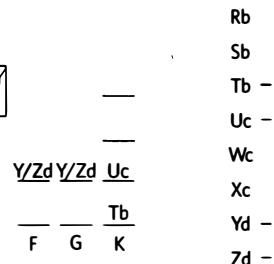
- Neither of the first two candidates interviewed are experienced.
- Either M or N, but not both, is experienced.
- P interviews before both O and R.
- R does not have experience.



We noted the last rule together with the third, and also notated it on the elements list. Note that when there are just two subset groups (which happens fairly often), you want to be in the habit of associating “not X” with “Y,” as in “not experienced” with “inexperienced.” If you didn’t mark that Q is not mentioned that’s fine, but keep in mind that “free agents” are particularly useful in games that have 2 or fewer of them.

Three biologists—R, S, and T—three chemists—U, W, and X—and two doctors—Y and Z—will be split into three teams for a research project. Two teams—F and G—will have two people assigned to them, and team K will have four people assigned to it. The following conditions apply:

- No doctors are assigned to team K.
- No doctors are assigned to the same team.
- R and S are not assigned to the same team.
- U and T are assigned to the same team.

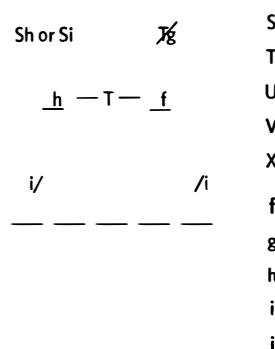


In this instance, it really pays off to read all of the rules before you start notating. Namely, the first and second rules together lead to a significant inference (that one doctor has to be on team F and the other on team G) that makes the game much easier to diagram and consider. This also leads to the inference that the U/T pair must be on team K. I also wanted to show one extra optional step: you can mark the elements that have already been placed on the elements list.

An animal show will feature five different animals—S, T, U, V, and X. One is a frog, one a guinea pig, one a hamster, one an iguana, and one is a jack rabbit. The animals will appear one at a time, according to the following conditions:

- T will appear at some point after the hamster, but at some point before the frog.
- The iguana will appear either first or last.
- S is either a hamster or an iguana.
- T is not a guinea pig.

The key rule in this game is most definitely the first one, considering that that it will impact three of the five total positions (with another one of the five, either of the ends, occupied with an i). As you answer questions, whether they specifically refer to h, T, f, or not, that first rule should be your first consideration when you picture your board.



As always, there are many effective ways to diagram games, and if you happened to notate something differently—that’s fine—just make sure that your notation is accurate.

Full Setups Drill 2

Six people—M, N, O, P, R, and S—are hired for jobs in three departments—F, G, and H. Two people are hired for each department. Some people are given benefits, while others are not. Additionally...

- The two people hired for G are given benefits.
 - Neither M nor N is given benefits.
 - S is the only person hired in his department who is given benefits.
 - M and P are not hired for the same department.
-

An artist applies six different colors—F, G, H, I, K, and L—to his painting, one color at a time. The first three colors he applies to the sky, and the next three colors he applies to other parts of the painting. It also must be true that:

- He applies F to the sky.
 - He uses K before L but after I.
 - He uses G fifth.
 - He uses K or H, but not both, for the sky.
-

A homeowner receives six different bids from six different contractors—M, N, O, P, R, and S—for a project on his house. Each bid is a different price. Some bids estimate that the job will take two weeks, some that the job will take four weeks, and one bid estimates a six-week job. The following conditions apply:

- N's bid price was higher than M's, but lower than R's.
- The lowest bid price came with a six-week estimate.
- O estimated two more weeks than N did.
- R's bid price was the second highest of those that came with a two-week estimate.

Full Setups Drill 2 Solutions

Six people—M, N, O, P, R, and S—are hired for jobs in three departments—F, G, and H. Two people are hired for each department. Some people are given benefits, while others are not. Additionally...

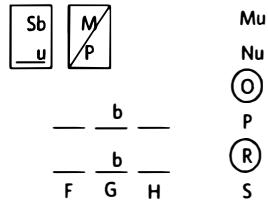
The two people hired for G are given benefits.

Neither M nor N is given benefits.

S is the only person hired in his department who is given benefits.

M and P are not hired for the same department.

The third rule is a bit tricky to notate, and in any such situation, if you feel stuck on how to notate a rule exactly, it's fine to write the rule out next to the diagram.



An artist applies six different colors—F, G, H, I, K, and L—to his painting, one color at a time. The first three colors he applies to the sky, and the next three colors he applies to other parts of the painting. It also must be true that:

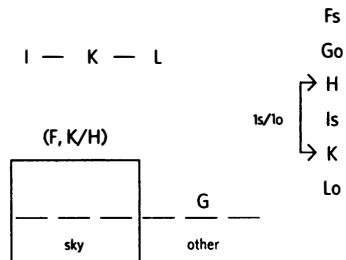
He applies F to the sky.

He uses K before L but after I.

He uses G fifth.

He uses K or H, but not both, for the sky.

You may have been tempted to draw your diagram to match a visual that you have of a painting—with a sky above and rest below. If so—bravo!—the better you can visualize, the better off you will be. One thing you definitely want to make sure of, though, is that any sort of creative design also lets you keep track of order, for order is clearly important in this game. We separated sky and other while keeping the slots in a row for order sake, but other methods could have been just as effective.



A homeowner receives six different bids from six different contractors—M, N, O, P, R, and S—for a project on his house. Each bid is a different price. Some bids estimate that the job will take two weeks, some that the job will take four weeks, and one bid estimates a six-week job. The following conditions apply:

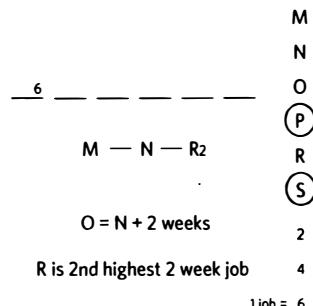
N's bid price was higher than M's, but lower than R's.

The lowest bid price came with a six-week estimate.

O estimated two more weeks than N did.

R's bid price was the second highest of those that came with a two-week estimate.

It's very important you take the time to carefully evaluate this game before you start laying out your board; the key is to use the prices to set up an order. How should you know to do this? From the rules. Notice that several of the rules reference higher and lower, and we know there can't be any ties. You could have set it up from highest to lowest price, and that would have been great too. Notice that we didn't have a great way to notate the last rule, and rather than come up with some random notation we'll confuse later on, we just wrote out the rule.



Full Setups Drill 3 Challenge Set*

A certain political campaign has stickers and posters in five different styles—F, G, H, I, and K. They will put these stickers and posters at five hotspots, labeled one through five. They will put one style of sticker and one style of poster at each location, and no style of either will be placed in more than one location. Additionally, the following rules apply:

The G-style sticker will be placed with the F-style poster.
The K-style sticker will be placed with the G-style poster.
No sticker and poster of the same style will be placed
in the same location.
The two H-style items will be used at hotspots 1 and 3.
I cannot be placed with K.

An author has written five novels—M, N, O, P, and R. Three of the novels—M, N, and O—are in Russian, and the other two—P and R—are in French. Two of the novels are best sellers, and three of them are not. The author will read excerpts from all five novels for an audience of fans. Additionally, we know that...

He reads from a best seller second.
Either N or O, but not both, is a best seller.
He reads from exactly two Russian books before his first French book.
He reads from M before O.

Four pairs of mittens are matched up with four pairs of socks for a window display. There is one pair of both in each of four colors—gray, indigo, jade, and khaki. The items are made of either cotton, polyester, or wool only. The following conditions apply:

The gray socks are paired with polyester mittens.
The indigo mittens are paired with wool socks.
The khaki socks are not paired with gray mittens.
Both the gray and jade socks are made of cotton.
Exactly one pair of socks is made of polyester.

* These are not your run-of-the-mill games, and if you saw one of these on the exam, it'd likely be the most difficult of your four games. Don't hesitate to get creative. You can do it!

Full Setups Drill 3 Challenge Set Solutions

A certain political campaign has stickers and posters in five different styles—F, G, H, I, and K. They will put these stickers and posters at five hotspots, labeled one through five. They will put one style of sticker, and one style of poster, at each location, and no style of either will be placed in more than one location. Additionally, the following rules apply:

The G-style sticker will be placed with the F-style poster.

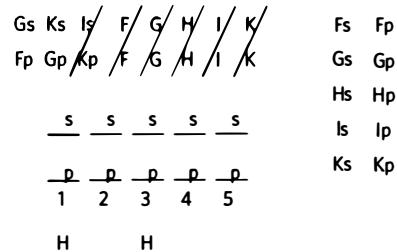
The K-style sticker will be placed with the G-style poster.

No sticker and poster of the same style will be placed in the same location.

The two H-style items will be used at hotspots 1 and 3.

I cannot be placed with K.

Note the use of two rows of lines for the two different types of items—stickers and posters—used at each locale. Also note that there are probably more elegant ways to notate the third rule, but I've done it in a way that is at least obvious. I wrote out the last rule with a slight inference.



An author has written five novels—M, N, O, P, and R. Three of the novels—M, N, and O—are in Russian, and the other two—P and R—are in French. Two of the novels are best sellers, and three of them are not. The author will read excerpts from all five novels for an audience of fans. Additionally, we know that...

He reads from a best seller second.

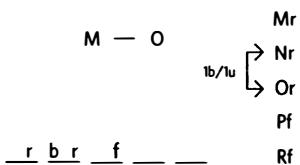
Either N or O, but not both, is a best seller.

He reads from exactly two Russian books before his first French book.

He reads from M before O.

We have two subsets here, but unlike the previous example, that obviously doesn't mean we should have ten positions (he's not going to be reading ten things). We can use lowercase letters placed to the left of where we write in the element to indicate the second layer of subset: whether the book is a best seller or not.

2 b's and 3 u's



Four pairs of mittens are matched up with four pairs of socks for a window display. There is one pair of both in each of four colors—gray, indigo, jade, and khaki. The items are made of either cotton, polyester, or wool only. The following conditions apply:

The gray socks are paired with polyester mittens.

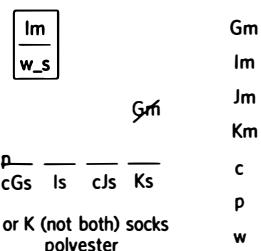
The indigo mittens are paired with wool socks.

The khaki socks are not paired with gray mittens.

Both the gray and jade socks are made of cotton.

Exactly one pair of socks is made of polyester.

In this case there is overlap between elements and positions—rare, but it has happened in a few games in the past. You could have chosen to make the mittens the base and the socks the elements—the rules would have worked out just fine that way as well. The key is that you put yourself in a position to match mittens with socks, and we've done that here. Note the slight inference noted at the bottom. Also note that we placed the positions in a horizontal arrangement even though there is no order; that shouldn't confuse us here.



12

LOGIC GAMES

numbers issues

About a quarter of all games require us to make inferences regarding numbers—that is, they give us clues about a certain number of elements in a subset or a group, and test our ability to infer something about other numbers based on that information. In most instances, the numbers issues that we will have to deal with on the LSAT are similar to one of these two hypothetical scenarios:

- You are at Taco Bell, where they sell four different things that you like. Everything is \$1 or \$2, and you have \$6 in your pocket. You’re trying to figure out what combination of food you want for that \$6.
- You are trying to figure out how much salary a co-worker makes. You know that there are four tiers of pay at your company, and you also know that this co-worker makes more than a certain person, less than another person, and so on.

The numbers issues on the LSAT will be no more complicated than these examples mentioned above. The numbers will always be small and the options very limited. Success won’t ever require “hard math.” What it will require is a recognition of when you need to think about these issues, as well as an ability to handle these situations with consistency and accuracy.

Numbers issues are not particularly common—the majority of games will not require the skills that we will discuss here. There are just two general situations in which we need to focus on numbers issues: when there is something other than a one-to-one relationship between elements and positions, and when there are subsets.

Up to this point, every game we’ve looked at has had a natural one-to-one relationship between elements and positions—five elements fill five slots, six elements fill six slots, and so on. However, there are certain games for which there is something other than a one-to-one relationship, either because there are more elements than positions, more positions than elements, or an uncertain number of positions to be filled. In this lesson, we will thoroughly discuss games that have something other than a one to one relationship between elements and positions.

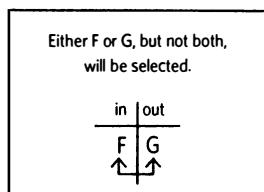
We actually dealt with a few basic *subset* numbers issues in the last lesson (by putting “= 2” next to a particular subset and such). We’ll look at some more examples of numbers situations that arise because of subsets in this lesson.

**Numbers issues
can appear
when the elements
and positions are not
one-to-one, or
when there
are subsets**

Issue One: More Elements than Positions

Just like when you tried out for that high school musical, sometimes there are more people that want spots than there are spots themselves. The natural consequence is that certain roles are assigned to certain individuals, and other individuals don't get positions. In high school, those who didn't make it were quickly forgotten, never to be heard singing in the halls again—but on the LSAT, when there are too many people or elements for positions, it's very important that you keep track of those that *don't* fit in.

We can do this by drawing “out” positions, as we’ve done below, and by keeping track of which elements are in, and which elements are out. The big vertical line will be our line of demarcation for rules about what is in and what is out. Rules about elements having to be in or out (see side note) can cradle this line of demarcation.



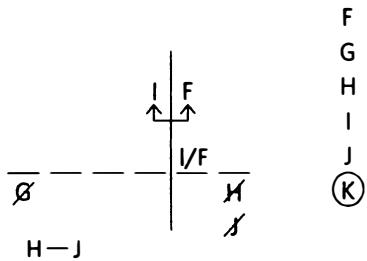
Note that when the number of “out” slots becomes fairly significant, as in the second example, this begins to look very much like a grouping game (with the “in” and “out” being the groups); in fact, there is a lot of natural overlap between the strategies for grouping games, and the strategies for situations with “in” and “out” members. The same strategies are effective in both situations, so this overlap shouldn’t cause any problems.

When there are more elements than positions, and ordering is not involved, subsets commonly will be involved, and there will often be numeric issues having to do with these subsets. The second example illustrates this sort of situation, and we’ll discuss this in greater depth starting on page 164. For now, make sure you understand how we were able to derive the inferences about the numbers for each subset.

Below are examples of game scenarios and rules that involve more elements than positions.

A coach will pick four of the six swimmers—F, G, H, I, J, and K—on his team to take part in a race. Each of the four selected swimmers will swim one lap, and they will do so in order. The following conditions apply:

Either I or F, but not both, will swim in the race.
Both H and J will swim in the race, and
H will go before J.
G will not swim first.



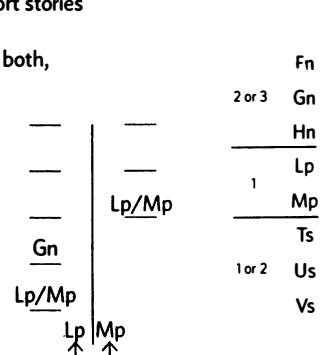
When there are clues in a game about who is selected and who is not, it’s just as important to keep track of the “out” positions as it is the “in” positions.

A writer submits three novellas—F, G, H—two poems—L and M, and three short stories—T, U, and V—to be published on a new website. The website chooses exactly five of those items to publish. Additionally, it must be true that:

No more than two short stories were chosen.

Either L or M, but not both, was chosen.

G was chosen.



The elements list is a natural place to keep track of subset numbers. Since we know that exactly 1 poem, and 2 or fewer short stories were chosen, we know that at least 2 of the 3 novels must have been chosen. Even if all three novels were chosen, we’re still not at 5 items, and so we know there must be at least 1 short story.

Issue Two: More Positions than Elements

For certain games there are fewer elements than there are positions, and there are a variety of consequences that can arise because of this. Let's discuss these types of games here, starting with ordering games that have more positions than elements.

Ordering Games with More Positions than Elements

If an ordering game has more positions than elements, there are two possible consequences—either certain positions will be left blank, or certain elements will be used more than once. Below are examples of these two different ordering scenarios.

When you know that certain spaces are going to be left blank, you want to make sure to keep track of spaces that you know must be filled, and spaces you know must remain empty. My suggested notations for these situations are to the side.

When there are more positions than elements, but all the positions must be filled, then we know that some of the elements will be used more than once. We'll want to remain mindful of this fact throughout the game. If the numbers of each element are a part of the game's mystery, we want to notate clues about this as we get them. If the numbers are made clear from the beginning, I suggest that you write out all the elements (i.e. M, M, N, N, O, O—if you know there are two of each of those elements) to make it easier to see all of the “pieces” that you have to place.

Grouping Games with More Positions than Elements

Grouping games with more positions than elements are a bit more common and a bit more interesting than are ordering games with more positions than elements.

The third position will be filled.



The third position will be empty.



The same element is in 3 & 4.



Different elements are in 3 & 4.



You don't have to use just squares and triangles—use any shape you can draw—the key is consistency or contrast. The shapes may seem childish, but they are great visual tools.

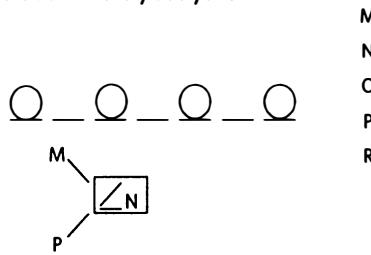
Below are examples of game scenarios and rules that involve more positions than elements.

Five babies—M, N, O, P, and R—were born over a seven year span—from 2001 through 2007. No more than one baby was born a year. The following conditions apply:

N was born after both M and P.

No baby was born the year before N was born.

Babies were born in every odd year.



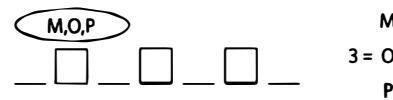
The circles (and triangles and such that we will soon be using) can make you feel like you are ten years old, but they are very visually effective. Remember that you want to try to combine rule notations whenever you can, as we've done with the first and second rule. This will make it easier for us to see how everything comes together.

A jewelry-maker is making a chain of seven beads. She will use at least one bead of each of three colors—magenta, orange, and purple—and beads of no other color. The following rules apply:

The first three beads will be of three different colors.

The second, fourth, and sixth beads will be of the same color.

There are exactly three orange beads used.



The large oval and commas are very useful when you know that a certain group of elements must go in a certain group of positions, but you don't know any more specifics. Our default understanding would probably be that each bead is used at least once, and so we probably don't need to notate that (though you certainly can if you want). If each bead did not need to be used at least once, that would likely be different from what we'd expect, so in that case it'd be important to make note of it.

Some grouping games are actually not very different from their related ordering games. Imagine the following scenario: four people who work at a company are assigned to three different projects. Two people will be assigned to each project, and each person will be assigned at least once.

In this case, it's fairly easy to see how the skills we've developed so far can be applied, and it's fairly easy to anticipate the key issues for this game; it's likely that we will be given some information about the number of projects each person works on, as well as some rules about how they will be grouped and assigned to specific projects.

Four people—F, G, H, and J—who work together at a company are assigned to three different projects—M, N, and P. Each person is assigned to at least one project, and each project will have two people assigned to it. The following rules apply:

- F is assigned to two projects.
- G and H are assigned to a project together.
- J is assigned to project M or N, but not both.

J/	/J	^{not} both	2 = F
—	—	—	G
M	N	P	H
			J

G
H

Grouping games with more positions than elements get more interesting when there is *uncertainty* in terms of the number of positions to be filled. Note that this sort of uncertainty is almost non-existent in ordering games (though there will be an example in your practice set), but is fairly common in grouping games.

At the top of the next page is an example of a grouping game that has this sort of issue. Notice that we can use the same circle and slash notation we introduced earlier. No big deal. If you are mindful of the various number inferences that can arise, these notations can be very useful for representing your understanding and for making inferences.

what does “or” mean?

In real life, words have a range of meaning, or even a variety of meanings, and all of us naturally adjust our understanding per the situation. When we hear that someone loves hamburgers, we know that this means something different than hearing that the person loves her husband. (Hopefully, it means something different.)

However, when it comes to the words used in reasoning issues, the LSAT requires a very specific understanding of the word’s meaning. One of these key words is the word “or.”

In real life, “or” has multiple meanings. If you win the lottery and are told that you can get the money in one lump sum, or in monthly payments, the intended meaning is that you can get one or the other, but not both. However, if we say that in order for Debbie to date a guy, he either has to have a job or be in school, chances are we aren’t meaning to exclude those that both have a job and go to school.

On the LSAT, the word “or” does not exclude the possibility of both. Thus, a statement like “M or N is selected” means that M, N, or both are selected.

If they do not mean for both to be a possibility, they must state, “but not both.”

Also keep in mind that many situations—most situations, actually—just naturally exclude the possibility of both. Let’s say we have a race and we are told that people finish one at a time and in order. If we are given the rule, “either R or N finished third,” note that the design of the game would prevent us from placing both into the third position.

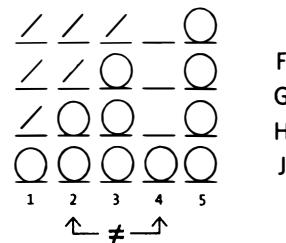
On the LSAT, the word “or” by itself does not inherently exclude the possibility of both. However, many situations (such as an order without ties) naturally exclude the possibility of “or” meaning “and.”

For a certain cooking competition, a chef can use four types of ingredients—F, G, H, and J—to cook five different dishes. Each ingredient must be used at least once, and each dish must contain at least one ingredient. Additionally, the following must be true:

The second dish he cooks has more ingredients than the first, but fewer than the third.

The last dish he cooks has the most ingredients of all.

The second dish and the fourth dish have no ingredients in common.

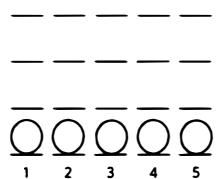


Fun, huh? Remind you of Connect Four? Here's how we figured all of this out: the first rule severely limits how many elements can be in the first, second, and third dishes. One thing it tells us is that since the 3rd dish must have more ingredients than the 2nd dish, which must have more ingredients than the 1st, the 3rd is either going to have 3 or 4 ingredients. Coupling this with the second rule breaks this game wide open; for the second rule to be true, he must use 3 ingredients in that third dish, and all four ingredients in the fifth. That also determines how many ingredients he uses in the first two dishes. Note that if we knew a bit more about exactly how many ingredients 4 had, we could have used contrasting shapes to represent the final rule.

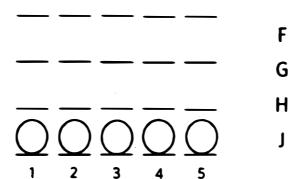
4 MINUTE UNCERTAIN GROUPS DRILL

Imagine the same scenario above, but with the different sets of rules written below. Each set of rules allows for significant number inferences—do your best to complete each board with accurate inferences, and see if you can do all four in four minutes or less! As always, if you would like to repeat the drill, make sure to do your work on a separate page.

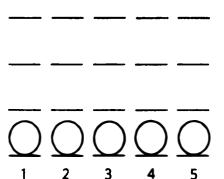
1.
G is used in the first three dishes and no others.
The fourth dish uses more ingredients than the third.
The second dish has F or J, but not both.



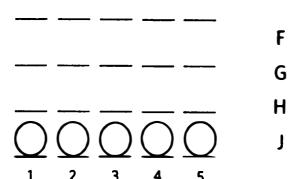
2.
The first and third dishes are the only ones with F.
The second and third dishes are the only ones with H.
The third and fourth dishes have the same number of ingredients.



3.
The third dish uses more ingredients than the fifth.
The second dish uses more ingredients than the first.
The first and third dishes have the same number of ingredients, but none of the same ingredients.



4.
He uses G on exactly three dishes.
F and J are always paired together.
Each dish has G or F, but not both.
The third dish uses more ingredients than the second.
He uses H on exactly one dish.



4 MINUTE UNCERTAIN GROUPS DRILL SOLUTIONS

<p>1.</p>	<p>2.</p>	<p>3.</p>	<p>4.</p>
-----------	-----------	-----------	-----------

If G is not used in 4&5 we can eliminate a slot from both. Since 2 is missing F or J, we can eliminate a slot there too. Since 3 has less than 4, 3 can't have more than 2, and 4 can't have less than 2. Remember that for these types of games, a slot with no circle or slash is a slot we are not sure gets filled.

Here, knowing elements can't go in particular dishes is what drives the position eliminations. The key inference is that the third and fourth dishes must both have two ingredients—3 can't have less than 2, and 4 can't have more than 2.

This one is all about numbers, and no specific assignments at all. Note the use of the different shapes to indicate that 1 and 3 share nothing in common, though of course there are other ways to note this.

F = 2, G = 3, H = 1, J = 2

In this case, we're able to make some inferences about the number of each element. Since each dish has either G or F, but not both, and three dishes have G, that must mean exactly two dishes have the F/J pairing.

Subset and Group Inferences

When a game has elements that are in subsets, and these elements are then split into two groups, we are commonly required to make deductions about the number of elements from each subset that go in each group.

The zoo game on page 169 is an example of this type of game, and most real LSAT scenarios that involve such deductions have been structured very similarly to this example. It is very common for the LSAT to use three subsets and two groups when it wants us to make these types of deductions. Notice that the rules and situation naturally lead us to think, “How many are selected from each subset?” When a game inspires this type of thinking, chances are that these numerical deductions will be important, especially when it comes to solving questions.

The drills on the next page will help you practice making these types of deductions. Keep in mind that though these deductions are most commonly required for games similar to the zoo game, they have in the past been required for other types of game situations. In short, this is an important skill for you to master.

Math Inferences Drill

Here is an exercise designed to fine-tune your ability to make the type of numerical inferences that are commonly required by the LSAT. If you feel uncomfortable with your ability to make these inferences, make it a point to revisit these exercises throughout the study process. Solutions are on the next page.

The situation: Five of eight students will be selected to take part in a math competition. The students are from classrooms A, B, and C. The rules of the game have given us some information about the number of students from each class, and that's been added into the chart already. Your job is to fill in the possibilities for the blank spaces. The first line has been filled in for you.

A	B	C	Total
1	2 or 3	1 or 2	5
0	<3		5
2		1	5
1	≤2		5
	3	0 or 1	5
	0 or 1	1 or 2	5
	≥2	≥2	5
<2	1		5
2		0 or 1	5
>2	<3		5

A	B	C	Total
1		2 or 3	5
2		1 or 2	5
≤2		≤2	5
1	0 or 1		5
	1	≥2	5
	≥2	0 or 1	5
1		≥2	5
<2	1		5
2		0 or 1	5
1 or 2		1 or 2	5

A	B	C	Total
≤2		2	5
	<3	0 or 1	5
1		0 or 1	5
2		<3	5
	1 or 2	1 or 2	5
0	≥3		5
	0 or 1	≥2	5
1		≤2	5
≤2		0 or 1	5
0 or 1		2	5

Time: _____ Accuracy: _____ /10 Time: _____ Accuracy: _____ /10 Time: _____ Accuracy: _____ /10

The situation: Joan will pack six accessories in her suitcase. She will pick from four belts, three hats, and three scarves, and **she must take at least one of each type of item**. The rules of the game allow us to fill in some of this information. Your job is to fill in the rest.

B (4)	H (3)	S (3)	Total
3			6
1			6
2 or 3		<2	6
	3	1 or 2	6
2 or 3		<3	6
1		>2	6
	2 or 3	≥2	6
	2	1	6
≥3			6
2		≥2	6

B (4)	H (3)	S (3)	Total
2		1 or 2	6
≤2		2	6
	2 or 3		6
	≤2	1	6
≥3			6
≤2	≤2		6
1 or 2		2	6
	≥2	≥2	6
2		<3	6
1		2 or 3	6

B (4)	H(3)	S(3)	Total
1		>1	6
1 or 2		≥2	6
	3		6
≤2		≤2	6
2		1 or 2	6
≥3		1	6
≤2		2	6
>2	1		6
1	<3		6
1			6

Time: _____ Accuracy: _____ /10 Time: _____ Accuracy: _____ /10 Time: _____ Accuracy: _____ /10

Math Inferences Drill Solutions

The situation: Five of eight students will be selected to take part in a math competition. The students are from classrooms A, B, and C. The rules of the game have given us some information about the number of students from each class, and your job is to practice filling in the rest. (Note that you could have chosen to write in the missing piece differently, and of course that's fine.)

A	B	C	Total
1 -	2 or 3	1 or 2	5
0	<3	3,4, or 5	5
2	2	1	5
1	≤2	2,3, or 4	5
1,2	3	0 or 1	5
2,3,4	0 or 1	1 or 2	5
0 or 1	≥2	≥2	5
<2	1	3 or 4	5
2	2 or 3	0 or 1	5
>2	<3	0,1, or 2	5

A	B	C	Total
1	1 or 2	2 or 3	5
2	1 or 2	1 or 2	5
≤2	1,2,3,4,5	≤2	5
1	0 or 1	3 or 4	5
0,1, or 2	1	≥2	5
0,1,2,3	≥2	0 or 1	5
1	0,1, or 2	≥2	5
<2	1	3 or 4	5
2	2 or 3	0 or 1	5
1 or 2	1,2, or 3	1 or 2	5

A	B	C	Total
≤2	1,2, or 3	2	5
2,3,4,5	<3	0 or 1	5
1	3 or 4	0 or 1	5
2	1,2, or 3	<3	5
1,2, or 3	1 or 2	1 or 2	5
0	≥3	0,1, or 2	5
0,1,2,3	0 or 1	≥2	5
1	2,3,4	≤2	5
≤2	2,3,4,5	0 or 1	5
0 or 1	2 or 3	2	5

The situation: Joan will pack six accessories in her suitcase. She will pick from four belts, three hats, and three scarves, and she must take at least one of each item. The rules of the game allow us to fill in some of this information. Your job is to fill in the rest.

B (4)	H (3)	S (3)	Total
3	1 or 2	1 or 2	6
1	2 or 3	2 or 3	6
2 or 3	2 or 3	<2	6
1 or 2	3	1 or 2	6
2 or 3	1,2 or 3	<3	6
1	2	>2	6
1 or 2	2 or 3	≥2	6
3	2	1	6
≥3	1 or 2	1 or 2	6
2	1 or 2	≥2	6

B (4)	H (3)	S (3)	Total
2	2 or 3	1 or 2	6
≤2	2 or 3	2	6
1,2, or 3	2 or 3	1,2, or 3	6
3 or 4	≤2	1	6
≥3	1 or 2	1 or 2	6
≤2	≤2	2 or 3	6
1 or 2	2 or 3	2	6
1 or 2	≥2	≥2	6
2	2 or 3	<3	6
1	2 or 3	2 or 3	6

B (4)	H(3)	S(3)	Total
1	2 or 3	>1	6
1 or 2	1,2, or 3	≥2	6
1 or 2	3	1 or 2	6
≤2	2 or 3	≤2	6
2	2 or 3	1 or 2	6
≥3	1 or 2	1	6
≤2	2 or 3	2	6
>2	1	1 or 2	6
1	<3	3	6
1	2 or 3	2 or 3	6

Directions for drill on following page: The following pages contain scenarios and rules for diagramming practice. Don't worry about timing for now—do your best to set up your diagrams as accurately as possible and check against the solutions after each set of games. As always, you shouldn't feel that you need to diagram the rules in exactly the same way that I have; however, when there are differences, you do want to double check that your notations are accurate and effective.

Full Setup Drill 1

Here are two sets of three games each. Choose whether to check the solutions after each game, or after each set.

Fanny, Greg, Harry, and Jane all get chicken burritos. For their burritos, they each get at least one of four toppings—M, N, O, and P. Additionally, the following conditions apply:

- Fanny gets fewer toppings than anyone else.
- One person gets all four toppings.
- Three of the friends get N as a topping.
- Greg gets fewer toppings than Jane.
- Jane gets O or P, but not both.

Sam has purchased five different models of computers—G, H, I, K, and L. He's never purchased more than one computer in a year. He bought his first computer in 2001, and his last in 2007. Additionally, the following conditions apply:

- He bought K after he bought both G and H.
 - He did not purchase a computer in the year after he purchased G.
 - He bought a computer in 2002 or 2003, but not both.
 - He did not purchase L first nor last.
-

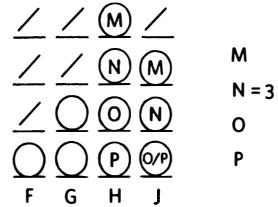
A company will choose five employees for a management training program. They will be chosen out of a total of nine employees: F, G, and H from accounting; N, O, and P from marketing; and T, V, and W from sales. The following conditions apply:

- Either F or G, but not both, will be chosen.
- W will not be chosen.
- They will choose fewer people from sales than from marketing.
- T or V, but not both, will be chosen.

Full Setup Drill 1 Solutions

Fanny, Greg, Harry, and Jane all get chicken burritos. For their burritos, they each get at least one of four toppings—M, N, O, and P. Additionally, the following conditions apply:

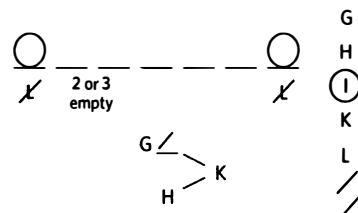
- Fanny gets fewer toppings than anyone else.
- One person gets all four toppings.
- Three of the friends get N as a topping.
- Greg gets fewer toppings than Jane.
- Jane gets O or P, but not both.



It really pays to handle the rules out of order here. If Jane gets less than four toppings because she will be missing O or P, G gets fewer toppings than Jane, and Fanny gets fewer toppings than anyone else. That must mean that Fanny gets one topping, Greg two, and Jane three. That also means Harry will get all four toppings.

Sam has purchased five different models of computers—G, H, I, K, and L. He's never purchased more than one computer in a year. He bought his first computer in 2001, and his last in 2007. Additionally, the following conditions apply:

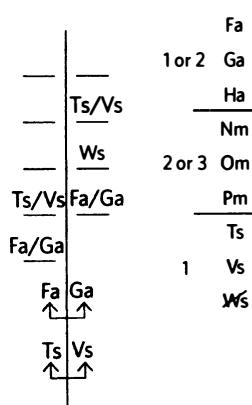
- He bought K after he bought both G and H.
- He did not purchase a computer in the year after he purchased G.
- He bought a computer in 2002 or 2003, but not both.
- He did not purchase L first nor last.



Notice we notated the first and second rules together; we want to combine rules whenever possible. There are other ways to represent the third rule but don't be hesitant to just write in, rather than symbolize, what you mean, when that seems to be the cleanest option. The two slashes in the list of elements are completely optional, but a good reminder.

A company will choose five employees for a management training program. They will be chosen out of a total of nine employees: F, G, and H from accounting; N, O, and P from marketing; and T, V, and W from sales. The following conditions apply:

- Either F or G, but not both, will be chosen.
- W will not be chosen.
- They will choose fewer people from sales than from marketing.
- T or V, but not both, will be chosen.



The positions on the left of the line are for those who are chosen, and the positions on the right are for those who are not. Note that we can use the third rule to make an inference about the number of elements that must come from marketing.

Full Setup Drill 2

A zoo will feature six of ten animals for its new brochure. Three of the animals—F, G, H—are elephants, three—J, K, L—are monkeys, and four—N, P, Q, and S—are rhinos. The selection of animals will be as follows:

- The brochure must feature at least one of each type of animal.
 - At least two rhinos will be featured.
 - Either both F and G are featured, or neither of them are.
 - The brochure will not feature fewer elephants than monkeys.
-

Ten films—F, G, H, M, N, O, P, R, S, and T—will be shown in four different theaters—W, X, Y, and Z. Each theater will show at least one, but no more than three, of the films, and each film will only be shown in one theater. The following conditions apply:

- X will show the same number of films as W.
 - Y will show the same number of films as Z.
 - More films are shown at X than at Y.
 - Both F and N are shown at Z.
 - O and S are shown in the same theater.
-

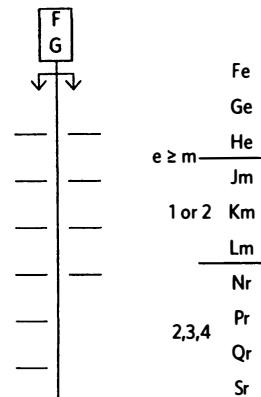
Three friends—Frank, Harry, and Ingrid—leave a total of eight messages on an answering machine. Each friend leaves at least one, but no more than four, messages. The following conditions apply:

- The person who left the first message also left the last message.
- The person who left the second message also left the seventh message.
- Harry left the third message.
- No one leaves two consecutive messages.
- No one leaves more messages than Frank.

Full Setup Drill 2 Solutions

A zoo will feature six of ten animals for its new brochure. Three of the animals—F, G, H—are elephants, three—J, K, L—are monkeys, and four—N, P, Q, and S—are rhinos. The selection of animals will be as follows:

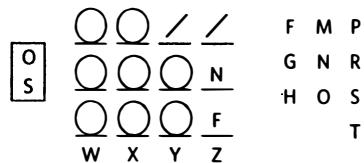
- The brochure must feature at least one of each type of animal.
- At least two rhinos will be featured.
- Either both F and G are featured, or neither of them are.
- The brochure will not feature fewer elephants than monkeys.



We know at least two rhinos are in—that leaves two to four spaces. If there can't be more monkeys than elephants, that leaves us with 1 or 2 monkeys.

Ten films—F, G, H, M, N, O, P, R, S, and T—will be shown in four different theaters—W, X, Y, and Z. Each theater will show at least one, but no more than three, of the films, and each film will only be shown in one theater. The following conditions apply:

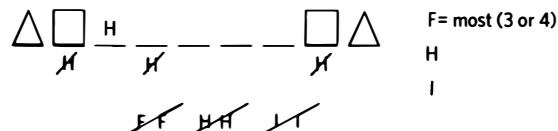
- X will show the same number of films as W.
- Y will show the same number of films as Z.
- More films are shown at X than at Y.
- Both F and N are shown at Z.
- O and S are shown in the same theater.



It's helpful to remember here that with 10 films to place, and twelve total spots, there will only be two empty positions. The first, second, and third rules, when combined, require us to put three films in W and X, and two each in Y and Z.

Three friends—Frank, Harry, and Ingrid—leave a total of eight messages on an answering machine. Each friend leaves at least one, but no more than four, messages. The following conditions apply:

- The person who left the first message also left the last message.
- The person who left the second message also left the seventh message.
- Harry left the third message.
- No one leaves two consecutive messages.
- No one leaves more messages than Frank.



The triangle and square are great tools for reminding yourself that the same element has to go in 1 & 8, and the same one in 2 & 7. Note that we can make an inference that Frank must have left either the first and last, or second and seventh, message (there wouldn't be enough spots for F to appear most otherwise); but that's a fairly subtle inference, and not that useful of one, so no need to mark it (unless you want to, of course).

13

LOGIC GAMES

conditional rules

Up to this point, we've been working with rules that are absolute and always true. If we are told that X is before Y, X will always be before Y, no matter what else happens in the game. If we are told that G is third, G will be third, no matter what. Like your mother's love, we can think of these rules as being *unconditional*.

Now it's time to focus on *conditional* rules. Here are some examples of conditional rules:

"If X is selected, Y will not be."

"If X is before Y, Y will be before Z."

"If X is selected, it will be before Y."

Conditional rules, and conditional reasoning in general, are very important to both Logic Games and Logical Reasoning, and we'll be discussing conditional issues quite a bit in the lessons to come. For now, you can start by thinking about conditional rules as rules that only apply sometimes. They are essentially rules that come into effect when a "trigger," the "if" statement, sets them off.

In this lesson, we will work to develop a simple and correct understanding of exactly what conditional statements mean. We will also practice notating conditional statements, and finally, we will discuss how to link conditional rules with other conditional rules. To begin, let's take a look at how some basic unconditional rules and conditional rules impact a sample ordering game and a sample grouping game.

Conditional rules
are rules
that only apply
sometimes

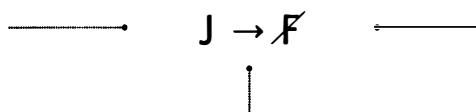
basic conditional symbol



THE ANATOMY OF A CONDITIONAL STATEMENT

"If John is selected, Fanny will not be."

John getting selected is the "trigger" that sets this rule in action. In formal terms, we think of it as being "sufficient," or enough, to guarantee the result.



This arrow is the universal symbol for a conditional rule, and it is absolutely iron-clad—if the left side happens, the right side will happen. The most important thing to remember about an arrow is that it points in one direction. Fanny not getting selected will not guarantee that John will be.

F not getting selected is the "result" of J getting selected. Note that we are using the term "result" a bit loosely. We are not implying causation, but rather a resulting inference. If we know J is selected, a result will be that we know F is not selected.

Imagine this basic ordering scenario and rules:

Six toys—F, G, H, J, K, and L—are placed into positions 1 through 6 in a display. The following rules apply:

H is put in 3, and J in 5.
If F is put in 2, K will be put in 4.

The first rule is simple to understand and implement, and we can add it to our diagram like this:



The second rule requires a bit more thought. We can't just put F in 2 and K in 4, because we don't know for sure that those things are true.

What this rule does tell us is that once we do know that F is in the second position, then we can place K in the fourth position. We won't write this into the diagram, but rather to the side. We use the arrow symbol to represent conditional understanding:

$$\frac{F}{2} \rightarrow \frac{K}{4}$$

We'll be using this arrow quite a bit, and you always want to think of it as meaning, "If..., then..."

Bonus

Okay, so we know that if F is in 2, K will be in 4. What else do we know from this statement?

What if F is not in 2? Do we know K will not be in 4? No.

What if K is in 4? Must F be in 2? No.

What if K is not in 4? Does that mean that F must not be in 2? Yes, it does! Because we know that if F were in 2, K would be in 4! We can write this inference down as well if we'd like:

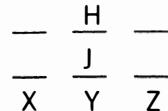
$$\frac{K}{4} \rightarrow \frac{\cancel{F}}{2}$$

Imagine this basic grouping scenario and rules:

Six pets—F, G, H, J, K, and L—will be assigned to three different groomers—X, Y, and Z. The following rules apply:

H and J are assigned to Y.
If F is assigned to X, K will be assigned to Z.

The first rule is again simple to understand and implement, and we can add it to our diagram like this:



The second rule requires a bit more thought. We can't just put F in X and K in Z, because we don't know for sure that those things are true.

What this rule does tell us is that if we do know that F is assigned to X, then we will know for sure that K will be assigned to Z. We use the arrow symbol to represent conditional understanding:

$$\frac{F}{X} \rightarrow \frac{K}{Z}$$

Bonus

Just as before, let's think: What else do we know from this statement?

What if F is not assigned to X? Do we know K will not be assigned to Z? No.

What if K is assigned to Z? Must F be assigned to X? No...

What if K is not assigned to Z? Does that mean that F must not be assigned to X? Yes, it does! Because we know that if F were assigned to X, K would be assigned to Z. We can write this down as well if we'd like:

$$\frac{\cancel{K}}{Z} \rightarrow \frac{F}{X}$$

This additional information we gained for both problems is called the contrapositive, and we will be discussing it in greater detail on the next page.

Understanding Conditional Rules

Does it make sense why we choose to notate conditional rules using arrows? Does it make sense how we were able to make those additional inferences? It's very important that you understand exactly what conditional rules mean and what their implications are, so let's spend a bit of time making sure we start off with a solid foundation.

Here is a basic conditional statement:

"If it rains, John will not go to the park."

This statement is about two things—rain and going to the park. Both of these issues are absolutes; that is, it will either rain or it won't—there is no middle ground—and he'll go to the park or he won't—again, there is no middle ground.

Assuming that this statement is true, and we must assume that all conditional statements are meant to be absolutely true, let's think about exactly what we know based on the information given to us.

First, we know that if it rains, John will not go to the park. That is a *guarantee*, and it's very important you get used to seeing it as such. "If" is a powerful word on the LSAT, and if this statement were in a real LSAT argument or game, John cannot possibly go to the park if it rains.

Per this statement, can we say that if it doesn't rain, the opposite consequence must happen—that is, John must go to the park? No. We cannot say that. If it's 3:00 a.m. and not raining, John does not have to be at the park—and it's clear the statement is not telling us that he does.

Note that what I did there was just to take the *opposite* of each part—I switched rain to no rain, and not going to the park to going to the park. Under the pressure of the exam, that sort of move can seem logical enough, but it's absolutely not valid, and it's the type of incorrect reasoning off of which wrong answers are commonly built.

Can we say that if John did not go to the park, it was raining? No. The argument didn't say that rain was the only thing that would keep him away from the park.

Notice that in this case, we are *reversing* the elements in the original argument—again, this is not okay, and this type of reasoning also underlies a lot of wrong answers.

Finally, can we say that if John went to the park, it didn't rain?

Yes, we can actually say that. Because we know he wouldn't have gone if it had rained. Let's go ahead and put these issues into symbol form to think about what is going on in a more abstract way. The images are on the top of the next page.

If is a powerful
word on the
LSAT

Original	Possible Inferences		
"If it rains, John will not go to the park."	"If it does not rain, John will go to the park."	"If John does not go to the park, it must be raining."	"If John goes to the park, it must not be raining."
$R \rightarrow \cancel{P}$	$\cancel{R} \rightarrow P$	$\cancel{P} \rightarrow R$	$P \rightarrow \cancel{R}$
	WRONG	WRONG	RIGHT

Notice what happens in the invalid inferences—the elements are either simply negated or reversed. It's always wrong to think this leads to a valid inference.

For the one inference that was valid, notice what happened: the elements were both reversed *and* negated. Turns out, it's *always* going to be *right* to do this.

The **contrapositive** is an inference that can be derived from any and all conditional statements, and in fact should be thought of as a basic part of understanding any conditional statement.

In fact, this is an inference that can be deduced from every conditional statement. Every conditional statement yields this additional inference, and this additional conditional inference is known as the **contrapositive**.

"Contrapositive" is an unfortunately complicated-sounding word, but the concept itself is quite simple to reason through. Let's go back to our original conditional statement:

"If it rains, John will not go to the park."

We can think of the rain as the "trigger" and the not going to the park as a "result," something we know as a consequence of knowing that it rains.

We know that if the trigger happens, it's guaranteed that the result will happen. Therefore, it makes sense that if the result didn't happen, the trigger must not have happened.

This is what the contrapositive will always tell us: if the result isn't true, the trigger isn't true.

Again, remember what we *did* on a more abstract level—we switched what was on the left for what was on the right, and we switched positives and negatives. You can think of this as "reverse and negate," and this system will always work for helping you derive the contrapositive.

reverse & negate

Notice we just switched left and right and positive and negative.

Original

"If it rains, John will not go to the park."

$$R \rightarrow \cancel{P}$$

Contrapositive

"Since John went to the park, it must not have rained."

$$P \rightarrow \cancel{R}$$

The rain is the trigger that guarantees that we know John will not go to the park.

Since we know that the guaranteed result didn't happen, we know the trigger must not have happened.

Hidden Conditional Rules

There are many ways to write conditional statements, and some of these ways are clearer than others. Most conditional rules that appear in Logic Games are clearly conditional, and the test writers do not often try to challenge us with the way they word these rules (at least not to the degree that they challenge us with the wording of conditional statements in Logical Reasoning questions). However...

Once in a while the test writers will sneak in a conditional rule that is less obviously a conditional rule, and if you are not careful these “hidden conditional” rules can get you in trouble. In general, these hidden conditionals will appear in games that have subsets or mismatch issues, for these hidden conditionals generally involve elements or characteristics that can appear more or less than once.

Let’s imagine that we have a game about an event featuring eight solo-artists who perform in an order. We don’t know the artists’ names; we just know that some of the artists are dancers, some are orators, and the remaining are singers.

And we get the following rule: *“Any time a dancer performs, a singer must immediately follow.”* We could, without thinking twice about it, notate it like as we have to the side.¹

1. DS

However, this would be an inaccurate representation of the rule, and this notation would likely cause trouble down the line. Before we explain why, can you see for yourself why this notation is flawed?

Let’s imagine that we find out a singer goes fifth. Does that mean a dancer must perform fourth? Absolutely not. To test, just imagine that an orator went fourth, then a singer fifth, and notice that that wouldn’t violate our rule in any way.

This is a tricky clue—we know that when a dancer performs, a singer must immediately follow, but that does not mean that a dancer must perform before every singer. Our notation doesn’t represent this subtlety well. It is better to notate this rule this way.²

2. D → DS

We always read the arrow the same way (that is, as the marker of a conditional rule), and we can read this statement to mean “If there is a dancer, then a singer must immediately follow.”

As we mentioned before, these types of rules are fairly rare, and they will generally appear in games that either involve uncertain amounts of elements or members in subgroups. To see why this is the case, let’s imagine a situation analogous to the one above, but this time in a game without subgroups and with only one-to-one relationships.

So, let’s imagine we’ve just got eight performers—F, G, H, I, J, K, L, M, and N—and we get the following rule: *“G performs immediately after M.”*

Would it be okay to notate this as “MG”? (After all, that’s how we’ve been doing it up to this point!) Another way to think about it is—if we place M, do we know G must immediately follow? If we place G, do we know M must immediately precede? The answer to both questions is yes.

If there is only one G and one M, and we know that M must follow G, then we know G must go before M. With a one-to-one element to position relationship, the situation is naturally more simple.

When in doubt, thinking about a rule as we just did in “both directions,” will generally help you see whether a rule is conditional or not.

To illustrate, let’s imagine another situation:

Thomas is baking pies for five friends—M, N, O, P, and R. Each pie will have at least one of six ingredients: F, G, H, J, K, and L. The following rules apply:

Every pie with F will have H in it.

Let’s imagine you see this on the exam, and you are wondering whether or not this is a rule that you have to think of conditionally. Let’s test it in “both directions.”

If we know that the pie has F, do we know that it must have H? Yes, the rule tells us that.

If we know that the pie has H, must the pie have F? No. To test, imagine a pie with just H as an ingredient—notice it wouldn’t violate our condition.

Therefore, we know that this is a conditional rule—a rule that applies in certain situations but not others. We want to make sure to notate it conditionally.³

What would the contrapositive of such a conditional rule be? In this case, we know that the trigger is having F, and the result is having H. Therefore, we know that if a pie does not have H (i.e., if the result didn’t happen) it must not have F (i.e., the trigger did not take effect).⁴

Compound Conditional Rules

Perhaps some of the most intimidating rules that appear in Logic Games are the ones that we’ll think of as “compound conditionals.” Compound conditional rules are conditional rules that discuss more than one element or characteristic in either the trigger or result. Here are some examples of compound conditionals:

“If Tom *and* Sarah are selected, Phil will not be selected.”

“If the ice cream has mint, it will also have either nuts *or* caramel.”

It’s easy to overcomplicate our understanding of these rules, but in reality they are really **paper tigers**; it’s likely that you intuitively understand them already. To verify this understanding, let’s break down a few compound conditional rules. We can use the same pie baking scenario from the previous page. Imagine four different compound conditional rules that could appear with that situation (these rules are not meant to go together in the same game):

paper tiger:
something that
seems scarier
than it is

Thomas is baking pies for five friends: M, N, O, P, and R. Each pie will have at least one of six ingredients: F, G, H, J, K, and L. The following rules apply:

- Possible Rule 1: If a pie has F and G, it must also have J.
- Possible Rule 2: If a pie has G or H, it will not have K.
- Possible Rule 3: If a pie has L, it will also have F and G.
- Possible Rule 4: If a pie does not have H, it will have J or L.

The first rule states, “If a pie has F and G, it must also have J.”⁵

In this case, we’ve got a compound trigger: in order for this rule to take effect, we need to know that two things are true—the pie must have F *and* the pie must have G. Notice that only knowing something about F, or only knowing something about G, does nothing for us—we need to know something about *both* F and G. If both of them are in the pie, then the pie will also have J.

5. $F \& G \rightarrow J$

Now let’s think of the contrapositive, and we can do so in terms of “if the result didn’t happen, the trigger must not have happened.”

6. $J \rightarrow \neg F \text{ or } \neg G$

The result not happening is the pie not having J. If the pie does not have J, what must be true? It must not have both F and G—that is, it must be missing F, G, or both F and G.⁶

To review, let’s think about the original rule and the contrapositive one more time: The original rule told us that if the pie has F and G, it must have J. That must mean that if the pie does not have J, it must be missing F or G. The notations for both the original rule and the contrapositive are to the side—keep in mind that as a default, “or” on the LSAT includes the possibility of “both.”

The second rule states, “If a pie has G or H, it will not have K.”

7. $G \text{ or } H \rightarrow \neg K$
 $K \rightarrow \neg G \& \neg H$

We can notate this rule as we’ve done to the side. Now let’s reason through the contrapositive. What do we know if the pie has K? It must be missing both G and H. Both the original rule and the contrapositive are notated to the side.⁷

Notice one thing that is different about this statement as opposed to the original one: in this case, we don’t actually have to know something about both G and H to know about K—that is, if we just know that G is in the pie, we know for sure that the pie will not have K. We don’t need to know anything about H to figure out the consequences for K. In the same way, we can also determine that K is out if we just know that H is in. For the first conditional rule, we had to know something about both elements in the trigger in order to know something about the consequence. For this one, we don’t.

8. $G \rightarrow \neg K$
 $H \rightarrow \neg K$
 $K \rightarrow \neg G$
 $K \rightarrow \neg H$

Since we know that G in leads to K out, and since we know that H in leads to K out, we can actually just write this compound conditional out as two separate conditional statements, as we’ve done to the side. Split up this way, it’s obviously a bit easier for us to handle the rule, and it’s easier to come up with the contrapositives.⁸

Okay, that seems simple enough, but maybe you are asking yourself, “How can I know which compound conditionals can be split up, and which ones can’t?”

There are certain “mechanical” ways in which you can answer this question, and I’ve put the information on the side at the top of the next page.

ORIGINAL	If a pie has F and G, it must also have J. $F \& G \rightarrow J$	If a pie has G or H, it will not have K. $G \text{ or } H \rightarrow \cancel{K}$	If a pie has L, it will also have F and G. $L \rightarrow F \& G$	If a pie does not have H, it will have J or L. $\cancel{H} \rightarrow J \text{ or } L$
CONTRAPOSITIVE	$J \rightarrow \cancel{F} \text{ or } \cancel{G}$ If a pie doesn't have J, it must be missing F or G.	$K \rightarrow \cancel{G} \& \cancel{H}$ If a pie has K, it won't have G and it won't have H.	$\cancel{F} \text{ or } \cancel{G} \rightarrow \cancel{L}$ If a pie is missing F or G, it does not have L.	$\cancel{J} \& \cancel{L} \rightarrow H$ If a pie doesn't have J nor L, it must have H.

Here's a "mechanical" explanation of what you can split and what you can't: You can split conditionals that have "or" in the trigger (i.e., either thing can set off the consequence) or "and" in the consequence (i.e., you have two independent results). You cannot split conditionals that have "and" in the trigger, because you need both of those things to happen for the result to happen. You can't split "or" in the result, because it's unclear which of those results happened. Tricky to "memorize," but not too tough to understand, and if you understand you don't need to memorize.

However, by far the easiest way to figure out whether or not compound conditional statements can be split up is to try to split them up. With the first compound conditional rule, it's easy to see that we can't split it up—we need to know something about F and G. With the second compound conditional, it's easy to see that just knowing that G is in, or just that H is in, is enough to know that K is out; that is, we don't need to know something about both F and G to know something about K. That means there is no problem splitting this rule into two simple ones.

Keep in mind that you don't need to split compound conditional statements. You can do just fine not doing so. However, the challenge of knowing which compound conditionals can be split is easy enough and the benefit of doing so is great enough that it warrants you thinking through, with each compound conditional you face, whether or not you can split it. I promise that with just a little practice the decision will become an easy one.

The third rule states, "If a pie has L, it will also have F and G."

In this case, the trigger is simple enough—it's the result that is compounded. We know that if a pie has L, it will have F, and it will also have G. To come up with the contrapositive, let's think: "When will this result not happen?" If the pie is missing either F or G, we know it must not have had L. I've written notations for both the original statement and the contrapositive to the side.⁹

Can we split up this conditional statement? If we know the pie has L, do we know something about just F, or just G? Yes we do. If the pie has L, we know it must have F, and we don't need to know anything about G to know that this is true. In the same vein, if the pie has L, that means it must have G. This is another compound rule that we can think of as two simpler rules. Again, note that the key decision had to do with the compound component—whether we knew something about each component individually, or if we didn't. Since we knew independent consequences for F and G, we were able to split up this conditional statement.¹⁰

The final rule states, "If a pie does not have H, it will have J or L."

Again, we've got a simple trigger and a compound result—in this case, if the pie is missing H, it must have either J or L (and remember, "or" includes the possibility of both).

9. $L \rightarrow F \& G$
 $\cancel{F} \text{ or } \cancel{G} \rightarrow \cancel{L}$

10. $L \rightarrow F$
 $L \rightarrow G$
 $\cancel{F} \rightarrow \cancel{L}$
 $\cancel{G} \rightarrow \cancel{L}$

If the pie is missing H, it will include J or L. When will this result not happen? If the pie is missing both J and L. What will this mean? That it has H. I've notated the original statement and the contrapositive to the side.¹¹

11. $H \rightarrow J \text{ or } L$
 $\neg J \& \neg L \rightarrow H$

Okay, little quiz: Can this compound conditional be split up? If we know that the pie does not have H, do we know something about J, independently, without knowing anything about L?

No, we do not. We only know that at least one of those two, J or L, is in the pie. Since we do not know independent consequences for those elements, this is a compound conditional statement that cannot be split up.

Notice the physical structure of the contrapositives for each of these four statements. In each case we've reversed and negated, as we've always done. The additional step is that we've also switched "and" for "or," and vice versa. If you are comfortable with understanding why the contrapositives work this way, this is a useful "technical" way of thinking about the contrapositives for compound conditionals: you reverse and negate, and switch and's and or's. If your understanding of the original condition was correct, this technique will always yield correct contrapositives.

Again, however, I can't stress enough how dangerous a purely technical understanding is—only use such "systems" when you are completely comfortable with the underlying logic. The LSAT is too well designed to be gamed. To perform well, you absolutely need to understand what you are doing and why.

On the following page is a drill on translating and understanding conditional statements correctly. This is a drill that most people will benefit from trying more than once. Work on accuracy first, then speed.

Conditional Rules Drill

Below are four scenarios, each accompanied by the types of conditional rules that you will see on the exam. Your job is to first translate the statement into conditional form, then derive the contrapositive. As always, use your level of comfort to determine when you should check your work against the answers before moving on to the next set.

Scenario: Eight people—F, G, H, I, J, K, L, and M—are split into two teams: A and B.

If F is on A, M will be on B.	$F_A \rightarrow M_B$	$M_A \rightarrow F_B$	If F and G are on A, H won't be.		
If F is not on A, J will be on A.			If J is on B, H and G will be on A.		
If G is on B, L will be on B.			If H or I is on A, K will be on B.		
H will be on A if J is not.			If L is on B, H or J will be too.		

Scenario: A singer will perform, in order, five of seven songs: L, M, N, O, P, Q, and R.

If L is performed, O will not be.		If M or O is first, P will be second.	
If L is third, N will be fifth.		If M is performed, it will be first.	
If L is not third, R will not be fifth.		If both M and N are performed, Q will not be.	
O will be performed if L is not.		If N is performed before M, P will be performed before Q.	

Scenario: Three cars will each get at least one of four services—S, T, V, and W—done.

Any car that gets S must get T.		Any car that gets S or T will not get V.	
No car that gets S will get V.		Every car that gets both V and W will also get T.	
If a car doesn't get T, it will get S.		No car gets both S and V.	
A car won't get S if it gets T.		If a car gets S, it will get V but not W.	

Scenario: Of the eight most common types of pet cats—M, N, O, P, Q, R, S, and T—Kayla owns one each of five types.

If she owns N, she owns P.		If she owns M or P, she does not own R.	
If she doesn't own Q, she owns P.		If she owns S, she also owns either Q or R.	
She owns M if she owns O.		If she owns S and Q, she also owns T and P.	
If she doesn't own P, she doesn't own Q.		She owns P and N if she owns R.	

Conditional Rules Drill Solutions

As always, you don't have to notate everything exactly the same way I did, but your understanding should be the same.

Scenario: Eight people—F, G, H, I, J, K, L, and M—are split into two teams: A and B.

If F is on A, M will be on B.	$\frac{F}{A} \rightarrow \frac{M}{B}$	$\frac{M}{A} \rightarrow \frac{F}{B}$	If F and G are on A, H won't be.	$\frac{F \& G}{A \& A} \rightarrow \frac{H}{B}$	$\frac{H}{A} \rightarrow \frac{F \text{ or } G}{B \text{ or } B}$
If F is not on A, J will be on A.	$\frac{F}{B} \rightarrow \frac{J}{A}$	$\frac{J}{B} \rightarrow \frac{F}{A}$	If J is on B, H and G will be on A.	$\frac{J}{B} \rightarrow \frac{H \& G}{A}$	$\frac{H \text{ or } G}{B} \rightarrow \frac{J}{A}$
If G is on B, L will be on B.	$\frac{G}{B} \rightarrow \frac{L}{B}$	$\frac{L}{A} \rightarrow \frac{G}{A}$	If H or I is on A, K will be on B.	$\frac{H \text{ or } I}{A} \rightarrow \frac{K}{B}$	$\frac{K}{A} \rightarrow \frac{H \& I}{B \& B}$
H will be on A if J is not.	$\frac{J}{B} \rightarrow \frac{H}{A}$	$\frac{H}{B} \rightarrow \frac{J}{A}$	If L is on B, H or J will be too.	$\frac{L}{B} \rightarrow \frac{H \text{ or } J}{B}$	$\frac{H \& J}{A} \rightarrow \frac{L}{A}$

Scenario: A singer will perform, in order, five of seven songs: L, M, N, O, P, Q, and R.

If L is performed, O will not be.	$L \rightarrow \emptyset$	$O \rightarrow \times$	If M or O is first, P will be second.	$\frac{M/O}{1} \rightarrow \frac{P}{2}$	$\frac{\cancel{P}}{2} \rightarrow \frac{M/O}{1}$
If L is third, N will be fifth.	$\frac{L}{3} \rightarrow \frac{N}{5}$	$\frac{\cancel{N}}{5} \rightarrow \frac{\cancel{X}}{3}$	If M is performed, it will be first.	$M \rightarrow \frac{M}{1}$	$\frac{\cancel{M}}{1} \rightarrow M$
If L is not third, R will not be fifth.	$\frac{\cancel{L}}{3} \rightarrow \frac{R}{5}$	$\frac{R}{5} \rightarrow \frac{L}{3}$	If both M and N are performed, Q will not be.	$M \& N \rightarrow \emptyset$	$Q \rightarrow M \text{ or } \cancel{N}$
O will be performed if L is not.	$\cancel{L} \rightarrow O$	$\emptyset \rightarrow L$	If N is performed before M, P will be performed before Q.	$N - M \rightarrow P - Q$	$Q - P \rightarrow M - N$

Scenario: Three cars will each get at least one of four services—S, T, V, and W—done.

Any car that gets S must get T.	$S \rightarrow T$	$\cancel{T} \rightarrow \cancel{S}$	Any car that gets S or T will not get V.	$S \text{ or } T \rightarrow \cancel{V}$	$V \rightarrow \cancel{S} \& \cancel{T}$
No car that gets S will get V.	$S \rightarrow \cancel{V}$	$V \rightarrow \cancel{S}$	Every car that gets both V and W will also get T.	$V \& W \rightarrow T$	$\cancel{T} \rightarrow \cancel{V} \text{ or } \cancel{W}$
If a car doesn't get T, it will get S.	$\cancel{T} \rightarrow S$	$\cancel{S} \rightarrow T$	No car gets both S and V.	$S \rightarrow \cancel{V}$	$V \rightarrow \cancel{S}$
A car won't get S if it gets T.	$T \rightarrow \cancel{S}$	$S \rightarrow \cancel{T}$	If a car gets S, it will get V but not W.	$S \rightarrow V \& \cancel{W}$	$\cancel{V} \text{ or } \cancel{W} \rightarrow \cancel{S}$

Scenario: Of the eight most common types of pet cats—M, N, O, P, Q, R, S, and T—Kayla owns one each of five types.

If she owns N, she owns P.	$N \rightarrow P$	$\cancel{P} \rightarrow \cancel{N}$	If she owns M or P, she does not own R.	$M \text{ or } P \rightarrow \cancel{R}$	$R \rightarrow M \& P$
If she doesn't own Q, she owns P.	$\cancel{Q} \rightarrow P$	$\cancel{P} \rightarrow Q$	If she owns S, she also owns either Q or R.	$S \rightarrow Q \text{ or } R$	$\cancel{Q} \& \cancel{R} \rightarrow \cancel{S}$
She owns M if she owns O.	$O \rightarrow M$	$\cancel{M} \rightarrow \emptyset$	If she owns S and Q, she also owns T and P.	$S \& Q \rightarrow T \text{ & } P$	$\cancel{T} \text{ or } \cancel{P} \rightarrow \cancel{S} \text{ or } \cancel{Q}$
If she doesn't own P, she doesn't own Q.	$\cancel{P} \rightarrow \emptyset$	$Q \rightarrow P$	She owns P and N if she owns R.	$R \rightarrow P \& N$	$\cancel{P} \text{ or } \cancel{N} \rightarrow \cancel{R}$

Conditional Rules that Link Up

Most of the time that we see conditional rules, there will be one or two of them mixed in with other types of rules and these conditional rules will play one part, commonly a secondary part, in our thinking process.

Imagine that we see an ordering game similar to the second one in the drill you just did—a singer sings five of seven songs—and you get a rule similar to the second one in that set: “If L is third, N will be fifth.”

You should go ahead and notate that condition somewhere near your row of positions, somewhere you are not likely to miss it. If you feel comfortable keeping the contrapositive in your head you can do so, and if not you can write that down as well.

It is highly unlikely that this conditional rule will play a foundational role in the design of the game, and it’s likely you’ll only need to think about it in a couple of circumstances—in those moments when you know for sure that L is third, or that N is not fifth.

There are certain games, however, for which conditional constraints play a greater role—they will become the key to playing that particular game. You’ll know this to be the case when every rule, or nearly every rule, is conditional. Almost always, this occurs in games that involve elements being split into two groups—games like the first and fourth in the last drill.

When you have a game that is structured around conditional rules, it’s likely that these conditional statements will link together, and your ability to see these links will be critical for answering questions.

The concept is simple to understand. Imagine we know that if it rains, John won’t go to the park, and we also know that if John doesn’t go to the park, he will go to the movies. Now, let’s say that it rains—what do we know? We know that John won’t go to the park, and so he will go to the movies. Notice how this might look in conditional notation.

$$R \rightarrow P + P \rightarrow M = R - M$$

↑↑
they link!

We are able to link the rules because the “result” of one rule matched the trigger for the other. That’s the only way to have a link, and that’s the only thing we’re looking for: the result of one rule matching the trigger for another.

Answers for
questions on
next page

A: In: JFI, Out: KH
B: In: MFI, Out: H

Now let’s imagine a different pair of rules: if it rains, John won’t go to the park, and if John goes to the park, he won’t go to the movies. Notice how we would notate these two statements. Does a result link up with a trigger? No, it doesn’t. We cannot link these two conditional statements to infer anything.

$$R \rightarrow P + P \rightarrow M = \text{nothin'!}$$

↑↑
they don't link!

Now it rains. We know John doesn't go to the park. Does that mean he'll go to the movies? No, absolutely not, and as we've discussed, "assuming" this type of link when it doesn't exist is a common error, one that will surely lead to an incorrect response.

Below is an example of a game that involves linking conditional statements. Notice that once we've written out the rules, we know very little "absolute" information about either group, and that's fine—the game is designed to be that way. Often, questions for these types of games will start the ball rolling by telling us that a certain element is in a certain group, as our different prompts have done.

Starting on the following page are four games that involve linking conditionals. Each game comes with two questions that are representative of the type that you would see when you encounter games heavily dependent on conditional logic on test day.

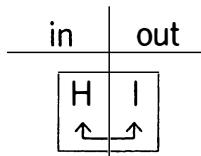
Imagine the following scenario and rules:

Of seven athletes—F, G, H, I, J, K, and M—some will be selected to attend the Olympics. The following rules apply:

If J or M is selected, F will be selected.
If J is not selected, K will be.
If H is selected, F will not be.
Either H or I, but not both, will be selected.

We can diagram the rules like this:

$J \text{ or } M \rightarrow F$ $F \rightarrow J \text{ and } M$
 $J \rightarrow K$ $K \rightarrow J$
 $H \rightarrow F$ $F \rightarrow H$



Notice that it feels like we know very little—not even one athlete on the team! That's okay, and that's simply per the design of the game. We've done everything correctly. What we should expect in a game like this is that we'll need to bring rules together to answer questions. Let's take a look at what we can figure out with a little prompting in the question stem.

If J is selected, what must be true?

in	out
J F I	H

If J is selected, F must be selected. If F is selected, H won't be. If H is not selected, I must be.

If H is selected, what must be true?

in	out
H K	F I J M

If H is selected, I will not be. Also, F will not be selected. If F is not, then J and M are not. If J is not selected, K is selected.

Hopefully the inference links make sense, and hopefully you even find the process to be a bit of fun! Try it yourself with the next couple of prompts—answers are written at the bottom of the previous page.

A. If K is not selected, what must be true?

in	out

B. If M is selected, what must be true?

in	out

Set 1

Here's a chance to put your work into practice. Here are four games heavily dependent on conditional rules and links. At this point, accuracy is far more important than speed, but do time yourself. Ideally you are able to diagram in three minutes or less, and the questions should take about a minute per.

Joan is donating seven items—J, K, L, M, N, O, and P. The items will either go to charity X, or charity Y, and not both. The following rules apply:

If L is given to charity Y, J will be given to charity X.
If O is given to charity Y, P will be given to charity X.
If M is given to charity X, both N and O will be given to Y.
If L is given to charity X, both K and M will be given to X.

1. If P is given to charity Y, which of the following could be true?

- (A) M is given to charity X
- (B) L is given to charity X
- (C) O is given to charity Y
- (D) J is given to charity Y
- (E) K is given to charity X

2. Which of the following determines where all items are donated?

- (A) P is given to charity Y
- (B) L is given to charity Y
- (C) J is given to charity Y
- (D) N is given to charity X
- (E) L is given to charity X

A certain network has made six pilot shows—Q, R, S, T, V, and W. They will determine which ones to air based on the following:

If it does not air W, it will air Q or V.
It will air T or W, but not both.
If it does not air S, it will not air V.
If it airs R or S it will not air T.

1. If W is not aired, how many pilots are aired?

- (A) 1
- (B) 2
- (C) 3
- (D) 4
- (E) it cannot be determined

2. If S is aired, what must be true?

- (A) V is aired
- (B) R is aired
- (C) W is aired
- (D) T is aired
- (E) Q is not aired

Set 2

A young girl will pack some of her seven dolls—F, G, H, I, K, L, and M—to take on a trip. The following rules apply:

- She will take K or G, but not both.
- She will take H or L, but not both.
- If she takes M, she will take F.
- If she doesn't take I, she won't take L.
- If she takes K, she will not take F.

1. Which of the following could be a complete list of dolls she takes?

- (A) F, G, H, I, M
- (B) F, G, H, L, M
- (C) F, G, H, K, M
- (D) G, H, I, M
- (E) K, L

2. Which of the following would completely determine which dolls she takes?

- (A) She takes F and H
- (B) She takes F, but leaves H
- (C) She takes M, but leaves H
- (D) She takes K and H
- (E) She takes M and H

Five people are selected from a group of specialists for a medical mission. The specialists consist of three doctors—J, L, M—two medical assistants—N, O—and three physical therapists—R, S, and T. The following conditions apply:

- If T is not selected, both O and R will be.
- If L is not selected, R will not be selected.
- If T is selected, J will not be selected.
- Exactly one medical assistant will be selected.

1. If N is selected, what must be true?

- (A) L is selected
- (B) M is selected
- (C) R is selected
- (D) J is not selected
- (E) S is not selected

2. If all three physical therapists go, who else must go?

- (A) J
- (B) L
- (C) M
- (D) N
- (E) O

Set 1 Solutions

Joan is donating seven items—J, K, L, M, N, O, and P. The items will either go to charity X, or charity Y, and not both. The following rules apply:

- If L is given to charity Y, J will be given to charity X.
- If O is given to charity Y, P will be given to charity X.
- If M is given to charity X, both N and O will be given to Y.
- If L is given to charity X, both K and M will be given to X.

J
K
L
M
N
O
P
$Ly \rightarrow Jx \quad Jy \rightarrow Lx$
$Oy \rightarrow Px \quad Py \rightarrow Ox$
$Mx \rightarrow Ny \& Oy \quad Nx \text{ or } Ox \rightarrow My$
$Lx \rightarrow Kx \& Mx \quad Ky \text{ or } My \rightarrow Ly$

Note that the challenge of diagramming this type of game is different from that of diagramming some of the other types of games we've seen thus far. There is less to do, but each part requires the utmost care—mess up one conditional and you're going to be in trouble. You don't need to spend time looking for additional inferences—once you have translated the conditions and come up with contrapositives you are good to go. For these games, the job of thinking about how rules come together is best saved for the questions.

A certain network has made six pilot shows—Q, R, S, T, V, and W. They will determine which ones to air based on the following:

- If it does not air W, it will air Q or V.
- It will air T or W, but not both.
- If it does not air S, it will not air V.
- If it airs R or S it will not air T.

Q
R
S
T
V
W
$W \rightarrow Q \text{ or } V \quad Q \& V \rightarrow W$
$S \rightarrow V \quad V \rightarrow S$
$R \text{ or } S \rightarrow T \quad T \rightarrow Q \& S$

It is very common for test writers to combine conditional rules and or rules—makes for fun inferences! The T/W rule can actually be considered a biconditional (a conditional statement that works both ways); we'll discuss biconditionals and their close relationship to or statements in the next lesson.

1. If P is given to charity Y, which of the following could be true?

- (A) M is given to charity X
- (B) L is given to charity X
- (C) O is given to charity Y
- (D) J is given to charity Y
- (E) K is given to charity X

x	y
O	J
P	M

2. Which of the following determines where all items are donated?

- (A) P is given to charity Y
- (B) L is given to charity Y
- (C) J is given to charity Y
- (D) N is given to charity X
- (E) L is given to charity X

c.	x	y	d.	x	y	e.	x	y
L	K	J	N	J	N	M	L	K
M	P	O					P	M

1. Here's where the fun begins: if P is in y, we can see that O must be in X. That leads to M in Y, which leads to L in Y. We don't know where K and N go.

2. Expect this type of question to generally take a bit more time, because per its design it requires us to spend time evaluating each answer. There are some things you can do to speed up the process. We can use our work from #1 to see that (A) is not a possibility, and we can play out (B) quickly in our minds, without writing things out, and see that it won't lead to nearly enough inferences. (C) works ($Jy \rightarrow Jx \rightarrow Kx \& Mx \rightarrow Ny \& Oy \rightarrow Px$), and if pressed for time, you would just pick it and move on. If you have time, you want to verify that (D) and (E) don't work. (E) is especially tricky, and you must make sure not to over-infer about J.

1. If W is not aired, how many pilots are aired?

- (A) 1
- (B) 2
- (C) 3
- (D) 4
- (E) it cannot be determined

T	Q	W	R
		S	V

2. If S is aired, what must be true?

- (A) V is aired
- (B) R is aired
- (C) W is aired
- (D) T is aired
- (E) Q is not aired

W	S	T

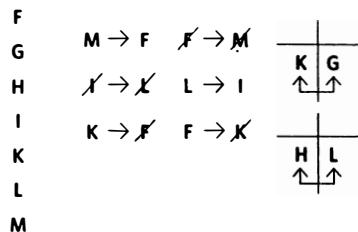
1. If W is out, Q or V is in. We don't know if it's one, the other, or both, and this can really screw up our counting! Let's put a pin in that for now. If W is out, we also know T is in. If T is in, R and S are out, and if S is out, V is out. That answers our original issue for us: since V must be out, Q must be in. Two of the six shows must be aired, and four will not be.

2. If S is aired, T will not be, and if T is not, W will be. We do not know much else about the other shows, so (A), (B), and (E) are all things that could be true or false. The danger in this problem is in over-inferring about the remaining elements.

Set 2 Solutions

A young girl will pack some of her seven dolls—F, G, H, I, K, L, and M—to take on a trip. The following rules apply:

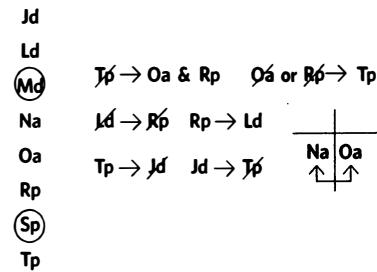
She will take K or G, but not both.
 She will take H or L, but not both.
 If she takes M, she will take F.
 If she doesn't take I, she won't take L.
 If she takes K, she will not take F.



Here we've got two or statements—think for a minute about what they tell us about the number of toys she takes—without considering any other rules, we know she will take no more than five, and leave no less than two. This setup is fairly straightforward, but the questions are tough.

Five people are selected from a group of specialists for a medical mission. The specialists consist of three doctors—J, L, and M—two medical assistants—N, O—and three physical therapists—R, S, and T. The following conditions apply:

If T is not selected, both O and R will be.
 If L is not selected, R will not be selected.
 If T is selected, J will not be selected.
 Exactly one medical assistant will be selected.



Here we've got a game that involves subsets and lots of conditional rules. When a game has both of those characteristics, chances are the game will hinge on conditional links, numeric inferences, or a combination of both. If we had a full set of questions, likely they would require us to do more work with the fact that five are in. Notice how we dealt with the last rule—we don't have to deal with that rule this way, but the way we've notated it works well with the other rules.

1. Which of the following could be a complete list of dolls she takes?

- (A) F, G, H, I, M
- (B) F, G, H, L, M
- (C) F, G, H, K, M
- (D) G, H, I, M
- (E) K, L

2. Which of the following would completely determine which dolls she takes?

- (A) She takes F and H
- (B) She takes F, but leaves H
- (C) She takes M, but leaves H
- (D) She takes K and H
- (E) She takes M and H

a.	b. M?	c.
H F K L G	W F H L I K G	I M H K F L G
d. I?	e. I?	

1. When a question asks for one possible list or order, there will be problems in the wrong answer choices—problems that are exposed when you compare them against the original rules. If we think about all the elements that are “in” in (A), no element forces any of the others out. (B) Must Be False because H and L can't both be in. (C) MBF b/c G and K can't both be in. (D) MBF because if M is in, F must be in. (E) MBF b/c if L is in, I will be too.

2. Another time-consuming question because all of the answer choices require quite a bit of work. However, note that though this problem is very tough, the challenge is one of executing correctly—you have all the tools to evaluate each answer, but you have to get through all the steps quickly and accurately.

1. If N is selected, what must be true?

- (A) L is selected
- (B) M is selected
- (C) R is selected
- (D) J is not selected
- (E) S is not selected

Tp	Na	Oa	Jd
----	----	----	----

2. If all three physical therapists go, who else must go?

- (A) J
- (B) L
- (C) M
- (D) N
- (E) O

Rp	Sp	Tp	Jd	Md
			Ld	

1. If N is selected, O is not, then T is, and J is not. Note that the elements mentioned in the other answers—L, M, R, and S—are all elements about which we don't have information.

2. If R, S, and T go, L must go and J must not. The M inference is an advanced one. Since we already have four selected, and either N or O must also be selected, there is not enough space for M.

Lesson Review

This was quite a full lesson! Let's highlight the key points we discussed:

- Conditional rules are rules that only apply sometimes.
- You cannot assume the reverse or negation of a conditional statement to be true.
- All conditional statements yield inferences known as contrapositives.
- You can always derive the contrapositive by reversing and negating.
- In games with mismatches or subsets, conditional statements can be hard to spot.
- Compound conditional statements include “and” or “or” in the trigger or the result.
- Conditional statements link together when the result of one condition triggers another condition.

Keep in mind that we'll be expanding on these topics and getting plenty more practice in the lessons to come. Specifically, there are two conditional issues we have yet to discuss:

- Biconditionals: these sound more complicated than they actually are, and we'll be discussing biconditionals in the next lesson.
- Challenging wording: as mentioned before, conditionals that are worded in a challenging fashion are far more common in Logical Reasoning than they are in Logic Games, and so we will revisit the topic in the next swatch of Logical Reasoning lessons.

At this point, some of you may already feel completely comfortable with these conditional rules, and of course that's terrific. If you don't yet feel mastery, know that this is normal. This is a lesson that you will likely benefit from revisiting as you continue your studies. As always, a great way to assess where you are, and where you need to be, is in terms of your skill set. When it comes to conditional rules, keep in mind that these are the skills that are required of you:

- You need to be able to recognize and correctly understand.
- You need to be comfortable translating that understanding into notation.
- You need to make valid inferences and recognize invalid inferences.
- You need to be able to see how conditional rules link together.
- You need to be able to apply your understanding to various types of tasks.

As you think about your comfort level with conditional rules, keep it simple and use the above skill set as a gauge. It's **expected** that you don't feel complete mastery just yet, but you should feel confident that you can master these skills before test day.

14

LOGIC GAMES

“or” rules

In the last lesson, we discussed the fact that conditional rules can either play a primary or a secondary role in the design of a game. *Or* rules work in much the same fashion—they can either be just one part of a game, or they can be the key to understanding a game and handling it correctly. In this lesson, we’ll start by briefly discussing common and basic *or* rules, then focus the bulk of our energy on more complicated *or* rules, which, as we’ll soon discuss, can be some of the most useful rules that we can possibly encounter in a game.¹

Simple Or Rules

Most *or* rules are fairly simple to understand, and in fact we’ve handled a few in our games already, even though we haven’t explicitly discussed them. Below are examples of three of the most common types of *or* rules that will appear on the LSAT.

Before we move further, it’s important to remember exactly how we should think about the word *or*. Remember that on the LSAT, *or* does not exclude the possibility of *both*; that is, if a statement simply says, “either F or G is selected,” both F and G being selected is a perfectly valid outcome.²

At the same time, it’s useful to know that most game situations involving the word *or* will in some way naturally exclude the possibility of *both* being a possibility. The first two situations below are examples of this—since two elements can’t occupy a position, and since an element can’t go in two different positions, *or* does not include *and*. The last situation does not naturally exclude the possibility of *both*, and so the phrase “but not both” was added to the rule.

Jenna has six classes—M, N, O, P, Q, and R—one at a time and in order...

“She has either M or P third.”

M/P
3

“O is either first or fifth.”

0/
—
1 2 3 4 5 6

M, N, O, P, Q, and R are split into pairs for three games—1, 2, and 3...

“M or P, but not both, play in game 3.”

/0
—
1 2 3
M/P
M
P (optional)

simple
or
rules

Keep in mind that there will be other situations in which *or* will not exclude the possibility of *both*, and because these other situations are less common, they can be easy to mistake. Imagine if the first situation had allowed for a tie, or the second one had allowed elements to go more than once, or if the third did not have the statement, “but not both”: *both* would definitely be a possibility in all three scenarios, and questions would undoubtedly hinge on a correct understanding of that rule. Any time you might get confused or forgetful—and commonly that will be when both *is* a possibility—it’s a good idea to mark your diagram in some clear way (such as simply writing “*both okay*” next to the notation).

What does “only if” mean?

Just two simple words: only and if. And yet this little phrase causes test takers to lose thousands of points on the exam each and every year. Why? Because it’s so easy to mistake the phrase for its more popular, thinner cousin, “if.”

The confusion is easy to understand. We use the two phrases interchangeably in real life. If someone says, “I’ll kiss you if you brush your teeth,” or if the person says, “I’ll kiss you only if you brush your teeth,” we think of the two statements as essentially meaning the same thing—if we brush our teeth we will get a kiss. The big danger is that on the LSAT, the two phrases mean very different things—in fact, they literally mean opposite things.

Imagine the following situation: You love a certain brand of coffee and you’ve just found out that your supermarket puts it on sale for half price every Sunday. So, you decide that you will buy coffee “only if” it’s Sunday.

Let’s think about this situation in terms of conditional logic (i.e., \rightarrow). Remember that we can think of the left side of a condition as “guaranteeing” the right.

We’ve got two factors—buying coffee (C) and it being Sunday (S). Per the phrase “I will buy coffee only if it is Sunday,” do we know for sure that:

- 1) If we bought coffee, it must be Sunday? $C \rightarrow S$? Yes.
- 2) If it’s Sunday, we have to buy coffee? $S \rightarrow C$? Not at all.

The phrase “I will buy coffee only if it is Sunday” tells us that if we bought coffee, it must be Sunday: $C \rightarrow S$.

Now let’s imagine that we work in a cafeteria kitchen and that we make three types of soup: one with beans and tomatoes; one with chicken and tomatoes; and one with chicken, onions, and tomatoes.

Is it true that a soup will have chicken only if it has tomatoes? Yes it is. We can see that there are two soups with chicken, and they both have tomatoes.

Is it true that a soup will have chicken if it has tomatoes? No. There’s a soup that has tomato but no chicken.

The phrase “The soup will have chicken (C) only if it has tomatoes (T)” tells us that if we have chicken, we must have tomatoes: $C \rightarrow T$.

It does not tell us that if we have tomatoes, we must have chicken. We cannot infer that $T \rightarrow C$.

Not too tough, right? Here’s the danger with this. Take a look below at how these two statements compare to their if cousins.

We’ll return to this topic again later, but for now remember that the statement, “A only if B” translates to $A \rightarrow B$. If we know A is true, B must have been as well. This is the reverse of what “A if B” would yield. If you are unsure of your understanding, try playing out the scenario “in both directions” as we’ve done with our examples, and also remember that “only if” statements will always flow in the reverse direction of “if” statements.

“I will buy coffee only if it’s Sunday” “I will buy coffee if it’s Sunday”

$C \rightarrow S$

$S \rightarrow C$

“The soup will have chicken only if it has tomatoes.”

$C \rightarrow T$

“The soup will have chicken if it has tomatoes.”

$T \rightarrow C$

Biconditionals

Biconditionals are conditional statements that work in both directions. Biconditionals can either be thought of as challenging conditional statements, or as simple *or* statements—in just a bit we'll discuss further exactly why this is so. However, before we get there, we need to agree on a definition for the phrase *only if*. So, please read the note on *only if* before moving further.

The basic construction of a biconditional statement is designed around the phrase “if and only if.” This phrase is actually a combination of two conditional statements: “if” and “only if.”

“Ted will be assigned to a group if and only if Steve is.”

Let's break this statement apart:

“Ted will be assigned if Steve is” gives us $S \rightarrow T$.

“Ted will be assigned only if Steve is” gives us $T \rightarrow S$.

So, per this statement, we know that if Ted is selected, Steve will be, and if Steve is selected, Ted will be.

Remember that most conditional statements flow in one direction—that is, you will be able to say that A leads to B, but not B leads to A. That is why the biconditional, a conditional statement that flows in “both directions,” is a bit of a wrinkle.

A traditional way of notating the biconditional is with a double arrow ($S \leftrightarrow T$) and you'll find that there are instances when we need to use that. However, there is an easier way to think about this rule—it tells us that Ted and Steve will be grouped together. We can simply notate it like we have to the side.³

3. $\begin{matrix} S \\ T \end{matrix}$

Biconditionals can be tricky when thought of as unusual conditional statements, but they are much simpler when thought of as hidden *or* statements. All biconditionals in the games section can be thought of as *or* situations.

“Fred will be selected if and only if Janice is not” means exactly the same thing as “Fred or Janice, but not both, will be selected,” and can be notated as we have to the side.⁴

4. $\begin{matrix} F & J \\ \uparrow & \downarrow \end{matrix}$

“Sarah will be on Team A if and only if Ryan is” means exactly the same thing as “Either both Sarah and Ryan are on Team A, or they are both not,” and can be thus notated.⁵

5. $\begin{matrix} Sa & Ra \\ or \\ Sa & Ra \end{matrix}$

Complex Or Rules

We will call *or* rules that involve three or more elements “complex” *or* rules. These rules are some of the most important and useful rules that we will see in the games section.

It's easy to see why—these rules will typically involve half, or nearly half, of all of the elements in a game, and these rules will severely limit where these elements can go. Contrast that with a simple and singular conditional rule, which will typically impact just one or two elements, and will only do so on certain occasions. There are few other rules that are as likely to have a significant impact on a game as complex *or* rules do.

Here are a few examples of *complex or* rules:

- J will arrive before either M or N, but not both.
- J will arrive after M or before N, but not both.
- J will be on the same team as M or N, but not both.

Note that the first two examples are ordering rules, and the last a grouping rule; *complex or* rules are more likely to appear in ordering games.

Let's take a minute to think about what these rules mean exactly.

"J will arrive before either M or N, but not both."

We'll work under the assumption that this rule comes in a game where no ties are allowed. What possibilities does this rule allow for?

If J arrives before M, we know it can't arrive before N. Therefore, if J arrives before M, the order of arrivals must go N - J - M.⁶

6. N - J - M

If J arrives before N, we know it can't arrive before M. Therefore, if J arrives before N, the order of arrivals must go M - J - N.⁷

7. M - J - N

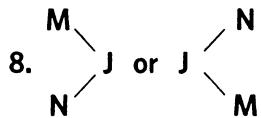
Are those the only two possibilities? Let's say we find out J arrives after M. What does that tell us? It must arrive before N. Let's say we find out J arrives after N. What does that tell us? It must arrive before M.

Now we know for sure that there are two different ways this rule can play out, and these are the only two ways in which the rule can play out. Either the elements go M-J-N or N-J-M, and we don't have to think about it more beyond that.

If you'd like, go ahead and think about how we might proceed with the other two sample statements before reading further.

"J will arrive after M or before N, but not both."

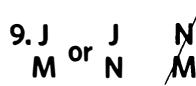
Again, we are working under the assumption that the game allows for no ties. In what ways can this rule play out?



If J is after M, it cannot be before N—therefore, it must also be after N. If J is before N, it cannot be after M—therefore, it must also be before M. Here are our two possibilities.⁸

Almost certainly, this would be the most useful rule for the particular game. Just imagine if it happens to be a game with six positions, and you find out at some point that J must be in position 3 or position 4—it's fairly easy to see how significant an impact this *or* rule would have on where all of the other elements could go.

"J will be on the same team as M or N, but not both."



This is a simpler rule to understand than the previous two, and can be notated as we have to the side.⁹ Notice that this rule yields us an additional inference—since J must be with M or N, but can't be with both, M and N can't be together.

Two Diagrams Instead of One

Sometimes, complex *or* rules are so significant to the design of a game that it makes sense to use them as the basis for creating two separate diagrams for a game. This is either because the *or* rule is built into the basic design of the game, or because the other rules hinge on the outcome of the *or* rule.

Imagine the following scenario:

"Six dancers—F, G, H, J, K, and L—will each perform in the first show or the second show, but not both. Either four dancers will perform in the first show and two in the second, or two dancers will perform in the first show and four in the second."

Note that in this case the *or* situation is built into the basic design of the game—we know we will either have four slots for the first show and two for the second, or vice-versa.

We could create a generic diagram that gives us four possible positions for each show, but then we wouldn't be taking full advantage of what we know. Instead, it makes a lot of sense to create two different diagrams that lay out the two distinct possibilities, as we've done on the top of the next page.

As we answer the questions, we'll make sure to keep both diagrams in mind, and we'll also find that certain questions will allow us to focus on just one set of positions or the other (say, for example, that you infer there must be at least three people in the second show, then you would know to only think about the second set of positions).

It also makes sense to make two diagrams, or two versions of a part of the diagram, when it's clear that the other rules in the game hinge on the outcome of the complex *or* condition.

What impact does the word "either" have?

SHORT ANSWER: On the LSAT, the term "either" has no clear and definable impact on the specific meaning of "or"; that is, the writers of the LSAT will not expect you to think that "either/or" is inherently different from "or."

LONGER ANSWER: Some people who have a background in formal logic or mathematics would argue that "either," by definition, excludes the possibility of both (they would say that "either X or Y attends" means that one must attend, but it can't be that both attend). However, in common everyday language, we use either

all the time when we don't mean to be exclusive. If someone asks if you prefer steak or chicken and you say "either is fine," you surely don't mean one of them, but not the other, is fine. How do LSAT writers deal with this dichotomy? By skirting around it. The writers of the LSAT do not choose to test your understanding of a specific definition for "either/or." And, whenever they do use "either" with "or," they typically do so in contexts in which "both" is not actually a possibility. If the situation doesn't naturally exclude both, the authors will make clear their intended meaning by stating "Either X or Y, but not both, will attend."

**two diagrams
instead of one**

or

The game on the opposite page is an example of this type of situation. Notice that I built two “chains” of relationships centered around the two different ways the *or* rule could play out, but just wrote out one set of slots. Keep in mind that there will be plenty more discussion of similar such problem-solving strategies in the lessons to come.

Following the example will be a drill focused on translating complex *or* statements, then five mini-games that will help you practice taking advantage of complex *or* issues.

A way for test writers to write complex “or” rules as conditional statements

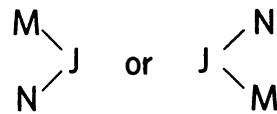
“If and only if” is not the only way that test writers will gussy up an “or” situation using conditional statements. A less common, less elegant method is to present a matching pair of conditional statements that, taken together, give us the same information as would a more simple “or” statement. Take a look at how some of the *or* rules that we’ve already discussed can be converted into matching conditional statements. It should make sense, per the discussion on biconditionals, why this works the way it does. Normally, conditional statements are subtle in that knowing a consequence of, say, J arriving before M tells us nothing about what happens if J arrives after M. However, note that taken together, these conditional statements lose their “direction;” that is, you don’t have to worry about falsely reversing or negating—you can just think of the pair of conditions as one “or” situation.

J will arrive before either M or N, but not both.

N—J—M or M—J—N

If J arrives before M, it will arrive after N.
If J arrives after M, it will arrive before N.

J will arrive after M or before N, but not both.



If J arrives after M, it will arrive after N.
If J arrives before M, it will arrive before N.

J will be on the same team as M or N, but not both.

J
M or J
N

If J is with M, it is not with N.
If J is not with M, it will be with N.

Directions for drill on page 196: Here is a basic scenario accompanied by four sets of complex *or* rules. All four sets are mirrors of one another, but with the questions reordered and the elements changed. Notate the rules and work to improve on accuracy and timing as you go from set to set.

sometimes two is better than one

Let's take a step-by-step look at how we can use a complex or rule to our advantage by using it as a springboard for setting up a pair of diagrams that show us the different possibilities for a game.

SAMPLE GAME

A manager will visit seven different locations—F, G, H, J, K, L, and M—one at a time and in order. The following must be true:

She will visit G before both F and K.
She will visit M immediately after J.
She visits exactly one location after K and before L.
She will visit F before H or J, but not both.

1. Which of the following could be true?
(A) She visits J third and M fourth.
(B) She visits H first and J fourth.
(C) She visits J second and L fourth.
(D) She visits G third and J sixth.
(E) She visits H first and K third.
2. If the manager visits G third, which of the following must be true?
(A) She visits F fifth.
(B) She visits K fourth.
(C) She visits L last.
(D) She visits J first.
(E) She visits H sixth.

STEP 1: NOTICE THE COMPLEX OR RULE

You always want to start a game by reading the scenario and rules before setting pen to paper, and this is when you want to make key decisions about how to set up a game. Here, notice that the last rule is a complex or rule. Also notice that many of the elements in that rule are repeated in other rules, meaning that this or rule impacts other rules. These things tell us that this is a rule off of which we can and probably should build two diagrams (or partial diagrams). After reading the scenario and rules, we begin by laying out this foundation:

J — F — H H — F — J

— — — — —

STEP 2: ADD OTHER RULES

Remember, we noticed that other rules were impacted by the or rule; by separating the possibilities the or rule presents into two diagrams, we can better represent these other rules as well.

We want to add on what we can to each of the diagrams, and we can add the first and second rules easily. Once those are in place we can add the third rule. What we end up with is a pair of diagrams that helps us see all of the possibilities in the game more clearly than we would have with just one diagram. We'll get more practice at reading, and using, such diagrams in future lessons, but hopefully this makes a lot of sense to you already.

JM — F — H H — F — JM
 / /
G — K — L G — K — L

— — — — —

STEP 3: USE BOTH DIAGRAMS TO ANSWER QUESTIONS

Creating more than one diagram really pays off when it comes time to answer the questions. If you work off of the or correctly, and understand how to use your diagrams, they can help you answer questions far faster than you could otherwise. Let's think about how we'd use our diagrams to answer these two questions.

1. This question is asking for one answer that could be true. That means there are four answers that must be false, and it's probably going to be easiest to knock those four wrong answers off. (A) must be false because J can't go third in either the first or second diagram. (B) is very tempting. H can go first in the second diagram. However, with H in first, J in fourth, and M in fifth, there is no place for the K_L group. For (C), she could only visit J second in the first of our diagrams, but in that scenario she cannot visit L fourth. For (D), she can only visit G third in the first diagram, and

if that were the case, J would have to go first, so (D) can't be true. That leaves us with (E), the correct answer. She can only visit H first in the second diagram, and in that one we can put K in the third position. The diagram below shows how (E) could work.

H — G — K — F — L — J — M

2. This is a conditional question, and we need to figure out the consequence of G going third. We realize this can only happen in the first diagram, and in that one, JM must go 1 and 2 if G goes third. Therefore, (D) must be true. F, H, K, and L can go into 4,5,6,7 in a few different orders, so none of the remaining choices must be true.

Complex “Or” Rules Drill

Scenario: Seven children—F, G, H, J, K, L, and M—will take turns riding a swing. They will ride one at a time, and they will each ride once. The following conditions apply:

Either F or G, but not both, will go before L.	L will go after K or before M, but not both.	L or J, but not both, will go before H does.	L will go before J if and only if it is after G.
J will go after L or M, but not both.	If F goes before J, it will go after K. If F goes after J, it will go before K.	F will go after G or before M, but not both.	J will go after H or F, but not both.
M will go before J or after L, but not both.	H will go before J if and only if it is after M.	Either K or M, but not both, will go before L.	Both H and F go before L, or neither of them do.
Either K or J, but not both, will go after F.	Both H and K go before M, or neither of them do.	H will go before M or J, but not both.	M will go before F or after G, but not both.
M or J, but not both, will go before F does.	L will go before K or J, but not both.	Either G or L, but not both, will go after F.	If F goes before L, it will go after H. If F goes after L, it will go before H.

____ / 10 Time: _____

____ / 10 Time: _____

Both L and K go before F, or neither of them do.	Either F or H, but not both, will go before M.	Either M or H, but not both, will go after F.	Both G and K go before F, or neither of them do.
J will go after F or H, but not both.	If G goes before F, it will go after K. If G goes after F, it will go before K.	H will go before K or after L, but not both.	H will go before G if and only if it is after F.
G will go after L or before M, but not both.	H or J, but not both, will go before G does.	If G goes before J, it will go after M. If G goes after J, it will go before M.	Either F or L, but not both, will go before M.
F will go before K or after L, but not both.	G will go before J if and only if it is after F.	G will go after L or F, but not both.	L will go after J or before H, but not both.
G will go before K or F, but not both.	Either K or F, but not both, will go after G.	L will go before F or G, but not both.	L or J, but not both, will go before G does.

____ / 10 Time: _____

____ / 10 Time: _____

Complex "or" Rules Drill Solutions

Scenario: Seven children—F, G, H, J, K, L, and M—will take turns riding a swing. They will ride one at a time, and they will each ride once. The following conditions apply:

Either F or G, but not both, will go before L.	L will go after K or before M, but not both. $\begin{array}{c} K \swarrow L \quad L \searrow K \\ M \quad \quad \quad M \end{array}$	L or J, but not both, will go before H does. $\begin{array}{c} L \swarrow H \quad J \searrow L \\ \text{or} \end{array}$	L will go before J if and only if it is after G. $\begin{array}{c} G \swarrow L \quad J \searrow G \\ \text{or} \end{array}$
J will go after L or M, but not both.	If F goes before J, it will go after K. If F goes after J, it will go before K. $\begin{array}{c} L \swarrow J \quad M \searrow J \\ \text{or} \\ M \swarrow J \quad L \searrow J \end{array}$	K — F — J or J — F — K	H — J — F or F — J — H
M will go before J or after L, but not both.	H will go before J if and only if it is after M. $\begin{array}{c} M \swarrow H \quad J \searrow M \\ \text{or} \\ J \swarrow H \quad M \searrow J \end{array}$	M — H — J or J — H — M	K — L — M or M — L — K
Either K or J, but not both, will go after F.	Both H and K go before M, or neither of them do. $\begin{array}{c} H \swarrow M \quad M \searrow H \\ \text{or} \\ K \swarrow M \quad M \searrow K \end{array}$	H will go before M or J, but not both. $\begin{array}{c} M \swarrow H \quad J \searrow M \\ \text{or} \\ J \swarrow M \quad H \searrow J \end{array}$	M will go before F or after G, but not both. $\begin{array}{c} M \swarrow F \quad F \searrow M \\ \text{or} \\ G \swarrow M \quad M \searrow G \end{array}$
M or J, but not both, will go before F does.	L will go before K or J, but not both. $\begin{array}{c} M \swarrow L \quad J \searrow L \\ \text{or} \\ J \swarrow L \quad M \searrow J \end{array}$	G — F — L or L — F — G	If F goes before L, it will go after H. If F goes after L, it will go before H. $\begin{array}{c} H \swarrow F \quad L \searrow H \\ \text{or} \\ L \swarrow F \quad H \searrow L \end{array}$

Both L and K go before F, or neither of them do. $\begin{array}{c} L \swarrow F \quad F \searrow L \\ \text{or} \\ K \swarrow F \quad F \searrow K \end{array}$	Either F or H, but not both, will go before M. $\begin{array}{c} F \swarrow M \quad H \searrow M \\ \text{or} \\ H \swarrow M \quad F \searrow H \end{array}$	Either M or H, but not both, will go after F. $\begin{array}{c} M \swarrow H \quad H \searrow M \\ \text{or} \\ H \swarrow F \quad F \searrow H \end{array}$	Both G and K go before F, or neither of them do. $\begin{array}{c} G \swarrow K \quad K \searrow G \\ \text{or} \\ K \swarrow G \quad G \searrow K \end{array}$
J will go after F or H, but not both.	If G goes before F, it will go after K. If G goes after F, it will go before K. $\begin{array}{c} F \swarrow J \quad H \searrow J \\ \text{or} \\ H \swarrow J \quad F \searrow H \end{array}$	K — G — F or F — G — K	H will go before G if and only if it is after F. $\begin{array}{c} F \swarrow H \quad G \searrow H \\ \text{or} \\ G \swarrow F \quad H \searrow G \end{array}$
G will go after L or before M, but not both.	H or J, but not both, will go before G does. $\begin{array}{c} H \swarrow G \quad G \searrow H \\ \text{or} \\ M \swarrow G \quad G \searrow M \end{array}$	H — G — J or J — G — H	Either F or L, but not both, will go before M. $\begin{array}{c} F \swarrow M \quad L \searrow M \\ \text{or} \\ L \swarrow M \quad F \searrow M \end{array}$
F will go before K or after L, but not both.	G will go before J if and only if it is after F. $\begin{array}{c} F \swarrow G \quad G \searrow F \\ \text{or} \\ J \swarrow G \quad G \searrow J \end{array}$	M — G — J or J — G — M	G will go after L or F, but not both. $\begin{array}{c} L \swarrow G \quad F \searrow G \\ \text{or} \\ F \swarrow G \quad L \searrow G \end{array}$
G will go before K or F, but not both.	Either K or F, but not both, will go after G. $\begin{array}{c} K \swarrow G \quad G \searrow K \\ \text{or} \\ F \swarrow G \quad G \searrow F \end{array}$	F — L — G or G — L — F	L or J, but not both, will go before G does. $\begin{array}{c} L \swarrow J \quad J \searrow L \\ \text{or} \\ J \swarrow G \quad G \searrow J \end{array}$

Directions for games starting on next page: Beginning on the next page are five games that hinge on complex or rules. At this point, accuracy trumps speed, but do time yourself so you can have a sense of where you are at: three minutes to set up and one minute per question is about ideal. As always, you can decide on when to look at the solutions based on your comfort level, but beware: the solution to the first game is right below it.

Game 1 & Solution

Game one

A food taster will test seven desserts—L, M, N, O, P, Q, and R—one at a time and in order. The following conditions apply:

She tests N after either L or O, but not both.

She tests P immediately after O.

She tests R fourth.

She will not test L first or last.

1. If she tests P immediately before R, each of the following must be true EXCEPT:

- (A) She tests M first.
- (B) She tests O second.
- (C) She tests P third.
- (D) She tests N fifth.
- (E) She tests L sixth.

2. Which of the following cannot be tested second?

- (A) L
- (B) N
- (C) O
- (D) P
- (E) Q

Game one

A food taster will test seven desserts—L, M, N, O, P, Q, and R—one at a time and in order. The following conditions apply:

She tests N after either L or O, but not both.

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She tests R fourth.

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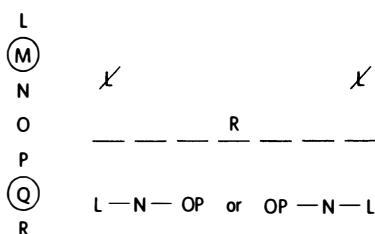
1. If she tastes P immediately before R, each of the following must be true EXCEPT:

- (A) She tests M first.
- (B) She tests O second.
- (C) She tests P third.
- (D) She tests N fifth.
- (E) She tests L sixth.



2. Which of the following cannot be tested second?

- (A) L
- (B) N
- (C) O
- (D) P
- (E) Q



The initial or rule is clearly the star in this game. Notice that it utilizes four of seven elements, and the other rules, you could argue, exist in order to impact how you handle these two possible chains—they prevent the ends of the chain (the L's) from stretching across all seven positions, and the R impacts how the middle of our chains play out.

1. If P is immediately before R, P must be in 3, and O in 2. N and L must come after the R, and since L can't be last, N must be in 5 and L in 6. That leaves M and Q to fill either of the two remaining slots—1 and 7.

2. The chains allow for most of the elements to be tested second; N is the only one who can't be in either chain—when L is before N, the earliest N can go is third (because L can't go first) and when OP is before N, the earliest N can go is third.

Games 2 & 3

Game two

Six books—F, G, H, J, K, and L—will be placed on a bookshelf with three shelves—a top shelf, a middle shelf, and a bottom shelf. The following rules apply:

Twice as many books will go on the bottom shelf as go on the top shelf.

G and J will go on the same shelf.

If K is on the bottom shelf, L will be on the middle shelf.

F will not go on the top shelf.

1. Which of the following, if true, would determine which books are on which shelves?

- (A) H is on the top shelf.
- (B) F is on the middle shelf.
- (C) L is on the middle shelf.
- (D) K is on the bottom shelf.
- (E) G is on the bottom shelf.

2. If K is not on the top shelf, which of the following must be false?

- (A) G is on the top shelf.
- (B) K is on the middle shelf.
- (C) J is on the middle shelf.
- (D) H is on the middle shelf.
- (E) F is on the bottom shelf.

Game three

Six children—R, S, T, V, W, and X—take turns playing with a toy. The following conditions apply:

T plays before R or after V, but not both.

Either T or W will go third.

V plays with the toy after W does.

Neither R nor V plays with the toy last.

1. If W plays first, each of the following must be false EXCEPT:

- (A) V plays second.
- (B) R plays second.
- (C) S plays fourth.
- (D) V plays fifth.
- (E) X plays fifth.

2. Which of the following must be false?

- (A) S plays first.
- (B) T plays second.
- (C) W plays fourth.
- (D) S plays fifth.
- (E) T plays last.

Games 2 & 3 Solutions

Game two solutions

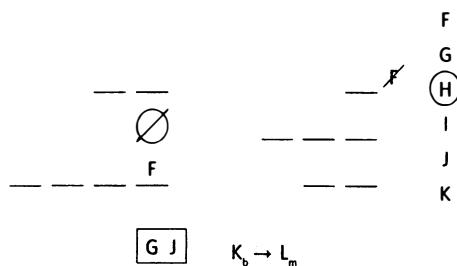
Six books—F, G, H, J, K, and L—will be placed on a bookshelf with three shelves—a top shelf, a middle shelf, and a bottom shelf. The following rules apply:

Twice as many books will go on the bottom shelf as go on the top shelf.

G and J will go on the same shelf.

If K is on the bottom shelf, L will be on the middle shelf.

F will not go on the top shelf.



The first rule creates a natural either/or split—either 2 on top and 4 on bottom, or 1 on top and 2 on bottom.

1. Which of the following, if true, would determine which books are on which shelves?

- (A) H is on the top shelf.
- (B) F is on the middle shelf.
- (C) L is on the middle shelf.
- (D) K is on the bottom shelf.**
- (E) G is on the bottom shelf.

2. If K is not on the top shelf, which of the following must be false?

- (A) G is on the top shelf.**
- (B) K is on the middle shelf.
- (C) J is on the middle shelf.
- (D) H is on the middle shelf.
- (E) F is on the bottom shelf.

1. A big key on these types of questions (which we'll discuss in greater detail in a future lesson) is to not waste time on wrong answers. If you don't see the information given leading to additional inferences, move on. With (D), if K is on the bottom, L must be on the middle—we're dealing with the second diagram. That means G and J must go on the middle shelf, and F on the bottom. That leaves H for the top.

2. If K is not on the top shelf, it must be on the bottom or middle shelf. If it's on the bottom shelf, L is on the middle shelf. So, the diagram on the left can't work. The big inference is that if K is not on the top shelf, it must be the diagram on the right. From that we can conclude that (A) must be false.

Game three solutions

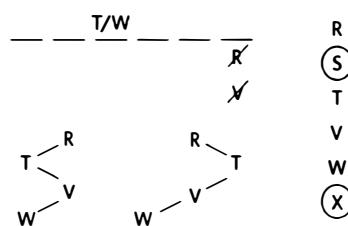
Six children—R, S, T, V, W, and X—take turns playing with a toy. The following conditions apply:

T plays before R or after V, but not both.

Either T or W will go third.

V plays with the toy after W does.

Neither R nor V plays with the toy last.



The first rule is challenging to understand correctly, but it is the key to organizing the rules of this game. Notice we end up with two possible “chains” of ordering rules, and we can use these chains to our advantage when it comes time to answer the questions.

1. If W plays first, each of the following must be false EXCEPT:

- (A) V plays second.
- (B) R plays second.
- (C) S plays fourth.
- (D) V plays fifth.**
- (E) X plays fifth.

W — T R/V R/V —

2. Which of the following must be false?

- (A) S plays first.
- (B) T plays second.
- (C) W plays fourth.**
- (D) S plays fifth.
- (E) T plays last.

1. If W is first, we know we're dealing with the link on the left of our diagram, not the one on the right. Per the links on the left, we know R and V must follow T, but we also know neither can go in 6. Therefore, R and V must go in 4 or 5. If you'd like, you can complete your diagram by placing S/X into the remaining two spots, but in real time that would probably be unnecessary. For a MBF question, you should expect to eliminate four answers to arrive at the correct one—all four wrong answers must be false.

2. A key here is to not waste time on wrong answers. You want to skip over answers that don't seem to lead to clear inferences until you spot an answer that leads to impossible consequences. With (C), if W is fourth, T must be third, forcing us to use the left chain of links. That would require R and V to go in 5 and 6, but since neither can go in 6, we know this answer can't be true.

Games 4 & 5

Game 4 (challenge)

Nine people—F, G, H, I, J, K, L, M, and N—are split into three teams of three. The following conditions apply:

H and K cannot be on the same team.

J and I will either be teamed with F or with G.
A team will have L if and only if it also has N.

1. Each of the following trios could be teams EXCEPT:

- (A) H, L, N
- (B) K, L, N
- (C) G, H, M
- (D) G, L, N
- (E) F, K, M

2. Which of the following, if true, would determine all three teams?

- (A) G is teamed with J.
- (B) L is teamed with H.
- (C) M is teamed with H.
- (D) N is teamed with K.
- (E) F is teamed with K.

Game five (challenge)

Seven models—H, J, K, L, M, O, and P—are placed in positions 1 through 7, from left to right. The following conditions apply:

Exactly one model is placed between K and L.

Exactly three models are placed between O and L.

Either K or J is in the first position.

M is in position 4.

1. Which of the following could be true?

- (A) K is placed in the second position.
- (B) O is placed in the second position.
- (C) L is placed in the second position.
- (D) J is placed in the second position.
- (E) J is placed in the seventh position.

2. If K is not first, which of the following is a complete list of positions, any one of which can be occupied by H?

- (A) 2
- (B) 2, 3, 5
- (C) 2, 5, 6
- (D) 2, 6
- (E) 6

Games 4 & 5 Solutions

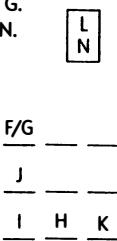
Game four solutions

Nine people—F, G, H, I, J, K, L, M, and N—are split into three teams of three. The following conditions apply:

H and K cannot be on the same team.

J and I will either be teamed with F or with G.

A team will have L if and only if it also has N.



Note that because the teams aren't differentiated (i.e., given specific names) we can go ahead and put our team rules directly on the slots. If there was, say, a green team, a red team, and a purple team, we'd have to notate all of the rules to the side. In any case, the big inference to be made is that the combination of the first and second rules tells us something about all three teams. We could have made frames off of the second rule, or off the L, N chunk—and if you did so that's great. We didn't feel the frames were necessary in this instance because the one diagram is simple enough, but they certainly wouldn't hurt either.

Game five solutions

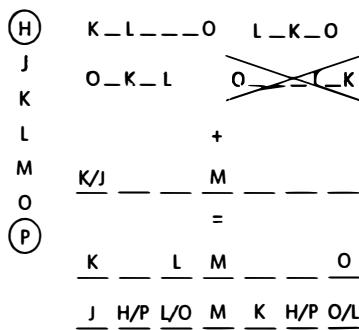
Seven models—H, J, K, L, M, O, and P—are placed in positions 1 through 7, from left to right. The following conditions apply:

Exactly one model is placed between K and L.

Exactly three models are placed between O and L.

Either K or J is in the first position.

M is in position 4.



Sometimes, you'll draw out your diagram and note the rules, then notice that creating two separate diagrams is advantageous. If you ended up getting to the same two diagrams for this game as the ones listed above, chances are you went through such a two-layer system. In the first layer, the key is thinking through the various ways in which the first and second rules can come together—they give us four (ultimately cut down to three) options for how to organize L, K, and O, and these three sets really tell us a lot about the game. When we couple what we know with the rule that K or J is in the first position, we really find out a lot

1. Each of the following trios could be teams EXCEPT:

- (A) H, L, N
- (B) K, L, N
- (C) G, H, M
- (D) G, L, N**
- (E) F, K, M

2. Which of the following, if true, would determine all three teams?

- (A) G is teamed with J.
- (B) L is teamed with H.
- (C) M is teamed with H.
- (D) N is teamed with K.
- (E) F is teamed with K.**

1. Placing our rules directly onto our diagram really helps us here. Again, it's a danger to spend too much time on wrong answers. If we look at our diagram, it's clear to see we have no place for a G, L, N team.

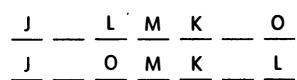
2. It's easy to spend too much time on the wrong answers for this type of question as well. Move on when the inference trail becomes uncertain. For example, with (A), if G is with J, we know G, J, I is one team. Where can the L, N chunk go? Perhaps there is some unusual and creative reason why it must go with H or K in this context, but don't look for that on your first go around. Instead, once you see that L, N placement doesn't seem restricted, move on to the next answer. With (E), we can see quickly that F with K forces G to be with J and I, and the L, N pair to be with H.

1. Which of the following could be true?

- (A) K is placed in the second position.
- (B) O is placed in the second position.
- (C) L is placed in the second position.
- (D) J is placed in the second position.**
- (E) J is placed in the seventh position.

2. If K is not first, which of the following is a complete list of positions, any one of which can be occupied by H?

- (A) 2
- (B) 2, 3, 5
- (C) 2, 5, 6
- (D) 2, 6**
- (E) 6



1. We're asked to find one answer that could be true, and so four answers must be false. Our three frames make it much easier to see why the other four answers must be false. (D) works as either K, J, L, M, H, P, O, or K, J, L, M, P, H, O.

2. If K is not first, J must be first. Two frames work with J being first, and it makes sense to draw them both out. Placing the O, K, L chunks around the M in 4 clarifies, quite a bit, where the H can go.

about the game. When K is first, there is only one option for how K, L, and O can be organized, and that will allow us to fill in much of our board. When J is first, we know that we can only fit either O_K_L or L_K_O, and, furthermore, there is only one set of positions (3–5–7) into which that trio can go. That leaves us with just H and P as options for the remaining two positions. Going through two layers of work like that might take just a bit of extra time and chances are you'd be fine without all that work, but if you were able to come up with it all, it would definitely be time well-spent.

How Did You Do?

Did you feel comfortable handling the complex *or* rules, and were you able to use them as the “centerpiece” of your thinking, both in your diagramming and in your process of solving questions? If so, that’s great. As mentioned before, these complex *or* rules are, for most test takers, some of the more intimidating rules to have show up in a game. At the same time, they are by far some of the most useful rules for setting up diagrams, and they are commonly central to the design of whatever game they are a part of. Any time you take a part of the test that is intimidating and are able to turn it into a key part of your solution process, you are making great progress.

If you feel like you are not quite there yet—maybe the concepts make just 80% sense, or maybe they make 100% sense but you still make some mistakes, or perhaps you still miss some inferences, or freeze when it’s time to answer a question—that’s certainly normal for this stage. But I hope you are seeing the benefit of the work that you are putting in.

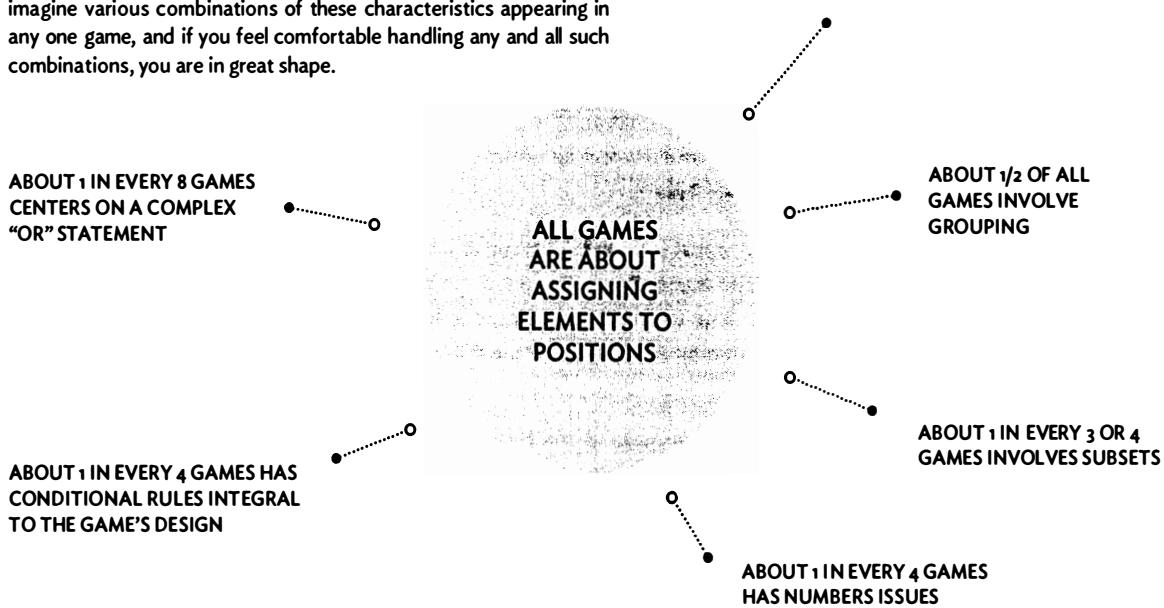
The great news is that we are now done covering every major diagramming issue that can appear in a Logic Game. That’s it—you’ve seen it all. Congratulations! The even greater news is that you are going to have many, many more chances to strengthen the skills we’ve worked on here.

In the next lesson we’ll do a quick review of what we’ve learned about diagramming, and then focus the bulk of our attention on a mixed set of practice games. When we come back to Logic Games after a swatch of Logical Reasoning lessons, we’ll build upon our diagramming basics and develop a simple, brutally effective skill-set for attacking a variety of questions.

For your reference, on the following page I’ve included a visual breakdown of all possible game scenarios and a summary of our key discussions. For a chart of all of the actual notations that we’ve used, please see page 206.

A MACRO VIEW OF GAME DESIGN

Here is a big picture view of how games are designed. As we've discussed, many of these characteristics can and do overlap. If you can imagine various combinations of these characteristics appearing in any one game, and if you feel comfortable handling any and all such combinations, you are in great shape.



AN OVERVIEW OF KEY POINTS

Here is a list of the key points that we have discussed in these last five lessons. You can use this checklist to get a sense for which issues you feel comfortable with, and which ones you don't.

- BASIC** The ability to diagram is the key to Logic Games success.
- All games are about assigning elements to positions.
- All game designs involve ordering, grouping, or both.

We will be asked to figure out subset assignments for elements, positions, or both. There are commonly just two or three subsets, but the number of subsets can equal the number of elements. Certain games may present us with more than one set of subsets.

- NUMBERS** Numbers issues generally appear when there are more elements than positions, or more positions than elements.
- Generally, element/position mismatches appear in ordering games.
- Numbers issues can also appear in games involving subsets.
- The numbers will generally be simple, but the numeric inferences can be subtle and difficult to notice.

Conditional rules represent guarantees: certain results must happen if certain triggers are set off. The contrapositive of any condition tells us that if the result didn't happen, the trigger didn't happen. When a game has multiple conditional rules, our task is to understand correctly how they link together. Biconditionals (Lesson 14) flow in both directions, and can be thought of as "or" rules.

- OR** The term "A or B" can, unless otherwise restricted, allow for A and B.
- However, most "or" statements are restricted from meaning and.
- Complex "or" rules are often the key for unlocking games, and may be used to create two diagrams.

15

LOGIC GAMES

diagramming review

We've covered a lot of ground in the last five lessons. The examples and drills were carefully designed so that by this point you've been exposed to all of the key diagramming issues that you are likely to see on your exam.

Should you feel *mastery* yet? Of course not (though if you do, and you aren't full of it, of course that's great). We're just partway through the process. You should certainly feel, though, that you are developing a solid foundation, and hopefully you feel confident that you are on the path to greater improvement.

In the introduction to games in Lesson 3, I laid out the skills required for consistent success in Logic Games:

1. You need to be able to see the overall design of the game.
2. You need to understand rules and be able to notate them in an easily usable way.
3. You need to be able to see how rules come together, and how they don't.
4. You need to approach each type of question with a smart plan of attack.

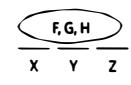
Keep in mind that your skills build on one another; your ability to picture the situation and take control of the rules serve as the foundation. If your foundation is strong, you will get farther faster. If your foundation is weak, it will limit how much you can improve.

General Breakdown of Games from 10 New, Actual, Official LSAT Prep Tests

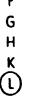
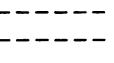
Exams	52	53	54	55	56	57	58	59	60	61	t
Game	1	2	3	4	1	2	3	4	1	2	40
Ord	*	*	*	*	*	*	*	*	*	*	27
Grp	*	*	*	*	*	*	*	*	*	*	16
Sub	*	*	*	*	*	*	*	*	*	*	13
#	*	*	*	*	*	*	*	*	*	*	11
Cond	*	*	*	*	*	*	*	*	*	*	9
Or	*	*	*	*	*	*	*	*	*	*	4

Here is a chart of how the games from exams 52–61 compare with the issues that we've been covering. Note that this represents about 3 1/2 years' worth of LSATs. That is enough of a sample to show you everything that you are likely to see on the exam. It is not enough of a sample to develop an in-depth understanding of tendencies. Other than the fact that you will likely get two or three ordering games, everything else is up in the air. Keep in mind that both grouping games (generally about 50% of all games, but at 40% for these games) and games dependent on complex or rules (just four in this set, though they are four of the more difficult games) are a bit less common here than they have been historically. Finally, note that for the games marked in each category, that particular issue is a significant rather than secondary issue for that game.

THE TABLE OF common notations

F is assigned to X $\frac{F}{X}$	X will be occupied 	X will not be occupied 	F or G is assigned to X $\frac{F/G}{X}$	F is assigned to X or Y $\frac{F/F}{X \quad Y}$	A boy is assigned to X $\frac{b}{X}$
F is before G $F - G$	F is immediately before G FG	F is at least two spots ahead of G $F __ G$	F is after G but before H $G - F - H$	F is exactly two spots ahead of G $F __ G$	F is immediately before a boy $F _ b$
G is after F $G __ F$	G is immediately after F $G F$	G is at least two spots after F $G ___ F$		G is exactly two spots after F $G __ F$	
There is at least one spot between F and G $F __ G$	F is right before or right after G $F G$	F is before both G and H $F \swarrow G \searrow H$	F is after both G and H $G \nearrow F \swarrow H$	There is exactly one spot between F and G $F __ G$	F is exactly two spots ahead of a boy $F __ b$
The same element is assigned to X and Y $\frac{\square \quad \square}{X \quad Y}$	Different elements are assigned to X and Y $\frac{\square \triangle}{X \quad Y}$	F, G, and H occupy X, Y, and Z 	F and G are grouped together 	F is grouped with a boy $F _ b$	F is a boy $F b$

(+)

not 	If...then... \rightarrow	or or	and $+$	free agents 	multiple diagrams 
--	-----------------------------------	-----------------------	----------------	--	--

Most of the rules above can be converted into "not" rules by adding a cross-out.

Most of the rules above can be combined into conditional rules.

Most of the rules above can be combined into compound rules through the use of "or" or "and."

If all but one or two of your elements are mentioned in the rules, it can be helpful to track the unrestricted elements.

Once in a while—most commonly in a game defined by a complex or rule—it will be helpful to work off of more than one diagram.

WHEN you first start studying Logic Games, it can seem like there are an infinite number of issues that can come up, an endless supply of different types of games that you cannot possibly be prepared for.

However, as you learn more and more about games, you quickly realize that there is great commonality to all games, and that there are just a few basic structural issues—primarily ordering and grouping—that define all games and all rules.

I hope that at this point you feel fairly comfortable with the various possible game scenarios, and the various possible rules that they may throw at you. For review, here are all of the common notations.

Let's do a quick review of the key characteristics that define these rules:

The most basic rules—rules of **assignment**—have to do with how particular positions will be filled. We can be told that a specific element will fill a specific position, that a particular position will not be filled, and so on.

The most common and varied rules, the rules of **order**, relate elements to one another in the context of an ordering game. These rules can be specific, or they can be general. Either two or three of the games you see on your exam will be ordering games, and understanding and utilizing ordering rules well will be the key to your success on those games.

Grouping is a very common game characteristic—appearing in just a little less than half of all games—and though the inferences related to grouping can be just as complicated as those relating to any other issue, methods of notating grouping rules are fairly simple. Unless game scenarios specifically dictate otherwise, we want to represent all grouping issues vertically, and doing so consistently can make visualizing grouping far easier.

The test writers use **subsets** to add an additional layer of complexity to common ordering and grouping games. Subsets can apply to elements, positions, or both. By always using lowercase letters (or numbers) for subset issues, we can easily just adapt our normal notations to accommodate subset rules.

When the number of elements doesn't equal the number of positions, or when games involve subsets, we can run into **numbers issues**. For these games, we have to think about whether elements will be included or not, or whether slots will be filled or not, and simple notations can help us do that.

Finally, the rules of a game can also be defined by the form of the rule itself.

The rule can be **conditional**—that is, it can be a rule that only applies in particular situations. These conditional rules can be some of the most tempting to misunderstand or misuse—accuracy and comfort with your notation systems are essential here.

Or, the rule can give us more complex possibilities through the use of **and** and **or**. These rules can also be more challenging than

normal to understand, but the benefit is often great. Because these rules commonly include more than two elements, or because these rules commonly create a clean “divide” between the various possibilities for a particular game, these rules are commonly the most important rules for the games in which they appear.

More on Conditional Rules

Nearly any pair of rules mentioned on the left can be turned into a conditional rule—that is, a rule that is triggered by something else happening. For all conditional rules, the key to success is to understand the rule correctly, and to understand ways in which it can be utilized, and (perhaps more importantly) ways in which it cannot. For every conditional rule, you must account for the contrapositive. You can choose to do so in your head or on paper, based on the game, but you should always put it down on paper if there is a chance it will be forgotten or mistaken. Again, correctly answering questions will likely require a careful understanding of any conditional rules, and many incorrect answers are built off of incorrect understandings of conditional rules.

We use a simple arrow to represent all conditional rules. Here is the basic notation along with the common wordings you will see for the rule. Below that is an example of a biconditional—a rule that is triggered in both directions.

“ $M \rightarrow P$ ” contrapositive: “ $\neg P \rightarrow \neg M$ ”

If M , then P
Any with M must have P
All with M have P
No M 's are without P 's
You can't have M unless you have P
 M only if P

“ $M \leftrightarrow P$ ” contrapositive “ $\neg P \leftrightarrow \neg M$ ”

M if and only if P

More on the Meaning of Or

Rules can be brought together through the use of “and” and “or.” The meaning of “and” is simple and clear, but the meaning of “or” is a bit more complex.

Keep in mind that unless there are other considerations, the word “or” does not, in and of itself, exclude the possibility of “both.” Thus, if a rule states “ F or G will be assigned to the management team,” it is entirely possible that both F and G can be assigned to the management team.

Also keep in mind that in many instances there are natural restrictions that prevent “or” from including “both.” If we are told each person can have one locker, then told F can have either “locker 2 or locker 3,” we will know that F getting both is not a possibility.

Basic Logic Games Strategy

Here is the general process that I recommend for solving Logic Games. We will discuss these strategies in greater depth in future lessons.

One: See the Big Picture

Before you set pencil to paper, read the scenario and rules and give yourself a second to take it all in. Keep in mind that your first few decisions are likely your most important.

When we think about a game in terms of the big picture, what we want to consider is:

- How are the positions organized? Are they being grouped or ordered?
- Are there subsets? How much information are we given about them?
- Is it one-to-one between elements and positions? If not, what type of situation is it?
- What rules seem to be most important?
- What rules seem to go together?
- Are there any rules that make us a bit nervous right off the bat? If so, why?
- Is there anything else unusual about the design of the game?

While this may seem like a lot to think about, you can do it all quite quickly if you have the right skills and habits. This part of the process will end with us writing out the elements and the positions in the way that we think fits the game best.

Two: Understand the Rules and Notate Them

There are certain situations for which accuracy is so important that it makes timing a non-factor, and understanding and notating games rules is just such a situation. No amount of pace can make up for not understanding or notating the rules well.

Take as much time as you need to completely understand all rules and notate them accurately. There are typically just four or five rules to a game, so no matter how careful you are, it won't take too long anyway.

Most rules are written simply and are simple to diagram. However, as we've discussed, certain rules (such as "Any group with T has N," or "The soup will have T only if it has S and O") require a bit more care. Slow down in these moments and make sure you handle these rules properly.

Certain rules are meant to be notated on the actual position slots you've drawn in, and others are meant to be notated off the grid. However, no matter what, you should see cohesion between your diagram and the rules; oftentimes when we find ourselves having a lot of trouble notating the rules, it's because we haven't laid out our diagram correctly.

Make sure you do one final check of your notations before moving on to the questions. A great way to do this is to look at each notation, say to yourself what it means, then check this understanding against how the rule was originally worded.

Three: Bring Rules Together

Or, to be more accurate, make sure you carefully evaluate how the rules come together and how they *do not* come together. This is also a part of your process that is dependent

on other parts; during the “picture it” phase, you should have done a quick assessment of which rules might be related, so that by the time you need to notate them, you know to think about them together. Also, the more consistent and transparent your notation of individual rules, the easier it is to see how they come together.

Seeing how rules come together is not a one-time process; rather, you should expect to bring rules together over and over again as you think about the game and answer questions. For now, remind yourself to think about how the rules come together at two critical points—as you are diagramming them and just before you start the questions.

Four: Use Effective Question Strategies

We have not discussed question-specific strategies much at all yet, and they will be a focus of many of our future lessons. For now, here are a few key points to consider:

When a question asks for one answer that must be true, expect to get one answer that must be true, and four answers that could be true or false—that is, four answers about which we don’t have enough information to say. If a question asks what must be false, the right answer must be false; the four wrong choices will most likely be ones that we don’t know to be true or false. For both of these types of questions, it is generally easier to search for the correct answer than it is to try and eliminate wrong ones.

When new information is presented in the question stem, there will always be additional stuff to infer from that new information, and what you figure out will invariably be what answers the question that you are asked. Take plenty of time to infer all you can from new information in a question stem before you move on to evaluate answer choices.

Finally, make sure to be conscious of how you solve questions, and make sure to compare your process to that mentioned in the solutions. Most test takers don’t think twice about specific question-solving strategies, even though they are quite simple to develop, and ultimately play a huge part in answering questions quickly. Just being mindful of the importance of process is half the battle. As mentioned, we’ll get into much more depth on this subject in future lessons.

On the next few pages are four pairs of games; each game has two questions. Taken as pairs, the drill sets are meant to be roughly equal in difficulty to one another, and on average, the questions are slightly more difficult than average LSAT questions.

Set a goal of completing each pair of games in a total of ten minutes (roughly three minutes to diagram each game and one minute per question). Note that you should practice creating a full diagram even if you don’t think you need it for the two questions. If it takes you longer than suggested, that’s fine; make sure you are prioritizing accuracy and completeness over pace at this point. Try to be quick, but it’s more important to be careful. After the games will be some tools to help you assess your performance.

Set 1

Seven horses—M, N, O, P, Q, R, and S—will be housed in seven stalls, labeled one through seven from left to right. The following conditions apply:

There will be exactly three stalls between M's stall and Q's stall.

There will be exactly four stalls between R's stall and Q's stall.

Q and O cannot be in adjacent stalls.

1. M can go in each of the following stalls EXCEPT:

(A) 2

(B) 3

(C) 4

(D) 5

(E) 6

2. If O is put in the third stall, which of the following could be true?

(A) R is put in the second stall.

(B) Q is put in the last stall.

(C) M is put in the sixth stall.

(D) Q is put in the first stall.

Seven coffees—F, G, and H from Brazil, and L, M, N, and O from Colombia—will be showcased on three different displays. One coffee will be displayed by itself on stand 1, and the other six coffees will be evenly split on stands 2 and 3. The following conditions apply:

F is displayed on stand 2.

One of the displays will have exactly two Brazilian coffees.

L and M must be displayed together.

F and H cannot be displayed together.

1. If O is displayed on stand 2, which of the following must be true?

(A) H goes on stand 1

(B) H goes on stand 3

(C) G goes on stand 2

(D) N goes on stand 1

(E) N goes on stand 2

2. Which of the following must be false?

(A) A Brazilian coffee is displayed by itself.

(B) A Colombian coffee is displayed by itself.

(C) One stand displays only Colombian coffees.

(D) Two stands each display both Brazilian and Colombian coffees.

(E) No stand displays only Colombian coffees.

Set 2

A professor is scheduling appointments with six students—R, S, T, V, W, and X. She will meet with them one at a time. The following conditions apply:

She will meet with R after she meets with T.

She will meet with S immediately before she meets with V.

X will be one of the first three students she meets with.

Either she meets with T before S or W, but not both.

1. Each of the following students either cannot meet with the professor first, or cannot meet with the professor last, EXCEPT:

- (A) S
- (B) W
- (C) R
- (D) V
- (E) X

2. Which of the following determines the order of all appointments?

- (A) S is first and X third.
- (B) X is first and T third.
- (C) X is immediately after W but immediately before T.
- (D) T is immediately before W but immediately after X.
- (E) W is immediately after X but immediately before T.

A display designer is dressing four mannequins “named” Fred, Gary, Hwang, and Jack. Each mannequin will wear clothes in at least one of four different colors—navy, orange, purple, and red. The following conditions apply:

Jack wears more colors than any other mannequin.

Gary wears less colors than any other mannequin.

Fred and Hwang wear the same number of colors, but none of the same colors.

Jack must wear every color Fred wears.

Hwang wears red.

Fred wears any color Gary wears.

1. Which of the following could be true?

- (A) Three mannequins wear red, and two wear purple.
- (B) Three mannequins wear navy, and three mannequins wear orange.
- (C) G and exactly two other mannequins wear orange.
- (D) G and exactly one other mannequin wears navy.
- (E) J and H share no colors in common.

2. If exactly two mannequins wear navy, which of the following is a complete list of mannequins that must wear navy?

- (A) F
- (B) H
- (C) J
- (D) F and H
- (E) F and J

Set 3

Sarah will host five out-of-town friends—M, N, O, P, and Q—at her house over the course of seven months—the first one in March and the last one in September. She will host each friend once, and no more than one friend per month. The following conditions apply:

During this period, she will not go two consecutive months without hosting an out-of-town friend.

She will host P after she hosts both M and Q.

She cannot host M in any odd-numbered month, and she cannot host anyone in the month after she hosts M.

N visits in August or September.

1. If P visits in July, which of the following must be true?

- (A) Q visits in March
- (B) Q visits in June
- (C) O visits in March
- (D) O visits in August
- (E) N visits in September

2. If O stays the month after Q but at some point before M, for how many visitors do we know which month they visited?

- (A) 1
- (B) 2
- (C) 3
- (D) 4
- (E) 5

Eight people—F, G, H, I, J, K, M, and N—participated in four tennis matches that took place one after another. Each match had a winner and a loser. The matches took place in accordance with the following:

K played in the second match.

H and J played each other.

Both I and K won their matches.

F played before H and after G.

1. Which of the following could be the full list of winners, in order of the matches they won?

- (A) G, K, I, H
- (B) G, F, K, I
- (C) G, K, F, I
- (D) F, K, H, I
- (E) G, K, F, H

2. If F is a winner, which of the following must be true?

- (A) G plays in the first match.
- (B) M plays in the second match.
- (C) G loses.
- (D) H loses.
- (E) J loses.

Set 4

A consultant visits five different sites—M, N, O, P, and R—over the course of five days—a different site each day. At some sites she leaves a list of suggestions, and at some sites she doesn’t. Additionally, it must be true that:

She leaves suggestions at the second and third sites she visits.

She visits R either first or fourth and leaves a suggestion.

She visits O immediately after she visits a site at which she doesn’t leave suggestions.

If she left a suggestion for N, she left a suggestion for M.

1. If she visits O at some point before she visits P, which of the following must be false?

- (A) She visited N third.
- (B) She visited P third.
- (C) She visited M last.
- (D) She visited N last.
- (E) She visited P last.

2. Which of the following could be true?

- (A) P is first and N second.
- (B) N is second and R third.
- (C) M is third and R fourth.
- (D) N is third and O fourth.
- (E) O is fourth and N fifth.

A coach will select some of the players that are trying out for the varsity team, and he will put the rest on the junior varsity team.

The eight players who are trying out are Nick, Otis, Pat, Quinn, Rachel, Sara, Tim, and Wilma. The following conditions apply:

If Nick or Quinn are selected for varsity, Rachel will not be.

Either Sara or Wilma, but not both, will be selected for junior varsity.

Sara and Rachel will be selected for the same team.

If Nick is selected for junior varsity, Otis will be too.

If Tim is selected for junior varsity, Wilma will be selected for varsity.

1. If Otis is selected for varsity, which of the following could be false?

- (A) Nick is selected to varsity.
- (B) Wilma is selected to varsity.
- (C) Rachel is selected to junior varsity.
- (D) Sara is selected to junior varsity.
- (E) Tim is selected to junior varsity.

2. Which of the following can be a pair of players, both of whom are selected for varsity?

- (A) N and S
- (B) O and W
- (C) Q and S
- (D) O and R
- (E) O and S

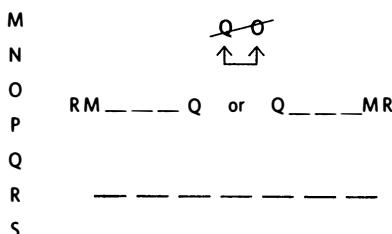
Set 1 Solutions

Seven horses—M, N, O, P, Q, R, and S—will be housed in seven stalls, labeled one through seven from left to right. The following conditions apply:

There will be exactly three stalls between M's stall and Q's stall.

There will be exactly four stalls between R's stall and Q's stall.

Q and O cannot be in adjacent stalls.



A big key to success for this game is recognizing that there are just a couple of ways in which the first and second rule can go together. The other possible options take up too many spaces. The R, M, Q chains break the game open, since they end up taking up six of the seven possible slots.

1. M can go in each of the following stalls EXCEPT:

- (A) 2
- (B) 3
- (C) 4
- (D) 5
- (E) 6

2. If O is put in the third stall, which of the following could be true?

- (A) R is put in the second stall. $\underline{R} \quad \underline{M} \quad \underline{O} \quad \underline{\quad} \quad \underline{Q} \quad \underline{\quad}$
- (B) Q is put in the last stall. $\underline{\quad} \quad \underline{\quad} \quad \underline{\quad} \quad \underline{\quad} \quad \underline{\quad} \quad \underline{Q}$
- (C) M is put in the sixth stall. $\underline{\quad} \quad \underline{\quad} \quad \underline{\quad} \quad \underline{\quad} \quad \underline{\quad} \quad \underline{M}$
- (D) **Q is put in the first stall.** $\underline{Q} \quad \underline{\quad} \quad \underline{\quad} \quad \underline{\quad} \quad \underline{\quad} \quad \underline{M} \quad \underline{R}$
- (E) R is put in the last stall. $\underline{\quad} \quad \underline{\quad} \quad \underline{\quad} \quad \underline{\quad} \quad \underline{\quad} \quad \underline{\quad} \quad \underline{R}$

1. We don't want to waste time thinking about where M can go; we want to focus on where it can't. We know that M can't go first or last, but neither of those are answer choices. Notice that M is, in both possibilities, at the "end" of a string—that makes this tough for M to go somewhere in the middle of the chain. Can it go fourth? No—we wouldn't have enough space to place the Q.

2. Putting O into third limits where we can place the R,M,Q link to two options, and we noted them above. After that, our job is to figure out what must be false, and we can see that A, B, C, and E all must be false.

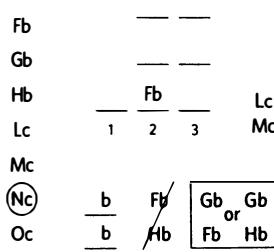
Seven coffees—F, G, and H from Brazil, and L, M, N, and O from Colombia—will be showcased on three different displays. One coffee will be displayed by itself on stand 1, and the other six coffees will be evenly split on stands 2 and 3. The following conditions apply:

F is displayed on stand 2.

One of the displays will have exactly two Brazilian coffees.

L and M must be displayed together.

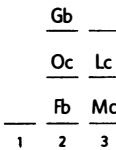
F and H cannot be displayed together.



You could have chosen to create two separate diagrams, and probably the easiest way to do that would be to put L and M into 2 in one diagram, and 3 in another. If you did that—great!—the questions were probably much easier to solve.

1. If O is displayed on stand 2, which of the following must be true?

- (A) H goes on stand 1
- (B) H goes on stand 3
- (C) **G goes on stand 2**
- (D) N goes on stand 1
- (E) N goes on stand 2



2. Which of the following must be false?

- (A) A Brazilian coffee is displayed by itself.
- (B) A Colombian coffee is displayed by itself.
- (C) One stand displays only Colombian coffees.
- (D) Two stands each display both Brazilian and Colombian coffees.
- (E) **No stand displays only Colombian coffees.**

1. If O is on stand 2, the L/M duo must go on stand 3. That forces G into stand 2.

2. The biggest danger here is wasting time with the wrong answers—it's really hard to see whether each answer could be true or false. It's also very easy to get turned around. For (E) to be true, each stand must have at least one Brazilian coffee. However, this cannot be. Therefore, (E) must be false.

Set 2 Solutions

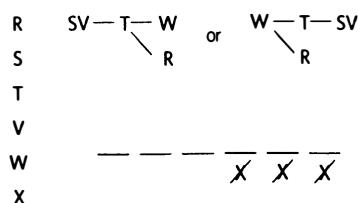
A professor is scheduling appointments with six students—R, S, T, V, W, and X. She will meet with them one at a time. The following conditions apply:

She will meet with R after she meets with T.

She will meet with S immediately before she meets with V.

X will be one of the first three students she meets with.

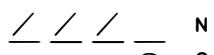
Either she meets with T before S or W, but not both.



The either/or rule impacts five of the six elements to be placed, so it makes sense to use that as the focal point of our diagramming. Note that you could have marked that X must go in 1, 2, or 3 with some other notation; however, with such broad information, the “not” notation tends to be a bit easier to think of.

A display designer is dressing four mannequins “named” Fred, Gary, Hwang, and Jack. Each mannequin will wear clothes in at least one of four different colors—navy, orange, purple, and red. The following conditions apply:

Jack wears more colors than any other mannequin.



Gary wears less colors than any other mannequin.



Fred and Hwang wear the same number of colors, but none of the same colors.



Jack must wear every color Fred wears.



Hwang wears red.

$$G \rightarrow F \rightarrow J$$

Fred wears any color Gary wears.

1. Each of the following students either cannot meet with the professor first, or cannot meet with the professor last, EXCEPT:

- (A) S
- (B) W
- (C) R
- (D) V
- (E) X

2. Which of the following determines the order of all appointments?

- (A) S is first and X third.
- (B) X is first and T third.
- (C) X is immediately after W but immediately before T.
- (D) T is immediately before W but immediately after X.
- (E) W is immediately after X but immediately before T.

1. The wording of this question is challenging—basically, four of the students have some reason why they can't meet with the professor first or last—R and V can't go first, and S and X can't go last. W is the only one that can go first and can go last.

2. It's easy to waste time on wrong answers; we're hoping for an answer that limits us to one of the either/or's then forces elements into an order, and (D) does that. T can only be before W in the first ordering, and if it immediately follows X, the only possible order is SVXTWR.

1. Which of the following could be true?

- (A) Three mannequins wear red, and two wear purple.
- (B) Three mannequins wear navy, and three mannequins wear orange.
- (C) G and exactly two other mannequins wear orange.
- (D) G and exactly one other mannequin wear navy.
- (E) J and H share no colors in common.

2. If exactly two mannequins wear navy, which of the following is a complete list of mannequins that must wear navy?

- (A) F
- (B) H
- (C) J
- (D) F and H
- (E) F and J

1. Generally you will answer a “could be true” by proving four answers must be false. (A) MBF b/c 3 can't wear red. (B) MBF b/c there isn't enough space to have 3 of 2 different colors. (D) MBF b/c whatever G wears F and J must wear. (E) MBF b/c otherwise there would not be enough colors to fill either H or J's positions.

2. Strangely worded question; we want to think about the ways in which two mannequins wear blue. There are two ways: the pairs are either F and J or H and J. Either way, J must wear blue.

It's highly unlikely my real-time diagram would look this pretty, but it would have the same information. There are a ton of number inferences to be made here, set off by the relationship between the second and third rules. The different shapes, as long as we are practiced at using them, give us a great visual sense of the fact that what goes in G must also go in F must also go in J, etc. Note that the circle shape should always stay “generic”—that is, we use it when we know a space has to be filled, but have no other association with that space.

Set 3 Solutions

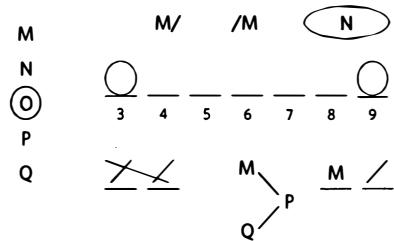
Sarah will host five out-of-town friends—M, N, O, P, and Q—at her house over the course of seven months—the first one in March and the last one in September. She will host each friend once, and no more than one friend per month. The following conditions apply:

During this period, she will not go two consecutive months without hosting an out-of-town friend.

She will host P after she hosts both M and Q.

She cannot host M in any odd-numbered month, and she cannot host anyone in the month after she hosts M.

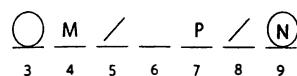
N visits in August or September.



We normally wouldn't mark ordering positions, but since this scenario is somewhat unusual (Mar. to Sept.) it makes sense to do so here. It takes a couple of steps to realize M must go in 4 or 6, so it's likely your paper looks a bit messier. Notice that the empty spots are a big key to this game.

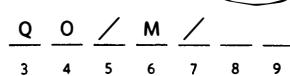
1. If P visits in July, which of the following must be true?

- (A) Q visits in March.
- (B) Q visits in June.
- (C) O visits in March.
- (D) O visits in August.
- (E) N visits in September.



2. If O stays the month after Q but at some point before M, for how many visitors do we know which month they visited?

- (A) 1
- (B) 2
- (C) 3
- (D) 4
- (E) 5



1. If P visits in 7, M must visit in 4. 5 must be empty, so 6 can't be, and the only other place that the other empty spot can be is 8—remember, 3 and 9 must be filled. Therefore, N must be in 9.

2. This condition means M must be in 6, and 7 must be blank. N and P will go in 8 and 9 in either order. The QO chunk must go in 3/4 because 3 can't be left blank.

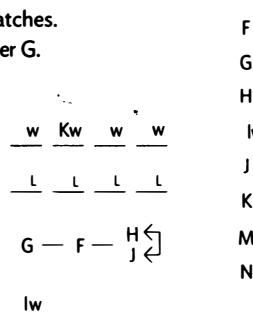
Eight people—F, G, H, I, J, K, M, and N—participated in four tennis matches that took place one after another. Each match had a winner and a loser. The matches took place in accordance with the following:

K played in the second match.

H and J played each other.

Both I and K won their matches.

F played before H and after G.

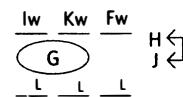


1. Which of the following could be the full list of winners, in order of the matches they won?

- (A) G, K, I, H
- (B) G, F, K, I
- (C) G, K, F, I
- (D) F, K, H, I
- (E) G, K, F, H

2. If F is a winner, which of the following must be true?

- (A) G plays in the first match.
- (B) M plays in the second match.
- (C) G loses.
- (D) H loses.
- (E) J loses.



No one aspect of this game is particularly difficult; here the challenge is in keeping track of multiple elements—order, group, and winner versus loser. Laying out a diagram that effectively conveys all of these issues goes a long way toward making these games more manageable.

1. If we try out (A), there doesn't seem to be anything wrong with it right off the bat. So we want to prove that the other answers must be false. (B) doesn't have K in position 2. (C) doesn't have a position for H, J. (D) doesn't have a position for G, which we know must go before F. (E) doesn't have I as a winner.

2. F can only go in 2 or 3, and if F is a winner, it must go in 3. That puts H, J in the fourth match, and I into the first as a winner. We know G lost the first or second match.

Set 4 Solutions

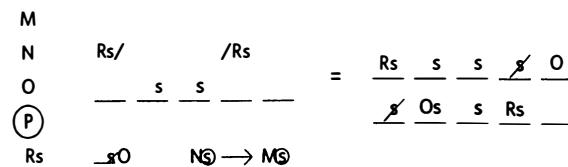
A consultant visits five different sites—M, N, O, P, and R—over the course of five days—a different site each day. At some sites she leaves a list of suggestions, and at some sites she doesn't. Additionally, it must be true that:

She leaves suggestions at the second and third sites she visits.

She visits R either first or fourth and leaves a suggestion.

She visits O immediately after she visits a site at which she doesn't leave suggestions.

If she left a suggestion for N, she left a suggestion for M.



You could have left it as it is on the left, or you could have written it out as two separate diagrams, one with R in the first position, and one with R in the fourth. No matter how you set it up, this is a deceptively tough game, largely because the questions require significant thought.

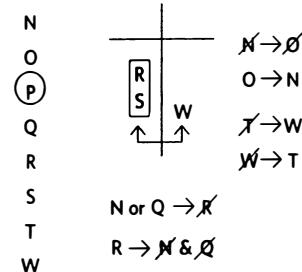
A coach will select some of the players that are trying out for the varsity team, and he will put the rest on the junior varsity team. The eight players who are trying out are Nick, Otis, Pat, Quinn, Rachel, Sara, Tim, and Wilma. The following conditions apply:

If Nick or Quinn are selected for varsity, Rachel will not be. Either Sara or Wilma, but not both, will be selected for junior varsity.

Sara and Rachel will be selected for the same team.

If Nick is selected for junior varsity, Otis will be too.

If Tim is selected for junior varsity, Wilma will be selected for varsity.



We switched V and JV to yes and no (/) to make the diagram a bit easier to see visually, but that's just an optional step. The link between the second and third rules is probably the most important feature of the game to pay attention to. Note that we don't know of a single person on either team, and that's fine.

1. If she visits O at some point before she visits P, which of the following must be false?

- (A) She visited N third.
- (B) She visited P third.
- (C) She visited M last.
- (D) She visited N last.
- (E) She visited P last.

2. Which of the following could be true?

- (A) P is first and N second.
- (B) N is second and R third.
- (C) M is third and R fourth.
- (D) N is third and O fourth.
- (E) O is fourth and N fifth.

1. If this is the case, O cannot be last, so it must be in 2. R must be in 4. If N is third, that would force P into 5 and M into 1, in front of O. It would also force N to be Ns, making M into Ms, and we can't have that in front of the O. Therefore, she cannot visit N third in this situation.

2. Again, with a CBT question, we want to eliminate four answers that must be false. Without two diagrams, (A) is the toughest answer to eliminate, but if P is in 1 and N in 2, that would force R into 4 and O into 5, and that can't be. (B) MBF b/c R can't be in 3. (D) MBF b/c O can't go in 4. (E) MBF b/c O can't go in 3.

1. If Otis is selected for varsity, which of the following could be false?

- (A) Nick is selected to varsity.
- (B) Wilma is selected to varsity.
- (C) Rachel is selected to junior varsity.
- (D) Sara is selected to junior varsity.
- (E) Tim is selected to junior varsity.

O	R
N	S
W	

2. Which of the following can be a pair of players, both of whom are selected for varsity?

- (A) N and S
- (B) O and W
- (C) Q and S
- (D) O and R
- (E) O and S

1. You can see just how important correct notation and careful work are in a question like this one. O in varsity sets off a chain of inferences illustrated on the T-diagram. O leads to N, which leads to R and S being out, which leads to W being on the team. Notice that (E) could trip you up if you falsely infer from the last rule.

2. Remember that we don't know anyone who is actually selected for either team, so this question is really about how the elements in the answer choices relate to one another. For (A), if N is in, R is out and thus S is out. (A) can't work. With (B) when O is in, R is out, and W is in. So, no problem with O and W being in together. For (C), if Q is in, R is out and S is out. Cut (C). For (D), if O is in then N is in and R is out. (D) is out. For (E), if O is in, N is in, R is out, and S is out. (E) should be cut too. This problem really shows the benefit of remembering work done on previous questions—you could have also gotten to (B) much quicker if you happen to remember that situation from question 1.

How Did You Do?

Here are some big picture issues it would have helped to notice before setting pen to paper.

Set 1

1. The M/Q and R/Q rules are really restrictive and define the game.
2. Not much. Subsets.

Set 2

1. Other rules hinge on last one.
2. Going to be all about #'s; G must =1 and F and H=2; conditionals link.

Set 3

1. Empty spots and M are keys.
2. Need to organize order, group, and subset. G - F- H link takes up 3 of 4 matches.

Set 4

1. Subsets again! O is very limited.
2. All about linking conditional rules; need to make sure to not confuse rules like the third and fourth for one another; varsity and junior varsity are easier to think of in terms of yes and no (/).

That was a tough set of games, meant to illustrate the benefits of the diagramming systems we've been working on, but also meant to push you and make you think about the next step in your improvement. We started the lesson by discussing the four general parts of the game-solving process; let's revisit them now.

The first step is to see the big picture—many of these games illustrated the advantage of taking a wide view before going into specific rules. On the side of this page are some of the issues that I thought were important to notice, right off the bat, for these eight games. If you'd like, you can use the notes to reflect back on your own thought process.

The next step is to understand the rules and to notate them in such a way that they easily match your understanding and help you see how rules come together. It's not necessary that you notated things the same way that I notated them in the solutions; however, you should take a very careful look at how you notated every rule for every game to pick out moments when your understanding was not quite right, or your notation not as effective as it could have been.

These games also required some key inferences, both in the setup and in the question solving process—this is consistently true of difficult LSAT games. You don't need to feel you are “perfect” at inferences (I know I'm not). However, you should feel like you are getting better and better.

Finally, it's likely that you solved some questions quickly, and took the longer route for others. Take a minute to reflect on *how* you solved questions. Pay particular attention to how the question stem should have guided your thinking, and also pay attention to the things you spent a lot of time thinking about that ultimately weren't important.

I've left some space below for you to subjectively evaluate your own performance. Be brutally honest, and use this as a gauge of where you are at this point in the study process. Come back to these games and play them again later in your studies to see how you are progressing. It'll be especially satisfying to look back on the challenges that you wrote down once you've mastered these very same games in the near future.

assess & address

Take stock of the things you want to improve on, and the things you want to remind yourself of.

I see the big picture

I have control over the rules

I see inferences

I use smart approaches to answer questions

16

LOGICAL REASONING

answering questions

Hopefully you found the last six lessons on Logic Games to be useful and perhaps even somewhat fun. Now it's time to get back to Logical Reasoning.

In lessons five through nine, we focused on *the* principal component of your Logical Reasoning skill set: your ability to recognize what is wrong with arguments. In this set of lessons you should see your hard work pay off. But before we go further, let's quickly review some of the big picture Logical Reasoning issues that we've either briefly introduced, or already discussed at length:

- Logical Reasoning questions test both your reading ability and your reasoning ability, in roughly equal parts.
- Two main reading skills are tested: your ability to read for structure, and your ability to understand the meaning of certain words.
- The main reasoning skill tested is your ability to recognize why reasons do not justify a point that is made.
- The final factor that will determine your performance is mental discipline.

In this lesson, we are going to discuss in more depth the specific reading skills that are required of us, and we will do so as we also discuss general Logical Reasoning strategies. In the lessons to come, we will expand on these strategies and break down specific types of questions.

quick review of lessons five through nine

The skill most important for Logical Reasoning is the ability to recognize what is wrong with an argument. Whenever our job is to be subjective, our primary task is to figure out why the reasons provided are not enough to prove the conclusion reached. Thinking about flaws in terms of these three categories can be extremely helpful for developing effective habits.

a piece ≠ the puzzle
overconcludes from limited support

Edith has an expensive purse.
She must be rich.

apples ≠ oranges
falsely equates

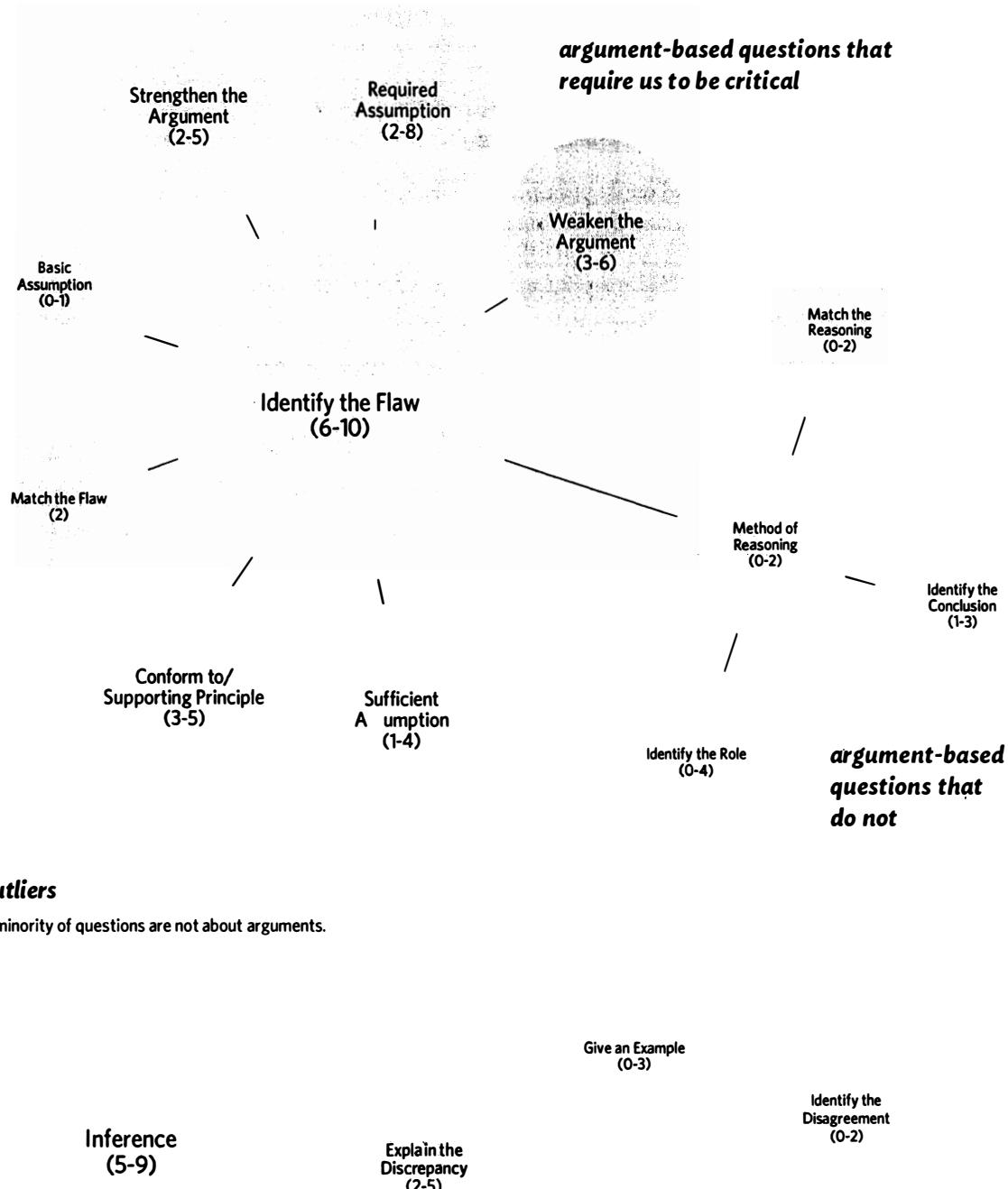
Since Mimi likes Nancy,
Nancy must like Mimi.

1 + 1 ≠ 3
reaches a conclusion by incorrectly bringing ideas together

Steve is tall, and he is a good chess player. Therefore, height must somehow help you play chess.

The Constellation of Questions

Once again, here is a breakdown of the different types of questions that you are likely to see in the Logical Reasoning section, as well as the relationship between them. The numbers represent the total of that question type that you are likely to see in the two Logical Reasoning sections combined.



outliers

A minority of questions are not about arguments.

Habits

When we first start studying for the LSAT, it can seem like questions require us to retain a challenging *quantity* of information—so much to keep track of at once, and so disorganized! However, this is a ruse, a **red-herring**, and if you don’t see it as such, it will block you from becoming truly excellent at Logical Reasoning.

red herring: a false challenge meant to distract you from the real challenge

The test writers don’t care about the quantity of information that you can retain; they are far more interested in the quality of your understanding. Put simply: your job is to prioritize the important information, and to understand that information very well; trying to keep track of *all* information will hinder you in this effort. In fact, the ability to see the structure of an argument and prioritize certain components is *the* most significant reading skill that is tested. If you are given a long argument, only a few parts of it will be relevant to the question you are being asked. The test writer will give you everything you need to figure out which parts are the important ones, then test you on this understanding, in challenging ways.

You will get better and better at Logical Reasoning as you get better and better at thinking about the right things, and at the right times. This will not happen from you wanting it to happen, or from you learning something clever. It will happen if you develop the correct habits. Your habits determine what you think about. So let’s discuss the critical habits.

An argument consists of a main point, and reasons given to support that point

Habit 1: Use the Question Stem to Understand Your Task

The first thing we always want to do is to read the question stem to get an understanding of exactly what our job is going to be when we read the argument. We’re always going to use the question stem to define our task; during our training, it will help us keep organized the varying approaches that we want to develop for different types of questions.

There are a variety of things that a question stem can tell us, and we’ll be discussing question stems at length in these upcoming lessons. However, the most important thing that a question stem tells us is whether our job is to read the stimulus objectively or subjectively. Here’s why this distinction is so important:

If our job is to be subjective, it’s always going to be in the same type of context: our job will be to evaluate arguments—reasons given to justify a point made. In every one of these situations, the reasons given will not justify the point made, and understanding why not is going to be the most important factor in terms of how easy or difficult the question feels for us.

If our job is to be objective, it is absolutely critical that we *not* judge—that we know not to waste time thinking about what is *wrong* with the reasoning, and more importantly we know not to bias ourselves with judgements. When questions ask that we be objective, the “faulty” thinking in the wrong answers is commonly going to prey on our subjectivity.

Subjective versus objective is going to be the critical divide for how we think about and study questions. In this swatch of Logical Reasoning lessons, we are going to focus on all the different types of questions that require subjective thinking. These questions are more common and tend to make up a significant majority of the hardest questions in any Logical Reasoning section. In the next swatch of Logical Reasoning lessons, we will focus on questions that require an objective read.

Keep in mind that many of the same skills are required for both types of questions. The work you do mastering subjective questions will invariably serve to also make you much stronger at objective questions.

Habit 2: Identify the Conclusion

Once you see that your job is to be critical, the next thing you want to do is to figure out exactly what you are supposed to be critical about. And so we always want to look for the point that is being made.

Expect to read a stimulus multiple times during the course of a question. The first time through the stimulus, of course you want to pay attention to everything, but keep in mind you have one specific job you *must* get done: you have to figure out what the point is. This is not particularly challenging, and this is something you should strive to be able to do accurately, without too much difficulty, for every single question that contains an argument.

When identifying a conclusion, there are two principle criteria:

1. If you are ever unsure about which part of an argument is meant to be the conclusion, and which part the reasoning, the best thing to do is to play out how one part *could* be used to support the other. A great tool for mechanically thinking through this is to stick the word "therefore" in between the two statements. If you try out "A therefore B" and "B therefore A," it can help make it much easier to see which part is meant to be the support, and which part the conclusion.

The conclusion is going to be an opinion of some sort. It may not be worded as such, but if it were a fact, it would not need justification. The conclusion will be something that is debatable and needs to be justified.

The conclusion will have support. You should be able to see that other elements in the argument are meant to compel you to think that a certain statement is true. That statement that is being supported is the conclusion.¹

In most instances, the conclusion will be contained within a single clause, or a single sentence. However, for a few questions in each Logical Reasoning section, the test writers will split up the conclusion and challenge you to put the pieces together correctly. They do this in two main ways: by putting a part of the conclusion in some other part of

conclusions in two parts

arguments with split-up conclusions

conclusions with placeholders

Tablets have proven themselves as useful entertainment vehicles, but they have yet to prove their utility in the workplace.

Some say talent is the key to success; others say it is hard work. The truth is, success requires both of these characteristics.

rebuttals

Many automotive experts claim that American car companies will never again develop the best cars in the world, but they are wrong.

The panel concluded that Mr. Roberts was definitely at fault, but the conclusion was unjustified.

the argument and putting a placeholder—such as a relative pronoun or a statement like “that idea”—in its place, or by having the conclusion be a counter to a different point—an opposing point—presented in the argument.

On the previous page were some examples of conclusions complicated in these ways. In these situations, you want to give yourself some extra time to understand the conclusions correctly. You want to be especially careful to understand “responding” conclusions correctly. In the first of our examples, note that the conclusion is that the original opinion was wrong. In the second, the point is simply that the original conclusion was reached without considering all of the issues. It’s left uncertain whether the author actually disagrees with the conclusion, and to over-infer would be a mistake.

Before we move further, let’s get in some practice to make sure that you feel comfortable identifying conclusions in Logical Reasoning arguments. On the following two pages are twenty arguments—some of them are from official LSAT questions. For each one, your job is simply to identify the conclusion. When the conclusion is presented in multiple parts, mark the multiple parts. When there is an intermediate conclusion, mark that as well.

Here are the conclusions from the opposite page, not split up:

Tablets have yet to prove their utility in the workplace.

Success requires talent and hard work.

American companies will develop the best cars in the world.

The conclusion that Mr. Roberts was at fault is unjustified.

intermediate conclusions

Occasionally—no more frequently than perhaps once per exam—it will be important that you think about an argument in terms of it possibly containing an **intermediate conclusion**. An intermediate conclusion is a conclusion that is used to support another conclusion. Any non-factual support that itself has support is an intermediate conclusion.

Keep in mind there are plenty of times that we run into intermediate conclusions and don’t actually have to think of them as such—in fact, this is the norm.

You typically only have to think about intermediate conclusions in a couple of situations. The first is when there is no, or almost no, gap between the main point and the primary support, coupled with a fairly significant gap between that primary support, and the information given that is meant to support that. The second scenario is when you are asked to formally and objectively define the parts of an argument. We’ll discuss this second situation further in another lesson. Here are two examples of arguments containing intermediate conclusions, and significant gaps in the reasoning meant to justify that intermediate conclusion.

intermediate conclusion



Ken studies hard SO he probably does well in school SO he probably gets good grades.

Josh likes candy SO he must be overweight SO he must be out of shape.

Note that in neither case is the intermediate conclusion-to-conclusion relationship ironclad, but in both cases there are more significant jumps from the support to the intermediate conclusion. In general you will only need to look for reasoning issues between support and intermediate conclusion when the gap between intermediate conclusion and conclusion seems small. Also note that this is a surprisingly rare construction for the test writers, and you can go several practice exams without running into an argument with a support-to-intermediate conclusion issue.

Drill: What's the Conclusion?

Directions: Identify and mark the conclusion. When the conclusion is in multiple parts, write it out below.

1. Hospital executive: At a recent conference on nonprofit management, several computer experts maintained that the most significant threat faced by large institutions such as universities and hospitals is unauthorized access to confidential data. In light of this testimony, we should make the protection of our clients' confidentiality our highest priority.
2. When exercising the muscles in one's back, it is important, in order to maintain a healthy back, to exercise the muscles on opposite sides of the spine equally. After all, balanced muscle development is needed to maintain a healthy back, since the muscles on opposite sides of the spine must pull equally in opposing directions to keep the back in proper alignment and protect the spine.
3. You claim that advertising does not play a bigger role in the lives of individuals than it once did. However, twenty years ago the average American was exposed to 1,000 advertisements a day. Now that figure is almost 10,000. Therefore, your claim is false.
4. Gary's wife says he eats too much red meat but this is simply not true; I eat lunch with him nearly every day, and I never see him eat red meat.
5. The makers of Brand X oatmeal cookies claim that their cookies are healthier than those that are made by our company. They cite the use of natural ingredients and whole grains as two primary factors. However, their cookies have more sugar and salt than do our cookies, and for most Americans both of those ingredients are very unhealthy. Therefore, the makers of Brand X are clearly wrong in their claim.
6. Most societies strive to protect individual freedoms of thought, and most individuals like to think of themselves as independent thinkers. However, nearly everyone is influenced by certain evocative forms of art. Therefore, what people like to think of themselves in this regard is not necessarily correct.
7. Philosopher: An action is morally right if it would be reasonably expected to increase the aggregate well-being of the people affected by it. An action is morally wrong if and only if it would be reasonably expected to reduce the aggregate well-being of the people affected by it. Thus, actions that would be reasonably expected to leave unchanged the aggregate well-being of the people affected by them are also right.
8. Driver: My friends say I will one day have an accident because I drive my sports car recklessly. But I have done some research, and apparently minivans and larger sedans have very low accident rates compared to sports cars. So trading my sports car in for a minivan would lower my risk of having an accident.
9. Serat claims that his new forecasting model is more accurate and useful than that currently used by the majority of the researchers in his field. However, a recent survey of people in his field revealed that fewer than ten percent of his colleagues agree with him. Therefore, Serat is wrong in his assessment.
10. Commentator: In academic scholarship, sources are always cited and methodology and theoretical assumptions are set out so as to allow critical study, replication, and expansion of scholarship. In open-source software, the code in which the program is written can be viewed and modified by individual users for their purposes without getting permission from the producer or paying a fee. In contrast, the code of proprietary software is kept secret, and modifications can be made only by the producer, for a fee. This shows that open-source software better matches the values embodied in academic scholarship, and since scholarship is central to the mission of universities, universities should use only open-source software.

Drill: What's the Conclusion?

11. We should accept the proposal to demolish the old train station because the local historical society, which vehemently opposes this, is dominated by people who have no commitment to long-term economic well-being. Preserving old buildings creates an impediment to new development, which is critical to economic health.
12. Of the two hundred students in his class, Thomas is taller than all but three of them. Of the sixty students in Sara's class, all but two are taller than Sara. Since we need someone tall to play the role of "giraffe" in the play, we should call Thomas.
13. All members of Team G have black badges. Only those with black badges are allowed access to the South Wing, which houses the only decompression chamber. Since Teri has access to the wing which houses the decompression chamber, she must be a member of Team G.
14. All Labrador retrievers bark a great deal. All Saint Bernards bark infrequently. Each of Rosa's dogs is a cross between a Labrador retriever and a Saint Bernard. Therefore, Rosa's dogs are moderate barkers.
15. Therapist: Cognitive psychotherapy focuses on changing a patient's conscious beliefs. Thus, cognitive psychotherapy is likely to be more effective at helping patients overcome psychological problems than are forms of psychotherapy that focus on changing unconscious beliefs and desires, since only conscious beliefs are under the patient's direct conscious control.
16. Atrens: An early entomologist observed ants carrying particles to neighboring ant colonies and inferred that the ants were bringing food to their neighbors. Further research, however, revealed that the ants were emptying their own colony's dumping site. Thus, the early entomologist was wrong.
17. When one lives in a rural area, one has an obligation to help others who are in need, if these individuals happen to be stopped on the side of the road. Nina, who lives in a rural area, recently drove past an individual stopped on the side of the road and did nothing to help that individual. Therefore, Nina failed to fulfill this obligation.
18. Senator, you recently stated that national security is your top priority. However, I find this claim to be without merit. Over the past five years, you have steadfastly refused to vote for any bill that increases military spending, and you have stated that your behavior will not change.
19. Although video game sales have increased steadily over the past three years, we can expect a reversal of this trend in the very near future. Historically, over three quarters of video games sold have been purchased by people from thirteen to sixteen years of age, and the number of people in this age group is expected to decline steadily over the next ten years.
20. The government recently made significant emergency loans to certain businesses in order to improve the overall condition of the country's economy. All businesses that received these loans have thus far been successful in improving their economic conditions. Therefore, we can say that the loans have, at least in part, had their desired effect.

What's the Conclusion? Solutions

1. Hospital executive: At a recent conference on nonprofit management, several computer experts maintained that the most significant threat faced by large institutions such as universities and hospitals is unauthorized access to confidential data. In light of this testimony, we should make the protection of our clients' confidentiality our highest priority.

5. The makers of Brand X oatmeal cookies claim that their cookies are healthier than those that are made by our company. They cite the use of natural ingredients and whole grains as two primary factors. However, their cookies have more sugar and salt than do our cookies, and for most Americans both of those ingredients are very unhealthy. Therefore, the makers of Brand X are clearly wrong in their claim.

8. Driver: My friends say I will one day have an accident because I drive my sports car recklessly. But I have done some research, and apparently minivans and larger sedans have very low accident rates compared to sports cars. So trading my sports car in for a minivan would lower my risk of having an accident.

2. When exercising the muscles in one's back, it is important, in order to maintain a healthy back, to exercise the muscles on opposite sides of the spine equally. After all, balanced muscle development is needed to maintain a healthy back, since the muscles on opposite sides of the spine must pull equally in opposing directions to keep the back in proper alignment and protect the spine.

6. Most societies strive to protect individual freedoms of thought, and most individuals like to think of themselves as independent thinkers. However, nearly everyone is influenced by certain evocative forms of art. Therefore, what people like to think of themselves in this regard is not necessarily correct.

9. Serat claims that his new forecasting model is more accurate and useful than that currently used by the majority of the researchers in his field. However, a recent survey of people in his field revealed that fewer than ten percent of his colleagues agree with him. Therefore, Serat is wrong in his assessment.

It may not be correct that we are independent thinkers.

Serat's new forecasting model is not more accurate and useful than that currently used by the majority of researchers in his field. (note that "not more accurate" ≠ "less accurate")

3. You claim that advertising does not play a bigger role in the lives of individuals than it once did. However, twenty years ago the average American was exposed to 1,000 advertisements a day. Now that figure is almost 10,000. Therefore, your claim is false.

Advertising does play a bigger role in the lives of individuals than it once did.

7. Philosopher: An action is morally right if it would be reasonably expected to increase the aggregate well-being of the people affected by it. An action is morally wrong if and only if it would be reasonably expected to reduce the aggregate well-being of the people affected by it. Thus, actions that would be reasonably expected to leave unchanged the aggregate well-being of the people affected by them are also right.

10. Commentator: In academic scholarship, sources are always cited and methodology and theoretical assumptions are set out so as to allow critical study, replication, and expansion of scholarship. In open-source software, the code in which the program is written can be viewed and modified by individual users for their purposes without getting permission from the producer or paying a fee. In contrast, the code of proprietary software is kept secret, and modifications can be made only by the producer, for a fee. This shows that open-source software better matches the values embodied in academic scholarship, and since scholarship is central to the mission of universities, universities should use only open-source software.

4. Gary's wife says he eats too much red meat but this is simply not true; I eat lunch with him nearly every day, and I never see him eat red meat.

Gary does not eat too much red meat.

What's the Conclusion? Solutions

11. We should accept the proposal to demolish the old train station because the local historical society, which vehemently opposes this, is dominated by people who have no commitment to long-term economic well-being. Preserving old buildings creates an impediment to new development, which is critical to economic health.

15. Therapist: Cognitive psychotherapy focuses on changing a patient's conscious beliefs. Thus, cognitive psychotherapy is likely to be more effective at helping patients overcome psychological problems than are forms of psychotherapy that focus on changing unconscious beliefs and desires, since only conscious beliefs are under the patient's direct conscious control.

18. Senator, you recently stated that national security is your top priority. However, I find this claim to be without merit. Over the past five years, you have steadfastly refused to vote for any bill that increases military spending, and you have stated that your behavior will not change.

The senator's claim that national security is his top priority lacks merit.

12. Of the two hundred students in his class, Thomas is taller than all but three of them. Of the sixty students in Sara's class, all but two are taller than Sara. Since we need someone tall to play the role of "giraffe" in the play, we should call Thomas.

16. Atrens: An early entomologist observed ants carrying particles to neighboring ant colonies and inferred that the ants were bringing food to their neighbors. Further research, however, revealed that the ants were emptying their own colony's dumping site. Thus, the early entomologist was wrong.

The ants are not bringing food to their neighbors.

19. Although video game sales have increased steadily over the past three years, we can expect a reversal of this trend in the very near future. Historically, over three quarters of video games sold have been purchased by people from thirteen to sixteen years of age, and the number of people in this age group is expected to decline steadily over the next ten years.

"Reversal" is a bit vague—at the least. The conclusion is: video game sales will stop increasing in the very near future.

13. All members of Team G have black badges. Only those with black badges are allowed access to the South Wing, which houses the only decompression chamber. Since Teri has access to the wing which houses the decompression chamber, she must be a member of Team G.

Teri must be a member of Team G.

17. When one lives in a rural area, one has an obligation to help others who are in need, if these individuals happen to be stopped on the side of the road. Nina, who lives in a rural area, recently drove past an individual stopped on the side of the road and did nothing to help that individual. Therefore, Nina failed to fulfill this obligation.

Nina failed to fulfill her obligation to help others in need.

20. The government recently made significant emergency loans to certain businesses in order to improve the overall condition of the country's economy. All businesses that received these loans have thus far been successful in improving their economic conditions. Therefore, we can say that the loans have, at least in part, had their desired effect.

14. All Labrador retrievers bark a great deal. All Saint Bernards bark infrequently. Each of Rosa's dogs is a cross between a Labrador retriever and a Saint Bernard. Therefore, Rosa's dogs are moderate barkers.

Habit 3: Find the Support

Once you have the conclusion, your next job is to think about how it is being supported. As we've discussed, LSAT arguments do not, in general, have multi-faceted reasoning issues—the author usually tries to justify his point with just a singular line of reasoning. This reasoning may come to us in one sentence, it may be spread out in a couple of sentences, or it may be all jumbled together with the background information. When the support is spread out, the best way to organize it and bring it together in your head is to think about how the support, as a whole, is meant to justify the point—how the support comes together to form “one” reason for the point. Students run into trouble when they fail to differentiate the support from the other information, and just as commonly, when they choose to, without reason or need, focus on specific portions of the support, rather than thinking about how it works together.

Habit 4: Figure Out What's Wrong

Once you have isolated the support and the reasoning, you can get on with the main task at hand: figuring out what is wrong with how the support justifies the conclusion. We won't spend too much time discussing this here as we've already discussed it in depth elsewhere, but do know that it is expected that by this point you are “naturally,” without too much conscious effort, focused on why reasons don't justify a point. It's certainly not expected that you are perfect at figuring out what's wrong, but the habit of looking for the flaw needs to be there for you to get better and better, and it is expected that you've laid this habit down and that it a foundational part of how you solve questions. If not, you may want to review Lessons 5 - 9 again before moving further.

Habits 5 and 6: Eliminate Wrong Answers and Confirm the Right Answer

We also won't spend much time in this lesson discussing these final two steps, for these are steps that are in certain ways specific to the particular questions that are being asked. We'll discuss these steps as we discuss each type of question, then come back to them and summarize after we get a few question types under our belt.

In general, you want to develop a habit of going through answer choices in two rounds. The first time around, you want to look for reasons to eliminate answers, and the second time around you want to look for reasons to confirm what remains.

On the next few pages are drills that build upon what we've already started. What we're going to do is take the same arguments that we used for the conclusion drill and use them to work on identifying the support. Then we'll isolate the support-conclusion relationship (the argument) and practice figuring out what's wrong. Finally, we'll end the lesson by having you solve ten LSAT questions, questions that will then be used as part of the instruction in Lessons 17 – 20.

Use these drills both to refresh yourself on the work we've already done, and to gauge where your focus should be for this batch of lessons. If you feel 80% or 90% confident about your ability to identify a conclusion or the support, make that a priority as you go through your work, and make it a goal to achieve total mastery of those skills by the time we're done with this set of five Logical Reasoning lessons.

Drill: What's the Support?

Directions: Identify and mark the support. When the support is difficult to note, write it out below.

1. Hospital executive: At a recent conference on nonprofit management, several computer experts maintained that the most significant threat faced by large institutions such as universities and hospitals is unauthorized access to confidential data. In light of this testimony, we should make the protection of our clients' confidentiality our highest priority.
2. When exercising the muscles in one's back, it is important, in order to maintain a healthy back, to exercise the muscles on opposite sides of the spine equally. After all, balanced muscle development is needed to maintain a healthy back, since the muscles on opposite sides of the spine must pull equally in opposing directions to keep the back in proper alignment and protect the spine.
3. You claim that advertising does not play a bigger role in the lives of individuals than it once did. However, twenty years ago the average American was exposed to 1,000 advertisements a day. Now that figure is almost 10,000. Therefore, your claim is false.
4. Gary's wife says he eats too much red meat but this is simply not true; I eat lunch with him nearly every day, and I never see him eat red meat.
5. The makers of Brand X oatmeal cookies claim that their cookies are healthier than those that are made by our company. They cite the use of natural ingredients and whole grains as two primary factors. However, their cookies have more sugar and salt than do our cookies, and for most Americans both of those ingredients are very unhealthy. Therefore, the makers of Brand X are clearly wrong in their claim.
6. Most societies strive to protect individual freedoms of thought, and most individuals like to think of themselves as independent thinkers. However, nearly everyone is influenced by certain evocative forms of art. Therefore, what people like to think of themselves in this regard is not necessarily correct.
7. Philosopher: An action is morally right if it would be reasonably expected to increase the aggregate well-being of the people affected by it. An action is morally wrong if and only if it would be reasonably expected to reduce the aggregate well-being of the people affected by it. Thus, actions that would be reasonably expected to leave unchanged the aggregate well-being of the people affected by them are also right.
8. Driver: My friends say I will one day have an accident because I drive my sports car recklessly. But I have done some research, and apparently minivans and larger sedans have very low accident rates compared to sports cars. So trading my sports car in for a minivan would lower my risk of having an accident.
9. Serat claims that his new forecasting model is more accurate and useful than that currently used by the majority of the researchers in his field. However, a recent survey of people in his field revealed that fewer than ten percent of his colleagues agree with him. Therefore, Serat is wrong in his assessment.
10. Commentator: In academic scholarship, sources are always cited and methodology and theoretical assumptions are set out so as to allow critical study, replication, and expansion of scholarship. In open-source software, the code in which the program is written can be viewed and modified by individual users for their purposes without getting permission from the producer or paying a fee. In contrast, the code of proprietary software is kept secret, and modifications can be made only by the producer, for a fee. This shows that open-source software better matches the values embodied in academic scholarship, and since scholarship is central to the mission of universities, universities should use only open-source software.

Drill: What's the Support?

11. We should accept the proposal to demolish the old train station because the local historical society, which vehemently opposes this, is dominated by people who have no commitment to long-term economic well-being. Preserving old buildings creates an impediment to new development, which is critical to economic health.
12. Of the two hundred students in his class, Thomas is taller than all but three of them. Of the sixty students in Sara's class, all but two are taller than Sara. Since we need someone tall to play the role of "giraffe" in the play, we should call Thomas.
13. All members of Team G have black badges. Only those with black badges are allowed access to the South Wing, which houses the only decompression chamber. Since Teri has access to the wing which houses the decompression chamber, she must be a member of Team G.
14. All Labrador retrievers bark a great deal. All Saint Bernards bark infrequently. Each of Rosa's dogs is a cross between a Labrador retriever and a Saint Bernard. Therefore, Rosa's dogs are moderate barkers.
15. Therapist: Cognitive psychotherapy focuses on changing a patient's conscious beliefs. Thus, cognitive psychotherapy is likely to be more effective at helping patients overcome psychological problems than are forms of psychotherapy that focus on changing unconscious beliefs and desires, since only conscious beliefs are under the patient's direct conscious control.
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17. When one lives in a rural area, one has an obligation to help others who are in need, if these individuals happen to be stopped on the side of the road. Nina, who lives in a rural area, recently drove past an individual stopped on the side of the road and did nothing to help that individual. Therefore, Nina failed to fulfill this obligation.
18. Senator, you recently stated that national security is your top priority. However, I find this claim to be without merit. Over the past five years, you have steadfastly refused to vote for any bill that increases military spending, and you have stated that your behavior will not change.
- The senator's claim that national security is his top priority lacks merit.*
19. Although video game sales have increased steadily over the past three years, we can expect a reversal of this trend in the very near future. Historically, over three quarters of video games sold have been purchased by people from thirteen to sixteen years of age, and the number of people in this age group is expected to decline steadily over the next ten years.
20. The government recently made significant emergency loans to certain businesses in order to improve the overall condition of the country's economy. All businesses that received these loans have thus far been successful in improving their economic conditions. Therefore, we can say that the loans have, at least in part, had their desired effect.
- The loans have at least in part improved the overall economic condition of the country's economy.*

What's the Support? Solutions

1. Hospital executive: At a recent conference on nonprofit management, several computer experts maintained that the most significant threat faced by large institutions such as universities and hospitals is unauthorized access to confidential data. In light of this testimony, we should make the protection of our clients' confidentiality our highest priority.

5. The makers of Brand X oatmeal cookies claim that their cookies are healthier than those that are made by our company. They cite the use of natural ingredients and whole grains as two primary factors. However, their cookies have more sugar and salt than do our cookies, and for most Americans both of those ingredients are very unhealthy. Therefore, the makers of Brand X are clearly wrong in their claim.

8. Driver: My friends say I will one day have an accident because I drive my sports car recklessly. But I have done some research, and apparently minivans and larger sedans have very low accident rates compared to sports cars. So trading my sports car in for a minivan would lower my risk of having an accident.

2. When exercising the muscles in one's back, it is important in order to maintain a healthy back, to exercise the muscles on opposite sides of the spine equally. After all, balanced muscle development is needed to maintain a healthy back, since the muscles on opposite sides of the spine must pull equally in opposing directions to keep the back in proper alignment and protect the spine.

6. Most societies strive to protect individual freedoms of thought, and most individuals like to think of themselves as independent thinkers. However, nearly everyone is influenced by certain evocative forms of art. Therefore, what people like to think of themselves in this regard is not necessarily correct.

9. Serat claims that his new forecasting model is more accurate and useful than that currently used by the majority of the researchers in his field. However, a recent survey of people in his field revealed that fewer than ten percent of his colleagues agree with him. Therefore, Serat is wrong in his assessment.

(Note that you could choose to mark the part that follows "since" as well.)

3. You claim that advertising does not play a bigger role in the lives of individuals than it once did. However, twenty years ago the average American was exposed to 1,000 advertisements a day. Now that figure is almost 10,000. Therefore, your claim is false.

7. Philosopher: An action is morally right if it would be reasonably expected to increase the aggregate well-being of the people affected by it. An action is morally wrong if and only if it would be reasonably expected to reduce the aggregate well-being of the people affected by it. Thus, actions that would be reasonably expected to leave unchanged the aggregate well-being of the people affected by them are also right.

(Note that you could choose to mark the part about an action being morally right as well.)

4. Gary's wife says he eats too much red meat but this is simply not true; I eat lunch with him nearly every day, and I never see him eat red meat.

10. Commentator: In academic scholarship, sources are always cited and methodology and theoretical assumptions are set out so as to allow critical study, replication, and expansion of scholarship. In open-source software, the code in which the program is written can be viewed and modified by individual users for their purposes without getting permission from the producer or paying a fee. In contrast, the code of proprietary software is kept secret, and modifications can be made only by the producer, for a fee. This shows that open-source software better matches the values embodied in academic scholarship, and since scholarship is central to the mission of universities, universities should use only open-source software.

What's the Support? Solutions

11. We should accept the proposal to demolish the old train station because the local historical society, which vehemently opposes this, is dominated by people who have no commitment to long-term economic well-being. Preserving old buildings creates an impediment to new development, which is critical to economic health.

(Note that “because” is what makes the first part of the support more significant to the reasoning than the last sentence.)

12. Of the two hundred students in his class, Thomas is taller than all but three of them. Of the sixty students in Sara’s class, all but two are taller than Sara. Since we need someone tall to play the role of “giraffe” in the play, we should call Thomas.

13. All members of Team G have black badges. Only those with black badges are allowed access to the South Wing, which houses the only decompression chamber. Since Teri has access to the wing which houses the decompression chamber, she must be a member of Team G.

14. All Labrador retrievers bark a great deal. All Saint Bernards bark infrequently. Each of Rosa’s dogs is a cross between a Labrador retriever and a Saint Bernard. Therefore, Rosa’s dogs are moderate barkers.

15. Therapist: Cognitive psychotherapy focuses on changing a patient’s conscious beliefs. Thus, cognitive psychotherapy is likely to be more effective at helping patients overcome psychological problems than are forms of psychotherapy that focus on changing unconscious beliefs and desires, since only conscious beliefs are under the patient’s direct conscious control.

(In this case we need the first bolded part to understand how the second is relevant to the conclusion.)

16. Atrens: An early entomologist observed ants carrying particles to neighboring ant colonies and inferred that the ants were bringing food to their neighbors. Further research, however, revealed that the ants were emptying their own colony’s dumping site. Thus, the early entomologist was wrong.

17. When one lives in a rural area, one has an obligation to help others who are in need, if these individuals happen to be stopped on the side of the road. Nina, who lives in a rural area, recently drove past an individual stopped on the side of the road and did nothing to help that individual. Therefore, Nina failed to fulfill this obligation.

18. Senator, you recently stated that national security is your top priority. However, I find this claim to be without merit. Over the past five years, you have steadfastly refused to vote for any bill that increases military spending, and you have stated that your behavior will not change.

19. Although video game sales have increased steadily over the past three years, we can expect a reversal of this trend in the very near future. Historically, over three quarters of video games sold have been purchased by people from thirteen to sixteen years of age, and the number of people in this age group is expected to decline steadily over the next ten years.

20. The government recently made significant emergency loans to certain businesses in order to improve the overall condition of the country’s economy. All businesses that received these loans have thus far been successful in improving their economic conditions. Therefore, we can say that the loans have, at least in part, had their desired effect.

Drill: What's Wrong?

Directions: Each argument has been stripped down. Identify what is wrong, and for extra credit, write down a potential counter-example.

1. Point: We should make protection of our clients' confidentiality our highest priority.

Why?: Computer experts said the most significant threat faced by large institutions like us is unauthorized access to confidential data.

What's Wrong?

2. Point: When exercising back, important to exercise muscles on each side equally.

Why?: Balanced muscle development needed to maintain a healthy back.

What's Wrong?

3. Point: Advertising plays a bigger role in lives than it once did.

Why?: We are exposed to a lot more advertisements than we used to be.

What's Wrong?

4. Point: Gary does not eat too much red meat.

Why?: I eat lunch with him nearly every day, and I never see him eat red meat.

What's Wrong?

5. Point: Brand X cookies are not healthier than ours.

Why?: They have more sugar and salt, which are both unhealthy.

What's Wrong?

6. Point: People are not necessarily independent thinkers.

Why?: Nearly all of us are influenced by evocative forms of art.

What's Wrong?

7. Point: Actions that leave unchanged general well-being are right.

Why?: Actions are wrong only if they reduce general well-being.

What's Wrong?

8. Point: Trading in my sports car for a minivan will lower risk of having accident.

Why?: Minivans have lower accident rates.

What's Wrong?

9. Point: Serat's new forecasting model is not more accurate and useful.

Why?: Fewer than 10% of people in his field think it is.

What's Wrong?

10. Point: Universities should only use open-source software.

Why?: Open-source software better matches values of academic scholarship, which is central to mission of universities.

What's Wrong?

11. Point: We should accept proposal to demolish the old train station.

Why?: A group opposing it is dominated by people with no commitment to long-term economic well-being.

What's Wrong?

12. Point: We should call Thomas.

Why?: We need someone tall. Thomas is one of the tallest in his class, and Sara is one of the shortest in hers.

What's Wrong?

13. Point: Teri must be a member of Team G.

Why?: Member of Team G → black badge. If allowed access → black badge. Teri is allowed access.

What's Wrong?

14. Point: Rosa's dogs are moderate barkers.

Why?: She's half Lab (barks a lot) half Saint Bernard (barks a little).

What's Wrong?

15. Point: Cognitive psychotherapy likely more effective than forms focused on changing unconscious beliefs and desires.

Why?: Cognitive psychotherapy focuses on changing conscious beliefs, which are the only things under patient's direct conscious control.

What's Wrong?

16. Point: Ants not bringing food to neighbors.

Why?: Ants emptying their own trash.

What's Wrong?

17. Point: Nina failed in her obligation to help someone in need.

Why?: She drove past someone stopped on the side of the road.

What's Wrong?

18. Point: Senator's claim that national security is his top priority is without merit.

Why?: The Senator will not vote for increasing military spending.

What's Wrong?

19. Point: Video game sales will stop increasing in the near future.

Why?: The age demographic that has traditionally bought the most games is shrinking in kids.

What's Wrong?

20. Point: The loans have had some positive impact in improving country's overall economy.

Why?: It has helped the businesses that received the loans.

What's Wrong?

What's Wrong? Solutions

1. Point: We should make protection of our clients' confidentiality our highest priority.

Why?: Computer experts said the most significant threat faced by large institutions like us is unauthorized access to confidential data.

What's Wrong? Takes for granted that we should do what the computer experts say. Perhaps the computer experts are biased and don't have an understanding of other, more important parts of the business.

2. Point: When exercising back, important to exercise muscles on each side equally.

Why?: Balanced muscle development needed to maintain a healthy back.

What's Wrong? Takes for granted exercising each side equally leads to balanced muscle development. Maybe one side (depending on left/right handedness) requires less work to develop.

3. Point: Advertising plays a bigger role in lives than it once did.

Why?: We are exposed to a lot more advertisements than we used to be.

What's Wrong? Takes for granted that more exposure = bigger role. Maybe we've learned to pay less attention.

4. Point: Gary does not eat too much red meat.

Why?: I eat lunch with him nearly every day, and I never see him eat red meat.

What's Wrong? Fails to consider that he may be eating the red meat at other parts of the day. Maybe Gary eats a steak every night.

5. Point: Brand X cookies are not healthier than ours.

Why?: They have more sugar and salt, which are both unhealthy.

What's Wrong? Fails to consider other aspects that contribute to overall healthiness. Maybe they are more healthy for a variety of other reasons, such as that our cookies have saturated fats in them.

6. Point: People are not necessarily independent thinkers.

Why?: Nearly all of us are influenced by evocative forms of art.

What's Wrong? Fails to consider that one can be influenced, but also think independently. For example, you can be influenced by the wisdom in your parents' advice but make your own decisions.

7. Point: Actions that leave unchanged general well-being are right.

Why?: Actions are wrong only if they reduce general well-being.

What's Wrong? Fails to consider that there is a middle ground between right and wrong.

8. Point: Trading in my sports car for a minivan will lower risk of having accident.

Why?: Minivans have lower accident rates.

What's Wrong? Mistakes correlation for causation. Perhaps minivans have lower rates because the people who drive them are safer drivers.

9. Point: Serat's new forecasting model is not more accurate and useful.

Why?: Fewer than 10% of people in his field think it is.

What's Wrong? Takes for granted that these opinions are correct. Maybe the people in his field are all wrong and stubborn to change.

10. Point: Universities should only use open-source software.

Why?: Open-source software better matches values of academic scholarship, which is central to mission of universities.

What's Wrong? Takes for granted that a product that best matches values is the best selection. Maybe there are more important reasons, such as quality, to pick proprietary software.

11. Point: We should accept proposal to demolish the old train station.

Why?: A group opposing it is dominated by people with no commitment to long-term economic well-being.

What's Wrong? Who cares about the opinions of the opposing group? Maybe there are other reasons not to accept the proposal.

12. Point: We should call Thomas.

Why?: We need someone tall. Thomas is one of the tallest in his class, and Sara is one of the shortest in hers.

What's Wrong? Fails to consider that Thomas and Sara might be coming from different contexts. Maybe Thomas is in first grade, and Sara is twelfth.

13. Point: Teri must be a member of Team G.

Why?: Member of Team G → black badge. If allowed access → black badge. Teri is allowed access.

What's Wrong? Fails to consider that others could have black badges. Maybe members of Team H also get black badges.

14. Point: Rosa's dogs are moderate barkers.

Why?: She's half Lab (barks a lot) half Saint Bernard (barks a little).

What's Wrong? Takes for granted that a cross must have an even mix of characteristics. You are not exactly the average of your parents' characteristics.

15. Point: Cognitive psychotherapy likely more effective than forms focused on changing unconscious beliefs and desires.

Why?: Cognitive psychotherapy focuses on changing conscious beliefs, which are the only things under patient's direct conscious control.

What's Wrong? Takes for granted that what is under the patient's direct conscious control will be more effective.

16. Point: Ants not bringing food to neighbors.

Why?: Ants emptying their own trash.

What's Wrong? Takes for granted that because something is trash, it cannot be food. (Most ants are not as proper as most people are.)

17. Point: Nina failed in her obligation to help someone in need.

Why?: She drove past someone stopped on the side of the road.

What's Wrong? Fails to consider that the person may not have needed help. Perhaps the person was picking flowers.

18. Point: Senator's claim that national security is his top priority is without merit.

Why?: The Senator will not vote for increasing military spending.

What's Wrong? Takes for granted that increasing military spending and prioritizing national security are congruent. Maybe building bombs is not the best way to be safe.

19. Point: Video game sales will stop increasing in the near future.

Why?: The age demographic that has traditionally bought the most games is shrinking.

What's Wrong? Takes for granted that the age demographic of users is static. Maybe more people will continue to play games into adulthood than in the past.

20. Point: The loans have had some positive impact in improving country's overall economy.

Why?: It has helped the businesses that received the loans.

What's Wrong? Takes for granted that the improvement of these businesses has improved the overall economic condition. Perhaps these companies have improved at the expense of consumers, who are forced to buy items at an unfair price.

Problem Set

Directions: Go ahead and solve these ten questions to the best of your ability. You will recognize the arguments from our previous exercises. We'll discuss these questions over the next few lessons. all questions are from the June '07 exam

2.2. All Labrador retrievers bark a great deal. All Saint Bernards bark infrequently. Each of Rosa's dogs is a cross between a Labrador retriever and a Saint Bernard. Therefore, Rosa's dogs are moderate barkers.

Which one of the following uses flawed reasoning that most closely resembles the flawed reasoning used in the argument above?

- (A) All students who study diligently make good grades. But some students who do not study diligently also make good grades. Jane studies somewhat diligently. Therefore, Jane makes somewhat good grades.
- (B) All type A chemicals are extremely toxic to human beings. All type B chemicals are nontoxic to human beings. This household cleaner is a mixture of a type A chemical and a type B chemical. Therefore, this household cleaner is moderately toxic.
- (C) All students at Hanson School live in Green County. All students at Edwards School live in Winn County. Members of the Perry family attend both Hanson and Edwards. Therefore, some members of the Perry family live in Green County and some live in Winn County.
- (D) All transcriptionists know shorthand. All engineers know calculus. Bob has worked both as a transcriptionist and as an engineer. Therefore, Bob knows both shorthand and calculus.
- (E) All of Kenisha's dresses are very well made. All of Connie's dresses are very badly made. Half of the dresses in this closet are very well made, and half of them are very badly made. Therefore, half of the dresses in this closet are Kenisha's and half of them are Connie's.

2.9. Although video game sales have increased steadily over the past 3 years, we can expect a reversal of this trend in the very near future. Historically, over three quarters of video games sold have been purchased by people from 13 to 16 years of age, and the number of people in this age group is expected to decline steadily over the next 10 years.

Which one of the following, if true, would most seriously weaken the argument?

- (A) Most people 17 years old or older have never purchased a video game.
- (B) Video game rentals have declined over the past 3 years.
- (C) New technology will undoubtedly make entirely new entertainment options available over the next 10 years.
- (D) The number of different types of video games available is unlikely to decrease in the near future.
- (E) Most of the people who have purchased video games over the past 3 years are over the age of 16.

2.17. Hospital executive: At a recent conference on nonprofit management, several computer experts maintained that the most significant threat faced by large institutions such as universities and hospitals is unauthorized access to confidential data. In light of this testimony, we should make the protection of our clients' confidentiality our highest priority.

The hospital executive's argument is most vulnerable to which one of the following objections?

- (A) The argument confuses the causes of a problem with the appropriate solutions to that problem.
- (B) The argument relies on the testimony of experts whose expertise is not shown to be sufficiently broad to support their general claim.
- (C) The argument assumes that a correlation between two phenomena is evidence that one is the cause of the other.
- (D) The argument draws a general conclusion about a group based on data about an unrepresentative sample of that group.
- (E) The argument infers that a property belonging to large institutions belongs to all institutions.

2.21. Driver: My friends say I will one day have an accident because I drive my sports car recklessly. But I have done some research, and apparently minivans and larger sedans have very low accident rates compared to sports cars. So trading my sports car in for a minivan would lower my risk of having an accident.

The reasoning in the driver's argument is most vulnerable to criticism on the grounds that this argument

- (A) infers a cause from a mere correlation
- (B) relies on a sample that is too narrow
- (C) misinterprets evidence that a result is likely as evidence that the result is certain
- (D) mistakes a condition sufficient for bringing about a result for a condition necessary for doing so
- (E) relies on a source that is probably not well-informed

Problem Set (Continued)

all questions are from the June '07 exam

2.23. Philosopher: An action is morally right if it would be reasonably expected to increase the aggregate well-being of the people affected by it. An action is morally wrong if and only if it would be reasonably expected to reduce the aggregate well-being of the people affected by it. Thus, actions that would be reasonably expected to leave unchanged the aggregate well-being of the people affected by them are also right.

The philosopher's conclusion follows logically if which one of the following is assumed?

- (A) Only wrong actions would be reasonably expected to reduce the aggregate well-being of the people affected by them.
- (B) No action is both right and wrong.
- (C) Any action that is not morally wrong is morally right.
- (D) There are actions that would be reasonably expected to leave unchanged the aggregate well-being of the people affected by them.
- (E) Only right actions have good consequences.

3.5. Atrens: An early entomologist observed ants carrying particles to neighboring ant colonies and inferred that the ants were bringing food to their neighbors. Further research, however, revealed that the ants were emptying their own colony's dumping site. Thus, the early entomologist was wrong.

Atrens's conclusion follows logically if which one of the following is assumed?

- (A) Ant societies do not interact in all the same ways that human societies interact.
- (B) There is only weak evidence for the view that ants have the capacity to make use of objects as gifts.
- (C) Ant dumping sites do not contain particles that could be used as food.
- (D) The ants to whom the particles were brought never carried the particles into their own colonies.
- (E) The entomologist cited retracted his conclusion when it was determined that the particles the ants carried came from their dumping site.

3.13. Therapist: Cognitive psychotherapy focuses on changing a patient's conscious beliefs. Thus, cognitive psychotherapy is likely to be more effective at helping patients overcome psychological problems than are forms of psychotherapy that focus on changing unconscious beliefs and desires, since only conscious beliefs are under the patient's direct conscious control.

Which one of the following, if true, would most strengthen the therapist's argument?

- (A) Psychological problems are frequently caused by unconscious beliefs that could be changed with the aid of psychotherapy.
- (B) It is difficult for any form of psychotherapy to be effective without focusing on mental states that are under the patient's direct conscious control.
- (C) Cognitive psychotherapy is the only form of psychotherapy that focuses primarily on changing the patient's conscious beliefs.
- (D) No form of psychotherapy that focuses on changing the patient's unconscious beliefs and desires can be effective unless it also helps change beliefs that are under the patient's direct conscious control.
- (E) All of a patient's conscious beliefs are under the patient's conscious control, but other psychological states cannot be controlled effectively without the aid of psychotherapy.

Problem Set (Continued)

all questions are from the June '07 exam

3.14. Commentator: In academic scholarship, sources are always cited, and methodology and theoretical assumptions are set out, so as to allow critical study, replication, and expansion of scholarship. In open-source software, the code in which the program is written can be viewed and modified by individual users for their purposes without getting permission from the producer or paying a fee. In contrast, the code of proprietary software is kept secret, and modifications can be made only by the producer, for a fee. This shows that open-source software better matches the values embodied in academic scholarship, and since scholarship is central to the mission of universities, universities should use only open-source software.

The commentator's reasoning most closely conforms to which one of the following principles?

- (A) Whatever software tools are most advanced and can achieve the goals of academic scholarship are the ones that should alone be used in universities.
- (B) Universities should use the type of software technology that is least expensive, as long as that type of software technology is adequate for the purposes of academic scholarship.
- (C) Universities should choose the type of software technology that best matches the values embodied in the activities that are central to the mission of universities.
- (D) The form of software technology that best matches the values embodied in the activities that are central to the mission of universities is the form of software technology that is most efficient for universities to use.
- (E) A university should not pursue any activity that would block the achievement of the goals of academic scholarship at that university.

3.17. When exercising the muscles in one's back, it is important, in order to maintain a healthy back, to exercise the muscles on opposite sides of the spine equally. After all, balanced muscle development is needed to maintain a healthy back, since the muscles on opposite sides of the spine must pull equally in opposing directions to keep the back in proper alignment and protect the spine.

Which one of the following is an assumption required by the argument?

- (A) Muscles on opposite sides of the spine that are equally well developed will be enough to keep the back in proper alignment.
- (B) Exercising the muscles on opposite sides of the spine unequally tends to lead to unbalanced muscle development.
- (C) Provided that one exercises the muscles on opposite sides of the spine equally, one will have a generally healthy back.
- (D) If the muscles on opposite sides of the spine are exercised unequally, one's back will be irreparably damaged.
- (E) One should exercise daily to ensure that the muscles on opposite sides of the spine keep the back in proper alignment.

Problem Set (Continued)

all questions are from the June '07 exam

3.20. We should accept the proposal to demolish the old train station, because the local historical society, which vehemently opposes this, is dominated by people who have no commitment to long-term economic well-being. Preserving old buildings creates an impediment to new development, which is critical to economic health.

The flawed reasoning exhibited by the argument above is most similar to that exhibited by which one of the following arguments?

- (A) Our country should attempt to safeguard works of art that it deems to possess national cultural significance. These works might not be recognized as such by all taxpayers, or even all critics. Nevertheless, our country ought to expend whatever money is needed to procure all such works as they become available.
- (B) Documents of importance to local heritage should be properly preserved and archived for the sake of future generations. For, if even one of these documents is damaged or lost, the integrity of the historical record as a whole will be damaged.
- (C) You should have your hair cut no more than once a month. After all, beauticians suggest that their customers have their hair cut twice a month, and they do this as a way of generating more business for themselves.
- (D) The committee should endorse the plan to postpone construction of the new expressway. Many residents of the neighborhoods that would be affected are fervently opposed to that construction, and the committee is obligated to avoid alienating those residents.
- (E) One should not borrow even small amounts of money unless it is absolutely necessary. Once one borrows a few dollars, the interest starts to accumulate. The longer one takes to repay, the more one ends up owing, and eventually a small debt has become a large one.

Here are the answers. As mentioned, we will not include detailed solutions in this lesson, but rather use these questions for our discussion in the next few lessons. However, if you just can't wait, I've included page numbers for where particular questions are discussed.

	2.2	2.9	2.17	2.21	2.23	3.5	3.13	3.14	3.17	3.20
Correct	B	E	B	A	C	C	B	C	B	C
On page	250	277	242	242	262	262	277	263	270	250

17

LOGICAL REASONING

flaw, assumption & match the flaw

The third issue.

The LSAT can be thought of as a test of three things: your reading ability, your reasoning ability, and your **mental discipline**. When it comes to developing question-specific strategies, it's important to recognize the significance of the third issue: mental discipline.

As you will see in this lesson and those that follow, the strategies for how to solve questions are fairly obvious and simple—I'm not going to ask you to memorize fifteen steps that you wouldn't think to implement otherwise, and I won't ask you to look at circles and think of them as squares.

The challenge comes from the fact that the optimal strategies for different types of questions sometimes complement one another and sometimes come into dangerous conflict. If you aren't conscious of this fact, and if you haven't trained yourself to retain a specific mental discipline, invariably you will mix up strategies for different types of questions, in ways you may not even be aware of, and this will lead to confusion and fuzziness. Fuzziness is not our friend.

In almost all instances, fuzziness is a consequence of a lack of planning and a misunderstanding of priorities during your study process. Remember that the person who has LSAT mastery isn't any better at thinking about more things, but rather, is better at thinking about the right things. In the lessons to come, the most important thing for you to do is to develop a simple and usable understanding of what each question stem is really asking for, and to develop a simple and usable skill set for consistently getting the job done. We are going to practice thinking about exactly the right things. The quote, "smart is simple," is consistently true of the LSAT, but it is particularly true of what we'll be discussing in these lessons.

smart → simple

Flaw Questions

"The reasoning in the argument is most vulnerable to criticism on the grounds that it..."

"The reasoning in the argument is flawed in that..."

"Which of the following is an error in the reasoning?"

What's wrong?

We are going to start our breakdown of question types with questions that ask you to identify what is wrong with the reasoning in an argument.

What's most important to remember about reasoning flaws is that they are not contained in the conclusion and they are not contained in the support. What we are interested in is figuring out what is wrong with using that particular support to reach that particular conclusion. Focus on this, and most incorrect answers become far more obviously so. If you critique or find fault with a conclusion without thinking about how it's being supported, you are essentially doing nothing more than giving your opinion on that particular point, and in no way whatsoever is the LSAT ever interested in your opinion about anything. Let's discuss the steps involved in solving a question that asks you to identify what is wrong.

SUPER-SIMPLE EXAMPLE

Carl says he is friends with Frank, but the other day I saw the two of them arguing. Therefore, Carl and Frank are clearly not friends.

The reasoning in the argument is flawed in that

- (A) it takes for granted that Frank and Carl do not have other friends in common.
- (B) it takes for granted that Carl frequently lies.
- (C) it takes for granted that only friends argue.
- (D) it takes for granted that only enemies argue.
- (E) it fails to consider that Carl and Frank can argue but still be friends.

The correct answer is (E). Certain answers are wrong because they aren't actually related to the argument (A). Others are wrong because they don't relate to the author's point (B), and finally others are wrong because they misrepresent the reason/point relationship (C), (D).

^{step one} understand your job

Begin each question by reading the question stem. Flaw question stems are worded in just a few different ways, and you should have little trouble recognizing that a question is a Flaw question.

We want to use the question stem to set our expectations. Once we see that it's a Flaw question, we know that our job is to find an argument in the stimulus, and to figure out what is wrong with that argument. Our expectation should be to have a very clear understanding of the flaw before moving on to the answer choices. This won't always be possible, but it definitely should be the norm.

^{two} find the point

You will use your first read of the stimulus to get a handle on the subject matter and the general relationship between the sentences and clauses.

However, your conscious focus should not be set on getting a bunch of different tasks done; rather, during your first read, you want to prioritize identifying the conclusion of the argument.

This conclusion will be the most important thing you think about during the rest of your process, and your understanding of it will play a big part in making easier every other part of the process.

If the conclusion is unclear, do not move on in your process. Figure out that conclusion before moving forward.

^{three} find the support

It's tough to find the support until you find the conclusion! However, once you know what the main point is, your next job is to dig through the argument to figure out how that point is being supported. Keep in mind that even when the support is spread out in two or three sentences, conclusions are supported either by just one reason or two reasons.

Your understanding of the task really comes into play when you encounter a longer stimulus. Longer stimuli can look intimidating, but in large part they are just testing your ability to wade through secondary information in order to identify a point and its support. Think of a longer stimulus not as an Easter egg hunt with more eggs, but rather the normal amount of eggs spread out over a larger area. When you run into a long stimulus, you should not expect to have to find extra reasoning, or retain more information. Rather, you should see it as more clutter around the typical volume of important information.

four figure out what's wrong

This is the step. Steps one through three serve to put you in a position to perform this step well, and the remaining steps are a reflection of how well you do here.

We've already discussed this step in great detail, and to the side are some simple reminders of what we've discussed. One important point is that you ought to strive for a conceptual, rather than textual, understanding of flaws. That is, you should know what is wrong, rather than some wording of what is wrong. Answers will represent flaws in ways you don't expect.

Perhaps most importantly, you should expect to have a strong understanding of the flaw for nearly every question you see. Keep in mind that no flaw you see on your exam will be unique; all of them will be ones you've seen numerous times in your prep. There are some ways to survive the few questions for which you don't have a strong sense of the flaw, but it is impossible to consistently perform well unless you are very good at seeing what is wrong with arguments.

five get rid of answers

The previous step was the most important step, but this is the step that most defines high-scorers: in order to do really well (in 35 minutes) you need to be awfully good at getting rid of wrong answers. During your first run through the answer choices, leave alone any answers that sound pretty good, and focus on thinking about why answers are wrong. For Flaw questions, you should expect to consistently get rid of at least three (and commonly four) of the answer choices before you seriously consider whether one answer is accurate.

This step is in many ways a reflection of how well you've performed the previous steps, and in particular how well you have prioritized the important information. If you are zealous in on what is wrong with the relationship between point and support, you will find most answer choices to fall outside of that realm. If you are holding the entire stimulus in your head without a sense of priority, many of the wrong choices will seem far more attractive.

Many wrong answers will have nothing to do with the stimulus at all (these answers are commonly about related subjects). Many wrong answers will have something to do with the secondary information in the argument, but no relevance to the point being made. Many wrong answers will relate to the conclusion or premise but not the relationship between the two. And finally, a few wrong answers will misrepresent the relationship between the support and the conclusion in some way. These wrong answers are generally the most attractive ones, and tempting wrong answers are often what defines whether a question is difficult or not.

six confirm the right answer

Left with just one or two serious contenders, now you should carefully evaluate the answer choice(s) to make sure it matches your understanding of the flaw. Go word for word, and in particular pay attention to modifiers that may create a disconnect between the answer choice and the stimulus.

Keep in mind that it can often seem like you can get away with partially fulfilling steps five or six, but for almost all top scorers, a huge key to success is double-covering the bases—knowing exactly what is wrong and why, and exactly what is right and why. Over the long run, this method of essentially getting to the answer in two ways will be very helpful in ensuring a certain level of accuracy. Finally, keep in mind that all of these strategies are designed to get us to the right answer as quickly as we can (but no quicker).

SIMPLE EXAMPLES OF FLAWS

Piece ≠ Puzzle

All architects must be good at math. Jerry is good with math; it's likely he would be a good architect. (*maybe Jerry has terrible design sense*)

Tom says Perry is smart but Tom is his father and Tom is biased. Therefore, Perry must not be smart. (*Tom can be biased, and Perry can still be smart*)

Apples ≠ Oranges

Anyone who works at TempKids gets a badge. Since Sara has a badge, she must work at TempKids. (*other people can get badges too*)

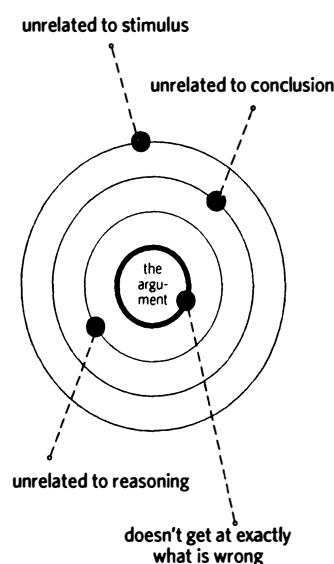
No one can be all good. Therefore, it must be true that we all have at least some evil. (*not everything has to be either good or evil*)

1 + 1 ≠ 3

Bridget loves Ted and Ted loves Carol. Therefore, Bridget must love Carol. (*love does not necessarily transfer*)

Of those who went on the camping trip, only those who drank my homemade soda got sick. My soda must have made them sick. (*maybe they all drank the soda while eating bad meat*)

CONSTELLATION OF WRONG ANSWERS



the process in action

Let's model the problem-solving process with two questions you solved at the end of the last lesson.

2.17. Hospital executive: At a recent conference on nonprofit management, several computer experts maintained that the most significant threat faced by large institutions such as universities and hospitals is unauthorized access to confidential data. In light of this testimony, we should make the protection of our clients' confidentiality our highest priority.

The hospital executive's argument is most vulnerable to which one of the following objections?

- (A) The argument confuses the causes of a problem with the appropriate solutions to that problem.
- (B) The argument relies on the testimony of experts whose expertise is not shown to be sufficiently broad to support their general claim.
- (C) The argument assumes that a correlation between two phenomena is evidence that one is the cause of the other.
- (D) The argument draws a general conclusion about a group based on data about an unrepresentative sample of that group.
- (E) The argument infers that a property belonging to large institutions belongs to all institutions.

Step 1: understand your job: We have to find an argument and figure out what's wrong with it.

Step 2: find the point: His point is that "we should make the protection of our clients' confidentiality our highest priority."

Step 3: find the support: Several computer experts said it ought to be.

Step 4: figure out what's wrong: Of course computer experts would say that! Just because one niche groups thinks a certain issue is most important doesn't mean it actually is.

Step 5: get rid of answers: (A) doesn't represent this argument at all. (B) isn't exactly what we expected, but it's tough to say what's wrong. Keep it. (C) is about correlation versus causation, but that's not our problem. (D) sounds good. Keep it. (E) is not directly relevant to this conclusion.

Step 6: confirm the right answer: The "general claim" in (B) is the claim the experts make, and it's true that the issue is that their opinion is just one part of the picture—we haven't been given proof ("is not shown to be sufficiently...") that their opinion is correct. (B) seems good. (D) sounded tempted at first, but looking at it more carefully, we can see that (D) is about "data" from a "sample of that group" and neither of those descriptions fits this argument. (B) is correct.

Step 1: understand your job: We have to find an argument and figure out what's wrong with it.

Step 2: find the point: His point is that trading in his sports car for a minivan will lower his risk of having an accident.

Step 3: find the support: Minivans have lower accident rates than sports cars.

Step 4: figure out what's wrong: Mistakes the correlation between accident rate and car type for causation—it could be that safer drivers choose minivans, and if he continues to drive recklessly the type of car won't matter.

Step 5: get rid of answers: (A) seems correct. Keep it. (B) doesn't accurately represent what's wrong. (C) doesn't match the conclusion. We've talked about (D) (in lesson 7) and that's not what is happening in this argument. (E) doesn't match this argument. Who is supposed to be not well informed?

Step 6: confirm the right answer: Here we only have one answer to check. No strange wording in (A) and it does represent what this author is doing—he reaches his conclusion by inferring that there must be some causal connection between the type of car and the accident rate—we don't have information in the argument to say that this is anything more than correlation.

2.21. Driver: My friends say I will one day have an accident because I drive my sports car recklessly. But I have done some research, and apparently minivans and larger sedans have very low accident rates compared to sports cars. So trading my sports car in for a minivan would lower my risk of having an accident.

The reasoning in the driver's argument is most vulnerable to criticism on the grounds that this argument

- (A) infers a cause from a mere correlation
- (B) relies on a sample that is too narrow
- (C) misinterprets evidence that a result is likely as evidence that the result is certain
- (D) mistakes a condition sufficient for bringing about a result for a condition necessary for doing so
- (E) relies on a source that is probably not well-informed

Flaw Questions

Here are three Flaw questions. Use these questions to work on your problem-solving process. Solutions follow.

29.1.14. Prosecutor: Dr. Yuge has testified that, had the robbery occurred after 1:50 A.M., then, the moon having set at 1:45 A.M., it would have been too dark for Klein to recognize the perpetrator. But Yuge acknowledged that the moon was full enough to provide considerable light before it set. And we have conclusively shown that the robbery occurred between 1:15 and 1:30 A.M. So there was enough light for Klein to make a reliable identification.

The prosecutor's reasoning is most vulnerable to criticism because it overlooks which one of the following possibilities?

- (A) Klein may be mistaken about the time of the robbery and so it may have taken place after the moon had set.
- (B) The perpetrator may closely resemble someone who was not involved in the robbery.
- (C) Klein may have been too upset to make a reliable identification even in good light.
- (D) Without having been there, Dr. Yuge has no way of knowing whether the light was sufficient.
- (E) During the robbery the moon's light may have been interfered with by conditions such as cloud cover.

29.4.18. All actions are motivated by self-interest, since any action that is apparently altruistic can be described in terms of self-interest. For example, helping someone can be described in terms of self-interest: the motivation is hope for a reward or other personal benefit to be bestowed as a result of the helping action.

Which one of the following most accurately describes an error in the argument's reasoning?

- (A) The term "self-interest" is allowed to shift in meaning over the course of the argument.
- (B) The argument takes evidence showing merely that its conclusion could be true to constitute evidence showing that the conclusion is in fact true.
- (C) The argument does not explain what is meant by "reward" and "personal benefit."
- (D) The argument ignores the possibility that what is taken to be necessary for a certain interest to be a motivation actually suffices to show that that interest is a motivation.
- (E) The argument depends for its appeal only on the emotional content of the example cited.

29.4.25. Formal performance evaluations in the professional world are conducted using realistic situations. Physicians are allowed to consult medical texts freely, attorneys may refer to law books and case records, and physicists and engineers have their manuals at hand for ready reference. Students, then, should likewise have access to their textbooks whenever they take examinations.

The reasoning in the argument is questionable because the argument

- (A) cites examples that are insufficient to support the generalization that performance evaluations in the professional world are conducted in realistic situations
- (B) fails to consider the possibility that adopting its recommendation will not significantly increase most students' test scores
- (C) neglects to take into account the fact that professionals were once students who also did not have access to textbooks during examinations
- (D) neglects to take into account the fact that, unlike students, professionals have devoted many years of study to one subject
- (E) fails to consider the possibility that the purposes of evaluation in the professional world and in school situations are quite dissimilar

Stick to the steps!

1. understand your job
2. find the point
3. find the support
4. figure out what's wrong
5. get rid of answers
6. confirm the right answer

Flaw Question Solutions

29.1.14. Prosecutor: Dr. Yuge has testified that, had the robbery occurred after 1:50 A.M., then, the moon having set at 1:45 A.M., it would have been too dark for Klein to recognize the perpetrator. But Yuge acknowledged that the moon was full enough to provide considerable light before it set. And we have conclusively shown that the robbery occurred between 1:15 and 1:30 A.M. So there was enough light for Klein to make a reliable identification.

The prosecutor's reasoning is most vulnerable to criticism because it overlooks which one of the following possibilities?

- (A) Klein may be mistaken about the time of the robbery and so it may have taken place after the moon had set.
- (B) The perpetrator may closely resemble someone who was not involved in the robbery.
- (C) Klein may have been too upset to make a reliable identification even in good light.
- (D) Without having been there, Dr. Yuge has no way of knowing whether the light was sufficient.
- (E) During the robbery the moon's light may have been interfered with by conditions such as cloud cover.

29.4.18. All actions are motivated by self-interest, since any action that is apparently altruistic can be described in terms of self-interest. For example, helping someone can be described in terms of self-interest: the motivation is hope for a reward or other personal benefit to be bestowed as a result of the helping action.

Which one of the following most accurately describes an error in the argument's reasoning?

- (A) The term "self-interest" is allowed to shift in meaning over the course of the argument.
- (B) The argument takes evidence showing merely that its conclusion could be true to constitute evidence showing that the conclusion is in fact true.
- (C) The argument does not explain what is meant by "reward" and "personal benefit."
- (D) The argument ignores the possibility that what is taken to be necessary for a certain interest to be a motivation actually suffices to show that that interest is a motivation.
- (E) The argument depends for its appeal only on the emotional content of the example cited.

1. understand your job: We have to find an argument and figure out what's wrong with it (what he's overlooked).

2. find the point: His point is that there was enough light for Klein to make a reliable identification.

3. find the support: The moon was giving off light at that time.

4. figure out what's wrong: Maybe the moon was out, but it was dark for some other reason!

5. get rid of answers: (A) questions the support, and doesn't fix the reasoning issue (moon is not the only factor when it comes to brightness). (B) and (C) are both unrelated to the support/conclusion relationship. (D) and (E) both seem like the types of answers we were looking for.

6. confirm the right answer: Did Dr. Yuge have to be there? Was that what is wrong with the argument? No. He is just testifying about when the moon goes down—he didn't have to be at the scene. Plus "no way" is too strong—he could know if he saw an accurate video-recording. The "cloud cover" in (E) is fairly specific, but that's just one example, and really what (E) is telling us is that there could have been other lighting factors other than just the amount of moonlight. (E) is correct.

1. understand your job: We have to find an argument and figure out what's wrong with it.

2. find the point: All actions are motivated by self-interest.

3. find the support: Any action that doesn't seem like it was driven by self-interest can be described in terms of self-interest.

4. figure out what's wrong: Just because you can describe an action as being motivated by self-interest doesn't actually mean that that description is correct.

5. get rid of answers: (A) isn't what is happening in the argument. (B) is somewhat tempting—let's leave it. (C) is about secondary issues. (D) doesn't represent this argument, which has nothing to do with necessary or sufficient. (E) doesn't represent the argument.

6. confirm the right answer: (B) is the only one standing. It didn't look great at first but let's take another look. It says the argument takes what could be true (actions could be motivated by self-interest) to prove that it is true (actions are motivated by self-interest). This may not match the way we first thought of the flaw, but it does represent the same issue. (B) is correct.

Flaw Question Solutions

29.4.25. Formal performance evaluations in the professional world are conducted using realistic situations. Physicians are allowed to consult medical texts freely, attorneys may refer to law books and case records, and physicists and engineers have their manuals at hand for ready reference. Students, then, should likewise have access to their textbooks whenever they take examinations.

The reasoning in the argument is questionable because the argument

- (A) cites examples that are insufficient to support the generalization that performance evaluations in the professional world are conducted in realistic situations
- (B) fails to consider the possibility that adopting its recommendation will not significantly increase most students' test scores
- (C) neglects to take into account the fact that professionals were once students who also did not have access to textbooks during examinations
- (D) neglects to take into account the fact that, unlike students, professionals have devoted many years of study to one subject
- (E) fails to consider the possibility that the purposes of evaluation in the professional world and in school situations are quite dissimilar

1. understand your job: We have to find an argument and figure out what's wrong with it.

2. find the point: Students should get open textbooks for exams.

3. find the support: Professionals get to consult books in real life situations.

4. figure out what's wrong: It treats two very different situations as if they are similar.

5. get rid of answers: (A) attacks the support, but isn't directly related to the conclusion. (B) is way off subject. (C) represents the issue incorrectly; what these professionals did as students is irrelevant to the comparison. (D) is tempting, in that it shows a difference between these professionals and the students. Let's keep it. (E) is pretty much what we were looking for. Keep it.

6. confirm the right answer: Yes, (D) does represent a difference, but it's unclear what impact "years of study" have on whether one should get books or not—it doesn't make a ton of sense to say that because professionals have experience, and students don't, that professionals should get help and students not (seems it should be the other way around). Checking each word of (E), we can confirm it does represent the issue we saw—the author is comparing apples and oranges. (E) is correct.

answer choices with

abstract language

Test writers occasionally write the answer choices for Flaw questions in an abstract fashion; that is, they describe the flaw in general terms—often in terms of formal reasoning issues. These answer choices can be more difficult to understand correctly, and if you have two or three answer choices written in such a way, they can make the question tougher to handle and more time-consuming.

Abstract language used to be a more frequent challenge for Flaw questions, but has become less common in the modern era. Today, you can expect this challenge maybe once per every exam or two.

You make your job far easier if you have done two other things well: one, developed a flexible, conceptual understanding of

the flaw in your mind, and two, focused on eliminating answers that don't represent that flaw. Go two for two, and it'll commonly leave you with just one answer choice that needs to be evaluated carefully, and you'll be in a better position to evaluate that one choice.

Below is a mini-drill to help you test your own comfort level with abstract answer choices. Listed are “sister” representations of all of the more challenging abstract flaw answers that appear in the problems from PT 52-61, along with very obvious examples of each of these flaws. Do your best to match the abstract language with its representative flaw. Solutions are below. If you have trouble with these answers, you should return to review this exercise a few more times later on in your studies.

Match these answers...

1. infers from the fact that a certain factor is sufficient for a result that the absence of that factor is sufficient for the opposite result
2. takes for granted that, if a condition coincided with the emergence of a certain phenomenon, it must have been causally responsible for that phenomenon
3. fails to address adequately the possibility that even if a condition is sufficient to produce an effect it may not be necessary
4. mistakes a merely relative property for one that is absolute
5. presents as a premise a claim that one would accept as true only if one already accepts the truth of the conclusion
6. bases a generalization on a sample that is likely to be unrepresentative
7. interprets an assertion that certain conditions are necessary as asserting that those conditions are sufficient

...to these faulty arguments.

- A. Of course what the mayor is saying is true. He would not be saying it otherwise.
- B. In order to become a pop star, one needs to be able to dance well. Since I can dance well, I will become a pop star.
- C. Since Jessica has more money than Tara, Jessica must be rich.
- D. Since eating sushi makes one healthy, not eating sushi makes one unhealthy.
- E. I got sick right after I ate that taco. The taco must have made me sick.
- F. I got fit by working out every day. If you want to get fit, you must work out every day.
- G. Since the managers at the company state that their employees are thoroughly grateful to be working under them, this must indeed be the case.

Answers: 1D 2E 3F 4C 5A 6G 7B

Assumption Questions

A less common sibling of the Flaw question is the Basic Assumption question. Keep in mind that there are several different types of assumption questions, and your task becomes very different when words like “required” or “follow logically” accompany the word assumption. We will deal with these other types of questions in future lessons. In this lesson, we will just quickly discuss Basic Assumption questions—those that simply ask us what the author is assuming.

For the purposes of the LSAT, we can define an assumption as an unstated and unjustified belief.

We don’t need to spend a lot of time on these questions because they are not too common and because you’ve already prepared for them: Basic Assumption questions are simply Flaw questions in disguise. Any time an author has made a *mistake* in thinking that his evidence is enough to reach his conclusion, he has *assumed* that his evidence is enough to reach his conclusion.

Think of “assuming” as a kinder version of “takes for granted.” When you run into an Assumption question, think about the stimulus exactly as you would for a Flaw question. Once you figure out what the flaw is, search for that answer that expresses that flaw as an assumption.

Below are the stimuli for the three Flaw problems you just solved, along with their question stems and correct answers. Right below is the question and answer rewritten as it would be for a Basic Assumption question.

Flaw Questions As Basic Assumption Questions

29.1.14 Prosecutor: Dr. Yuge has testified that, had the robbery occurred after 1:50 A.M., then, the moon having set at 1:45 A.M., it would have been too dark for Klein to recognize the perpetrator. But Yuge acknowledged that the moon was full enough to provide considerable light before it set. And we have conclusively shown that the robbery occurred between 1:15 and 1:30 A.M. So there was enough light for Klein to make a reliable identification.

The prosecutor’s reasoning is most vulnerable to criticism because it overlooks which one of the following possibilities?

(E) During the robbery the moon’s light may have been interfered with by conditions such as cloud cover.

As a Basic Assumption question...

The prosecutor assumes that...

(E) Other conditions did not interfere with the moon’s light during the robbery.

29.4.18 All actions are motivated by self-interest, since any action that is apparently altruistic can be described in terms of self-interest. For example, helping someone can be described in terms of self-interest: the motivation is hope for a reward or other personal benefit to be bestowed as a result of the helping action.

Which one of the following most accurately describes an error in the argument’s reasoning?

(B) The argument takes evidence showing merely that its conclusion could be true to constitute evidence showing that the conclusion is in fact true.

As a Basic Assumption question...

The author assumes that...

(B) Because the motivation for all actions can be described in terms of self-interest, all actions are in fact motivated by self-interest.

29.4.25 Formal performance evaluations in the professional world are conducted using realistic situations. Physicians are allowed to consult medical texts freely, attorneys may refer to law books and case records, and physicists and engineers have their manuals at hand for ready reference. Students, then, should likewise have access to their textbooks whenever they take examinations.

The reasoning in the argument is questionable because the argument

(E) fails to consider the possibility that the purposes of evaluation in the professional world and in school situations are quite dissimilar

As a Basic Assumption question...

What does the argument assume?

(E) Purposes of evaluation in the professional world and in school situations is similar

Match the Flaw

"The pattern of flawed reasoning in which one of the following arguments is most similar to that in the economist's argument?"

"Which one of the following arguments contains flawed reasoning most similar to that in the argument above?"

SUPER-SIMPLE EXAMPLE

All of the hats are on sale, and all of the sale items are on the display. Since this item is on the display, it must be a hat.

Which one of the following arguments contains flawed reasoning most similar to that in the argument above?

(A) All of my tools were in the garage, and everything in the garage got packed up. Since this item was packed up, it must be a tool.

(B) All dogs like playing fetch, but few cats do. Therefore, most animals that like playing fetch are dogs.

(C) Every person who went got a stamp. Since Sara did not go, she did not get a stamp.

(D) Some people love television. Some people hate television. Since you do not hate television, you must love it.

(E) Joey says ghosts are real. Since he is not intending to lie, ghosts must be real.

Common Problems.

The two matching questions—Match the Flaw and Match the Reasoning—are on average more labor-intensive than other types of questions, so when you run into them, you should give yourself a bit more time (an average of 1:30 to 1:40 per is fine).

On a closely related note, the two types of matching questions are also some of the most dangerous time suckers—if you don't make staying on task a priority, it's very easy to get lost in all of the different arguments. Find out what's wrong with the original and then eliminate mismatches. Get in, get out, and try not to waste time thinking about secondary issues. You can do this if you practice enough to turn efficient strategies into habits.

For whatever reason, these questions tend to most commonly come right at the beginning of a section, or right near the end of one. If it is toward the beginning, expect for the flaw to be obvious, and all of the wrong answers to be obviously so. A question that appears later in the section will still have an obvious flaw, but it may have a more complicated support structure, or wrong answers that require a bit more work.

The correct answer is (A). The four wrong answers do not contain the same flaw, and many of them are very different in structure from the original. The original argument has nothing like the dogs versus cats in (B). (C) has a negation from support to conclusion, which our argument didn't have. (D) has "some" issues; our argument doesn't. (E) is about not intending something—we have no match for that in the original.

step one understand your job

Once that we see that it is a Match the Flaw question, we know that our job during the initial read is to find an argument in the stimulus, and to figure out what is wrong with the argument. Our expectation should be to have a very clear understanding of the flaw before moving on to the answer choices. This won't always be possible, but it definitely should be the norm. We should also expect to spend more time in the answer choices than we normally do.

find the point

As you read through a stimulus the first time, you will develop a general sense of the subject matter and argument no matter if you try or not. The key is to not fragment your primary focus. During your first read, prioritize identifying the main point of the argument.

It is especially important that you have a clear understanding of the conclusion for Match the Flaw questions. These questions require you to wade through a lot of information in the five answer choices, and the conclusion serves as a very clear signal post.

If the conclusion is unclear, do not move on in your process. Figure out that conclusion.

find the support

In general (not always) match the flaw questions tend to have a bit less secondary information than do other types of questions.

Therefore, most commonly, most of the information in a stimulus other than the conclusion will be support for that conclusion (or background critical for understanding that support).

^{four} figure out what's wrong

Again, this is the step. Steps one through three serve to put you in a position to perform this step well, and the remaining steps are a reflection of how you do here.

The good news is that Match the Flaw questions tend to, on average, have fairly obvious flaws. They are arguments that you know are wrong the first time you read them. The bad news is that Matching questions in general tend to have $1 + 1 \approx 3$ types of flaws. That makes a lot of sense when you think about what these questions are testing (your ability to keep an argument in your mind as you think of other arguments).

Of course, it's not enough to think, "Oh, he's putting two premises together incorrectly," because it's likely that several answers will do that. As always, you want to develop as specific an understanding as possible of exactly what is wrong with the reasoning in that particular argument.

^{five} get rid of answers

For Match the Flaw questions, this is the step that will make or break you. If you have a great sense of what is wrong with the argument, chances are you will be able to get rid of four or five answers quickly. However, if you run into an argument that you have trouble holding in your head, or if you run into that rare (very rare) Match the Flaw question that has a close-but-no-cigar wrong answer, you can end up wasting a lot of valuable time.

Matching questions work very much like those games you played when you were very little where you look at two almost identical pictures and have to figure out what is different about them. The secret then was to focus on one part of the picture at a time (if you look at both of them as wholes you won't see the differences as easily).

It's the same key here. You don't have to think about arguments in their entirety to know that they are not good matches. Many answers will be wrong because they clearly reach very different conclusions. Many will be wrong because they use different support (there are qualifiers like "some" when there weren't in the original argument, or the original had an either/or and the answer choice does not). You want to find the quickest and most absolute reason to say that an answer is wrong, and you will know that in general, four of the five answers will have very obvious tells that show you, without you getting too deep into them, that they are different from the original. Do not use physical location (i.e., the support comes before the conclusion or the conclusion comes before the support) to match up arguments. You should only care about the reasoning structure.

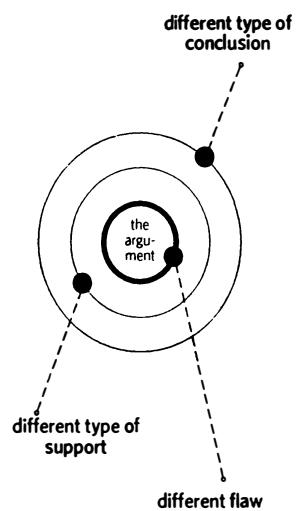
Of course, having a great understanding of what is wrong with the original argument is the key to all of this. If that understanding is fuzzy, the elimination process will naturally be more challenging.

^{six} confirm the right answer

Make sure the conclusion is the same type of conclusion. Make sure you have the same type of support. Make sure there are no stray words that change the meaning of that answer in some way. And of course make sure they have the same flaw.

It is easy, I must admit, to over-think this step. Rely on how confident you feel in your eliminations. If you feel great about them, and you see some slight change in the reasoning issue between the original argument and the correct answer (it happens), let it go. If you didn't feel so confident about eliminating that one last answer, and you're not 100% sure of the match—that could be a sign the question is a bit more difficult than you think.

CONSTELLATION OF WRONG ANSWERS



the process in action

Let's model the problem-solving process with two questions you solved at the end of the last lesson.

2.2. All Labrador retrievers bark a great deal. All Saint Bernards bark infrequently. Each of Rosa's dogs is a cross between a Labrador retriever and a Saint Bernard. Therefore, Rosa's dogs are moderate barkers.

Which one of the following uses flawed reasoning that most closely resembles the flawed reasoning used in the argument above?

- (A) All students who study diligently make good grades. But some students who do not study diligently also make good grades. Jane studies somewhat diligently. Therefore, Jane makes somewhat good grades.
- (B) All type A chemicals are extremely toxic to human beings. All type B chemicals are nontoxic to human beings. This household cleaner is a mixture of a type A chemical and a type B chemical. Therefore, this household cleaner is moderately toxic.
- (C) All students at Hanson School live in Green County. All students at Edwards School live in Winn County. Members of the Perry family attend both Hanson and Edwards. Therefore, some members of the Perry family live in Green County and some live in Winn County.
- (D) All transcriptionists know shorthand. All engineers know calculus. Bob has worked both as a transcriptionist and as an engineer. Therefore, Bob knows both shorthand and calculus.
- (E) All of Kenisha's dresses are very well made. All of Connie's dresses are very badly made. Half of the dresses in this closet are very well made, and half of them are very badly made. Therefore, half of the dresses in this closet are Kenisha's and half of them are Connie's.

1. understand your job: We have to match flaws. The first part of that is to read for an argument and figure out what's wrong with it.

2. find the point: We should accept the proposal to demolish the train station.

3. find the support: The people who want to preserve it don't care about economic well-being.

4. figure out what's wrong: Just because the people who want to preserve it aren't thinking about something does not mean the train station should be demolished—it's tough to see how their opinion has any direct impact on the decision at all. It's the common flaw of overvaluing the opinion of one group or person.

5. get rid of answers: (A) doesn't have an argument at all—it just states an opinion twice. (B) is an argument about what happens when you don't preserve—tough to see the relevance to the stimulus. (C) is somewhat tempting—it's recommending doing something based on the motivations of someone who recommends something else. Let's keep it for now. (D) is about heeding a certain opinion—we know that's a different situation than what we have. (E) has a series of premises that add together, and ultimately support a very subjective and general conclusion. This structure is very different from the original. That only leaves (C)!

6. confirm the right answer: (C) is perhaps not what we expected, in part because the scenario is very different, but it has all of the same issues as the original—the opinion of beauticians is simply not significant enough to justify making such a recommendation.

1. understand your job: We have to match flaws. The first part of that is to read for an argument and figure out what's wrong with it.

2. find the point: The point is that Rosa's dogs are moderate barkers.

3. find the support: They are crosses of a dog that barks a lot and a dog that barks a little.

4. figure out what's wrong: Who says her dogs should be an exact mix of the two? We're not all the exact average height of our parents.

5. get rid of answers: (A) has study versus not study—very different from our argument. (B) is almost exactly the same as the original. It's probably correct—keep it. (C) doesn't have the same type of problem. In fact, it's tough to see a problem at all. Different people in a family, living in different areas, is not the same as one dog having a split of characteristics. (D) is pretty close, but the conclusion is about adding together skills rather than mixing them together. (E) has different problems, and like (C), is about a different type of mixture (a closet full of individual dresses, as opposed to one dog).

6. confirm the right answer: Going back to (B), we can see that it's wrong to think the mixture will be somewhere in the middle of the two original items, just as it was wrong to think that way in the original argument. (B) is definitely correct.

3.20. We should accept the proposal to demolish the old train station, because the local historical society, which vehemently opposes this, is dominated by people who have no commitment to long-term economic well-being. Preserving old buildings creates an impediment to new development, which is critical to economic health.

The flawed reasoning exhibited by the argument above is most similar to that exhibited by which one of the following arguments?

(A) Our country should attempt to safeguard works of art that it deems to possess national cultural significance. These works might not be recognized as such by all taxpayers, or even all critics. Nevertheless, our country ought to expend whatever money is needed to procure all such works as they become available.

(B) Documents of importance to local heritage should be properly preserved and archived for the sake of future generations. For, if even one of these documents is damaged or lost, the integrity of the historical record as a whole will be damaged.

(C) You should have your hair cut no more than once a month. After all, beauticians suggest that their customers have their hair cut twice a month, and they do this as a way of generating more business for themselves.

(D) The committee should endorse the plan to postpone construction of the new expressway. Many residents of the neighborhoods that would be affected are fervently opposed to that construction, and the committee is obligated to avoid alienating those residents.

(E) One should not borrow even small amounts of money unless it is absolutely necessary. Once one borrows a few dollars, the interest starts to accumulate. The longer one takes to repay, the more one ends up owing, and eventually a small debt has become a large one.

Match the Flaw Questions

Here are two questions that ask us to match reasoning. Use these questions to walk through your problem-solving process. Solutions follow.

29.4.21. All too many weaklings are also cowards, and few cowards fail to be fools. Thus there must be at least one person who is both a weakling and a fool.

The flawed pattern of reasoning in the argument above is most similar to that in which one of the following?

- (A) All weasels are carnivores and no carnivores fail to be non-herbivores, so some weasels are nonherbivores.
- (B) Few moralists have the courage to act according to the principles they profess, and few saints have the ability to articulate the principles by which they live, so it follows that few people can both act like saints and speak like moralists.
- (C) Some painters are dancers, since some painters are musicians, and some musicians are dancers.
- (D) If an act is virtuous, then it is autonomous, for acts are not virtuous unless they are free, and acts are not free unless they are autonomous.
- (E) A majority of the voting population favors a total ban, but no one who favors a total ban is opposed to stiffer tariffs, so at least one voter is not opposed to stiffer tariffs.

30.2.6. The student body at this university takes courses in a wide range of disciplines. Miriam is a student at this university, so she takes courses in a wide range of disciplines.

Which one of the following arguments exhibits flawed reasoning most similar to that exhibited by the argument above?

- (A) The students at this school take mathematics. Miguel is a student at this school, so he takes mathematics.
- (B) The editorial board of this law journal has written on many legal issues. Louise is on the editorial board, so she has written on many legal issues.
- (C) The component parts of bulldozers are heavy. This machine is a bulldozer, so it is heavy.
- (D) All older automobiles need frequent oil changes. This car is new, so its oil need not be changed as frequently.
- (E) The individual cells of the brain are incapable of thinking. Therefore, the brain as a whole is incapable of thinking.

Stick to the steps!

1. understand your job
2. find the point
3. find the support
4. figure out what's wrong
5. get rid of answers
6. confirm the right answer

Match the Flaw Solutions

29.4.21. All too many weaklings are also cowards, and few cowards fail to be fools. Thus there must be at least one person who is both a weakling and a fool.



The flawed pattern of reasoning in the argument above is most similar to that in which one of the following?

- (A) All weasels are carnivores and no carnivores fail to be non-herbivores, so some weasels are nonherbivores.
- (B) Few moralists have the courage to act according to the principles they profess, and few saints have the ability to articulate the principles by which they live, so it follows that few people can both act like saints and speak like moralists.
- (C) Some painters are dancers, since some painters are musicians, and some musicians are dancers.
- (D) If an act is virtuous, then it is autonomous, for acts are not virtuous unless they are free, and acts are not free unless they are autonomous.
- (E) A majority of the voting population favors a total ban, but no one who favors a total ban is opposed to stiffer tariffs, so at least one voter is not opposed to stiffer tariffs.

1. understand your job: We need to find the flaw in the argument, and find an answer that has the same issue.

2. find the point: There must be at least one person who is both a weakling and a fool.

3. find the support: All too many weaklings are also cowards, and few cowards fail to be fools.

4. figure out what's wrong: Maybe the weaklings who are cowards are a part of the few who are not fools. Assumes an overlap between weaklings and cowards when we're not certain we have one.

5. get rid of answers: The premises in (A) are absolute (all, no) so we know it can't have the same reasoning issues. (B) is somewhat tempting, but the tone of the conclusion is very different (even though "at least one" and "few" mean similar things, the point the author is making is not consistent), and the structure of the support has a layer the original argument does not (i.e., moralists layered with courage). (C) has a different organizational structure (conclusion first) but the same logical issue—assumes overlap. Let's leave it. (D) is difficult to understand and a classic "time-sucker" but is clearly very different from the original argument (conditional links) and should be eliminated quickly. (E) matches a portion (majority) with an absolute (no one...) and so has a different reasoning structure from the original (the similar conclusion could certainly be tempting).

6. confirm the right answer: (C) uses different words, but has the same reasoning issue as the original argument. "At least one" and "all too many" are vague terms that can be interpreted in a broad number of ways, just like "some" can. None of those terms guarantee any overlap between groups.



30.2.6. The student body at this university takes courses in a wide range of disciplines. Miriam is a student at this university, so she takes courses in a wide range of disciplines.

Which one of the following arguments exhibits flawed reasoning most similar to that exhibited by the argument above?

- (A) The students at this school take mathematics. Miguel is a student at this school, so he takes mathematics.
- (B) The editorial board of this law journal has written on many legal issues. Louise is on the editorial board, so she has written on many legal issues.
- (C) The component parts of bulldozers are heavy. This machine is a bulldozer, so it is heavy.
- (D) All older automobiles need frequent oil changes. This car is new, so its oil need not be changed as frequently.
- (E) The individual cells of the brain are incapable of thinking. Therefore, the brain as a whole is incapable of thinking.

18

LOGICAL REASONING

sufficient assumption & supporting principle

In this lesson, we are going to discuss two question types: Sufficient Assumption and Supporting Principle. For these two types of questions, what we want to do is figure out what is wrong, and then search for an answer to *completely* fix the issue. That's what Sufficient Assumption and Supporting Principle questions are asking us to do—find the answer that completely fixes the issues in the argument.

You'll note from the information on the side that these two question types are not that common. The reason we're covering just these two question types here is because we are also going to use this lesson to expand our discussion of conditional logic. In fact, we'll start with this. Most Sufficient Assumption questions involve conditional logic, and Sufficient Assumption questions most commonly present the most challenging conditional logic issues.

Below are a few simple, flawed arguments. Imagine the gap in between the reasoning and the conclusion as a “hole” that needs to be fixed. What is an answer that would completely fill that hole? Can you perhaps come up with *multiple* ways to state what might fill that hole? Finally, for extra credit, can you perhaps come up with an answer that fills the hole, and then goes slightly above and beyond filling the hole? If you're not quite sure what I mean by that, don't worry about it. We'll discuss it shortly.

You should expect 2 or 3 Sufficient Assumption questions, and 3 or 4 Supporting Principle questions per exam.

Conditional logic:
We discussed conditional logic rules in Lesson 13. We will be expanding on that discussion in this lesson.

Sharon must be great at figuring out mysteries. After all, she is the police chief.

All carnivores eat meat. Therefore, all carnivores eat beef.

fill the hole

Bill is a vegetarian. For that reason, he must hate the taste of meat.

Most Texans own hats. Therefore, some Texans own hat racks.

Think about the point, the support, and the hole between the two. Try to come up with answers that will completely fill the hole—answers that leave no gap between the support and the point.

Conditional Logic 101

In Lesson 13, we introduced and discussed conditional reasoning in terms of four major characteristics:

Fill the Hole answers

Here are a few of the many ways we could represent the gap fillers:

The police chief is required to be good at figuring out mysteries. • (+a bit more) All police chiefs are great at solving mysteries.

Bill is a vegetarian only if he hates the taste of meat. • (+ a bit more) Every vegetarian hates the taste of meat.

All people who eat meat eat beef.

Every person^a who owns hats owns a hat rack.

"Can you see why "some people" or "most people" wouldn't fill the gap? Neither would ensure that Texans own hat racks.

1. contrapositives

Those who are not good at figuring out mysteries cannot be police officers.

Those who do not hate the taste of meat are never vegetarians.

If you don't eat beef, you don't eat any meat at all.

No one without a hat rack owns a hat.

1. Conditional Rules Are Rules That Only Apply Sometimes

To be more specific, they are rules that are set off by a “trigger,” more formally known as the *sufficient condition*. Why it is called the sufficient condition? Because it is sufficient, or enough, to guarantee the outcome. Speaking of which, the second characteristic we discussed was...

2. Conditional Statements Represent Guarantees

On the LSAT, “if” is a powerful and absolute word—it represents a guarantee. If the trigger takes effect, or more formally, if the sufficient condition is met, the outcome must result. This idea is fundamental to the make-up of the entire Logical Reasoning section.

It is the “guarantee” part of conditional statements that makes them so important to Logical Reasoning. One way to describe all flawed arguments is to say that they are arguments in which the author *thinks* the support is sufficient, or enough, when in fact it's not.

Notice how we fixed all of the flawed arguments from our “fill the hole” example—we needed to meld the support and premise with some sort of ironclad joint, and that's what a conditional statement provides. Notice that each correct response has a guarantee in it, and that guarantee can be thought of in terms of a trigger and a consequence.

3. Conditional Statements Provide Inferences

All conditional statements provide inferences known as contrapositives, and you can think of the original condition and the contrapositive as two different sides of the same coin. For challenging questions, the test writers will commonly give us our gap-filters in terms of their contrapositives. Consider these four answers¹ we could have gotten instead of the four answers we got above. Do you see that they give us the same information—the guarantee that we needed?

4. Conditional Statements Link Up

Remember that there were certain games that had a lot of conditional rules, and when this was the case it was often necessary to link these conditions up in order to answer questions. There are certain Logical Reasoning questions that work this way as well. When you see multiple conditional statements in one stimuli, you know that a part of your job will be to see how these statements link up, and how they don't.

Conditional Logic Language

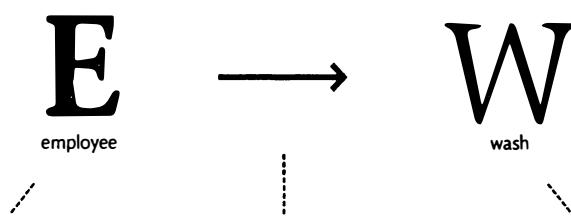
What's mentioned on the left represents all of the major "rules" that you need to know for conditional logic, but that's not all that makes conditional logic on the Logical Reasoning section challenging. In fact, many people would argue that a bigger challenge is consistently interpreting conditional statements correctly.

There are various ways in which the test writers can write conditional relationships. Some of these ways make the relationship obvious, while others don't. In fact, there are certain conditional statements that force everyone, even those who have a wealth of formal logic experience, to stop and have to think carefully. In large part, this is because these conditional statements involve words to which, in real life, we give situation contextual (that is, not universal or absolute) meaning. "Only if" is a statement we use for different meanings in real life, and that's a big reason that it causes us so much trouble. Another word that similarly causes our brains to get fuzzy is the word "unless."

Let's break down the different ways in which conditional statements can be written, and work on developing a system for thinking about them whenever we are uncertain. We'll start by taking a close-up look at just one conditional statement.

"ALL EMPLOYEES MUST WASH THEIR HANDS."

If one is an employee, one must wash his or her hands.

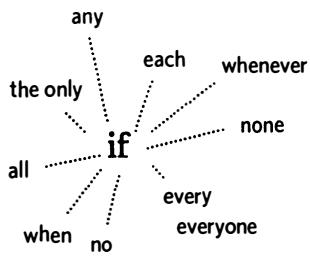


The trigger is known as the "sufficient condition" because it is enough to guarantee the outcome. In logic terms, "sufficient" is a powerful word (far more powerful than the word "necessary"). In this case, the word "all" gave us a sense of sufficiency. It tells us that if you have a certain characteristic (are an employee) there is a certain guaranteed result (you have to wash your hands). "If" is the most common word that starts a sufficient condition, but keep in mind that words like "all," "any," and "every," and their negative counterparts "no" and "none," are similar indicators of sufficiency.

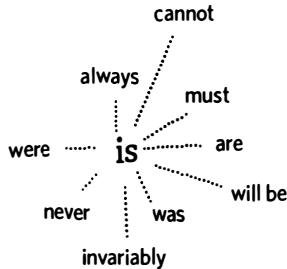
Just like certain words inform us of a sufficient condition, certain other words tell us that there is some sort of guarantee. In this case, the word "must" serves this function—it is absolute and gives us the guarantee. The most basic guarantee word is actually "is," and all its other forms (were, was, will be, etc.). "The car is red," can be thought of in conditional terms—if something is the car, then it is red. Keep in mind that just because one can think of a statement in conditional terms doesn't mean one should. In most instances, you don't want to think of the word "is" in a conditional sort of way.

Finally, certain words indicate that we have the "result" part of a conditional statement, more formally known as the "necessary consequent." Imagine this sentence rewritten as, "If you are an employee, you need to wash your hands." Note that the "need to" indicates what must be the result of being an employee. Another way to say it would be "Employees are required to wash their hands." In this case, "required to" informs us of what must be the consequence of being an employee.

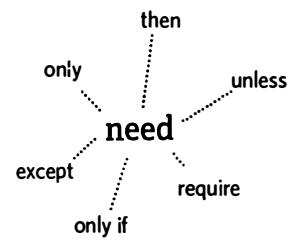
Keep in mind that many conditional statements (such as our example) contain more than one of these conditional markers.



words that indicate sufficiency



words that indicate guarantees



words that indicate a necessary result

translating well

We are going to need to translate conditional statements in the stimuli and in the answer choices. Here's how we want to think through them:

STEP ONE: For the purpose of translating conditional statements, it's best to think of them as **guarantees**. As you read a conditional statement, figure out what the two (or sometimes three) factors at issue are, then think about what the guarantee is in the situation. Does A guarantee B, or does B guarantee A? In most cases, this should help you see clearly the correct way to think about a conditional statement.

STEP TWO: There are two phrases, UNLESS and ONLY IF, that can get us all twisted around no matter how much we practice them. Never fear! A great way to combat these is to memorize a couple of **conditional mantras**. Just fit your difficult phrase into the structure of your mantra, and it should help you see how to translate the statement correctly. The process is modeled in the third example on the side.

conditional mantras

If you have these two phrases memorized, and know how to use them, they can be very helpful in a bind. Of course, you can use any other phrases you want, and come up with mantras for other conditional phrases that you find dizzying. **The key is that the mantras make it clearly obvious to you how you should correctly think about the guarantee.**

"You can't drive **UNLESS** you are at least sixteen." or
 "UNLESS you are at least sixteen, you can't drive." **Drive → ≥ 16**

These above statements do not mean everyone over sixteen can drive.

"He will eat fish **ONLY IF** it is dead." or
 "ONLY IF a fish is dead will he eat it." **Eat → Dead**

These statements do not mean that he'll eat any fish as long as it's dead.

EXAMPLES

"Every American likes television."

Does this guarantee that if you like television, you are American? No. Does it guarantee that if you are American you like television? Yes.

American → like television

"Getting into the house requires a key."

Does this mean that if you have a key you are guaranteed to get into the house? No. (Maybe you had the wrong key.) Does this mean that if you get into the house you are guaranteed to have had a key? Yes.

Get in → have key

"No act can be seen as altruism unless that person seeing it is himself selfless."

Does this mean that if you see an act as altruistic, you are selfless? Hmm. Does this mean that if you are selfless you will see an act as altruistic? Hmm. Does this mean if you are not selfless you will not see an act as altruistic? Hmm. Let's stop there. If you feel like you are turned around enough to possibly make a mistake, consider quickly how the statement relates to your conditional mantra.

We know...

So...

"You can't drive unless you are at least sixteen."

"No act can be seen as altruism unless that person seeing it is himself selfless."

is

must be

Drive → at least 16

altruism → selfless

Yes! We nailed it! Having a mantra to structure your thinking can help you when the abstract situation makes jelly out of your internal conditional sense.

Drill: Translating Conditional Statements

Directions: Match the statement to the correct interpretation.

D = DUCK

W = LIKE WATER

D → W, W → D

1. All ducks like water.
2. If you like water, you are a duck.
3. No duck doesn't like water.
4. Every animal that likes water is a duck.
5. No duck likes water.
6. Any animal that likes water is not a duck.
7. Unless an animal is a duck, it will not like water.
8. Ducks need to like water.
9. One does not like water only if one is a duck.
10. In order to like water, you must be a duck.

W → D, D → W

D → W, W → D

T = TUESDAY

W = GO TO WORK

T → W, W → T

1. If it's Tuesday, I'll go to work.
2. I never go to work on Tuesday.
3. I'll go to work only if it's Tuesday.
4. Unless it is Tuesday, I will go to work.
5. I go to work every Tuesday.
6. I only work on Tuesdays.
7. Any day that I am not working is not a Tuesday.
8. If it's not Tuesday, I don't work.
9. All Tuesdays are days I go to work.
10. Any day I go to work is a Tuesday.

W → T, T → W

T → W, W → T

T → W, W → T

A = AMERICAN

C = LOVES CHEESE

A → C, C → A

1. Every American loves cheese.
2. Only Americans love cheese.
3. No American loves cheese.
4. Unless you love cheese, you are not American.
5. People love cheese only if they are Americans.
6. Only those who love cheese are American.
7. Anyone who loves cheese is an American.
8. If you are American, you must love cheese.
9. Loving cheese is required of all Americans.
10. Anyone who is not American loves cheese.

C → A, A → C

A → C, C → A

A → C, C → A

Drill: Translating Conditional Statements

Directions: Match the statement to the correct interpretation.

D = DATE

$D \rightarrow F, F \rightarrow D$

1. Sarah only dates funny guys.
2. If you are funny, Sarah will date you.
3. Sarah will never date a funny guy.
4. Every guy Sarah dates is not funny.
5. Unless you are funny, Sarah will not date you.
6. All guys that Sarah dates are funny.
7. Sarah will go out with a guy only if he is funny.
8. If Sarah won't date you, that means you are funny.
9. Every funny guy has dated Sarah.
10. No funny guy has ever dated Sarah.

F = FUNNY

$F \rightarrow D, D \rightarrow F$

$D \rightarrow F, F \rightarrow D$

$D \rightarrow F, F \rightarrow D$

W = WHALE

$W \rightarrow M, M \rightarrow W$

1. All whales love music.
2. Only whales truly love music.
3. No whale loves music.
4. One cannot love music unless one is a whale.
5. One cannot be a whale unless one loves music.
6. One can love music only if one is a whale.
7. One can be a whale only if one loves music.
8. Every whale secretly does not love music.
9. All animals other than whales love music.
10. Every music lover is a whale.

M = LOVES MUSIC

$M \rightarrow W, W \rightarrow M$

$W \rightarrow M, M \rightarrow W$

$W \rightarrow M, M \rightarrow W$

solutions note that you may have thought of some of these in terms of their contrapositives

	1	2	3	4	5	6	7	8	9	10
DUCKS & WATER	$D \rightarrow W$	$W \rightarrow D$	$D \rightarrow W$	$W \rightarrow D$	$D \rightarrow W$	$W \rightarrow D$	$W \rightarrow D$	$D \rightarrow W$	$W \rightarrow D$	$W \rightarrow D$
TUESDAYS & WORK	$T \rightarrow W$	$T \rightarrow W$	$W \rightarrow T$	$W \rightarrow T$	$T \rightarrow W$	$W \rightarrow T$	$T \rightarrow W$	$W \rightarrow T$	$T \rightarrow W$	$W \rightarrow T$
AMERICANS AND CHEESE	$A \rightarrow C$	$C \rightarrow A$	$A \rightarrow C$	$A \rightarrow C$	$C \rightarrow A$	$A \rightarrow C$	$C \rightarrow A$	$A \rightarrow C$	$A \rightarrow C$	$A \rightarrow C$
DATING & FUNNY GUYS	$D \rightarrow F$	$F \rightarrow D$	$F \rightarrow D$	$D \rightarrow F$	$F \rightarrow D$	$F \rightarrow D$				
WHALES & MUSIC	$W \rightarrow M$	$M \rightarrow W$	$W \rightarrow M$	$M \rightarrow W$	$W \rightarrow M$	$M \rightarrow W$	$W \rightarrow M$	$W \rightarrow M$	$W \rightarrow M$	$M \rightarrow W$

Conditional-Heavy Stimuli

Just like certain games can be dominated by conditional rules, certain Logical Reasoning stimuli can be over-run by conditional logic statements. In most cases, just as in those types of games, the statements in these type of stimuli will link together.

This is only likely to happen in a few types of questions (Sufficient Assumption, Inference, Match the Flaw, and Match the Reasoning, most commonly) and will not happen more than once or twice per exam. However, these can often be some of the more intimidating questions in any Logical Reasoning section.

When you see a conditional-heavy stimulus for a Sufficient Assumption question (“What exactly is a Sufficient Assumption question?” you say! We’ll get to that on the next page), what you can expect is that the supporting premises link together in some way to form the conclusion. Well actually, they almost link together. They are missing one link, and the correct answer will fill that link in.

Keep in mind that just because these stimuli have statements that link up does not mean you *have to* link them up. Oftentimes, hopefully most of the time, you will see the missing link without putting all the different pieces together. Other times you’ll just simply see the missing link as a flaw in the argument, and not have to think about it in a conditional sense at all.

However, once in a while, there will be a question that will really require some strong linking skills. You want to be able to whip them out when you need them. You already have the ability to recognize and use links from the Logic Games conditional logic lesson. The extra challenge for Logical Reasoning problems, of course, is that you also need to translate these statements and strip them down before you link them.

Below are examples of a more obvious missing link, and a better hidden one. You want to avoid doing the heavy work when you can, but you also want to make sure you feel you can do it when you need to.

Obvious missing link

If you don’t sleep, you will be tired. If you are tired, you will be prone to making mistakes. Therefore, if you don’t sleep, you will get fired.

Support: Don’t sleep → tired → prone to mistakes

Conclusion: Don’t sleep → fired

Whoa, where did we get fired? We can see the gap here without doing too much linking work.

We need: prone to mistakes → fired

Hidden missing link

All the socks have polyester, and Ted is allergic to anything that has polyester. If something makes Ted feel itchy, he won’t buy it. Since Ted never pays attention to things he doesn’t buy, he won’t pay attention to the sock ad.

Support: sock → poly → allergic ; itchy → won’t buy → won’t pay attention to ad

Conclusion: sock → won’t pay attention to ad

You don’t need to think of the conclusion conditionally, though we did here. We know we need all the support to link up to give us the conclusion. The piece we are missing is that if he’s allergic, Ted will be itchy. Notice that if we fit that piece in, all the support can be linked to reach the conclusion.

We need: allergic → itchy

Sufficient Assumption

"The conclusion follows logically if which of the following is assumed?"

"Which of the following, if assumed, allows the conclusion to be properly drawn?"

Fill the hole.

When a conclusion to an LSAT argument "follows logically" or can be defined as "properly drawn," it's a big deal, considering the fact that figuring out why conclusions do not follow logically, or are not properly drawn, is our primary task for the Logical Reasoning section.

The biggest key to Sufficient Assumption questions is to have a very clear sense of the flaw. These arguments will have specific, clearly defined gaps in reasoning—you wouldn't be able make the arguments valid with just one statement in one answer choice otherwise. The second biggest key is to stay on task. Attractive wrong answers might strengthen the argument, or provide the argument with something it needs, without filling the hole to the point that the argument becomes valid. The right answer must leave the reasoning in the argument air-tight.

SUPER-SIMPLE EXAMPLE

Sandy has gotten straight A's all through high school. Therefore, she will be a valedictorian.

The conclusion follows logically if which one of the following is assumed?

- (A) Sandy has been accepted to every college she applied to.
- (B) Sandy did not get any grades lower than an A.
- (C) It is exceedingly rare for individuals to get all A's through high school.
- (D) Some valedictorians do not get all A's.
- (E) If a student gets all A's through high school, that person will be named valedictorian.

The correct answer is (E). Certain answers have no direct relation to the stimulus (A), (C), some have no connection to the point (B), and some play a different, or unclear, role relative to the reasoning issue (D). Note that the right answer leaves NO holes in the argument.

Step one understand your job

The question stems for Sufficient Assumption questions are defined by three main characteristics: they have the word "assumption," they almost always phrase that assumption in terms of a condition—"if assumed" (other types of assumption questions almost never have the word "if")—and most importantly, they include some sense that the argument would, with the assumption, be made logical or valid.

It's very important to keep the different Assumption questions clear (which is one of the reasons we are talking about them in different lessons). Basic Assumption, Sufficient Assumption, and Necessary Assumption are asking for different things, and it'll definitely cause you problems if you mix them up in your head.

Once you recognize that it's a Sufficient Assumption question, you should expect two things from the argument: it is more likely than not to have formal reasoning issues (most commonly conditional reasoning), and the argument is going to have one, clearly definable gap in reasoning.

Two find the point

As you go through the argument for the first time, try to get a sense of the overall flow of the reasoning. In particular, pay attention to whether you have a more typical support-to-conclusion relationship (which may be clouded in background and fluff), or if you have a series of supporting premises that are meant to link together. If it's the latter, you know that the gap, or flaw in reasoning, has to do with some sort of missing link in the chain.

All of the above should be done in a fairly cursory way. As always, your primary task during your first read-through is to identify the conclusion. If you notice that it's a complicated argument, you may want to write out the conclusion (perhaps with the → shorthand we've been using in this lesson) in order to have it handy as you break down the support.

Three find the support

As just stated, the support will either be of a more traditional variety (one supporting piece of evidence), or it will come as a series of linking conditions. If it's the former, and it's a difficult question, chances are that there will be a lot of fluff in the argument. It's not unusual to have an argument that takes up seven or eight lines, only to have the last two lines be the only ones that are relevant to the point being made. If it's a series of linking conditions, expect that pretty much everything other than the conclusion will be support. If it's a linking situation, and it's tough to see exactly where the missing link is, you may want to write out the supporting statements.

four figure out what's wrong

As always, this is the step. It's important to remember that the arguments for Sufficient Assumption questions will have one clearly definable hole or flaw. If they didn't—if an argument had multiple holes or a vaguely defined gap in reasoning—they could not create an answer that would be sufficient, or enough, to make the argument logically valid.

Finally, try to keep separate your understanding of what is wrong with the argument—that is, what the hole is in the argument, and how you might go about filling it. For more difficult questions, they may not fill the gap in the way that you might expect—having a sense of the issue, rather than a particular way of fixing it, will help you better adapt in the moment.

five get rid of answers

The wrong choices are most commonly what determine whether a Sufficient Assumption question is more challenging or less so. Many Sufficient Assumption questions will have four wrong choices that have nothing to do with the argument. If you are diligent about finding the flaw and focusing on why answers are wrong, you can get through some of these questions very quickly. As always, don't try to identify the right answer; carefully evaluate attractive wrong answers. Get rid of answers that are obviously wrong first, then think carefully about the answer choices you are forced to think carefully about.

The hardest Sufficient Assumption questions can have several wrong answer choices that at first glance can seem like they fill the gap. Commonly, these attractive wrong choices match the argument in terms of subject matter, but don't give us the connection that we need in order to validate the conclusion. To illustrate, consider these two sample arguments, and these two sample answers. The first answer validates the first argument because it allows us to use the support to justify the conclusion. The second answer does not validate the second argument because it does not ensure that the conclusion will result (other people could have gotten bonuses too). The most attractive wrong choices for Sufficient Assumption questions commonly tend to work in this way.

Argument 1

**Erica earned over \$35,000.
Therefore, she got a bonus.**
Sufficient Assumption
**Everyone who earned over
\$35,000 got a bonus.**

Argument 2

**Erica got a bonus. Therefore,
she earned over \$35,000.**
Insufficient Assumption
**Everyone who earned over
\$35,000 got a bonus.**

Also keep in mind that other attractive wrong answers can help strengthen the argument—sometimes help strengthen it a lot—but that's very different from making the argument valid. The wrong answers can also provide something that needs to be true to reach the conclusion, but doesn't get us all the way to the conclusion (more on this in the next lesson).

six confirm the right answer

You should be able to see that if you place the answer in between the support and the conclusion, it makes the conclusion 100% justifiable. If it makes the conclusion seem really, really good but somehow not 100% justifiable—there may be something wrong. Keep in mind that the right answer can go above and beyond filling a gap. If, say, we need to know that Manny “makes over \$35,000” to get a certain bonus, finding out he makes \$50,000 would be more specific than, and above and beyond, what we need to fill the gap, but it would absolutely be the correct answer, because it would be enough (more than enough) to make the conclusion 100% valid.

SAME MEANING/DIFFERENT WORDS

There are many ways of stating the same information, and LSAT-writers take advantage of that when they form answer choices. You need to be comfortable understanding statements, particularly conditional statements, in all of their various forms. Consider the following argument, all the ways to fill the gap, and all the ways they could create attractive wrong choices that give us the reverse or negation of what we need.

Argument

Kermit is a frog. Therefore, he loves green.

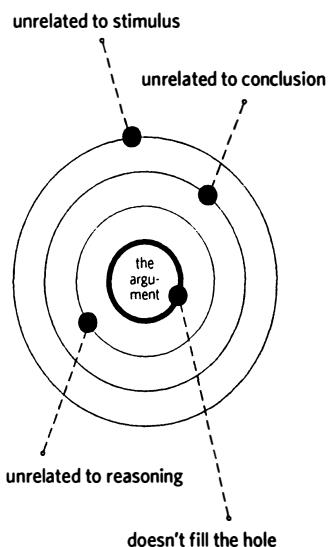
What will fill the gap?

All frogs love green.
Every frog loves green.
One is a frog only if one loves green.
If you don't love green, you are not a frog.

What won't?

Anything that loves green is a frog.
Everything that loves green is a frog.
One loves green only if one is a frog.
If you are not a frog, you do not love green.

CONSTELLATION OF WRONG ANSWERS



the process in

Let's model the problem-solving process with two questions you solved at the end of Lesson 16.

2.23. Philosopher: An action is morally right if it would be reasonably expected to increase the aggregate well-being of the people affected by it. An action is morally wrong if and only if it would be reasonably expected to reduce the aggregate well-being of the people affected by it. Thus, actions that would be reasonably expected to leave unchanged the aggregate well-being of the people affected by them are also right.

The philosopher's conclusion follows logically if which one of the following is assumed?

- (A) Only wrong actions would be reasonably expected to reduce the aggregate well-being of the people affected by them.
- (B) No action is both right and wrong.
- (C) Any action that is not morally wrong is morally right.
- (D) There are actions that would be reasonably expected to leave unchanged the aggregate well-being of the people affected by them.
- (E) Only right actions have good consequences.

1. understand your job: We have to find an argument and figure out what's wrong with it. Then we need to find an answer that plugs that gap.

2. find the point: The point is that actions expected to leave peoples' well-being unchanged are morally right.

3. find the support: There is actually no support for this! If an action increases well-being, it's morally right. If it decreases, it's morally wrong. Also, if an action is morally wrong, it decreases well-being.

4. figure out what's wrong: We have no information about actions that leave unchanged peoples' well-being. We need an answer that connects these types of actions to them being morally right.

5. get rid of answers: (A) is a tempting opposite, but if we are thinking about sufficiency, this doesn't help us prove that the actions mentioned in the conclusion are *morally right*. (B) is strange! Let's leave it. (C) looks good. Our action is not yet morally wrong. If we put (C) in there, our action becomes morally right. Let's leave it. (D) simply shows us our conclusion is a possible situation—that's a long way away from proving it must be so. (E) might be tempting if we over-think it, but in no way does it validate the conclusion.

6. confirm the right answer: On the same note, tough to see how (B) impacts our conclusion—it leaves our conclusion neither right or wrong. (C) does impact our conclusion though, and it's the only answer remaining. Let's walk through it carefully. "Any action that is not morally wrong"—we're told only those actions that make people worse off are morally wrong, so we know for sure that an action that has no +/- is not morally wrong. If we add (C) to the conclusion and support, we get that any action that leaves unchanged the aggregate well-being is not morally wrong, and any action that is not morally wrong is morally right. This is enough to justify the conclusion and (C) is correct.

3.5. Atrens: An early entomologist observed ants carrying particles to neighboring ant colonies and inferred that the ants were bringing food to their neighbors. Further research, however, revealed that the ants were emptying their own colony's dumping site. Thus, the early entomologist was wrong.

Atrens's conclusion follows logically if which one of the following is assumed?

- (A) Ant societies do not interact in all the same ways that human societies interact.
- (B) There is only weak evidence for the view that ants have the capacity to make use of objects as gifts.
- (C) Ant dumping sites do not contain particles that could be used as food.
- (D) The ants to whom the particles were brought never carried the particles into their own colonies.
- (E) The entomologist cited retracted his conclusion when it was determined that the particles the ants carried came from their dumping site.

1. understand your job: We have to find an argument and figure out what's wrong with it. Then we need an answer that plugs that gap.

2. find the point: Ants do not bring food to their neighbors.

3. find the support: Ants dumping their trash.

4. figure out what's wrong: The issue is tough to see at first, but when you separate out the point and the support it limits what could be wrong in the argument—the author is taking for granted that the trash does not have food. We need to find an answer that proves this is the case.

5. get rid of answers: (A) is the type of answer a strong sense of task can help you eliminate quickly. (B) too. Neither prove anything about food. (C) is exactly what we need. Let's keep it. (D) is unrelated to the point. (E) does not validate the conclusion, for the entomologist could have been wrong in retracting, and whether he retracted his opinion or not has no bearing on what ants actually do.

6. confirm the right answer: (C) is the only answer standing, and seems like a great hole filler. Let's read through it one more time. If (C) is true, then we know for sure that what the ants are taking to their neighbors has no food in it. (C) is correct.

Supporting Principle Q's

Just as Basic Assumption questions are very close siblings of Flaw questions, Supporting Principle questions are very close siblings of Sufficient Assumption questions. Just like sufficient assumptions, supporting principles serve to bridge the gap between the reasoning given and the conclusion reached.

There are a few secondary differences between Supporting Principle questions and Sufficient Assumption questions. The flaws in the arguments for Supporting Principle questions tend to be less absolute and abstract than those in Sufficient Assumption questions, and by the same token the right answers may not always have the same sense of closure. Furthermore, expect that the right answer will generalize beyond what we need to fill the gap—after all, a principle is just a rule that is generalized.

These are differences that ultimately have very little to do with getting to the right answer. The way you want to think about and solve Supporting Principle questions is no different from how you handle Sufficient Assumption questions—find the problem, and look for the one answer that would plug it up.

A question type that is even less common but still very closely related is the **conform to a principle question**. You saw an example of this in Lesson 16, and it's written below. The main difference with these questions is that the gaps will be written less as flaws and more as opinions. Your job is still the same—find the hole and plug it.

supporting principle question stems

Here is how a supporting principle question is typically phrased:

Which one of the following principles, if valid, most helps to justify the economist's reasoning?

conform to a principle question stems

Here are some ways in which conform to a principle questions can be phrased:

The reasoning above most closely conforms to which of the following principles?

Which one of the following propositions is most precisely exemplified by the situation presented above?

Step 1. Understand Your Job

We have to find an argument and figure out the gap between the support and the point. The right answer will plug that gap.

Step 2. Find the Point

Universities should only use open-source software.

Step 3. Find the Support

Open-source software better matches values embodied in academic scholarship, and academic scholarship is central to the mission of schools.

Step 4. Figure Out What's Wrong

Who says the software you use has to match, in some particular way, your value system? What if proprietary software is far more useful and cheaper? In any case, the author is taking for granted they should do something because it matches the values of the university.

Step 5. Get Rid of Answers

(A) matches our "what's wrong" hypothetical, but doesn't match the author's point. Neither does (B). (C) seems like exactly what we need. (D) is close right to the end, but the author's point is not about efficiency. (E) is not directly related to the stimulus.

Step 6. Confirm the Right Answer

That leaves (C) as the only legitimate contender. Notice how nicely (C) fits in between the support and the conclusion. This is the principle that underlies the author's thinking.

3.14. Commentator: In academic scholarship, sources are always cited, and methodology and theoretical assumptions are set out, so as to allow critical study, replication, and expansion of scholarship. In open-source software, the code in which the program is written can be viewed and modified by individual users for their purposes without getting permission from the producer or paying a fee. In contrast, the code of proprietary software is kept secret, and modifications can be made only by the producer, for a fee. This shows that open-source software better matches the values embodied in academic scholarship, and since scholarship is central to the mission of universities, universities should use only open-source software.

The commentator's reasoning most closely conforms to which one of the following principles?

- (A) Whatever software tools are most advanced and can achieve the goals of academic scholarship are the ones that should alone be used in universities.
- (B) Universities should use the type of software technology that is least expensive, as long as that type of software technology is adequate for the purposes of academic scholarship.
- (C) Universities should choose the type of software technology that best matches the values embodied in the activities that are central to the mission of universities.
- (D) The form of software technology that best matches the values embodied in the activities that are central to the mission of universities is the form of software technology that is most efficient for universities to use.
- (E) A university should not pursue any activity that would block the achievement of the goals of academic scholarship at that university.

Sufficient Assumption & Supporting Principle Questions

26.3.21. The companies that are the prime purchasers of computer software will not buy a software package if the costs of training staff to use it are high, and we know that it is expensive to teach people a software package that demands the memorization of unfamiliar commands. As a result, to be successful, commercial computer software cannot require users to memorize unfamiliar commands.

The conclusion above follows logically if which one of the following is assumed?

- (A) If most prime purchasers of computer software buy a software product, that product will be successful.
- (B) Commercial computer software that does not require users to memorize unfamiliar commands is no more expensive than software that does.
- (C) Commercial computer software will not be successful unless prime purchasers buy it.
- (D) If the initial cost of computer software is high, but the cost of training users is low, prime purchasers will still buy that software.
- (E) The more difficult it is to learn how to use a piece of software, the more expensive it is to teach a person to use that software.

29.1.19. Arbitrator: The shipping manager admits that he decided to close the old facility on October 14 and to schedule the new facility's opening for October 17, the following Monday. But he also claims that he is not responsible for the business that was lost due to the new facility's failing to open as scheduled. He blames the contractor for not finishing on time, but he too, is to blame, for he was aware of the contractor's typical delays and should have planned for this contingency.

Which one of the following principles underlies the arbitrator's argument?

- (A) A manager should take foreseeable problems into account when making decisions.
- (B) A manager should be able to depend on contractors to do their jobs promptly.
- (C) A manager should see to it that contractors do their jobs promptly.
- (D) A manager should be held responsible for mistakes made by those whom the manager directly supervises.
- (E) A manager, and only a manager, should be held responsible for a project's failure.

29.1.20. The price of a full-fare coach ticket from Toronto to Dallas on Breezeway Airlines is the same today as it was a year ago, if inflation is taken into account by calculating prices in constant dollars. However, today 90 percent of the Toronto-to-Dallas coach tickets that Breezeway sells are discount tickets and only 10 percent are full-fare tickets, whereas a year ago half were discount tickets and half were full-fare tickets. Therefore, on average, people pay less today in constant dollars for a Breezeway Toronto-to-Dallas coach ticket than they did a year ago.

Which one of the following, if assumed, would allow the conclusion above to be properly drawn?

- (A) A Toronto-to-Dallas full-fare coach ticket on Breezeway Airlines provides ticket-holders with a lower level of service today than such a ticket provided a year ago.
- (B) A Toronto-to-Dallas discount coach ticket on Breezeway Airlines costs about the same amount in constant dollars today as it did a year ago.
- (C) All full-fare coach tickets on Breezeway Airlines cost the same in constant dollars as they did a year ago.
- (D) The average number of coach passengers per flight that Breezeway Airlines carries from Toronto to Dallas today is higher than the average number per flight a year ago.
- (E) The criteria that Breezeway Airlines uses for permitting passengers to buy discount coach tickets on the Toronto-to-Dallas route are different today than they were a year ago.

31.2.10. If something would have been justifiably regretted if it had occurred, then it is something that one should not have desired in the first place. It follows that many forgone pleasures should not have been desired in the first place.

The conclusion above follows logically if which one of the following is assumed?

- (A) One should never regret one's pleasures.
- (B)Forgone pleasures that were not desired would not have been justifiably regretted.
- (C) Everything that one desires and then regrets not having is a forgone pleasure.
- (D) Many forgone pleasures would have been justifiably regretted.
- (E) Nothing that one should not have desired in the first place fails to be a pleasure.

Stick to the steps!
1. understand your job
2. find the point
3. find the support
4. figure out what's wrong
5. get rid of answers
6. confirm the right answer

Sufficient Assumption & Supporting Principle Solutions

26.3.21. The companies that are the prime purchasers of computer software will not buy a software package if the costs of training staff to use it are high, and we know that it is expensive to teach people a software package that demands the memorization of unfamiliar commands. As a result, to be successful, commercial computer software cannot require users to memorize unfamiliar commands.

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- (C) Commercial computer software will not be successful unless prime purchasers buy it.
- (D) If the initial cost of computer software is high, but the cost of training users is low, prime purchasers will still buy that software.
- (E) The more difficult it is to learn how to use a piece of software, the more expensive it is to teach a person to use that software.



1. understand your job: We have to find an argument and figure out what's wrong with it. Then we need to find an answer that bridges support and conclusion.

2. find the point: The shipping manager is also to blame.

3. find the support: He was aware of the contractor's typical delays and should have planned for this contingency.

4. figure out what's wrong: This argument has a much simpler argument (everything before "he too" is secondary), and a more clearly definable gap (support about being aware and planning, and conclusion is about blame) than the above argument. Note that this isn't as much a flaw (though we can think of it that way) as it is just space between an opinion and reasoning. We need an answer that fills the space—something that connects being aware and needing to plan to being as much to blame.

5. get rid of answers: (A) looks like the type of answer we are looking for—the manager should have "planned for the contingency." Let's leave it. (B) is not the point, and (C) is not a good match for "planned for contingency." (D) gives us "held responsible," which is a great match for blame. Let's leave it. "Only a manager" in (E) makes it clear that this is a not a good match for the arbitrator's point.

6. confirm the right answer: We had two attractive answers—(A) and (D)—let's evaluate them more carefully. (A) talks about what a manager should do, which is a good but not great match for being partly to blame. Looking carefully at (D), it has an even bigger issue—we have no idea if the manager directly supervises the contractor. (D) is definitely wrong, so (A) is close enough and it is correct.

1. understand your job: We have to find an argument and figure out what's wrong with it. Then we need to find an answer that completely fixes the issue.

2. find the point: To be successful, commercial computer software cannot require users to memorize unfamiliar commands.

3. find the support: Expensive to teach people unfamiliar commands, and companies that are prime purchasers won't buy package if costs of training staff to use it are high.

4. figure out what's wrong: This is a very tough issue to spot, and on the real exam this is a situation where you may need to go into the answers without the clear sense of the flaw we normally hope to have. The issue has to do with the modifier "prime"—perhaps the company can be successful even if it doesn't sell to the main purchasers (think Apple computers before they became more mainstream).

5. get rid of answers: (A) is helpful, but doesn't fill any gap in reasoning. (B) is unrelated to the types of expenses being discussed here and so doesn't fill the gap. If you didn't initially recognize the significance of "prime purchasers," maybe you paid more attention to it after you read (C). Let's leave it. (D) hurts the argument. "Difficult to learn" in (E) is irrelevant to our argument.

6. confirm the right answer: (C) is the only attractive answer, and if we fit it into the argument, we can see that it links the support to the conclusion, and connects the two concepts (prime purchases and success) that we needed to connect. The support gave us: need to memorize unfamiliar commands → training expensive → prime purchases won't buy. If we add (C) at the end of that link, it guarantees our conclusion.

29.1.19. Arbitrator: The shipping manager admits that he decided to close the old facility on October 14 and to schedule the new facility's opening for October 17, the following Monday. But he also claims that he is not responsible for the business that was lost due to the new facility's failing to open as scheduled. He blames the contractor for not finishing on time, but he too, is to blame, for he was aware of the contractor's typical delays and should have planned for this contingency.

Which one of the following principles underlies the arbitrator's argument?

- (A) A manager should take foreseeable problems into account when making decisions.
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- (E) A manager, and only a manager, should be held responsible for a project's failure.

Sufficient Assumption & Supporting Principle Solutions

29.1.20. The price of a full-fare coach ticket from Toronto to Dallas on Breezeway Airlines is the same today as it was a year ago, if inflation is taken into account by calculating prices in constant dollars. However, today 90 percent of the Toronto-to-Dallas coach tickets that Breezeway sells are discount tickets and only 10 percent are full-fare tickets, whereas a year ago half were discount tickets and half were full-fare tickets. Therefore, on average, people pay less today in constant dollars for a Breezeway Toronto-to-Dallas coach ticket than they did a year ago.

Which one of the following, if assumed, would allow the conclusion above to be properly drawn?

- (A) A Toronto-to-Dallas full-fare coach ticket on Breezeway Airlines provides ticket-holders with a lower level of service today than such a ticket provided a year ago.
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- (D) The average number of coach passengers per flight that Breezeway Airlines carries from Toronto to Dallas today is higher than the average number per flight a year ago.
- (E) The criteria that Breezeway Airlines uses for permitting passengers to buy discount coach tickets on the Toronto-to-Dallas route are different today than they were a year ago.

31.2.10. If something would have been justifiably regretted if it had occurred, then it is something that one should not have desired in the first place. It follows that many forgone pleasures should not have been desired in the first place.

The conclusion above follows logically if which one of the following is assumed?

- (A) One should never regret one's pleasures.
- (B)Forgone pleasures that were not desired would not have been justifiably regretted.
- (C) Everything that one desires and then regrets not having is a forgone pleasure.
- (D) Many forgone pleasures would have been justifiably regretted.
- (E) Nothing that one should not have desired in the first place fails to be a pleasure.

1. understand your job: We have to find an argument and figure out what's wrong with it. Then we need to find an answer that completely fixes the issue.

2. find the point: On average people pay less for this ticket than they did a year ago.

3. find the support: Full price same + greater percentage sold at a discount.

4. figure out what's wrong: This is a cleverly written problem and a tough flaw to spot—can you see it? It's unclear how much the discounts are for. If most of the discounts this year are for 5%, and most last year were for 50%, this reasoning won't support the conclusion.

5. get rid of answers: (A) is irrelevant to the argument. (B) fills the gap we saw—let's leave it. (C) gives more detail about a premise we got, but not in a way that fixes any holes or guarantees an outcome. (D) is irrelevant to the argument. (E) explains why a premise may be true, but does not fix a hole.

6. confirm the right answer: (B) is the only attractive answer. If we know that the discounts are the same, the full prices are the same, and a greater percentage of people are getting the discount, that is enough to guarantee that people are on average paying less.

1. understand your job: We have to find an argument and figure out what's wrong with it. Then we need to find an answer that completely fixes the issue.

2. find the point: Many foregone pleasures should not have been desired in the first place.

3. find the support: If something would have been justifiably regretted if it had occurred, then it is something that one should not have desired in the first place.

4. figure out what's wrong: This argument has a very clearly defined gap—we need an answer that tells us that many foregone pleasures would have been justifiably regretted had they occurred.

5. get rid of answers: (A) is about pleasures had, not forgone pleasures. (A) is irrelevant. (B) gives us the reverse of what we need. (C) helps define the premise but not in a way that bridges the gap to the conclusion. (D) seems like what we need—let's leave it. (E) seems tempting at first, but does not match up with "foregone" pleasures.

6. confirm the right answer: Perhaps you were tempted by either (B) or (E) above—if so, this would be the step in which you try to fit them into the space between support and conclusion. Neither does the work that (D) clearly does. (D) is correct.

19

LOGICAL REASONING

required assumption strengthen, weaken

A Quick Note About Mental Discipline

Questions that ask you to identify a required assumption, strengthen the argument, or weaken the argument require a high level of mental discipline. These three questions test the same skills you've been tested on so far—your ability to read for structure and your ability to be critical of reasoning—but on top of that, they also present additional and specific challenges. These additional challenges are far less significant when you are able to stay on point, and far more dangerous when you are not.

To illustrate exactly why, let's walk through the layers of challenge that a difficult question will present. We'll imagine a question that asks us to Strengthen the Argument, but what we'll discuss is true for all three of these question types. First, it's likely that the stimulus will hold a lot of extraneous information—you'll need discipline not to get bogged down and to quickly identify the point. It's likely that in that sea of clutter that remains, only a phrase or two will be used to support this point—your next job is to dig these out. Then, you need the discipline to isolate this point and support in order to figure out what's wrong. For the toughest questions, it won't always be easy to figure out what's wrong, and the truth is you may be forced to go forward without a complete sense of the problem (though hopefully that won't happen to you too often). As you evaluate the answer choices, some will strengthen the point—but not in any way that relates to the reasoning in the argument. Some answers will prop up questionable supporting premises—but not in a way that impacts the argument. Finally, you'll find that answer that does directly address the argument—but it actually weakens it. You need the discipline to not lose sight of the specific reasoning issue and your specific task.

Phew! If you have weaknesses in one or two of these areas, you can likely survive easier questions. However, you can see how these skills build upon one another—if you are not strong at the individual components, there is no way you will be in control of a beastly question like the one described above. If you have a vague sense of the point, a vague sense of the support, and a vague sense of the reasoning issue, many of the answer choices will surely look good to you.

The great news is that if you can hold a specific understanding of the support-conclusion relationship in your head (even if you can't see exactly what is wrong), and if you can remember that your job is to strengthen the bond between this support and the point, more often than not it should be that only one answer choice remains after eliminating wrong choices. The great news is that if you can stay on point, the wrong answers are far more obviously wrong, and that will determine how quickly and easily you can get these questions correct.

Required Assumption

"Which of the following is an assumption required by the argument?"

"The argument relies on which one of the following assumptions?"

"Which one of the following is an assumption on which the argument depends?"

What needs to be true?

Required Assumption questions (a.k.a. Necessary Assumption questions) ask us to think about the problem in an argument in a very specific way. These questions ask that we figure out the gap in reasoning, then find one answer that needs to be true if that gap is going to be filled. Required Assumption questions are very common, and they are the most common of the questions centered on "assumptions."

Compared to the other types of questions we've seen thus far, these questions can more often have less clearly definable flaws. They also commonly have stimuli with an excess of secondary information. A big key to Required Assumption questions is to stick to a specific and narrow understanding of "required"—we are not being asked for answers that strengthen the argument, or perhaps even fix the argument, and many of the most tempting wrong choices will perform these other functions.

SUPER-SIMPLE EXAMPLE

Megan has gotten into great shape recently. She must be going to the gym regularly.

Which of the following is an assumption required by the argument?

- (A) Megan goes to the gym the same number of days each week.
- (B) Going to the gym is one of the best ways to get in shape.
- (C) Everyone who goes to a gym will get in great shape.
- (D) Different people have the same sense of what being in great shape means.
- (E) Megan did not get into great shape solely by doing yoga in her home.

The author is assuming that going to the gym is the only way to get in great shape. The correct answer is (E). Note that some wrong answers don't relate to the argument (D), some relate (questionably) to the conclusion but not the support (A), and some aid the argument but are not required (B), (C). Note that the right answer is not one we could predict, but is something that must be true if the reasoning in the argument is ever going to work.

step one
understand your job

The question stems for Required Assumption questions are defined by two primary characteristics: they almost always have the word "assumption" (though almost never the word "if"), and they *must* have some other word that indicates necessity—such as *required*, *rely*, or *depend*.

find the point^{two}

Once you recognize the question type, you know that your job is to identify the flaw, and to find the one answer that needs to be true if the support is ever going to actually prove the point. Of course, this starts with understanding the problem in the argument correctly.

find the support^{three}

Steps one through four are the same for every question that asks you to be critical of the reasoning in an argument. You want to isolate the critical components—the point and the support—then carefully evaluate that relationship. Hopefully you are having to think about performing these steps less and less—that is, they are simply becoming habit.

figure out what's wrong^{four}

Whereas steps two and three are more mechanical, step four is less likely to feel as absolute, at least not until you get very close to the end of your process. Once you get all of your other habits down, knowing what's wrong is ultimately the last thing that remains that makes certain stimuli more difficult than others. For steps one through three, make sure you do not go forward until you are finished with that step. For step four, you may need to occasionally move on without a complete picture of the flaw. That's okay. If you are strong at your other skills, you should be able to compensate. Still, questions are of course always easier when you know what is wrong with the argument, so do always give yourself a fair shot at figuring out what is wrong before moving forward.

five get rid of answers

Once you have a firm understanding of the argument and flaw, you want to move on to eliminating answers.

One important thing to keep in mind is that, in general, you cannot anticipate the answer for a Required Assumption question. This is very different from, say, a Flaw question, or even a Sufficient Assumption question, both of which will have answer choices that look very much like the exact issue that you spotted in the argument.

The reality is, when an argument is flawed, it generally requires many different assumptions; therefore these questions will tend to have many possible right answers. Knowing this plays an important role in your elimination process. Don't eliminate an answer because it does not match what you were expecting.

Instead, as always, eliminate answers based on your understanding of the argument and your understanding of the task. As always, most wrong choices will have no direct connection to the argument being made, and often you can get rid of all four answer choices with just a strong sense of the argument.

The most attractive wrong choices are ones that seem to support the argument in some way, or even perhaps completely fix the argument. Keep in mind that there are certain assumptions that can fix an entire argument, but are not *needed* or required for that argument to be fixed (more on this on the side and in a couple of pages). A clear sense of task is critical here. There is a difference between helpful and required, and if your focus is on *required*, these wrong choices will be more obviously wrong.

As always, do not think too deeply about right answers in this step—try to find clear, obvious reasons why answers are wrong, and if you can't find them, leave the answers for your last step.

six confirm the right answer

Left with just one or two serious contenders, now you should carefully evaluate the answer choice(s) to figure out which one is required in order for the argument to work. Again, keep in mind the difference between required and helpful. If one answer needs to be true for the argument to work but hardly helps it, and another answer completely fixes all issues, but not in a way they needed to be fixed, the first answer will be correct.

For Required Assumption questions, a great tool for confirming the correct answer is the negation test (see side for example). If the support is in fact required or necessary in order to reach a conclusion, it stands to reason that if the exact opposite of that support were true, it would severely hurt or even destroy the argument being made. If you negate an answer choice and the negation does not hurt the argument, the answer was not something that was necessary to the argument. The negation test will work on all correct answers to Required Assumption questions, and it's something you should build in to your process for solving all Required Assumption questions.

always negate to confirm a required assumption

REQUIRED ≠ IMPORTANT

Remember that required and important are different criteria. A necessary assumption may be important, or it may not be. (More on page 271.)

Megan has gotten into great shape recently. She must be going to the gym regularly.

Required assumptions

(+ negations):

Megan did not get into great shape solely by doing yoga in her home (*Megan got into great shape solely doing yoga in her home.*)

Megan goes to the gym. (*Megan does not go to the gym.*)

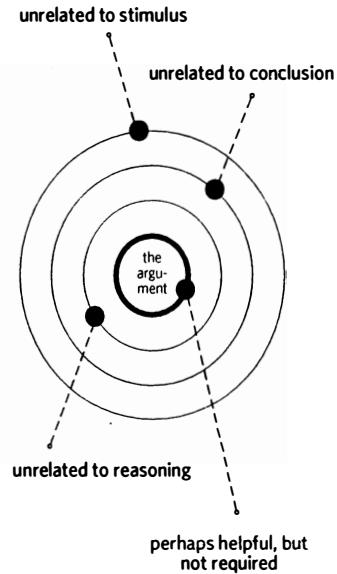
Helpful, but not required:

Going to the gym is one of the best ways to get in shape. (*Going to the gym isn't one of the best ways to get in shape*—so what, it could have still worked for Megan).

Everyone who goes to a gym will get in great shape. (*Not everyone who goes to the gym gets in great shape*—so what, ditto as above.)

Note how the negation test can help weed out the truly necessary assumptions from the other answers.

CONSTELLATION OF WRONG ANSWERS



the process in action

Let's model the problem-solving process with a question you solved at the end of Lesson 16.

1. understand your job

We have to figure out what's wrong with the argument then find an assumption required in order to make the argument work.

2. find the point

When exercising one's back, it's important to exercise muscles on both sides equally.

3. find the support

Balanced muscle development is important for a healthy back.

4. figure out what's wrong

Very tough to see what is wrong here. Both the support and the conclusion are about the same consequence (maintaining a healthy back) and it's tough to see an issue! The argument makes sense—we need balanced development, so we should exercise both sides the same. Maybe there is something to "exercise"...

5. get rid of answers

(A) Muscles on opposite sides of the spine that are equally well developed will be enough to keep the back in proper alignment.
(B) Exercising the muscles on opposite sides of the spine unequally tends to lead to unbalanced muscle development.
(C) Provided that one exercises the muscles on opposite sides of the spine equally, one will have a generally healthy back.
(D) If the muscles on opposite sides of the spine are exercised unequally, one's back will be irreparably damaged.
(E) One should exercise daily to ensure that the muscles on opposite sides of the spine keep the back in proper alignment.

6. confirm the right answer

We weren't 100% sure of the flaw, but with a clear sense of the conclusion and the support, and our task, we were still able to get rid of four answers. Left with just (B), now the gap in the argument makes more sense—maybe we don't need to "exercise" both sides equally for balanced development (perhaps you naturally use one side more depending on whether you are left or right handed, and so you need to exercise the other side more in order for your back to balance out). (B) may be easy to overlook because it may seem too obvious, but it does address an assumption in the argument, and it is something we need to assume in order for the argument to work.

The negation of (B) would be, "Exercising the muscles on opposite sides of the spine unequally does not tend to lead to unbalanced muscle development." Notice that this would severely hurt how the author is trying to use his reasons to make his point. That's a good sign of a necessary assumption.

3.17. When exercising the muscles in one's back, it is important, in order to maintain a healthy back, to exercise the muscles on opposite sides of the spine equally. After all, balanced muscle development is needed to maintain a healthy back, since the muscles on opposite sides of the spine must pull equally in opposing directions to keep the back in proper alignment and protect the spine.

Which one of the following is an assumption required by the argument?

- (A) Muscles on opposite sides of the spine that are equally well developed will be enough to keep the back in proper alignment.
 - (B) Exercising the muscles on opposite sides of the spine unequally tends to lead to unbalanced muscle development.
 - (C) Provided that one exercises the muscles on opposite sides of the spine equally, one will have a generally healthy back.
 - (D) If the muscles on opposite sides of the spine are exercised unequally, one's back will be irreparably damaged.
 - (E) One should exercise daily to ensure that the muscles on opposite sides of the spine keep the back in proper alignment.
-

required ≠ IMPORTANT

We've now taken a look at all three question types that speak of the *flaw* in an argument as an *assumption* that the author has made. *Basic Assumption* questions simply ask us to state the problem in an argument in terms of an assumption the author has made. *Sufficient Assumption* questions ask us to identify an answer that would completely fix the reasoning issue in an argument. *Required Assumption* questions ask us to identify an assumption that needs to be true for the conclusion to be true.

The three types of questions are very easy to lump together, but they each require something unique from us, and it's important to develop specific habits for each one.

Required Assumption questions are the most common of the three, and also the ones where discipline is most important. Perhaps the most important thing to remember is the specific meaning of the word "required." It's very easy to think of "required" as being "important," and while these two characteristics sometimes coincide, they do not define one another. The right answer to a Required Assumption question might be very important to the entire argument—in fact, it may match your exact understanding of the flaw in the argument, or it may be something that is secondary, but nonetheless needs to be true in order for the argument to work.

The reason why this is important to remember is that "importance" is the primary factor the test writers have for creating less attractive right answers, and more attractive wrong ones. Take a look below at two sample arguments, along with potential answer choices. The first two answer choices represent required assumptions—one that goes a long way toward fixing the issues in the argument and one that does not. The last two choices represent potentially attractive wrong answers to Required Assumption questions—one that might make the argument better, and another that might even completely fix it—but neither of which are required. Keep in mind that a required assumption need not fix the argument or even get close to fixing it—it's simply something that needs to be true if the argument is going to work.

Because we locked the door, no one can break into our house.

Possible Assumptions:

Required and important: There are not other ways to break into the house.

Required and less important: One cannot break into the house going through the chimney.

Helpful but not required: None of the windows to the house can be opened.

Fills the gap but is not required: The door is the only way in and out of the house, and the lock impenetrable.

My husband says I consume too much caffeine but that is false. I only drink one cup of coffee a day, and one cup of coffee is not too much caffeine for a person to consume daily.

Possible Assumptions:

Required and important: She does not get her excess of caffeine through other means.

Required and less important: She does not get an excess of caffeine from drinking tea.

Helpful but not required: The coffee she drinks has less caffeine than normal coffee.

Fills the gap but is not required: Coffee is the only substance I consume that contains caffeine. (Very tempting, but more than we need.)

We have now discussed three question types that center on the word "assumption." Each of these assumption questions is asking us for a slightly different type of answer. Let's take a quick look at the three different types of assumption questions and the tasks they present.

Basic Assumption

"The argument assumes that..."

Task: Look for an answer that expresses the flaw in reasoning as an assumption.

Sufficient Assumption

"Which of the following, if assumed, allows the argument to be properly drawn?"

Task: Look for an answer that makes the argument air-tight.

Necessary Assumption

"Which of the following is an assumption required by the argument?"

Task: Look for an answer that needs to be true if the argument is to work.

required vs important

Required Assumption Questions

26.2.7. Speakers of the Caronian language constitute a minority of the population in several large countries. An international body has recommended that the regions where Caronian-speakers live be granted autonomy as an independent nation in which Caronian-speakers would form a majority. But Caronian-speakers live in several, widely scattered areas that cannot be united within a single continuous boundary while at the same time allowing Caronian-speakers to be the majority population. Hence, the recommendation cannot be satisfied.

The argument relies on which one of the following assumptions?

- (A) A nation once existed in which Caronian-speakers formed the majority of the population.
- (B) Caronian-speakers tend to perceive themselves as constituting a single community.
- (C) The recommendation would not be satisfied by the creation of a nation formed of disconnected regions.
- (D) The new Caronian nation will not include as citizens anyone who does not speak Caronian.
- (E) In most nations several different languages are spoken.

28.1.2. If the government increases its funding for civilian scientific research, private patrons and industries will believe that such research has become primarily the government's responsibility. When they believe that research is no longer primarily their responsibility, private patrons and industries will decrease their contributions toward research. Therefore, in order to keep from depressing the overall level of funding for civilian scientific research, the government should not increase its own funding.

Which one of the following is an assumption on which the argument relies?

- (A) Governments should bear the majority of the financial burden of funding for civilian scientific research.
- (B) Any increase in government funding would displace more private funding for funding for civilian scientific research than it would provide.
- (C) Private donations toward research are no longer welcomed by researchers whose work receives government funding.
- (D) Civilian scientific research cannot be conducted efficiently with more than one source of funding.
- (E) Funding for civilian scientific research is currently at the highest possible level.

28.3.19. On a certain day, nine scheduled flights on Swift Airlines were canceled. Ordinarily, a cancellation is due to mechanical problems with the airplane scheduled for a certain flight. However, since it is unlikely that Swift would have mechanical problems with more than one or two airplanes on a single day, some of the nine cancellations were probably due to something else.

The argument depends on which one of the following assumptions?

- (A) More than one or two airplanes were scheduled for the nine canceled flights.
- (B) Swift Airlines has fewer mechanical problems than do other airlines of the same size.
- (C) Each of the canceled flights would have been longer than the average flight on Swift Airlines.
- (D) Swift Airlines had never before canceled more than one or two scheduled flights on a single day.
- (E) All of the airplanes scheduled for the canceled flights are based at the same airport.

29.1.15. Ordinary mountain sickness, a common condition among mountain climbers, and one from which most people can recover, is caused by the characteristic shortage of oxygen in the atmosphere at high altitudes. Cerebral edema, a rarer disruption of blood circulation in the brain that quickly becomes life-threatening if not correctly treated from its onset, can also be caused by a shortage of oxygen. Since the symptoms of cerebral edema resemble those of ordinary mountain sickness, cerebral edema is especially dangerous at high altitudes.

Which one of the following is an assumption on which the argument depends?

- (A) The treatment for ordinary mountain sickness differs from the treatment for cerebral edema.
- (B) Cerebral edema can cause those who suffer from it to slip into a coma within a few hours.
- (C) Unlike cerebral edema, ordinary mountain sickness involves no disruption of blood circulation in the brain.
- (D) Shortage of oxygen at extremely high altitudes is likely to affect thinking processes and cause errors of judgment.
- (E) Most people who suffer from ordinary mountain sickness recover without any special treatment.

Required Assumption Solutions

26.2.7. Speakers of the Caronian language constitute a minority of the population in several large countries. An international body has recommended that the regions where Caronian-speakers live be granted autonomy as an independent nation in which Caronian-speakers would form a majority. But Caronian-speakers live in several, widely scattered areas that cannot be united within a single continuous boundary while at the same time allowing Caronian-speakers to be the majority population. Hence, the recommendation cannot be satisfied.

The argument relies on which one of the following assumptions?

- (A) A nation once existed in which Caronian-speakers formed the majority of the population.
- (B) Caronian-speakers tend to perceive themselves as constituting a single community.
- (C) The recommendation would not be satisfied by the creation of a nation formed of disconnected regions.
- (D) The new Caronian nation will not include as citizens anyone who does not speak Caronian.
- (E) In most nations several different languages are spoken.



1. understand your job: Our job is to find what's wrong with the argument, then find an answer that needs to be true for the argument to work.

2. find the point: Cannot form an independent nation with Caronian-speakers as majority.

3. find the support: Caronian-speakers are too spread out to form majority in any one area.

4. figure out what's wrong: The argument seems to make a lot of sense, especially in real life terms. Still, the fact that they are too spread out does not seem enough to absolutely prove the conclusion—perhaps some of the people can move to form a majority in an area, etc.

5. get rid of answers: (A) is related in subject matter, but if we are thinking about what is required, we can see that (A) is definitely not something that needs to be true for the author's argument to work. Neither is (B)—what they think of themselves has no direct bearing on the point. (C) is not an answer we expected, but it does relate to the premise-conclusion relationship. Let's keep it. (D) is more than needed for the argument, and (E) does not need to be true for the argument to work. That leaves us with only (C).

6. confirm the right answer: We think of a nation as one block of land, and so (C) is not an answer most of us will anticipate. However, (C) does need to be true for the argument to work—if a nation could be created by people living in different areas, his support would not justify his conclusion.

28.1.2. If the government increases its funding for civilian scientific research, private patrons and industries will believe that such research has become primarily the government's responsibility. When they believe that research is no longer primarily their responsibility, private patrons and industries will decrease their contributions toward research. Therefore, in order to keep from depressing the overall level of funding for civilian scientific research, the government should not increase its own funding.

Which one of the following is an assumption on which the argument relies?

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Required Assumption Solutions

28.3.19. On a certain day, nine scheduled flights on Swift Airlines were canceled. Ordinarily, a cancellation is due to mechanical problems with the airplane scheduled for a certain flight. However, since it is unlikely that Swift would have mechanical problems with more than one or two airplanes on a single day, some of the nine cancellations were probably due to something else.

The argument depends on which one of the following assumptions?

- (A) More than one or two airplanes were scheduled for the nine canceled flights.
- (B) Swift Airlines has fewer mechanical problems than do other airlines of the same size.
- (C) Each of the canceled flights would have been longer than the average flight on Swift Airlines.
- (D) Swift Airlines had never before canceled more than one or two scheduled flights on a single day.
- (E) All of the airplanes scheduled for the canceled flights are based at the same airport.



1. understand your job: Our job is to find what's wrong with the argument, then find an answer that needs to be true for the argument to work.

2. find the point: Some of the nine cancellations were due to something other than mechanical problems.

3. find the support: Unlikely that mechanical problems would keep more than one or two airplanes on the ground.

4. figure out what's wrong: Hmm. Tough to see. Maybe there is something with the difference between flights and airplanes.

5. get rid of answers: Not sure how (A) is necessary, but it is about flights and airplanes, and seems relevant. Let's leave it. (B) is nice and all, but it has nothing to do with the support-conclusion relationship. (C) also has nothing to do with the argument. (D) supports the premise, but isn't necessary. (E) provides an alternative explanation for the cancellations (maybe an airport was closed down) but that thought requires a lot of conjecture, and certainly isn't something the argument requires.

6. confirm the right answer: Looking back at (A), the issue with the argument seems obvious now—airplanes make multiple flights a day—maybe the nine cancellations are just from one or two planes. The negation of (A)—(no more than one or two planes...) hurts the argument and helps prove that (A) is correct.

1. understand your job: Our job is to find what's wrong with the argument, then find an answer that needs to be true for the argument to work.

2. find the point: Cerebral edema is especially dangerous at high altitudes.

3. find the support: Symptoms of cerebral edema are similar to those of mountain sickness. Cerebral edema is very dangerous, while mountain sickness is not.

It's tough to understand the support here, but essentially the author is saying that because this life-threatening thing is so similar to something common and less life-threatening, it's more dangerous. Ah, maybe because people mistake one for the other.

4. figure out what's wrong: This argument seems strong. While misdiagnosing and being dangerous are two different things, it seems from real life that misdiagnosing a critical condition is dangerous. We're really going to need to rely on task to eliminate answers.

5. get rid of answers: (A) seems attractive—let's leave it. If the treatment were the same, why would the misdiagnosis be dangerous? (B) seems to support the conclusion, but wait—it's not required. (C) explains differences between the two, but is not required. (D) might make it easier to mistake one for the other, but is not required. (E) doesn't impact the conclusion.

6. confirm the right answer: Let's go back to (A)—we can walk through it carefully to see that it is indeed a necessary assumption. If the treatment for both was the same, misdiagnosing one for the other might not be so bad.

29.1.15. Ordinary mountain sickness, a common condition among mountain climbers, and one from which most people can recover, is caused by the characteristic shortage of oxygen in the atmosphere at high altitudes. Cerebral edema, a rarer disruption of blood circulation in the brain that quickly becomes life-threatening if not correctly treated from its onset, can also be caused by a shortage of oxygen. Since the symptoms of cerebral edema resemble those of ordinary mountain sickness, cerebral edema is especially dangerous at high altitudes.

Which one of the following is an assumption on which the argument depends?

- (A) The treatment for ordinary mountain sickness differs from the treatment for cerebral edema.
- (B) Cerebral edema can cause those who suffer from it to slip into a coma within a few hours.
- (C) Unlike cerebral edema, ordinary mountain sickness involves no disruption of blood circulation in the brain.
- (D) Shortage of oxygen at extremely high altitudes is likely to affect thinking processes and cause errors of judgment.
- (E) Most people who suffer from ordinary mountain sickness recover without any special treatment.

Strengthen / Weaken

"Which of the following, if true, most strengthens the argument?"

"Which of the following, if true, most seriously weakens the argument?"

"Which one of the following, if true, most calls into question the author's reasoning?"

Strengthen and Weaken questions are similar to Required Assumption questions in that our job is to identify the flaw in the argument, and then address that flaw in some way. Compared to question types from previous lessons, these questions will more commonly have vague or more difficult to define flaws, and they will often have a lot of secondary "fluff" around the critical components of the argument. Right answers need not make the argument perfect, and generally will not.

Some of the most tempting wrong answers for Strengthen and Weaken questions are ones that strengthen or weaken the author's point, but not in a way that impacts how he made the point originally (i.e. the reasoning). Answers that play an opposite role—strengthen answers for weaken questions and vice-versa, are also often surprisingly tempting. As always, a huge key to success is your ability to focus on the argument and the task.

SUPER-SIMPLE EXAMPLE

Mr. Thomas, the owner of the convenience store, is not friendly to customers. Therefore, it is unlikely that his store will remain open for long.

Which of the following, if true, most strengthens the argument?

- (A) It is difficult for businesses to remain open beyond an initial period if their owners are not friendly to their customers.
- (B) Mr. Thomas has poor math skills and incorrectly prices many items.
- (C) Most owners of convenience stores are naturally outgoing people.
- (D) Mr. Thomas is unfriendly because he is trying to be professional.
- (E) By working long hours and cutting down on employee costs, Mr. Thomas can offer lower prices than his competitors.

The correct answer is (A). Certain answers are wrong because they don't relate directly to the argument (C); some give us information about the premise, but not in a way that helps the conclusion (D); some arguably impact the conclusion but not the support-conclusion relationship (B); and some arguably weaken the argument (E).

step one understand your job

Perhaps more so than any other type of question, Strengthen and Weaken questions have somewhat deceptive question stems. What is deceptive about them is that they will invariably ask for the answer that *most strengthens* or *most weakens*, but only give you one answer that can possibly strengthen or possibly weaken. This is true every single time. Why do they do this? We could take some educated guesses, but it really doesn't matter.

find the point^{two}

What does matter is that you approach these questions with the right mindset. A Strengthen or a Weaken question will require you to understand the flaw in the argument and then identify the one answer choice that matches the task.

find the support^{three}

One other thing to notice is that these questions will always have the statement, "if true," contained in the question stem. This tells us not to waste our energy thinking about the validity of the answer choices. Rather, we want to focus on how that answer choice, if true, impacts the relationship between the support given and the conclusion reached.

figure out what's wrong^{four}

Strengthen and Weaken questions, especially as they get more difficult, can tend to have a lot of secondary information. Just as with Required Assumption questions, when you see a large stimulus your sense should not be, "Wow, there's going to be a lot to think about," but rather, "Wow, there's a lot to dig through to get to what's important."

Once you've isolated the support and the conclusion, your next job is always to figure out what is wrong. Hopefully you feel like you are getting more and more specific in terms of understanding what is wrong with arguments. Strengthen and Weaken questions will test your abilities: the support and conclusion will often be separated by a lot of "fluff," and commonly the issues will be less clear-cut than in some other question types. Still, you want to be able to see what is wrong for the vast majority of questions. If you do need to move on to the next step with anything less than a clear picture, there are secondary steps you can take to still get the question correct.

five get rid of answers

Like all questions, Strengthen and Weaken questions will have answers you can eliminate because they have no direct bearing on the relationship between the support and the conclusion. Even when you can't quite put your finger on exactly what is wrong with an argument, if you can simply isolate the argument from the secondary information, it's not uncommon to see four wrong choices have no direct bearing on the argument. By this point, hopefully you feel that you are becoming more and more of an expert at quickly sniffing out and eliminating these incorrect answers.

Of course, answers that have a more direct bearing on the elements within the argument will be far more attractive. Beware of answer choices that strengthen or weaken the conclusion, but not in a way that seems to relate to the reasoning you originally considered. Remember that strengthening or weakening the author's point is not your job. Your job is to strengthen or weaken the bond between the support and the conclusion.

Lastly, do not be swayed by how much the answer choice strengthens or weakens. Just like with Required Assumption questions, it's true that certain answers "fix" issues in ways you expect, whereas other correct answers strengthen or weaken the argument just a little bit, still leaving it with plenty of flaws. Do not eliminate an answer because it only seems to strengthen or weaken a little—that's fine. Only eliminate answers that you know do not perform the job at all.

six confirm the right answer

Hopefully the previous step has left you with just one answer, or maybe two (though on occasion there will be one or two questions per section with three or four attractive answer choices). This last step of confirming the right answer is particularly important and useful for Strengthen and Weaken questions.

The key challenges particular to Strengthen and Weaken are that 1) they can have hard-to-pinpoint problems in the argument, 2) attractive wrong choices strengthen or weaken the point but not the reasoning, and 3) attractive wrong choices also often play the opposite role relative to what we need.

All this can lead to mistakes. In this final step, you can confirm that you have selected the right answer. First, take your answer and try to "fit" it in between the support and the conclusion. You should see that it strengthens this bond or weakens it. If you can't see it doing either, it's not the right answer. This step will help you catch yourself when you fall prey to the most tempting wrong choices. Then, as a last step, always make it a habit to double-check the question stem and make sure that your answer performs the task that it is supposed to.

Keys to Strengthen/Weaken

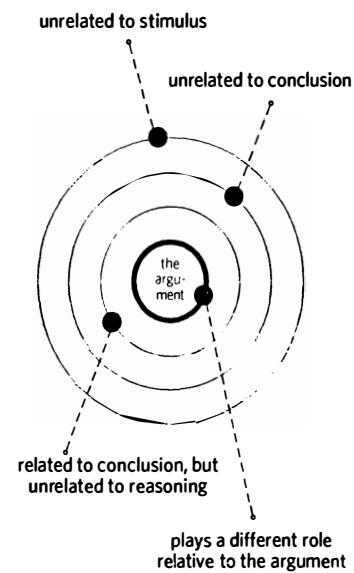
It's important to remember that all strengthen and weaken questions will be asked in terms of an answer that "most" strengthens or weakens, but all strengthen and weaken questions are designed to have just one answer that actually performs that particular task.

This is important for you to remember as you eliminate answer choices (you should expect four not to strengthen or weaken) and as you confirm the right answer (you don't need something that strengthens or weakens a lot, as "most" implies—you just need an answer that actually strengthens or weakens).

It's also important to remember that attractive incorrect choices will strengthen or weaken the conclusion but not the argument (that is, they won't strengthen or weaken the premise-conclusion bond), or they will play an opposite role.

You can avoid many costly mistakes by confirming that the answer you select plays the correct role, and by confirming that you can "fit" the answer in between the support and the conclusion.

CONSTELLATION OF WRONG ANSWERS



the process in action

Let's model the problem-solving process with two questions you solved at the end of Lesson 16.

2.9. Although video game sales have increased steadily over the past 3 years, we can expect a reversal of this trend in the very near future. Historically, over three quarters of video games sold have been purchased by people from 13 to 16 years of age, and the number of people in this age group is expected to decline steadily over the next 10 years.

Which one of the following, if true, would most seriously weaken the argument?

- (A) Most people 17 years old or older have never purchased a video game.
- (B) Video game rentals have declined over the past 3 years.
- (C) New technology will undoubtedly make entirely new entertainment options available over the next 10 years.
- (D) The number of different types of video games available is unlikely to decrease in the near future.
- (E) Most of the people who have purchased video games over the past 3 years are over the age of 16.

1: understand your job: We have to find an argument and figure out what's wrong with it. Then we need to find an answer that weakens the support-conclusion relationship.

2: find the point: Video games sales will stop increasing.

3: find the support: Most people who buy games are between 13–16, and the number of people in this group is going to shrink.

4: figure out what's wrong: Hmm. This is a tough one. However, this is a bit of a correlation/causation issue here—just because most past customers were between 13 and 16 doesn't mean that being that age and being a customer are causally related. Maybe some other age group will buy new types of video games in the future.

5: get rid of answers: (A) seems to hurt the argument—let's leave it. (B) is tempting, but actually not related at all (rental). (C) seems to support the conclusion, and has nothing to do with the support-conclusion relationship. Ditto for (D). (E) seems to go against the premise that most people who buy are kids? Hmm. That can't be. Let's leave it.

6: confirm the right answer: (A) seems correct, but we've got (E) too. (A) is about people over 17 who don't buy games—on second thought, this doesn't have any direct impact on the argument. Who cares if ten percent or ninety percent of people over 17 have bought a video game—this doesn't tell us anything about the people who actually buy the games. It's a trap. What about (E)? An answer choice cannot contradict the premise, so let's return to the text to figure out what's going on: the premise is about historically, and (E) is about the last three years—ah, what does that mean? The trend is changing. That weakens the support-conclusion relationship, and now I see what was wrong with the argument to begin with more clearly—maybe the demographic of people who buy games is changing. (E) is correct.

3.13. Therapist: Cognitive psychotherapy focuses on changing a patient's conscious beliefs. Thus, cognitive psychotherapy is likely to be more effective at helping patients overcome psychological problems than are forms of psychotherapy that focus on changing unconscious beliefs and desires, since only conscious beliefs are under the patient's direct conscious control.

Which one of the following, if true, would most strengthen the therapist's argument?

- (A) Psychological problems are frequently caused by unconscious beliefs that could be changed with the aid of psychotherapy.
- (B) It is difficult for any form of psychotherapy to be effective without focusing on mental states that are under the patient's direct conscious control.
- (C) Cognitive psychotherapy is the only form of psychotherapy that focuses primarily on changing the patient's conscious beliefs.
- (D) No form of psychotherapy that focuses on changing the patient's unconscious beliefs and desires can be effective unless it also helps change beliefs that are under the patient's direct conscious control.
- (E) All of a patient's conscious beliefs are under the patient's conscious control, but other psychological states cannot be controlled effectively without the aid of psychotherapy.

1: understand your job: We have to find an argument and figure out what's wrong with it. Then we need to find an answer that strengthens the argument.

2: find the point: Cognitive psychotherapy is more likely to be effective than therapy that focuses on changing unconscious beliefs and desires.

3: find the support: Cognitive therapy focuses on changing conscious beliefs, and only conscious beliefs are under the patient's direct control.

4: figure out what's wrong: Who says that what we are in better control of is related in any way to what is more effective? There is no reasoning bond between these two ideas, and we need some help here.

5: get rid of answers: (A) hits at the flaw in the argument and would be a great weaken answer, but we are looking to strengthen. (B) gives us the connection we need. Let's leave it. Whether there are other therapies that focus on changing conscious beliefs is not relevant to the comparison in this particular conclusion, so we can knock off (C). (D) uses a lot of the same language as the original argument, but is actually about something else, something more complicated—we don't need to waste time thinking about it—knowing that it doesn't directly relate to the conclusion is enough to eliminate it. (E) tells us something more about the premise, but doesn't help explain why more control means more help.

6: confirm the right answer: (B) seems to address our gap. Let's check it one more time to make sure it "fits" between support and conclusion—if we take (B) to be true, it makes a lot more sense for the author to use his premise to reach his conclusion. Yes, (B) is definitely correct.

Strengthen & Weaken Questions

28.1.5. The number of codfish in the North Atlantic has declined substantially as the population of harp seals has increased from two million to more than three million. Some blame the seal for the shrinking cod population, but cod plays a negligible role in the seal's diet. It is therefore unlikely that the increase in the seal population has contributed significantly to the decline in the cod population.

Which one of the following, if true, most seriously weakens the argument?

- (A) People who fish for cod commercially are inconvenienced by the presence of large numbers of seals near traditional fishing grounds.
- (B) Water pollution poses a more serious threat to cod than to the harp seal.
- (C) The harp seal thrives in water that is too cold to support a dense population of cod.
- (D) Cod feed almost exclusively on capelin, a fish that is a staple of the harp seal's diet.
- (E) The cod population in the North Atlantic began to decline before the harp-seal population began to increase.

28.1.15. The town of Springhill frequently must declare a water emergency, making it temporarily unlawful to use water for such nonessential purposes as car washing. These emergencies could be avoided if Springhill would introduce permanent economic incentives for water conservation. Actually, Springhill discourages conservation because each household pays a modest monthly flat fee for any amount of water below a certain usage threshold, and a substantial per-liter rate only after the threshold is reached.

Which one of the following, if true, most strengthens the argument?

- (A) The Springhill authorities do a poor job of enforcing its water emergency laws and many people break the laws without incurring a penalty.
- (B) The town council of Springhill recently refused to raise the threshold.
- (C) The threshold is kept at a high enough level to exceed the water requirements of most households in Springhill.
- (D) The threshold is not as high in Springhill as it is in neighboring towns.
- (E) The threshold remains at the predetermined level specified by law until a change is approved by the Springhill town council.

28.1.23. Further evidence of a connection between brain physiology and psychological states has recently been uncovered in the form of a correlation between electroencephalograph patterns and characteristic moods. A study showed that participants who suffered from clinical depression exhibited less left frontal lobe activity than right, while, conversely, characteristically good-natured participants exhibited greater left lobe activity. Thus one's general disposition is a result of the activity of one's frontal lobe.

Each of the following, if true, weakens the argument EXCEPT:

- (A) Many drugs prescribed to combat clinical depression act by causing increased left lobe activity.
- (B) Excessive sleep, a typical consequence of clinical depression, is known to suppress left lobe activity.
- (C) Frontal lobe activity is not subject to variation the way general disposition is.
- (D) Earlier studies indicated that frontal lobe activity and emotive states are both caused by activity in the brain's limbic system.
- (E) Social interaction of the kind not engaged in by most clinically depressed people is known to stimulate left lobe activity.

28.3.25. The interstitial nucleus, a subregion of the brain's hypothalamus, is typically smaller for male cats than for female cats. A neurobiologist performed autopsies on male cats who died from disease X, a disease affecting no more than .05 percent of male cats, and found that these male cats had interstitial nuclei that were as large as those generally found in female cats. Thus, the size of the interstitial nucleus determines whether or not male cats can contract disease X.

Which of the following statements, if true, most seriously weakens the argument?

- (A) No female cats have been known to contract disease X, which is a subtype of disease Y.
- (B) Many male cats who contract disease X also contract disease Z, the cause of which is unknown.
- (C) The interstitial nuclei of female cats who contract disease X are larger than those of female cats who do not contract disease X.
- (D) Of 1,000 autopsies on male cats who did not contract disease X, 5 revealed interstitial nuclei larger than those of the average male cat.
- (E) The hypothalamus is known not to be causally linked to disease Y, and disease X is a subtype of disease Y.

Strengthen & Weaken Solutions

28.1.5. The number of codfish in the North Atlantic has declined substantially as the population of harp seals has increased from two million to more than three million. Some blame the seal for the shrinking cod population, but cod plays a negligible role in the seal's diet. It is therefore unlikely that the increase in the seal population has contributed significantly to the decline in the cod population.

Which one of the following, if true, most seriously weakens the argument?

- (A) People who fish for cod commercially are inconvenienced by the presence of large numbers of seals near traditional fishing grounds.
- (B) Water pollution poses a more serious threat to cod than to the harp seal.
- (C) The harp seal thrives in water that is too cold to support a dense population of cod.
- (D) Cod feed almost exclusively on capelin, a fish that is a staple of the harp seal's diet.
- (E) The cod population in the North Atlantic began to decline before the harp-seal population began to increase.



1. understand your job: We have to find an argument and figure out what's wrong with it. Then we need to find an answer that helps fix the issue.

2. find the point: Water emergencies can be avoided if Springhill introduced permanent \$ incentives for conserving water.

3. find the support: Springhill discourages saving by charging a flat fee for up to a certain amount, then a high per-liter rate.

4. figure out what's wrong: At first it's tough to see the author's reasoning—the missing piece is that the author is assuming most people don't pass the flat-fee threshold (otherwise, there would be an economic incentive to cut water usage because of the per-liter rate). He has no justification for assuming this is the case.

5. get rid of answers: (A) relates to the background but not the argument. It's tough to see how (B) impacts the argument, but it seems related—let's leave it. (C) is directly related to the argument, and it's exactly what the argument needed. Let's leave it. Who cares about neighbors—let's eliminate (D). (E) gives us technicalities that don't impact our argument.

6. confirm the right answer: With (B), how does not raising the threshold strengthen the argument that the flat fee discourages saving? Tough to see. The issue is about whether the threshold is set to financially encourage, or not encourage, water savings. The author says it's set up to not encourage, and (C) gives him the support he needs to use his premise to support the conclusion. (C) is correct.

1. understand your job: We have to find an argument and figure out what's wrong with it. Then we need to find an answer that weakens the argument.

2. find the point: Unlikely that increase in seal population has contributed to decline in cod population.

3. find the support: Seals don't eat a lot of cod.

4. figure out what's wrong: Perhaps the seals don't eat much cod relative to what else they eat, but they still eat a ton of cod. Or perhaps the seals impact the cod in some other way—maybe seal urine is poisonous to cod (sorry to be gross).

5. get rid of answers: (A) shows how seals can impact the cod population, but if anything, it shows how the seals might improve the cod population. (B) is not directly related—whether other issues pose greater threats isn't directly relevant to whether seals have an impact. (C) might help explain why cod plays a negligible role in the seal's diet, but it doesn't have a clear impact on the conclusion. (D) gives us another way that seals can hurt the cod population—let's leave it. (E) would likely strengthen the author's point that seals aren't related to the decrease.

6. confirm the right answer: (D) is the only attractive answer, and we can see that it weakens the relationship between support and conclusion. (D) shows us how, even if seals don't eat cod, they can impact the cod population. (D) is correct



28.1.15. The town of Springhill frequently must declare a water emergency, making it temporarily unlawful to use water for such nonessential purposes as car washing. These emergencies could be avoided if Springhill would introduce permanent economic incentives for water conservation. Actually, Springhill discourages conservation because each household pays a modest monthly flat fee for any amount of water below a certain usage threshold, and a substantial per-liter rate only after the threshold is reached.

Which one the following, if true, most strengthens the argument?

- (A) The Springhill authorities do a poor job of enforcing its water emergency laws and many people break the laws without incurring a penalty.
- (B) The town council of Springhill recently refused to raise the threshold.
- (C) The threshold is kept at a high enough level to exceed the water requirements of most households in Springhill.
- (D) The threshold is not as high in Springhill as it is in neighboring towns.
- (E) The threshold remains at the predetermined level specified by law until a change is approved by the Springhill town council.

Strengthen & Weaken Solutions

28.1.23. Further evidence of a connection between brain physiology and psychological states has recently been uncovered in the form of a correlation between electroencephalograph patterns and characteristic moods. A study showed that participants who suffered from clinical depression exhibited less left frontal lobe activity than right, while, conversely, characteristically good-natured participants exhibited greater left lobe activity. Thus one's general disposition is a result of the activity of one's frontal lobe.

Each of the following, if true, weakens the argument EXCEPT:

- (A) Many drugs prescribed to combat clinical depression act by causing increased left lobe activity.
(B) Excessive sleep, a typical consequence of clinical depression, is known to suppress left lobe activity.
(C) Frontal lobe activity is not subject to variation the way general disposition is.
(D) Earlier studies indicated that frontal lobe activity and emotive states are both caused by activity in the brain's limbic system.
(E) Social interaction of the kind not engaged in by most clinically depressed people is known to stimulate left lobe activity.

1. understand your job: We have to find an argument and figure out what's wrong with it. Then we need to find an answer that hurts the argument.

2. find the point: The size of the interstitial nucleus determines whether male cats can get disease X.

3. find the support: Male cats that get disease X have larger than average interstitial nuclei.

4. figure out what's wrong: They are trying to trick us with science again, but we're too strong for that! This is again a classic correlation/causation issue—the correlation between the size of this thing and the chances of getting disease X does not imply causation, as the conclusion claims.

5. get rid of answers: (A) is about female cats—get rid of it. (B) is about another disease—get rid of it. (C) is somewhat tempting, even though it's about female cats...but it's just more correlation! Get rid of it. (D) tells us that it's rare for male cats to have this large thing, but that wouldn't weaken the argument in any way. (E) is about causality, and the only answer left. Let's examine it.

6. confirm the right answer: (E) is not a great answer. So what if X is a subtype of Y? Maybe it's a totally unique subtype. However, a weaken answer does not have to completely destroy the argument—it just needs to hurt the premise-conclusion relationship, and (E) clearly does that. (E) is essentially telling us there is no causal link between this large thing, and the family that includes this disease. Since the problem with the argument was that the author was assuming causation, (E) clearly hurts the author's argument. (E) is correct.

1. understand your job: An except question! We have to find an argument and figure out what's wrong with it. Then we need to eliminate four answers that weaken.

2. find the point: One's mood based on frontal lobe activity.

3. find the support: Correlation between moods and certain frontal lobe activities.

4. figure out what's wrong: They are trying to blind us with science, but correlation does not prove causation! The wrong answers will likely exploit this flaw.

5. get rid of answers: (A) is a consequence that makes sense based on this argument, not something that weakens the argument—let's leave it. (B) shows that mood can influence frontal lobe activity, which is essentially the reverse of the causation proposed in the argument. This definitely weakens the reasoning, so we can eliminate (B). (C) shows a potential lack of correlation between mood and frontal lobe activity—definitely hurts, so let's eliminate. (D) gives us a potential exterior cause—definitely hurts, so let's eliminate. (E) again shows that mood might impact frontal lobe activity, rather than the reverse causal relationship the author is proposing.

6. confirm the right answer: (A) is the only answer remaining. The correct answer for a Weaken EXCEPT question does not need to strengthen the argument (or even have anything to do with the argument at all). It simply needs to not weaken. (A) does not weaken, and (A) is correct.

28.3.25. The interstitial nucleus, a subregion of the brain's hypothalamus, is typically smaller for male cats than for female cats. A neurobiologist performed autopsies on male cats who died from disease X, a disease affecting no more than .05 percent of male cats, and found that these male cats had interstitial nuclei that were as large as those generally found in female cats. Thus, the size of the interstitial nucleus determines whether or not male cats can contract disease X.

Which of the following statements, if true, most seriously weakens the argument?

- (A) No female cats have been known to contract disease X, which is a subtype of disease Y.
(B) Many male cats who contract disease X also contract disease Z, the cause of which is unknown.
(C) The interstitial nuclei of female cats who contract disease X are larger than those of female cats who do not contract disease X.
(D) Of 1,000 autopsies on male cats who did not contract disease X, 5 revealed interstitial nuclei larger than those of the average male cat.
(E) The hypothalamus is known not to be causally linked to disease Y, and disease X is a subtype of disease Y.

20

LOGICAL REASONING

review and assess

Habits.

We started this swatch of lessons by discussing the importance of habits. Sound habits help ensure that the work you put in during your study leads to actual and significant improvement, and habits are what we rely on during the pressure of the exam.

Do you feel that you are developing habits that lead to consistent success? By this point, especially if you have been following along with the corresponding work in the *10 New, Actual LSATs* book, you should be feeling the positive impact of these habits—perhaps the two most significant benefits being that you are naturally zeroing in more and more on the issues that are significant to getting the question correct, and naturally pushing the secondary information more and more into the background.

If you don't feel that you are developing habits and skills, or if you feel that you are developing less-than-ideal habits, now is the time to stop and reassess. Remember, LSAT skills build upon one another—if your foundation isn't strong, you will not be able to get too high up the ladder. Let's take this lesson to assess our progress, discuss additional exercises to bolster weaknesses, and also discuss secondary strategies for solving the toughest questions. We'll finish up with a set of problems that will help you assess how far you've progressed, and what you need to focus on as you continue studying.

Habit 1: Understand Your Task

We want to start every question by looking at the question stem. The question stem will help us figure out how to attack the question as efficiently as possible. First, we'll use the question stem to determine whether we are supposed to be critical of the reasoning in the argument or not. Then we will use the question stem to define what to expect in the right and wrong answers.

Many question stems are written like one another, and it's easy if you aren't careful to mistake one question type for another. The good news is that the test writers use exactly the same question stems exam after exam, and there are only a few different phrasings with which you need to get familiar for each type of question.

Think back on the different types of questions that we've discussed and see if you can visualize the different question stems that you are likely to encounter. If you have trouble with this, you may want to try the exercise suggested on the right.

Do you feel
that you
are developing
habits that
lead to
consistent
success?

To practice recognizing question stems, take any Logical Reasoning section and go through it quickly, looking just at question stems and not at the stimuli themselves. For each question stem, first see if it requires you to be critical, and then determine what type of question it is. Afterwards, walk through the section slowly to see if you got all the question stems correct. Keep a list of stems that trip you up. Repeat until you can recognize every critical question stem without any effort.

Habit 2: Identify the Conclusion

Once you recognize that a question is asking for you to be critical of reasoning, you want to go into the stimulus expecting to find an argument, and the first part of that is figuring out what the conclusion is.

Habit 3: Find the Support

To practice reading for structure, review questions you have already solved. For each question, just focus on the stimulus, and work on zeroing in on the conclusion and the support. Mark what you think that conclusion and support are. After a set of questions, review carefully how the conclusion and support that you marked relate to the correct answer to the question. You should see a connection every single time. Repeat until the process feels automatic, and separate out the process of identifying the conclusion or the supporting premises if you think just that part of your skill set needs more work.

Once you know the point, it generally becomes easier to figure out what the author has given us to help support that point. This support can come in the form of one sentence or one short clause, or it can be the amalgamation of a few different pieces of information and opinion. You want to do your best to understand the support in a conceptual way—what sort of general reasoning strategy is the author using to prove his point?

These two reading habits (2 and 3) should feel fairly automatic, every time. These reading skills are critical for making the question-solving process easier, and if you have trouble with these two steps it's very difficult to consistently get right answers quickly. Try the review exercise to the side if you feel your reading skills need a bit of freshening up.

Habit 4: Figure Out What's Wrong

The money step. In Lessons 6 through 10, we started our Logical Reasoning training process by focusing on the most significant part of a successful Logical Reasoning skill set—your ability to recognize why the reasons provided are not enough to justify the conclusion reached.

Picture your ability to figure out what is wrong with an argument as a physical shape, maybe as a piece of modern sculpture. The test writers are trying to assess the quality of your understanding—from the front, from the side, from above, and from below—and one could argue that all of the different types of questions we've been dealing with are simply different views, different perspectives, on the same work of modern art—your understanding of what is wrong with the reasoning in an argument.

How do you feel about your piece? Are you proud of it? Do you know that it's solid all the way around? Or do you like how it looks from certain angles but not others?

For all subjective questions, if you know the flaw, you should be able to see how the right answer relates to that flaw, every single time. You should also be able to see, in very clear ways, the many wrong answers that have no direct bearing on the flaw. If you know you have trouble with eliminating wrong answers, it's a sign that you are having trouble seeing the flaw clearly, or integrating the flaw into your process. You will have a chance to assess your skill set at the end of this lesson.

Steps two through four are the same for all subjective questions. Before moving on to step five, you want to re-read the question stem to remind yourself of the task that the particular question presents. The task will play a starring role in helping us determine which answers to eliminate. (*continued on page 284*)

To practice recognizing flaws, review questions you have already solved. For each question, just read the stimulus, not the answer choices, and mark down what you think is wrong with the argument. After a set of questions, review carefully how the correct answer relates to this flaw you saw. You should see a connection every single time. If you have a lot of trouble, consider whether your reading skills might be holding you back. Also feel free to repeat the same questions over and over again—this is very good for setting habits, for you will likely see the very same reasoning issues in the arguments on your real exam.

Answer Choice Strategies

Flaw Strategies

For all subjective questions, your ability to handle answer choices quickly and with confidence is dependent on how well you understand what's wrong with that argument.

All questions that require you to be critical are prone to having answer choices that have no direct connection to the argument in the stimulus—in fact, it's often true that all four wrong answers can be eliminated for this reason. If you can successfully prioritize the conclusion and support, these answer choices become far less attractive.

All questions are also prone to having answer choices that serve a different function relative to the argument. There will always be just one answer, the correct answer, that functions in the argument the way it's supposed to.

Each question type also has its own subtle tendencies in terms of wrong answers, right answers, and the processes you can use to identify either. Let's summarize some of these nuances here.

The answers for Flaw questions are as directly related to your understanding of the argument as can be. That means that more so than for any other type of question we've discussed thus far, you need to make sure you understand what is wrong with the argument before moving on to the answers. The vast majority of wrong answers will be unrelated to the reasoning in the argument. The right answer will generally hit the issue right on the head. When right answers are difficult to spot, it is commonly because of abstract wording. Make sure you are comfortable with the language you might see, and make it a habit to not eliminate answer choices until you understand them enough to know for certain that something is wrong with them. (Also applies to Basic Assumption questions.)

Match the Flaw Strategies

The arguments for Match the Flaw questions also tend to have fairly clearly definable flaws, and very commonly these flaws are of the $1 + 1 \neq 3$ variety. Also, in comparison to other types of questions, the stimuli for these questions tend to have a bit less secondary information, or “fluff.” Reasoning structure will allow you to eliminate most wrong answers—they reach different types of conclusions or use a different type of reasoning than what we saw in the original. Left with one answer that you think is correct, make sure to check all of the small words and modifiers to make sure the answer doesn't have a different type of flaw.

Sufficient Assumption Strategies

Sufficient Assumption answers need to completely fix the problem with an argument. You need to have a clear sense of the flaw in order to figure out what will be enough to fix it, and these arguments are designed to have clear and specific problems. You should expect to be able to spot these problems almost every time. Tempting wrong answers might provide a required assumption, or one that is very helpful to the argument but doesn't completely fix it. Right answers need to pass the “sufficiency” threshold—if an answer choice leaves what you feel like are definite gaps, that answer choice will not be correct. Finally, keep in mind that right answers can go above and beyond what we need—they can tell us someone has \$1,000,000 when we just needed to know that they have more than \$100,000—more than enough is fine in an answer. (Also applies to Supporting Principle questions.)

Required Assumption Strategies

The arguments for questions that ask for a Required Assumption will sometimes have flaws that are more difficult to determine or define than do arguments for some other question types. Tempting wrong answers commonly support the argument and can even completely fix the issues in an argument, but answer choices will not be correct unless they need to be true to reach the conclusion. A great way to confirm that an answer is correct is to use the negation test: consider the opposite of the answer and see if it severely damages how the author is trying to support his point. If it does, it's a good sign that the answer represents something that needed to be true for the argument to work.

Strengthen / Weaken Strategies

The arguments for questions that ask you to strengthen or weaken will sometimes have flaws that are more difficult to determine or define than do arguments for some other question types. Arguments for Strengthen and Weaken questions also commonly have a lot of secondary information that you need to wade through. Tempting wrong answers will often support or weaken the conclusion, but not in a way that impacts the reasoning structure. They can also validate or invalidate the support, but not in a way that impacts the point. A great way to confirm a right answer is to see if it “fits” in between the support and the conclusion. A Strengthen answer should make this bond firmer, while a Weaken answer will weaken it. Even though questions ask for the answer that *most* strengthens or *most* weakens, there will almost always be just be one answer choice that strengthens or weakens, and it's possible that the correct answer will strengthen or weaken the argument a lot, or just a bit.

Habit 5: Get Rid of Answers

Getting rid of wrong answers is not a luxury and it's not a time-consuming step—it is a necessary component of a successful skill set

When you first started studying perhaps you thought, if only for a moment, that all this stuff with eliminating wrong answers was a bunch of fluff. “Oh, I don’t have time for that. He can’t be serious that I need to do *that* for every question!”

In my years as a trainer of instructors, I worked with and interviewed many, many people who have scored over 172 on the LSAT—not one of them valued the importance of getting rid of wrong answers much less than I did.

Getting rid of wrong answers is not a luxury and it is not a time-consuming step—it is a necessary component of a successful skill set, and it is a habit that consistently makes it easier for you get questions right. To think that just going after the right answer is easier, or saves time, is equivalent to thinking that driving with just one foot pedal, the gas, is somehow easier or faster than driving with the gas and brake.

Okay—that’s the last lecture I’ll give about eliminating answers, I promise.¹

¹ At least for now.

When it comes to wrong answer characteristics, the question types we’ve discussed naturally have a lot of overlap, but they also have unique quirks. I’ve highlighted some of these on the previous page.

Habit 6: Confirm the Right Answer

The correct answer must relate to the reasoning and it must play the intended role

The final step is to figure out what the correct answer is. If you have done your work correctly, for the vast majority of questions, you will find yourself with just one answer, or perhaps one and a half answers (one answer you feel pretty sure is right, and another you think is wrong but you can’t exactly say why) left to evaluate carefully. One caveat is that each test is likely to have one or two questions for which this is not true—challenging questions for which three or four answers may at first seem attractive.

For all subjective questions, there are two factors involved in confirming the right answer—you need to be able to see that the answer choice is directly related to the reasoning relationship between the support and the conclusion, and you need to make sure that the answer choice plays the role that it is supposed to relative to the argument. Even when you feel a bit fuzzy-headed about the stimulus, or about what is wrong with the argument, if you can remember to think of each answer choice in terms of these two criteria, you can often survive difficult questions and know that you got the right answer, even if you didn’t have a great handle on issues during your problem-solving process.

Directions for the drill on the next page: This drill will help you practice evaluating arguments and matching answers to question stems. For each problem, first underline the conclusion and bracket the support. Write in the flaw in the reasoning and follow the question stem prompts. Answers can be used more than once. This is an untimed drill, but do practice being quick.

Drill: One Argument & Ten Answers

underline the conclusion and bracket the support	write in what's wrong	ten answer choices...
A. In recent years, more and more people have been switching to electronic media, such as computers and tablet devices, as their primary means of getting news information. The consequence of this is that the public actually knows less about the news. Studies show that people retain less of what they read when they read on an electronic device, as opposed to when they read on the standard gray paper that newspapers are printed on.		A. Revenue from newspaper advertising has dropped drastically in recent years. B. Prior to this recent trend, most people got their information from magazines, which are printed differently than newspapers. C. Magazines are printed on glossy white paper, which people find less pleasant to read on than the screens of electronic devices. D. The amount that one knows about the news is related to the means by which one gets the news. E. Research has shown a link between the amount of information one retains when taking in news and the amount that one actually knows about the news. F. People who watched television regularly as children are far more likely to get news through electronic media than are people who did not. G. Newspapers were not printed on gray paper until eighty years ago. H. People who get news primarily through electronic media offset the loss in retention by taking in a far greater volume of news. I. A society can prevent a decay of news understanding only if members of that society do not switch to electronic means of obtaining news information. J. A public that knows less about the news is more likely to vote for incompetent leaders.
1. Find at least four answers that have no clear bearing on the reasoning in the argument.		
2. Find two answers that strengthen the argument.		
3. Find at least one answer that weakens the argument.		
4. Find one answer that is required by the argument.		
5. Find one answer that is sufficient to validate the argument.		
B. A study recently published in a leading psychology magazine showed that, surprisingly, those who are in the top 5% in terms of the amount of sleep they get daily have, on average, about the same level of anxiety and depression as those who are in the bottom 5%. This proves conclusively that the amount of sleep one gets has minimal correlation to the amount of anxiety and depression one feels.		A. People who get the most sleep are actually less likely to take naps than are those who get the least sleep. B. Whether one is anxious or depressed, diet can have a significant impact on sleep patterns. C. The study showed that those who are within ten percent of the mean for daily sleep were significantly less likely than others to suffer from both anxiety and depression. D. Anxiety and depression are known to exacerbate one another. E. If those who are in the lower or higher five percent of a statistical average have minimal differences in terms of a certain trait, then the subject of that statistical average has minimal relation to the certain trait. F. There are other factors besides sleep that impact levels of anxiety. G. It could be true that though there is consistency at the extremes, there is a lack of consistency among people who fall in other parts of the range of average sleep. H. Depression often causes changes in sleeping behavior. I. Anxiety can cause some people to sleep more, and others to sleep less. J. The study also showed that those in the 25th and 75th percentiles also have, on average, about the same level of anxiety and depression as those in the top and bottom 5%.
1. Find at least four answers that have no clear bearing on the reasoning in the argument.		
2. Find two answers that strengthen the argument.		
3. Find one answer that weakens the argument.		
4. Find a principle that supports the argument.		
5. Find one answer that represents the flaw in the argument.		

Drill: One Argument & Ten Answers

underline the conclusion and bracket the support	write in what's wrong	ten answer choices...
C. Joe claims that drinking tea does not cause him any trouble falling asleep. However, before he started drinking tea, he never had trouble falling asleep. In the six months that he's been drinking tea, he's had trouble falling asleep at least one night per week. During this time, there has been no other significant change in what Joe eats or drinks. So, Joe must be wrong in his claim.		A. What one eats and drinks is the primary factor that impacts falling asleep. B. Joe does not drink black tea, which is the tea that contains the greatest amount of caffeine. C. Joe has recently had some stressful life events which he admits he can't stop thinking about at night. D. The tea Joe drinks contains caffeine, which is known to cause people trouble falling asleep. E. People who don't drink tea commonly drink coffee, and coffee is known to cause a great amount of trouble falling asleep. F. Once Joe falls asleep, he rarely has any trouble staying asleep. G. Six months ago Joe got a puppy, and Joe can hear the puppy howling loudly every night the moon is out. H. The tea Joe drinks has natural ingredients that help one sleep more soundly once one is asleep. I. When Joe falls asleep later, he tends to wake up later. J. The tea impacts Joe falling asleep.

- Find at least four answers that have no clear bearing on the reasoning in the argument.
- Find at least two answers that strengthen the argument.
- Find two answers that weaken the argument.
- Find one answer that represents the assumption.

D. Medical Expert: For the past six months, we have been keeping statistics on the surgery time for prostatectomies performed through traditional means, and through a new procedure that uses robotics. The study revealed that surgeries using robotics took an average of forty-three minutes, whereas traditional surgeries took an average of over seventy minutes. The study involved a sufficient enough mix of doctors and hospitals to guarantee that personal surgical skills and access to other types of equipment were not a factor in the study outcome. Therefore, we can conclude that in general it is faster to perform prostatectomies robotically than it is to perform them using traditional means.	A. The differences in relevant characteristics for the patients of both types of surgeries were minimal. B. Traditional surgery, when done well, can result in far less recovery time and medical expense than robotic surgery. C. Surgeons who used robotic surgery were far more likely to stay within five minutes of the mean than were surgeons who performed traditional surgery. D. Robotics are being used in more and more surgeries and at some point will become the most common form of surgery. E. Those who have the surgery done through traditional means are far less likely to have complications days after the surgery than are those who have the surgery done robotically. F. More-complicated prostatectomies cannot be performed as accurately robotically, and so are all performed through traditional means. G. When making decisions about which surgery type is best, how quickly the surgery can be performed should play no part. H. Patients are less likely to feel anxious about robotic surgery than they do about traditional surgery. I. For the most simple prostatectomies, traditional surgeries take, on average, less time than robotic surgeries. J. There may be differences between the typical prostatectomies done robotically and those done through more traditional means.
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- Find at least four answers that have no clear bearing on the reasoning in the argument.
- Find an answer that strengthens the argument.
- Find at least one answer that weakens the argument.
- Find one answer that represents the flaw in the argument.

Drill: One Argument & Ten Answers

underline the conclusion and
bracket the support

write in what's wrong

ten answer choices...

E. Professor Watkins just received a significant raise and now Professor Jenson has requested one too. However, Professor Watkins was only eligible to get a raise if she received tenure; she recently was awarded tenure, and was given the raise. Professor Jenson has no desire to get tenure, is not on track to get tenure, and will not get tenure. So, Professor Jenson's request will likely be denied.

- A. Professor Watkins has been at the university for three years less than Professor Jenson has.
- B. Professor Jenson teaches at multiple schools, and does not want tenure because he has tenure at a more prestigious university.
- C. Professor Jenson is well-known for the work he does in his field, and the school is known to give raises in order to retain professors who are significant in the areas in which they work.
- D. Perhaps Professor Watkins and Professor Jenson have different types of agreements with the university about the timing of raises.
- E. Professor Watkins contributes significantly to campus social life, whereas Professor Jenson does not.
- F. Professor Watkins works in the English department, and Professor Jenson does not.
- G. The rules that govern raises are the same for all professors at the university.
- H. Of those professors who received raises last year, fewer than half had tenure.
- I. Professor Watkins never requested the raise she was recently given.
- J. The university is having financial problems and giving out far fewer significant raises than they once did.

1. Find at least four answers that have no clear bearing on the reasoning in the argument.
2. Find one answer that is sufficient to make the argument valid.
3. Find one answer that represents a flaw in reasoning.
4. Find at least two answers that would weaken the argument.

F. Access to information on the internet has enriched our lives in many ways, but in at least one situation it has caused more harm than good. Nowadays people frequently go online to diagnose their own medical issues, in lieu of making a visit to a doctor. These people are almost always incorrect in their own diagnoses, whereas professional doctors rarely are.

- A. Doctors are required to spend years studying both in classrooms and in actual situations with patients before they can be professionally licensed.
- B. Though the information online is generally correct, it is very easy to misunderstand, especially if one does not have a medical background.
- C. The value of the occasional correct diagnoses outweighs the problems caused by the many incorrect diagnoses.
- D. All forms of communication that are likely to lead to misunderstanding cause more harm than good.
- E. Far more people have access to online information now as compared to ten years ago.
- F. Though people commonly diagnose their own issues, people do not take action based on self-diagnosis until it is confirmed to be true by a professional doctor.
- G. When people misdiagnose their own medical issues, they commonly alter their daily routine.
- H. Doctors with more experience are less likely to misdiagnose a medical issue than are doctors with less experience.
- I. Because of changes in the medical industry, much of the work that was traditionally done by doctors is now done by other medical professionals.
- J. At least one person who has misdiagnosed their own medical issues online has been harmed by this action.

1. Find at least four answers that have no bearing on the reasoning in the argument.
2. Find a required assumption.
3. Find a sufficient assumption or supporting principle.
4. Find two answers that strengthen.
5. Find two answers that weaken.

solutions

A. What's wrong: Just because they retain less of what they read does not mean they know less about the news. Maybe they get a lot more news to make up for the lack of retention. 1. A,C,F,G,J • 2. D,E • 3. B, H • 4.D • 5.I

Note that assumptions also work as strengtheners (though the reverse is not always true) and flaws also work as weakeners (though the reverse is not always true). Answer C is not relevant unless we have some sign people used to get news from magazines.

B. What's wrong: Similarities at the extreme ends of the sleep range do not conclusively show there are similarities for all parts of the sleep range. 1. A,B,D,F,H,I • 2. E,J • 3. C • 4. E • 5.G

Answer B is not relevant because whether other things impact sleep or not does not impact our conclusion. Same with F. Though both H and I could be relevant to the discussion, as presented they are too vague to have a decisive impact.

C. What's wrong: Correlation between tea and sleep trouble does not prove causation. 1. B,E,F,H,I • 2. A,D,J • 3. C,G • 4. J

Notice that answer D is relevant to the argument but E is not. Joe drinks tea, and even though it's not guaranteed that caffeine affects him, D certainly gives us more reason to think the argument may be valid. E is based on a characteristic Joe does not have, and requires far more conjecture on our part than D does in order to be relevant.

D. What's wrong: Doesn't take into account that there could have been other differences between the types of surgeries performed robotically and traditionally. 1.B,C,D,E,G,H • 2.A • 3.F,I,J • 4.J

What makes this tough is that in our heads something like "prostatectomy" is one specific type of surgery. However, it could be true that there are a lot of different types of prostatectomies, and if robotics are used for some types and not others, the comparison loses validity.

E. What's wrong: Apples to oranges. The criteria that applied to Watkins may not be the same as that applied to Jenson. 1. A,B,E,F,I,J • 2. G • 3. D • 4. C,D,H

Notice the extra information in C that makes it relevant. E and F give additional reasons for potential raises, but don't tie them into the argument. J hurts the conclusion, but not in a way that relates to the support and reasoning.

F. What's wrong: Assumes that these common incorrect diagnoses cause more harm than good. 1. A,B,E,G,H,I • 2. J • 3. D • 4. D,J • 5. C,F

Our subject-dependent common sense can get us in trouble here, since most of us know that misdiagnosing medical issues generally leads to more harm than good in real life.

These six sets of questions were meant to be challenging. The conclusions were sometimes subtle or hidden, the support sometimes compound or spread out, the reasoning issues unexpected or vague, the wrong answer choices tempting, and the right answers convoluted.

How do you feel about each part of the process? Did you zero in on the right argument, every time? Were you able to see the flaws in reasoning? Were you able to quickly eliminate answers that don't play a clear role relative to the reasoning? Did you use your skills to confirm right answers, and did it work?

In a couple of pages there will be a complete set of all the subjective questions from one section of one exam (fourteen questions total). This set will give you an accurate view of how your skills currently match up with the challenges of the exam. As you work on that set, remind yourself to pay extra attention to those skills that felt weakest for you in this exercise.

tips for surviving uncertainty

Imagine that you need to find a certain princess who is locked in a castle in the woods, and Dora the Explorer is going to help you do it. If you've ever seen the Dora the Explorer show—sorry for the unpleasant experience—you know that she commonly has to go to three different areas to solve whatever problem that episode presents. So, let's imagine that in order to get the princess, you and Dora have to swim across a lake, cross a bridge, then enter a castle. You swim across the lake, but there is a problem—you see two different bridges that you can take. Oh no. But look! If we look beyond the bridge on the left, we can see the castle—the bridge on the right has no such castle behind it. We need to go left!

Gaining LSAT mastery does not mean that every question becomes easy—it does mean that you have the tools to meet the challenges. **When we run into trouble on Logical Reasoning problems, often the next step in the process can be a hint for what we should do or how we should think.**

Our first step in understanding an argument is to identify the conclusion. But let's imagine you have trouble here—perhaps there are two statements that seem like they are the conclusion, or it seems like the conclusion can be interpreted in a couple of different ways, and you can't for the life of you determine what is correct. One thing you can do is to search for the supporting evidence. Because of the wealth of experience at evaluating argument structure that you now have, the supporting evidence can help you develop a clearer sense of what exactly the conclusion is.

Our next step is to identify all of the support. But maybe the support is spread out and it's tough to pull it together, or maybe it's tough to differentiate the support from the background. If you have a sense of the conclusion, a sense of what would justify that conclusion, and just a partial sense of the support, you can often figure out what could be wrong, and then work backwards to piece that support together.

Did you have trouble seeing what was wrong, exactly, with any of the arguments in the previous exercise? Did you find that when you were unclear of the flaw, or not sure about it, that sometimes the answer choices helped you develop a firmer understanding of what the problem was in the first place? Even incorrect answers, if you pay careful attention to why they are incorrect, can give you clues about the original argument.

Also, under time pressure, sometimes we won't be able to figure out exactly why every wrong answer is wrong. What can we rely on then? The next step. It's time to figure out why the right answer is right. Finding a right answer can help you see better why other answers were wrong. For the hardest problems, it's often true that the clearest sense you have of the argument will come after you have selected the right answer and are able to see, based on the shape of that right key, exactly what the lock was like.

You don't want to be overly-reliant on these "reverse-engineering" skills, and being so is an indication of issues in your skill set. Still, the ability to use the next step, in addition to past steps, to figure out what to do in the current step comes in very handy when you are stuck, and using the next step to help when you are uncertain should be a habitual and central part of your problem-solving backup process.

Question Set

Directions: Here are the fourteen subjective questions that together appeared in one LSAT section (section 4 of exam 30). This set of questions will help give you a sense of what your strengths and weaknesses are at this point. Do time yourself, but don't cut yourself off at any point.

1. A government ought to protect and encourage free speech, because free speech is an activity that is conducive to a healthy nation and thus is in the best interest of its people.

The main conclusion above follows logically if which one of the following is assumed?

- (A) An activity that is in the best interest of the people ought to be protected and encouraged by a nation's government.
- (B) Basic, inalienable rights of the people ought to be protected and encouraged by government.
- (C) An activity that helps a government to govern ought to be protected and encouraged by it.
- (D) A government ought to protect and encourage an activity that is conducive to the interests of that government.
- (E) Universal human rights that are in the best interest of the people ought to be protected and encouraged by a nation's government.

6. Commissioner: Budget forecasters project a revenue shortfall of a billion dollars in the coming fiscal year. Since there is no feasible way to increase the available funds, our only choice is to decrease expenditures. The plan before you outlines feasible cuts that would yield savings of a billion dollars over the coming fiscal year. We will be able to solve the problem we face, therefore, only if we adopt this plan.

The reasoning in the commissioner's argument is flawed because this argument

- (A) relies on information that is far from certain
- (B) confuses being an adequate solution with being a required solution
- (C) inappropriately relies on the opinions of experts
- (D) inappropriately employs language that is vague
- (E) Takes for granted that there is no way to increase available funds

8. Archaeologist: The fact that the ancient Egyptians and the Maya both built pyramids is often taken as evidence of a historical link between Old-and New-World civilizations that is earlier than any yet documented. But while these buildings are similar to each other, there are important differences in both design and function. The Egyptian pyramids were exclusively tombs for rulers, whereas the Mayan pyramids were used as temples. This shows conclusively that there was no such link between Old- and New-World civilizations.

Which one of the following most accurately describes a flaw in the archaeologist's argument?

- (A) The argument equivocates with respect to the term "evidence."
- (B) The argument appeals to emotion rather than to reason.
- (C) The argument assumes the conclusion it is trying to prove.
- (D) The argument incorrectly relies on words whose meanings are vague or imprecise.
- (E) The argument presumes that no other evidence is relevant to the issue at hand.

11. High school students who feel that they are not succeeding in school often drop out before graduating and go to work. Last year, however, the city's high school dropout rate was significantly lower than the previous year's rate. This is encouraging evidence that the program instituted two years ago to improve the morale of high school students has begun to take effect to reduce dropouts.

Which one of the following, if true about the last year, most seriously weakens the argument?

- (A) There was a recession that caused a high level of unemployment in the city.
- (B) The morale of students who dropped out of high school had been low even before they reached high school.
- (C) As in the preceding year, more high school students remained in school than dropped out.
- (D) High schools in the city established placement offices to assist their graduates in obtaining employment.
- (E) The anti-dropout program was primarily aimed at improving students' morale in those high schools with the highest dropout rates.

Question Set

12. The television show Henry was not widely watched until it was scheduled for Tuesday evenings immediately after That's Life, the most popular show on television. During the year after the move, Henry was consistently one of the ten most-watched shows on television. Since Henry's recent move to Wednesday evenings, however, it has been watched by far fewer people. We must conclude that Henry was widely watched before the move to Wednesday evenings because it followed That's Life and not because people especially liked it.

Which one of the following, if true, most strengthens the argument?

- (A) Henry has been on the air for three years, but That's Life has been on the air for only two years.
- (B) The show that replaced Henry on Tuesdays has persistently had a low number of viewers in the Tuesday time slot.
- (C) The show that now follows That's Life on Tuesdays has double the number of viewers it had before being moved.
- (D) After its recent move to Wednesday, Henry was aired at the same time as the second most popular show on television.
- (E) That's Life was not widely watched during the first year it was aired.

14. Joseph: My encyclopedia says that the mathematician Pierre de Fermat died in 1665 without leaving behind any written proof for a theorem that he claimed nonetheless to have proved. Probably this alleged theorem simply cannot be proved, since—as the article points out—no one else has been able to prove it. Therefore it is likely that Fermat was either lying or else mistaken when he made his claim.

Laura: Your encyclopedia is out of date. Recently someone has in fact proved Fermat's theorem. And since the theorem is provable, your claim—that Fermat was lying or mistaken—clearly is wrong.

Which one of the following most accurately describes a reasoning error in Laura's argument?

- (A) It purports to establish its conclusion by making a claim that, if true, would actually contradict that conclusion.
- (B) It mistakenly assumes that the quality of a person's character can legitimately be taken to guarantee the accuracy of the claims that person has made.
- (C) It mistakes something that is necessary for its conclusion to follow for something that ensures that the conclusion follows.
- (D) It uses the term "provable" without defining it.
- (E) It fails to distinguish between a true claim that has mistakenly been believed to be false and a false claim that has mistakenly been believed to be true.

15. It is not good for a university to have class sizes that are very large or very small, or to have professors with teaching loads that are very light or very heavy. After all, crowded classes and over-worked faculty cripple the institution's ability to recruit and retain both qualified students and faculty.

Which one of the following, if added as a premise to the argument, most helps to justify its conclusion?

- (A) Professors who have very light teaching loads tend to focus their remaining time on research.
- (B) Classes that have very low numbers of students tend to have a lot of classroom discussion.
- (C) Very small class sizes or very light teaching loads indicate incompetence in classroom instruction.
- (D) Very small class sizes or very light teaching loads are common in the worst and the best universities.
- (E) Professors with very light teaching loads have no more office hours for students than professors with normal teaching loads.

17. Researchers have found that people who drink five or more cups of coffee a day have a risk of heart disease 2.5 times the average after corrections are made for age and smoking habits. Members of the research team say that, on the basis of their findings, they now limit their own daily coffee intake to two cups.

Which one of the following, if true, indicates that the researchers' precaution might NOT have the result of decreasing their risk of heart disease?

- (A) The study found that for people who drank three or more cups of coffee daily, the additional risk of heart disease increased with each extra daily cup.
- (B) Per capita coffee consumption has been declining over the past 20 years because of the increasing popularity of soft drinks and also because of health worries.
- (C) The study did not collect information that would show whether variations in level of coffee consumption are directly related to variations in level of stress, a major causal factor in heart disease.
- (D) Subsequent studies have consistently shown that heavy smokers consume coffee at about 3 times the rate of nonsmokers.
- (E) Subsequent studies have shown that heavy coffee consumption tends to cause an elevated blood-cholesterol level, an immediate indicator of increased risk of heart disease.

Question Set

18. People who have political power tend to see new technologies as a means of extending or protecting their power, whereas they generally see new ethical arguments and ideas as a threat to it. Therefore, technical ingenuity usually brings benefits to those who have this ingenuity, whereas ethical inventiveness brings only pain to those who have this inventiveness.

Which one of the following statements, if true, most strengthens the argument?

- (A) Those who offer new ways of justifying current political power often reap the benefits of their own innovations.
- (B) Politically powerful people tend to reward those who they believe are useful to them and to punish those who they believe are a threat.
- (C) Ethical inventiveness and technical ingenuity are never possessed by the same individuals.
- (D) New technologies are often used by people who strive to defeat those who currently have political power.
- (E) Many people who possess ethical inventiveness conceal their novel ethical arguments for fear of retribution by the politically powerful.

19. Birds need so much food energy to maintain their body temperatures that some of them spend most of their time eating. But a comparison of a bird of a seed-eating species to a bird of a nectar-eating species that has the same overall energy requirement would surely show that the seed-eating bird spends more time eating than does the nectar-eating bird, since a given amount of nectar provides more energy than does the same amount of seeds.

The argument relies on which one of the following questionable assumptions?

- (A) Birds of different species do not generally have the same overall energy requirements as each other.
- (B) The nectar-eating bird does not sometimes also eat seeds.
- (C) The time it takes for the nectar-eating bird to eat a given amount of nectar is not longer than the time it takes the seed-eating bird to eat the same amount of seeds.
- (D) The seed-eating bird does not have a lower body temperature than that of the nectar-eating bird.
- (E) The overall energy requirements of a given bird do not depend on factors such as the size of the bird, its nest-building habits, and the climate of the region in which it lives.

20. Consumer advocate: The introduction of a new drug into the marketplace should be contingent upon our having a good understanding of its social impact. However, the social impact of the newly marketed antihistamine is far from clear. It is obvious, then, that there should be a general reduction in the pace of bringing to the marketplace new drugs that are now being tested.

Which one of the following, if true, most strengthens the argument?

- (A) The social impact of the new antihistamine is much better understood than that of most new drugs being tested.
- (B) The social impact of some of the new drugs being tested is poorly understood.
- (C) The economic success of some drugs is inversely proportional to how well we understand their social impact.
- (D) The new antihistamine is chemically similar to some of the new drugs being tested.
- (E) The new antihistamine should be on the market only if most new drugs being tested should be on the market also.

23. When investigators discovered that the director of a local charity had repeatedly overstated the number of people his charity had helped, the director accepted responsibility for the deception. However, the investigators claimed that journalists were as much to blame as the director was for inflating the charity's reputation, since they had naïvely accepted what the director told them, and simply reported as fact the numbers he gave them.

Which one of the following principles, if valid, most helps to justify the investigators' claim?

- (A) Anyone who works for a charitable organization is obliged to be completely honest about the activities of that organization.
- (B) Anyone who knowingly aids a liar by trying to conceal the truth from others is also a liar.
- (C) Anyone who presents as factual a story that turns out to be untrue without first attempting to verify that story is no less responsible for the consequences of that story than anyone else is.
- (D) Anyone who lies in order to advance his or her own career is more deserving of blame than someone who lies in order to promote a good cause.
- (E) Anyone who accepts responsibility for a wrongful act that he or she committed is less deserving of blame than someone who tries to conceal his or her own wrongdoing.

Question Set

24. Telephone companies are promoting “voice mail” as an alternative to the answering machine. By recording messages from callers when a subscriber does not have access to his or her telephone, voice mail provides a service similar to that of an answering machine. The companies promoting this service argue that it will soon make answering machines obsolete, since it is much more convenient, more flexible, and less expensive than an answering machine.

Which one of the following, if true, most calls into question the argument made by the companies promoting voice mail?

- (A) Unlike calls made to owners of answering machines, all telephone calls made to voice-mail subscribers are completed, even if the line called is in use at the time of the call.
- (B) The surge in sales of answering machines occurred shortly after they were first introduced to the electronics market.
- (C) Once a telephone customer decides to subscribe to voice mail, that customer can cancel the service at any time.
- (D) Answering machines enable the customer to hear who is calling before the customer decides whether to answer the telephone, a service voice mail does not provide.
- (E) The number of messages a telephone answering machine can record is limited by the length of the magnetic tape on which calls are recorded.

25. The judgment that an artist is great always rests on assessments of the work the artist has produced. A series of great works is the only indicator of greatness. Therefore, to say that an artist is great is just to summarize the quality of his or her known works, and the artist’s greatness can provide no basis for predicting the quality of the artist’s unknown or future works.

Which one of the following contains questionable reasoning most similar to that in the argument above?

- (A) The only way of knowing whether someone has a cold is to observe symptoms. Thus, when a person is said to have a cold, this means only that he or she has displayed the symptoms of a cold, and no prediction about the patient’s future symptoms is justified.
- (B) Although colds are very common, there are some people who never or only very rarely catch colds. Clearly these people must be in some way physiologically different from people who catch colds frequently.
- (C) Someone who has a cold is infected by a cold virus. No one can be infected by the same cold virus twice, but there are indefinitely many different cold viruses. Therefore, it is not possible to predict from a person’s history of infection how susceptible he or she will be in the future.
- (D) The viruses that cause colds are not all the same, and they differ in their effects. Therefore, although it may be certain that a person has a cold, it is impossible to predict how the cold will progress.
- (E) Unless a person displays cold symptoms, it cannot properly be said that the person has a cold. But each of the symptoms of a cold is also the symptom of some other disease. Therefore, one can never be certain that a person has a cold.

solutions

1. A 6. B 8. E 11. A 12. C 14. C 15. C
17. C 18. B 19. C 20. A 23. C 24. D 25. A

1. A | Point: Gov't ought to protect and encourage free speech. **Support:** free speech conducive to healthy nation/in best interests of people. **Flaw:** takes for granted that government ought to protect and encourage what is in best interests of people.

Task: Completely fix issue.

1st Elimination: “Inalienable rights” in (B) not discussed. “Helps a gov’t to govern” in (C) not discussed. “Interests of that gov’t” in (D) not discussed. “Universal human rights” in (E) not discussed. Leave (A).

Confirm Answer: If you place (A) in between the support and the conclusion, it creates a damn solid bridge.

6. B | Point: We can solve the problem only if we adopt this cost-cutting plan. **Support:** Can't increase funds, so must decrease expenditures. **Flaw:** Mistakes one plan for only plan.

Task: Describe the flaw.

1st Elimination: We don't know if information is far from certain, and it's unclear how this impacts the argument, so (A) is out. It's not certain the argument inappropriately relies on the opinion of experts, so (C) is out. No vague language as (D) states. (E) is mentioned as a premise, so it is not taken for granted. Leave (B).

Confirm Answer: “Feasible” means doable or reasonable, which is an okay match with “adequate” in (B). The rest of (B) represents the reasoning flaw exactly, and (B) is correct.

8. E | Point: There is no such link (link evidenced by pyramids) between Old- and New-World civilizations. **Support:** Pyramids used for different purposes. **Flaw:** Piece ≠ Puzzle. The fact that they were used for different purposes is not enough to definitely prove no link.

Task: Describe the flaw.

1st Elimination: The argument doesn't equivocate (mince words) with “evidence” and even if it did that would have no bearing on the reasoning, so (A) is out. (B) is not the flaw and is easy to eliminate. (C) is not the problem with the support-conclusion relationship. (D) is also not the reasoning problem here. Leave (E).

Confirm Answer: “This shows conclusively” indicates the high level of (faulty) regard in which the author holds his piece of evidence, and (E) is a fairly accurate representation of the flaw.

11. A (tough!) | Point: Program to improve morale of h.s. students has begun to reduce dropouts. **Support:** Last year's h.s. dropout rate significantly lower than year before. **Flaw:** Correlation does not prove causation. Seems there could be many other reasons for reduction in dropout rate.

Task: Weaken the argument.

1st Elimination: (A) brings in additional information, but it also provides an alternative explanation for why students stayed in school. Leave it. (B) has no direct impact on the reasoning. (C) tells us nothing about what caused a decrease in dropout rate. (D) also gives another reason for dropout rates, so leave it. (E) gives us more information about the support, but not in a way that impacts the conclusion.

Confirm Answer: Both (A) and (D) are attractive answers, so let's break each down carefully. (A) makes a lot of sense—if there are less jobs, then students are likely to stay in school. When we look back at the argument, however, we notice that the students who drop out aren't necessarily ones looking for work (“go to work” is given as a consequence of dropping out, not a cause), but rather ones who feel they are not succeeding in school. So, it's not perfect—maybe jobs have no impact on whether they decide to drop out...If we look at (D), it also gives a reason why students might want to stay in school—now the school is going to give them more help looking for work once they are out. But wait a minute...are these placement offices a part of this “improving morale” plan or not? Shoot, it's not clear at all. This has a big impact on whether this answer weakens or strengthens the argument. Since we don't know, that means (A) must be correct.

12. C | Point: Henry was widely watched because it followed That's Life. **Support:** Periods of success correlate to when it followed That's Life. **Flaw:** correlation/causation. Could be, for example, that Henry was just coincidentally only good for that one year it followed That's Life.

Task: Strengthen the argument.

1st Elimination: It's unclear how (A) relates to the argument. (B) would seem to either have no impact (if That's Life is no longer on Tuesdays at same time) or weaken the argument(if That's Life is). (C) shows more correlation between following That's Life and getting more viewers—leave it. (D)

provides an alternative explanation for why Henry may have dropped in ratings, so if anything would weaken the argument. (E) has no bearing on the point.

Confirm Answer: (C) is the only viable answer. Of course it does not confirm a causal link, but by giving us more correlation it makes it more likely.

14. C (tough!) | Point: Fermat was not lying or mistaken when he said he could prove theorem. **Support:** The theorem is provable. **Flaw:** Just because the theorem is provable does not mean Fermat must have honestly and correctly proved it.

Task: Describe the flaw.

1st Elimination: (A) doesn't happen in the argument. Quality of a person (B) is not discussed or relevant. (C) is interesting—not a great match for our view of the flaw, but perhaps related. Leave it. (D) does not describe a reasoning flaw (imagine if you had to define every word you ever used to reason something!). (E) is confusing—let's leave it.

Confirm Answer: Could (C) represent the flaw? In order to prove a theorem it has to be provable—that is the necessary component. However, being provable does not guarantee that he did prove it—so, yes, the author mistakes something necessary for something sufficient. What about (E)? On careful review, it clearly does not represent what is going on in this argument (how is that distinction relevant to this author's point?). (C) is correct.

15. C | Point: Not good for university to have classes too big or small, or professors teaching too much or too little. **Support:** Crowded classrooms and overworked teachers hurt school's ability to get qualified students and faculty. **Flaw:** Where's the reason for why small/too little is bad?

Task: Support the point.

1st Elimination: (A) is not directly related to the argument. Unless we assume that classroom discussion is bad, (B) doesn't help the argument. (C) gives us a reason why small/too little is bad—leave it. (D) gives us an anti-reason (weakens the argument, if anything)—cut it. (E) is not directly relevant to the support-conclusion relationship.

Confirm Answer: (C) is the only viable answer, and we knew we needed something about small and light.

17. C | Point: Members limit daily coffee to two cups. **Support:** People who drink five or more cups a day have increased risk of heart disease. **Flaw:** Who's to say five is worse than two? Maybe it's that first cup that's worst of all.

Task: Weaken the argument.

1st Elimination: (A) shows that the more coffee one drinks, the worse it is, so if anything it strengthens the argument. More so, though, it has no direct impact, since it leaves unclear whether that means two is okay or not. (B) is irrelevant to the point. (C) represents the flaw we saw initially, and if (C) is true, it hurts the author's claim—leave it. (D) shows an alternative causal force, but the premise tells us they've already accounted for smoking habits. (E) is tempting, but how do we define heavy consumption? Maybe two cups is heavy consumption?

Confirm Answer: Does (C) destroy the argument? No, and we don't need it to do that. However, if (C) is true, it does make it seem less wise for these members to think the study makes two cups somehow okay.

18. B | Point: Tech ingenuity usually brings benefits, ethical inventiveness only brings pain. **Support:** People with political power see tech as means of extending power, and new ethical ideas as threats to it. **Flaw:** Assumes that views of people with political power have some direct impact on those with ingenuity or inventiveness without providing any evidence.

Task: Strengthen this.

1st elimination: It's unclear how "new ways of justifying power" relates to this particular argument—it does clearly not represent either of the parties (tech/ethical) in this discussion. (B) is what we needed—leave it. Whether (C) is true or not has no impact on the argument (you can have benefit and pain). (D) weakens a premise—cut it. (E) is not directly relevant unless we assume that hiding arguments brings pain.

Confirm Answer: If (B) is true, it makes it much more reasonable to use this support to justify this point.

19. C | Point: Seed-eating birds must spend more time eating than nectar-eating birds. **Support:** Same amount of nectar gives more energy. **Flaw:** Presumes a link between volume of food needed and time needed to eat the food. Maybe seeds can be eaten very quickly, whereas eating nectar is for some reason a more tedious process.

Task: Find required assumption.

1st elimination: We don't need to know that (A) is true for the argument to work.

(B) does not have to be true for the argument to work, and without knowing whether it's faster to eat seeds or nectar, it's unclear what the impact of this answer is. (C) matches the flaw we saw—let's leave it. (D) is not relevant to the argument. (E) doesn't match our understanding of the flaw, but seems it is relevant to the support—conclusion relationship—leave it.

Confirm answer: (C) seems correct. If we negate (C), it tells us eating nectar takes longer, and that does a lot of damage to the reasoning in the argument. Looking back at (E), it no longer looks attractive—we're actually told that this argument is about birds that require the same amount of energy. If we weren't, (E) would be really attractive, but as is we now realize it has no direct bearing on the particular argument being made.

(C)—looks good. "In order to advance his or her own career" eliminates (D). For (E), accepts responsibility versus conceal is not our issue.

Confirm answer: (C) creates a solid bridge between support and conclusion.

24. D | Point: Voice mail will soon make answering machines obsolete. **Support:** More convenient, flexible and cheaper. **Flaw:** Maybe there are other reasons people like their answering machines.

Task: Weaken the argument.

1st elimination: (A) seems to give an advantage for voice mail. It's unclear how (B) impacts the conclusion—cut it. (C) seems to give an advantage (or at least take away a potential disadvantage) for voice mail. (D) gives a reason why people might like answering machines better—leave it. (E) seems to give us a problem with answering machines—cut it.

Confirm answer: (D) is our only viable choice. It doesn't destroy the argument, but it does give us a reason to question whether the reasons given will actually make it so people prefer voice mail.

25. A | Point: Artists' greatness can provide no basis for predicting quality of future work. **Support:** Greatness is only an indication of the past. **Flaw:** Assumes that the past cannot be used to make predictions about the future—seems that past history of creating great art is relevant to future chances of producing great art.

Task: Match the flaw.

1st elimination: (A) has the same type of flaw—just because symptoms are in the past doesn't mean they can't be used to predict future symptoms—leave it. (B) is about some unique people, and reaches a very different conclusion than our argument. (C) has a similar type of conclusion about not being able to predict the future, but uses a different line of reasoning (infinite number of different colds) that seems far more reasonable than that in the original argument. Not a match. (D) is not about past/future—cut it. (E) is about not being able to properly assess a situation, which is different from being able to predict what will happen in the future. Cut it.

Confirm answer: (C) was tempting, but (A) is the most attractive answer here. We check to make sure that parts of the answer (conclusion, support) match up to parts in the original argument, and they do. Same parts, same flaw = right answer.

How Did You Do?

If you went -0 or -1, that's incredible. Phenomenal work. Eat a little extra dessert tonight. If you didn't do as well, that is, at this point, to be expected. We still have a lot of work ahead of us. As far as your ultimate score goes, how you react to your performance is far more important than how many you actually got right and wrong.

Taken together, this set of questions nicely represents the range of challenges that you will see on test day, and it also nicely illustrates the variety of skills you will need in order to succeed at a high level.

Start your self-assessment by checking to see if there were any questions you were certain you got right that you ultimately missed. These are the biggest red flags, and generally they indicate that there was a significant mistake made or a significant misunderstanding while solving the problem. By this point in your training, this should be happening very rarely—i.e. you should have a very good sense of when you know you are right, and when you don't. If you are often surprised that you missed a question, it's a sure tell sign that there are problems with your skill set or your understanding of how particular questions are designed.

Next, consider carefully the questions you had difficulty with, and think about where it is exactly that the problems started. Did you not have a clear sense of the argument or the flaw? Did you have a clear sense of wrong answers to avoid? Or did you do everything else right, but make some error in trying to confirm the correct answer?

Finally, consider timing. Timing is most directly a consequence of your thought process—if you are thinking about the right things, timing will be less of an issue. If you are distracted or you don't know exactly what to think about, timing will be a bigger issue. If you had trouble with timing (and at this point, I would generalize that to spending more than 24 minutes for the previous set), first and foremost you want to think about all of the extra things you are doing that are not important to answering the question. Go back through each problem, think about what you thought about, and be critical of any time you spent thinking about anything that wasn't ultimately relevant to eliminating wrong answers and identifying the right one. Occasionally, timing issues can also come about even though test takers know what to think about and when, and this is because the test taker is being overly cautious about each decision. Be mindful of over-thinking and make sure you don't fall prey to decision-making inertia. Still, do know that the vast majority of timing issues are because of time wasted thinking about the wrong things, as opposed to too much time spent thinking about the right things.

We all miss problems once in a while. The biggest issues to take note of are the deepest ones—those having to do with reading the argument, identifying what is wrong, and understanding what our task is. Use these questions to honestly gauge how effective you are at each of these skills, and work from general and fundamental to specific and nuanced as you go about strengthening your skill set.

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LOGIC GAMES

review and assess

We will return to games full-time in Lesson 26, but for now here is a small oasis in the game-less desert. Starting in a few pages will be four full games that have appeared on previous LSATs.

Before we get to those games, I want to start out by quickly reviewing diagramming and by discussing some basic games strategies. In addition, I also want to discuss the first of the question types that we will be studying: the Rules question. The Rules question is almost always the first question asked for any game, and there is a simple and effective method for getting any Rules question correct.

The Key to Games Success: Diagramming

In order to answer the questions that are asked in the games section, we need to think about how rules come together with other rules; we need to be able to do so accurately, over and over again, as we think of each answer choice for each question. The tool that allows us to do that is our diagram. When drawn well, our diagram will help us see the rules of a game far more clearly than when those rules are in worded form, and our diagram will aid us as we think about how these rules come together. In Lessons 10 through 15, we focused on developing diagramming strategies. In this lesson and the rest of the Logic Games lessons that follow, we will integrate our diagramming abilities into the bigger task of successfully solving Logic Games questions.

Some Quick Tips on Playing Logic Games

We will be discussing much more specific strategies in later lessons but here are a few things to keep in mind for now:

- 1) Read the scenario and rules and “picture” the general structure of a game before you start your diagram.
- 2) Diagram first the rule or combination of rules that you think are most significant.
- 3) Confirm your notations by checking them against the written rules.
- 4) Always think about how the rules relate to each other.
- 5) Do as much work at the point of the question stem as possible.
- 6) Expect to do very little work with each answer. Know that almost all of your work should be done before you consider specific answer choices.

For a review of common notations, please return to page 206.

The Rules Question

Over 90% of all games begin with a Rules question. A Rules question is a question that asks you to identify, among the answer choices, one assignment of elements that could be true based on what we know about a game. Rules questions always ask about the assignment of all elements to all spots (though, in a few rare instances, they will do so somewhat indirectly), they almost always (over 90% of the time) only appear as the first question of a game, and they are always asked in terms of what “could be true” based on what we know.

Rules questions are fundamentally different from all other games questions. Every other games question will differentiate between right and wrong answers based on the *inferences* we learn by bringing rules together. For example, if a game tells us that “X is on Team One” and “X and Y are not on the same team,” neither of those statements will be helpful in figuring out which answers are right or wrong. What we learn by *bringing two ideas together* (Y is not on Team One) will almost certainly be directly relevant for differentiating between right and wrong answers for at least one of the questions in the set.

Rules questions are unique in that they are not dependent on inferences. They might be if our job was to come up with one set of assignments that satisfies the rules, but it's not. Our job is to evaluate the options given to us, and for just these questions, what differentiates right and wrong answers is not the inferences, but rather the given rules themselves (hence the name of the question). Going back to the example about X and Y—each of the two rules given, in their original forms, would likely allow us to eliminate incorrect answers.

This is what makes Rules questions different from other questions—we want to develop methods specific to Rules questions, methods that do not relate to how we approach all other types of questions.

You can probably imagine a few ways to go about solving Rules questions: you can use your diagram, you can check the answers against the rules, or you can use the rules to test the answers. Feel free to try out all options yourself, but I promise you that you will come to a certain conclusion: using the rules to test answers, as I have for the two examples on the side, is the most efficient and accurate way to solve Rules questions. This has to do with the design of the questions themselves—the four wrong choices are consistently written so that individual rules eliminate individual answers. If you are given four rules to a game, it is almost certain that each of those rules will allow you to eliminate exactly one of the four wrong answer choices—the last answer standing—the one that doesn't violate the list of rules—is the one that is correct. If you are given fewer than four rules, you can expect that one of them will eliminate more than one answer, and if you are given more than four rules, you know some won't be useful in eliminating choices. Still, by simply going down the list of given rules' and using them to see which answers must be false, you will always be able to quickly eliminate the four incorrect choices and identify the right answer.

1. tiny caveat: once in a blue moon, there will be an answer you need to eliminate based on information given in the scenario. In these cases, this information will typically be more specific (i.e., more rule-like) than the information we typically get in the scenario.

SUPER-SIMPLE EXAMPLE:

Five people—F, G, H, J, K—take turns using a computer. One person uses it at a time, and they each use it once. The following conditions apply:

- F does not use it first.
- G uses it before H.
- J uses it third.
- K does not use it second.

Which of the following could be the order in which people use computers?

- (A) G, K, J, F, H
- (B) H, F, J, K, G
- (C) G, F, K, J, H
- (D) F, G, J, K, H
- (E) G, F, J, K, H

The first rule tells us (D) must be wrong. The second rule eliminates (B). The third (C). The fourth (D). (E) is correct. With four rules, you can typically expect them to each eliminate one choice.

SUPER-SIMPLE EXAMPLE (B):

Five people—F, G, H, J, and K—take turns using a computer. One person uses it at a time, and they each use it once. The following conditions apply:

- F does not use it first.
- G uses it before H.
- J uses it third.

Which of the following could be the order in which people use computers?

- (A) F, G, J, H, K
- (B) H, F, J, K, G
- (C) G, F, K, J, H
- (D) F, G, J, K, H
- (E) G, F, J, K, H

Given just three rules, we can expect one to eliminate two answers. If given more than four rules, we would expect some not to eliminate any wrong answers. The first rule eliminates (A) and (D), the second rule eliminates (B), and the third rule eliminates (C). That leaves (E) as our correct answer.

Instructions for next page: Starting on the following page will be four Logic Games, each with their full accompaniment of questions. Taken together, the games are representative of the variety and difficulty present in a typical games section. The one difference is that this set of four has 22 total questions, whereas your exam will almost surely have 23. Time yourself for each game. If you are solving the games as a full practice session, don't stop your work at the thirty-five minute mark, and don't give up on any question because of time constraints. Solutions and discussion will follow. FYI—on the real exam, you will have two pages to do your games work, so feel free to use extra space to diagram and such if you feel you need it.

GAME 1 | PT 27, GAME 1, QUESTIONS 1 – 5

During a period of seven consecutive days—from day 1 through day 7—seven investors—Fennelly, Gupta, Hall, Jones, Knight, López, and Moss—will each view a building site exactly once. Each day exactly one investor will view the site. The investors must view the site in accordance with the following conditions:

Fennelly views the site on day 3 or else day 5.

López views the site on neither day 4 nor day 6.

If Jones views the site on day 1, Hall views the site on day 2.

If Knight views the site on day 4, López views the site on day 5.

Gupta views the site on the day after the day on which Hall views the site.

1. Which one of the following could be the order in which the investors view the site, from day 1 through day 7?

- (A) Hall, Gupta, Fennelly, Moss, Knight, López, Jones
- (B) Hall, Gupta, López, Fennelly, Moss, Knight, Jones
- (C) López, Gupta, Hall, Moss, Fennelly, Jones, Knight
- (D) López, Jones, Fennelly, Knight, Hall, Gupta, Moss
- (E) López, Jones, Knight, Moss, Fennelly, Hall, Gupta

2. If Jones views the site on day 1, which one of the following investors must view the site on day 4?

- (A) Fennelly
- (B) Gupta
- (C) Knight
- (D) López
- (E) Moss

3. If Knight views the site on day 4 and Moss views the site on some day after the day on which Jones views the site, which one of the following must be true?

- (A) Jones views the site on day 1.
- (B) Jones views the site on day 2.
- (C) Jones views the site on day 6.
- (D) Moss views the site on day 2.
- (E) Moss views the site on day 6.

4. If Hall views the site on day 2, which one of the following is a complete and accurate list of investors any one of whom could be the investor who views the site on day 4?

- (A) Knight
- (B) Moss
- (C) Jones, Moss
- (D) Knight, Moss
- (E) Jones, Knight, Moss

5. If Hall views the site on the day after the day Knight views the site and if Fennelly views the site on the day after the day López views the site, then Jones must view the site on day

- (A) 1
- (B) 2
- (C) 3
- (D) 4
- (E) 5

GAME 2 | PT 32, GAME 2, QUESTIONS 7 –11

The organizer of a reading club will select at least five and at most six works from a group of nine works. The group consists of three French novels, three Russian novels, two French plays, and one Russian play. The organizer's selection of works must conform to the following requirements:

- No more than four French works are selected.
- At least three but no more than four novels are selected.
- At least as many French novels as Russian novels are selected.
- If both French plays are selected, then the Russian play is not selected.

7. Which one of the following could be the organizer's selection of works?

- (A) one French novel, two Russian novels, one French play, one Russian play
- (B) two French novels, one Russian novel, two French plays one Russian play
- (C) two French novels, two Russian novels, two French plays
- (D) three French novels, one Russian novel, two French plays
- (E) three French novels, two Russian novels, one Russian play

8. Which one of the following could be true about the organizer's selection of works?

- (A) No Russian novels are selected.
- (B) Exactly one French novel is selected.
- (C) All three plays are selected.
- (D) All three Russian novels are selected.
- (E) All five French works are selected.

9. If the works selected include three French novels, which one of the following could be a complete and accurate list of the remaining works selected?

- (A) one Russian novel
- (B) two French plays
- (C) one Russian novel, one Russian play
- (D) one Russian novel, two French plays
- (E) two Russian novels, one French play

10. The organizer must at least select

- (A) one French novel and one French play
- (B) one French novel and one Russian play
- (C) one Russian novel and one French play
- (D) two French novels
- (E) two Russian novels

11. Any one of the following could be true about the organizer's selections of works EXCEPT:

- (A) No Russian novels and exactly one play are selected.
- (B) Exactly one Russian novel and both French plays are selected.
- (C) Exactly two French novels and the Russian play are selected.
- (D) Exactly two French novels and exactly two plays are selected.
- (E) Exactly two Russian novels and exactly one play are selected.