Content

TPO 01

Lecture 01 Rose Frantzen

Narrator: Listen to part of a lecture in a contemporary art class.

MALE PROFESSOR: OK, I'm going to begin this lecture by giving you your next assignment. Remember I said that at some point during this semester I wanted you to attend an exhibit at the Ferry Street Gallery and then write about it? Well, the exhibit that I want you to attend is coming up, it's already started in fact, but it'll be at the gallery for the next month, which should give you plenty of time to complete this assignment.

The name of the artist exhibiting there is Rose Frantzen. Frantzen's work may be unfamiliar to you, since she's a relatively young artist, but she's got a very unusual style, compared to some of the artists we've looked at this term, but anyway, Frantzen's style is what she herself calls Realistic Impressionism. So you've probably studied both of these movements... separately, separate movements... Realism and Impressionism in some of your art history courses, so who can just sum these up?

FEMALE STUDENT: Well, Impressionism... started in the late nineteenth century. Uh, the basic Impressionist style was very different from earlier styles... it didn't depict scenes or models exactly as they looked. Uh, Impressionist painters tended to apply paint really thickly, and in big brushstrokes, so the texture of the canvas was rough.

MALE PROFESSOR: Good... what else? What were the subjects?

MALE STUDENT: Well, a lot of Impressionist artists painted everyday scenes, like people on the streets, and in cafes, uh, lots of nature scenes, especially landscapes.

MALE PROFESSOR: Good, so when you go to the exhibit, I really want you to take a close look at a certain painting—it's a farm scene, and you'll see it right as you enter the gallery. The reason I think this painting is so important is that it stresses the Impressionist aspect of Frantzen's style. It's an outdoor scene, an everyday scene, it's kind of bleak, but you can really see those broad brushstrokes, and the blurry lines.

The colors aren't quite realistic—the sky's kind of, well, an unnatural pinkish yellow, and the fence in the foreground is blue, but somehow the overall scene gives an impression of a cold, bleak winter day on a farm. So that's the Impressionist side of her work. Oh, and speaking about farms, that reminds me—one interesting thing I read about Frantzen is that when she first moved back to Iowa after living abroad, she often visited this place in her town called the Sales Barn.

And the Sales Barn, it was basically this place where the local farmers bought and sold their cattle, their farm animals. And the reason Frantzen went there—and she later on would visit other places, like dance halls, was to observe people and the ways that they moved. She really found that this helped her work, that it gave her an understanding of body movements and actions, how humans move—and stand still, what their postures were like, too.So, what about Realism? What are the elements of Realism we should be looking for in Frantzen's work?

MALE STUDENT: Uh, real, honest depictions of subject matter, pretty unidealized stuff. And pretty everyday subject matter, too.

MALE PROFESSOR: Good, one other painting I really want you to look at is of a young woman surrounded by pumpkins. You'll notice that the woman's face is so realistic looking that it's almost like a photograph. The woman's nose is a little less than perfect, and her hair is kind of messed up—this is Realism.

But then the background of the painting—this woman with the pumpkins is wrapped in a blanket of broad, thick brushstrokes, and—it's all kinds of zigzagging brush strokes and lines, kind of chaotic almost, when you look at it close. And there are vibrant colors—there's lots of orange, with little hints of an electric blue peeking out.

I find Frantzen to be a very accessible artist. I mean some artists, to appreciate them, you have to know their life story. But here's a little bit about Rose Frantzen's life anyway ... She attended art school, but was told by one of her instructors that she wasn't good at illustration, that she should go into advertising instead. So she took advertising classes, and fine arts classes too, until she was convinced by the head of an advertising agency that her work was really good, that she could be an artist.

But of course, it's not as easy as that, and so Frantzen had to paint other people's portraits at places like art fairs— just to make money to buy paint for her more serious artwork. No matter what, she never stopped painting, and now Frantzen's doing extremely well, and her work's being shown all over the country. So, I think most of us would be discouraged if we had to face challenges and difficulties like that, but what's important is that you keep at it, that you don't give up. That's what's really important to remember.

1.What is the purpose of the lecture?
A. To explain the difference between two artistic styles
B. To describe a new art gallery to the class
C. To introduce an artist's work to the class
D. To show how artists' styles can evolve over time

2.What does the professor say about Frantzen's painting of a farm scene?
A. It resembles a photograph.
B. It may be Frantzen's best-known painting.
C. It was painted in the Impressionist style.
D. It was painted while Frantzen lived abroad.

3.Why did Frantzen go to the Sales Barn?
A. To study human form and movement
B. To earn money by painting portraits
C. To paint farm animals in an outdoor setting
D. To meet people who could model for her paintings

4.What does the professor imply about the painting of the young woman surrounded by pumpkins?
A. It was painted at an art fair.
B. It combines Impressionism with Realism.
C. It convinced Frantzen that she was a good illustrator.
D. It was originally meant to be used in an advertisement.

5.Why does the professor discuss Frantzen's difficulties as a young painter?
A. He wants to point out mistakes that young artists commonly make.
B. He thinks her example can inspire the students in their own lives.
C. Her difficulties remind him of the difficulties he himself experienced as a young artist.
D. Her difficulties are the subject of some of the paintings in the gallery that the students will visit.

6.What does the professor imply when he says this: **TEXT：last two Paragraph**
A. The students can understand Frantzen's art without knowing about her life
B. The students should pay very close attention to what he is going to say
C. Some of his students are already familiar with Frantzen's life story
D. Some of his students may not appreciate Frantzen's work

Lecture 02 Uranium-Lead Dating

Narrator: Listen to part of a lecture in a geology class.

MALE PROFESSOR: OK, let's get started. Great—today I want to talk about a way in which we are able to determine how old a piece of land or some other geologic feature is. Dating techniques. I'm gonna talk about a particular dating technique. Why? Good dating is key to good analysis. In other words, if you want to know how a land formation was formed, the first thing you probably want to know is how old it is. It's fundamental.

Uh, take the Grand Canyon for instance. Now, we geologists thought we had a pretty good idea of how the Grand Canyon in the southwestern United States was formed. We knew that it was formed from sandstone that solidified somewhere between 150 and 300 million years ago. Before it solidified, it was just regular sand—essentially, it was part of a vast desert.

And, uh, until just recently most of us thought the sand had come from an ancient mountain range fairly close by that flattened out over time. That's been the conventional wisdom among geologists for quite some time. But now we've learned something different and quite surprising using a technique called uranium-lead dating.

I should say that uranium-lead dating has been around for quite a while, but there have been some recent refinements—I'll get into this in a minute. Anyway, uranium-lead dating has produced some surprises. Two geologists discovered that about half of the sand from the Grand Canyon was actually once part of the Appalachian Mountains. That's really eye-opening news, since the Appalachian Mountain range is, of course, thousands of kilometers to the east of the Grand Canyon. Sounds pretty unbelievable, right?

Of course, the obvious question is, how did that sand end up so far west? The theory is that huge rivers and wind carried the sand west, where it mixed in with the sand that was already there. **Well, this was a pretty revolutionary finding, uh, and it was basically because of uranium-lead dating. Why?**

Well, as everyone in this class should know, we usually look at the grain type within sandstone, meaning the actual particles in the sandstone, to determine where it came from. You can do other things, too, like look at the wind or water that brought the grains to their location and figure out which way it was flowing. But that's only useful up to a point, and that's not what these two geologists did.

Uranium-lead dating allowed them to go about it in an entirely different way. What they did was they looked at the grains of zircon in the sandstone. Zircon is a material that contains radioactive uranium, which makes it very useful for dating purposes.

Uh, zircon starts off as molten magma, the hot lava from volcanoes. This magma then crystallizes. And when zircon crystallizes, the uranium inside it begins to change into lead. So, if you measure the amount of lead in a zircon grain, you can figure out when the grain was formed. After that, you can determine the age of zircon from different mountain ranges.

Once you do that, you can compare the age of the zircon in the sandstone in your sample to the age of the zircon in the mountains. If the age of the zircon matches the age of one of your mountain ranges, then it means the sandstone actually used to be part of that particular mountain range. Is everybody with me on that? Good. So in this case, uranium-lead dating was used to establish that half of the sandstone in the samples was formed at the same time the granite in the Appalachian Mountains was formed.

So, because of this—this new way of doing uranium-lead dating, we've been able to determine that one of our major assumptions about the Grand Canyon was wrong.Like I said before, uranium-lead dating has been with us for a while, but, uh, until recently, in order to do it, you really had to study many individual grains, and it took a long time before you got results. It just wasn't very efficient and it wasn't very accurate.

But technical advances have cut down on the number of grains you have to study, so you get your results faster. So I'll predict that, uh, uranium-lead dating is going to become an increasingly popular dating method. There are a few pretty exciting possibilities for uranium-lead dating.

Here's one that comes to mind. You know, the theory that Earth's continents were once joined together and only split apart relatively recently? Well, with uranium-lead dating, we could prove that more conclusively. If they show evidence of once having been joined, that could really tell us a lot about the early history of the planet's geology.

1.What does the professor mainly discuss?
A. The differences in age among American mountain ranges
B. The importance of a technique used for dating geological materials
C. The recent discovery of an ancient canyon
D. A comparison of various minerals used for dating

2.Before the use of uranium-lead analysis, where did most geologists think the Grand Canyon sandstone came from?
A. An ancient lake located in the American Southwest
B. A desert that once connected two continents
C. Sands carried by a river from the Appalachian Mountains
D. A nearby mountain range that had flattened out over time

3.In the talk, the professor describes the sequence of uranium-lead dating. Summarize the sequence by putting the events in the correct order.
A.Zircon in the sandstone is matched to the zircon in a particular mountain range
B.The amount of lead in sandstone zircon is measured.
C.The age of zircon in a sandstone sample is determined.

4.According to the professor, what change has caused uranium-lead dating to gain popularity recently?
A. It can be performed outside a laboratory.
B. It can now be done more efficiently.
C. It no longer involves radioactive elements.
D. It can be used in fields other than geology.

5.Why does the professor talk about the breaking apart of Earth's continents?
A. To give another example of how uranium-lead dating might be useful
B. To explain how the Grand Canyon was formed
C. To demonstrate how difficult uranium-lead dating is
D. To disprove a theory about the age of Earth's first mountain ranges

6.What does the professor imply when he says this: **Well, this was a pretty revolutionary finding, uh, and it was basically because of uranium-lead dating. Why? Well, as everyone in this class should know, we usually look at the grain type within sandstone, meaning the actual particles in the sandstone, to determine where it came from.**

A. The class is easier than other geology classes
B. The class has already studied the information he is discussing
C. Some students should take a course in geological dating techniques
D. He will discuss the topic later in the class

Lecture 03 Catalhoyuk

Narrator: Listen to part of a lecture in an archaeology class.

FEMALE PROFESSOR: OK, we've been talking about early agriculture in the Near East, so let's concentrate on one site and see what we can learn from it. Let's look at Catalhoyuk … um, I better write that down.Catalhoyuk, that's about as close as we get in English. It's Turkish really--the site's in modern-day Turkey, and who knows what the original inhabitants called it.

Anyway, um, Catalhoyuk wasn't the first agricultural settlement in the Near East, but it was pretty early--settled about 9,000 years ago, in the Neolithic period. And, uh, the settlement--a town, really--lasted about a thousand years, and grew to a size of about 8 or 10 thousand people. That certainly makes it one of the largest towns in the world at that time.

One of the things that makes a settlement of this size impressive is the time period . . . It's the Neolithic, remember--the late Stone Age--so the people that lived there had only stone tools--no metals--so everything they accomplished, like building this town, they did with just stone,... plus wood, bricks, that sort of thing.

But you gotta remember that it wasn't just any stone they had, they had obsidian--And, um, obsidian is a black volcanic... well, almost like glass. It flakes very nicely into really sharp points. The sharpest tools of the entire Stone Age were made of obsidian, and, uh, the people of Catalhoyuk got theirs from further inland, from central Turkey--traded for it, probably.

Anyway, what I wanna focus on is the way the town was built. The houses are all rectangular, one-story, made of sun-dried bricks... but what's really interesting is that there are no spaces between them. No streets, in other words. And so, generally, no doors on the houses either. People walked around on the roofs and entered a house through a hatchway on the roof, down a wooden ladder. You can still see the diagonal marks of the ladders in the plaster on the inside walls.

Once you were in the house, there would be one main room and a couple of small rooms for storage. The main room had the hearth: for cooking and for heat--it would've been pretty cold during the winters. And, uh, it also looks like they made their tools near the fire: there tends to be a lot of obsidian flakes and chips in the hearth ashes. But, uh, no chimney... the smoke just went out the same hatchway the people used for going in and out themselves. So there would've been an open fire inside the house, with only one hole in the roof to let the smoke out. You and I would've found it a bit too smoky in there. You can see on the walls, which they plastered and decorated with paintings... they ended up with a layer of black soot on them... and so did people's lungs--the bones found in the graves show a layer of soot on the inside of the ribs. And that's another unusual feature of Catalhoyuk--the burial sites.

The graves have all been found under the houses--right under the floors. And it may be this burial custom that explains why the houses were packed in so tightly without streets. I mean, you might think it was for protection or something, but there's been no evidence found yet of any violent attack that would indicate that kind of danger. It may be they wanted to live as near as possible to their ancestors' graves... and be buried near them themselves. But it makes a good point.

Based on excavations we can know the layout of the houses, and the location of the graves, but we're only guessing when we try to say why they did it that way. That's the way it is with archaeology--you're dealing with the physical remains the people left behind. We have no sure access to what they thought and how they felt about things. I mean, it's interesting to speculate, and the physical artifacts can give us clues, but there's a lot we can't really know.

So for instance, their art. They painted on the plaster walls, and uh, usually they painted hunting scenes, with wild animals in them. Now, they did hunt, and they also raised cereal crops and kept sheep. But we don't know why so many of the paintings are of hunting scenes. Was it supposed to have religious or magical significance? That's the kind of thing we can only guess at, based on clues, and hopefully further excavation of Catalhoyuk will yield more clues. But we'll probably never know for sure.

1.What is the lecture mainly about?
A. Art in the Neolithic period
B. The site of a Neolithic town
C. Methods of making stone tools
D. The domestication of plants and animals by early farmers

2.What does the professor imply about the tools used by the people of Catalhoyuk?
A. They were made of stone that came from Catalhoyuk.
B. They were among the sharpest tools available at the time.
C. They were often used in religious rituals.
D. They were used primarily for agriculture.

3.What does the professor say about the entrances to the houses in Catalhoyuk?
Click on 2 answers.
A. They were in the roof.
B. They were usually kept closed.
C. They allowed smoke to escape from the houses.
D. They stood opposite one another across narrow streets.

4.What does the professor say about Catalhoyuk graves?
A. The graves contained precious stones.
B. Many people were buried in each grave.
C. The graves were located under the house floors.
D. The graves contained ashes rather than bones.

5.What does the professor think of the idea that the inhabitants of Catalhoyuk deliberately arranged their houses so that they could live near their ancestors' graves?
A. She thinks it is a good guess, but only a guess.
B. She thinks some evidence supports it, but other evidence contradicts it.
C. She thinks that further excavations will soon disprove it.
D. She thinks that it is not appropriate to make such guesses about the distant past.

6.What are three things the professor says about the artwork of Catalhoyuk? Click on 3 answers.
A. It was clearly important to the Catalhoyuk religion.
B. It became covered with soot.
C. It often shows farmers at work.
D. Its significance is unknown.
E. It contains many hunting scenes

Lecture 04 Marmots

Narrator: Listen to part of a lecture in a biology class.

FEMALE PROFESSOR: For today's discussion, we'll review the case study on how some animals have behaviorally adapted to their environments. Now, you had to read about two animal species: the eastern marmot and the Olympic marmot.

Marmots are rodents... they're large ground squirrels about the size of an average house cat, and they live in a variety of habitats. And even though they spend a significant portion of the year hibernating, according to this case study, marmots are still considered excellent subjects for animal behavioral studies. Why is that?

MALE STUDENT: Well, when they're not hibernating, you can find them in open areas, and they're pretty active during the day, which makes them easy to observe, right?

FEMALE PROFESSOR: Uh huh. So, first let's discuss the eastern marmots. They reside throughout the eastern region of North America where there's a temperate climate, where the growing season lasts for at least five months of the year... which is when they do all their mating, playing, and eating.

MALE STUDENT: Oh, I see... at first, I wasn't sure what 'growing season' meant just from the reading, but now I get it. It's the amount of time it takes for them to grow, right? So, it'd be five months?

FEMALE PROFESSOR: Hm? Ohh, I'm sorry but no, it has nothing to do with that. It's not about the time it takes for eastern marmots to grow, it's when the food is available. That is--when it's not covered in snow and there's no frost covering the grass, and um vegetative parts of uh, plants, herbs, and the flowers that marmots like to eat. So, 'growing season' refers to the availability of the food they eat. Ok? So now, how would you describe the eastern marmots' social habits?

FEMALE STUDENT: Well, they're really territorial and loners and just so aggressive even with other eastern marmots. And their mating ritual is just so... impersonal.

FEMALE PROFESSOR: Uh huh. Now, when they emerge in the spring from hibernation, the mating process begins. For them, well, they come together to mate and then they go their separate ways. Then, about six to eight weeks after birth, the offspring leave their mothers.

FEMALE STUDENT: Really, just six weeks? Is it possible for the offspring to make it on their own so young?

FEMALE PROFESSOR: Well, it's not as if they aren't ready for the real world... because they are. Remember, they mature quickly and the weather's nice. Also, they live in open fields where there's lots of edible vegetation. So roughly six weeks after birth, eastern marmots are just old enough to take their chances of surviving in a temperate environment. So, how does this relate to their behavior?

FEMALE STUDENT: Oh, I get it. Since, the climate's not too bad, the eastern marmots don't have to rely on each other too much and they really don't need to stay together as a family to survive either.

FEMALE PROFESSOR: Uh huh. And in contrast... the Olympic marmots... what about them?

FEMALE STUDENT: Well, they live together as a family and take care of their young until they're at least two years old. They're really friendly with each other, and what I really like is that they even have greeting ceremonies and they're not at all aggressive and territorial like the eastern marmots. So, um, their social behavior's so different from the eastern marmots' because of the climate where they live? That seems so bizarre!

FEMALE PROFESSOR: Well, the Olympic marmots inhabit meadows high in the Olympic Mountains where the weather conditions are much harsher so there's a lot more wind and snow. The growing season only lasts about two to three months. So, in that much shorter period of time, all of the Olympic marmots, male and female, eat, play, work, and nurture the young together.

Because the climate is so harsh, cooperation increases the survival rate of the Olympic marmots. They keep their young at home until they're physically able to survive on their own. This could explain why the social behavior of the Olympic marmots is so unlike that of the eastern marmots.

1.What is the main topic of the lecture?
A. The types of habitats marmots prefer
B. Methods of observing marmot behavior
C. Feeding habits of some marmot species
D. Differences in behavior between marmot species

2.According to the case study, why are marmots ideal for observation?
A. They do not hide from humans.
B. They reside in many regions throughout North America.
C. They are active in open areas during the day.
D. Their burrows are easy to locate.

3.What reason does the professor give for the differences in marmot behavior patterns?
A. Type of food available
B. The size of the population
C. Interaction with other marmot species
D. Adaptations to the climate

4.Why does the professor say this:
STUDENT: Oh, I see... at first, I wasn't sure what 'growing season' meant just from the reading, but now I get it. It's the amount of time it takes for them to grow, right? So, it'd be five months?

PROFESSOR: Hm? Ohh, I'm sorry but no, it has nothing to do with that.

A. To inform the student that his definition is incorrect
B. To suggest that the student did not do the reading
C. To encourage the student to try again
D. To change the topic of discussion

5.Why does the professor say this:
Student: Really? Just six weeks?

Student: Is that possible for the offspring to make it on their own so young?

Professor: Well, it’s not as if they aren’t ready for the real world because they are.

A. To express a similar concern
B. To encourage the student to explain what she means
C. To address the student's concern
D. To agree with the student

TPO 02

Lecture 01 Behaviorism

Narrator: Listen to part of a psychology lecture. The professor is discussing behaviorism.

MALE PROFESSOR: Now, many people consider John Watson to be the founder of behaviorism. And like other behaviorists, he believed that psychologists should study only the behaviors they can observe and measure. They're not interested in mental processes. While a person could describe his thoughts, no one else can see or hear them to verify the accuracy of his report.

But one thing you can observe is muscular habits. What Watson did was to observe muscular habits because he viewed them as a manifestation of thinking. One kind of habit that he studied are laryngeal habits. Watson thought laryngeal habits...you know, from larynx, in other words, related to the voice box... he thought those habits were an expression of thinking. He argued that for very young children, thinking is really talking out loud to oneself because they talk out loud even if they're not trying to communicate with someone in particular. As the individual matures, that overt talking to oneself becomes covert talking to oneself, but thinking still shows up as a laryngeal habit.

One of the bits of evidence that supports this is that when people are trying to solve a problem, they, um, typically have increased muscular activity in the throat region. That is, if you put electrodes on the throat and measure muscle potential–muscle activity–you discover that when people are thinking, like if they're diligently trying to solve a problem, that there is muscular activity in the throat region.

So, Watson made the argument that problem solving, or thinking, can be defined as a set of behaviors—a set of responses—and in this case the response he observed was the throat activity. That's what he means when he calls it a laryngeal habit. Now, as I am thinking about what I am going to be saying, my muscles in my throat are responding. So, thinking can be measured as muscle activity. Now, the motor theory…yes?

FEMALE STUDENT: Professor Blake, um, did he happen to look at people who sign? I mean deaf people?

MALE PROFESSOR: Uh, he did indeed, um, and to jump ahead, what one finds in deaf individuals who use sign language…when they're given problems of various kinds, they have muscular changes in their hands when they are trying to solve a problem…muscle changes in the hand, just like the muscular changes going on in the throat region for speaking individuals. So, for Watson, thinking is identical with the activity of muscles.

A related concept of thinking was developed by William James. It's called ideomotor action. Ideomotor action is an activity that occurs without our noticing it, without our being aware of it. I'll give you one simple example. If you think of locations, there tends to be eye movement that occurs with your thinking about that location. In particular, from where we're sitting, imagine that you're asked to think of our university library.

Well, if you close your eyes and think of the library, and if you're sitting directly facing me, then according to this notion, your eyeballs will move slightly to the left, to your left, 'cause the library's in that general direction.James and others said that this is an idea leading to a motor action, and that's why it's called "ideomotor action"—an idea leads to motor activity.

If you wish to impress your friends and relatives, you can change this simple process into a magic trick. Ask people to do something such as I've just described: think of something on their left; think of something on their right. You get them

to think about two things on either side with their eyes closed, and you watch their eyes very carefully. And if you do that, you'll discover that you can see rather clearly the eye movement — you can see the movement of the eyeballs.

Now, then you say, think of either one and I'll tell which you're thinking of. OK. Well, Watson makes the assumption that muscular activity is equivalent to thinking. But given everything we've been talking about here, one has to ask: are there alternatives to this motor theory—this claim that muscular activities are equivalent to thinking? Is there anything else that might account for this change in muscular activity, other than saying that it is thinking? And the answer is clearly yes. Is there any way to answer the question definitively? I think the answer is no.

1.What is the professor mainly discussing?
A. The development of motor skills in children
B. How psychologists measure muscle activity in the throat
C. A theory about the relationship between muscle activity and thinking
D. A study on deaf people's problem-solving techniques

2.Why does the professor say this?
PROFESSOR: Watson thought laryngeal habits...you know, from larynx, in other words, related to the voice box...he thought those habits were an expression of thinking.

A. To give an example of a laryngeal habit
B. To explain the meaning of a term
C. To explain why he is discussing laryngeal habits
D. To remind students of a point he had discussed previously.

3.What does the professor say about people who use sign language?
A. It is not possible to study their thinking habits.
B. They exhibit laryngeal habits.
C. The muscles in their hands move when they solve problems.
D. They do not exhibit ideomotor action.

4.What point does the professor make when he refers to the university library?
A. A study on problem solving took place there.
B. Students should go there to read more about behaviorism.
C. Students' eyes will turn toward it if they think about it.
D. He learned about William James's concept of thinking there.

5.The professor describes a magic trick to the class. What does the magic trick demonstrate?
A. An action people make that they are not aware of.
B. That behaviorists are not really scientists.
C. How psychologists study children.
D. A method for remembering locations.

6.What is the professor's opinion of the motor theory of thinking?
A. Most of the evidence he has collected contradicts it.
B. It explains adult behavior better than it explains child behavior.
C. It is the most valid theory of thinking at the present time.
D. It cannot be completely proved or disproved.

Lecture 02 Manila Hemp

Narrator: Listen to part of a lecture from a Botany class.

FEMALE PROFESSOR: Hi, everyone. Good to see you all today. Actually, I expected the population to be a lot lower today. It typically runs between 50 and 60 percent on the day the research paper is due. Um, I was hoping to have your exams back today, but, uh, the situation was that I went away for the weekend, and I was supposed to get in yesterday at five, and I expected to fully complete all the exams by midnight or so, which is the time that I usually go to bed, but my flight was delayed, and I ended up not getting in until one o'clock in the morning. Anyway, I'll do my best to have them finished by the next time we meet.

OK. In the last class, we started talking about useful plant fibers. In particular, we talked about cotton fibers, which we said were very useful, not only in the textile industry, but also in the chemical industry, and in the production of many products, such as plastics, paper, explosives, and so on. Today we'll continue talking about useful fibers, and we'll begin with a fiber that's commonly known as "Manila hemp".

Now, for some strange reason, many people believe that Manila hemp is a hemp plant. But Manila hemp is not really hemp. It's actually a member of the banana family–it even bears little banana-shaped fruits. The "Manila" part of the name makes sense, because Manila hemp is produced chiefly in the Philippine Islands and, of course, the capital city of the Philippines is Manila.

Now, as fibers go, Manila hemp fibers are very long. They can easily be several feet in length and they're also very strong, very flexible. They have one more characteristic that's very important, and that is that they are exceptionally resistant to salt water. And this combination of characteristics–long, strong, flexible, resistant to salt water–makes Manila hemp a great material for ropes, especially for ropes that are gonna be used on ocean-going ships.

In fact, by the early 1940's, even though steel cables were available, most ships in the United States Navy were not moored with steel cables; they were moored with Manila hemp ropes. Now, why was that? Well, the main reason was that steel cables degrade very, very quickly in contact with salt water. If you've ever been to San Francisco, you know that the Golden Gate Bridge is red. And it's red because of the zinc paint that goes on those stainless steel cables.

That, if they start at one end of the bridge and they work to the other end, by the time they finish, it's already time to go back and start painting the beginning of the bridge again, because the bridge was built with steel cables, and steel cables can't take the salt air unless they're treated repeatedly with a zinc–based paint.

On the other hand, plant products like Manila hemp, you can drag through the ocean for weeks on end. If you wanna tie your anchor to it and drop it right into the ocean, that's no problem, because plant fibers can stand up for months, even years, in direct contact with salt water.

OK. So how do you take plant fibers that individually you could break with your hands and turn them into a rope that's strong enough to moor a ship that weighs thousands of tons? Well, what you do is extract these long fibers from the Manila hemp plant, and then you take several of

these fibers, and you group them into a bundle, because by grouping the fibers you greatly increase their breaking strength–that bundle of fibers is much stronger than any of the individual fibers that compose it.

And then you take that bundle of fibers and you twist it a little bit, because by twisting it, you increase its breaking strength even more. And then you take several of these little bundles, and you group and twist them into bigger bundles, which you then group and twist into even bigger bundles, and so on, until eventually, you end up with a very, very strong rope.

1.What aspect of Manila hemp fibers does the professor mainly discuss in the lecture?
A. Similarities between cotton fibers and manila hemp fibers
B. Various types of manila hemp fibers
C. The economic importance of Manila hemp fibers
D. A use of Manila hemp fibers

2.Why does the professor mention going away for the weekend?
A. To tell the class a joke.
B. To apologize for not completing some work.
C. To introduce the topic of the lecture
D. To encourage students to ask about her trip

3.What does the professor imply about the name "Manila hemp"?
A. It is a commercial brand name.
B. Part of the name is inappropriate.
C. The name has recently changed.
D. The name was first used in the 1940's.

4.Why does the professor mention the Golden Gate Bridge?
A. To demonstrate a disadvantage of steel cables
B. To give an example of the creative use of color
C. To show that steel cables are able to resist salt water
D. To give an example of a use of Manila hemp

5.According to the professor, what was the main reason that many ships used Manila hemp ropes instead of steel cables?
A. Manila hemp was cheaper.
B. Manila hemp was easier to produce.
C. Manila hemp is more resistant to salt water.
D. Manila hemp is lighter in weight.

6.According to the lecture, what are two ways to increase the strength or rope made from Manila hemp fibers? [Click on 2 answers.]
A. Coat the fibers with zinc-based paint
B. Combine the fibers into bundles
C. Soak bundles of fibers in salt water
D. Twist bundles of fibers

Lecture 03 Aristotle

Narrator: Listen to part of a lecture in a philosophy class.

FEMALE PROFESSOR: OK. Another ancient Greek philosopher we need to discuss is Aristotle–Aristotle's ethical theory. What Aristotle's ethical theory is all about is this: he's trying to show you how to be happy–what true happiness is. Now, why is he interested in human happiness? It's not just because it's something that all people want or aim for. It's more than that. But to get there we need to first make a very important distinction.

Let me introduce a couple of technical terms: extrinsic value and intrinsic value. To understand Aristotle's interest in happiness, you need to understand this distinction. Some things we aim for and value, not for themselves but for what they bring about … in addition to themselves. If I value something as a means to something else, then it has what we will call "extrinsic value." Other things we desire and hold to be valuable for themselves alone. If we value something not as a means to something else, but for its own sake, let us say that it has "intrinsic value."

Exercise. There may be some people who value exercise for itself, but I don't. I value exercise because if I exercise, I tend to stay healthier than I would if I didn't. So I desire to engage in exercise and I value exercise extrinsically...not for its own sake, but as a means to something beyond it. It brings me good health.

Health. Why do I value good health? Well, here it gets a little more complicated for me. Um, health is important for me because I can't...do other things I want to do–play music, teach philosophy–if I'm ill. So health is important to me–has value to me–as a means to a productive life. But health is also important to me because I just kind of like to be healthy–it feels good. It's pleasant to be healthy, unpleasant not to be. So to some degree I value health both for itself and as a means to something else: productivity. It's got extrinsic and intrinsic value for me.

Then there's some things that are just valued for themselves. I'm a musician, not a professional musician; I just play a musical instrument for fun. Why do I value playing music? Well, like most amateur musicians, I only play because, well, I just enjoy it. It's something that's an end in itself.

No , something else I value is teaching. Why? Well, it brings in a modest income, but I could make more money doing other things. I'd do it even if they didn't pay me. I just enjoy teaching. In that sense it's an end to itself. But teaching's not something that has intrinsic value for all people–and that's true generally.

Most things that are enjoyed in and of themselves vary from person to person. Some people value teaching intrinsically, but others don't. So how does all this relate to human happiness? Well, Aristotle asks: is there something that all human beings value...and value only intrinsically, for its own sake and only for its own sake?

If you could find such a thing, that would be the universal final good, or truly the ultimate purpose or goal for all human beings. Aristotle thought the answer was yes. What is it? Happiness. Everyone will agree, he argues, that happiness is the ultimate end...to be valued for itself and really only for itself. For what other purpose is there in being happy? What does it yield. The attainment of happiness becomes the ultimate or highest good for Aristotle.

The next question that Aristotle raises is: what is happiness? We all want it; we all desire it; we all seek it. It's the goal we have in life. But what is it? How do we find it? Here he notes, with some frustration, people disagree. But he does give us a couple of criteria, or features, to keep in mind as we look for what true human happiness is.

True human happiness should be, as he puts it,

complete. Complete in that it's all we require. Well, true human happiness...if you had that, what else do you need? Nothing. And, second, true happiness should be something that I can obtain on my own. I shouldn't have to rely on other people for it.

Many people value fame and seek fame. Fame for them becomes the goal. But, according to Aristotle, this won't work either, because fame depends altogether too much on other people. I can't get it on my own, without help from other people. In the end, Aristotle says that true happiness is the exercise of reason–a life of intellectual contemplation...of thinking. So let's see how he comes to that.

1.What is the main purpose of the lecture?
A. To illustrate the importance of extrinsic values
B. To explain Aristotle's views about the importance of teaching
C. To explain why people change what they value
D. To discuss Aristotle's views about human happiness

2.The professor gives examples of things that have value for her. Indicate for each example what type of value it has for her. [Click in the correct box. This question is worth 2 points.]

	Only extrinsic value	Only intrinsic value	Both extrinsic and intrinsic value
Teaching			
Exercise			
Health			
Playing a musical instrument			

3.Why is happiness central to Aristotle's theory?
A. Because it is so difficult for people to attain
B. Because it is valued for its own sake by all people
C. Because it is a means to a productive life
D. Because most people agree about what happiness is

4.According to the professor, why does Aristotle think that fame cannot provide true happiness?
A. Fame cannot be obtained without help from other people.
B. Fame cannot be obtained by all people.
C. Fame does not last forever.
D. People cannot share their fame with other people.

5.What does the professor mean when she says this?

No , something else I value is teaching. Why? Well, it brings in a modest income, but I could make more money doing other things.

A. Teaching is not a highly valued profession in society.
B. She may change professions in order to earn more money.
C. The reason she is a teacher has little to do with her salary.
D. More people would become teachers if the salary were higher.

Lecture 04 Bode's Law

Narrator: Listen to part of a lecture in an astronomy class. You will not need to remember the numbers the professor mentions.

MALE PROFESSOR: OK. Let's get going. Today I'm going to talk about how the asteroid belt was discovered. And...I'm going to start by writing some numbers on the board. Here they are: We'll start with zero, then 3,...6,...12. Uh, tell me what I'm doing.

FEMALE STUDENT: Multiplying by 2?

MALE PROFESSOR: Right. I'm doubling the numbers, so 2 times 12 is 24, and the next one I'm going to write after 24 would be...

FEMALE STUDENT: 48.

MALE PROFESSOR: 48. Then 96. We'll stop there for now. Uh. now I'll write another row of numbers under that. Tell me what I'm doing. 4, 7, 10...How am I getting this second row?

MALE STUDENT: Adding 4 to the numbers in the first row.

MALE PROFESSOR: I'm adding 4 to each number in the first row to give you a second row. So the last two will be 52, 100, and now tell me what I'm doing.

FEMALE STUDENT: Putting in a decimal?

MALE PROFESSOR: Yes, I divided all those numbers by 10 by putting in a decimal point. Now I'm going to write the names of the planets under the numbers. Mercury... Venus... Earth... Mars. So, what do the numbers mean? Do you remember from the reading?

MALE STUDENT: Is it the distance of the planets from the Sun?

MALE PROFESSOR: Right. In astronomical units–not perfect, but tantalizingly close. The value for Mars is off by...6 or 7 percent or so. It's...but it's within 10 percent of the average distance to Mars from the Sun. But I kind of have to skip the one after Mars for now. Then Jupiter's right there at 5-point something, and then Saturn is about 10 astronomical units from the Sun. Um, well, this pattern is known as Bode's Law.

Um, it isn't really a scientific law, not in the sense of predicting gravitation mathematically or something, but it's attempting a pattern in the spacing of the planets, and it was noticed by Bode hundreds of years ago. Well, you can imagine that there was some interest in why the 2.8 spot in the pattern was skipped, and um...but there wasn't anything obvious there, in the early telescopes. Then what happened in the late 1700s? The discovery of...?

FEMALE STUDENT: Another planet?

MALE PROFESSOR: The next planet out, Uranus–after Saturn. And look, Uranus fits in the next spot in the pattern pretty nicely, um, not perfectly, but close. And so then people got really excited about the validity of this thing and finding the missing object between Mars and Jupiter. And telescopes, remember, were getting better. So people went to work on finding objects that would be at that missing distance from the Sun, and then in 1801, the object Ceres was discovered.

And Ceres was in the right place–the missing spot. Uh, but it was way too faint to be a planet. It looked like a little star. Uh, and because of its starlike appearance, um, it was called an asteroid.OK? "Aster" is Greek for "star," as in "astronomy." Um, and so, Ceres was the first and is the largest of what became many objects discovered at that same distance. Not just one thing, but all the objects found at that distance form the asteroid belt. So the asteroid belt is the most famous success of this Bode's Law. That's how the asteroid belt was discovered.

1.What is Bode’s law?
A. A law of gravitation
B. An estimate of the distance between Mars and Jupiter
C. A prediction of how many asteroids there are
D. A pattern in the spacing of the planets

2.Why does the professor explain Bode's Law to the class?
A. To describe the size of the asteroids
B. To explain how the asteroids belt was discovered
C. To explain how gravitational forces influence the planets
D. To describe the impact of telescopes on astronomy

3.How does the professor introduce Bode's Law?
A. By demonstrating how it is derived mathematically
B. By describing the discovery of Uranus
C. By drawing attention to the inaccuracy of a certain pattern
D. By telling the names of several of the asteroids

4.According to the professor, what two factors contributed to the discovery of the asteroid Ceres? [Click on 2 answers.]
A. Improved telescopes
B. Advances in mathematics
C. The discovery of a new star.
D. The position of Uranus in a pattern

5.What does the professor imply about the asteroid belt?
A. It is farther from the Sun than Uranus.
B. Bode believed it was made up of small stars.
C. It is located where people expected to find a planet.
D. Ceres is the only one of the asteroids that can be seen without a telescope.

6.Why does the professor say this.

Um, well, this pattern is known as Bode's Law.

Um, it isn't really a scientific law, not in the sense of predicting gravitation mathematically or something, but it's attempting a pattern in the spacing of the planets, and it was noticed by Bode hundreds of years ago.

A. To introduce an alternative application of Bode's Law.
B. To give an example of what Bode's law cannot explain.
C. To describe the limitaions of gravitational theory.
D. To contrast Bode's Law with a real scientific law.

TPO 03

Lecture 01 Humming Birds

Narrator: Listen to part of a lecture in an environmental science class.

FEMALE PROFESSOR: Now, we've been talking about the loss of animal habitat from housing developments, ah, growing cities… small habitat losses. But today I want to begin talking about what happens when habitat is reduced across a large area. There are, of course, animal species that require large areas of habitat…and, um some migrate over very long distances. So what's the impact of habitat loss on those animals? Animals that need large areas of habitat?

Well, I'll use the hummingbirds as an example. Now, you know a hummingbird is amazingly small. But even though it's really tiny, it migrates over very long distances… travels up and down the Western Hemisphere… the Americas… back and forth between where it breeds in the summer and the warmer climates where it spends the winter. So we would say that this whole area over which it migrates is its habitat, because on this long-distance journey, it needs to come down to feed and sleep every so often, right?

Well, the hummingbird beats its wings—get this—about 3,000 times per minute. So you think, wow, it must need a lot of energy, a lot of food, right? Well, it does — it drinks a lot of nectar from flowers and feeds on some insects — but it's energy-efficient, too. You can't say it isn't. I mean, as it flies all the way across the Gulf of Mexico, it uses up almost none of its body fat.

But that doesn't mean it doesn't need to eat! So hummingbirds have to rely on plants in their natural habitat. And it goes without saying, but… well, the opposite is true as well. Plants depend on hummingbirds too. There are some flowers that can only be pollinated by the hummingbird. Without it stopping to feed and spreading pollen from flower to flower, these plants would cease to exist!

But, the problem, well…as natural habitat along these migration routes is developed by humans for housing or agriculture, or, um, cleared for raising cattle, for instance…there's less food available for migrating hummingbirds. Their nesting sites are affected too…the same, by the same sorts of human activities. And all of these activities pose a real threat to the hummingbird population. So, to help them survive, we need to preserve their habitats…

And one of the concrete ways people have been doing this is by cleaning up polluted habitat areas…and then replanting flowers, uh, replanting native flowers that hummingbirds feed on. Promoting ecological tourism is another …way to help save their habitat. As the number of visitors — ecotourists who come to hummingbird habitats to watch the birds—the more the number of visitors grows, the more local businesses profit. So ecological tourism can bring financial rewards. All the more reason to value these beautiful little creatures and their habitat, right?

But to understand more about how to protect and support hummingbirds the best we can, we've gotta learn more about their breeding… nesting… sites and migration routes—and also about the natural habitats we find there. That should help us determine how to prevent further decline in the population. A good research method…a good way to learn more…is by, um, running a banding study.

Banding the birds allows us to track them over their lifetime. It's a practice that's been used by researchers for years. In fact, most of what we know about hummingbirds comes from banding studies…where we, uh, capture a hummingbird and make sure all the information about it — like…its weight and, um, age and length — are all recorded… put into international… an international information database.

And, then we place an extremely lightweight band around one of its legs…well, what looks like a leg—although, technically it's considered part of the bird's foot. Anyway, these bands are perfectly safe and some hummingbirds have worn them for years with no evidence of any problems. The band is labeled with a tracking number…Oh, and there's a phone number on the band for people to call, for free, to report a banded bird they've found or recaptured.

So, when a banded bird is recaptured and reported, we learn about its migration route, its growth,…and how long it's been alive…its life span. One recaptured bird had been banded almost 12 years earlier! She's one of the oldest hummingbirds on record. Another interesting thing we've learned is that some hummingbirds, uh, they no longer use a certain route, they travel by a different route to reach their destination. And findings like these have been of interest to biologists and environmental scientists in a number of countries, who are trying to understand the complexities of how changes in a habitat… affect the species in it–species like these hummingbirds.

1.What does the professor mainly discuss?
A. Major changes in the migratory patterns of hummingbirds
B. The adaptation of hummingbirds to urban environments
C. Concern about the reduction of hummingbird habitat
D. The impact of ecotourism on hummingbird populations

2.What does the professor imply might cause a decrease in the hummingbird population?
A. An increase in the ecotourism industry.
B. An increase in the use of land to raise crops and cattle.
C. A decrease in banding studies.
D. A decrease in the distance traveled during migration.

3.What does the professor say people have done to help hummingbirds survive?
A. They have built a series of hummingbird feeding stations.
B. They have supported new laws that punish polluters of wildlife habitats.
C. They have replanted native flowers in once polluted areas.
D. They have learned to identify various hummingbird species.

4.What way of collecting information about migrating hummingbirds does the professor mention?
A. Receiving radio signals from electronic tracking devices
B. Being contacted by people who recapture banded birds
C. Counting the birds that return to the same region every year
D. Comparing old and young birds' migration routes

5.What does the professor imply researchers have learned while studying hummingbird migration?
A. Hummingbirds have totally disappeared from some countries due to recent habitat destruction.
B. Programs to replant flowers native to hummingbird habitats are not succeeding.
C. Some groups of hummingbirds have changed their migration patterns.
D. Some plant species pollinated by hummingbirds have become extinct.

6.What does the professor imply when she say this: **So hummingbirds have to rely on plants in their natural habitat. And it goes without saying, but… well, the opposite is true as well. Plants depend on hummingbirds too.**
A. There is disagreement about the idea she has presented.
B. She does not plan to discuss all the details.
C. Her next point may seem to contradict what she has just said.
D. The point she will make next should be obvious to the students.

Lecture 02 Jean Painlevé

Narrator: Listen to part of a lecture in a film history class.

MALE PROFESSOR: Okay, we've been discussing film in the 1920s and 30s, and, ah, how back then, film categories as we know them today had not yet been established. Ah, we said that, by today's standards, many of the films of the 20s and 30s would be considered "hybrids," that is, a mixture of styles that wouldn't exactly fit into any of today's categories. And in that context, today we're going to talk about a, a filmmaker who began making very unique films in the late 1920s. He was French, and his name was Jean Painlevé. Jean Painlevé was born in 1902. He made his first film in 1928. Now in a way, Painlevé's films conform to norms of the 20s and 30s; that is, they don't fit very neatly into the categories we use to classify films today. That said, even by the standards of the 20s and 30s, Painlevé's films were a unique hybrid of styles.

He had a special way of fusing—or some people might say confusing—science and fiction; his films begin with facts, but then they become more and more fictional, they gradually add more and more fictional elements. In fact, Painlevé was known for saying that "science is fiction."

Painlevé was a, a pioneer in underwater filmmaking, and a lot of his short films focus on the aquatic animal world. He liked to show small underwater creatures displaying what seemed like familiar human characteristics—what we think of as unique to humans. He might take a clip of a mollusk going up and down in the water and set it to music, you know, to make it look as if the mollusk were dancing to the music like a human being. That sort of thing. But then he'd suddenly change the image or narration to remind us how different the animals are, how unlike humans. He confused his audience in the way he portrayed the animals he filmed, mixing up our notions of the categories "human" and "animal."

The films make us a little uncomfortable at times because we're uncertain about what we're seeing. It gives his films an uncanny feature…the familiar made unfamiliar, the normal made suspicious. He liked twists, he liked the unusual. In fact, one of his favorite sea animals was the sea horse because with sea horses, it's the male that carries the eggs. And he thought that was great. His first and most celebrated underwater film is about the sea horse. Susan? You have a question?

FEMALE STUDENT: But underwater filmmaking wasn't that unusual, was it? I mean, weren't there other people making movies underwater?

MALE PROFESSOR: Well, actually it was pretty rare at that time. I mean, we're talking the early 1930's here.

FEMALE STUDENT: But what about Jacques Cousteau? Wasn't he like an innovator, you know, with underwater photography, too?

MALE PROFESSOR: Ah, Jacques Cousteau. Well, Painlevé and Cousteau did both film underwater, and they were both innovators, so you're right in that sense, but that's pretty much where the similarities end. First of all, Painlevé was about 20 years ahead of Cousteau…

Um, and Cousteau's adventures were high-tech, with lots of fancy equipment, whereas Painlevé kind of patched equipment together as he needed it. … Uh, Cousteau usually filmed large animals, usually in the open sea, whereas Painlevé generally filmed smaller animals; and, and he liked to film in shallow water.

Uh, what else? Well the main difference was that Cousteau simply investigated and presented the facts; he, he didn't mix in fiction. He was a strict documentarist; he set the standard, really, for the nature documentary. Painlevé, on the other hand, as we said before, mixed in elements of fiction, and his films are much more artistic, incorporating music as an important element. John, you have a question?

MALE STUDENT: Well, maybe I shouldn't be asking this…Uh, but if Painlevé's films are so special, so good, why haven't we ever heard of them? I mean, everyone's heard of Jacques Cousteau. …

MALE PROFESSOR: Well, that's a fair question. Uh, the short answer is that Painlevé's style just never caught on with the general public. I mean it probably goes back, at least in part, to what we mentioned earlier, that, that people didn't know what to make of his films, that they were confused by them. Whereas Cousteau's documentaries were very straightforward, met people's expectations more than Painlevé's films did. But your true film history buffs know about him, and Painlevé's still highly respected in many circles.

1.What is the main purpose of the lecture?
A. To discuss the style of an early filmmaker
B. To describe different types of filmmaking in the 1930s
C. To discuss the emergence of the documentary film
D. To describe Painlevé's influence on today's science-fiction films

2.Why are Painleve's films typical of the films of the 1920s and 1930s?
A. They do not have sound.
B. They are filmed underwater.
C. They are easy to understand.
D. They difficult to categorize.

3.According to the professor, how did Painlevé's film confuse the audience?
A. They show animals out of their natural habitat.
B. They depict animals as having both human and animal characteristics.
C. The narration is scientific and difficult to understand.
D. The audiences of the 1920s and 1930s were not used to films shot underwater.

4.Why does the professor mention sea horses?
A. To explain that they were difficult to film in the 1930s
B. To point out that Cousteau made documentaries about them
C. To illustrate Pianlevé's fascination with unusual animals
D. To explain why Painlevé's underwater films were not successful

5.Why does the professor compare the film style of Jacques Cousteau and Jean Painleve?
A. To explain how Painlevé influenced Cousteau
B. To emphasize the uniqueness of Painlevé's filming style
C. To emphasize the artistic value of Cousteau's documentary films
D. To demonstrate the superiority of Painlevé's filmmaking equipment

6.What does the student imply when he say this:

Well, maybe I shouldn't be asking this, but if Painlevé's films are so special, so good, why haven't we ever heard of him? I mean, everyone's heard of Jacques Cousteau.

A. He does not like Jean Painleve's films.
B. He thinks that the professor should spend more time discussing Jacques Cousteau's film.
C. He believes that high quality filmmakers are usually well known.
D. He believes that Jean Painleve's film have been unfairly overlooked.

Lecture 03 Chauvet Paintings

Narrator: Listen to part of a lecture in an art history class. The professor has been discussing the origins of art.

MALE PROFESSOR: Some of the world's oldest preserved art is the cave art of Europe, most of it in Spain and France. And, uh, the earliest cave paintings found to date are those of the Chauvet cave in France, discovered in 1994. And, you know, I remember when I heard about the results of the dating of the Chauvet paintings. I said to my wife, "Can you believe these paintings are over 30,000 years old?" and my three-year-old daughter piped up and said, "Is that older than my great-grandmother?"But, uh, that was the oldest age she knew.

And, you know, come to think of it, it's pretty hard for me to really understand how long 30,000 years is too. I mean, we tend to think the people who lived at that time must have been pretty primitive..., but I'm gonna show you some slides in a few minutes, and I think you'll agree with me that this art is anything but primitive—they're masterpieces. And they look so real, so alive, that it's very hard to imagine that they're so very old.

Now, not everyone agrees on exactly how old. A number of the Chauvet paintings have been dated—by a lab—to 30,000 or more years ago. That would make them not just older that any other cave art, but about twice as old as the art in the caves at Altamira or Lascaux, which you may have heard of.

Some people find it hard to believe Chauvet is so much older than Altamira and Lascaux, and they noted that only one lab did the dating for Chauvet, without independent confirmation from any other lab. But be that as it may, whatever the exact date, whether it's 15,000, 20,000, or 30,000 years ago, the Chauvet paintings are from the dawn of art, so they're a good place to start our discussion of cave painting.

Now, one thing you've gotta remember is the context of these paintings. Paleolithic humans — that's the period we're talking about here, the Paleolithic, the early Stone Age, not too long after humans first arrived in Europe. The climate was significantly colder then, and so rock shelters—shallow caves—were valued as homes protected from the wind and rain.

And in some cases at least, artists drew on the walls of their homes. But many of the truly great cave art sites—like Chauvet—were never inhabited. These paintings were made deep inside a dark cave, where no natural light can penetrate. There's no evidence of people ever living here—cave bears, yes, but not humans. You would have had to make a special trip into the cave to make the paintings, and a special trip to go see it, and each time you'd have to bring along torches to light your way. And people did go see the art—there's charcoal marks from their torches on the cave walls, clearly dating from thousands of years after the paintings were made—so we can tell people went there. They came, but they didn't stay. Deep inside a cave like that is not really a place you'd want to stay, so, uh, why? What inspired the Paleolithic artists to make such beautiful art in such inaccessible places? We'll never really know, of course, though it's interesting to speculate.

But, uh, ... getting to the paintings themselves. Virtually all Paleolithic cave art represents animals, and Chauvet is no exception. The artists were highly skilled at using—or even enhancing—the natural shape of the cave walls

to give depth and perspective to their drawings. The sense of motion and vitality in these animals—well, wait till I show you the slides.

Anyway, most Paleolithic cave art depicts large herbivores. Horses are most common overall, with deer and bison pretty common too. Probably animals they hunted. But earlier, at Chauvet, there's a significant interest in large, dangerous animals. Lots of rhinoceros, lions, mammoths, bears ... remember that the ranges of many animal species were different back then, so all these animals actually lived in the region at that time— but, uh, the Chauvet artists didn't paint people. There's a half-man, half-bison creature, and there's outlines of human hands, but no depiction of a full human. So, why these precise animals? Why not birds, ... fish, ... snakes? Was it for their religion? Magic? Or sheer beauty? We don't know, but whatever it was, it was worth it to them to spend hours deep inside a cave, with just a torch between them and utter darkness. So ..., on that note, let's dim the lights so we can see these slides and actually look at the techniques they used.

1.What does the professor mainly discuss?
A. The oldest known cave art
B. How ancient cave art is dated
C. The homes of Paleolithic humans
D. How Paleolithic humans thought about animals

2.Why does the professor mention his daughter?
A. To describe her reaction to seeing the paintings
B. To explain the universal appeal for the Chauvet paintings
C. To demonstrate the size of most Paleolithic cave art
D. To emphasize his point about the age of the Chauvet paintings

3.What is the professor's opinion about the art at the Chauvet cave?
A. It is extremely well done.
B. It probably reflected artists' religious beliefs.
C. It is less sophisticated than the art at Lascaux and Altamira.
D. It is probably not much older than the are at Lascaux and Altamira.

4.According to the professor,what is the significance of charcoal marks on the walls of the Chauvet cave?
A. They suggest that Paleolithic people cooked their food in the cave.
B. They prove that people came to the cave long after the paintings were made.
C. They show how much light the Paleolithic artists needed for their work.
D. They were used in recent times to date the paintings.

5.Compared to other Paleolithic art, what is unusual about the animals painted at Chauvet?
A. Most of them are horses.
B. Many of them are dangerous.
C. Many of them are shown alongside humans.
D. All of them are species that are still found in France.

6.What are two questions about the Chauvet cave artists that the professor raises but cannot answer? [Click on two answers.]
A. How they lighted their work area
B. How they obtained pigments for their paints
C. Why they chose to paint certain animals and not others
D. Why they placed their art in dark,uninhabited places

Lecture 04 Spectroscopy

Narrator: Listen to part of a lecture in an astronomy class.

MALE PROFESSOR: Now astronomy didn't really, uh, balloon, into the science it is today until the development of spectroscopy. Spectroscopy is basically the study of spectra and spectral lines of light, and specifically for us, the light from stars. It makes it possible to analyze the light emitted from stars. When you analyze this light you can figure out their distance from the Earth and identify what they're made of—determine their chemical composition.

Before we get into that, though, it's probably a good thing to back up a bit. You all know how when you take a crystal prism and pass a beam of sunlight through it, you get a spectrum which looks like a continuous band of rainbow colors. The light that we see with our human eyes as a band of rainbow color falls in the range of what's called visible light. And visible light spectroscopy is probably the most important kind of spectroscopy. Anyone wanna take a stab at the scientific term for visible light… and I'm sure all of you know this because you all did the reading for today…

FEMALE STUDENT: Optical radiation. But I thought being exposed to radiation's dangerous.

MALE PROFESSOR: Yes and no. If you're talking about radiation like in the element uranium, yeah, that's dangerous, but radiation as a general term actually refers to anything that spreads away from its source, so optical radiation is just visible light energy spreading out.

OK, so we've got a spectrum of a beam of sunlight and it looks like the colors bleed into each other, uh, there're no interruptions, just a band flowing from violet to green to yellow to…you get the idea. Well what happens if the sunlight spectrum is magnified? [pause - then slightly under breath] Maybe you all didn't do the reading. Well here's what you'd see: I want you to notice that this spectrum is interrupted by dark lines, called spectral lines.

If you really magnified the spectrum of the sunlight, you could identify more than a hundred thousand of 'em. They may look kinda randomly placed, but they actually form many distinct patterns. And if you were looking at the spectrum of some other star, the colors would be the same, but the spectral lines would break it up at different places, making different patterns. Each pattern stands for a distinct chemical element, and so different sets or patterns of spectral lines mean that the star has a different chemical composition.

FEMALE STUDENT: So, how do we know which spectral patterns match up with which elements?

MALE PROFESSOR: Well, a kind of spectroscopic library of elements was compiled using flame tests. A known element, uh, say a piece of iron for example, is heated in a pure gas flame. The iron eventually heats to the point that it radiates light. This light is passed through a prism, which breaks it up into a spectrum, and a unique pattern, kind of like a chemical fingerprint, of spectral lines for that element appears.

This process was repeated over and over again for many different elements. So we can figure out the chemical makeup of another star by comparing the spectral pattern it has to the pattern of the elements in the library. Oh! An interesting story about how one of the elements was discovered through spectroscopy. There was

a pretty extensive library of spectral line patterns of elements even by the 1860's.

A British astronomer was analyzing a spectrograph of sunlight and he noticed a particular pattern of spectral lines that didn't match anything in the library. So, he put two and two together and decided there was an element in the Sun that hadn't been discovered here on the Earth yet. Any guesses about what that element is? It's actually turned out to be pretty common and I'm sure all of you know it. OK. Let's try something else…Any of you happen to be familiar with the Greek word for sun, by chance?

MALE STUDENT: Something like helios or something like that? Oh! It must be helium. So you're sayin' that helium was discovered on the Sun first?

MALE PROFESSOR: Yes. And this is a good example of how important spectroscopy is in astronomy.

1.What is the lecture mainly about?
A. Different ways of magnifying the spectrum of a star
B. How a chemical element was first discovered on the Sun
C. How astronomers identify the chemical elements in a star
D. Why the spectra of different stars are composed of different colors

2.What does the professor explain to one of the students about the term “radiation”?
A. It is defined incorrectly in the textbooks.
B. It was first used in the nineteenth century.
C. It is rarely used by astronomers.
D. It does not refer only to harmful energy.

3.What can be inferred about two stars if their spectra have similar spectral line patterns?
A. The stars are approximately the same distance from the Earth.
B. The stars probably have some chemical elements in common.
C. The stars have nearly the same brightness.
D. The stars are probably of the same size.

4.According to the professor,what is the purpose of heating an element in a spectroscopic flame test?
A. To cause an element to emit light
B. To study an element in combination with other elements
C. To remove impurities from the element
D. To measure an element's resistance to heat

5.Why does the professor say this?
MALE PROFESSOR: Before we get into that, though, it's probably a good thing to back up a bit. You all know how when you take a crystal prism and pass a beam of sunlight through it, you get a spectrum which looks like a continuous band of rainbow colors.
A. He is about to provide some background information.
B. He is about to repeat what he just said.
C. He intends to focus on the history of astronomy.
D. He intends to explain two different points of view.

6.Why does the professor ask this?
MALE PROFESSOR: It's actually turned out to be pretty common and I'm sure all of you know it. OK. Let's try something else…Any of you happen to be familiar with the Greek word for sun, by chance?
A. To check the students' understanding of their reading assignment.
B. To give the students a hint to the answer to his previous question.
C. To emphasize how important it is for astronomers to study Greek.
D. To remind the students about the historical background of astronomy.

TPO 04

Lecture 01 Displacement Activity

Narrator: Listen to part of a lecture in a biology class. The class is discussing animal behavior.

FEMALE PROFESSOR: OK, the next kind of animal behavior I want to talk about might be familiar to you. You may have seen, for example, a bird that's in the middle of a mating ritual. And, and suddenly it stops and preens--you know, it takes a few moments to straighten its feathers--and then returns to the mating ritual. This kind of behavior-- this doing something that seems completely out of place--is what we call a displacement activity.

Displacement activities are activities that animals engage in when they have conflicting drives—if, we take our example from a minute ago—if, if the bird is afraid of its mate, it's conflicted, it wants to mate, but it's also afraid and wants to run away, so instead it starts grooming itself. So the displacement activity, the, the grooming, the straightening of its feathers seems to be an irrelevant behavior. So what do you think another example of a displacement activity might be?

MALE STUDENT: How about an animal that, um, instead of fighting its enemy or running away, it attacks a plant or a bush?

FEMALE PROFESSOR: That's a really good suggestion, Carl, but that's called redirecting. The animal is redirecting its behavior to another object, in this case, the plant or the bush. But that's not an irrelevant or inappropriate behavior—the behavior makes sense—it's appropriate under the circumstances, but what doesn't make sense is the object the behavior's directed toward. OK, who else? Carol?

FEMALE STUDENT: I think I read in another class about an experiment, um, where an object that the animal was afraid of was put next to its food—next to the animal's food—and the animal, it was conflicted between confronting the object, and eating the food, so instead it just fell asleep. Like that?

FEMALE PROFESSOR: That's exactly what I mean. Displacement occurs because the animal's got two conflicting drives, two competing urges, in this case, fear and hunger—and what happens is they inhibit each other—they cancel each other out in a way, and a third, seemingly irrelevant behavior surfaces … through a process that we call disinhibition. Now, in disinhibition, the basic idea is that two drives that seem to inhibit, to hold back a third drive.

Or well, they get in the way of each other in a, in a conflict situation, and somehow lose control, lose their inhibiting effect on that third behavior…wh-which means that the third drive surfaces...it-it's expressed in the animal's behavior. Now, these displacement activities can include feeding, drinking, grooming, even sleeping. These are what we call "comfort behaviors." So why do you think displacement activities are so often comfort behaviors, such as grooming?

MALE STUDENT: Maybe because it's easy for them to do—I mean, grooming is like one of the most accessible things an animal can do—it's something they do all the time, and they have the–the stimulus right there, on the outside of their bodies in order to do the grooming—or if food is right in front of them. Basically, they don't have to think very much about those behaviors.

FEMALE STUDENT: Professor, isn't it possible that animals groom because they've gotten messed up a little from fighting or mating? I mean, if a bird's feathers get ruffled, or an animal's fur—maybe it's not so strange for them to stop and tidy themselves up at that point.

FEMALE PROFESSOR: That's another possible reason, although it doesn't necessarily explain other behaviors such as eating, drinking, or sleeping. What's interesting is that studies

have been done that suggest that the animal's environment may play a part in determining what kind of behavior it displays.

For example, there's a bird–the wood thrush, anyway when the wood thrush is in an attack-escape conflict—that is, it's caught between the two urges to escape from or attack an enemy—if it's sitting on a horizontal branch, it'll wipe its beak on its perch. If it's sitting on a vertical branch, it, um, will groom its breast feathers. The immediate environment of the bird—its immediate, um, its relationship to its immediate environment seems to play a part in which behavior it will display.

1.What is the lecture mainly about?
A. Methods of observing unusual animal behavior
B. A theory about ways birds attract mates
C. Ways animals behave when they have conflicting drives
D. Criteria for classifying animal behaviors

2.Indicate whether each of the activities below describes a displacement activity. [Click in the correct boxes.]

	Yes	No
An animal attacks the ground instead of its enemy		
An animal falls asleep in the middle of a mating ritual		
An animal eats some food when confronted by it enemy		
An animal takes a drink of water after grooming itself		

3.What does the professor say about disinhibition?
A. It can prevent displacement activities from occurring.
B. It can cause animals to act on more than one drive at a time.
C. It is not useful for explaining many types of displacement activities.
D. It is responsible for the appearance of seemingly irrelevant behavior.

4.According to the lecture, what is one possible reason that displacement activities are often grooming behaviors?
A. Grooming may cause an enemy or predator to be confused.
B. Grooming is a convenient and accessible behavior.
C. Grooming often occurs before eating and drinking.
D. Grooming is a common social activity.

5.Why does the professor mention the wood thrush?
A. To contrast its displacement activities with those of other animals species
B. To explain that some animals display displacement activities other than grooming
C. To point out how displacement activities are influenced by the environment
D. To give an example of an animal that does not display displacement activities

6.What does the professor mean when she says this?

FEMALE PROFESSOR:So what do you think another example of a displacement activity might be?

MALE STUDENT: How about an animal that, um, instead of fighting its enemy or running away, it attacks a plant or a bush?

FEMALE PROFESSOR: That's a really good suggestion, Carl, but that's called redirecting.

A. She is impressed by how much the student knows about redirecting.
B. She thinks it is time to move on to the next part of this lectures.
C. The student’s answer is not an example of a displacement activity.
D. The student should suggest a different animal behavior to discuss next.

Lecture 02 Emerson's Self-reliance

Narrator: Listen to part of a lecture in a literature class.

MALE PROFESSOR: Alright, so let me close today's class with some thoughts to keep in mind while you're doing tonight's assignment. You'll be reading one of Ralph Waldo Emerson's best-known essays, Self-Reliance, and comparing it with his poems and other works. I think this essay has the potential to be quite meaningful for all of you—as young people who probably wonder about things like truth, and where your lives are going … all sorts of profound questions.

Knowing something about Emerson's philosophies will help you when you read Self-Reliance. And basically, one of the main beliefs that he had, was about truth. Not that it's something that we can be taught... Emerson says it's found within ourselves. So this truth... the idea that it's in each one of us... is one of the first points that you'll see Emerson making in this essay. It's a bit abstract, but he's very into, ah, into each person believing his or her own thought. Believing in yourself, the thought or conviction that's true for you.

But actually, he ties that in with a sort of universal truth, something that everyone knows but doesn't realize they know. Most of us aren't in touch with ourselves, in a way, so we just aren't capable of recognizing profound truths. It takes geniuses... people like, say, Shakespeare, who are unique because when they have a glimpse of this truth—this universal truth—they pay attention to it and express it, and don't just dismiss it like most people do. So, Emerson is really into each individual believing in, and trusting, him or herself.

You'll see that he writes about... well, first, conformity. He criticizes the people of his time, for abandoning their own minds and their own wills for the sake of conformity and consistency. They try to fit in with the rest of the world, even though it's at odds with their beliefs and their identities. Therefore, it's best to be a nonconformist—to do your own thing, not worrying about what other people think. That's an important point—he really drives this argument home throughout the essay.

When you're reading I want you to think about that, and why that kind of thought would be relevant to the readers of his time. Remember, this is 1838. Self-reliance was a novel idea at the time, and United States citizens were less secure about themselves as individuals and as Americans.

The country as a whole was trying to define itself. Emerson wanted to give people something to really think about. Help them find their own way and ah, what it meant to be who they were. So, that's something that I think is definitely as relevant today as it was then... probably, uh... especially among young adults like yourselves. You know, uh, college being a time to sort of really think about who you are and where you're going.

Now, we already said that Emerson really emphasized nonconformity, right? As a way to sort of not lose your own self and identity in the world? To have your own truth and not be afraid to listen to it? Well, he takes it a step further. Not conforming also means, ah, not conforming with yourself, or your past.

What does that mean? Well, if you've always been a certain way, or done a certain thing, but it's not working for you anymore, or you're not

content—Emerson says that it'd be foolish to be consistent even with our own past. Focus on the future, he says: that's what matters more. Inconsistency is good!

He talks about a ship's voyage—and this is one of the most famous bits of the essay—how the best voyage is made up of zigzag lines. Up close, it seems a little all over the place, but from farther away the true path shows, and in the end it justifies all the turns along the way. So, don't worry if you're not sure where you're headed or what your long term goals are—stay true to yourself and it'll make sense in the end. I mean, I can attest to that. Before I was a literature professor, I was an accountant. Before that, I was a newspaper reporter. My life has taken some pretty interesting turns, and here I am, very happy with my experiences and where they've brought me. If you rely on yourself and trust your own talents, your own interests, don't worry. Your path will make sense in the end.

1.What is the main purpose of the lecture?
A. To point out similarities in Emerson's essays and poems
B. To prepare the students to read an essay by Emerson
C. To compare Emerson's concept of universal truth to that of other authors
D. To show the influence of early United States society on Emerson's writing

2.On what basis did Emerson criticize the people of his time?
A. They refused to recognize universal truths.
B. They did not recognize the genius of certain authors.
C. Their convictions were not well-defined.
D. They were too interested in conformity.

3.What does Emerson say about the past?
A. It should guide a person's present actions.
B. It must be examined closely.
C. It is less important than the future.
D. It lacks both clarity and universal truth.

4.What point does the professor make when he mentions a ship's path?
A. It is easy for people to lose sight of their true path.
B. Most people are not capable of deciding which path is best for them.
C. The path a person takes can only be seen clearly after the destination has been reached.
D. A person should establish a goal before deciding which path to take.

5.What does the professor imply about himself when he recounts some life experiences he had before becoming a literature professor? [Click on 2 answers.]
A. He did not consider the consequences of his decisions.
B. He did not plan to become a literature professor.
C. He has always tried to act consistently.
D. He has trusted in himself and his decisions.

6.Why does the professor say this？

Remember, this is 1838. Self-reliance was a novel idea at the time, and United States citizens were less secure about themselves as individuals and as Americans.

A. To suggest that United States citizens have not changed much over time.
B. To encourage the class to find more information about this time period.
C. To explain why Emerson's essay has lost some relevance.
D. To provide background for the concept he is explaining.

Lecture 03 Moving Rocks

Narrator: Listen to part of a lecture in a geology class.

MALE PROFESSOR: Now, we've got a few minutes before we leave for today. So I'll just touch on an interesting subject that I think makes an important point. We've been covering rocks, and different types of rocks, for the last several weeks, but next week we're going to do something a bit different. And to get started I thought I'd mention something that shows how, uhh, as a geologist, you need to know about more than just rocks and the structure of solid matter. Moving rocks. You may have heard about them. It's quite a mystery.

Death Valley is this desert plain...a dry lakebed in California, surrounded by mountains, and on the desert floor are these huge rocks... some of them hundreds of pounds... and they move! They leave long trails behind them—tracks you might say—as they move from one point to another. But nobody has been able to figure out how they're moving because no one has ever seen it happen.

Now there are a lot of theories, but all we know for sure is that people aren't moving the rocks. There're no footprints, no tire tracks, and no heavy machinery—like a bulldozer, umm nothing was ever brought in to move these heavy rocks. So what's going on?

Theory number one: wind. Some researchers think powerful, um, windstorms might move the rocks. Most of the rocks move in the same direction as the dominant wind pattern, from southwest to northeast. But some, and this is interesting, move straight west, while some zigzag... or even move in large circles. Hmmm... how can that be? How 'bout wind combined with rain? The ground of this desert is made of clay. It's a desert, so it's dry. But when there is the occasional rain, the clay ground becomes extremely slippery. It's hard for anyone to stand on, walk on.

Some scientists theorize that perhaps when the ground is slippery, the high winds can then move the rocks. There's a problem with this theory. One team of scientists flooded an area of the desert with water, then tried to establish how much wind force would be necessary to move the rocks. And get this, you need winds of at least 500 miles an hour to move just the smallest rocks, and winds that strong have never been recorded, ever, not on this planet. So I think it's safe to say that that issue's been settled.

Here's another possibility. Ice. It's possible that rain on the desert floor could turn to thin sheets of ice when temperatures drop at night. So, if rocks uh become embedded in ice, uh, OK, could a piece of ice with rocks in it be pushed around by the wind? But there's a problem with this theory too. Rocks trapped in ice together would have moved together when the ice moved. But that doesn't always happen. The rocks seem to take separate routes.

There are a few other theories. Maybe the ground vibrates, or maybe the ground itself is shifting, tilting. Maybe the rocks are moved by a magnetic force. But sadly, all these ideas have been eliminated as possibilities. There's just no evidence. I bet you're saying to yourself, well, why don't scientists just set up video cameras to record what actually happens?

Thing is, this is a protected wilderness area, so by law, that type of research isn't allowed. Besides, in powerful windstorms, sensitive camera equipment would be destroyed. So why

can't researchers just live there for a while until they observe the rocks moving? Same reason. So where are we now? Well, right now we still don't have any answers.

So all this leads back to my main point. You need to know about more than just rocks as geologists. The researchers studying moving rocks, well they combined their knowledge of rocks with knowledge of wind, ice, and such, uhh not successfully, not yet, but y'know... they wouldn't even have been able to get started without, umm... earth science understanding. Knowledge about wind, storms... you know, meteorology. You need to understand physics. So for several weeks, like I said, we'll be addressing geology from a wider perspective. I guess that's all for today. See you next time.

1.What does the professor mainly discuss?
A. His plans for research involving moving rocks
B. A difference between two geological forces that cause rocks to move
C. Theories about why desert rocks move
D. Reasons why geologists should study moving rocks

2.According to the professor, what have the researchers agreed on?
A. The rocks cannot move after ice storms.
B. The rocks do not move at night.
C. The rocks never move in circles.
D. The rocks are not moved by people.

3.The professor mentions experiments on the wind speed necessary to move rocks. What is the professor's attitude toward the experiments?
A. Their results were decisive.
B. They were not carried out carefully.
C. They were not continued long enough to reach a conclusion.
D. The government should not have allowed the experiments.

4.What important point does the professor make about the area where the rocks are found?
A. It has been the site of Earth's highest wind speeds.
B. It is subject to laws that restrict experimentation.
C. It is accessible to heavy machinery.
D. It is not subject to significant changes in temperature.

5.What is the professor's purpose in telling the students about moving rocks?
A. To teach a lesson about the structure of solid matter
B. To share a recent advance in geology
C. To give an example of how ice can move rocks
D. To show how geologists need to combine information from several fields

6.What does the professor imply when he says this:

Most of the rocks move in the same direction as the dominant wind pattern, from southwest to northeast. But some, and this is interesting, move straight west, while some zigzag... or even move in large circles. Hmmm... how can that be?

A. The movement pattern of the rocks was misreported by researchers.
B. The rocs are probably being moved by people.
C. The movement pattern of the rocks does not support the wind theory.
D. There must be differences in the rocks' composition.

Lecture 04 Government Support for Arts

Narrator: Listen to part of a lecture in a United States government class.

FEMALE PROFESSOR: OK, last time we were talking about government support for the arts. Who can sum up some of the main points?

MALE STUDENT: Well, I guess there wasn't really any, you know, official government support for the arts until the twentieth century. But the first attempt the United States government made to, you know, to support the arts was the Federal Art Project.

FEMALE PROFESSOR: Right. So, what can you say about the project?

MALE STUDENT: Uh, it was started during the Depression, uh in the 1930's, to employ out-of-work artists.

FEMALE PROFESSOR: So was it successful? Janet? What do you say? Scene 12:

FEMALE STUDENT: Yeah, sure, it was successful—I mean, for one thing, the project established a lot of, like, community art centers and, uh, galleries in places like rural areas where people hadn't really had access to the arts.

MALE STUDENT: Yeah, but didn't the government end up wasting a lot of money for art that wasn't even very good?

FEMALE PROFESSOR: Uh, some people might say that, but wasn't the primary objective of the Federal Art Project to provide jobs?

MALE STUDENT: That's true. I mean it did provide jobs for thousands of unemployed artists.

FEMALE PROFESSOR: Right, but then, when the United States became involved in the Second World War, unemployment was down, and it seemed that these programs weren't really necessary any longer. So, moving on... we don't actually see any govern—er, well, any real government involvement in the arts again until the early 1960's, when President Kennedy and other politicians started to push for major funding to support and promote the arts.

It was felt by a number of politicians that, well, that the government had a responsibility to... to support the arts as sort of, what can we say, the soul, or spirit of the country. The idea was that there'd be a federal subsidy, uh, financial assistance to artists and artistic or cultural institutions. And for just those reasons, in 1965, the National Endowment for the Arts was created. So, it was through the NEA, the National Endowment for the Arts, uh, that the arts would develop, would be promoted throughout the nation.

And then, individual states throughout the country started to establish their own state arts councils to help support the arts. There was kind of a cultural explosion—and by the mid-1970's, by 1974, I think, all 50 states had their own arts agencies, their own states arts councils that worked with the federal government, with corporations, artists, performers, you name it.

MALE STUDENT: Did you just say corporations? How were they involved?

FEMALE PROFESSOR: Well, you see, corporations aren't always altruistic, they might not support the arts unless . . . well, unless the government made it attractive for them to do so, by offering corporations tax incentives to support the arts—that is by letting corporations pay less in taxes if they were patrons of the arts.

Uh, the Kennedy Center in Washington, D.C., you may, maybe you've been there, or Lincoln Center in New York? Both of these were built with substantial financial support from corporations. And the Kennedy and Lincoln centers aren't the only examples—many of your cultural establishments in the United States will have a plaque somewhere acknowledging the support, the money, they've received from whatever corporation. Yes, Janet?

FEMALE STUDENT: But aren't there a lot of people who don't think it's the government's role to support the arts?

FEMALE PROFESSOR: Well, as a matter of fact, a lot of politicians who did not believe in government support for the arts, wanted to do away with the

agency entirely for that very reason—to get rid of governmental support—but they only succeeded in taking away about half the annual budget. And as far as the public goes... Well, there are about as many individuals who disagree with government support as there are those who agree—in fact, with artists in particular, you have lots of artists who support—and who have benefitted from—this agency, al–although it seems that just as many artists oppose a government agency being involved in the arts for many different reasons—reasons like they don't want the government to control what they create. In other words... the arguments both for and against government funding of the arts are as many and, and as varied as the individual styles of the artists who hold them.

1.What is the lecture mainly about?
A. Reasons the United States government should not support the arts
B. The history of government support for the arts in the United States
C. Strengths and weaknesses of different government-sponsored arts programs
D. Different ways in which governments can help support artists

2.According to the talk, in what two ways was the Federal Art Project successful? *[Click on 2 answers.]*
A. It established standards for art schools.
B. It provided jobs for many artists.
C. It produced many excellent artists.
D. It gave many people greater access to the arts.

3.The class discusses some important events related to government support for the arts in the United States. Put the events in order from earliest to latest. *[Drag each sentence to the space where it belongs. The first one is done for you.]*
A.Arts councils were established in all 50 states of the country.
B.The federal budget supporting the arts was reduced by half.
C.The Federal Art Project helped reduce unemployment.
D.The National Endowment for the Arts was established.

4.Why does the professor mention the Kennedy Center and Lincoln Center?
A. To give example s of institutions that benefit from corporate support
B. To illustrate why some artists oppose the building of cultural centers
C. To show how two centers were named after presidents who supported the arts
D. To name two art centers built by the government during the Depression

5.What does the professor say about artists' opinions of government support for the arts?
A. Most artists believe that the government should provide more funding for the art.
B. Most artists approve of the ways in which the government supports the arts.
C. Even artists do not agree on whether the government should support the arts.
D. Even artists have a low opinion of government support for the arts.

6.What does the professor imply when she says this?

MALE STUDENT: Yeah, but didn't the government end up wasting a lot of money for art that wasn't even very good?

FEMALE PROFESSOR: Uh, some people might say that, but wasn't the primary objective of the Federal Art Project to provide jobs?

A. Others students should comment on the man's remark.
B. Most people would agree with the man's opinion.
C. Artwork funded by the government is usually of excellent quality.
D. The government project was not a waste of money.

TPO 05

Lecture 01 Meme

Narrator: Listen to part of a lecture in a sociology class.

FEMALE PROFESSOR: Have you ever heard the one about alligators living in New York sewers? The story goes like this: a family went on vacation in Florida, and bought a couple of baby alligators as presents for their children, then returned from vacation to New York, bringing the alligators home with them as pets.

But the alligators would escape and find their way into the New York sewer system where they started reproducing, grew to huge sizes and now strike fear into sewer workers. Have you heard this story? Well, it isn't true and it never happened, but despite that, the story's been around since the 1930s. Or how about the song "Twinkle, twinkle, little star"? You know "Twinkle, twinkle, little star, how I wonder what you are…" Well, we've all heard this song.

Where am I going with this? Well, both the song and the story are examples of memes, and that's what we'll talk about, the theory of memes. A meme is defined as a piece of information copied from person to person. By this definition, most of what you know… ideas, skills, stories, songs… are memes. All the words you know, all the scientific theories you've learned, the rules your parents taught you to observe… all are memes that have been passed on from person to person.

So what?… you may say. Passing on ideas from one person to another is nothing new… Well, the whole point of defining this familiar process as transmission of memes is so that we can explore its analogy with the transmission of genes. As you know, all living organisms pass on biological information through the genes.

What's a gene? A gene is a piece of biological information that gets copied, or replicated, and the copy, or replica, is passed on to the new generation. So genes are defined as replicators… Genes are replicators that pass on information about properties and characteristics of organisms. By analogy, memes also get replicated and in the process pass on cultural information from person to person, generation to generation. So memes are also replicators.

To be a successful replicator, there are three key characteristics: longevity, fecundity, and fidelity. Let's take a closer look… First, longevity. A replicator must exist long enough to be able to get copied and transfer its information. Clearly, the longer a replicator survives, the better its chances of getting its message copied and passed on. So longevity is a key characteristic of a replicator. If you take the alligator story, it can exist for a long time in individual memory—let's say my memory. I can tell you the story now, or ten years from now. The same with the "Twinkle, twinkle" song. So these memes have longevity, because they're memorable, for one reason or another.

Next, fecundity. Fecundity is the ability to reproduce in large numbers. For example, the common housefly reproduces by laying several thousand eggs. So each fly gene gets copied thousands of times. Memes? Well, they can be reproduced in large numbers as well. How many times have you sung the "Twinkle, twinkle" song to someone? Each time you replicated the song—and maybe passed it along to someone who didn't know it yet, a small child maybe.

And finally, fidelity. Fidelity means accuracy of the copying process. We know fidelity is an essential principle of genetic transmission. If a copy of a gene is a bit different from the original, that's called a genetic mutation, and mutations are usually bad news. An organism often cannot survive with a mutated gene—and so a gene usually cannot be passed on unless it's an exact copy.

For memes, however, fidelity is not always so important. For example, if you tell someone the alligator story I told you today, it probably won't be word for word exactly as I said it. Still, it will be basically the same story, and the person who hears the story will be able to pass it along. Other memes are replicated with higher fidelity, though—like the "Twinkle, twinkle" song?

It had the exact same words twenty years ago as it does now. Well, that's because we see songs as something that has to be performed accurately each time. If you change a word, the others will usually bring you in line. They'll say, "That's not how you sing it," right? So, you can see how looking at pieces of cultural information as replicators, as memes, and analyzing them in terms of longevity, fecundity, and fidelity, we can gain some insight about how they spread, persist, or change.

1.What is the main purpose of the lecture?
A. To introduce a method that can help students remember new information
B. To introduce a way to study how information passes from one person to another
C. To explain the differences between biological information and cultural information
D. To explain the differences between stories, songs, and other pieces of information

2.Why does the professor tell the story about alligators?
A. To explain the difference between true and false stories
B. To draw an analogy between alligator reproduction and cultural transmission
C. To give an example of a piece of information that functions as a meme
D. To show how a story can gradually change into a song

3.According to the professor, which of the following are examples of meme transfer? [Click on 2 answers.]
A. Telling familiar stories
B. Sharing feelings
C. Composing original music
D. Learning a scientific theory

4.What example does the professor give of a meme's longevity?.
A. A story has been changing since it first appeared in the 1930s.
B. A person remembers a story for many years.
C. A gene is passed on through many generations without changing.
D. A song quickly becomes popular all over the world.

5.What does the professor compare to a housefly laying many eggs?
A. A child learning many different ideas from his or her parents
B. Alligators reproducing in New York sewers
C. Different people remembering different versions of a story
D. A person singing the "Twinkle, twinkle" song many times

6.Why does the professor say this?

If you change a word, the others will usually bring you in line. They'll say, 'that's not how you sing it', right?

A. To explain why some memes do not change much.
B. To ask the students for their opinion about songs as memes.
C. To acknowledge a problem with the meme theory.
D. To ask the student to test an idea about memes.

Lecture 02 Moon Landing

Narrator: Listen to part of a lecture in an astronomy class.

MALE PROFESSOR: Last week, we covered some arguments against going back to the Moon. But there are compelling reasons in favor of another Moon landing, too, um, not the least of which is trying to pinpoint the Moon's age. We could do this, in theory, by studying an enormous impact crater known as the South Pole–Aitken Basin. Ah, it's located in the Moon's south polar region. But, since it's on the far side of the Moon, it can be seen only from space.

Here's an image of … we'll call it the SPA Basin. This color-coded image of the SPA Basin—hhh, those aren't its actual colors, obviously—uh, this image is from the mid-nineties, from an American spacecraft called Clementine. Um, unlike earlier lunar missions, Clementine didn't orbit only around the Moon's equator.

Its orbits enabled it to send back data to create this topographical map of… Well, the gray-and-white area toward the bottom is the South Pole. The purples and blues in the middle correspond to low elevations—the SPA Basin itself. Uh, the oranges and reds around it are higher elevations.

The Basin measures an amazing 2,500 kilometers in diameter, and its average depth is 12 kilometers. That makes it the biggest known crater in our solar system. And it may well be the oldest. Y'know, planetary researchers love studying deep craters to learn about the impacts that created them, um, how they redistributed pieces of the planet's crust.

And, in this case, we especially want to know if any of the mantle, the layer beneath the crust, was exposed by the impact. Not everyone agrees, but some experts are convinced that whatever created the SPA Basin did penetrate the Moon's mantle. And we need to find out, because much more than the crust, the mantle contains information about a planet's or moon's total composition. And that's key to understanding planet formation. um, Diane?

FEMALE STUDENT: So the only way to know the Basin's age is to study its rocks directly?

MALE PROFESSOR: Well, from radio survey data, we know that the Basin contains lots of smaller craters. So it must be really old—around 4 billion years, give or take a few hundred million years. But that's not very precise. If we had rock samples to study, we'd know whether these small craters were formed by impacts during the final stages of planetary formation, or if they resulted from later meteor showers.

FEMALE STUDENT: But if we know around how old the Basin is, I'm not sure that's reason enough to go to the Moon again.

MALE PROFESSOR: Oh, but such crude estimates…mm, we can do better than that! Besides, there's other things worth investigating. Like, is there water ice on the Moon? Clementine's data indicated that the wall of a south polar crater was more reflective than expected. So some experts think there's probably ice there. Also, data from a later mission indicate significant concentrations of hydrogen, and by inference, water, less than a meter underground at both poles.

MALE STUDENT: If there's water, how'd it get there? Underground rivers?

MALE PROFESSOR: We think meteors that crashed into the Moon, or tails of passing comets, may have introduced water molecules. Any water molecules that found their way to the floors of craters near the Moon's poles, that water would be perpetually frozen because the floors of those craters are always in shadow. Uh, furthermore, if the water ice was mixed in with rock and dust, it'd be protected from evaporation.

FEMALE STUDENT: So, are you saying there might be primitive life on the Moon?

MALE PROFESSOR: Uh, that's not my point at all! Um, OK, say there is water ice on the Moon. That would be of very practical value for a future Moon base for astronauts. Uh, water ice could be melted and purified for drinking. It could also be broken down into its component parts—oxygen and hydrogen. Oxygen could be used to breathe. And hydrogen could be turned into fuel, rocket fuel. So, water ice could enable the creation of a self-sustaining Moon base someday, a mining camp, perhaps, or, uh, a departure point for further space exploration.

MALE STUDENT: But hauling tons of equipment to the Moon to make fuel and build a life-support system for a Moon base…wouldn't that be too expensive?

MALE PROFESSOR: A permanent base uh, may be a ways off, but we shouldn't have to wait for that. The dust at the bottom of the SPA Basin really does have a fascinating story to tell. What I wouldn't give for a few samples of it!

1.What is the main purpose of the lecture?
A. To explain why scientists disagree about the age of the Moon
B. To present arguments in favor of another Moon landing
C. To explain how scientists discovered a crater on the far side of the Moon
D. To review some finding of a recent mission to the Moon

2.What does the professor imply about the spacecraft Clementine?
A. It sent back the first color photographs of the Moon.
B. It was powered by solar energy.
C. It landed on the far side of the Moon.
D. It flew over the Moon's polar regions.

3.Why does the professor mention the Moon's mantle?
A. To explain why scientists believe that meteor impacts cannot affect the Moon's mantle
B. To explain what kind of information scientists hope to obtain from the mantle
C. To point out that the Moon's crust and mantle are made of similar materials
D. To point out that the Moon's mantle and Earth's mantle have different compositions

4.Why is the South Pole-Aitken Basin thought to be exceptionally old?
A. The walls of the Basin are more reflective than those of most other craters.
B. Testing of rocks from the Basin's floor proves them to be as old as the Moon itself.
C. Many small craters have been detected at the bottom of the Basin.
D. A large amount of dust has been detected in and around the Basin.

5.Why does the professor consider it important to find out if water ice exists on the Moon? [Click on 2 answers.]
A. Water ice could be processed to provide breathable air for astronauts.
B. One component of water ice could be used as a fuel for rockets.
C. Water ice could contain evidence of primitive life on the Moon.
D. Water ice could be tested to find out what type of meteors crashed into the Moon.

6.What does the professor imply when he says this :
FEMALE STUDENT: But if we know around how old the Basin is, I'm not sure that's reason enough to go to the Moon again.

MALE PROFESSOR: Oh, but such crude estimates…
A. The current age estimates for the South Pole-Aitken Basin are based on incorrect assumptions.
B. The technology to analyze Moon rocks has not advanced much since the days of the Moon landings
C. Too few of the original Moon-rock samples were dated accurately
D. Only by testing samples from South Pole-Aitken Basin can its age be precisely determined

Lecture 03 Spectroscopy

Narrator: Listen to part of a lecture in a chemistry class.

MALE PROFESSOR: OK, I know you all have a lot of questions about this lab assignment that's coming up, so I'm gonna take a little time this morning to discuss it. So you know the assignment has to do with spectroscopy, right? And your readings should help you get a good idea of what that's all about. But let's talk about spectroscopy a little now, just to cover the basics.

What is spectroscopy? Well, the simplest definition I can give you is that spectroscopy is [slowly] the study of the interaction between matter and light. Now visible light consists of different colors, or wavelengths, which together make up what's called a spectrum—a band of colors, like you see in a rainbow.

And all substances—all forms of matter—can be distinguished according to what wavelengths of light they absorb and which ones they reflect. It's like—well, every element has what we'd call its own spectral signature; if we can read that signature, we can identify the element. And that's exactly what spectroscopy does.

Now laser spectroscopy, which is the focus of your assignment, works by measuring, very precisely, what parts of the spectrum are absorbed by different substances. And it has applications in a lot of different disciplines. And your assignment will be to choose a discipline that interests you and devise an experiment.

For example, I'm gonna talk about art—I'm interested in art. And to me, it's interesting how spectroscopy is used to analyze art. Let's say a museum curator comes to you with a problem. She's come across this painting that appears to be an original—say a Rembrandt—and she wants to acquire it for her museum. But she's got a problem: She's not absolutely certain it's an original. So what do you do? How do you determine whether the painting's authentic?

OK, think about the scientific process. You've got a question: Is the painting a Rembrandt? So first, you'd need to make a list of characteristics the painting would have to have to be a Rembrandt. Then you have to discover whether the painting in question has those characteristics.

So first of all, you'll need to know the techniques Rembrandt used when he applied paint to canvas—[listing] his brushstrokes, how thickly he applied his paint—so you'd need to work with an art historian who has expert knowledge of Rembrandt's style. You'd have to know when he created his paintings, um, what pigments he used—in other words, what ingredients he used to make different colors of paint. 'Cause the ingredients used in paints and binding agents—plus varnishes, finishes, what have you—have changed over time.

Since you're trying to verify if it's a Rembrandt, the ingredients in the pigment would need to have been used during Rembrandt's lifetime, in the seventeenth century. And that's where chemistry comes in. You've got to find out what's in those pigments—learn their composition. And that requires lab work—detective work, really—in a word, spectroscopy. So how do we use spectroscopy? Well, we put an infrared microscope—a spectroscope—on tiny, tiny bits of paint, and using ultraviolet light, we can see the spectral signature of each component part of the pigment.

Then we compare these signatures with those of particular elements, like zinc or lead, to determine what the pigment was made of. So you can see why this type of analysis requires a knowledge of the history of pigments, right? How and when they were made. Say we determine a pigment was made with zinc, for example. We know the spectral signature of zinc, and it matches that of the paint sample. We also know that zinc wasn't discovered until the eighteenth century. And since Rembrandt lived during the seventeenth century, we know he couldn't've painted it.

Now spectroscopy has a very distinct advantage over previous methods of analyzing artworks because it's not invasive—you don't have to remove big chips of paint to do your analysis, which is what other methods require. All you do is train the microscope on tiny flecks of paint and analyze them.

Now, a word or two about restoration. Sometimes, original artworks appear questionable or inauthentic because they've had so many restorers add touch-up layers to cover up damage—damage from the paint having deteriorated over time. Well, spectroscopy can reveal the composition of those touch-up layers too, so we can find out when they were applied. Then, if we want to undo some bad restoration attempts, we can determine what kind of process we can use to remove them—to dissolve the paint and uncover the original.

1.What is the main purpose of the lecture?
A. To discuss recent innovations in laboratory equipment
B. To give an example of a practical use for a particular scientific technique
C. To familiarize students with the chemical composition of paint pigments
D. To show how researchers were able to restore a particular work of art

2.What does the professor imply when he mentions an art historian?
A. Art historians have been learning how to use spectroscopes.
B. Scientists need to learn how art historians analyze paintings.
C. Confirming the authenticity of artworks requires collaboration.
D. Spectroscopic analysis can help identify a painter’s techniques.

3.Why does the professor discuss the presence of zinc in paint pigments?
A. To explain why some paints may deteriorate over the course of time
B. To stress the need for caution when attempting to restore old artworks
C. To show how pigments differ from varnishes and binding agents
D. To show how spectroscopy can help establish the age of a painting

4.According to the professor, what is the primary advantage of spectroscopy over other laboratory methods for analyzing artworks?
A. It does not damage the artworks.
B. It provides a more accurate analysis than other methods do.
C. It uses equipment that can be transferred to other locations.
D. It can be used by individuals with little scientific training.

5.What is one way the professor mentions that chemists can help with art restoration?
A. By re-creating the pigments and binding agents used by artists of earlier eras
B. By removing pigments and binding agents that dissolve paintings over time
C. By creating protective coatings of paint that do not damage original paintings
D. By developing ways to safely remove paint added by previous restorers

6.Why does the professor say this?
Now, a word or two about restoration.

A. He is searching for a synonym for the term.
B. He is not sure how much information the student need.
C. He is going to briefly address a related topic.
D. He is giving the students a writing assignment.

Lecture 04 Folk Tales and Fairy Tales

Narrator: Listen to part of a lecture in a literature class.

MALE PROFESSOR: Now, we can't really talk about fairy tales without first talking about folktales … because there is a strong connection between these two genres, these two types of stories. In fact, many fairy tales started out as folktales. So, what's a tale? How would you characterize them? Jeff?

MALE STUDENT: Well, they're old stories, traditional stories. They were passed down orally within cultures, from generation to generation, so they changed a lot over time; I mean, every storyteller, or maybe every town, might have had a slightly different version of the same folktale.

MALE PROFESSOR: That's right, there's local difference, and that's why we say folktales are communal. By "communal," we mean they reflect the traits and the concerns of a particular community at a particular time. So essentially the same tale could be told in different communities, with certain aspects of the tale adapted to fit the specific community. Um, not the plot … the details of what happens in the story would remain constant; that was the thread that held the tale together. But all the other elements, like the location or characters, might be modified for each audience.

OK, so what about fairy tales? They also are found in most cultures, but how are they different from folktales? I guess the first question is what is a fairy tale? And don't anyone say, "a story with a fairy in it." Because we all know that very few fairy tales actually have those tiny magical creatures in them. But what else can we say about them? Mary?

FEMALE STUDENT: Well, they seem to be less realistic than folktales. Like they have something improbable happening—a frog turning into a prince, say. Oh, that's another common element, royalty … a prince or princess. And fairy tales all seem to take place in a location that's nowhere and everywhere at the same time.

MALE PROFESSOR: What's the line, ah—how do all those stories start? "Once upon a time, in a faraway land …" In the case of folktales, each storyteller would specify a particular location and time, though the time and location would differ for different storytellers. With fairy tales, however, the location is generally unspecified, no matter who the storyteller is … that “land faraway.. ." We'll come back to this point in a few minutes.

MALE STUDENT: Um, I thought a fairy tale was just the written version of an oral folktale.

MALE PROFESSOR: Well, not exactly, though that is how many fairy tales developed. For example, in the late eighteenth century, the Grimm brothers traveled throughout what's now Germany recording local folk tales. These were eventually published—as fairy tales—but not before undergoing a process of evolution. Now, a number of things happen when an oral tale gets written down.

First, the language changes, it becomes more formal, more standard—some might say less colorful. It's like the difference in your language depending on whether you're talking to someone or writing them a letter.

Second, when an orally transmitted story is written down, an authoritative version, with a recognized author is created. The communal aspect gets lost; the tale no longer belongs to the community; it belongs to the world, so to speak. Because of this, elements like place and time can no longer be tailored to suit a particular audience, so they become less identifiable, more generalizable to any audience.

On the other hand, descriptions of characters and settings can be developed more completely. In folk tales, characters might be identified by a name, but you wouldn't know anything more

about them. But in fairy tales, people no longer have to remember plots—they're written down, right? So more energy can be put into other elements of the story, like character and setting.

So you get more details about the characters, and about where the action takes place, what people's houses were like, whether they're small cabins or grand palaces... And it's worth investing that energy because the story, now in book form, isn't in danger of being lost, those details won't be forgotten. If a folk tale isn't repeated by each generation, it may be lost for all time. But with a fairy tale, it's always there in a book, waiting to be discovered again and again.

Another interesting difference involves the change in audience—who the stories are meant for. Contrary to what many people believe today, folktales were originally intended for adults, not for children. So why is it that fairy tales seem targeted toward children nowadays?

1.What is the lecture mainly about?
A. Oral traditions in folktales and fairy tales
B. Common characters and plots in folktales and fairy tales
C. Differences between folktales and fairy tales
D. Hidden meaning in folktales and fairy tales

2.What does the professor mean when he says that folktales are communal?
A. They vary little from one community to another.
B. They serve to strengthen tiles among individuals within a community.
C. They relate important events in the history of a community.
D. They can be adapted to meet the needs of a community.

3.Why does the professor clarify the concept of a "fairy tale"?
A. To explain the origins of the term "fairy tale"
B. To eliminate a possible definition of the term" fairy tale"
C. To support a claim about the function of fairy tales
D. To indicate that fairies are a major element in fairy tale

4.What does the professor say about the setting of fairy tales?
A. The tales are usually set in a nonspecific location.
B. The location is determined by the country of origin of a tale.
C. The tales are set in a location familiar to the author.
D. A storyteller varies the location of a tale depending on the audience.

5.In the lecture, the professor discusses characteristics of folktales and fairy tales. Indicate the characteristics of each type of tale. [Click in the correct boxes. This question is worth two points.]

	A.Folk tales	B.Fairy Tales
Their appeal is now mainly to children.		
The plot is the only stable element.		
The tales are transmitted orally.		
There is one accepted version.		
Characters are well developed.		
The language is relatively formal.		

6.Why does the professor say this?

FEMALE STUDENT: And fairy tales all seem to take place in a location that's nowhere and everywhere at the same time.

MALE PROFESSOR: What's the line, ah—how do all those stories start? "Once upon a time, in a faraway land …"

A. To support the student's statement.
B. To ask the student to clarify her statement.
C. To find out if the students know what story the line comes from.
D. To clarify the relationship between time and space in fairy tales.

TPO 06

Lecture 01 Boom and Bust

Narrator: Listen to part of a lecture in an economics class.

FEMALE PROFESSOR: Now, when I mention the terms "boom" and "bust," what does that bring to mind?

MALE STUDENT: The dot-com crash of the 90s!

FEMALE PROFESSOR: OK. The boom in the late 1990s when all those new Internet companies sprang up and were then sold for huge amounts of money. Then the bust around 2000…2001, when many of those same Internet companies went out of business. Of course, booms aren't always followed by busts—we've certainly seen times when local economies expanded rapidly for a while then went back to a normal pace of growth.

But, there's a type of rapid expansion, what might be called a "hysterical" or irrational boom that pretty much always leads to a bust. See, people often create and intensify a boom when they get carried away by some new industry that seems like it'll make lots of money, fast. You'd think that by the 90s, people would've learned from the past. If they did—well, look at tulips.

MALE STUDENT: Tulips…? You mean, like, the flower?

FEMALE PROFESSOR: Exactly. For instance, do you have any idea where tulips are from? Originally, I mean.

MALE STUDENT: Well, the Netherlands, right?

FEMALE PROFESSOR: That's what most people think—but no, they're not native to the Netherlands, or even Europe. Tulips actually hail from an area the Chinese call the "Celestial Mountains" in central Asia—a very remote mountainous region. It was Turkish nomads who first discovered tulips and spread them slowly westward.

Now, around the sixteenth century, Europeans were traveling to Istanbul in Turkey as merchants and diplomats. And the Turks often gave the Europeans tulip bulbs as gifts, which they would carry home with them. For the Europeans, tulips were totally unheard of, a great novelty. The first bulbs to show up in the Netherlands, the merchant who received them roasted and ate them—he thought they were a kind of onion.

It turns out that the Netherlands was an ideal country for growing tulips. It had the right kind of sandy soil, for one thing, but also it was a wealthy nation with a growing economy, willing to spend lots of money on new, exotic things—plus the Dutch had a history of gardening. Wealthy people would compete, spending enormous amounts of money to buy the rarest flowers for their gardens.

Soon tulips were beginning to show up in different colors as growers tried to breed them specifically for colors which would make them even more valuable, but they were never completely sure what they would get. Some of the most prized tulips were white with purple streaks or red with yellow streaks on the petals—even a dark purple tulip that was very much prized.

What happened then was a craze for these specialized tulips. We call that craze "tulip mania."So—here we've got all the conditions for an-an irrational boom: a prospering economy, so more people had more disposable income —money to spend on luxuries—but they weren't experienced at investing their new wealth.

Then along comes a thrilling new commodity —sure, the first specimens were just plain old red tulips, but they could be bred into some extraordinary variations—like that dark purple tulip. And finally, you have an unregulated marketplace — no government constraints — where prices could explode. And explode they did, starting in the 1630s.

There was always much more demand for tulips than supply. Tulips didn't bloom frequently like roses; tulips bloomed once in the early spring and that was it for the year. Eventually, specially bred, multicolored tulips became so valuable… Well, according to records, one tulip bulb was worth 24 tons of wheat or a thousand pounds of cheese. One particular tulip bulb

was sold in exchange for a small ship! In other words, tulips were literally worth their weight in gold.

As demand grew, people began selling promissory notes guaranteeing the future delivery of prized tulip bulbs. The buyers of these pieces of paper would resell the notes at marked-up prices. These promissory notes kept changing hands—from buyer to buyer—until the tulip was ready for delivery.

But it was all pure speculation, because, as I said, there was no way to know if the bulb was really going to produce the variety, the color, that was promised. But that didn't matter to the owner of the note, the owner only cared about having that piece of paper, so it could be traded later at a profit. And people were borrowing—mortgaging their homes, in many cases—to obtain those bits of paper because they were sure they'd found an easy way to make money.

So now you've got all the ingredients for a huge bust—and bust it did, when one cold February morning in 1637, a group of bulb traders got together and discovered that suddenly there were no bidders—nobody wanted to buy. Panic spread like wildfire, and the tulip market collapsed totally.

1.What is the main purpose of the talk?
A. to show what happens after an economy has experienced a boom-and-bust cycle.
B. to illustrate the conditions needed to produce a boom-and-bust cycle.
C. to demonstrate how boom-and-bust cycles have changed over time.
D. to explain why the boom-and-bust cycle is not a frequent historical occurrence.

2.What is the professor's opinion about the dot-com crash?
A. she thinks that people should have realized it would happen.
B. she does not believe that anything like it will happen again.
C. she is surprised that it did not have more serious consequences.
D. she is confident that people learned a valuable lesson from it.

3.According to the professor, where did tulips originate?
A. the mountains of central Asia.
B. the region around Istanbul in Turkey.
C. the sandy soils of the Netherlands.
D. the forests of northern Europe.

4.Why does the professor mention a merchant who ate tulip bulbs?
A. to explain how the Turks introduce the flower to European visitors.
B. to explain what happened to tulip bulbs that did not produce desirable colors.
C. to give an example of one way that the rich in the Netherlands showed off their wealth.
D. to illustrate her point that Europeans were unfamiliar with the flower.

5.What were some of the factors that contributed to the tulip craze in the Netherlands in the seventeenth century? Click on 3 answers.
A. Wealthy gardeners liked to compete for rare plants.
B. The number of people with disposable income was growing.
C. Tulip bulbs were initially cheap and easy to obtain.
D. Tulips in the wild bloomed in unusual color combinations.
E. The tulip market was not regulated by the government.

6.The professor mentions the practice of trading promissory note in the Netherlands in the 1630s,what does this practice explain? Click on 2 answers.
A. why tulips replaced gold as a form of currency.
B. why buyers were no longer interested in owning actual tulips.
C. why borrowing in the Netherlands increased on a significant scale.
D. why the middle class in the Netherlands expanded in size.

Lecture 02 Nightcap Oak

Narrator: Listen to part of a lecture in a biology class.

FEMALE PROFESSOR: OK, I have an interesting plant species to discuss with you today. Uh, it's a species of a ve-e-ry rare tree that grows in Australia, Eidothea hardeniana, but it's better known as the Nightcap Oak.

Now, it was discovered only very recently, just a few years ago. Uh, it remained hidden for so long because it's so rare, there're only about, oh, two hundred of 'em in existence. They grow in a rain forest, in a mountain rage range in the north part of New South Wales, which is, uh, a state in Australia. So just two hundred individual trees in all.

Now, another interesting thing about the Nightcap Oak is that it is… it represents… a—a very old…type, a kind of a tree that grew…a hundred million years ago. Uh we found fossils that old that bear a remarkable resemblance to the tree. So, it's a primitive tree, a... a living fossil, you might say. It's a relic from earlier times, and it has survived all these years without much change. And... it—it's probably a kind of tree from which other trees that grow in Australia today evolved.

Just—just to give you an idea of what we're talking about, here's a picture of the leaves of the tree and its flowers. II dunno how well you can see the flowers, they're those little clusters sitting at the base of the leaves.

OK, what have we tried to find out about the tree since we've discovered it? Hmm well how... why is… is it so rare? It is one of the first questions. Uh, how is it, uh how does it reproduce? It is another question. Uh, maybe those two questions are actually related? Jim.

MALE STUDENT: Hmm, I dunno, but uh I can imagine that…for instance…uh seed dispersal might be a factor I mean if the uh y'know if the seeds cannot really disperse in a wide area then you know the tree may not uh colonize new areas, it can't spread from the area where it's growing.

FEMALE PROFESSOR: Right, that's that's actually a very good answer. Uh, of course, you might think there might not be many areas where the tree could spread into, uh because uh well it's it's very specialized in terms of the habitat. But that's not really the case here, uh the the suitable habitat habitat that is the actual rain forest is much larger than than the few hectares where the Nightcap Oak grows.

Now, this tree is a flowering tree as I showed you, uh uh, it—it produces a fruit, much like a plum, on the inset inside there's a seed with a hard shell. Uh it it appears that the shell has to crack open or break down somewhat to allow the seed to soak up water. If the Nightcap Oak remains if their seeds remain locked inside their shell, they will not germinate. Now actually the seeds, uh they don't retain the power to germinate for very long, maybe two years.

So there's actually quite a short window of opportunity for the seed to germinate. So the shell somehow has to be broken down before this uh germination ability expires. And... and then there's a kind of rat that likes to feed on the seeds as well. So, given all these limitations, not many seeds that the tree produces will actually germinate. So this is a possible explanation for why the tree does not spread. It doesn't necessarily explain how it became so rare but it explains why it doesn't increase.

OK, so it seems to be the case that this species, uh this Nightcap Oak, is not very good at spreading. However, it seems, though we can't be sure, that it's very good at persisting as a population. Uh, uh we, uh, there—there're some indications to suggest that the population of the Nightcap Oak has not declined over the last uh, y'know, many hundreds of years.

So, it's stayed quite stable; it—it's not a remnant of some huge population that has dwindled in the last few hundred years for some reason. It's not necessarily a species in retreat. OK, so it cannot spread very well but it's good at maintaining itself. It's rare but it's not disappearing.

OK the next thing we might wanna ask about a plant like that is what chances does it have to survive into the future. Let's look at that.

1.What topic related to the Nightcap Oak does the professor mainly discuss? Click on 2 answers.
A. factors that relate to the size of the area in which it grows.
B. the size of its population over the last few centuries.
C. whether anything can be done to ensure its survival.
D. why it did not change much over the last one hundred million years.

2.According to the professor, what led scientists to characterize the Nightcap Oak as primitive?
A. it has no evolutionary connection to other trees growing in Australia today.
B. it has an inefficient reproductive system.
C. its flower are located at the bases of the leaves.
D. it is similar to some ancient fossils.

3.What point does the professor make about the Nightcap Oak's habitat?
A. it is stable despite its limited size.
B. unlike the habitats of many plants,it is expanding.
C. its recent changes have left the Nightcap Oak struggling to adapt.
D. its size is much larger than the area where the Nightcap Oak grows.

4.According to the professor, what are two factors that prevent Nightcap Oak population from spreading? Click on 2 answers.
A. The complex conditions required for the trees to produce fruit.
B. the fact that the seed cannot germinate while locked inside the shell.
C. the limited time the seed retain the ability to germinate.
D. competition with tree species that evolved more

5.why does the professor mention the size of the Nightcap Oak population over the last few hundred years?
A. to explain why it is likely the Nightcap Oak population will increase in the future.
B. to point out that Nightcap Oak's limited reproductive success has not led to a decrease in its population.
C. to present evidence that the Nightcap Oak is able to tolerate major changes in its environment.
D. to point out that the Nightcap Oak is able to resist diseases that have destroyed other tree species.

6.Why does the professor say this?

OK, what have we tried to find out about the tree since we've discovered it? Hmm well how... why is… is it so rare? It is one of the first questions. Uh, how is it, uh how does it reproduce? It is another question. Uh, maybe those two questions are actually related?

A. She wants the students to think about a possible connection.
B. She wants to know if the students have any questions.
C. She is implying that researchers have been asking the wrong questions.
D. She is implying that there may be no connection between the questions.

Lecture 03 Character Sketch

Narrator: Listen to part of a lecture in a creative writing class.

MALE PROFESSOR: All right everybody. The topic for today is, well... we're gonna take a look at how to start creating the characters for the stories you're writing. One way of doing that is to come up with what's called a character sketch . I don't mean a sketch like a drawing. I guess that's obvious. It's, ummm...a sketch is a way of getting started on defining your characters' personalities.

To begin, how do we create fictional characters? We don't just pull them from thin air, do we? I mean, we don't create them out of nothing. We base them -- consciously or unconsciously -- we base them on real people. Or, we, um... blend several people's traits... their attributes... into one character. But when people think fiction, they may assume the characters come from the author's imagination.

But the writer's imagination is influenced by... by real people. Could be anyone, so pay attention to the people you meet... someone in class, at the gym, that guy who's always sitting in the corner at the coffeehouse... uh, or your cousin who's always getting into dangerous situations. We're pulling from reality... gathering bits and pieces of real people. You use these people...and the bits of behavior or characteristics as a starting point as you begin to sketch out your characters.

Here's what you should think about doing first. When you begin to formulate a story, make a list of interesting people you know or have observed. Consider why they're unique... or annoying. Then make notes about their unusual or dominant attributes.

As you create fictional characters, you'll almost always combine characteristics from several different people on your list to form the identity and personality of just one character. Keeping this kind of character sketch can help you solidify your character's personality . . . so that it remains consistent throughout your story.

You need to define your characters...know their personalities so that you can have them acting in ways that're predictable...consistent with their personalities. Get to know them like a friend. You know your friends well enough to know how they'll act in certain situations, right?

Say you have three friends, their car runs out of gas on the highway. John gets upset, Mary remains calm, Teresa takes charge of handling the situation. And, let's say... both John and Mary defer to her leadership. They call you to explain what happened. And when John tells you he got mad, you're not surprised because he always gets frustrated when things go wrong. Then he tells you how Teresa took charge, calmed him down, assigned tasks for each person, and got them on their way.

Again you're not surprised. It's exactly what you would expect. Well, you need to know your characters like you know your friends...if you know a lot about a person's character, it's easy to predict how they'll behave. So if your characters' personalities are well defined, it'll be easy for you as the writer to portray them realistically...believably in any given situation

While writing character sketches, do think about details. Ask yourself questions, even if you don't use the details in your story... uh, what does each character like to eat, what setting does each prefer... the mountains? The city? What about educational background? Their reactions to success... or defeat? Write it all down.

But here I need to warn you about a possible pitfall. Don't make your character into a stereotype. Remember, the reader needs to know how your character is different from other people who might fall in the same category. Maybe your character loves the mountains and has lived in a remote area for years.

To make sure he's not a stereotype, ask yourself how he sees life differently from other people who live in that kind of setting. Be careful not to make him into the clich é of the rugged mountain dweller.

OK. Now I'll throw out a little terminology... it's easy stuff. Major characters are sometimes called round characters. Minor characters are sometimes called... well, just the opposite. Flat. A round character is fully developed. A flat character isn't--character development is fairly limited. The flat character tends to serve mainly as a, um motivating factor.

For instance, you introduce a flat character who has experienced some sort of defeat...and then your round...your main character, who loves success and loves to show off, comes and boasts about succeeding... and jokes about the flat character's defeat in front of others... humiliates the other guy. The flat character is introduced solely for the purpose of allowing the round character to show off.

1.What aspect creative writing does the professor mainly discuss?
A. How to keep a reader's interest
B. How to create believable characters
C. Key differences between major and minor characters
D. Techniques for developing short-story plots

2.Why does the professor recommend that students pay attention to the people they see every day?
A. The behavior and characteristics of these people can be used in character sketches.
B. Observing people in real-life situations can provide ideas for story plots.
C. It is easier to observe the behavior of familiar people than of new people.
D. Students can gather accurate physical descriptions for their characters.

3.The professor discusses an example of three friends who run out of gas. What point does he use the example to illustrate?
A. Writers should know their characters as well as they know their friends.
B. Writers should create characters that interact in complex ways.
C. Friends do not always behave the way we expect them to behave.
D. Friends' behavior is often more predictable than fictional characters' behavior.

4.What warning does the professor give when he talks about the man who lives on the mountain?
A. Avoid placing characters in remote settings
B. Avoid having more than one major character
C. Avoid using people as models whose lives are unusual
D. Avoid making characters into stereotypes

5.What does the professor imply is the importance of flat characters?
A. They act more predictably than other characters.
B. They are difficult for readers to understand.
C. They help reveal the main character's personality.
D. They are the only characters able to experience defeat.

6.Why does the professor say this?.

<u>One way of doing that is to come up with what's called a character sketch . I don't mean a sketch like a drawing. I guess that's obvious. It's, ummm...a sketch is a way of getting started on defining your characters' personalities.</u>

A. To indicate that he is about to explain what type of drawing he wants
B. To help students understand a term that may be confusing.
C. To indicate that he used the wrong word earlier.
D. To motivate the students to do better work.

Lecture 04 Climate Change in Sahara Desert

Narrator: Listen to part of a lecture in an Earth Science class.

MALE PROFESSOR: We're really just now beginning to understand how quickly drastic climate change can take place. We can see past occurrences of climate change that took place over just a few hundred years.

Take hm the Sahara desert in Northern Africa. The Sahara was really different 6,000 years ago. I mean, you wouldn't call it a tropical paradise or anything--ah or maybe you would if you think about how today in some parts of the Sahara it only rains about once a century. Hm but basically, you had greenery and you had water.

And what I find particularly interesting, amazing, really what really indicates how un-desert-like the Sahara was thousands of years ago, was something painted on a rock prehistoric art –hippopotamuses. As you know, hippos need a lot of water, and hence... Hence what?

FEMALE STUDENT: They need to live near a large source of water year-round.

MALE PROFESSOR: That's right.

MALE STUDENT: But how's that proof that the Sahara used to be a lot wetter? I mean, the people who painted those hippos…well, couldn't they have seen them on their travels?

MALE PROFESSOR: OK, in principle they could, Carl. But the rock paintings aren't the only evidence. Beneath the Sahara are huge aquifers, basically a sea of fresh water that's perhaps a million years old, filtered through rock layers. And, ah an-an then there's fossilized pollen from low shrubs and grasses that once grew in the Sahara.

In fact these plants still grow ah but hundreds of miles away in more vegetated areas. Anyway, it's this fossilized pollen, along with the aquifers, and the rock paintings—these three things are all evidence that the Sahara was once much greener than it is today, that there were hippos and probably elephants, and giraffes, and so on.

MALE STUDENT: So, what happened?

MALE PROFESSOR: How did it happen? Well now we're so used to hearing about how human activities are affecting the climate, right; but that takes the focus away from the natural variations in the Earth's climate. Like the Ice Age, right? The planet was practically covered in ice just a few thousand years ago. Now, as far as the Sahara goes, there's some recent literature that points to the migration of the monsoon in that area.

STUDENT: "huh?"

MALE PROFESSOR: What do I mean? OK. A monsoon is a seasonal wind that can bring in a large amount of rainfall. Now, if the monsoon migrates, well that means the rains move to another area, right?

So what caused the monsoon to migrate? Well, the answer is the dynamics of Earth's motions--the same thing that caused the Ice Age, by the way. [slowly, wanting every word to sink in] The Earth's not always the same distance from the Sun. And it's not always tilting toward the Sun at the same angle. There're slight variations in these two parameters. They're gradual variations, but their effects can be pretty abrupt, and can cause the climate to change in just a few hundred years.

FEMALE STUDENT: That's abrupt?

MALE PROFESSOR: Well, yeah, considering that other climate shifts take thousands of years, this one's pretty abrupt. So these changes in the planet's motions, they caused the climate to change; but it was also compounded. What the Sahara experienced was a sort of runaway drying effect. As I said, the monsoon migrated south—so there was less rain in the Sahara. The land started to get drier—which in turn caused a huge decrease in the amount of vegetation,

because vegetation doesn't grow as well in dry soil, right?

And then, less vegetation means the soil can't hold water as well—the soil loses its ability to retain water when it does rain. So then you have less moisture to help clouds form…nothing to evaporate for cloud formation. And then the cycle continues—less rain, drier soil, less vegetation, fewer clouds, less rain, etcetera.

MALE STUDENT: But what about the people who made the rock paintings?

MALE PROFESSOR: Good question. No one really knows. But there might be some connection to ancient Egypt.

At about the same time that the Sahara was becoming a desert, mm…5,000 years ago, Egypt really began to flourish out in the Nile River Valley. And that's not that far away. So it's only logical to hypothesize that a lot of these people migrated to the Nile Valley when they realized that this was more than a temporary drought.

And some people take this a step further--and that's ok, that's science--and they hypothesize that this migration actually provided an important impetus in the development of ancient Egypt. Well, we'll stay tuned on that.

1.What is the lecture mainly about?
A. An example of rapid climate change
B. A comparison of two mechanisms of climate change
C. The weather conditions in the present-day Sahara
D. Recent geological findings made in the Sahara

2.Not long ago,the Sahara had a different climate. What evidence does the professor mention to support this? [Click on 3 answers.]
A. Ancient pollen
B. Bones from large animals
C. Rock paintings
D. Agriculture in ancient Egypt
E. Underground water

3.In the lecture, what do the Ice Age and the creation of the Sahara Desert both illustrate about past climate changes. Click on 2 answers.
A. that some climate changes benefitted the development of civilization.
B. that some climate changes were not caused by human activity.
C. that some climate change were caused by a decrease of moisture in the atmosphere.
D. that some climate changes were caused by changes in Earth's motion and position.

4.What started the runway effect that led to the Sahara area of north Africa becoming a desert?
A. The prevailing winds became stronger.
B. The seasonal rains moved to a different area.
C. The vegetation started to die off in large areas.
D. The soil lost its ability to retain rainwater.

5.The professor mentions a theory that people migrating from the Sahara were important to the development of the Egyptian civilization. Which sentence best describes the professor's attitude toward this theory?
A. It is exciting because it perfectly explains recent archaeological discoveries.
B. It is problematic because it goes too far beyond the generally available data.
C. It raises an interesting possibility and he hopes to see more evidence for it.
D. It cannot be taken seriously until it explains how the migrants got to Egypt.

6.Why does the professor say this?
I mean, you wouldn't call it a tropical paradise or anything--ah or maybe you would if you think about how today in some parts of the Sahara it only rains about once a century.

A. To correct a misstatement he made about the Sahara's climate.
B. To suggest that the current dryness of the Sahara is exaggerated.
C. To indicate that scientists are not in agreement about the Sahara's past climate.
D. To emphasize the difference between the current and past climates of the Sahara.

TPO 07

Lecture 01 the Well-made Play

Narrator: Listen to part of a lecture in a class on theater history. The professor is discussing the theater of nineteenth-century France.

MALE PROFESSOR: The nineteenth century was the time that saw what we call "realism" develop in the European theater. Uh to understand this, though, we first need to look at an earlier form of drama known as the "well-made play," which, basically, was a pattern for constructing plays—plays that, um, beginning with some early nineteenth-century comedies in France, proved very successful commercially.

The dramatic devices used here weren't actually anything new—they'd been around for centuries. But th–the formula for a well-made play required that certain of these elements be included, in a particular order.

And most importantly—that everything in the play be logically connected. In fact, some of these playwrights would start by writing the end of a play and work backward toward the beginning, just to make sure each event led logically from what had gone before. OK, so what are the necessary elements of a well-made play?

Well, uh the first is logical exposition. Exposition is whatever background information you have to reveal to the audience so they'll understand what's going on. Before this time, exposition might have come from actors simply giving speeches. Uh someone might walk out on stage and say, "In fair Verona, where we lay our scene," and then tell all about the feuding families of Romeo and Juliet.

But for the well-made play, even the exposition had to be logical... believable. So, for example, uh you might have two servants gossiping as they're cleaning the house, and one says, "Oh, what a shame the master's son is still not married." And the other might mention a rumor about a mysterious gentleman who's just moved into town with his beautiful daughter. These comments are part of the play's logical exposition.

The next key element of a well-made play is referred to as "the inciting incident." After we have the background information, we need a key moment that gets things moving, that really makes the audience interested in what happens to the characters we just heard about.

So, for example, after the two servants reveal all this background information, we meet the young man, just as he first lays eyes on the beautiful young woman and immediately falls in love. This is the inciting incident. It sets off the plot of the play.

Now the plot of a well-made play is usually driven by secrets— uh, things that the audience knows, but the characters often don't know. So for example, the audience learns through a letter or through someone else's conversation who this mysterious gentleman is and why he left the town many years before. But the young man doesn't know about this … And the woman doesn't understand the ancient connection between her family and his.

And before the secrets are revealed to the main characters, the plot of the play proceeds as a series of sort of up-and-down moments. For example, the woman first appears not to even notice the young man, and it seems to him like the end of the world. But then he learns that she actually wants to meet him too, so life is wonderful.

Then if he tries to talk with her, maybe her father gets furious, for no apparent reason. So they can't see each other. But just as the young man has almost lost all hope, he finds out... well, you get the idea—the reversals of fortune continue, increasing the audience's tension and excitement,

making them wonder if everything's going to come out OK or not.

Next comes an element known as the obligatory scene. It's uh, it's a scene, a moment in which all the secrets are revealed and generally things turn out well for the hero and others we care about—a happy ending of some sort. This became so popular that a playwright almost had to include it in every play, which is why it's called the obligatory scene.

And that's followed by the final dramatic element, The denouement or the resolution, when all the loose ends have to be tied up in a logical way. Remember, the obligatory scene gives the audience emotional pleasure, but the denouement offers the audience a logical conclusion. That’s the subtle distinction we need to try very hard to keep in mind.

So, as I said, the well-made play—this form of playwriting—became the basis for realism in drama and for a lot of very popular nineteenth-century plays—and also a pattern we find in the plots of many later plays and even movies that we see today.

1.What is the lecture mainly about?
A. The importance of creating believable characters in plays
B. The influence of the literature of "realism" on French theater
C. A successful standard formula for writing plays
D. A famous example of a well-made play

2.According to the professor ,why did some playwrights write the end of a play before the beginning?
A. To produce multiple scripts as quickly as possible
B. To prevent the audience from using logic to guess the endings
C. To avoid writing endings similar to those of other plays
D. To ensure that the plot would develop in a logical manner

3.Why does the professor mention a conversation between two servants?
A. To give examples of typical characters in a well-made play
B. To show how background information might be revealed in a well-made play
C. To explain why Romeo and Juliet can be considered a well-made play
D. To explain how playwrights develop the obligatory scene of a well-made play

4.According to the professor, what dramatic elements are typically included in a well-made play to help move the plot forward? [Click on 2 answers.]
A. A series of major changes in the hero's apparent chances of success
B. The introduction of new characters midway through the play
C. Information known to the audience but not to the main characters
D. The movement of major characters from one setting to another

5.What does the professor imply about the obligatory scene and the denouement?
A. The difference between them might be unclear to some people.
B. Both are useful techniques for developing realistic characters.
C. The denouncement usually occurs within the obligatory scene.
D. The obligatory scene is usually less exciting than the denouncement.

6.Why does the professor say this?
This is the inciting incident. It sets off the plot of the play.

A. To help students understand the meaning of a new term.
B. To indicate that his point is not related to the main topic of the lecture.
C. To emphasize one element of a play over all others.
D. To begin to summarize the main points of the lecture.

Lecture 02 Bats' Use of Ultrasound

Narrator: Listen to part of a lecture in a biology class.

FEMALE PROFESSOR: So, that's how elephants use infrasound… Now let's talk about the other end of the acoustical spectrum—sound that's too high for humans to hear: ultrasound. Ultrasound is used by many animals that detect—and, some of them, send out—very high-frequency sounds. So, what's a good example? Yes, Carol?

FEMALE STUDENT: Well, bats—since they're all blind, bats have to use sound for—uh, y'know—to keep from flying into things.

FEMALE PROFESSOR: That's echolocation. Echolocation is pretty self-explanatory: Using echoes—reflected sound waves—to locate things… As Carol said, bats use it for navigation and orientation… and what else? Mike?

MALE STUDENT: Well, finding food is always important—and, uh, I guess, not becoming food for other animals…

FEMALE PROFESSOR: Right on both counts. Avoiding other predators—and locating prey—uh, typically insects that fly around at night. Now, before I go on, let me just respond to something Carol was saying—this idea that bats are blind… actually, there are some species of bats—the ones that don't use echolocation—that do rely on their vision for navigation but, it is true that, for many bats, their vision is too weak to count on.

OK, so: quick summary of how echolocation works. The bat emits these ultrasonic pulses—very high-pitched sound waves that we can't hear—and then: they analyze the echoes—how the waves bounce back. Uh, here, let me finish this diagram I started before class…So the bat sends out these pulses—very focused bursts of sound, and echoes bounce back…Y'know, I don't think I need to draw in the echoes. Your-your reading assignment for the next class—it has a diagram that shows this very clearly—so anyway as I was saying… By analyzing these echoes, the bat can determine, say, if there's a wall in a cave that it needs to avoid… and—how far away it is. Another thing it uses ultrasound to detect, is the size and shape of objects. For example, one echo they'd quickly identify is the one they associate with a moth, which is common prey for a bat—particularly, a moth beating its wings.

However, moths happen to have a major advantage over most other insects: they can detect ultrasound. This means that, when a bat approaches, the moth can detect the bat's presence… so it has time to escape to safety… or else they can just remain motionless—since, um, when they stop beating their wings, they'd be much harder for the bat to distinguish from, oh, a-a leaf… or-or some other object…

Now, we've tended to underestimate just how sophisticated the abilities of animals that use ultrasound are. In fact, we kind of assumed that they were filtering a lot out—uh, the way a sophisticated radar system can ignore echoes from stationary objects on the ground. Radar does this to remove "ground clutter"—information about, um, hills or buildings that it doesn't need.

But bats—we thought they were filtering out this kind of information because they simply couldn't analyze it. But it looks as if we were wrong. Recently, there was this experiment with trees and a specific species of bats—a bat called the lesser spear-nosed bat.

Now a tree should be a huge acoustical challenge for a bat, right? I mean, it's got all kinds of surfaces, with different shapes and angles… So, well, the echoes from a tree are going to be a mass of chaotic acoustic reflections, right? Not like the echo from a moth.

So, we thought, for a long time, that bats stopped their evaluation at simply "that's a tree."

Yet, it turns out that-that bats, or at least this particular species, can not only tell that it's a tree, but can also distinguish between, say, a pine tree and a deciduous tree—like, a maple, or an oak tree: just by their leaves—an-and when I say "leaves," I mean pine needles, too. Any ideas on how it would know that?

MALE STUDENT: Well… like with the moth—could it be their shape?

FEMALE PROFESSOR: You're on the right track. It's actually the echo off all the leaves—as a whole—that matters. Now, think: A pine tree—with all those little, densely packed needles… those produce a large number of faint reflections in wh-what's called a-a "smooth" echo—the waveform is very even … but an oak—which has fewer but bigger leaves with stronger reflections—produces a jagged waveform—or what we call a "rough" echo. And these bats can distinguish between the two—and not just with trees, but with any echo that comes in a smooth or rough shape.

1.What is the lecture mainly about?
A. How animals emit ultrasonic pulses
B. How bats use acoustical signals
C. A comparison of echolocation and radar
D. Variations among bats in the use of ultrasound

2.Why does the professor decide NOT to add more information to the diagram on the board?
A. She wants students to complete the diagram themselves as an assignment.
B. She needs to look up some information in order to complete the diagram accurately.
C. The additional information is not relevant to the topic that she wants to discuss next.
D. Students already have the additional information in their textbook.

3.According to the professor, what are two ways in which a moth might react when it detects the presence of a bat? [Click on 2 answers.]
A. The moth might stop beating its wings.
B. The moth might emit high-frequency sounds.
C. The moth might leave the area.
D. The moth might change its color to match its surroundings.

4.What surprising information did a recent experiment reveal about lesser spear-nosed bats?
A. They filter out echoes from some types of trees.
B. They can analyze echoes from stationary objects with complex surfaces.
C. They cannot analyze "jagged" echoes.
D. They cannot analyze echoes from certain types of small moving objects..

5.According to the professor, why does a pine tree produce a "smooth" echo?
A. Because it has a smooth trunk
B. Because it has large branches spaced at regular intervals
C. Because it has many small, densely packed needles
D. Because it remains stationary in all types of weather

6.Why does the professor say this?

Now, before I go on, let me just respond to something Carol was saying

A. To answer a question that Carol asked.
B. To correct a statement that Carol made
C. To praise Carol for an example that she gave
D. To give an example of a principle that Carol stated

Lecture 03 Iroquois people & Birch Tree

Narrator: Listen to part of a lecture in an anthropology class.

FEMALE PROFESSOR: So we've been discussing sixteenth century Native American life, and today we're going to focus on Iroquois and Huron peoples, um they lived in the northeastern Great Lakes region of North America. Now, uh back then, eh their lives depended on the natural resources of the forest, especially the birch tree. The birch tree can grow in many different types of soils and i-is prevalent in that area. Now, um eh can anyone here describe a birch tree?

MALE STUDENT: Umm, they're tall? And…white? The bark, I mean.

FEMALE PROFESSOR: Yes, the birch tree has white bark. And this tough protective outer layer of the tree, this, this white bark, is waterproof, and this waterproof quality of the bark oh it made it useful for making things like cooking containers, um …a-a variety of utensils. And…i-if you peel birch bark in the winter—eh we call it the "winter bark" —um, another layer, a tougher inner layer of the tree adheres to the bark, producing a stronger material…so the "winter bark" was used for larger utensils and containers.

MALE STUDENT: Umm, I know people make utensils out of wood, but…utensils out of tree bark?

FEMALE PROFESSOR: Well, birch bark is pliable and very easy to bend. The Native Americans would cut the bark and fold it into any shape they needed, then secure it with cords until it dried. They could fold the bark into many shapes.

FEMALE STUDENT: So, if they cooked in bowls made of birch bark, wouldn't that make the food taste funny?

FEMALE PROFESSOR: Oh, that's one of the great things about birch bark. The taste of the birch tree doesn't get transferred to the food—so it was perfect for cooking containers. Eh but the most important use of the bark by far was the canoe. Since the northeast region of North America is uh it's interconnected by many streams and waterways, water transportation by vessels like a canoe was most essential.

The paths through the woods were often overgrown, so, so water travel was much faster. And here's what the Native Americans did…they would peel large sheets of bark from the tree to form lightweight yet sturdy canoes. The bark was stretched over frames made from tree branches, uh stitched together and sealed with resin— y-you know that, that sticky liquid that comes out of the tree—and when it dries, it's watertight.

One great thing about these birch bark canoes was, uh they could carry a large amount of cargo. F-For example, a canoe weighing about 50 pounds could carry up to 9 people and 250 pounds of cargo.

FEMALE STUDENT: Wow! But…how far could they travel that way?

FEMALE PROFESSOR: Well, like I said, the northeastern region is uh interconnected by rivers and streams, and uh the ocean at the coast. The canoes allowed them to travel over a vast area that-that today would take a few hours to fly over. You see, the Native Americans made canoes of all types, for travel on small streams or on large open ocean waters.

For small streams they made narrow, maneuverable boats, while, while larger canoes were needed for the ocean. They could travel throughout the area, only occasionally having to portage, um to, to, carry the canoe over land a short distance eh to another nearby stream. And since the canoes were so light…this wasn't a difficult task. Now, how do you think this affected their lives?

FEMALE STUDENT: Well, if they could travel so easily over such a large area, they could trade with people from other areas…which I guess, would…lead them to form alliances?

FEMALE PROFESSOR: Exactly. Having an efficient means of transportation, well that helped the Iroquois to form a federation, linked by natural waterways, and this federation expanded from uh what is now southern Canada all the way south to the Delaware River. And eh this efficiency of the birch bark canoes also made an impression on newcomers to the area. French traders in the seventeenth century modeled their … eh well they adopted the design of the Iroquois birch bark canoes and they found that they could travel great distances—more than 1500 kilometers a month.

Now, besides the bark, Native Americans also used the wood of the birch tree. Eh, the young trees were used as supports for lodgings, with the waterproof bark used as roofing. Um, branches were folded into snowshoes, and the Native American people were all adept at running running very fast over the snow in these uh these birch branch snowshoes, which, if you've ever tried walking in snowshoes, you know isn't easy.

1.What is the lecture mainly about?
A. Different kinds of trees used for building canoes
B. Various methods of Native American transportation
C. The value of birch trees to some Native American groups
D. The trading of birch wood products by Europeans in North America

2.According to the professor, what characteristic of birch bark made it useful to Native Americans? [Click on 2 answers.]
A. It repels water.
B. It can be eaten.
C. It is easy to fold.
D. It has a rough texture.

3.According to the professor, why was the canoe important to some Native American groups? [Click on 2 answers.]
A. There was a network of waterways where they lived.
B. Snowy winters made land travel too difficult.
C. Some Native American groups sold their canoes to other groups.
D. Canoe travel helped form relationships between groups of Native Americans.

4.Why does the professor mention French traders who arrived in the Iroquois region?
A. To illustrate how far news of the Iroquois canoe design had traveled
B. To explain the kinds of objects the Iroquois received in exchange for their canoes
C. To support her point about how efficient the Iroquois canoe design was
D. To emphasize that the Iroquois were first settlers in that region

5.Why does the student say this.

I know people make utensils out of wood, but utensils out of tree bark?

A. To share what he knows about birch wood.
B. To point out a misprint in the textbook.
C. To bring up a point from a previous lecture.
D. To request more explanation from the professor.

6.Why does the professor say this.

The canoes allow them to travel over a vast area that today would take a few hours to fly over.

A. To show how slow canoe travel was.
B. To illustrate the size of a geographic area.
C. To compare different means of travel.
D. To describe how waterways change over time.

Lecture 04 Glacial Movement

Narrator: Listen to part of a lecture in a geology class.

MALE PROFESSOR: Last time we started to talk about glaciers and how these masses of ice form from crystallized snow. And some of you were amazed at how huge some of these glaciers are. Now, even though it may be difficult to understand how a huge mass of ice can move—or flow, it's another word for it—it's really no secret that glaciers flow because of gravity. But how they flow, the way they flow needs some explaining.

Now, the first type of glacier flow is called basal slip. Basal slip—or sliding, as it's often called—basically refers to the slipping or sliding of a glacier across bedrock—actually across a thin layer of water on top of the bedrock. Uh, so this process shouldn't be too hard to imagine. What happens is that the ice at the base of a glacier is under a great deal of pressure, the pressure coming from the weight of the overlying ice.

And you probably know that under pressure, the melting temperature of water, uh of the ice I mean, is reduced. So ice at the base of the glacier melts, even though it's below zero degrees Celsius, and this results in a thin layer of water between the glacier and the ground. This layer of water reduces friction, it's, it's like a lubricant, and it allows the glacier to slide or slip over the bedrock. OK?

Now, the next type of movement we'll talk about is called deformation. You already know that ice is brittle—if you hit it with a hammer, it will shatter like glass. But ice is, ah, also plastic—it can change shape without breaking. If you leave, for example, a bar of ice supported only at one end, the end—the unsupported end—will deform under its own weight—it'll kind of flatten out at one end, get distorted, deformed. Think of deformation as a very slow oozing. Depending on the stresses on a glacier, the ice crystals within it reorganize. And during this…uh reorganization, uh, the ice crystals realign in a way that allows them to slide past each other. And so the glacier oozes downhill without any ice actually melting.

Now there are a couple of factors that affect the amount of deformation that takes place or the speed of the ah glacier's movement. For example, deformation is more likely to occur the thicker the ice is—because of the gravity of the weight of the ice.

And temperature also plays a part here, in that cold ice does not move as easily as ice that is closer to the melting point—in fact, it's not too different from hm the way oil is, uh, thicker, at low temperatures. So if you have a glacier in a slightly warmer region, it will flow faster than a glacier in a colder region.

OK, hm now I'd like to touch briefly on extension and compression. Your textbook includes these as types—as a particular type—of glacial movement, but you'll see that there are as many textbooks that omit it as a type of movement as include it. And I might not include it right now if it weren't in your textbook.

But hm basically, the upper parts of glaciers have less pressure on them, so they don't deform as easily, they tend to be more brittle. And crevasses can form in these upper layers of the glaciers when the glacier comes into contact with bedrock walls or ah is otherwise under some kind of stress but can't deform quickly enough.

So the ice will expand or constrict, and that can cause big fissures, big cracks to form in the surface layers of the ice. And that brittle surface ice moving is sometimes considered a type of glacial movement, depending on which source you're consulting.

Now, as you probably know, glaciers generally move really slowly, but sometimes they

experience surges, and during these surges, in some places they can move at speeds as high as 7,000 meters per year. Now speeds like that are pretty unusual, hundreds of times faster than the regular movement of glaciers—but you can actually see glaciers move during these surges, though it is rare.

1.What is the lecture mainly about?
A. Explanations of how glaciers move
B. Landscape changes caused by glacial movement
C. Climate changes that influence glacial movement
D. Causes of glacial formation

2.The professor discusses the process of basal slip. Put the steps in the correct order. [Click on a sentence. Then drag it to the space where it belongs.]
A.Friction between the glacier and bedrock is reduced
B.A liquid layer forms at the base of the glacier
C.The glacier begins to slide
D.Pressure is increased on the ice

3.What factors are involved in the amount of deformation a glacier undergoes? [Click on 2 answers.]
A. The thickness of glacial ice
B. The hardness of glacial ice
C. The amount of water beneath the glacial ice
D. The temperature of the glacial ice

4.What does the professor say about the speed of glaciers?
A. It affects the amount of glacial ice that forms.
B. It can be fast enough for movement to be noticeable.
C. It is reduced by cracks in the ice.
D. It is unusually high in colder regions.

5.What does the professor explain when he says this?

But ice is also plastic, it can change shape without breaking. If you leave, for example, a bar of ice supported only at one end, the end, the unsupported end will deform under its own weight.

A. A characteristic of ice that is related to glacial movement.
B. How scientists first discovered that glaciers could move.
C. That factors like temperature can affect the strength of ice.
D. Why deformation is the most common type of glacial movement.

6.What does the professor imply about compression and extension?

now I'd like to touch briefly on extension and compression. Your textbook includes these as types—as a particular type—of glacial movement, but you'll see that there are as many textbooks that omit it as a type of movement as include it. And I might not include it right now if it weren't in your textbook.

A. He believes it accounts for a great deal of glacial movement.
B. He thinks it is a slower type of a glacial movement than basal slip.
C. He is not convinced that it is a type of glacial movement.
D. He does not agree that it causes fissures in glaciers.

TPO 08

Lecture 01 Active Habitat Selection

Narrator: Listen to part of a lecture in an animal behavior class.

FEMALE PROFESSOR: OK, well, last time we talked about passive habitat selection. Like plants, for example—they don't make active choices about where to grow— they're dispersed by some other agent, like the wind. And if the seeds land in a suitable habitat, they do well and reproduce.

With active habitat selection, an organism is able to physically select where to live and breed, and because an animal's breeding habitat is so important, we'd expect animal species to have developed preferences for particular types of habitats, places where their offspring have the best chance of survival. So let's look at the effect these preferences can have by looking at some examples. But first let's recap. What do we mean by "habitat." Frank?

MALE STUDENT: Well, it's basically the place or environment where an organism normally lives and grows.

FEMALE PROFESSOR: Right. And as we've discussed, there're some key elements that a habitat must contain: food, obviously. Water; and it's got to have the right climate; and spaces for physical protection. And we saw how important habitat selection is when we looked at habitats where some of these factors are removed, perhaps through habitat destruction. Um, I just read about a shorebird, the plover.

The plover lives by the ocean and feeds on small shellfish, insects, and plants. It blends in with the sand, so it's well camouflaged from predator birds above. But it lays its eggs in shallow depressions in the sand, with very little protection around them. So if there're people or dogs on the beach, the eggs and fledglings in the nests are really vulnerable.

Out in California, where there's been a lot of human development by the ocean, the plovers are now a threatened species. So conservationists tried to create a new habitat for them. They made artificial beaches and sandbars in areas inaccessible to people and dogs. And the plover population is up quite a bit in those places.

OK, that's an instance where a habitat is made less suitable. But now what about cases where an animal exhibits a clear choice between two suitable habitats—in cases like that, does the preference matter? Well, let's look at the blue warbler.

The blue warbler is a songbird that lives in North America. They clearly prefer hardwood forests with dense shrubs—ah, bushes—underneath the trees. They actually nest in the shrubs, not the trees. So they're pretty close to the ground but these warblers also nest in forests that have low shrub density. It's usually the younger warblers that nest in these areas because the preferred spots where there are a lot of shrubs are taken by the older, more dominant birds.

And the choice of habitat seems to affect reproductive success. Because the older, more experienced birds, who nest in the high-density shrub areas, have significantly more offspring than those in low-density areas. Which suggests that the choice of where to nest does have an impact on the number of chicks they have.

But a preferred environment doesn't always seem to correlate with greater reproductive success. For example, in Europe, studies have been done of blackcap warblers—we just call them blackcaps.

The blackcap can be found in two different environments. Ah, their preferred habitat is forests near the edges of streams. However, blackcaps also live in pine woods away from water. Studies've been done on the reproductive success rates for the birds in both areas and the results showed — surprisingly — that the

reproductive success was essentially the same in both areas—the preferred and the second choice habitat. Well, why?

It turned out that there were actually four times as many bird pairs, or couples, living in the stream-edge habitat compared to the area away from the stream. So the stream-edge area had a much denser population, which meant more members of the same species competing for resources—wanting to feed on the same things or build their nests in the same places, which lowered the suitability of the prime habitat even though it's their preferred habitat.

So the results of the studies suggest that when the number of competitors in the prime habitat reaches a certain point, the second-ranked habitat becomes just as successful as the prime habitat, just because there are fewer members of the same species living there. So it looks like competition for res urces is another important factor in determining if a particular habitat is suitable.

1.What is the main purpose of the lecture?
A. To compare active habitat selection with passive habitat selection
B. To show that most habitat preferences in animals are learned
C. To compare the habitat requirements of several bird species
D. To examine the consequences of habitat selection by animals

2.What element of the plover's habitat in California was threatened?
A. The availability of food
B. The availability of water
C. The safety of nests from human activity
D. The protection of nests from predatory birds

3.What does the professor illustrate with the example of the blue warbler?
A. The relationship between human activity and habitat loss
B. The relationship between habitat and reproductive success
C. The advantages of habitats with low vegetation density
D. The reproductive advantage that young warblers have over older warblers

4.Why does the professor mention the population density of blackcaps in two different habitats?
A. To explain the similar reproductive rates in the two habitats
B. To explain the relation between a species' population density and its nesting behavior
C. To illustrate the advantages of a preferred habitat over a secondary habitat
D. To illustrate the possible impact of making a poor habitat selection

5.According to the professor, why did some blackcaps choose a secondary habitat?
A. They were following a moving food supply.
B. Their preferred habitat was taken over by another bird species.
C. Their nesting sites were disturbed by human activity.
D. Their preferred habitat became too competitive.

6.What can be inferred about the professor when she says this?

Professor: Ok. That is an instance where a habitat is made less suitable. But now, what about cases where an animal exhibits a clear choice between two suitable habitats? In cases like that, does the preference matter?

A. She realizes that she just contradicted a statement she made earlier.
B. She is about to discuss another aspect of the topic.
C. She thinks the answer to her question is obvious.
D. She wants students to recall a case that she has already discussed.

Lecture 02 Women Artists in Paris

Narrator: Listen to part of a lecture in an art history class.

MALE PROFESSOR: We've been talking about the art world of the late nineteenth century in Paris, and today I'd like to look at the women who went to Paris at that time to become artists. Now, um, from your reading, what do you know about Paris…about the art world of Paris during the late nineteenth century?

MALE STUDENT: People came there from all over the world to study.

FEMALE STUDENT: It had a lot of art schools and artists who taught painting. There were…our book mentions classes for women artists. And, uh, it was a good place to go to study art.

MALE PROFESSOR: If you wanted to become an artist, Paris was not a good place to go– Paris was the place to go. And women could find skilled instructors there. Um, before the late nineteenth century, if they…women who wanted to become artists had to take private lessons or learn from family members. They had more limited options than men did.

But around 1870, some artists in Paris began to offer classes for female students. These classes were for women only. And by the end of the nineteenth century, it became much more common for women and men to study together in the same classes. So…so within a few decades, things had changed significantly.

Uh, OK, let's back up again and talk about the time period from the 1860s to the 1880s, and talk more about what happened in women's art classes. In 1868, a private art academy opened in Paris—and for decades it was probably the most famous private art school in the world. Its founder, Rodolphe Julian, was a canny businessman. and quickly established his school as a premiere destination for women artists. What he did was, after an initial trial period of mixed classes, he changed the school policy; he completely separated the men and women students.

FEMALE STUDENT: Any reason why he did that?

MALE PROFESSOR: Well, like I said, Julian was a brilliant businessman with progressive ideas—he saw that another small private art school where all the students were women was very popular at that time, and that's probably why he adopted the women-only classes. These classes were typically offered by, um…by established artists and were held in the studio, the…the place where they painted.

This was a big deal because finally women could study art in a formal setting. And there was another benefit to the group setting of these classes. The classes included weekly criticism. And the teacher would rank the art of all the students in the class, from best to worst. How would you like it if I did that in this class?

MALE STUDENT: No way!

FEMALE STUDENT: But our textbook said that the competitive…the competition was good for women. It helped them see where they needed to improve.

MALE PROFESSOR: Isn't that interesting? One woman artist, um her name was Marie Bashkirtseff. Uh, Bashkirtseff once wrote how she felt about a classmate's work. She thought her classmate's art was much better than her own, and it gave her an incentive to do better.

Overall, the competition in the women's art classes gave women more confidence… confidence that they could also compete in the art world after their schooling. And even though Bashkirtseff couldn't study in the same classes as men, she was having an impact as an artist. Um, just look at the Salon. What do you know about the Salon?

FEMALE STUDENT: It was a big exhibition, um, a big art show that they had in Paris every year. The art had to be accepted by judges.

MALE STUDENT: It was a big deal. You could make a name for yourself.

MALE PROFESSOR: You could have a painting or sculpture in the Salon and go back to your home country saying you'd been a success in Paris. Um, it was sort of a seal of approval. It was a great

encouragement for an artists' career. And by the last two decades of the nineteenth century, one fifth of the paintings in the Salon were by women—much higher than in the past.

In fact, Marie Bashkirtseff herself had a painting in the Salon in 1881. Interestingly, this masterpiece, called In the Studio, is a painting of the interior of Julian's art school. Um, it's not in your textbook—I'll show you the painting next week… Uh, the painting depicts an active, crowded studio with women drawing and painting a live model.

It was actually, Bashkirtseff actually followed Julian's savvy suggestion, and painted her fellow students in a class at the school with the artist herself at the far right—a great advertisement for the school when the painting eventually hung at the Salon, for a women's studio had never been painted before.

1.What is the lecture mainly about?
A. Why the Salon exhibitions became popular among women artists in Paris
B. Why French society did not approve of art schools or women
C. How opportunities for women artists in Paris improved
D. How women artists in Paris cooperated with one another

2.What point does the professor make about Julian when he mentions that Julian's art school offered some classes only for women?
A. Julian's school was the first art school in Paris to offer women-only classes.
B. Julian wanted to encourage the distinctive style of women in Paris.
C. Julian viewed himself as a social reformer.
D. Julian possessed outstanding business skills.

3.What does the professor emphasize as one benefit of competition in women's classes?
A. Women gained more confidence in their artistic abilities.
B. Women became instructors in private art studios.
C. Women were able to sell their paintings for large amounts of money.
D. Women created new styles of painting.

4.According to the professor, what were two ways that the situation of women artists had changed by then end of the nineteenth century in Paris? [Click on 2 answers.]
A. Women and men took art classes together.
B. Women artists played a greater role in the Salon exhibitions.
C. More schools were established by women artists.
D. Fewer women artists were traveling to Paris.

5.What does the professor imply about Bashkirtseff's painting In the Studio?
A. It was one of many paintings that depicted a women's studio.
B. It did not bring Bashkirtseff recognition for her artistic ability.
C. It was criticized for an unrealistic depiction of women artists.
D. It was beneficial for both Bashkirtseff and the school where she studied.

6.What does the professor mean when he says this?

FEMALE STUDENT: It had a lot of art schools and artists who taught painting. There were, our book mentions classes for women artists. And it was a good place to go to study art.

MALE PROFESSOR: If you wanted to become an artist, Paris was not a good place to go; Paris was the place to go.

A. Paris was a popular place to visit, but not the best place to study art.
B. Paris was the most important place for an artist to study and work.
C. Living in Paris was difficult for women artists from other countries.
D. Studing in Paris was beneficial for some artists, but not for others.

Lecture 03 Vision Correction

Narrator: Listen to part of a lecture in a history class.

FEMALE PROFESSOR: So we've been talking about the printing press, how it changed people's lives, making books more accessible to everyone. More books meant more reading, right? But as you know, not everyone has perfect vision. This increase in literacy, in reading, led to an increase in demand for eyeglasses. And here's something you probably haven't thought of: This increased demand impacted societal attitudes towards eyeglasses.

But um first let me back up a bit and talk about vision correction before the printing press. And what did people with poor vision do, I mean especially those few people who were actually literate, what did they do before glasses were invented? Well they had different ways of dealing with not seeing well.

If you think about it, poor vision wasn't their only problem. I mean, think about the conditions they lived in: Houses were dark, sometimes there weren't any windows, candles were the only source of light … So in some places, umm... like ancient Greece, for example, the wealthiest people with poor vision could have someone else read to them. Easy solution if you could afford it.

Another solution was something called a reading stone. Around 1000 CE, European monks would take a piece of clear rock, often quartz, and place it on top of the reading material. The clear rock magnified the letters, making them appear larger. Umm, it's like what happens when a drop of water falls on something. Whatever's below the drop of water appears larger, right? Well, the reading stone works in a similar way.

But rocks like quartz, quartz of optical quality, weren't cheap. Late in the thirteenth century, glassmakers in Italy came up with a less expensive alternative—they made reading stones out of clear glass. And these clear-glass reading stones evolved into the eyeglasses we know today. So we're pretty sure that glasses were invented in about the late 1200s, well over a hundred years before the printing press.

But, it's not clear who exactly invented them first, or exactly what year, but records show that they were invented in both Europe and China at about the same time. By the way, we call this independent discovery. Independent discovery means when something is invented in different parts of the world at the same time. And it's not as unusual as it sounds. You can look at the time line charts in the back of your textbook to see when things were invented in different cultures at about the same time, to see what I'm talking about.

So now let's tie this to what I said before about societal attitudes towards glasses. Initially, in parts of Europe and in China, glasses were a symbol of wisdom and intelligence. This is evident in the artwork from the period. European paintings often portrayed doctors or … or … judges wearing glasses. In China, glasses were very expensive.

So in addition to intelligence they also symbolized affluence, wealth. In fourteenth-century Chinese portraits, the bigger the glasses, the smarter and wealthier the subject was. So glasses were a status symbol in some parts of the world.

Now let's get back to the invention of the printing press in 1440. What happened? Suddenly books became readily available, and more people wanted to read, so the need, well actually, not only the need, but the demand, for more affordable glasses rose drastically. Eventually inexpensive glasses were produced and then glasses were available to everyone. People could purchase them easily from a traveling peddler.

1.What is the lecture mainly about?

A. Political events that led to the invention of eyeglasses

B. A comparison of attitudes toward vision correction in Europe and China

C. The relationship between the printing press and literacy

D. An overview of vision correction over time

2.According to the professor, what was an advantage of using clear glass instead of quartz to make reading stones?

A. Clear glass was easier to find than quartz.

B. Clear glass was easier to cut to the appropriate size.

C. Clear glass magnified the letters more than quartz did.

D. Clear glass was less expensive than quartz.

3.What does the professor imply about the invention of eyeglasses?

A. Its historical records are more detailed than those of other inventions.

B. It has little impact on social attitudes toward vision correction.

C. Its occurrence in different places at approximately the same time is not unusual.

D. It contributed to a substantial increase in the number of literate people.

4.Which sentence best describe eyeglasses before the invention of the printing press?

A. They were available to everyone.

B. They were a symbol of wealth and wisdom.

C. They could not correct vision accurately.

D. They could be bought only from traveling peddlers.

5.Put the events in the order that they happened. [Click on a sentence. Then drag it to the space where it belongs.]

A.Inexpensive eyeglasses became available.

B.The first eyeglasses were made.

C.The number of people interested in reading increased.

D.The printing press was invented.

6.What does the professor imply when she says this?

So in some places, umm... like ancient Greece, for example, the wealthiest people with poor vision could have someone else read to them. Easy solution if you could afford it.

A. She is impressed by the solution.

B. The solution she describes is obvious.

C. The solution was not a common practice.

D. The solution was not particularly expensive.

Lecture 04 The Periodic Table of Elements

Narrator: Listen to part of a lecture in a chemistry class. The professor has been discussing the periodic table of elements.

MALE PROFESSOR: So … are there any questions?

FEMALE STUDENT: Yes, um, Professor Harrison? You were saying that the periodic table is predictive? What exactly does that mean? I mean, I understand how it organizes the elements, but … where's the prediction?

MALE PROFESSOR: OK, let's look at our periodic table again. OK - it groups elements into categories that share certain properties, right?

FEMALE STUDENT: Uh-huh …

MALE PROFESSOR: And it's arranged according to increasing atomic number, which is … ?

FEMALE STUDENT: The number of protons in each atom of an element.

MALE PROFESSOR: Right. Well, early versions of the periodic table had gaps. Missing elements. Every time you have one more proton you have another element, and then — oops — there'd be an atomic number for which there was no known element. And the uh prediction was that an element with that atomic number existed somewhere, but it just hadn't been found yet. And its location in the table would tell you what properties it should have. It was really pretty exciting for scientists at that time, to find these missing elements and confirm their predicted properties.

Um actually, that reminds me of a, of a, of a very good example of all this … element 43. See on the table, the symbols for elements 42 and 44? Well in early versions of the table, there was no symbol for an element with 43 protons because no element had yet been discovered with 43 protons. So the periodic table had a gap between elements 42 and 44.

And, then, uh, in 1925 a team of chemists led by a scientist named Ida Tacke claimed that they had found element 43. They had been , uh, using a relatively new technology called x-ray spectroscopy —and they were using this to examine an ore sample — and they claimed they'd found an element with 43 protons. And they named it masurium.

MALE STUDENT: Um, Professor Harrison? Then how come in my periodic table here element 43 is "Tc"--that's technetium, right?

MALE PROFESSOR: OK, let me add that …Actually, uh, that's the point I'm coming to. Hardly anyone believed that Tacke had discovered a new element. X-ray spectroscopy was a new method at the time. And they were never able to isolate enough masurium to have a weighable sample, to convince everyone of their discovery, so they were discredited. But then, twelve years later, in 1937, a different team became the first to synthesize an element using a cyclotron. And that element had …

MALE STUDENT: 43 protons?

MALE PROFESSOR: That's right. But they named it technetium to emphasize that it was artificially created — with technology. And people thought that synthesizing this element, making it artificially, was the only way to get it. We still hadn't found it occurring in nature.Now, element 43, whether you call it masurium or technetium, is radioactive. Why does that matter? What's true of a radioactive element?

FEMALE STUDENT: It decays? It turns into other elements? Oh, so does that explain why it was missing in the periodic table?

MALE PROFESSOR: Exactly. Because of its radioactive decay, element 43 doesn't last very long … and therefore… if it ever had been present on Earth it would have decayed ages ago … So … the masurium people were obviously wrong and the technetium people were right … right? Well, that was then.

Now we know that element 43 does occur naturally — it can be naturally generated from uranium atoms that have spontaneously split. And guess what... the ore sample the masurium group was working with had plenty of uranium in it — enough to split into measurable amounts of masurium. So Tacke's team might very well have found small amounts of masurium in their ore sample. It's just that once it was generated from split uranium, it decayed very quickly.

And you know, here's an incredible irony. Ida Tacke — the chemist who led the masurium team — well, she was the first to suggest that uranium could break up into smaller pieces. But she didn't know that that was the defense of her own discovery of element 43!

MALE STUDENT: So is my version of the periodic table wrong? Should element 43 really be called masurium?

MALE PROFESSOR: Maybe. But you know it's hard to tell for sure after all this time if Ida Tacke's group did discover element 43. They didn't um publish enough detail on their methods or instruments for us to know for sure.

But I like to think element 43 was discovered twice. As masurium, it was the first element discovered that occurs in nature only from spontaneous fission; and, as technetium, it was the first element discovered in a laboratory. And, of course, it was an element the periodic table led us to expect existed … before anyone had found it — or made it.

1.In the beginning of the lecture a student asks a question about the periodic table. How does the story of element 43 answer her question?
A. By providing an example of an element whose place in the periodic table was moved
B. By providing an example of an element whose existence was predictable from the periodic table
C. By providing an example of an element which scientists predicted was formed from uranium
D. By providing an example of an element that can only be made artificially

2.What does the professor say about early versions of the periodic table?
A. Early versions listed two names for some elements.
B. Early versions had the incorrect atomic number for some elements.
C. Early versions were not as easy to use as modern version.
D. Early versions did not list an element for every atomic number.

3.What fact inspired researchers to give the name "technetium" to element 43?
A. The element was radioactive.
B. The element was derived from uranium.
C. The element was created artificially.
D. The element was found using x-ray spectroscopy.

4.What characteristic of element 43 might explain why the scientific community doubted the findings of Ida Tacke's team?
A. Element 43 has a very fast rate of decay.
B. Element 43 always contains small amount of other elements.
C. Element 43 cannot be created artificially.
D. Element 43's radioactivity makes it easy to isolate and measure.

5.What does the professor believe the claim that Ida Tacke's team made about element 43?
A. Scientists should have accepted the claim when it was first published.
B. There is not enough evidence to know if the team actually discovered element 43.
C. The team's unusual scientific methods were unreliable.
D. If the team's ore sample had contained element 43, the team would have been able to isolate a weighable amount.

6.What does the professor imply about the chemist Ida Tacke when he says this?

And you know, here's an incredible irony. Ida Tacke — the chemist who led the masurium team — well, she was the first to suggest that uranium could break up into smaller pieces. But she didn't know that that was the defense of her own discovery of element 43!

A. She did not realize that the periodic table predicted the radioactivity of element 43.
B. She did not understand why her team's findings were dismissed by the scientific community.
C. Her theory about uranium would have explained the presence of element 43 in her team's ore sample.
D. Her theory about uranium would have explained the errors that created element 43 in a cyclotron.

Appendix: Vocabulary

1. contemporary					
2. semester					
3. exhibit					
4. gallery					
5. term					
6. separately					
7. exactly					
8. brushstroke					
9. depict					
10. texture					
11. canvas					
12. landscapes					
13. blurry					
14. foreground					
15. fence					
16. cattle					
17. depictions					
18. zigzag					
19. chaotic					
20. vibrant					
21. extremely					
22. dating					
23. technique					
24. instance					
25. essentially					
26. flatten					
27. refinement					
28. revolutionary					
29. grain					
30. sandstone					
31. zircon					
32. radioactive					
33. crystallize					
34. molten					
35. establish					
36. assumptions					
37. comparison					
38. sequence					
39. archaeology					
40. inhabitant					
41. flake					
42. rectangular					
43. brick					
44. hatchway					
45. diagonal					
46. ash					
47. chimney					
48. plaster					
49. burial					
50. excavation					
51. speculate					
52. cereal					
53. domestication					
54. escape					
55. grave					
56. appropriate					
57. soot					
58. behaviorally					
59. marmot					
60. squirrel					
61. portion					
62. hibernating					
63. temperate					
64. frost					
65. territorial					
66. aggressive					
67. ritual					
68. emerge					
69. offspring					
70. bizarre					
71. meadow					
72. harsh					
73. burrow					
74. address					
75. behaviorism					
76. muscular					
77. manifestation					
78. laryngeal					
79. mature					
80. electrode					
81. ideomotor					
82. botany					
83. fiber					
84. cable					
85. hemp					
86. moor					
87. bundle					

88. twist					
89. coat					
90. soak					
91. ethical					
92. distinction					
93. extrinsic					
94. engage					
95. sake					
96. astronomy					
97. asteroid					
98. astronomical					
99. tantalizingly					
100. gravitation					
101. Jupiter					
102. telescope					
103. hummingbird					
104. breed					
105. pollinated					
106. cease					
107. concrete					
108. ecotourist					
109. recapture					
110. category					
111. fuse					
112. aquatic					
113. mollusk					
114. notion					
115. documentarist					
116. masterpiece					
117. penetrate					
118. torch					
119. charcoal					
120. enhance					
121. depict					
122. herbivore					
123. rhinoceros					
124. mammoth					
125. bison					
126. uninhabited					
127. spectroscopy					
128. spectroscopic					
129. spectrograph					
130. spectrum					
131. spectra					
132. prism					

133. beam					
134. stab					
135. magnify					
136. helium					
137. ritual					
138. preen					
139. mating					
140. disinhibition					
141. conviction					
142. conformity					
143. consistency					
144. attest					
145. criticize					
146. trail					
147. track					
148. lakebed					
149. clay					
150. vibrate					
151. tilt					
152. meteorology					
153. council					
154. altruistic					
155. incentive					
156. patron					
157. alligator					
158. sewer					
159. analogy					
160. replica					
161. replicate					
162. replicator					
163. longevity					
164. fecundity					
165. fidelity					
166. mutation					
167. compelling					
168. crater					
169. orbit					
170. diameter					
171. crust					
172. crude					
173. estimate					
174. mission					
175. meteor					
176. molecule					
177. perpetual					

178. evaporation					
179. primitive					
180. mantle					
181. laser					
182. devise					
183. curator					
184. pigment					
185. varnish					
186. infrared					
187. ultraviolet					
188. invasive					
189. fleck					
190. deteriorate					
191. collaboration					
192. tale					
193. genre					
194. orally					
195. communal					
196. trait					
197. cabin					
198. boom					
199. bust					
200. hysterical					
201. irrational					
202. tulip					
203. diplomat					
204. bulb					
205. roast					
206. sandy					
207. craze					
208. promissory					
209. mortgage					
210. dispersal					
211. hectare					
212. germinate					
213. remnant					
214. consciously					
215. portray					
216. tropical					
217. paradise					
218. hippopotamus					
219. wetter					
220. aquifer					
221. monsoon					
222. motion					

223. abrupt					
224. compound					
225. vegetation					
226. moisture					
227. evaporate					
228. flourish					
229. hypothesize					
230. impetus					
231. pollen					
232. atmosphere					
233. commercially					
234. device					
235. playwright					
236. feud					
237. fraud					
238. servants					
239. gossip					
240. rumor					
241. incite					
242. furious					
243. obligatory					
244. denouement					
245. subtle					
246. basis					
247. plot					
248. infrasound					
249. acoustical					
250. orientation					
251. prey					
252. echolocation					
253. sophisticate					
254. sophisticated					
255. spear					
256. maple					
257. stationary					
258. moth					
259. anthropology					
260. birch					
261. prevalent					
262. bark					
263. utensil					
264. pliable					
265. canoe					
266. vessel					
267. stitch					

268. resin					
269. maneuver					
270. maneuverable					
271. glacial					
272. bedrock					
273. friction					
274. lubricant					
275. brittle					
276. shatter					
277. distort					
278. deform					
279. ooze					
280. gravity					
281. crevasse					
282. fissure					
283. surge					
284. basal					
285. disperse					
286. breed					
287. recap					
288. blend					
289. camouflage					
290. fledgling					
291. warbler					
292. canny					
293. premiere					
294. brilliant					
295. monk					
296. quartz					
297. affluence					
298. portrait					
299. drastic					
300. peddler					
301. wisdom					
302. periodic					
303. proton					
304. cyclotron					
305. synthesize					
306. decay					
307. spontaneous					
308. ore					
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