

**Critical Thinking**

**Instructor Guide**

**Corporate Training Materials**

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# Preface

*You may be disappointed if you fail, but you are doomed if you don’t try.*

*Anonymous*

## What is Courseware?

MC900071138[1]Welcome to Corporate Training Materials, a completely new training experience!

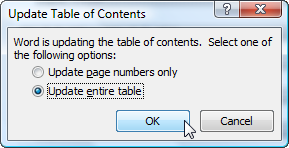
Our courseware packages offer you top-quality training materials that are customizable, user-friendly, educational, and fun. We provide your materials, materials for the student, PowerPoint slides, and a take-home reference sheet for the student. You simply need to prepare and train!

Best of all, our courseware packages are created in Microsoft Office and can be opened using any version of Word and PowerPoint. (Most other word processing and presentation programs support these formats, too.) This means that you can customize the content, add your logo, change the color scheme, and easily print and e-mail training materials.

## How Do I Customize My Course?

Customizing your course is easy. To edit text, just click and type as you would with any document. This is particularly convenient if you want to add customized statistics for your region, special examples for your participants’ industry, or additional information. You can, of course, also use all of your word processor’s other features, including text formatting and editing tools (such as cutting and pasting).

To remove modules, simply select the text and press Delete on your keyboard. Then, navigate to the Table of Contents, right-click, and click Update Field. You may see a dialog box; if so, click “Update entire table” and press OK.

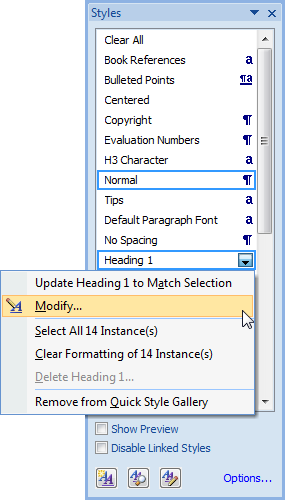


(You will also want to perform this step if you add modules or move them around.)

If you want to change the way text looks, you can format any piece of text any way you want. However, to make it easy, we have used styles so that you can update all the text at once.

If you are using Word 97 to 2003, start by clicking the Format menu followed by Styles and Formatting. In Word 2007 and 2010 under the Home tab, right-click on your chosen style and click Modify. That will then produce the Modify Style options window where you can set your preferred style options.

For example, if we wanted to change our Heading 1 style, used for Module Titles, this is what we would do:



Now, we can change our formatting and it will apply to all the headings in the document.

For more information on making Word work for you, please refer to Word 2007 or 2010 Essentials by Corporate Training Materials.

## Materials Required

All of our courses use flip chart paper and markers extensively. (If you prefer, you can use a whiteboard or chalkboard instead.)

We recommend that each participant have a copy of the Training Manual, and that you review each module before training to ensure you have any special materials required. Worksheets and handouts are included within a separate activities folder and can be reproduced and used where indicated. If you would like to save paper, these worksheets are easily transferrable to a flip chart paper format, instead of having individual worksheets.

We recommend these additional materials for all workshops:

* Laptop with projector, for PowerPoint slides
* Quick Reference Sheets for students to take home
* Timer or watch (separate from your laptop)
* Masking tape
* Blank paper

## Maximizing Your Training Power

We have just one more thing for you before you get started. Our company is built for trainers, by trainers, so we thought we would share some of our tips with you, to help you create an engaging, unforgettable experience for your participants.

* **Make it customized.** By tailoring each course to your participants, you will find that your results will increase a thousand-fold.
  + Use examples, case studies, and stories that are relevant to the group.
  + Identify whether your participants are strangers or whether they work together. Tailor your approach appropriately.
  + Different people learn in different ways, so use different types of activities to balance it all out. (For example, some people learn by reading, while others learn by talking about it, while still others need a hands-on approach. For more information, we suggest Experiential Learning by David Kolb.)
* **Make it fun and interactive.** Most people do not enjoy sitting and listening to someone else talk for hours at a time. Make use of the tips in this book and your own experience to keep your participants engaged. Mix up the activities to include individual work, small group work, large group discussions, and mini-lectures.
* **Make it relevant.** Participants are much more receptive to learning if they understand why they are learning it and how they can apply it in their daily lives. Most importantly, they want to know how it will benefit them and make their lives easier. Take every opportunity to tie what you are teaching back to real life.
* **Keep an open mind.** Many trainers find that they learn something each time they teach a workshop. If you go into a training session with that attitude, you will find that there can be an amazing two-way flow of information between the trainer and trainees. Enjoy it, learn from it, and make the most of it in your workshops.

And now, time for the training!

# Module One: Getting Started

*The way to get started is to quit talking and begin doing.*

*Walt Disney*

We live in a knowledge based society, and the more critical you think the better your knowledge will be. Critical Thinking provides you with the skills to analyze and evaluate information so that you are able to obtain the greatest amount of knowledge from it. It provides the best chance of making the correct decision, and minimizes damages if a mistake does occur.

Critical Thinking will lead to being a more rational and disciplined thinker. It will reduce your prejudice and bias which will provide you a better understanding of your environment. This workshop will provide you the skills to evaluate, identify, and distinguish between relevant and irrelevant information. It will lead you to be more productive in your career, and provide a great skill in your everyday life.

Before we begin with the main points of this course, however, we first need to complete some activities to help focus and maximize our learning experience. In Module One, we’re going to cover topics such as basic housekeeping, parking lot, workshop objectives and action plans and evaluation. So, let’s get started.

## Housekeeping Items

Take a few moments to cover basic housekeeping items.

* If you need an opening or a way to introduce the participants to each other, utilize the Icebreakers folder to begin or between breaks during the day.
* Let participants know where they can find washrooms, break facilities, and fire exits.
* Ask participants to turn off their cell phones or at least turn them to vibrate. If they must take a call, request that they do it outside.
* Take this time to encourage the group to ask questions and make this an interactive workshop.
* Write the words Respect, Confidentiality, and Practice on a piece of flip chart paper and tape it to the wall. Explain to participants that in order to get the most out of this workshop, we must all work together, listen to each other, explore new ideas, and make mistakes. After all, that’s how we learn!

## C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\MP321RS9\MC900057299[1].wmfThe Parking Lot

Explain the concept of The Parking Lot to participants.

* The Parking Lot is a visible place where you will “park” ideas that arise which are not on the agenda, may be off topic, or are better addressed outside of the program.
* At the end of the session, we will review parked ideas and follow up, or make suggestions for your own investigation when you are back at work.

Suggestions for the trainer:

1. If you are working with a large group of participants, you may wish to nominate a recorder to park items as you are facilitating.
2. It’s a good idea to note the name of the contributor along with the parked item.
3. Items noted on the parking lot can be useful to you later as you plan future training sessions.

## Workshop Objectives

C:\Users\Kimmi\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\JVU559D0\MCj02934740000[1].wmfResearch has consistently demonstrated that when clear goals are associated with learning, it occurs more easily and rapidly.

The objectives for this course are as follows:

* Understand the components of critical thinking
* Utilize non-linear thinking
* Use logical thinking
* Recognize what it means to be a critical thinker
* Evaluate information using critical thinking skills
* Identify the benefits of critical thinking
* Revise perspective, when necessary
* Comprehend problem solving abilities

## Action Plans and Evaluation Forms

Explain the action plan to participants:

Personal action plans are provided to lead you through this learning process. They gauge how well you can apply the material each module contains. The action plans will help you achieve your personal and professional goals when they are used correctly. Your assignments will cover supply chain management regarding what it is and how to implement it. The instructor will explain how to use the action plans and inform you when they are due.

You and your instructor will evaluate your personal action plans. Your action plan scores will be calculated based on the rubrics given to your instructor. The action plan evaluations are used to evaluate your mastery of each skill set.

Pass out the participant action plans and evaluation handouts, available in the activities folder. Ask participants to add information throughout the day as they learn new things and have ideas about how to incorporate the concepts being discussed into their work or personal lives.

# Module Two: Components of Critical Thinking

*Thinking is the talking of the soul with itself.*

*Anonymous*

Critical thinking is akin to the study of logic. Critical thinking relates to how we make decisions and use our judgment. Critical thinking is more than just thinking about thinking or metacognition. It is also about how we take action. Critical thinking involves many components, and we will address a number of unique components in this module.

## Applying Reason

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\MP321RS9\MC900389552[1].wmfThe ability to reason is often considered one of the characteristic marks of being human. Further, the individual’s ability to reason well is a critical thinking skill. Many of the definitions of critical thinking tend to focus on this ability to reason. Reasoning occurs when we use our knowledge of one thing, process, or statement to determine if another thing, process, or statement is true. When we apply reasoning, we use logic to determine “what follows what.” Human reasoning does not always follow logic and is often based on emotional bias.

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| **Estimated Time** | 15 minutes |
| **Topic Objective** | Learners will provide examples of different types of reasoning skills. |
| **Topic Summary** | There are many different types of reasoning. In this section, we will examine six major terms in reasoning:   * Inductive * Deductive * Syllogisms * Linear orderings * Probability * If, Then Statements |
| **Materials Required** | Flip Chart, Markers, Chart Paper for Groups |
| **Planning Checklist** | None |
| **Recommended Activity** | Have learners work in groups of 3 – 4 to complete this activity.  State: “Reasoning has two forms, deductive and inductive reasoning. Deductive reasoning is when we use our prior knowledge to two or more premises to infer a valid conclusion. With inductive reasoning, we gather data or make observations that lead to a hypothesis or conclusion (much like the scientific method).”  Begin by writing each term on the flip chart and discuss each one in detail:   * INDUCTIVE -Use observations lead to a conclusion * DEDUCTIVE - Use stated premises to infer a valid conclusion * SYLLOGISMS–Uses two or more premises to derive a valid conclusion (e.g., a fire produces smoke. There is smoke coming from the house. There is a fire in the house). * LINEAR ORDERING -Involves inference of orderly relationships along a single dimension (e.g., size, quantity, position) * PROBABILITY– Uses information to determine to determine if the conclusion probably is or is not true * IF, THEN STATEMENTS–Uses contingency statements that *if* the antecedent is true, *then* the consequence must also be true.   Then ask the learners to use the chart paper to give write two (2) examples of each term: syllogisms, linear ordering, probability, and if, then statements.  Discuss when was the last time learners used any of these types of reasoning in daily life. |
| **Stories to Share** | Much of the reasoning we do in everyday is of the probability sort. Think about when we get up in the morning and decide what to wear. We do so based on the weather. We often check the forecast and see what the probability is for rain, snow, or sunshine. |
| **Delivery Tips** | NONE |
| **Review Questions** | Why is probability often used in real life? What can affect probabilities (variables, goals)? |

## Open Mindedness

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\31B2RP17\MC900234543[1].wmfOpen-mindedness is the virtue by which we learn. In particular, being open-minded means taking into account relevant evidence or argument to revise a current understanding. It means being critically open to alternatives, willing to think about other possibilities even after having formed an opinion, and not allowing pre-conceived notions to constrain or inhibit reflection on newly presented information. Open-minded inquiry is a central theme in education.

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| **Estimated Time** | 10 minutes |
| **Topic Objective** | Learners will list criteria that influence the component of open-mindedness and about Socratic thought. |
| **Topic Summary** | The notion of open-mindedness is embedded in Socratic thought of following an argument to where it leads and is the foundation of inquiry. In this section, we discuss criteria that influence open-mindedness. |
| **Materials Required** | Flipchart, Markers  Worksheet: 01-Components of Critical Thinking |
| **Planning Checklist** | NONE |
| **Recommended Activity** | Have learners work in pairs for this activity. They will complete activity 1.  Ask students to look at activity 1 and try and list all of the factors that might affect a person being open-minded. For example:  BIAS, PRECONCEPTIONS, EXPERTISE, HUMILITY, GULLIBILITY, FALLIBILITY, INDOCTRINATION, MANNER, LISTENING, CRITICAL RECEPTIVENESS, LISTENING SKILLS, etc.  Give the learners 5 minutes to list as many criteria as they can and to discuss these with their partners.  Then, reconvene the class and discuss as a group. |
| **Stories to Share** | **Open-minded Inquiry,** by *The Critical Thinking Community*  “Many people would agree with John Dewey and Bertrand Russell that open-mindedness is one of the fundamental aims of education, always elusive but eminently worth pursuing. For Dewey, it is the childlike attitude of wonder and interest in new ideas coupled with a determination to have one's beliefs properly grounded; and it is vitally important because we live in a world that is characterized by constant change. For Russell, open-mindedness is the virtue that prevents habit and desire from making us unable or unwilling to entertain the idea that earlier beliefs may have to be revised or abandoned; its main value lies in challenging the fanaticism that comes from a conviction that our views are absolutely certain.”  Source: [http://www.criticalthinking.org/pages/open-minded-inquiry/579](http://www.criticalthinking.org/pages/open-minded-inquiry/579%20) |
| **Delivery Tips** | NONE. |
| **Review Questions** | Can we say that one factor contributes more to open-mindedness than another? |

## Analysis

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\EOAYJ771\MC900020014[1].wmfIn critical thinking the step of analysis helps us to discriminate and access information. Going back to Bloom’s taxonomy, remember that learning occurs in three domains: cognitive, affective, and psychomotor. In the cognitive domain, analysis is the fourth level and a higher ordered thinking skill. Analysis involves the process, as previously mentioned, of discriminating or separating.

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| **Estimated Time** | 10 minutes |
| **Topic Objective** | Learners will provide at least three questions regarding the component of analysis. |
| **Topic Summary** | In general critical thinking is an analytical step. If we were to apply Bloom’s Taxonomy, analysis is one of the upper three cognitive levels and involves logical reasoning. In this section, we will learn more about Socratic thought and critical thinking and how to analyze information. |
| **Materials Required** | Flipchart, Markers  Worksheet: 01-Components of Critical Thinking |
| **Planning Checklist** | NONE |
| **Recommended Activity** | Have learners work in pairs for this activity. They will complete activity 1.  We can do our own analysis by asking questions regarding three things: argument, evidence, and language.  In this activity, learners will think of three questions regarding the ARGUMENT, EVIDENCE, and LANGUAGE.  Do not tell the learners at first, but these are the kind of questions they should ask when presented with new information:  Argument – Is it valid? Are the conclusions consistent with existing ideas? Are there hidden assumptions?  Evidence – Is there enough evidence? Is the evidence described accurately? It’s the evidence from reliable sources?  Language – Is it clear? Is language used consistently? Does language imply something not yet acknowledged or taken for granted? |
| **Stories to Share** | When Socrates lived about 2400 years ago, debate, and rhetoric was very common. However, Socrates railed against the way debates were conducted and he challenged his contemporaries. He felt the bland of traditional rhetoric and way of debate was confusing, closed-minded and led to many misconceptions. He challenged both his students and authority to look deeper and to analyze what was being said at the time. |
| **Delivery Tips** | None |
| **Review Questions** | What are some questions we can ask once we begin to analyze information? |

## Logic

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\OVV8IZ9R\MC900198191[1].wmfLogic and reasoning are similar but not the same. Logic is the branch of philosophy that gives the rules for deriving valid conclusions. A conclusion is valid if it follows from statements that are accepted as facts. For instance, a logical statement might be, 1 + 1 = 2. This is a rule based on fact. Factual statements are called premises. When reasoning does not follow the rules, we say it is illogical.

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| **Estimated Time** | 15 minutes |
| **Topic Objective** | Learners will apply logic to a simple problem. |
| **Topic Summary** | In this section, we will examine the role of logic in critical thinking. We will solve a logic problem and discuss it. |
| **Materials Required** | Flipchart  Markers |
| **Planning Checklist** | NONE |
| **Recommended Activity** | Have learners, work alone to complete the logic problem. Then, reconvene as a group.  State: “Jerry is taller than Charles, but not as tall as Bob. Bob is taller than Jerry, but not as tall as Daniel. Who is the tallest and the second tallest?”  Give the learners 2 minutes to work out this problem. Then, have a learner come up and solve it (2 minutes). Discuss the problem as a group and methods use to solve the logic problem: linear diagrams, Venn diagram graphs, logic trees, etc. Discuss what these different types of graphical tools look like.  Now, ask the learners to come up with their own logic problem. Have someone volunteer to come up to the flip chart and write his or her problem down. |
| **Stories to Share** | Many work-related problems are logic problems. In linear reasoning, the use of negations and confirmations is common. For instance, Route 66 does not go as far east as New York. We use logic, negation, and confirmation every day without realizing it. |
| **Delivery Tips** | NONE |
| **Review Questions** | What are some steps we take in solving a logic problem? |

## Case Study

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\FZCJR17Y\MC900287131[1].wmfA group of physicists have been researching matter and motion for some years. After numerous studies, they have come to the following conclusions:

“No physical activity happens by chance. All chance occurrences are random events. No random events are physical activities.”

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| **Estimated Time** | 15 - 20 minutes |
| **Topic Objective** | Learners will use reasoning and analytical skills to finish a set of syllogisms. |
| **Topic Summary** | In this section, we will try to put together what we’ve learned about the components of critical thinking and in particular reasoning and logic. |
| **Materials Required** | Flipchart  Markers  Worksheet: 02-Case Study Logical Reasoning |
| **Planning Checklist** | None |
| **Recommended Activity** | Have learners work on a logic problem in groups of 3 – 4.   1. For the statement above debate whether this underlined thought is true or not. Remember open-minded inquiry as you discuss the topic. 2. Now try to see if you can represent this idea in linear order. 3. Can you draw a Venn diagram to determine if it is a valid statement? 4. Can the statement be negated or refuted? Can they be confirmed? What evidence would you use? 5. How would do you think the physicist went about testing this logic problem? How would you design the experiment? Analyze the challenges you may face.   After 15 minutes, have the learners reconvene and discuss the problem as a class. |
| **Stories to Share** | Imagine if we did not have logical reasoning how difficult it would be for scientists to investigate the natural world. Before fancy instrumentation, scientist had to rely upon logic and mathematics to support their hypothesis. Many of the theories regarding the astronomy and objects that we cannot test directly are based on syllogisms. Can you think of other instances when syllogisms are used? |
| **Delivery Tips** | None |
| **Review Questions** | Which components of critical thinking did you use for this problem? |

## Module Two: Review Questions

1. What is the difference between deductive and inductive reasoning?
   1. Deductive reasoning is based on observations
   2. Deductive reasoning is used to form a hypothesis
   3. Inductive reasoning is used to form a hypothesis
   4. Inductive reasoning infers a conclusion

Answer: **b. Inductive reasoning is used to form a hypothesis** Inductive reasoning involves making observations and using the information to draw a conclusion or form a hypothesis. Inductive reasoning is used in the scientific method.

1. What is a syllogism?
   1. Two or more premises used to come to a valid conclusion
   2. A statement that says things occur in relation to each other based on a certain order
   3. A statement that says if the antecedent is true, then the following consequence must also be true
   4. A statement of probability

Answer: **a. Two or more premises used to come to a valid conclusion** A syllogism is when two or more premises are used to come to a valid conclusion. The premises are factual statements used for this kind of logical reasoning.

1. What does it mean to be open-minded?
   1. Refuting new information without examining its validity
   2. Being unreceptive to new information
   3. Willingness to accept new information even when an opinion has been formed
   4. An unwilling to accept new evidence that opposes opinions

Answer: **c. Willingness to accept new information, even when an opinion has been formed** Educators consider one of the main criteria to learning is being open-minded. An open-minded person is receptive to new information and does not allow preconceptions to inhibit their ability to receive new input.

1. Which scholar/philosopher encouraged open-mindedness and questioned traditional rhetoric 2400 years ago?
   1. Pliny the Elder
   2. Descartes
   3. Emerson
   4. Socrates

Answer: **d. Socrates** Socrates lived about 2400 years and was a great philosopher. He challenged the rhetoric of his time, especially confusing and barren language.

1. Where does analysis fall in Bloom’s Taxonomy?
   1. It’s the very top domain
   2. It’s the first domain
   3. High level – one of the upper three domains
   4. Low level – one of the lower three domains

Answer: **c. High level – one of the upper three domains** Analysis is the fourth domain from the base. It is considered a higher-ordered thinking skill.

1. Which of the following is not one of the three factors to consider when analyzing new information?
   1. Argument
   2. Evidence
   3. Environment
   4. Language

Answer: **c. Environment** When listening to new information, Socratic process considers the argument, evidence, and language. The environment is not one of the three factors.

1. What is logic?
   1. Rules
   2. Conclusions
   3. Premises
   4. A branch of philosophy

Answer: **d. A branch of philosophy** Logic involves rules, premises, and conclusions. However, it is not these things. It is the branch of philosophy that states the rules for reaching valid conclusions.

1. What is a premise?
   1. A statement of fact or value
   2. Rule
   3. Conclusion
   4. Bias

Answer: a. **A statement of fact or value** Premises are facts. They are statements that allow a logical conclusion to be inferred.

1. What had the physicists been researching for years?
   1. Matter only
   2. Motion only
   3. Matter and motion
   4. None of the above

Answer: **c. Matter and motion.** The case study clearly states this fact.

1. The scientists came to the conclusion that: “No \_\_\_\_ activity happens by chance.”
   1. Mental
   2. Physical
   3. Spiritual
   4. Psychological

Answer: b. **Physical** After years of research, the scientists concluded: “No physical activity happens by chance. All chance occurrences are random events. No random events are physical activities.”

# Module Three: Non-Linear Thinking

*Neither a closed mind nor an empty one is likely to produce much that would qualify as effective reasoning.*

*R.S. Nickerson*

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\FTRMPN7N\MC900200277[1].wmfThere are two ways to work out problems vertically and laterally, as we learned in Module Two we can approach critical thinking and problems in a step-by-step fashion. This is called linear or vertical thinking. However, often we tend to not line up the premises in a normal step-by-step fashion. When we approach a problem in a different order, we are using non-linear thinking. Sometimes, non-linear thinking is also called lateral thinking.

## Step Out of Your Comfort Zone

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\MP321RS9\MC900055555[1].wmfOne of the first steps in developing non-linear thinking is to step out of your comfort zone. Basically, this concept involves seeing information or circumstances from a different perspective. A zone is defined as an area set apart in some way. In critical thinking and problem-solving, sometimes we have to get out of the areas or zones we are comfortable with and stretch our thinking.

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| **Estimated Time** | 10 minutes |
| **Topic Objective** | Learners will demonstrate stepping out of their comfort zone by doing an activity. |
| **Topic Summary** | In this section, we will further explore the components of critical thinking and in particular non-linear thinking by doing an activity. |
| **Materials Required** | Flipchart, Marker |
| **Planning Checklist** | None |
| **Recommended Activity** | Have the learners work in pairs with someone of the opposite sex, if possible.  Ask the learners what their lives would have been like if they were the opposite sex. What subjects would they have taken in school? Which careers would they have chosen? What fashion style? What foods would they like and what would their current interest be?  For the next five minutes, ask the each participant to take turn describing their lives to the other person, but as if they were actually born the opposite sex.  Reconvene after 5 minutes and ask: Were the discussions the same? What did it feel like to have a gender change, temporarily? |
| **Stories to Share** | Sherlock Holmes, the world’s most famous fictional thinker, used lateral thinking are non-linear thinking to solve mysteries. Watson, on the other hand, usually approached matters in a linear fashion. Think about some other fictional or non-fictional detectives who use this style of problem solving. |
| **Delivery Tips** | None |
| **Review Questions** | What does the phrase: “Stepping out of your comfort zone” imply? |

## Don’t Jump to Conclusions

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\FTRMPN7N\MC900390808[1].wmfAn important step in problem solving is taking the time to acquire the necessary information. Often, we tend to jump to conclusions before we have all of the facts. How can we use our understanding of logic to gather all the necessary facts? Remember, the premises are the facts or statements that help us come to conclusions.

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| **Estimated Time** | 10 minutes |
| **Topic Objective** | Learners will demonstrate the concept of not jumping to conclusions by solving a logic problem. |
| **Topic Summary** | In this section, we will continue to fine tune our understanding of logic and problem-solving to enhance critical thinking. |
| **Materials Required** | Worksheet: 03-Non-Linear Thinking and Problem Solving |
| **Planning Checklist** | None |
| **Recommended Activity** | Have learner’s work in pairs.  Ask the learner’s to look at Worksheet 3 and attempt to solve the problem.  On a train, Williams, Edwards, and Paul are a teacher, scientist, and a doctor, but NOT respectively. Also, aboard the train are three businessmen who have the same names: a Mr. Williams, a Mr. Edwards, and a Mr. Paul.   1. Mr. Edwards Lives in New York. 2. The scientist lives halfway between Chicago and New York 3. Mr. Paul earns exactly $60,000 per year. 4. The scientist’s nearest neighbor, one of the businessmen, earns exactly three times as much as the scientist. 5. Williams beats the teacher in billiards. 6. The passenger whose name is the same as the scientist lives in Chicago.   Who is the doctor? Williams OR Edwards OR Paul  Answer: Williams, he cannot be teacher because he beats the teacher in billiards. He also cannot be the scientist, who has the same name as Mr. Paul his Chicago neighbor. We can logically infer that Mr. Paul earns three times as much as the scientist; so the scientist must be Paul, the teacher must be Edwards and the doctor Williams. |
| **Stories to Share** | Only about 2.5% get problems similar to this one correct. Word problems and logical problems are difficult to solve and require lateral thinking as well as the ability to infer and do deductive reasoning. |
| **Delivery Tips** | None |
| **Review Questions** | What other critical thinking components are involved in problem solving? |

## Expect and Initiate Change

“Be the change you wish to see,” is a common slogan on bumper stickers. With so many events happening on an international and national level each day, change is simply a standard course in businesses. We can always expect changes in organizations. Nothing stays the same, and we sometimes are in the position where we the ones initiating the change.

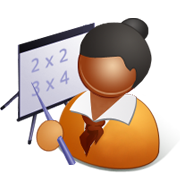
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| **Estimated Time** | 10 minutes |
| **Topic Objective** | Learners will list obstacles and facilitators of change. |
| **Topic Summary** | In this section, we will learn some factors that are obstacles to change. We will also identify factors that facilitate change. |
| **Materials Required** | Flipchart, Markers |
| **Planning Checklist** | None |
| **Recommended Activity** | Have the learners work as a class for this activity.  One a flipchart page, write “OBSTACLES” ask the learners what are some obstacles to change? List these. Discuss each obstacle individually. Responses will vary according to the class make-up. Some common responses might include: lack of knowledge, resources, time, etc.  Next, on a new page, write “FACILITATORS,” and ask the learners what are some things that promote change? Discuss the responses. Possible answers include, being open-minded, readiness, and adaptability. |
| **Stories to Share** | Change is one of the biggest hurdles that manager’s face. Instead of incorporating huge changes all at once. Many managers have found that a “tipping point” approach works well. They gradually introduce the changes little by little until a critical mass is reached, and then organizational becomes more widespread. |
| **Delivery Tips** | None |
| **Review Questions** | How can we initiate changes in our work departments or organizations? |

## Being Ready to Adapt

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\OVV8IZ9R\MC900054968[1].wmfThe question in today’s culture is not will change occur in an organization, but how well are employees at adapting to change. Employees protect themselves from becoming obsolete by changing. Adaptation is a survival skill of nature. The species which survive in an environment are those that are capable of adapting well.

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| **Estimated Time** | 10 minutes |
| **Topic Objective** | Leaders will demonstrate adaptation techniques. |
| **Topic Summary** | In this section, we will discuss how managers and professionals readily adapt to change. |
| **Materials Required** | Flipchart, Markers |
| **Planning Checklist** | Worksheet: 03-Non-Linear Thinking and Problem Solving |
| **Recommended Activity** | Have the learners work in pairs.  Write the following outline on the flipchart or eraser board:  ADAPTATION TECHNIQUES:   * BEING AWARE * LETTING GO OF OLD IDEAS * GAINING CONTROL OF FEAR * QUICKLY ASSESSING NEW INFORMATION   + SPLIT IT UP, REARRANGE IT, AND REINTERPRET IT   Acting on new information  Complete activity 2 on worksheet 3.1. Adapting to change. Discuss each example and how the subjects can adapt to their new situations. |
| **Stories to Share** | Dr. Spencer Johnson’s *Who Moved My Cheese* is a short but powerful message on coping with changes in organizations. It tells the story of how the characters, mice, respond to change in their environment, and how wise mice learn to look for new cheese when their cheese is moved. |
| **Delivery Tips** | None |
| **Review Questions** | What are some factors that may change difficult? |

## Case Study

You are a high school, mathematics teacher and you want your students to improve their reasoning skills. You assign word problems, but most of the students just are not getting it. At the present time, the students do not comprehend the process of using logic and why the word problems are important or relevant to them. Some students can do the calculations, but even these students lack an understanding of the process of logic. You want your students to understand that coming up with the right answer is not the most important goal in solving the word problems. You realize you have to come up with some way to…”

1. Change you student’s thinking from linear to non-linear.
2. Get the student’s to better understand the process of logic.

Ask: What can this teacher do to solve her problem? How can she get her students to think differently?

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| **Estimated Time** | 15 minutes |
| **Topic Objective** | Learners will apply what they have learned about non-linear thinking to problem. |
| **Topic Summary** | In this module, we have look at some factors that influence non-linear thinking. In this section, we will try and put all of those factors together in a case study, which is actually a logic problem. |
| **Materials Required** | Worksheet: 03-Non-Linear Thinking and Problem Solving |
| **Planning Checklist** | None |
| **Recommended Activity** | Have the learners work in pairs to solve the problem in the case study. |
| **Stories to Share** | A comic character says to another, “That human’s clothing is so clever it’s tailored to keep his hands and head naked. Think we can get one of those outfits.” We normally think of clothes as keeping us covered not naked. This is non-linear thinking |
| **Delivery Tips** | None |
| **Review Questions** | What are some steps involved in changing the way we thinking? |

## Module Three: Review Questions

1. What is another term for non-linear thinking
   1. Vertical thinking
   2. Cyclic thinking
   3. Lateral thinking
   4. Tangential thinking

Answer: **c. Lateral thinking** non-linear thinking is also called lateral thinking. Linear thinking is sometimes referred to as vertical thinking.

1. What is a zone?
   1. Delineated area
   2. Demarcation
   3. Type of thinking
   4. A line

Answer**: a. Delineated area** A zone is an area set apart or delineated in some way. In critical thinking, sometimes we have to get out of the areas or zones we are comfortable.

1. All of the following can help prevent us from jumping to conclusions except for:
   1. Gathering all of the facts
   2. Reviewing the premises
   3. Ignoring the premises
   4. Evaluating all the pertinent information

Answer: c. **Ignoring the premises** To prevent jumping to conclusions, we must take time to review all pertinent information. In the terms of logic, this means reviewing the premises.

1. Premises help all the following except to:
   1. Lead to conclusions
   2. Develop an argument
   3. Provide evidence
   4. Manipulate language

Answer: **d. Manipulate** **language** Premises help to develop arguments, provide evidence, and lead to conclusions. Premises are not meant to manipulate language.

1. What is an obstacle to change?
   1. Fear
   2. Adaptation
   3. Courage
   4. Open-mindedness

Answer: **a. Fear** Fear is an obstacle to change. There are many other obstacles including resources and knowledge.

1. What is a facilitator of change?
   1. Lack of knowledge
   2. Readiness
   3. Limited resources
   4. Status quo

Answer: **b. Readiness** A great facilitator of change is readiness. To improve the readiness level of employees, sometimes it’s helpful to initiate change gradually.

1. What is the first step adaptation?
   1. Awareness
   2. Controlling fear
   3. Assessing new information
   4. Letting go

Answer: **a. Awareness** The first step in adapting is to recognize that a change is necessary. Awareness of the environment, unknown or situation comes even before fear develops.

1. All of the following are techniques to assess new information except for:
   1. Splitting it up
   2. Re-arranging it
   3. Denying it
   4. Re-interpreting it

Answer: **c. Denying** it Adaptation requires recognizing and being aware of changes. Denying new information is not a technique used to assess new information.

1. What type of teacher is in the case study?
   1. Science
   2. Social Studies
   3. Health
   4. Math

Answer: d. **Math** The case study clearly states this.

1. One of the tasks of the teacher is to change the students’ way of thinking from \_\_\_ to \_\_\_\_.
   1. Linear to Non-Linear
   2. Abstract to Concrete.
   3. Non-Linear to Linear
   4. Concrete to Abstract

Answer: a. **Linear to Non-Linear** The case study clearly states this.

# Module Four: Logical Thinking

*Reasoning is simply a matter of getting your facts straight.*

*B.F. Anderson*

*Be the change you want to see in the w*

Logical thinking is a process which involves steps. In general logical thinking involves checking the components of the argument and making the connections between, which is what we call reasoning. The four major steps of logical are 1) asking the right questions, 2) organizing data, 3) evaluating the information, and 4) drawing conclusions. In this module, we will analyze these basic steps.

## Ask the Right Questions

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\EOAYJ771\MC900383528[1].wmfThe first step in logical thinking should begin with asking the questions. Based on the components of critical thinking, the logical thinker should begin reasoning by asking many questions. An important question to ask is what are the premises? If we are confused about the premises, we may make mistakes further down the line in the logic process. We should distinguish between whether the statement is a fact or a value and be alert to not confuse the two. Finally, we should check to see if any premises or vital information is missing. A key point to remember is that no conclusions can be made without premises.

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| **Estimated Time** | 10 minutes |
| **Topic Objective** | Learners will analyze types of premises. |
| **Topic Summary** | A key point about the logic process is that conclusions are based on premises. We find out the premises by asking the right questions. In this section, we will analyze types of premises. There are three types of premises we will analyze:   * Facts – A statement about what *IS* the case. * Values – A statement about what *SHOULD* or *OUGHT* to be the case. * Suppressed premises – An unstated premise (for instance, when we make assumptions.) |
| **Materials Required** | Flipchart, Markers  Worksheet: 04-Logical Thinking |
| **Planning Checklist** | None |
| **Recommended Activity** | Have learners work in pairs for this activity.  Ask learners to complete activity 1 on worksheet 4.1. For 5 minutes, each partner will write down 6 - 10 premises based on the three types, but not specify the type of premise. Then, the partners will exchange statements and identify whether each of the partner’s statement is a fact, value, or suppressed premise. |
| **Stories to Share** | Often in advertising we are faced with suppressed premises. For instance, we often see claims like product XYZ outsold or outlasted its three leading competitors. So, XYZ is clearly the best product on the market. What is the claim the seller is really making in this case. We need to be careful. Are they presenting facts, values, or suppressed premises? |
| **Delivery Tips** | None |
| **Review Questions** | What are the three types of premises? |

## Organize the Data

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\31B2RP17\MC900297267[1].wmfOrganizing data is the second step in the logic process. Once we know the premises we can begin to organize the data. We can organize the information by making connections. An effective method of organizing data includes breaking up the information and diagramming or lying out the premises. Tree diagrams are helpful because they graphically show the connections. For instance, we can use tree diagrams such as this one:

Wealthy

Not Wealthy Lives in a fancy house

Lives in an average house

Does not live in a fancy house

Start

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| **Estimated Time** | 10 minutes |
| **Topic Objective** | Learners will identify and organize argument data using a tree diagram. |
| **Topic Summary** | In this section, we will continue to learn more about logical thinking and how the process works. We will practice organizing information and distinguishing between and learn two terms convergent and chained-linked:   * Convergent structure supports the conclusion and lead to conclusions. They are reinforcing, supplementing, or supporting * Chain linked arguments are like links of a chain. One premise follows another. |
| **Materials Required** | Flipchart, Markers  Worksheet: 04-Logical Thinking |
| **Planning Checklist** | None |
| **Recommended Activity** | Have learners work in pairs for this activity.  Have learners practice organizing the data in activity 2 on worksheet 4. |
| **Stories to Share** | **Aristotle,** excerpt of article by Garth Kemmerling  “Philosophically, the works of Aristotle reflect his gradual departure from the teachings of Plato and his adoption of a new approach. Unlike Plato, who delighted in abstract thought about a supra-sensible realm of forms, Aristotle was intensely concrete and practical, relying heavily upon sensory observation as a starting-point for philosophical reflection. Interested in every area of human knowledge about the world, Aristotle aimed to unify all of them in a coherent system of thought by developing a common methodology that would serve equally well as the procedure for learning about any discipline.  For Aristotle, then, logic is the instrument (the "organon") by means of which we come to know anything. He proposed as formal rules for correct reasoning the basic principles of the categorical logic that was universally accepted by Western philosophers until the nineteenth century.”  Source: <http://www.philosophypages.com/hy/2n.htm> |
| **Delivery Tips** | Point out they can also use circle maps to organize diagrams or mind-mapping techniques they may have previously learned. |
| **Review Questions** | What is the difference between convergent and chain-linked structures? |

## Evaluate the Information

After organizing the information, the logical thinker can proceed with evaluating it. Evaluating information involves determining whether the information is valid. Conclusions cannot be made until a distinction is made between truth and validity. People often have trouble separating what is valid from what is true because of their ingrained beliefs. **Belief bias** occurs when an individual’s belief system interferes with his or her ability to come to a logical conclusion. **Confirmation bias** is the tendency to use information to support your hypothesis about a problem.

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| **Estimated Time** | 10 – 15 minutes |
| **Topic Objective** | Participants will evaluate information by distinguishing between truth and validity of premises or claims. |
| **Topic Summary** | In deductive reasoning if the major premise is true, then we can infer than the conclusions must also be true. This is important to understand because in deductive reasoning consistency follows in all minor and major premises. Distinction between truth and validity is as follows:   * Validity – there’s consistency in the form of the argument, validity guarantees that if the premises are true then the conclusions will also be true * Truth – Refers to truth in the premises, you can have a valid argument with false premises, and in this case the conclusion will be false. |
| **Materials Required** | Flip Chart, Markers  Worksheet: 04-Logical Thinking |
| **Planning Checklist** | None |
| **Recommended Activity** | Have the learners work in pairs to complete activity 3 on worksheet 4.  After 5 minutes reconvene the class and discuss the truth/validity statements. |
| **Stories to Share** | In inductive reasoning the argument goes beyond the premises. Remember, inductive reasoning involves making observations to develop a hypothesis or conclusion. When the scientist Blaise Pascal set out to test the laws of atmospheric pressure, he conducted a number of experiments with his brother-in-law. Based on a series of observations, he made a series of single statements about his observations that eventually were used to form a law. He could not make an inductive argument (universal claim) because he could not claim that all unobserved cases definitively resembled observed cases. But, he could make a valid argument based on his observations. This often a problem in science. |
| **Delivery Tips** | None |
| **Review Questions** | What is the distinction between truth and validity? |

## Draw Conclusions

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\9PDUOZYV\MC900197875[1].wmfOnce the data has been collected, organized, and evaluated, we can then draw conclusions. Recall that in deductive reasoning, conclusions are inferred based on valid premises. In inductive reasoning, uses observations to draw conclusions or a hypothesis. Inferences naturally flow from the evidence. In making inferences, the logical thinker should be certain not draw more or less than what is implied, instead:

* Infer only what the data implies
* Check to ensure inferences are consistent
* Identify underlying assumptions

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| **Estimated Time** | 10 – 15 minutes |
| **Topic Objective** | Learners will draw conclusions bases on data provided to them. |
| **Topic Summary** | The natural consequence of logical thinking is that a conclusion is eventually reached. In this section, we will practice drawing conclusions and list some questions relevant to drawing conclusions. |
| **Materials Required** | Flip Chart, Markers  Worksheet: 04-Logical Thinking |
| **Planning Checklist** | None |
| **Recommended Activity** | The learners will complete this activity as a whole class discussion.  First, ask the learners to look at the examples on activity 4 of worksheet 4 and come up with a conclusion for each set of premises. Discuss these after 5 minutes.  Now brainstorm and ask the learners to what are some relevant questions to ask when drawing conclusions. Possible answer choices include:   * Is my inference based on the premises/data? * How should we interpret the data? * What is the best possible conclusion? * Are there other possible conclusions to consider? * Does this interpretation make sense or is it far flung? * Does the solution follow from our data? * How did we reach this conclusion? |
| **Stories to Share** | Consistency in inference is a major factor in logical thinking. One term that appears in philosophy is “fallacy of division.” In fallacy of division, someone argues that something that is true for a whole is also true of its parts when considered separately. Researchers believe this type of logic is commonly the basis of forms of discrimination or racism. |
| **Delivery Tips** | None |
| **Review Questions** | What are some key points to consider when drawing conclusions? |

## Case Study

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\31B2RP17\MC900198873[1].wmfLogic problem:

You are a chemistry student in the lab ad one assignment your group has is to mix chemicals until a color change occurs. In this case, you should see a pink color. You are given four beakers of colorless liquids, labeled 1-4. You are given a flask labeled X, which contains the reagent (activating solution). The reagent is needed to cause the color change. How will you determine which combination of chemicals will produce the required pink color?

Answer: This problem is an example of combinational reasoning (Piaget). The students in the lab will mix individually liquid from each with the activating solution (1 + X), (2+X), and so on. Then, they will mix one and two together with the activating solution and so on (1+2+X), (1+3+X). They will try all combinations until the color changes.

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| **Estimated Time** | 15 – 20 minutes |
| **Topic Objective** | Given a logic problem, learners will go through the four steps up to drawing a conclusion. |
| **Topic Summary** | In this section of the module, we will pull together everything we have learned so far about logical thinking. We will do a case study in groups and then reconvene and discuss it as a class. |
| **Materials Required** | Flip Chart, Markers  Worksheet: 05-Case Study Logic Problem |
| **Planning Checklist** | None |
| **Recommended Activity** | Have the learners work in groups to complete the case study.  In this case study learners should use either a tree diagram or circle maps to organize information. |
| **Stories to Share** | One important factor in logical thinking is clarity of language. During Socrates’ time he argued for debaters to use rhetoric that was not obtuse or bland. No matter how complex a subject it is it can be expressed in clear terms. This is a mark of good communication and particularly effective writing. For example, read Bertrand Russell’s The Theory of Philosophy. Although this text is very complex and esoteric, Russell explains his thoughts in an accessible manner. |
| **Delivery Tips** | None |
| **Review Questions** | What are the four steps of logical thinking? How were they used in this case study? |

## Module Four: Review Questions

1. Why is asking the right questions important?
   1. Because questioning is the last step in the logic process
   2. Because questions are based on conclusions
   3. Since premises do not provide any information, you have to ask questions
   4. Because asking the right questions will lead to solutions

Answer: **d. Because questioning is the first step in the logic process** Asking questions is the first step in the logic process. Logical thinkers ask the right question to lead to solutions.

1. What is one question that logical thinkers should ask?
   1. What are the premises?
   2. How long will the process take?
   3. Who is involved?
   4. What are the risks?

Answer: **a. What are the premises?** Logical thinkers should begin with asking many questions? The most important question they should ask is, “What are the premises?” The other answer questions are also important and may be included in the premises.

1. All of the following terms describe convergent structure in organizing data, except for:
   1. Supporting
   2. Reinforcing
   3. Supplemental
   4. Variances

Answer: **d.** **Variances** Convergent structure begins at a starting point and provides premises that support each other. Variances would not appear in a convergent structure.

1. What is an advantage of using a tree diagram?
   1. Disperse information
   2. Shows connections
   3. Makes information more complex
   4. Verbal representation

Answer: **b. Shows connections** Tree diagrams are graphical devices that make it easier to interpret information. They show the connections and relationships.

1. What is confirmation bias?
   1. Using premises to support other premises
   2. Using premises to obtain information
   3. Using premises to support what you already believe
   4. Using premises to refute a claim

Answer: **c. Using premises to support what you already believe** Confirmation bias is when you use a premise to support what you already believe. It is used to confirm opinions.

1. Validity of data is?
   1. Absolute truth
   2. Probability
   3. Lack of support
   4. Truth based on premises

Answer: **d. Truth based on premises** The validity is based on the premises. A conclusion is considered valid if it’s true because its premises are true.

1. What is one risk involved in drawing conclusions?
   1. Draw more from the premises
   2. Make a valid conclusion
   3. Analyze thoroughly
   4. Determine reasonable probability

Answer: **a. Draw more from the premises** Logical thinkers should be careful to not draw more from the premises than what is there. They also should be careful not to infer too little.

1. When drawing conclusions thinkers should identify?
   1. Underlying motives
   2. Key factors
   3. Possible outcomes
   4. Underlying assumptions

Answer: **d. Underlying assumptions** When drawing conclusions, logical thinkers should do three things. They should infer only what the data implies, check for consistencies, and identify underlying assumptions.

1. After mixing chemicals, the students are supposed to see what color?
   1. Blue
   2. Green
   3. Pink
   4. Yellow

Answer: **c. Pink** The case study clearly states this.

1. The problem in the case study is an example of whose theory?
   1. Freud
   2. Erikson
   3. Piaget
   4. Dewey

Answer: **c. Piaget** Piaget is a psychologist and philosopher who have created a theory regarding cognitive development.

# Module Five: Critical Thinkers (I)

*The ear says more than the tongue.*

*W.S. Graham*

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\9PDUOZYV\MC900415144[1].wmfWhat are some characteristics of critical thinkers? Are there innate abilities that make some individuals better at thinking critically? In module five and six, we will examine eight characteristic characteristics of critical thinkers. The four characteristics we will discuss in Module five are:

* Active Listening
* Curiosity
* Self-Discipline
* Humility

## Active Listening

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\3YJGCFYP\MC900197844[1].wmfWe have all heard it before the best communicators are active listeners. What does it mean to practice active listening? Active listening means the listener is completely engaged in what the speaker is communicating and judging what is being said. The listener is not formulating his rebuttal or responses to the speaker, or even worse thinking about something else unrelated.

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| **Estimated Time** | 10 minutes |
| **Topic Objective** | Learners will demonstrate active listening. |
| **Topic Summary** | In this section, we will learn some specific actions of active listening. We will also learn how we all can become better at active listening. |
| **Materials Required** | Flipchart, Markers |
| **Planning Checklist** | None |
| **Recommended Activity** | Have learners complete this activity in rotating pairs.  In this activity, learners will visit with another learner and practice active listening. One learner will speak for 1 minute each. The other learner will practice active listening while his or her partner is speaking. Then, the instructor will ask the learners to quickly find a new partner and repeat what their first partner said. After 2 minutes, the learners will stop again and find new partners. They will then try to repeat what their first and second partners said. (This should take 6 – 8 minutes total)  The instructor will then ask the class to reconvene and discuss what where some challenges to active listening and remembering what their partners said and how can they improve this skill |
| **Stories to Share** | Active listening is such an important skill. It is not only essential in the workplace, where active listening improves productivity and prevents error. Every service oriented occupation is based on active listening. Additionally, active listening is also a key to happy relationships. |
| **Delivery Tips** | None |
| **Review Questions** | What is active listening? |

## Be Curious

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\ZKNEI80I\MC900198799[1].wmfCuriosity is yet another skill in developing critical thinking. Some scholars believe that Socrates ultimate goal was not so much to advocate his method as to advocate the self-improvement and sparking of curiosity. The main goal of a teacher is to spark curiosity and engage his or her students. There are many methods to engage curiosity but they all essentially involve rising a question. For instance, Einstein prompted his curiosity by asking questions about how matter and energy functioned.

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| **Estimated Time** | 15 - 20 minutes |
| **Topic Objective** | Learners will create a game to help promote curiosity. |
| **Topic Summary** | In this section, we will examine the role curiosity plays in critical thinking by engaging in an activity to promote curiosity. Some scholars assert that curiosity must be enhanced by actions following the questions. |
| **Materials Required** | Chart Paper, Markers |
| **Planning Checklist** | None |
| **Recommended Activity** | Learners will work in groups of 3 -5 to create a board curiosity board game.  State: One method to spark curiosity is a two part (or two footed) approach to questioning:   * Part 1 of the question presents the facts * Part 2 of the question expresses the experiences and interest of people or parties involved   Give each group a piece of chart paper and markers and ask the learners to create a board game (e.g., Monopoly). Using the two parted question approach. Instead of a board game, groups can instead create a Jeopardy or Pictionary like game.  Allow at 1 - 2 minutes at the end of the activity for discussion and insights. |
| **Stories to Share** | Throughout history, we can certainly see how curiosity and an open mind contribute to success. For instance, consider Florence Nightingale, the mother of modern nursing. She was also a skilled statistician whose open mind and curiosity led her to write an important report on the sanitary health of the battlefield. This report led Britain’s Royal Commission to adopt changes that saved many lives during the Crimean War. |
| **Delivery Tips** | None |
| **Review Questions** | Besides questioning, are there any other ways to spark curiosity? |

## Be Disciplined

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\OVV8IZ9R\MC900231048[1].wmfReasoning and rationale are often associated with self-discipline. Critical thinking is a self-disciplined and self-guided action. Critical thinking requires the individual to use his own reasoning skills and ability to evaluate and reflect. One important thing to consider is that people who are critical thinkers commonly are also more empathetic and aware of their world. They show a commitment to self-development and strive to make their environment a better place.

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| **Estimated Time** | 10 minutes |
| **Topic Objective** | Learners will demonstrate an understanding of how self-discipline relates to critical thinking by interpreting a passage. |
| **Topic Summary** | In this section, we will explore what it means to be discipline in relation to critical thinking. Critical thinking usually implies rationale and reasoning, qualities often associated with self-discipline. |
| **Materials Required** | None |
| **Planning Checklist** | Flipchart, Markers |
| **Recommended Activity** | Have learners work in pairs,  Write the following passage on the flipchart:  “THE PHILOSOPHER FRIEDRICH NIETZSCHE CALLED CRITICAL THINKING PHILOLOGY, WHICH MEANS BOTH "LOVE OF WORDS" AND "LOVE OF REASON."  Ask the learners to discuss what Nietzsche means by “philology” and why he may have felt critical thinking requires self-discipline. |
| **Stories to Share** | Critical is similar to the word criterion. A criterion is a test or standard and can be an item that is psychological, moral, or scientific or practical. Hence, we can see how critical thinking is related to being discipline. Discipline usually denotes practicality. |
| **Delivery Tips** | None |
| **Review Questions** | How is discipline related to critical thinking? |

## Be Humble

Humility is defined as the “quality of being modest of opinion or estimate of one’s own importance.” Humility is the opposite of arrogance. Humility relates having an open mind. To be receptive to new information or opinions, the critical thinker would have to be modest of his or her own opinion. Being humble allows you to accept and see information in a way that is not filtered through your ego.

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| **Estimated Time** | 10 minutes |
| **Topic Objective** | Learners will demonstrate an understanding of intellectual humility through discussions. |
| **Topic Summary** | We will explore how humility affects one’s ability as a critical thinker. |
| **Materials Required** | Flipchart, Markers |
| **Planning Checklist** | None |
| **Recommended Activity** | Have learners work in pairs.  Write the following on the flipchart: WHAT IS INTELLECTUAL HUMILITY?  Ask learners to discuss this question for 5 minutes.  Then reconvene the class and share this excerpt from The Critical Thinking Community :  “HAVING A CONSCIOUSNESS OF THE LIMITS OF ONE'S KNOWLEDGE, INCLUDING SENSITIVITY TO CIRCUMSTANCES IN WHICH ONE'S NATIVE EGOCENTRISM IS LIKELY TO FUNCTION SELF-DECEPTIVELY; SENSITIVITY TO BIAS, PREJUDICE, AND LIMITATIONS OF ONE'S VIEWPOINT. INTELLECTUAL HUMILITY DEPENDS ON RECOGNIZING THAT ONE SHOULD NOT CLAIM MORE THAN ONE ACTUALLY KNOWS. IT DOES NOT IMPLY SPINELESSNESS OR SUBMISSIVENESS. IT IMPLIES THE LACK OF INTELLECTUAL PRETENTIOUSNESS, BOASTFULNESS, OR CONCEIT, COMBINED WITH INSIGHT INTO THE LOGICAL FOUNDATIONS, OR LACK OF SUCH FOUNDATIONS, OF ONE'S BELIEFS.”  Source: <http://www.criticalthinking.org/pages/valuable-intellectual-traits/528> |
| **Stories to Share** | Traditionally, the concept of humility in business has been nearly non-existence. How can a business succeed in a competitive environment if the leaders take a humble or modest approach? However, researchers have identified and coined a term to explain the place of humility in business, “neohumility.” This term indicates a type of humility without weakness. |
| **Delivery Tips** | None |
| **Review Questions** | What is humility? Are there different types? |

## Case Study

You are on a management team responsible for determining how to reduce the number of returns for defective software products in a large company. No particular department wants to take responsibility for the returns but the problem must be solved because the company is losing revenue and customers.

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| **Estimated Time** | 15 minutes |
| **Topic Objective** | Learners will conduct a role play demonstrating their understanding of how the four characteristics relate to critical thinking. |
| **Topic Summary** | In this section, we will pull together what we have learned so far about critical thinking and the qualities of active listening, curiosity, self-discipline, and humility. We will do a role play in which each group member will demonstrate one of these qualities. |
| **Materials Required** | Flipchart, Markers, Index cards or Paper  Worksheet: 06-Case Study – Critical Thinkers (II) |
| **Planning Checklist** | Prior to this activity write out the four characteristics on index cards, a set for each group. |
| **Recommended Activity** | The learners will complete this activity in groups of 4.  Give each learner in the group a different index card. Ask them to role play or demonstrate appropriate or inappropriate examples of the characteristics they receive but not to tell their fellow group members which version they are acting out. Each person should take 1 - 2 minutes to role play.  The group members will attempt to identify the term and discuss.  Reconvene a few minutes before the activity time is up and discuss as a whole class the learners’ observations. |
| **Stories to Share** | While it is confidence that help businessmen introduce new products to market, it is humility that prevents the confidence from spilling over into arrogance. Of the traits that commonly lead to failure, arrogance is one of the downfalls. Blind over-assurance can lead to taking unnecessary risks. |
| **Review Questions** | What are the features of each of the characteristics from this section? |

## Module Five: Review Questions

1. Active listening is:
   1. Engaged listening
   2. Judging what the speaker is saying
   3. Formulating your own thoughts
   4. Selective listening

Answer: **a. Engaged** listening Active listening is a mark of good communication. It involves the listener being engaged.

1. One common obstacle to active listening is:
   1. Formulating own thoughts when listening
   2. Speakers who talk too much
   3. Speakers who use complex language
   4. Good concentration

Answer: **a. Formulating** our thoughts when listening A common obstacle to engaged listening include the listener formulating his or her own thoughts when listening. Another common obstacle is for the listener to think judge what the speaker is saying.

1. Critical thinking is sparked by:
   1. Thinkers
   2. A match
   3. Curiosity
   4. Debate

Answer: **c. Curiosity** Critical thinking and self-improvement are sparked by curiosity. Curiosity is also an impetus for learning.

1. Questions must be followed by:
   1. Actions
   2. Premises
   3. Facts
   4. Claims

Answer: **a. Actions** In terms of addressing curiosity, critical thinkers should follow questions by actions. Premises, facts, and claims are also important but action is the most appropriate answer.

1. Which qualities are often associated with self-discipline?
   1. Stubbornness and resolve
   2. Narrow-mindedness and judgment
   3. Reasoning and rationale
   4. Impatience and lack of perseverance

Answer: **c. Reasoning and rationale** The critical and logical thinker needs self-discipline to make good decisions. Reasoning and rationale are logical thinking qualities also associated with self-discipline.

1. Why is discipline important to critical thinking?
   1. Critical thinking requires technical skills
   2. Critical thinking is difficult to master
   3. Critical thinking requires the individual to rely on others
   4. Critical thinking requires the individual to use their reasoning skills

Answer: **d. Critical thinking requires the individual to use their reasoning skills** The critical thinker needs discipline because they must rely on their own understanding and skills. Critical thinking is involved but it is not difficult to master.

1. Humility is:
   1. Being of modest opinion of one’s own importance
   2. Being overconfident
   3. Having an inflated ego
   4. Being inconsiderate of others

Answer: **a. Being of modest opinion of one’s own importance** Humility is related to being open-minded and willing to accept new information. This characteristic is very important in critical thinking.

1. All of the following qualities help promote humility in the critical thinker except for:
   1. Self-discipline
   2. Confidence
   3. Receptivity
   4. Arrogance

Answer: **d. Arrogance** Humility is the opposite of arrogance. The other answer choices will promote humility.

1. The case study is about learning how to reduce the number of returns on what type of product?
   1. Software
   2. Clothing
   3. Hair products
   4. Furniture

Answer: **a. Software** The case study clearly states this.

1. How are the defective products affecting the company?
   1. It is losing revenue only
   2. It is losing revenue and customers
   3. It is losing customers only
   4. Its stock price is dropping

Answer: **b. It is losing revenue and customers** The case study clearly states this.

# Module Six: Critical Thinking (II)

*Man is but a reed, the most feeble thing in nature, but he is a thinking reed.*

*Blaise Pascal*

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\39XQYYJK\MC900406372[1].wmfIn the previous module, we began to examine characteristics of critical thinkers. In this module, we will continue to look at more characteristics to help us improve our critical thinking capabilities. Four additional topics are presented in this module. They are:

* Seeing the big picture
* Objectivity
* Using your emotions
* Being self-aware

## Seeing the Big Picture

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\FTRMPN7N\MC900410297[1].wmfOne of the main functions of thinking is to make connections. Our own ideas gain significance when we can relate or connect them to other ideas. We start to gain insight when we see the similarities between ideas. The way we structure our ideas can be based on how they connect in one of two ways: causal or conceptual relationships. Since many problems arise due to causal changes, we will focus on this aspect. Steps in discovering causal relations include:

* Laying out the account
* Determining a hierarchy
* Interpreting convergences and divergences
  + Convergences are ideas/things that reinforce, supplement, or complement events
  + Divergences are points that do not reinforce events

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| **Estimated Time** | 10 minutes |
| **Topic Objective** | Learners will identify the patter of causal relations in a given situation. |
| **Topic Summary** | In this section, we will focus on causal relationships. In everyday affairs, many problems arise due to a change in the causal relations between individuals and within organizations. |
| **Materials Required** | Flipchart, Markers  Worksheet: 07-Critical Thinkers |
| **Planning Checklist** | None |
| **Recommended Activity** | Have learners work in pairs.  Ask learners to look at the example problem in activity 1 of Worksheet 6 and find a solution. Have the learners map out the causal relations, making certain they interpret the convergences and divergences as well as the hierarchy. |
| **Stories to Share** | Causal relations are used in investigative journalism to tell stories. The first step writers will take is to generate ideas, and then proceed with determining the facts until the story unfolds and the structure is reveal. |
| **Delivery Tips** | NONE |
| **Review Questions** | What is the difference between convergences and divergences? |

## Objectivity

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\3YJGCFYP\MC900415928[1].wmf Objectivity is defined as “intentness on objects external to the mind.” In critical thinking, we want have a keen sense of objectivity. This is a heuristic or rules/strategies for problem solving. Objectivity helps us to engage more thoughtfully and deliberately in the critical thinking process. However, we should not completely exclude our emotions and or subjective feelings in the decision making or problem solving process. The most important thing to remember is that evaluating information objectively helps us to be more deliberate or thorough.

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| **Estimated Time** | 10 minutes |
| **Topic Objective** | Learners will demonstrate objectivity when presented with examples of critical thinking problems. |
| **Topic Summary** | In this section, learners will learn how to improve our objectivity. In general, this can occur may practicing three steps:   1. Recognize any underlying mental or emotional modes operating 2. Stop emotional processing and observe what is presenting at the moment 3. Gather or collect the data without judging it or placing value statements on the data |
| **Materials Required** | Flipchart, Markers  Worksheet: 07-Critical Thinkers |
| **Planning Checklist** | None |
| **Recommended Activity** | Have the learners work in pairs.  Ask the learners to complete activity 2 on worksheet 6.  For the five examples, ask learners what data can they derive from the information?  Discuss how the learners can gather data objectively. |
| **Stories to Share** | Sometimes we cannot easily see how our emotions about things cloud our vision and prevent us from thinking objectively. We can easily get confused in this situation: we decide we want to buy a particular car and then all of a sudden everywhere we go we see this car. We may think the frequent appearance of the car is a sign the car is a good purchase without actually gathering data about the performance and benefits of the vehicle. |
| **Delivery Tips** | None |
| **Review Questions** | What are the steps in thinking objectively? |

## Using Your Emotions

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\FTRMPN7N\MC900389028[1].wmfAs mentioned in the previous section, emotions should not be ignored altogether when thinking critically. Emotions play a crucial role in the thinking process. For instance, professionals need empathy when working with others regardless of their occupation in order to vicariously experience what others feel, believe, or wish. The issue with emotions and decision making is to not allow emotions to cloud your judgment.

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| **Estimated Time** | 10 - 15 minutes |
| **Topic Objective** | Learners will demonstrate empathy by role playing several situations. |
| **Topic Summary** | In this section, learners will observe the role emotions play in critical thinking. Two important factors to consider are   * How do our emotions affect the quality of our decisions * How do our emotions or mood affect others who may be in position of making decisions for us |
| **Materials Required** | Flipchart, Markers  Worksheet: 07-Critical Thinkers |
| **Planning Checklist** | None |
| **Recommended Activity** | Have learners work in groups of 3 – 4.  Ask learners to role play the three examples in the activity 3 of Worksheet 6. In each example, two people will enact the scenario and one person will observe. After each role play, learners will discuss the situation |
| **Stories to Share** | Researchers have found that emotions play such a huge part in our decisions. Moreover, external stressors can amplify emotions. In one study, participants were asked to place their hands in buckets of water. Then, they were asked to give their opinions on various people. The researchers discovered that participants tended to be more hostile when their hands were in the water. So, the conclusion was that external stressors can also impact emotions. |
| **Delivery Tips** | None |
| **Review Questions** | What to factors regarding emotions and decisions should we remember? |

## Being Self-Aware

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\39XQYYJK\MC900215486[1].wmfSelf-awareness is yet another characteristic of the critical thinker. This characteristic relates to acutely being aware of one’s feelings, opinions, and assumptions. Moreover, it is a starting point for thinking critically. Our assumptions are how the first and strongest filters through we evaluate information.

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| **Estimated Time** | 10 minutes |
| **Topic Objective** | Learners will analyze how an individual’s self-awareness affects actions in a work environment. |
| **Topic Summary** | We are all cognizant at some level of how self-awareness affects us in making decisions. In this section, we analyze how self-awareness affects others in making decisions to improve our overall understanding of this characteristic. |
| **Materials Required** | Flipchart, Markers  Worksheet: 07-Critical Thinkers |
| **Planning Checklist** | None |
| **Recommended Activity** | Have learners work in groups of 3 – 4.  Ask learners to discuss the examples in activity 4 of Worksheet 6. |
| **Stories to Share** | The more self-aware we are the more empathetic we are of others. Empathy relates to the universal Golden Rule. In the 18th Century Emmanuel Kant, a German philosopher said:  “Act only on the maxim through which you can at the same time will that it should become a universal law.”  In everyday terms, this means acting in a way as if it were a universal code of behavior. |
| **Delivery Tips** | None |
| **Review Questions** | How does self-awareness affect decision-making? |

## Case Study

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\9MJXCRQW\MC900397148[1].wmf“You are a financial officer in a medium size company, which has been in business for 10 years. The owner of the company stays abreast of changes and trends in their industry and to use his intuition when making decisions. He not only bases decisions on how he feels but he also acts quickly. Initially, the owner’s way of doing business worked. He seemed to be on a winning streak, so to speak. Now that the economy has changed, the financial manager is concerned. However, the owner continues to makes decisions in the same manner. Recently, the owner has requested funds to purchase a fleet of 20 new cars, hybrids, in the next three months. As the financial officer you are concerned about this decision. ”

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| **Estimated Time** | 15 minutes |
| **Topic Objective** | Learners demonstrate an understanding of the characteristics of critical thinking and how they affect decision making. |
| **Topic Summary** | In this section, we will combine all of the characteristics of critical thinking that we have learned so far. We will use our understanding of critical thing to see how it influences a professional in a case study. |
| **Materials Required** | Flipchart, Markers  Worksheet: 08-Case Study Critical Thinkers (I) |
| **Planning Checklist** | None |
| **Recommended Activity** | Have the learners work in groups of 3 – 4.  Have the learners analyze the case study in Worksheet 7. |
| **Stories to Share** | One way that some people side step demands from others is arguing the relativism of the ideas. Relativism says that values are relative. Social and cultural influences can affect the issues or ideas and even products. Taking into social and cultural differences only complicates decision-making. |
| **Delivery Tips** | None |
| **Review Questions** | What are the eight characteristics of critical thinking discussed in this course? |

## Module Six: Review Questions

1. In evaluating the big picture, what are convergences?
   1. Variances
   2. Similarities
   3. Differences
   4. Non-reinforcing information

Answer: **b. Similarities** Convergences are reinforcing information that helps thinkers see the big picture. Convergences are similarities.

1. In evaluating the big picture, what are divergences?
   1. Variances
   2. Consistent information
   3. Complementary information
   4. Reinforcing information

Answer: **a. Variances** Divergences are variances in the information being given. They are the differences that sometimes give us additional problem solving clues.

1. What does it mean to be objective?
   1. To be biased
   2. To judge based on opinions
   3. Make external, non-opinionated observations
   4. To base observations on person feelings

Answer: **c. Make external, non-opinionated** observations Objectivity means to make external, non-opinionated observations. Objectivity is freedom from bias.

1. What is heuristics?
   1. Rules or strategies for organizing information
   2. Rules or strategies for problem solving
   3. Process of evaluation
   4. Way learners memorize information

Answer: **b. Rules or strategies for problem solving** Heuristics are strategies used to solve problems. Sometimes, we refer to heuristics as general rules of thumb.

1. What emotion is important for professionals when working with others?
   1. Empathy
   2. Anger
   3. Impatient
   4. Aggressiveness

Answer: **a. Empathy** Professionals need empathy, especially managers and those working in care giver occupations. Empathy allows individuals to relate to the experiences of others as if their own.

1. What is a problem with emotions and decision making?
   1. Clouds an individual’s judgment
   2. Makes it easier to understand the facts
   3. Clarifies the premises
   4. Makes problem solving less complex

Answer: **a. Clouds an individual’s judgment** Emotions can interfere with effective decision making. When exercised inappropriately, emotions can place blinders on the individual and cloud judgment.

1. What does it mean to be self-aware?
   1. To be aware of what is affecting others
   2. For others to provide advice
   3. For others to direct thinking
   4. To be aware of our own thoughts and feelings

Answer: **d. To be aware of own thoughts and feelings** Self-awareness is an important criteria for critical thinkers. Self-awareness means to be aware of our own thoughts and feelings.

1. What is the starting point for critical thinking?
   1. The theories of past thinkers
   2. Information cited in the media
   3. Textbooks
   4. Our own thoughts and feelings

Answer: **d. Our own thoughts and feelings** Our own thoughts are the starting point for critical thinking. We use our own opinions and assumptions to understand new information and draw conclusions.

1. How long has the company been in business?
   1. 10 years
   2. 5 years
   3. 7 years
   4. 15 years

Answer: **a. 10 years** The case study clearly states this.

1. How many new cars / hybrids would the owner like to purchase in the next three months?
   1. 10
   2. 20
   3. 40
   4. 100

Answer: **b. 20** The case study clearly states this.

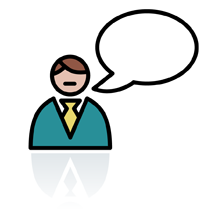
# Module Seven: Evaluate the Information

*True genius resides in the capacity for evaluation of uncertain, hazardous, and conflicting information.*

*Winston Churchill*

A big challenge in the process of critical thinking is how to evaluate information. We have already looked at some steps in evaluating information during the process of logic. In this module, we will delve deeper into evaluation. The best critical thinkers are those people, as Winston Churchill noted, who capable of gleaning through information that may be unclear or conflicting.

## Making Assumptions

As we mentioned in the previous module, self-awareness is a starting point from which we begin to think critically. We based our decisions on assumptions we make about objects or things. Assumptions are the arguments, but the distinguishing feature of an assumption is that it is a statement in which no proof or evidence is provided. Assumptions can be either verbally stated or mentally held (unstated). In most cases, they are unstated.

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| **Estimated Time** | 10 minutes |
| **Topic Objective** | Learners will identify assumptions. |
| **Topic Summary** | In this section, we learn how assumptions are made in everyday context. In particular we will learn the difference between implied and explicit statements. In explicit statement the terms of the assumptions are directly expressed. In implicit statement, the assumption is not clearly stated and can only be implied. |
| **Materials Required** | Flipchart, Markers  Worksheet: 09-Evaluate the Information |
| **Planning Checklist** | None |
| **Recommended Activity** | Have learner’s work in pairs.  Ask learners to complete activity 1 on Worksheet 7.1. Identify whether the statements in the examples of assumptions are implied or explicit. Examples:   1. Raises are likely for the fourth quarter. (We will get raises.)**Implied** 2. Changes will occur in the department. Several new positions will be added. (The company will hire). **Implied** 3. Duties for the therapist include setting the times for sessions, counseling, documenting, and following up with clients. (The therapist is responsible for scheduling clients.)**Explicit** 4. The patient may experience side effects from the medication, including nausea, headache, and blurred vision (The medicine might make you sick).**Explicit** 5. He’s a successful lawyer. (He must be smart).**Implied**   Then, have the learners come up with their own examples of implied and explicit statements. |
| **Stories to Share** | Assumptions are often made in politics. For example, consider the following from a guide on Washington politics by Tim Brennan:  “With enough assumptions, any policy can be justified.” |
| **Delivery Tips** | None |
| **Review Questions** | What is an assumption? |

## Watch out for the Bias

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\1JXY5E11\MC900390810[1].wmfAs we learned in the section on logic, confirmation bias can influence the inferences we draw. Bias is not something that we can completely eliminate. However, when thinking critically, we need to watch out for confirmation bias. We should ensure that we don’t allow our preconceived opinions to influence the way we evaluate data to the degree that we use the data to confirm what we already believe. We can use objectivity to oppose bias.

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| **Estimated Time** | 10 minutes |
| **Topic Objective** | Learners will identify bias. |
| **Topic Summary** | In this section, we will use our understanding of objectivity, to recognize bias. In particular, given a set of statements, learners will identify which statements are biased. |
| **Materials Required** | Flipchart, Markers  Worksheet: 09-Evaluate the Information |
| **Planning Checklist** | None |
| **Recommended Activity** | Complete this activity as a whole class discussion.  Ask the learners to look at the five statements in activity 3 of worksheet 8, then as a whole class go through each statement. Have the learners identify which are biased. |
| **Stories to Share** | People commonly have difficulty reasoning and thinking critically when information goes against what we previously believed as true. We can see this situation happen in political debates and societal opinions regarding war. What other examples can you think when our bias affects our ability to think critically? |
| **Delivery Tips** | None |
| **Review Questions** | What is bias? |

## Ask Clarifying Questions

As we addressed in an earlier section, asking the right questions is important. Equally important is to ask clarifying questions when making decisions. Clarifying questions are thought-provoking questions and help the thinker acquire more information. Question types can be either generic or specific. With clarifying questions you can expect other questions to arise out of the answers you receive, so be prepared for those.

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| **Estimated Time** | 10 minutes |
| **Topic Objective** | Learners will provide questions for a problem. |
| **Topic Summary** | In this section, learners will provide questions for a given problem. The learners will present both specific and generic questions. |
| **Materials Required** | Flipchart, Markers |
| **Planning Checklist** | None |
| **Recommended Activity** | Have the learners complete this activity as a whole class discussion.  Ask the learners to list as many general and specific questions they can for the following business problems:   1. A director must hire a new manager to oversee a department of both professional and nonprofessional employees. Some of whom belong to a union. 2. A sales person has been assigned a new market. 3. An owner of a small business is looking for ways to market his products. 4. A manager has an employee who is performing low. She is preparing for a meeting with this employee. 5. A school teacher must teach critical thinking skills to help her students pass standardized tests. |
| **Stories to Share** | Critical thinking skills are very important in preparing students for their future. One big topic in public school education today is how to encourage students to be critical thinkers. Among their many duties teachers must now create lessons that promote higher ordered thinking skills (HOTS). |
| **Delivery Tips** | None |
| **Review Questions** | What are the types of clarifying questions? |

## SWOT Analysis

SWOT Analysis is also called Strengths, Weaknesses, Opportunities, and Threats. We use this type of analysis to be more objective thinkers. SWOT allows us to think cleanly and clearly, and from a logical point of view and is very helpful in most business and marketing situations, Strengths and Weaknesses are regarded as internal factors, while Opportunities and Threats are regarded as external factors.

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| **Strengths and Weaknesses** | Situation inside the company or organization (Internal environment) | Examples:  pricing, products, costs, or performance | Factors tend to be in the present |
| **Opportunities and Threats** | Situation outside the company or organization (External environment) | Examples:  markets, sectors, audience, or trends | Factors tend to be in the future |

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| **Estimated Time** | 15 minutes |
| **Topic Objective** | Learners will use SWOT to analyze their business. |
| **Topic Summary** | In this section, we will learn how to use SWOT to analyze businesses. Learners will complete a SWOT chart for their particular industry. |
| **Materials Required** | Chart paper, Markers, Tape |
| **Planning Checklist** | None |
| **Recommended Activity** | Have the learners work in groups of 4 – 5.  If possible, group learners according to their industry. If not ask the learners to select an industry to represent for their group. Have each group create a SWOT chart for their chosen industry and tape the charts around the room, like a gallery. Then, ask the learners to walk around the room and review each other’s charts. |
| **Stories to Share** | SWOT analysis is commonly used in business. However, this type of analysis can be used in education and health organizations as well. This is a tool that allows professionals to organize strengths and weaknesses to see how to better use their resources. |
| **Review Questions** | What does SWOT represent? |

## Case Study

Your department has really worked hard over the past 18 months. Your boss wants to implement an employee recognition program spamming a twelve-month period. He wants some form of recognition to take place every month, and at the end of the year when you department has its annual team meeting. He wants a trophy awarded to one outstanding employee and a plaque awarded to section of the department that preformed the best. How will your employee recognition team go about implementing this challenge? What responsibilities and timeline will you follow?

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| **Estimated Time** | 15 minutes |
| **Topic Objective** | Learners will role play a scenario using critical thinking skills. |
| **Topic Summary** | In this section, learners will practice what they have learned. The learners will demonstrate the four characteristics learned in this module through role playing a workplace scenario. |
| **Materials Required** | Flipchart, Markers and Worksheet: 10-Case Study |
| **Planning Checklist** | None |
| **Recommended Activity** | Have the learners work in groups of 3 – 4.  Ask the group members to assign a team lead. This individual will moderate the activities of the role play. |
| **Delivery Tips** | Critical thinking is a skill used in every field. Imagine if scientist or doctors did not use critical thinking skills in their professions? Doctors rely upon critical thinking skills to make a diagnosis or what is called a differential diagnosis in medicine. A differential diagnosis is when a physician uses his or her critical thinking skills, resources, and training to distinguish one illness from another illness with similar symptoms. |
| **Review Questions** | What are the four characteristics of critical thinkers did we discuss in this module? |

## Module Seven: Review Questions

1. What is an assumption?
   1. A statement in which no proof or evidence is provided
   2. A fact
   3. A state of evidence
   4. The proofs made to assert a claim

Answer: **a.** **A statement in which no proof or evidence is provided** An assumption is statement in which no proof or evidence is provided. Assumptions can be mental or verbal.

1. An assumption that is not clearly stated is an:
   1. Explicit statement
   2. Truth
   3. Valid point
   4. Implied statement

Answer: **d. Implied statement** An assumption that is clearly stated is an explicit statement. One that is not clearly stated is an implied statement.

1. What is a function of confirmation bias?
   1. To refute existing assumptions
   2. To support existing assumptions
   3. To validate new information
   4. To help us understand others’ ideas

Answer: **b. To support existing assumptions** One problem with bias is it can influence our conclusions. Confirmation bias is when we use new information to confirm or support existing ideas or assumptions.

1. What is the opposite of bias?
   1. Subjectivity
   2. Evaluation
   3. Observation
   4. Objectivity

Answer: **d. Objectivity** Critical thinkers can over bias by being objective. Objectivity does not take into account our own opinions while bias does.

1. Clarifying questions do what?
   1. Reveal opinions
   2. Help the thinker acquire more information
   3. Delineate details
   4. Help critical thinkers be less objective

Answer: **b. Help the thinker acquire more information** Clarifying questions can help critical thinkers think more objectively. They can also help thinkers acquire more information.

1. What is one type of clarifying question discussed in this module?
   1. Factual
   2. Opinion
   3. Generic
   4. Rhetorical

Answer: **c. Generic** There many types of clarifying questions. In this module, we discussed generic and specific clarifying questions.

1. What do the S and W represent in SWOT analysis?
2. Subjective, Weak
3. Subjective, Wide
4. Strengths, Wide
5. Strengths, Weaknesses

Answer: **d. Strengths, Weaknesses** SWOT analysis is an effective evaluation tool for managers. The “S” and “W” in SWOT analysis stands for strengths and weaknesses.

1. What do the O and T represent in SWOT analysis?
   1. Opposite, Trial
   2. Opponent, Type
   3. Opportunities, Threats
   4. Opportunities, Types

Answer: **c. Opportunities, Threats** The SWOT chart can be used by any professional or anyone wishing to analyze a course of action or a possible solution. The O and T in SWOT analysis stands for opportunities and threats.

1. The boss would like to implement an employee recognition program spanning what time period?
   1. 18 months
   2. 2 years
   3. 3 months
   4. 12 months

Answer: **d. 12 months** the case study clearly states this.

1. At the end of the employee recognition period, what would the boss like to award to an outstanding employee?
   1. Trophy
   2. Company logo items
   3. Paid time off
   4. Plaque

Answer: **a. Trophy** The case study does not mention awarding company logo items or paid time off. It does, however mention awarding a plaque to the section of the department that has performed the best and a trophy to an outstanding employee.

# Module Eight: Benefits of Critical Thinking

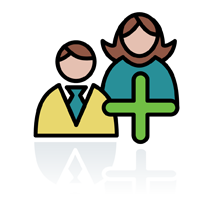
*Life consists of what a man is thinking of all day.*

*Ralph Waldo Emerson*

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\9MJXCRQW\MC900441515[2].wmfWe have already determined why critical thinking is important. We know in particular that critical thinking helps us make better decisions and to rationally apply information. While there are many benefits of critical thinking, in this module, we will examine only four. They are:

* Being more persuasive
* Better communication
* Better problem solving
* Increased emotional intelligence

## Being More Persuasive

Persuasiveness is the characteristic of being able to influence others. We normally think of salespersons and politicians when we hear the word persuasiveness. However, all managers or professionals use persuasiveness on a daily basis. Anytime, we want to have others accept our ideas, we do so through the power of persuasion. How will critical thinking make us more persuasive? It is because critical thinking is a deliberate or thoughtful process, and the more deliberate we are, the better we are in expressing our assumptions or ideas and persuading others.

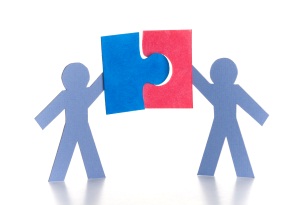
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| **Estimated Time** | 15 minutes |
| **Topic Objective** | Learners will demonstrate persuasiveness in an activity. |
| **Topic Summary** | In this section, learners will review 5 tips for improving their powers of persuasion. The five tips are   1. Make it logical 2. Make whatever you are presenting realistic 3. Provide information in a sequence that’s easy to comprehend 4. Use graphical aids, such as diagrams, charts, etc. 5. Use analogies, metaphors, and comparisons |
| **Materials Required** | Flipchart, Markers |
| **Planning Checklist** | None |
| **Recommended Activity** | Have the learners work in groups 6.  The groups will break into two teams   * Persuading team * Receiving team   Three persuading members of the group will choose a topic and develop an idea to persuade the other three to go along with them. One of the three people with the idea will be the speaker. This speaker will present the idea to the “receiving” group members. The receiving group members will be as resistant as possible. The other two members in the persuading team can help the speaker.  After 10 minutes, reconvene and discuss. |
| **Stories to Share** | Psycholinguistics is a whole branch of psychology that deals with language. Researchers in this field study how we acquire language and how we use it. Language is a complex skill that human use to express their cognitive activity. |
| **Delivery Tips** | None |
| **Review Questions** | What are some ways to improve persuasiveness? |

## Better Communication

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\39XQYYJK\MC900282914[1].wmfCritical thinking improves communication for some of the same reasons that it improves persuasiveness. Many of the same factors we use to improve our persuasiveness also make us better communicators in general. For instance, the use of analogies and metaphors is a great persuasion and general communication technique. In addition to helping us in using language more persuasively; critical thinking also helps us use language with more clarity.

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| **Estimated Time** | 10 minutes |
| **Topic Objective** | Learners will demonstrate rules of clear communication in a role play. |
| **Topic Summary** | In this section, we will learn some rules of clear communication and how to apply them. Six rules for clear communication include:   1. Telling the listeners relevant information 2. Avoid being unnecessarily redundant and tell mostly new information (keep the proportion of old information low relative to the proportion of new information) 3. Vary the style of communication according to your listeners or audience (consider age, background, and social status) 4. Present information truthfully 5. Speak in a straightforward, simple manner 6. Use context to clarify the meaning |
| **Materials Required** | Flipchart, Markers |
| **Planning Checklist** | None |
| **Recommended Activity** | Have the learners work in pairs.  Have one learner face the front of the room, while the other learner should face the back of the room (or away from the flipchart).  Writing the following words of the flipchart and ask the person facing the flipchart to try and describe the words with giving the word away to his or her partner  MONDAY NIGHT FOOTBALL   * PRETZELS * LOUNGE CHAIRS * REMOTE CONTROL * HELMETS * BEER   Have the partners switch and write these words  SWITZERLAND   * SNOW * CHEESE * CHOCOLATE * MOUNTAINS * POCKET KNIFE |
| **Stories to Share** | A psychology author named Paul Ekman talks about “lying truthfully” in one of his books. This term means to literally tell the truth while leaving the listener with the opposite impression. This happens when we cast preposterous acts in irony so that the listener believes we are joking. |
| **Delivery Tips** | To save time, the instructor can write the words on the flipchart ahead of time. |
| **Review Questions** | What are some ways to promote clear communication? |

## Better Problem Solving

Critical thinking and problem solving are closely related and are almost intertwined. Sometimes we say that to solve logic problems we must use our critical thinking skills. In fact, logic, critical thinking, and problem solving use some of the same cognitive processes. Critical thinkers use their problem solving skills not just their intuition to make decisions or draw conclusions.

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| **Estimated Time** | 10 – 15 minutes |
| **Topic Objective** | Learners will demonstrate problem-solving skills. |
| **Topic Summary** | In this section, we will review some problem-solving strategies that critical thinkers use. They include:   * Means-end analysis – breaking the problem down * Working backwards – going from the goal backwards * Simplification –allows you see solutions in an efficient way * Generalization and specialization –often uses tree diagrams * Random search – involves searching for solutions down possible paths * Trial and error – similar to random search but more systematic * Rules – used often in mathematics * Hints – sometimes we can find hints to the answer in the problem itself * Brainstorming – is just fun! * Contradiction – many solutions to problems involve a contradictory component and in this case try not to compromise quality * Analogies and metaphors – again a persuasive communication technique that helps us think out of the box |
| **Materials Required** | Flipchart, Markers  Worksheet: 11-Benefits of Critical Thinking |
| **Planning Checklist** | None |
| **Recommended Activity** | Have learners work in pairs.  Ask learners to solve the following problem in activity 1 of Worksheet 10 :  A TROOP OF SOLDIERS HAD BEEN TRAVELLING FOR WEEKS BY FOOT THROUGH A DESERT LANDSCAPE WHICH RESEMBLED THE MOON, A BARREN WASTELAND. WHILE THE TROOPS PROBABLY HAD ENOUGH FOOD AND WATER RATIONS TO MAKE IT TO THE NEAREST POST, THEY WERE BECOMING PHYSICALLY WEAK FROM THE CONSTANT WALKING 12 – 14 HOURS PER DAY. EVENTUALLY, THE SOLDIERS CAME UPON A HUGE MASS OF ROCK. THEY KNEW THAT THEY WERE NOT TOO FAR FROM THEIR DESTINATION NOW. BUT THE PROBLEM WAS HOW WERE THEY SUPPOSED TO GET PAST THE BIG ROCK? SOMEONE SUGGESTED CLIMBING IT, BUT AT ONE POINT, THEY HAD LEFT ALL THEIR RAPPELLING GEAR BEHIND TO LIGHTEN THEIR LOAD. SOMEONE SUGGESTED BLOWING UP THE ROCK BECAUSE THEY STILL HAD EXPLOSIVES. EVENTUALLY, THE TROOP LEADER CAME UP WITH AN IDEA. CAN YOU GUESS WHAT?  Ask the learners to discuss the strategies used in solving this problem. |
| **Stories to Share** | One problem-solving strategy not often acknowledged is the fantasy analogy. In the fantasy analogy, critical thinkers come up the solution they would only consider in their wildest dreams. For example, imagine a solution of being able to get through traffic jams by pushing a button and your car becomes a helicopter (Although, this solution may not be so far from the truth soon). |
| **Delivery Tips** | None |
| **Review Questions** | What are some problem solving strategies? |

## Increased Emotional Intelligence

What is emotional intelligence and how does critical thinking help increase our emotional intelligence? Emotional intelligence is identified as the ability to assess and control the emotions of oneself, others and even groups. Emotional intelligence is being “heart smart” as opposed to “book smart.” Critical thinking helps increase emotional intelligence because one of the characteristics of a critical thinker is self-awareness. Also, critical thinkers know how and when to use their emotions, such as empathy, in making decisions. The more a person uses his or her critical thinking skills the better adept he or she should become at identifying, understanding, and managing his or her emotions. Emotional intelligence in general consists of four abilities:

* Self-awareness
* Self-management
* Social awareness
* Relationship management

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| **Estimated Time** | 10 minutes |
| **Topic Objective** | Learners demonstrate steps in raising emotional intelligence. |
| **Topic Summary** | In this section, learners will role play five skills related to emotional intelligence by engaging in a role play. These five skills actually serve to increase our emotional intelligence and they are   1. Calm down and reduce any feelings of being overwhelmed 2. Recognize which emotions are operating and manage these 3. Connect with others through nonverbal communication 4. Use humor to diffuse challenging situations 5. Resolve conflicts confidently and positively |
| **Materials Required** | Flipchart, Markers |
| **Planning Checklist** | None |
| **Recommended Activity** | Have the learners work in groups of 3 – 4.  The groups will pick two (2) of the skills in emotional intelligence and role play these.  At the last two minutes of this activity, reconvene and discuss the learner’s observations. |
| **Stories to Share** | There is a difference between knowing and applying skills. For instance, all of the skills of emotional intelligence are quite obvious. However, in the heat of an argument or when feeling extremely overwhelmed, it can be quite challenging to remember these steps. Stress in particular can hijack the best-laid plans. A key to applying emotional intelligence techniques is to develop some strategy to remember these skills. Some people find deep breathing or counting to 10 helpful. |
| **Delivery Tips** | None |
| **Review Questions** | How is emotional intelligence different from self-awareness? |

## Case Study

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\1JXY5E11\MC900295752[1].wmfYour team of cardiovascular nurses has been assigned the duty of developing some patient education materials. Your patient population is primarily comprised non-English speakers. In the training you must develop education on how to lower the risks of a heart attack. First however, you must identify the risk of hearts attacks. In three weeks, two members of your team will be presenting to 25 patients at a health forum. The problem is how will you design and implement training for these patients? Before the actual forum, your team should have a practice run of the training sessions.

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| **Estimated Time** | 15 - 20 minutes |
| **Topic Objective** | Learners will critical thinking using persuasiveness, clear communication, problem solving, and emotional intelligence. |
| **Topic Summary** | In this section, learners will enact a role play to demonstrate the benefits of critical thinking. In particular, learners will emphasis how critical thinking helps improve persuasiveness, clear communication, problem solving, and emotional intelligence. |
| **Materials Required** | Flipchart, Markers, Chart paper  Worksheet: 11-Benefits of Critical Thinking |
| **Planning Checklist** | None |
| **Recommended Activity** | Have learners work in groups of 3 – 5.  Learners will come up with a solution to the following case study and then role play their solution. Give each group a piece of chart paper and some markers so they can outline their solution.  In the last few minutes of this activity, reconvene and discuss the role play. |
| **Stories to Share** | Graham Wallas was an English social psychologist who lived from 1858 – 1932. He came up with many ideas regarding creative thinking and problem solving processes. In his book the Great Society (1914) he asserted that a social-psychological analysis could explain the problems created by the industrial revolution on society of his time. Most notably, he contrasted the roles nature and nurturing play in modern society. If lived now, how do you think he would define the Occupy Movement? |
| **Delivery Tips** | None |
| **Review Questions** | What are the benefits of critical thinking? |

## Module Eight: Review Questions

1. What does it mean to be persuasive?
   1. Promoting discord
   2. Having influence over others
   3. Causing disagreement
   4. Not being convincing

Answer: **b. Having influence over other** The persuasive quality is the ability to influence others. A person who is persuasive is convincing and able to get others to agree with his or her ideas.

1. All of the following enhance persuasiveness except for:
   1. Empathy
   2. Deliberation
   3. Clearly expressing our ideas
   4. Illogical reasoning

Answer: **d. Illogical reasoning** Persuasiveness involves empathy, deliberation, and clearly expressing our ideas. Illogical reasoning does not typically enhance persuasiveness.

1. What does clear communication and persuasiveness have in common?
   1. They both involve deliberation
   2. They express complex ideas
   3. They express simple ideas
   4. They take a long time to master

Answer: **a. They both involve deliberation** Communication and persuasiveness are thoughtful processes. They both involve deliberation.

1. All of the following are steps in clear communication except for:
   1. Telling the listeners relevant information
   2. Using context to clarify the meaning
   3. Avoid being unnecessarily redundant
   4. Embellishing information or giving inaccurate information

Answer: **d. Embellishing information or giving inaccurate information** Clear communication involves telling the truth. Speakers should avoid embellishing information or giving inaccurate information.

1. How does critical thinking improve problem solving?
   1. Both use logic
   2. It involves analysis
   3. Both are complex
   4. It involves questioning

Answer: **a. Both use logic** Both critical thinking and problem solving involve our logic skills. They are similar processes, so as we improve our critical thinking, we improve our problem solving skills.

1. Which of the following is a feature of means-analysis?
   1. Uses hints
   2. Uses brainstorming
   3. Breaks down the problem
   4. Often involves a contradictory component

Answer: **c. Breaks down the problem** The means analysis is one way problem solving strategy discussed in this module. It involves breaking the problem down. The other answer choices are other strategies.

1. What is emotional intelligence?
   1. Being aware of our opponents views
   2. Being self-aware
   3. Ability to assess and control our emotions and the emotions of others
   4. Ability to vicariously experience what others are feeling

Answer: **c. Ability to assess and control our emotions and the emotions of others** Emotional intelligence is a powerful communication tool. It is the ability to assess and control our own emotions and the emotions of others.

1. What is the first step in raising emotional intelligence?
   1. Use humor to diffuse situations
   2. Determine what the questions are
   3. Connect with others
   4. Calm down and reduce any feelings of being overwhelmed

Answer: **d. Calm down and reduce any feelings of being overwhelmed** The first step in raising emotional intelligence is to first calm and reduce any feelings of being overwhelmed. Then, assess what emotions are underlying.

1. What type of nurses is mentioned in the case study?
   1. Cardiovascular
   2. Medical-Surgical
   3. Acute Care
   4. Ambulatory Care

Answer: **a. Cardiovascular** The case study clearly states this.

1. The nursing team will be presenting to how many patients at the health forum?
   1. 10
   2. 30
   3. 25
   4. 15

Answer: **c. 25** The case study clearly states this fact.

# Module Nine: Changing Your Perspective

*Everyone sees drama from his own perspective.*

*Jean-Marie Le Pen*

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\FTRMPN7N\MC900090420[1].wmfThe interesting thing about perspective is that everyone has one. Earlier in this course, we learned how important having an open mind is in critical thinking. One aspect of open-mindedness we learn is that it makes us receptive to other viewpoints. In this module, we will examine further the concept of changing our perspective.

## Limitations of Your Point of View

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\MP321RS9\MC900197955[1].wmfAs mentioned at the beginning of this course, one component of critical thinking is open mindedness. This component as well as bias relate to the critical thinkers point of view. The less open-minded and more biased a person is the more limited his or her point of view. The challenge in critical thinking is avoid limitations of your point of view and not be constrained by cognitive or mental blinders.

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| **Estimated Time** | 10 minutes |
| **Topic Objective** | Learners will apply techniques for expanding their point of view. |
| **Topic Summary** | In this section, we will see what it means to change your point of view. The learners will try to identify objects based on their point of view. |
| **Materials Required** | Flipchart, Markers  PowerPoint What Is This Object? - slides #1– 3 |
| **Planning Checklist** | None |
| **Recommended Activity** | Have learners complete this activity as a whole class discussion.  Put the images on the overhead and give the learners 1 – 2 to identify what the object is and then discuss limitations of point of view. |
| **Stories to Share** | Point of view is a critical element that many artist use. Consider Monet and many other masters. Think of the famous painting the Water Lilies, for example. The artist subtlety, use of light, and point of view created masterpieces. |
| **Delivery Tips** | None |
| **Review Questions** | How does limited point of view affect critical thinking? |

## Considering Others Viewpoint

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\9MJXCRQW\MC900297401[1].wmfOne reason we find it so difficult to consider others viewpoint is that we are over-concerned with our own opinions and views. A challenge for the critical thinker is to step down from the mountain of self, up to the mountain of the other. Considering others viewpoint is easier when we understand the benefits. For instance, it helps us be more empathetic, it helps to see the bigger picture and it also promotes objectivity.

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| **Estimated Time** | 10 minutes |
| **Topic Objective** | Learners will demonstrate exchanging and considering others viewpoints. |
| **Topic Summary** | In this section, learners will role situations from the workplace. The goal of this assignment is to help us consider others viewpoint more. |
| **Materials Required** | Flipchart, Markers |
| **Planning Checklist** | None |
| **Recommended Activity** | Have learners work in pairs.  Tell the learners they will do a role play. Ask the learners to   * Imagine that one person is the boss and the other an employee. The boss needs to have a difficult discussion with the employee. They should spend three minutes do the difficult discussion * Switch and the employee now should lead the discussion. In this case, the employee has to tell the boss that someone in the department has broken a very expensive piece of equipment that’s necessary to get the job done.   Allow up to 3 minutes for role playing each situation. Then reconvene the class, and discuss. |
| **Stories to Share** | In a study reported in the Journal of Personality and Social Psychology, researchers found that repeated exposure matters as much to people as opinions from many different sources. |
| **Delivery Tips** | None |
| **Review Questions** | How can we consider others viewpoint more easily |

## Influences on Bias

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\3YJGCFYP\MC900383238[1].wmfIn this course, we have discussed bias and how it influences our conclusions in the logic process. What are some influences on bias? The first thing that can influence bias is the way the person interprets information he or she is receiving. The other influence on bias is the way the presenter or speaker frames questions or information. For instance, researchers have found that hypothetical questions influence behavior and promote bias. The key to not being influenced by hypothetical information is to remember that it is just that and not factual information.

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| **Estimated Time** | 10 minutes |
| **Topic Objective** | Learners will demonstrate influences on bias. |
| **Topic Summary** | In this section, learners will observe influences on bias. One person will ask others a hypothetical question and observe the reaction. |
| **Materials Required** | Flipchart, Markers |
| **Planning Checklist** | None |
| **Recommended Activity** | Have learners work in groups 3 – 4.  Write the following topics on the board and have the learners take turns asking hypothetical questions:   * Juror selection (e.g., if you were a victim of credit card fraud would that affect your ability to be impartial). * Politician’s reputation * Medical diagnosis * Sales transaction * Insurance policy   After 6 – 7 minutes of group discussion. Reconvene the class and discuss. |
| **Stories to Share** | In a study on Organizational Behavior and Human Decision Processes, researchers found that hypothetical questions not only influence people’s behavior but their opinions as well. They also found that most of the time people are unaware that they are being affected. |
| **Delivery Tips** | None |
| **Review Questions** | What are some influences on bias? |

## When New Information Arrives

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\3YJGCFYP\MC900055154[1].wmfWhen the critical thinker receives new information, how should they organize it? One way of and probably the most common way of handling new information is through an organization schema. Schema indicates which role new information plays. It compartmentalizes information into a familiar format, which makes it easier for the critical thinker use.

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| **Estimated Time** | 10 minutes |
| **Topic Objective** | Learners will organize new information into a schema. |
| **Topic Summary** | In this section, we will practice organizing new information. Given a passage learners will attempt to categorize it into a familiar aspect. |
| **Materials Required** | Flipchart, Markers |
| **Planning Checklist** | None |
| **Recommended Activity** | Have the learners work on this activity as a whole class discussion.  Write the following terms on the flipchart page and ask learners to categorize:  **Example 1**   * FACILITIES * SEPARATE INTO PILES * FACET OF LIFE * SIMPLE TASK * CYCLES   (Answer: Doing the laundry)  **Example 2**   * MUST REMEMBER * DATA * FINAL STEP * SELECTION * STORES   (Answer: Saving a file)  Discuss some features of organizing information in schema. |
| **Stories to Share** | Consider all the different means we have of storing and organizing information today. In the information age, the proliferation of information is not the only problem we have, but how do we store and recover that information for later use. |
| **Delivery Tips** | Write the terms on the flipchart ahead of time. |
| **Review Questions** | What is a schema? |

## Case Study

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\FTRMPN7N\MC900432397[1].wmfRonnie owns a spa and salon. Generally her customers leave satisfied and she has developed a loyal client base. However, recently she had an incident where a customer came into the spa to receive a facial and a microdermabrasion. Prior to the service the front desk staff explained the procedures and the risks, which included skin irritation. After the service, the client’s face was red as it normally should be. The client did not indicate any problem as she was checking out. Two days later the client calls the spa to speak to Ronnie. The client is upset because her face is still red and she has an important engagement to attend where she is a speaker. What should Ronnie do?

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| **Estimated Time** | 15 minutes |
| **Topic Objective** | Learners will evaluate a case study and demonstrate changing their perspective. |
| **Topic Summary** | In this section, we will pull all of the information we have learned in this module together. We will analyze a case study and role play the scenario. |
| **Materials Required** | Flipchart, Markers  Worksheet: 12-Changing Your Perspective |
| **Planning Checklist** | None |
| **Recommended Activity** | Have learners work in groups of 3 – 5.  Ask learners to evaluate the preceding case study and then act out the roles by changing the perspective. |
| **Stories to Share** | In customer service, one of the main ways service representatives can be effective is by changing their perspective. Studies have shown that customers appreciate it when they are listened to and when sales staff see the sale from the customer’s viewpoint. |
| **Delivery Tips** | None |
| **Review Questions** | What are some techniques for changing our perspective? |

## Module Nine: Review Questions

1. What is a problem with a limited viewpoint?
   1. It involves objectivity
   2. It easily accepts new information,
   3. It involves bias
   4. It is curious

Answer: **c. It involves bias** Recall that critical thinkers attempt to reduce their bias. A limited viewpoint interferes having an open mind and increases our bias.

1. How can we change our viewpoint?
   1. Remove cognitive constraints or blinders
   2. Consider only one viewpoint
   3. Hold onto preconceived views
   4. Over analyze new information

Answer: **a. Remove cognitive constraints or blinders** To change our viewpoint, we have to be able to see others point of view. This act requires removing cognitive constraints or blinders.

1. Considering the viewpoint of others helps do all of the following except for:
   1. Be empathetic
   2. See the big picture
   3. Be more objective
   4. Be more biased

Answer: **d. Be more biased** Considering the viewpoints of others increase our objectivity and empathy. It aids us in seeing the big picture, but it does not make us more biased.

1. The reason we have difficulty seeing others viewpoint is:
2. We are looking at the big picture
3. We are overwhelmed with information
4. We infer more from the premises than what’s there
5. We are overly concerned with our own views

Answer: **d. We are overly concerned with our own views** The reason we have difficulty seeing others views is we are usually overly concerned with our own viewpoints. This interferes with our being open minded.

1. What is an influence on bias?
   1. Hypothetical questions
   2. Clarifying questions
   3. Numerical data
   4. Factual information

Answer: **a. Hypothetical questions** Researchers have found that hypothetical questioning influences bias. The other answer choices are things that help reduce bias.

1. The way to overcome the factor influencing bias is:
   1. To review data carefully
   2. To double check premises
   3. To accept information at face value
   4. To remember hypothetical information is just hypothetical and not facts

Answer: **d. To remember hypothetical information is just hypothetical and not facts** Hypothetical information is not necessarily factual. To overcome influences it may have on bias, it’s helpful to remember that the information is simply hypothetical.

1. For critical thinkers, new information can needs to be:
   1. Organized
   2. Made more complex
   3. Ignored
   4. Critiqued

Answer: **a. Organized** New information needs to be organized. Organizing new information helps to process it

1. One way to organize new information is to:
   1. Store on a computer
   2. Analyze it
   3. Place in schema
   4. File in a folder

Answer: **c. Place in schema** One to organize new information is to place it in schema. Schemas are mental organization tools.

1. What type of business does Ronnie own?
   1. Dog Kennel
   2. Restaurant
   3. Bakery
   4. Spa and salon

Answer: **d. Spa and salon** The case study clearly states this.

1. What type of phone call did Ronnie receive from a client?
   1. Service issue
   2. Business suggestion
   3. Recognition of an outstanding employee
   4. Question about directions to the business

Answer: **a. Service issue** Ronnie owns a spa and salon. A client had previously visited the business for a facial. Although the client was informed that her face would be red sometime after the procedure, she called the company after having a red face for two days.

# Module Ten: Problem Solving

*We can’t solve problems by using the same kind of thinking we used when we created them.*

*Albert Einstein*

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\9MJXCRQW\MC900090572[1].wmfA major function of critical thinking is it allows us to solve problems. Regardless of our vocation or profession, we are presented daily with a host of decisions and problems to solve. In this module, we will learn some steps for problem solving for critical thinkers. Some psychologists define a problem as a gap or barrier between where an individual is and where they wish to be. In other words, a problem is the space between point A and B. Problems then essentially consist of the initial state and a goal state. All possible solution paths leading to the goal state are located in the problem space. Some researchers say that problem solving has three primary stages:

1. Preparation or familiarization
2. Production
3. Judgment and evaluation

## Identify Inconsistencies

Much of critical thinking is about how to connect the two points in a problem. However, sometimes critical thinkers are presented with inconsistencies or what scientists call cognitive dissonance. Cognitive dissonance can appear through a discrepancy between attitude and beliefs. Inconsistencies can also be called variances or dissimilarities. It is a natural tendency to want to eliminate inconsistencies when solving a problem. The best way critical thinkers can identify inconsistencies is by using their logic and objectivity to see variances. Identifying inconsistencies would fall under the first stage of problem solving in which we are familiarizing ourselves with the subject.

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| **Estimated Time** | 10 minutes |
| **Topic Objective** | Learners will identify inconsistencies in information provided to them. |
| **Topic Summary** | One challenge when using critical thinking to solve problems is to identify the inconsistencies. In this section, we will practice identifying inconsistencies. |
| **Materials Required** | Flipchart  Markers  PowerPoint Slide 7 and 8 |
| **Planning Checklist** | None |
| **Recommended Activity** | Have the learners work in pairs.  Show PowerPoint Slide 7 and ask learners to identify the inconsistencies. Leave the slide up for 3 minutes.  Then show PowerPoint Slide 8 and ask learners to identify the inconsistencies. Leave the slide up for 3 minutes.  Reconvene the class and discuss. |
| **Stories to Share** | Lawyers often look for inconsistencies in evidence or claims. When they find the inconsistencies, they take these as a basis for their case. Think of the last episode of Law and Order that you saw? Was the show based on trying to identify and prove the inconsistencies? Most likely! |
| **Delivery Tips** | None |
| **Review Questions** | What is a way to a identify inconsistencies? |

## Trust Your Instincts

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\FZCJR17Y\MC900149724[1].wmf“Trust your instincts” falls under the second stage of problem solving, of which we are now beginning to produce solution paths. Instincts are defined as a natural intuitive power. Intuition or instincts are key pieces in problem solving. When coupled with trial and error, informed guesses, and brainstorming, intuition and instincts can lead to a highly creative process. Many scientific discoveries and inventions were made because the innovator followed his or her instincts. Think of Benjamin Franklin and Thomas Edison, for instance.

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| **Estimated Time** | 10 minutes |
| **Topic Objective** | Learners will demonstrate an understanding of trust of your instincts. |
| **Topic Summary** | In this section, we will examine what it means to trust your instincts. Learners will take a quote, analyze it, and explain what it means. |
| **Materials Required** | Flipchart  Markers  PowerPoint Slide 9 |
| **Planning Checklist** | None |
| **Recommended Activity** | Ask learners to work in pairs.  Show the learners the following quote:  “What we know is shaped by the act of knowing.” from Thinking Skills for Professionals by Bryan Greetham.  Ask the learners to discuss what his quote means and how instincts have helped them in the past to solve problems. Allow the learners 5 minutes for paired discussion.  Reconvene and discuss as a class. |
| **Stories to Share** | Sir Peter Medawar, a British immunologist and Nobel Peace prize winner, said regarding the process of thinking that it only seems logical in character. He said that “it can be made to appear so when we look back upon a completed episode of thought.” Instead he argued, it is “simply posture(s) we choose to be seen in when the curtain goes up and the public sees us.” |
| **Delivery Tips** | None |
| **Review Questions** | What does it mean to trust your instincts? |

## Asking Why?

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\MP321RS9\MC900234625[1].wmfIn a previous module, we discussed how asking the right question is important in logical thinking. Asking why is equally important in problem solving. It is not sufficient to be simply presented with the information or data. Critical thinkers must always be willing to dig deeper and explore various possibilities. Asking why can fall under any of the three stages of problem solving.

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| **Estimated Time** | 10 minutes |
| **Topic Objective** | Learners will demonstrate the peer reciprocal questioning technique. |
| **Topic Summary** | In this section, we will learn two questioning techniques and practice one. The instructor will provide learners a problem and they will practice reciprocal peer questioning. Two important questioning techniques learners can use are   * Reciprocal peer questioning – where learners in a group pose thoughtful questions and take turns answering * Generic questioning-are questions that can be used in almost any context (e.g., who are the parties involved, what is the issue, etc.) |
| **Materials Required** | Flipchart, Markers, Chart Paper |
| **Planning Checklist** | None |
| **Recommended Activity** | Have learners work in groups of 3 – 4.  Ask learners to think of a current issue in the news and to generate questions. First, write the questions on the chart paper. Now, take turns providing answers.  Ask learners what is this process similar to? (Answer: Brainstorming)  Allow 5 minutes.  After the groups have discussed the topic, reconvene and discuss as a class. |
| **Stories to Share** | **Brief History of Critical Thinking**, excerpt by the Critical Thinking Community  “Socrates set the agenda for the tradition of critical thinking, namely, to reflectively question common beliefs and explanations, carefully distinguishing those beliefs that are reasonable and logical from those which — however appealing they may be to our native egocentrism, however much they serve our vested interests, however comfortable or comforting they may be — lack adequate evidence or rational foundation to warrant our belief.  Socrates’ practice was followed by the critical thinking of Plato (who recorded Socrates’ thought), Aristotle, and the Greek skeptics, all of whom emphasized that things are often very different from what they appear to be and that only the trained mind is prepared to see through the way things look to us on the surface (delusive appearances) to the way they really are beneath the surface (the deeper realities of life). From this ancient Greek tradition emerged the need, for anyone who aspired to understand the deeper realities, to think systematically, to trace implications broadly and deeply, for only thinking that is comprehensive, well-reasoned, and responsive to objections can take us beyond the surface.”  Source: <http://www.criticalthinking.org/pages/a-brief-history-of-the-idea-of-critical-thinking/408> |
| **Delivery Tips** | None |
| **Review Questions** | What is the importance of asking why in problem solving? |

## Evaluate the Solution(s)

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\EOAYJ771\MC910217102[1].wmfOnce a possible solution has been derived, problem solvers may feel they can proceed with the solution. However, they should not overlook the all-important step of evaluating all possible solutions. Sometimes, one problem has more than one solution and taking the time to evaluate the efficacy of each alternative is a critical thinking skill. Evaluation is also called judgment, and this is the third stage of problem solving. The critical thinker should evaluate each alterative and judge which one is the best. The following steps are an effective evaluation technique:

1. Make a T-chart to weigh the pros and cons of each possible solution
2. Develop criteria (or requirements) and assign weights to each criteria
3. Prioritize the criteria
4. Rate the proposed solutions using the criteria

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| **Estimated Time** | 10 minutes |
| **Topic Objective** | Learners will list and use techniques for evaluating problem solutions. |
| **Topic Summary** | In the previous sections, we have learned many factors related to coming up with possible solutions to a problem. Now, we will look at how to determine which solution is the best. The best solution should not just minimize the problem, it should actually solve it. |
| **Materials Required** | Flipchart, Markers  Worksheet: 13-Problem Solving |
| **Planning Checklist** | None |
| **Recommended Activity** | Have learners work in groups of 3 – 4.  Ask learners to do activity 1 on Worksheet 12. Allow 5 minutes.  After the groups have discussed the topic, reconvene and discuss as a class. |
| **Stories to Share** | **Brief History of Critical Thinking**, excerpt by the Critical Thinking Community  “In the Middle Ages, the tradition of systematic critical thinking was embodied in the writings and teachings of such thinkers as Thomas Aquinas (Sumna Theologica) who to ensure his thinking met the test of critical thought, always systematically stated, considered, and answered all criticisms of his ideas as a necessary stage in developing them. Aquinas heightened our awareness not only of the potential power of reasoning but also of the need for reasoning to be systematically cultivated and "cross-examined." Of course, Aquinas’ thinking also illustrates that those who think critically do not always reject established beliefs, only those beliefs that lack reasonable foundations.”  Source: <http://www.criticalthinking.org/pages/a-brief-history-of-the-idea-of-critical-thinking/408> |
| **Delivery Tips** | None |
| **Review Questions** | What are the steps in evaluation? |

## Case Study

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\9MJXCRQW\MC900396222[1].wmfA team of account managers need to implement a better system to track their sales. One problem is that some managers say they have generated X amount of leads, but when the team lead looks at the weekly reports the number of leads on the computer do not match what the managers’ report verbally. Another issue is that the sales are promised but transactions do not actually occur until weeks or months later. The sales team has been trying to work with customer service and billing on this issue. After several meetings the account managers and their team lead have decided that they need a task force to solve the problem. Your group is the task force.

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| **Estimated Time** | 15 minutes |
| **Topic Objective** | Learners will apply problem solving skills. |
| **Topic Summary** | In this section, we will combine the entire problem solving skills we have learned in this module. Learners will note the three stages of problem solving: preparation, production, and evaluation. |
| **Materials Required** | Flipchart, Markers, Chart Paper |
| **Planning Checklist** | None |
| **Recommended Activity** | Have learners work in groups of 4 – 6.  The learners will use a process to solve the problem in the case study. They must apply the four skills learned in this section:   * Identify inconsistencies * Trust your instincts * Ask why * Evaluate the solution |
| **Stories to Share** | Problem solving may also include an incubation period were an individual may not be actively be working on the problem. The incubation period is when critical thinkers take time to mull over ideas and possible solutions. |
| **Delivery Tips** | None |
| **Review Questions** | What are the four skills involved in solving problems? |

## Module Ten: Review Questions

1. What is cognitive dissonance?
   1. Variances in attitudes and beliefs
   2. Mental patterns
   3. Complementary information
   4. Convergences

Answer: **a. Variances in attitudes and beliefs** Cognitive dissonance are inconsistencies. They are variances in attitudes and beliefs.

1. What is one way to identify inconsistencies?
   1. Analyze information only once
   2. Take information in large chunks
   3. Process information quickly
   4. Use objectivity to see variances

Answer: **d. Use objectivity to see variances** One way to identify inconsistencies is to use objectivity to see variances. Critical thinkers should also process information clearly and recheck it if necessary.

1. All of the following coupled with intuition make a creative process, except for:
   1. Trial and error
   2. Informed guesses
   3. Brainstorming
   4. Strictly delineated processes

Answer: **d. Strictly delineated processes** Intuition coupled with trial and error, informed guesses and brainstorming can lead to a creative process. Processes are helpful in problem solving, but not strictly delineated processes.

1. Instincts are defined as:
   1. Natural intuitive power
   2. Excessive emotions
   3. Physical capabilities
   4. Cognitive processes

Answer: **a. Natural intuitive power** Instincts are natural intuitive power. They are innate characteristics we are born with and that help us in problem solving.

1. Being presented with information is not enough, critical thinkers must also:
   1. Follow up
   2. Ask questions
   3. Listen carefully
   4. Use technology

Answer: **b. Ask questions** Critical thinkers must always have an inquisitive mindset. They should not settle for new information given, but ask questions.

1. Questioning helps the critical thinker:
   1. Remain shallow
   2. Explore possibilities
   3. Keep a narrow view
   4. Remain biased

Answer: **b. Explore possibilities** Questioning is a continual process. Critical thinkers should use questions to dig deeper and explore possibilities.

1. What is one step in evaluating solutions?
   1. Review the requirements
   2. Develop a plan
   3. Prioritize the tasks
   4. Rate the proposed solutions using the criteria

Answer: **d. Rate the proposed solutions using the criteria** Evaluation involves making a chart, developing criteria, and prioritizing criteria. It also involves rating the proposed solutions using the criteria.

1. What kind of chart can we use to evaluate solutions that we discussed in this module?
   1. Venn diagram
   2. Tree diagram
   3. T-chart
   4. Y-chart

Answer: **c. T-chart** We can use many graphical tools to evaluate information or solutions. In this module, we discussed the T-chart.

1. What type of system did the account managers want to create?
   1. One that better tracks attendance
   2. One that better tracks the demographics of their clients
   3. One that better tracks the amount of vacation time each has
   4. One that better tracks their sales

Answer: **d. One that better tracks their sales** The case study clearly states this.

1. What is the first issue mentioned in the case study?
   1. The number of leads verbally reported does not match the number of leads shown on the computer.
   2. Sales are promised but the transactions aren’t completed until weeks or months later.
   3. Many account managers are taking vacation time that they have not accrued.
   4. Tardiness is a problem among the account managers.

Answer: **a. The number of leads verbally reported does not match the number of leads shown on the computer** There are two problems mentioned in the case study. The second is that sales are promised but the transactions aren’t completed until weeks or months later.

# Module Eleven: Putting It All Together

*Happiness comes from when we test our skills toward some meaningful purpose.*

*John Stossel*

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\MP321RS9\MC900198613[1].wmfWe have learned many new skills for logic and critical thinking. Now, we need to learn how to combine these new skills. A skill is only beneficial if it is easy to apply. In this module, we will in particular learn how to:

* Retain your new skills
* Reflect and learn from mistakes
* Always ask the right questions
* Practice critical thinking

## Retaining Your New Skills

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\OVV8IZ9R\MC900404337[1].wmfNow that we have learned many new critical thinking skills, our next challenge is to retain these skills. There are many methods to help you retain your new critical thinking skills. Developing a schema for organizing and remembering information is one method. The subject of critical thinking and metacognition (thinking about thinking) is vast, so there are many resources both online and in print to help you retain the information from this course. The most effective technique to help you retain and improve your critical thinking skills, however, is for you to practice them regularly.

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| **Estimated Time** | 10 minutes |
| **Topic Objective** | Learners will identify ways to retain their new critical thinking skills. |
| **Topic Summary** | We are now starting to pull all the ideas we have learned so far in this course together. In this section, learners will list as many ideas as they can to help them retain their new skills. |
| **Materials Required** | Flipchart , Markers |
| **Planning Checklist** | None |
| **Recommended Activity** | Have learners complete this activity as a whole class discussion.  Ask one learner at a time to come up to the flipchart and list a method to help them retain what they have learned. Possible answer choices include:   1. Keep learning more about critical thinking 2. Learn more about how you think 3. Learn more about how the mind processes information 4. Teach someone else how to be a critical thinker |
| **Stories to Share** | Metacognition is a new buzz word in psychology that literally means “thinking about thinking.” It has not been widely studied cross-culturally, so researchers are not clear about the impact of cultural differences. However, some psychologists suggest that metacognition is human survival tool, so that would make it the same across cultures. |
| **Delivery Tips** | None |
| **Review Questions** | How can retain our new skills? |

## Reflect and Learn From Mistakes

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| **Estimated Time** | 10 minutes |
| **Topic Objective** | Learners will list the benefits of reflection. |
| **Topic Summary** | Reflection is an important learning tool and should not be overlooked. Reflection has many benefits, the primary benefit however is that it allows us to learn from our mistakes. In this section, learners will list additional benefits of reflection. |
| **Materials Required** | Flipchart, Markers |
| **Planning Checklist** | None |
| **Recommended Activity** | Have learners complete this activity as a whole class discussion.  Ask one learner at a time to come up to the flipchart and list a benefit of reflection. Possible answer choices include:   1. Learn from mistakes 2. Recognize strengths and weakness 3. Understand the critical thinking process better 4. Identify different ways to solve a problem   Discuss the learners’ answers. |
| **Stories to Share** | In 2008, a health study revealed that medical errors cost the US economy $19.5 billion. The errors included bed sores, infections, medication errors, etc. Now, an effort is being made to standardize patient safety. Imagine the importance of learning from medical mistakes? |
| **Delivery Tips** | None |
| **Review Questions** | Why is reflection so important? |

## Always Ask Questions

The importance of inquisitiveness cannot be overemphasized in the process of critical thinking. One contribution to civilization that Socrates made was that he advocated the questioning process during debate. Furthermore, learning is a process sparked by the desire to know more. The inquisitiveness and curiosity of the individual is the foundation of the learning. Questions lead to possible solution paths and ultimately answers. Critical thinkers should never abandon the questioning process.

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| **Estimated Time** | 10 minutes |
| **Topic Objective** | Learners will list generic questions related to a current issue. |
| **Topic Summary** | In the previous modules we learned some questioning techniques and the importance of questioning. Now, we will practice the asking generic questions. |
| **Materials Required** | Flipchart, Markers, Chart paper |
| **Planning Checklist** | None |
| **Recommended Activity** | Have learners to work in groups of 3 – 4.  Ask learners to brainstorm for the next five minutes and list as many generic questions they can on the chart paper. Remember, generic questions can apply in almost any context. Examples include:  WHAT IS THIS AN EXAMPLE OF…?  HOW COULD…BE USED TO…?  WHAT WOULD HAPPEN IF…?  HOW DO YOU THINK…WOULD SEE THIS ISSUE? |
| **Stories to Share** | Researchers have found that when students become skilled at using higher-level questioning, they are able to transfer those skills into new situations. Additionally, individual students who received training on how ask good questions performed better than students who did not receive any training, even student who worked in groups. |
| **Delivery Tips** | None |
| **Review Questions** | What are generic questions? |

## Practicing Critical Thinking

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\OVV8IZ9R\MC900199615[1].wmfThe best way to improve your critical thinking skills is to practice them often. Develop ways to remember and organize the techniques from this curse. Develop a schema. The way you organize information will affect the way you think. Additionally, try to improve upon critical thinking and creative thinking as these two types of thinking tend to support each other.

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| **Estimated Time** | 15 minutes |
| **Topic Objective** | Learners will demonstrate an understanding of critical and creative thinking. |
| **Topic Summary** | In this section, we will learn how creative thinking can help us to improve our critical thinking skills. The three concepts we will examine are   * Sensitivity – using our senses * Synergy – pulling together parts that appear separate into a functioning whole * Serendipity - a chance happening |
| **Materials Required** | Flipchart, Markers, Chart Paper |
| **Planning Checklist** | None |
| **Recommended Activity** | Have learners work in groups of 3.  Explain to learners they are illustrators for a weekly cartoon in a science/technology newsletter. Their job is to create a cartoon that illustrates a worker in a lab or computer geek coming using sensitivity, synergy and serendipity to solve a problem. The cartoon should have at least three panels to tell the story.  Reconvene and discuss. |
| **Stories to Share** | A special mark of the creative person is to find problems as well as solutions. The creative individual tends to notice an aspect of the environment or issue that the rest of us commonly overlook. They are very open-minded. |
| **Delivery Tips** | None |
| **Review Questions** | How are creativity and critical thinking related? |

## Case Study

Retailers realize the economy is still recovering, and have been pulling out the stops. A team of retailers on South Congress, a 1 mile run of eclectic homebred businesses located in Austin pulled together the past season to tackle the problem in a unique way. They wanted to encourage local shopping, while promoting the holiday spirit and repeat business. You were on that team and part of the planning included a brainstorming session called ‘Stop the Grinch from getting Christmas.’

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| **Estimated Time** | 15 minutes |
| **Topic Objective** | Learners will demonstrate critical thinking skills. |
| **Topic Summary** | In this section, we now are going to create some synergy. We will pull together all of the elements we have learned in this course. We will analyze a case study and using logic and critical thinking skills, as well as our creativity and emotions, and develop a solution. |
| **Materials Required** | Flip Chart, Markers, Chart Paper  PowerPoint slide 10 |
| **Planning Checklist** | None |
| **Recommended Activity** | Have learners work in groups of 3 – 5.  Ask learners to look at the problem on the slide, PowerPoint 10, and come up with a solution using the skills they have learned in this case study. |
| **Stories to Share** | Oftentimes the media represents the critical thinker as being cold and calculating; think of Dr. Spock from Star Trek. Other stereotypes of the critical thinker include the geek, nerd, or “square peg.” However, empathy, creativity, and imagination are key aspects of critical thinking. |
| **Delivery Tips** | Remind learners there are many resources for improving and learning more about critical thinking. Also, encourage learners to keep a journal when they are working on a big project as it will help them to reflect later. |
| **Review Questions** | What is critical thinking? |

## Module Eleven: Review Questions

1. What is metacognition?
   1. Study of “thinking about thinking”
   2. Study of cognitive domains
   3. Study of speed reading
   4. Study of emotions

Answer: **a. Study of “thinking about thinking”** Metacognition literally means thinking about thinking. It is the study of how we process thoughts.

1. What is the most effective way to retain skills?
   1. To use them infrequently
   2. To take material from a course and file it away
   3. To talk about them once
   4. To practice them regularly

Answer: **d. To practice them regularly** The best way to retain skills and to improve them is to practice them regularly. Also, teaching others and reading information on the subject is helpful.

1. Critical thinkers should reflect on: (Big decisions)
   1. Mundane activities
   2. Major decisions
   3. Routine tasks
   4. Minor activities

Answer: **b. Major decisions** Critical thinkers should take the time to reflect on major decisions. They should look for what went well and for the challenges.

1. Managers should reflect on: (interactions)
   1. Interactions with employees
   2. Routine tasks
   3. Reporting duties
   4. Procedures

Answer: **a. Interactions with employees** Managers should reflect on interactions with everyone they come into contact with on a daily basis. They should especially reflect on interactions with employees.

1. What is reciprocal peer questioning?
   1. Asking yourself questions
   2. Asking authorities and experts questions
   3. Asking peers questions and receiving their answers
   4. Seeking employee input

Answer: **c. Asking peers questions and receiving their answers** Reciprocal peer questioning involves asking peers questions and receiving their input. It is a useful questioning strategy when reviewing information.

1. What is generic questioning?
   1. Questions that can apply in a variety of contexts
   2. Questions that have to do with how something is produced
   3. Questions that relate to the details
   4. Questions that relate to the overall process

Answer: **a. Questions that can apply in a variety of contexts** Generic questions are great for critical thinkers because they objective. They are questions that can apply in a variety of contexts.

1. What is a schema?
   1. Way of organizing information
   2. Fact
   3. Logic category
   4. Way of applying logic

Answer: **a. Way of organizing information** We can aid memorization by placing information into schema. Schemas are categories or ways we organize information.

1. All the following factors relate to critical thinking except:
   1. Curiosity
   2. Empathy
   3. Intuition
   4. Close-mindedness

Answer: **d. Closed mindedness** Critical thinking is an active process involving curiosity, empathy and intuition. It also requires open-mindedness.

1. Where is the business in the case study located?
   1. Austin
   2. Dallas
   3. Houston
   4. San Antonio

Answer: **a. Austin** The case study clearly states this.

1. What is the name of the brainstorming session?
   1. Oh Christmas Tree
   2. Stop the Grinch from Getting Christmas
   3. The Twelve Days of Christmas
   4. Silent Night

Answer: **b. Stop the Grinch from Getting Christmas** The case study clearly states this.

# Module Twelve: Wrapping Up

*All our dignity lies in thought.*

*Blaise Pascal*

Although this workshop is coming to a close, we hope that your journey to improve your critical thinking skills is just beginning. Please take a moment to review and update your action plan. This will be a key tool to guide your progress in the days, weeks, months, and years to come. We wish you the best of luck on the rest of your travels!

## Words from the Wise

* **MC900370486[1]Alison King**: Good questioners are good thinkers.
* **Henry Ward Beecher:** All words are pegs to hang ideas on.
* **Rudolf Arnheim:** All perceiving is also thinking, all reasoning is also intuition, all observation is also invention.

**Review of Parking Lot**

Review the items on the parking lot. Some items may need one-to-one participant follow up. You may be able to clear other items up now. Follow-up workshops may even be appropriate.

## Lessons Learned

* Critical thinking has many components and that open-mindedness is the basis for learning.
* Non-linear thinking helps critical thinkers to step out of their comfort zone and be adaptable.
* Logical thinking is a systematic process that helps us draw conclusions.
* Critical thinkers require many characteristics to be effective. These characteristics include qualities such as curiosity, humility, discipline objectivity, self-awareness and active listening.
* Methods critical thinkers use to evaluate information in asking clarifying questions and SWOT analysis.
* Critical thinking has many benefits, such as improving our persuasion skills, communication skills, problem solving skills and increasing our emotional intelligence.
* Critical thinking may require an individual to change his or her perspective to assess new information.
* Problem-solving in critical thinking involves identifying inconsistencies, asking questions, trusting your instincts, and taking the time to evaluate all possible solutions.
* Critical thinking is a lifelong process. To retain critical thinking skills, individuals must practice critical thinking, continue to ask questions and learn from their mistakes.

## Completion of Action Plans and Evaluations

Do a quick round robin and ask everyone to share one thing that they learned today. Then, ask participants to make sure their action plans and evaluations are complete.

If possible, ask participants to buddy up and set up a follow-up system, so that they can check up on each other in the coming days, weeks, and months. If appropriate, provide your contact information in case they have any questions.