

I n s i d e r L i s t e n i n g

Answer Key

Chapter 1 Main Idea Questions

Basic Drills _ p.18

[Answer]

- (C)
 - There are two groups of words that are repeated or have similar meanings. The first is words like: *burglary, break-ins, robberies, crime, and thieves*. The other group consists of words like: *safeguard, protect, thief-proof, and precaution*. Based on these word groupings, you should be able to figure out that the main point of the lecture has to do with how to protect your home from thieves.
 - (C)
- Although the student mentions that he is on an athletic scholarship, and that he plays on the football team, this information is background information which explains why he will miss some assignments.
 - The notes provided for the lecture are organized in a format that makes physical comparisons between humans and chimps. Although genetics and evolution are mentioned in the lecture, they are clearly not the main ideas.

Listening Practice 1 _ p.19

- Student wrking on appltcn to grad. schl.
- interview by admsns review committee
- Prof. can't take part in intrvw. b/c she is his stdnt.
- Stdnt wants prof. to give advice & intrvw prep.
- prof. will make reading list for stdnt.

[Answer]

- (C)
 - (A)
 - (D)
- The key to understanding this is when the girl corrects the professor (about halfway through the conversation). The professor is worried that the student wants his help in the admissions process, but she corrects him, explaining that she only wants his advice on how to prepare for the interview.
 - This is clearly stated by the professor in his second response to the student.
 - This is clearly stated by the professor when he says that he will make the student a reading list.

Building Your Listening Skills _ p.20

[Answer]

- Excuse
- these are
- That is
- supposed to
- don't you
- This will
- take part in the interview process
- Is there any
- There are
- That would
- It is

Listening Practice 2 _ p.21

- Alaska, Jpn, Indnsa, many earthquakes & volcns
- movmnt in earth's crust → earthquakes. + volcns
- Ring of Fire
- ∩ shape from W. coast S. Am., to E coast Asia = 40,000Km
- has many tectonic plates colliding
- 90% of earthquakes + 75% of volcns

[Answer]

- (C)
 - (B)
 - ☒ Eastern coastal Asia
☐ Western coastal India
☒ Western coastal South America
☐ Eastern coastal Africa
- Although earthquakes and volcanoes are mentioned at the beginning of the discussion, they are simply things that characterize the Pacific Ring of Fire. Answer B is far too broad, and D is incorrect because Japan and Indonesia are only mentioned as two locations along the Pacific Ring of Fire.
 - Student B explains this in answering the professor's question about why Alaska and Japan have many volcanoes and earthquakes. Answer B is just a paraphrase of this information.
 - The answers are the 1st and 3rd boxes; the professor states this clearly in describing the Pacific Ring of Fire.

Building Your Listening Skills _ p.22

[Answer]

1. Statement from the discussion: Uh, and not only are these areas of high earthquake activity, they're also areas with a lot of volcanic activity. That's actually not too surprising because, as we'll see, earthquakes and volcanoes often go hand-in-hand.
 2. Statement from the discussion: As we mentioned in the last class, the earth's crust is made of plates which are always in motion, and it's this motion that causes earthquakes and volcanoes.
1. The paraphrased sentence is really just a combination of the information contained in these two sentences from the discussion. Saying that two things are linked is equivalent to saying those two things "go hand-in-hand."
 2. The paraphrase summarizes the information in the original statement. It omits the idea that the earth's plates are in constant motion, but still retains the basic explanation of cause and effect. The phrase "seismic activity" refers to volcanoes and earthquakes.

Listening Practice 3 _ p.23

Guggenheim, Musm. of Mod. Art = deconstructionist blds.

Deconstruction

- don't look like bldgs, look like mod. sculptures
- strange angles and curves

purpose:

- Break with architect. traditions, create new style
- like cubism and expressionism in art

Not possible before b/c no compts. or advncd. materials

[Answer]

1. (A)
 2. (A)
 3. (C)
1. Although the concepts in answers B, C, and D are all mentioned in the discussion, they are only discussed in relation to the deconstructionist movement.
 2. The professor says that deconstructionist architects wish to break away from traditional architecture. Answer A is basically a paraphrase of this idea.
 3. The professor explains that deconstructionist architecture and the cubist and expressionist movements in painting were all attempts to deconstruct traditions in their fields.

Building Your Listening Skills _ p.24

[Answer]

1. (B)
 2. (C)
 3. This section is not planned. This section, which explains why it took so long for deconstruction to develop in architecture, is in response to a student question.
1. The main purpose of this section of the discussion is to introduce the concept of deconstructionist architecture.
 2. This section is primarily concerned with defining deconstructionist architecture by explaining its most important characteristics.

Listening Practice 4 _ p.25

Important life saving technique: cardiopulmonary Resuscitation (CPR)

Learn how and when to give

- must be: unconscious, not breathing, no heartbeat

used to supply blood to brain

Steps:

1. Call 911
2. lay on back
3. give 2 breaths
4. do 30 chest compressions
5. repeat 3&4 until paramedics arrive

[Answer]

1. (C)
 2. ☐ Severe bleeding
☒ Loss of consciousness
☐ An erratic heartbeat
☒ Lack of respiration
☐ Lack of a heartbeat
1. The professor clearly states at the beginning of the lecture that she will discuss how and when to give CPR.
 2. This is clearly stated, although the phrase "lack of respiration" is a paraphrase of "not breathing."

Listening Practice 5 _ p.26

Segregation stopped in 1954 but continued b/c:

- neighborhoods still seg'd.
- Afrn. Am. couldn't move into white neighborhoods
- Schl attend based where stndt. lives

Solution:

Court ordered bus prg. to deseg. schls.

- Afrn. Am. stndts sent by bus to school in white areas

P.G. County, M.D.:

1974 75% white 25% Afrn. Am.

Court ordered mandatory bus prg.

- resltd in long bus rides for stndts

Stopped in 2000 b/c more Afrn. Ams than whites in county = not necessary

[Answer]

1. (D) 2. (B) 3. (C)

1. A is far too broad, and C is only an example that is mentioned in the lecture.
2. The professor clearly states that school attendance was based on what neighborhood a person lived in, and that American neighborhoods remained segregated.
3. This is clearly stated in the lecture when the professor says that some students had bus rides as long as an hour.

Vocabulary Review I _ p.27

[Answer]

- 1-1. configured 1-2. safeguard
1-3. de facto 1-4. hoarding
- 2-1. been all the rage
→ Although the band used to be very popular, they are not anymore.
- 2-2. do away with
→ The candidate promised to get rid of all sales taxes if he was elected.
- 2-3. has slim chances
→ After their poor marketing decision, the company's chances of making a profit this year are not good.
- 2-4. goes hand-in-hand
→ If you ask me, hard work is essential for success.

/BT Practice I _ p.28~29

[Answer]

1. (A) 2. (B) 3. (C)
4. (B) 5. (B) 6. (B)

1. Answers B, C, and D are just individual features of narrative ballet mentioned in the discussion.
2. This is clearly stated in the discussion.
3. The professor discusses two examples of techniques used in narrative ballet (the *divertissement* and the *pas de deux*) and explains why they are used.
4. The professor's discussion of Swan Lake primarily involves a summary of the plot and an explanation of where that plot comes from.
5. The key is to consider this statement with the student's earlier statement that he gets (understands) how music and dance influence ballet. The contrast implied by the student's use of the word "but" should give you an important clue concerning the answer.
6. You can infer this from the fact that professor says that breaking up the ballet into acts puts it into sections that are manageable for most people.

Listening for Total Comprehension _ p.30

In recent years, many U.S. corporations have experienced significant difficulties in attracting qualified personnel, especially in the fields of engineering and management. As the world becomes more globalized, individuals with such skills have employment options in any number of nations, and many are choosing to work and live outside of the U.S. This problem is commonly known as "brain drain," a phenomenon in which a nation loses its best and brightest.

As a result, many top companies are looking for innovative new ways to attract talent. Aside from the traditional methods of offering handsome salaries and bonus packages, many companies are now trying to offer improvements in the lifestyle of their most talented employees. This includes greater flexibility in work schedule, longer vacations, and enhanced retirement benefits. It is only through such efforts that companies can now hope to compete in the global marketplace.

[Answer]

1. American companies have had problems in attracting qualified applicants for engineering and management positions.
2. Globalization has led to this problem because applicants have more options concerning where they work.
3. The phrase "its best and brightest" refers to the nation's best and brightest people.

Summarization Skills _ p.31

[Answer]

The first summary is the correct summary. The second summary contains a number of inaccuracies. Most importantly, it states that the demographics of Prince George's County changed as a result of the busing program, which is incorrect.

Integration Skills _ p.32

[Answer]

1. The lecture says that the most important thing is to ensure that blood is supplied to the brain. But the reading says that in most heart attacks, the heart doesn't stop. Therefore oxygen is still being supplied to the brain. The major danger, according to the reading, is the stress placed on the heart. The reading says that when CPR is given by untrained individuals, they can actually make things worse by placing more stress on the heart.
2. The lecture says that you should press down forcefully on the chest, but the reading says that this is very dangerous with children because you can break their breastbone and puncture their heart. Instead, it says you should gently massage the area below the breastbone.

Chapter 2 Supporting Detail Questions

Basic Drills _ p.36

[Answer]

1. Turbulence is an important keyword from the lecture. According to the lecture, turbulence is the shaking of an aircraft when the aircraft travels through rough air. Important points about turbulence include the following facts: it can be detected by radar but not totally avoided, and it can cause injuries to passengers.
 2. Disaster Relief:
 Search + rescue genrly main focus
Look for people in rubble
 largest # of deaths from diseases caused by no sanitation
sewers don't work, and no garbage pickup
 focus should be on disease prevention + sanitation
bottled water very cheap
 3. (B)
3. This a paraphrase of the following statement from the lecture: *Uh, basically, gold companies restrict the availability of gold to keep the price high.*

Listening Practice 1 _ p.37

- Stdnt has to fill out work order
- needs air con. fixed
 - 1. air con doesn't make room cooler
- Man thinks air con needs coolant to be rechrld.
- not done yet b/c too much constretn in summer - too busy
 - workers will come next weds.

[Answer]

1. (B) 2. (C) 3. (D)

1. The woman clearly states that she has come to submit a work order, and later in the conversation, she specifies what the work order is for.
2. The man clearly states that because of the building projects on campus during the summer, the workers were too busy to service the air conditioners.
3. The man clearly states that the workers are scheduled to come to the student's dormitory next Wednesday.

Building Your Listening Skills _ p.38

[Answer]

1. This is the
2. put in a
3. get you
4. seem to do
5. went on

Listening Practice 2 _ p.39

Hybridization = two species interbreed

exmp: horse + donkey = mule

In wild happens when similar species have very close territories

- very rare, 1 in 1,000

Humans force animals to interbreed b/c hybrids stronger

exmpl: mule has best qualities of horse & donkey

Drawbacks

- Offspring often sterile
- May lack natural protectns of parents

[Answer]

1. (C)
 2. ☐ The presence of large animal populations
☒ Territories that merge into one another
☒ The presence of two genetically similar species
☐ Genetically unique parents that can create hybrids
 3. (B)
1. You should be able to use the notes to help you determine the main topic of the discussion. The first part clearly describes the ways that hybridization can occur (causes), and the second part discusses the advantages and disadvantages (results).
 2. This is clearly stated in the discussion when the professor says that hybridization occurs between closely related species with overlapping territories.
 3. This is clearly stated in the discussion.

Building Your Listening Skills _ p.40

[Answer]

1. Statement from the discussion: *In the wild, hybridization is extremely rare. Uh, it only happens when you have two closely related species that have overlapping territories. Uh, so, for example, if you have wild donkeys and wild horses living in the same area, there is a chance that they will interbreed. But even in those situations, chances are less than 1 in 1,000 that any interbreeding will occur.*

2. Statement from the discussion: *Uh, for example, hybrid butterflies often lack the protective coloration of either parent, and therefore make easier prey for predators.*

1. The paraphrased sentence is basically just a summary of this section of the discussion. The clause "even when all conditions are met" is a general reference to the specific requirements mentioned in the discussion.
2. The paraphrase is essentially a generalization drawn from the information in this specific example. The phrase "adaptations that protect their parents" refers to the protective coloration of butterflies mentioned in the discussion.

Listening Practice 3 _ p.41

Porcelain = famous form of Chinese pottery

Materials = Chinese clay and porceln stone

- both have tiny plates which make very smooth

process: 1) make body & let dry

2) brush on glaze & let dry

3) fire in kiln at temp of 1250 - 3000°C

Kilns = ovens used to fire porcln

- dragon kilns

a. built into hill b/c of huge size

b. very high temp, used more Chin. clay, found in south

- Egg-shaped shaped kilns

a. used more porcln stone, fired at lower temp, found in north

b. faster but heat uneven

[Answer]

1. (C)
 2. (B)
 3. ☐ Glazed in bright, vivid colors
☒ Fired at lower temperatures
☒ Use less Chinese clay
☐ Use porcelain stone exclusively
1. Although B is discussed in the lecture, it is not the main topic, and A and D are never discussed in the lecture.
 2. This is clearly stated in the lecture.
 3. The color of the porcelain of different regions is never discussed, and the lecture explicitly states that all porcelain used a mixture of porcelain stone and Chinese clay.

Building Your Listening Skills _ p.42

[Answer]

1. (B)
2. (A)
3. This section is primarily concerned with describing the differences in the materials and firing methods used in making porcelain in the northern and southern parts of China.

1. The rest of the lecture is concerned with describing how Chinese porcelain is produced.
2. This section describes the process of shaping, glazing, and firing porcelain.

Listening Practice 4 _ p.43

- Inertial energy = mass x velocity
 Impacts of hypervelocity obj.
- Hypervel = more than 5,000 mph
 - inertial energy is more than strength of matrl.
 - result of impact = matrl like liquid, vaporize & make plasma
- Happens most often in space
 Problems for satellites
- shielding useless b/c no matrl strong enough
 - electronics damaged by plasma

[Answer]

1. (C)
- 2.

	Yes	No
The structural strength of any material becomes insignificant.	✓	
Atoms are induced to undergo a fission process.		✓
Objects are instantly merged into to one solid form.		✓
Large portions of inertial energy are converted to thermal energy.	✓	

3. (A)

1. The professor clearly states this in the introduction to the lecture.
2. The lecture clearly states that inertial energy far outweighs the strength of any material, and that much of an object's inertial energy is converted into heat (thermal energy).
3. The passage clearly states that even if a satellite is not totally destroyed, the plasma created in the collision can short out its electronics.

Listening Practice 5 _ p.44

Monetary policies: contractn policy, expansn policy

- contractn policy = less \$ in circulation
 a. reason: slow down inflation
- expansn policy = more \$ in circulation
 a. reason: more spending to help econ.

Methods:

Less money

- stop making \$ no good b/c too slow
- instead sell bonds
- or make banks keep more \$ in reserve

More money

- reverse steps for contractn pol.

[Answer]

1. (B)
2. (C)
3. ☐ Printing money in larger denominations
☐ Restricting banks' ability to loan money
☒ Reducing reserve requirements for banks
☒ The buying of bonds by the govenment

1. A, C and D all contain ideas that are not covered in the discussion.
2. The professor clearly states that since only old bills are taken out of circulation, stopping the printing of money would be too slow.
3. The professor clearly states that enacting an expansionary policy would involve reversing the actions taken in a contraction policy, and selling bonds and increasing reserve requirements for banks are both actions taken in a contraction policy.

Vocabulary Review I _ p.45

[Answer]

- 1-1. microscopic 1-2. rubble
 1-3. catastrophic 1-4. robust

2-1. come into play

→ The team's endurance will only have an effect if we allow the game to go into overtime.

2-2. at full blast

→ The teenager's decision to play his stereo as loud as possible quickly brought the police to his home.

2-3. put the brakes on

→ If Jessica does not start shopping less, she will have a huge credit card bill at the end of the month.

2-4. stick with

→ The caddy advised the golfer to change to a smaller club, but he chose to continue to use his 5-iron.

I /BT Practice I _ p.46~47

[Answer]

1. (B) 2. (A) 3. (D)
4. (D) 5. (C)

1. The student is not doing well in his chemistry class and is considering dropping the course. He talks to the advisor to learn what the procedure for dropping the course is.
2. The student says he has taken more courses than he should have. He now realizes this is a mistake. He knows, in order to do well in chemistry, he will have to study hard, but now he doesn't have the time.
3. Dropping a course must be done earlier than withdrawal. It requires no signature from the professor and will not be registered on the student's permanent record. Withdrawal will be accompanied by some kind of grade.
4. It seems most likely that the student will drop the course. To do this, the student must fill out a form. The advisor reminds him to do this, and the student says that he's on his way. In other words, he's going directly from the advisor's office to get the form.
5. The advisor knows the student doesn't want to withdraw from the course with a bad grade and have it go on his permanent record. So, she emphasizes this by stating it in the form of a tag question.

Listening for Total Comprehension _ p.48

For much of its history, space travel and exploration has been the exclusive domain of a select few of the most advanced nations in the world. Space programs have traditionally been huge, government-run operations with staggering budgets and vast bureaucracies. Many critics have charged that their size made inefficiency and a lack of innovation an inherent part of government-run space agencies. Yet, due to the complexity of space travel and the tight restrictions on space related technologies, there seemed to be little alternative.

In recent years, however, the first signs of corporate space programs have begun to emerge. Space tourism, in which the ultra wealthy could pay for a seat on a governmentally funded rocket, opened the doors for other private, for-profit ventures. There are now several companies seeking to build their own manned rockets with the express purpose of marketing trips into space as a sort of exotic vacation for those with the money to pay for such adventures. Whether these corporations will be any more efficient or innovative in their operations than governments have been remains to be seen, but it is certain that space travel has entered a new era.

[Answer]

1. Critics say that inefficiency and a lack of innovation are inherent parts of government space programs because of the size of their bureaucracies.
2. Space tourism first started when the super-rich were able to pay for a seat on a rocket in a government funded space program.

Summarization Skills _ p.49

[Answer]

The second summary is the correct summary. The first summary completely omits the description of how materials behave in hypervelocity impacts, only stating that hypervelocity impacts are very destructive.

Integration Skills _ p.50

[Answer]

1. In the lecture, the professor admits that expansionary policies can lead to greater inflation, but he states that the real goal is to stimulate the economy. The situation described in the reading seems to be one in which an expansionary policy went out of control. Although Germany enacted an expansionary policy in order to help meet its treaty obligations, the result was inflation that was so great that money seems to have lost its meaning. As a result of the rapidly increasing prices, the German people stopped saving, and became obsessed with buying things as soon as they had money. So while Germany's expansionary policy did encourage consumer spending, it seems to have done so to an extreme degree. Also, banks stopped loaning money because they knew the loans would be worthless when they were repaid. The lecture seems to indicate that expansionary policies should encourage bank loans, so this would be another way in which Germany's expansionary policies had unintended consequences.

iBT Mini Test 1 _ p.52~57

[Answer]

1. (B) 2. (D) 3. (C)
4. (B) 5. (A) 6. (D)

7.

	Broca's aphasia	Wernicke's aphasia
Damage to the temporal lobe		✓
Damage to the frontal lobe	✓	
Short, meaningful phrases	✓	
Long, meaningless phrases		✓
Discovered first	✓	

8. (B) 9. (A) 10. (C)
11. (B) 12. (D)

13.

1. Hydrogen is induced to separate into its constituent particles.
2. Protons pass through the fuel cell.
3. Electrons power an electrical circuit.
4. Protons, electrons, and oxygen combine to form water.

14. (C) 15. (B) 16. (C)
17. (C)

- The student visits the professor with his preliminary report. He has a lot of data but is having problems organizing it into a report.
- The first thing the professor notices about the report is that it is not in the format of a report. Only later does she also notice that the student has not used any references to support his findings.
- The professor says that citing sources would make the student's report seem professional because it would show that the student is aware of the research already done on the topic.
- The student complains that he will have to do a lot more work to follow up on the professor's suggestions, and mentions that he is not getting paid for this project.
- There are two key phrases in the professor's question. The first is "since you brought it up" and the other is "I wonder if." Both of these are used to prepare the listener for a question that may be serious or personal. In a way, the person is asking for permission, although it is the preparation that is important here.
- The professor discusses the two major types of aphasia (classification), and discusses the role of strokes in causing aphasia.
- The professor states that most cases of aphasia are caused by strokes, and that therefore, the elderly make up many of those who suffer from aphasia. This clearly suggests that strokes happen most frequently in the elderly.

- The professor clearly states that aphasia caused by T.I.A. strokes may only last several hours or a few days.
- The professor says that the prognosis (the possibility of recovery) is better for children, and says that this is due to the ability of a child's brain to rewire itself around a damaged area.
- The statement that the professor wants to see the students' pencils moving clearly suggests that the students should take note of these two names.
- The professor clearly states that the topic of the discussion will be the "ups and downs" of fuel cell technology. Although some time is spent explaining how fuel cell technology works, this is to provide the students with the necessary background information.
- The professor says that fuel cells used to cost about \$1,000 for every kilowatt produced, but that this is expected to drop to about \$30 per kilowatt soon.
- The professor corrects the student when he says that hydrogen is dangerous, but then goes on to point out that fuel cells would need an entirely new infrastructure. The professor uses gas stations as an example of this new infrastructure.
- The student's comment comes immediately after a highly technical explanation of a chemical process by the professor. The student's comment is intended to let the professor know that he has not understood that explanation.
- The professor implicitly compares the use of hydrogen to the use of liquid natural gas to suggest that there is little real danger of explosion.

Chapter 3 Content-Linking Questions

Basic Drills _ p.62

[Answer]

- 1-1. (C) 1-2. (A) 1-3. (A)
2. Fact 1: Jim has gained weight recently
 Fact 2: Jim knows this, and is upset about it
 Fact 3: Jim has recently started to go to the gym
 Fact 4: Jim only bought fruit and vegetables at the supermarket.
 Fact 5: Jim is worried because it will be summer soon, and he does not want to go to the beach looking as he does.
 Conclusion: The clear implication of all this is that Jim is trying to lose weight.
3. (B)

- 1-1. The implication is that the team lost because their pitcher was injured.
- 1-2. The implication is that Jake's car problems are the reason for his lateness.
- 1-3. There are actually two implications in this dialog. The first is that Harry does not arrive at work by 9 pm. The second implication is that since he is the boss's son, he does not have to follow the rules.
3. There are a couple clues that help make this inference. First, we know that the woman is upset because the president has not kept his promises from the last election. Second, the woman says that she won't make the mistake of voting for the president again clearly implying that she will vote against him.

Listening Practice 1 _ p.63

Stdnt needs info re: course b/c thinking of registering

- specifically needs info on focus of class

Prof answer: focus will be cultural life

- course reqmnts: lots of reading, 3 exams, no essays or papers to help

Stdnt no worried b/c wants to audit course but needs permission from prof.

will get answer after prof. checks stdnts record

[Answer]

1. (B) 2. (C) 3. (D)

1. The student clearly states that she needs some information about the professor's History 225 course before she registers for it.

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2. The professor implies this by mentioning the amount of reading required by the course and the fact that there are no essays to help bring up the student's grade if she does not do well on the exams.
3. The professor says that he will check the student's record tonight and give her an answer tomorrow, clearly implying that she should return to speak with him again tomorrow.

Building Your Listening Skills _ p.64

[Answer]

- | | |
|---------------|---------------|
| 1. are you | 2. about your |
| 3. Will it be | 4. Will it be |
| 5. life | 6. Will it be |
| 7. life | 8. Do you |
| 9. to pad you | |

Listening Practice 2 _ p.65

B-movies

- today's meaning: horror & sci-fi films w/low productn. value

History of term:

- studios in 30s and 40s used two kinds of actors A actors, and B actors
 1. A actors starred in headliner films
 2. B actors starred in lower quality films which were shown after films w/A actors

Movies w/B actors were known as B movies

Not just horror films, also cowboy films, gangster films

Characterized by lots of action to get audience excited

[Answer]

1. (A) 2. (B)

1. This is implied when the professor states that the appeal of a B-movie's low production value depends on who you ask.
2. This is implied when the professor says that, originally, B-movies could be any kind of film that would get the audiences' hearts racing.

Building Your Listening Skills _ p.66

[Answer]

1. Statement in the discussion: *As to whether their low production quality is part of their appeal or not ... well, that just depends on who you ask.*
 2. Statement in the discussion: *The B actors ... well, think of them as kind of like a minor league team in baseball. They starred in lesser movies in the hope that they would get noticed, and move up into the A stable.*
1. The phrase "that just depends on who you ask" is commonly used in English to indicate that something is not always true, or is a matter of opinion.
 2. The comparison of B actors to members of a minor baseball team is intended to show that they were not top quality actors.

Listening Practice 3 _ p.67

Important engineering concept = factor of safety

- Def. = amount something will exceed its design specs.

exmp: if crane lifts 10,000kg, and cable holds 40,000kg, then factor is 4

Why use high factor of safety?

- ans: helps avoid unexpected accidents (ex. crane cable breaks, hurts or kills people)
- high factor of safety used when failure may cause death
- lower factor of safety used when failure will not cause death or much damage

[Answer]

1. (B)
 2. (C)
 3. (A)
1. This can be inferred by the student's question about why a high safety factor is necessary and the professor's answer that it often pays to be safe.
 2. This is clearly stated in the discussion.
 3. At the end of this section of the discussion, the professor mentions that there are some exceptions to the rule of when high safety factors are used, implying this will be the next topic of discussion.

Building Your Listening Skills _ p.68

[Answer]

1. (A)
 2. (B)
 3. This section of the discussion explains how engineers determine what factor of safety to use. The professor explains this in response to a student's question.
1. This section of the discussion is primarily concerned with explaining the concept of a factor of safety.
 2. The student has asked the teacher why you would pay for capabilities that you will never use. The professor justifies the use of high safety factors by explaining the possible negative effects of not doing so.

Listening Practice 4 _ p.69

Impact of animals + plants on global warming
 more than 100 million cows in US
 produce methane, which is greenhouse gas
 which will acct for 15% of global warming over next 50 years
phytoplankton = tiny sea orgs.
 gain enrgy through photosynthesis
 release oxygen + sulfur
 slfr helps form clouds = more reflection of sun's heat

[Answer]

1. (B)
 2. (B)
 3. (B)
1. The professor clearly states that other farm animals such as sheep produce methane. Since we know that methane contributes to global warming, we can clearly infer that these animals are also responsible for global warming.
 2. The professor clearly states that phytoplankton help create clouds, which, in turn, reflect some of the sun's heat. The implication is that phytoplankton therefore help to reduce global warming.
 3. The professor clearly states that sulfur acts as a seed particle in cloud formation.

Listening Practice 5 _ p.70

Alliances: most common form = multi-national coalition
 • def: many natns have common goal so defer individ. interests

exmples:

NATO: formed in cold war, mostly defensive alliance

EU: goals = economic, expand European power

+ of Alliances:

- more influence on world stage
- more effective competition against hostile alliance

- of Alliances:

- sometimes must do things nation doesn't want to do
 example: US pressure European nations to spend more on defense

[Answer]

1. (C) 2. (B) 3. (A)

1. This is a paraphrase of the concept of a multi-national coalition alliance, which is the main topic of the lecture. Although A and D are both parts of the lecture, they are too narrow to be the main topic.
2. The key here is the professor's use of the phrase "at least in theory," which implies that this is not always the way that coalition alliances work in real life.
3. This can be inferred from the fact that the US is able to pressure the other nations in NATO into doing things they may not wish to do.

Vocabulary Review I _ p.71

[Answer]

- 1-1. retaliation 1-2. burden
 1-3. defer 1-4. specifications

2-1. brought up

→ Jessica would have never known we went to the movies without her if Mike hadn't mentioned it during dinner.

2-2. is just around the corner

→ Although Christmas is very soon, I haven't done a bit of shopping.

2-3. is a snake in the grass

→ While Diane's mother likes her new boyfriend, her father doesn't trust him.

2-4. touched on

→ Although the documentary briefly discussed a number of social issues, it didn't discuss any of them in detail.

IBT Practice I _ p.72~73

[Answer]

1. (D)
2. ☐ The analysis of anatomic changes in human ancestors
☒ The analysis of the distribution of culture-specific artifacts
☒ The analysis of specific genetic mutations in the gene pool
☒ The analysis of linguistic evolution
☐ The analysis of ancient historical records
3. (C) 4. (C) 5. (B)
6. (C)

1. B is mentioned, but it is only an example used in the discussion, not the main idea. C incorrectly relates ideas from the discussion, and A is never mentioned in the discussion.
3. The professor clearly states that these genetic markers are useful because we inherit them directly from our parents. A is incorrect because the professor also states that they do undergo mutations on rare occasions, and that these mutations are important in tracking human migration.
4. The professor's discussions of tracking artifacts and the changes in languages are intended for review only. The only new method covered in the discussion is the tracking of DNA.
5. This is clearly implied when the professor states that, in her opinion, the use of DNA is "quite exciting."
6. This is suggested by the time scale that the professor gives regarding how long it would have taken the language on Jeju Island to evolve into a language that was entirely different from Korean.

Listening for Total Comprehension _ p.74

Agricultural activities can be quite harmful to the environment if not carefully controlled. While much attention is paid to obviously destructive agricultural practices, such as slash-and-burn farming, even seemingly innocuous activities can have far reaching and unforeseen effects.

Take, for instance, chicken farming in the Chesapeake Bay area of the United States. The Chesapeake is one of the nation's greatest aquatic resources, teeming with fish, clams, and crabs. Yet, in recent years, populations of fish and shellfish in the Chesapeake, especially that of the blue crab, one of the region's most economically important species, have fallen drastically. The primary

cause of these population declines has been algae blooms. These algae blooms are in turn caused by water run-off from chicken farms situated too closely to the shores of the Chesapeake. The run-off from these farms carries high concentrations of the nitrates and sulfates on which the algae thrive, causing the huge blooms that kill fish across the region. Thus, even a seemingly harmless agricultural activity can have devastating effects on the local environment if not properly controlled.

[Answer]

1. They are significant because blue crabs are an important species for the local economy.
2. They are harmful because they increase algae blooms, which, in turn, kill other aquatic species.

Summarization Skills _ p.75

[Answer]

The first summary is the correct summary. Although the second summary discusses both examples from the discussion, it leaves out important details from both. Most importantly, it fails to discuss the specific ways that cows and phytoplankton influence global warming.

Integration Skills _ p.76

[Answer]

1. The discussion states that products are designed with high safety factors when there is a risk that failure will cause death. This is obviously the case in aircraft design, but according to the reading, aircraft are not designed with high safety factors because doing so would make them prohibitively expensive.

Chapter 4 Organization / Rhetorical Connection Questions

Basic Drills _ p.80

[Answer]

1. • broken home is where normal family relationships don't exist
• father in prison (example)
• parents beat child (example)
• difficulty forming relationships (result)
• child learns not to trust anyone (explanation)
• child may be afraid to allow others to get emotionally close to them (explanation)
2. Stdnt: probs w/ group. Work is too sloppy.
Ex. don't check results or proofread.
Stdnt wants prof. to talk to group.
Prof. doesn't think this is good idea.
Stdnt. doesn't understand why
Prof: When sdnt was doing teaching child was unpopular b/c never solved his own problems. Prof thinks the situation is similar

2. The example given by the professor is the student's experience during her student teaching. The student had a child in her class who was unpopular because he always told on the other children. The professor's point is that the student's situation is a similar one, and therefore she should try to handle the problem on her own.

Listening Practice 1 _ p.81

~~stdnts.~~ prob: got letter re: outstanding tuition bill but already sent in check

~~clrk:~~ stdnt. paid \$1,500 but still owes \$2,000

~~stdnt:~~ \$2,000 is paid by student loan

~~clrk:~~ not paid b/c stdnt turned in appl. late, will take several weeks

~~stdnt:~~ cant wait b/c registration is next week

~~clrk:~~ stdnt has to pay tuition in full before registration

~~stdnt:~~ will ask parents for money

[Answer]

1. (B)
2. (A)
3. (B)

1. The student goes to the registrar's office because she received a letter saying her tuition had not been paid. However, she has already sent in a check for her tuition, so she does not understand why she got the letter.

- The fact that the man says this just after the woman asks why her student loan has not been paid indicates that his response is an answer to her question. Although B and C seem like potentially logical answers, they both ask you to assume too much.
- This woman says this right after the man has told her that she should have received a letter about her student loan. The clear implication is that she has not received the letter.

Building Your Listening Skills _ p.82

[Answer]

- | | |
|-------------------|-----------------|
| 1. Let's just | 2. What is your |
| 3. that is all | 4. long is it |
| 5. Could you | 6. could have |
| 7. would not have | |

Listening Practice 2 _ p.83

WWI lit. unique b/c unique viewpoint on war + large amount written

- earlier war lit. romanticized war experience

Characteristics of WWI lit:

- cynical, disillusioned view of war
- showed war as brutal, dehumanizing
- a. exmpl: quote by Owen (very negative) contrasted with quote by Emerson (positive)

Many soldiers wrote. Why?

- Nature of warfare in WWI. Soldiers had little to do but wait in trenches for attack
- Soldiers wanted to express their feelings of betrayal

[Answer]

- | | |
|--------|--------|
| 1. (A) | 2. (C) |
|--------|--------|

- There are several clues to this question. The first is that this quote comes at a stage in the lecture when the professor is describing the pessimism of WWI literature. In addition, it directly follows a quote from a famous WWI poet. Finally, the professor describes Emerson's views as a "far cry" from those of Owen, setting up a contrasting relationship.
- The professor's mention of the soldiers' feelings of betrayal comes at a point when he is explaining the various reasons for why WWI soldiers wrote so much about their experiences.

Building Your Listening Skills _ p.84

[Answer]

- Statement from the lecture: *While literature about the experience of war is certainly not unique to World War I, the First World War does stand out as a unique period in the genre of war literature, both for its sheer volume and for the unique perspective it offered on the horrors of war.*
- Statement from the lecture: *Millions of soldiers found themselves stuck in the trenches for weeks or months at a time, with little to do but wait for and contemplate the horror of the next artillery barrage or the order to attack. Under such circumstances, it can hardly seem surprising that so many soldiers sought a diversion through writing.*

- This is a fairly direct paraphrase of the original statement in the lecture. A "unique perspective" describes a perspective that is "drastically different" and the phrase "sheer volume" in the original statement means that these soldiers wrote a great deal.
- The paraphrased statement basically summarizes the information contained in this section of the lecture. The "need to kill time" refers to the idea that soldiers had to wait in the trenches for many weeks with nothing to do.

Listening Practice 3 _ p.85

will look at soct. w/ divided societies that are successful
exmp: Canada + South Africa

Canada:

- 2 major cltrs.: French-speaking + English-speaking
- most French speakers in Quebec
- each cltr. has distinct values, and political views

Little conflict. b/c:

- each culture lives in different area
- Canada gives lots of autonomy to provinces
- Canada stresses the importance of each culture

[Answer]

- | | |
|--------|--------|
| 1. (B) | 2. (C) |
|--------|--------|

- The professor's response to the student's comment gives an important clue to this question, since the professor basically justifies her reasons for excluding the Inuit from her discussion.
- The professor says that language differences are not the only differences between French and English speaking Canadians. She then mentions the political views of Canadians as an example of another difference between these two groups.

Building Your Listening Skills _ p.86

[Answer]

1. (C)
 2. (B)
 3. This section of the discussion is probably the most important part. At the beginning of the discussion, the professor said that she wanted to look at some success stories to try to find out why they were successful. That is what she does in this section of the discussion. She explains why Canadian society has been able to deal with the divisions between English speakers and French speakers.
1. Although the professor does briefly mention what has been discussed previously, she does not do this in any detail. Therefore the main purpose of this section is not to review information. The professor finishes this section by stating what she wishes to discuss in the following sections of the discussion.
 2. While the professor does respond to the student's question by stating that the Inuit have been marginalized in Canadian society, she is not justifying this marginalization. She is only explaining why she is not including them in her discussion (because it would complicate her example). The majority of this section of the discussion is dedicated to describing the two largest parts of Canadian society, English-speaking Canadians and French-speaking Canadians.

Listening Practice 4 _ p.87

- Vegetative reprod. = 2nd reprod. process for plants
- doesn't need seeds or pollination
 - like cloning b/c new plants genetically identical to parent
- Reqs.: section of stem that is horizontal and underground
- will start to send roots down and shoots up
- Exmpls.: potatoes, roses, elm trees
- uses by people:
- avoids the need for pollination
 - avoids mixing gen. traits
 - can copy ideal plant

[Answer]

1. (C)
2. ☒ A section of plant stem must be horizontal.
☐ There must be an absence of pollinating insects.
☐ Seeds of the plant must be severed from the stem.
☒ Part of the plant's stem must be underground.
3. (C)

1. The professor is explaining the concept of vegetative reproduction when she mentions cloning. It makes logical sense that she is mentioning this to help explain the concept to the students.
2. The professor clearly states both of these requirements in the discussion.
3. The professor's mention of farmers and florists comes right after the student's question about how humans exploit the process of vegetative reproduction, and introduces a detailed example intended to answer the student's question.

Listening Practice 5 _ p.88

- Einstein's theory of relativity very successful theory
- untested predctn. = existence of gravitational waves
 - a. def. = kind of wave that stretches space and time
 - b. caused by very powerful space events - ex. supernovas
- Probs. in testing:**
- changes caused by grav. waves smaller than size of atom
 - only super powerful events could be detected
- Soltn:**
- New test = laser interferometry
- uses 2 lasers to measure changes
 - better b/c can measure smaller sizes than one laser
 - must be used w/ observations of stellar events b/c impossible to eliminate interference

[Answer]

1. (A)
 2. (C)
1. The professor says that relativity is one of the most successful theories in the history of science, and mentions the bending of light and the existence of black holes as examples of its predictions that have withstood numerous tests.
 2. The professor mentions that interference can never be totally eliminated from laser interferometry, but states that matching the observations from this method with those of the observation of supernova and other stellar events will help overcome this difficulty.

I Vocabulary Review I _ p.89

[Answer]

- 1-1. fatalistic 1-2. marginalized
1-3. outstanding 1-4. acquaintance
- 2-1. shed new light on
→ After the crash, investigators searched the crash site hoping to find something that would help them understand the cause of the crash.
- 2-2. work out
→ After several hours of negotiations, Kelly was able to agree upon a new work arrangement with her boss.
- 2-3. stand up to
→ The oil tanker was designed to be able to withstand waves of up to 50 feet.
- 2-4. is a far cry from
→ Listening to a CD of an opera at home is not nearly as good as seeing one in person.

I /BT Practice I _ p.90~91

[Answer]

- (B)
 - ☒ They are the earliest known biblical writings.
☐ They authenticate many biblical stories.
☒ They date from a key point in Jewish history.
☐ They caused Judaism to split into different sects.
 - (C) 4. (B) 5. (C)
 - (C)
- While the Essenes are an important part of the lecture, they are not the main topic. Therefore A and D are incorrect. The effects of the Dead Sea Scrolls on biblical study are not discussed in detail.
 - The professor states that the Dead Sea Scrolls are the earliest surviving biblical writings. The professor also states that many of the Dead Sea Scrolls date from a period when the Hebrews regained their independence and rebuilt their temple.
 - The professor says that it is unlikely that the Essenes wrote all of the Dead Sea Scrolls because many of the scrolls contain religious beliefs that the Essenes would not have agreed with.
 - The professor states that she finds this theory to be more interesting and more compelling. Furthermore, she gives quite a bit of evidence to support this theory.
 - The professor mentions that the Essenes were geographically isolated while explaining the theory that the other sects gave their sacred texts to the Essenes, suggesting that their isolation was part of the reason for this.

- The professor has mentioned earlier in the lecture that there are multiple theories on the origins of the Dead Sea Scrolls. She simply wants to remind the students of this before discussing one particular theory.

Listening for Total Comprehension _ p.92

After the collapse of the Roman Empire, Western Europe was faced with a near complete absence of the rule of law. Land was divided up between rival warlords, and there was little or no centralized authority. Considering the chaotic nature of the times, it might seem natural that the ruling class of Europe was, in fact, a warrior class. The nobility of Europe were highly trained and hardened warriors, and for them, violence was a way of life.

Yet, there was a central contradiction that lay at the heart of this warrior society. While the European aristocracy was engaged in near constant warfare, it was also an extremely religious group. Like all Christians of the time, these nobles lived in perpetual terror that their sins might condemn them to hell in the afterlife. Yet the very nature of their society compelled them to commit acts of violence as a matter of course. It was this constant need to be forgiven for their sins that gave the Church such power over the nobles of Europe.

[Answer]

- The two important characteristics of European nobles were that they were warriors, and therefore lived violent lives, and that they were extremely religious and were terrified of the possibility of going to hell.
- These characteristics gave the Church power over the nobles because they relied on the Church to forgive them for committing acts of violence that were required of them by their society.

Summarization Skills _ p.93

[Answer]

The second summary is the correct summary. The first summary incorrectly relates a number of ideas from the lecture. First, it states that there are a number of phenomena that cannot be explained by relativity. This is untrue. The lecture states that there are a number of phenomena predicted by relativity that have not yet been confirmed. The summary also states that gravitational waves cause black holes and supernovas, which is also incorrect.

Integration Skills _ p.94

[Answer]

1. The lecture focuses on the changes in the way that the war experience was portrayed in literature. Essentially, war was portrayed as being far less glorious than it had been in earlier eras. According to the reading, the change in the way that people viewed war was accompanied by similar changes in the reality of warfare. According to the reading, advances in technology made warfare impersonal, and made concepts of bravery and heroism unimportant.

iBT Mini Test 2 _ p.96~101

[Answer]

1. (B)
2. (B)
3. ☐ The name of her show
☒ What kind of show she will have
☐ A description of her intended audience
☒ A list of goals for her radio show
4. (C)
5. (B)
6. (C)
7. (C)
8. (A)
9. (A)
10. (D)
11. (B)
12. (C)
13.

1. Ripples form on the sand.
2. Obstacles form with steep slip faces.
3. Avalanches occur on the dunes.
4. Sand dunes migrate.
14. (B)
15. (D)
16. (B)
17. (A)

1. The woman clearly states at the beginning of the conversation that her friend had a radio show last semester, and that she thinks it would be fun to have her own show.
2. The man explains to the woman that there are a limited number of open time slots, and that there are always more students who want radio shows than there are time slots. Therefore, the student has to submit a proposal for her intended radio show.
3. The man clearly states that the student's proposal must include a description of the format and the goals of the show.
4. The man suggests that the student might want to think more before she does all the work of making a proposal, clearly implying there is a good chance she will not get a show.
5. The man says that it is a good thing the woman came to talk to him. Before this comment, her answers to his questions are very vague, and she isn't able to provide any detail about the kind of show she wants to do. The clear implication is that the man thinks she has not really given enough thought to her show.
6. This is a paraphrase of the concept of a dominance hierarchy, which is the main topic of the discussion
7. The professor states, before talking about chimpanzee societies, that he is choosing to talk about them because they are our closest relatives. This follows a student's question as to whether or not dominance hierarchies exist among humans. He describes their society but leaves it up to the students to draw any conclusions about whether their societies are similar to human society or not.
8. There is no mention about the role of intelligence in gaining the dominant position. Only chimps are mentioned as using coalitions to gain power, and the question is a more general one about animal societies.

The top position seems to be frequently challenged rather than seldom challenged.

9. The professor says that many fights are avoided by pretending to be tough or posturing.
10. Male chimps associate with each other quite a bit. During these associations, they often form coalitions or partnerships with other males in order to fight more effectively for more dominant positions, a behavior that the professor suggests may be viewed as somewhat similar to political activity in humans.
11. There are many idioms in American English that come from baseball. "To step up to the plate" is one of them. This is the time in a baseball game that you become the focus of all attention as you try to perform at your best. It is the time you can no longer only talk, but must also act. So in this context, the dominant animal can only pretend to be tough for so long, and at some point, he must be willing to actually fight to maintain his position; he must step up to the plate.
12. A great deal of the lecture was spent on the formation of sand dunes, but, though it took up much of the talk, there were still other points that were considered, such as sand dune booming, that really had nothing to do with the formation of sand dunes. If we take all of the topics covered into account, it would be better to choose sand dune dynamics as the main topic. This would take into account not only the formation, but also movement and the production of sounds.
14. The professor had just stated the importance of the right wind speed. Too low, and the sand grains wouldn't move; too high, and the dunes could be destroyed. He then mentions how sand dunes have been destroyed by the strong winds in a hurricane.
15. Barchan dunes only form ridges as a transitory feature on their way to forming transverse dunes. Besides, ridges are not an unusual feature of dunes. There is no information connecting barchan dunes to booming noises. The one fact that is given is that they tend to migrate or move quickly.
16. When a speaker says that something isn't given much credit, he or she generally means that it deserves more credit or attention. In this case, the prevailing opinion that wind is a minor element in erosion is being criticized. It is true that wind may not be as important as water, but it is not as insignificant an element as some people believe.
17. The professor has just spent considerable time explaining the dune formation process and the dynamics of dune movement. In other words, he has given them a lot of information to digest in a short period. He decides to check if they are following him by asking this question. If they were not, or were confused, this is when they should ask for clarification.

Chapter 5 Organization Questions

Basic Drills _ p.106

[Answer]

- | | | |
|---|----------|----------|
| 1-1. (B) | 1-2. (A) | 1-3. (B) |
| 2. (B) | | |
| Bacteria - simple single cell orgs. | | |
| Most # on Earth | | |
| No complex internal structures | | |
| usually parasitic (harm host) or symbiotic (benefit host) | | |
| Body has millions of bacteria - some essential | | |
| EX. bacteria in stomach help digest food | | |
| Bacteria in soil recycle nutrients | | |
| Some bacteria create toxins | | |
| Toxins cause many diseases | | |

- 1-1. The last statement by the professor shows that a cause and effect pattern will be used.
- 1-2. The professor states that many things must happen in a particular order, implying that he will describe this sequence.
- 1-3. The professor states that the millions of different kinds of insects can be categorized by a few characteristics, implying that she will now discuss those categories.
2. The first part of the lecture defines the term bacteria, and the second and third parts of the lecture categorize bacteria into those that are helpful and those that are harmful. The professor indicates that he will use this categorizational structure when he states that bacteria can either be symbiotic or parasitic.

Listening Practice 1 _ p.107

stdt. wants change lab partners b/c partner is too slow - checks 3-4 times

Prof. response:

- paired stdt b/c stdt does sloppy lab work
- stdt has good theory but poor method
- Roger has good method but bad theory
- profs. wants stdy to keep working w/ Roger - habits rub off on each other

[Answer]

- | | |
|--------|--------|
| 1. (B) | 2. (A) |
|--------|--------|

1. The student says that his lab partner is driving him crazy because he takes too long to do the experiments. The student then asks the professor to change his lab partner.

- The professor explains that while the student has a good understanding of theory, his methodology is poor. Roger, on the other hand, is just the opposite. The professor explains that this is why she paired the two students together.

Building Your Listening Skills _ p.108

[Answer]

- | | |
|-------------|------------------|
| 1. time | 2. Right now |
| 3. want you | 4. checking them |

Listening Practice 2 _ p.109

Blue Techn: call and response

- def. singer sings short phrase then gtr. responds w/ complimentary line
- uses: create + relieve tension/ alter mood of song

Types:

Leader/chorus call and response:

- gtr. line follows singer

Question/Answer call and response:

- singer's melody seems incomplete, gtr. line finishes melody

C&R set sometimes repeated more than once - so not 6 sets
Last 2 bars for turn around (different technique)

[Answer]

- | | |
|--------|--------|
| 1. (B) | 2. (D) |
|--------|--------|

- The professor clearly discusses two different types of call and response. While another blues technique (the turn around) is briefly mentioned at the end of the discussion, there is no comparison made between call and response and the turn around.
- The professor mentions a different technique (the turn around) at the end of the discussion, but does not explain it in any detail. It is most likely that he will explain this technique in the next section of the discussion.

Building Your Listening Skills _ p.110

[Answer]

- Statement from the discussion: *But anyway, you'll get a short vocal phrase like that, followed by a short instrumental phrase, uh, usually played on a guitar, but not always, that seems to compliment it. Call and response is used to build and relieve tension within the structure of a blues song.*

- Statement from the discussion: *Not usually, no. For one thing, a particular call and response set may be repeated. For another thing, the last two bars of a 12-bar blues pattern are taken up the turn around...*

- The paraphrased statement is a summary of the information contained in this section of the discussion. Building and relieving tension in a song would be one way of altering the mood of the song.
- In order to understand this paraphrase, you have to consider the professor's statements in conjunction with the question asked by the student just before this.

Listening Practice 3 _ p.111

Insular Dwarfism:

- def. animals become smaller when isolated for long time
- exmpl: nrmal. Mammoth = 13 ft. but some Mam. lived on small island so genetically & geographically isolated, result = pygmy Mam. only 6 ft

Theories for Ins. Dwf.:

- resrcs. limited so larger anim. die b/c need more food
- genetic evirnmnt. - genetic isolation = smaller size an natural reponse

[Answer]

- | | |
|--------|--------|
| 1. (C) | 2. (C) |
|--------|--------|

- The professor's discussion of mammoths centers around the sequence of events that led to the evolution of small-sized mammoths, which are a species that exemplify island dwarfing.
- The professor first describes a theory which focuses on the effects of environmental pressures (the lack of resources) and then discusses a theory which focuses on the isolation of the gene pool.

Building Your Listening Skills _ p.112

[Answer]

- | | |
|--------|--------|
| 1. (A) | 2. (A) |
|--------|--------|
- This section of the lecture describes the two dominant theories of why island dwarfing occurs.

- This section of the lecture is primarily concerned with providing a definition of island dwarfing.
- In the previous section of the lecture, the professor has given a basic definition of island dwarfing. A specific example is now given to help clarify that definition.

Listening Practice 4 _ p.113

Characteristics of polymers:

1. very large size
2. made of smaller molecules (monomers)
3. contain repeating chains of monomers

Exmpl: polyethene formed from ethene monomers

Complex polymers:

- have more than one type of monomer
- kinds of monomers and order of monomers determine chem. prop.

Exmpl: thousands of proteins made from 20 different amino acids (monomers)

Other polymers:

Inorganic: Kevlar, nylon

Organic: carbohydrates, proteins, DNA

[Answer]

1.		Yes	No
	Contain repetitious sub-units	✓	
	Significantly larger than other molecules	✓	
	Unable to react with smaller monomers		✓
	Very limited in arrangement and sequencing		✓
	Essential to life	✓	

2. (B)

1. The professor states that she will start with a simple example (polyethene) which contains only one type of monomer. The professor then discusses more complex polymers that contain more than one type of monomer.

Listening Practice 5 _ p.114

Poverty of Stim:

- def: learn ops. can't explain the knowledge of person

Assmpts re: Lang. learning:

- kids learn lang. by copying parents
- only learn correct grammar b/c never see incorrect grammar

Chomsky's prob: How can kids identify incorrect grammar if never exposed?

Chomsky's answr.: Humans have innate understanding of grammar, not something that needs teaching

[Answer]

1. (D)

2. (B)

1. Chomsky observed that traditional theories of language learning could not explain how children can identify incorrect grammar because they are never exposed to such grammar. His conclusion was that humans must have an innate ability to understand grammar.
2. The professor mentions computers to give students a familiar, everyday example that is somewhat similar to the concept of the innate understanding of grammar.

Vocabulary Review I _ p.115

[Answer]

1-1. spur 1-2. niche

1-3. assumptions 1-4. grasp

1-5. differentiate

2-1. would be a stretch

→ It's true that Hank is a good tennis player, but it would be an exaggeration to say he is a pro.

2-2. take her at face value

→ If there's no way to check the truthfulness of her story, you'll just have to accept her story as the truth.

2-3. rub off on him

→ John never smokes around his son because he doesn't want his son to start smoking.

iBT Practice I _ p.116~117

[Answer]

1. (A)

2.	Yes	No
The occurrence of an earthquake		✓
The presence of loose, fine-grained soil	✓	
The exertion of downward forces on the soil		✓
The super saturation of the soil	✓	

3. (B)

4.	1. An earthquake disrupts the arrangement of the soil.
	2. Soil particles settle into a new formation.
	3. Water is forced up as spaces between particles close.
	4. Upper levels of soil become saturated.

5. (C)

6. (C)

1. This is a paraphrase of the idea of soil liquefaction.
3. The professor states that soil liquefaction is especially dangerous when it occurs on a hillside (an inclined slope).
5. The professor clearly states that soil liquefaction during an earthquake is more destructive because the destruction is spread over a much broader area.
6. The implication is that students would not stack things in this manner because they know that whatever they stacked would fall over.

Listening for Total Comprehension

Although the theft of masterpiece paintings is a popular subject in films and detective novels, it is, in practice, not very widespread. Aside from the obstacle posed by the impressive security measures at most world-class museums, the theft of a masterpiece simply isn't very profitable for the thief. Once stolen, because of their fame, these paintings usually prove to be virtually impossible to sell on the black market, and thus there is little chance for the thief to profit from his crime. For instance, The Scream, by Edvard Munch, was stolen in 2004. Yet, despite having it in their possession for more than a year, the thieves were unable to sell it, and it was eventually returned to the museum once the thieves were caught. When the Mona Lisa was stolen, the situation was similar. After keeping the painting hidden for two years, the thief was immediately caught as soon as he attempted to sell it.

[Answer]

1. It isn't profitable to steal masterpiece paintings because they are too famous to sell on the black market.
2. *The Scream*, which was stolen in 2004, and the *Mona Lisa* are the two examples discussed. In both cases, the thieves held the paintings for a long time, but were unable to sell them, and were eventually caught.

Summarization Skills _ p.119

[Answer]

The first summary is the correct summary. The second summary has a number of inaccuracies in it. First, it states that island dwarfing was very common in prehistoric times. There is no mention of this in the lecture. Second, it incorrectly summarizes the theories of the causes of island dwarfing.

Integration Skills _ p.120

[Answer]

1. The reading states that the human brain is programmed to understand certain grammar concepts that are common to all languages, such as the construction of sentences and the concepts of nouns and verbs. This is very similar to Chomsky's concept of an innate understanding of grammar that is used to explain the problem of the poverty of stimulus described in the lecture.

Identifying Relationship Questions

Chapter 6

Basic Drills _ p.124

[Answer]

1-1. Yes 1-2. No 1-3. Yes

2.		Diesel Engines	Gasoline Engines
	Longer lasting	✓	
	Used in more expensive cars		
	High production costs	✓	
	Lower fuel economy		✓
	More difficult to find fuel		

- 1-1. The two students will probably compare the two professors. The woman says that the man is lucky to be in Professor Johnson's class. The man, on the other hand, expresses sympathy for the woman when he hears that she is in Professor Flanders' section. The students will probably discuss the differences between these two professors and why Professor Johnson is better than Professor Flanders.
- 1-2. While the professor briefly compares the slave revolt on Saint-Dominique to other slave revolts in terms of success, the professor's later statements make it clear that the rest of the lecture will focus on what caused the slave revolt on Saint-Dominique. Therefore, the structure of the lecture will most likely be focused around cause and effect relationships and not on comparisons.
- 1-3. The professor states that much of the early American space program was based on German military technology, and says that the students will be surprised to learn to what extent this is true. The professor will most likely compare the technologies of the German missile program and the American space program to prove his point.
2. The professor introduces the idea that diesel engines are found in luxury automobiles and gasoline engines are found in economy class cars with the phrase "As a side note." This indicates that this is not an important point in the lecture. The point made about it being difficult to find a gas station with diesel fuel is simply an additional thought that is tagged onto the large idea of fuel economy.

Listening Practice 1 _ p.125

stdnt. needs recording room b/c project in ling. class - record accents
 worker: stdnt 1st has to take training session b/c stdnt hasn't used recording room before
 stdnt thinks this is stupid/not necessary
 Worker reaction: annoyed with stdnt, equipment expensive and complicated-more than other lang. labs.
 Sessions:
 Time: 4pm
 next one is thurs b/c only one worker in lab today
 stdnt will sign up for lab

[Answer]

1. (B) 2. (A)

1. The student states that she is not a Linguistics major after the worker's question about whether or not she has used the language lab before. This implies her statement is intended to respond to his question. Since she is not a Linguistics major, it is likely that she has not used the Linguistics lab before.
2. The man explains the need for the training session by stressing the expense and sophistication of the equipment in the language lab. Part of the way he does this is by comparing the Linguistics lab to labs in other departments, which only use simple tape recorders.

Building Your Listening Skills _ p.126

[Answer]

1. Do 2. do
 3. have to do 4. got to 5. is sign up

Listening Practice 2 _ p.127

Glassblowing: origins: 1st century A.D. Syria
Technq:
 1) melt sand 2) gather melted sand on hollow tube
 3) blow in tube and make bubble
 4) shape bubble 5) let glass cool
History: Tradtn. use: very practical, make things for everyday use
Littleton + Labino: Changed approach to glassblowing - When: seminar in Toledo 1962
Changes: glassblowing as art - glass sculptures, one person does all work, not factory approach

[Answer]

1. (D) 2. (A)

1. The professor says that one key difference between earlier glassblowing and glassblowing after the seminar by Littleton and Labino is that they saw glassblowing as an art, while before it had been more of a practical craft.
2. The professor says that Littleton and Labino taught involvement in every part of the glassblowing process as opposed to the factory style approach of earlier times.

Building Your Listening Skills _ p.128

[Answer]

1. Statement in the lecture: *The art of glassblowing seems to have first emerged in the first century A.D. in Syria.*
2. Statement in the lecture: *You can go into almost any modern art museum and find studio glass works. This is all a testament to the influence of Littleton and Labino.*

1. This is a pretty direct paraphrase of the original statement. The only real changes are the move from the mention a specific nation (Syria) to a general region (the Middle East), and the change in the way that time is discussed.
2. Saying that something "is a testament" to something is roughly equivalent to saying that it shows or proves something.

Listening Practice 3 _ p.129

When is animal endgrd?

Total #s not good enough b/c acceptable #s different from animal to animal

- exmpl: several thousand tigers OK, several thousand crabs = extinction very soon
- Minimum viable population used to detrmn if anim. is endgrd.
- def. minimum number w/ 90% chance survival for 100 years

Calculated Min. Viable Pop.:

1. make computer model with all variables that affect population
2. run computer model w/ different starting pops.
3. stop when species survives 90 out of 100 computer sims.

[Answer]

1. (B) 2. (C)

1. The professor uses these two species to demonstrate why total population isn't a good indicator of the danger of extinction for a species. According to the professor, what is considered an acceptable number of tigers is very different than what is an acceptable number of crabs.
2. The professor uses a made up example of calculating the minimum viable population of the tiger in order to demonstrate how computer models are used in the process.

Building Your Listening Skills _ p.130

[Answer]

1. (A) 2. (B)
3. This section of the discussion gives a detailed explanation of how computer modeling is used to determine the minimum viable population of a species by using a hypothetical example to illustrate the process.

1. This section of the discussion primarily describes the problem of how to determine how endangered a species is. The rest of the discussion describes the solution to that problem (calculating the minimum viable population).
2. The professor describes the process of determining the minimum viable population in response to the student's question.

Listening Practice 4 _ p.131

Known that minrils. crystallize whn they cool and harden

Bowen's expmntn:

1. melt powdered rock
2. allow to cool to a certain temp & examine minerals that formed
3. repeat at many different temps.

Bowen's reaction series:

def. A list of the minerals that form at different temps - hottest to coolest

- olivine: very high temp, unstable at lower temps, very rare at Earth's surface
- quartz: very low temp, near bottom of series, much more common mineral

uses of reactn series:

Examine trace amounts of minerals in rock formation - will give info re: conditions when rock formed

[Answer]

	High Temperature Minerals	Low Temperature Minerals
Unstable near the Earth's surface	✓	
Consist of commonly recognized minerals		✓
Form deep in the Earth	✓	

1. The professor clearly states that high temperature minerals like olivine are unstable at lower temperatures, and therefore are very rare near the Earth's surface. They form deep in the Earth where temperatures are very high. Low temperature minerals, on the other hand, are very stable near the Earth's surface, and therefore make up the most commonly recognized minerals like quartz.

Listening Practice 5 _ p.132

Subculture:

basic def: a group w/ behaviors or values different from mainstream soc.

Ex: tattoo community, homosexual community

Acceptnc by mainstrm cltr:

Depends on how far from mainstream values & what values

Ex. tattoo community only different value of beauty, but homosexual community different ideas of sexuality = core value of society so less acceptnc

Fluidity of subcultr:

Subcultures change b/c some become accepted by mainstream, no longer subcultr

Ex: tattoos now widely accepted, maybe in future no longer subcultr, part of mainstream.

[Answer]

1. (B) 2. (B)

1. The professor says that the level of acceptance given to a subculture by mainstream society is determined by how far the subculture deviates from the values of mainstream society, and uses a comparison of the tattoo and homosexual communities as an example of this.
2. The professor begins to discuss the fluidity of subcultures, and uses the growing acceptance of tattoos as an example of this idea.

Vocabulary Review | p.133

[Answer]

- 1-1. utilitarian 1-2. viable
1-3. durable 1-4. mainstream

2-1. is on the brink

→ The baseball player is very close to breaking the homerun record, and is expected to do so any day now.

2-2. have his nose to the grindstone

→ Although Jason is successful, he always seems to be working really hard and never seems to enjoy his success.

2-3. the flip side of it

→ While his illness gives him a few more days to study for the exam, it also means that he will have a lot of make-up work when he gets back.

2-4. have been pulling my leg

→ When Bob told me that he won the lottery, I knew he must have only been joking.

/BT Practice | p.134~135

[Answer]

1. (C) 2. (A)

3.	1. Herman Melville reads Dana.
	2. Herman Melville goes to sea.
	3. Herman Melville writes popular novels.
	4. <i>Moby Dick</i> is published.

4. (B) 5. (D) 6. (A)

- Certainly allegory is discussed and some examples of its use given, but these examples are quite limited and generally given only to clarify the definition of allegory. Melville and Dana are only briefly compared. And though the professor states that *Moby Dick* is a great novel, he says little to support this assertion.
- All fables are allegories in that the surface story is often just there to support a deeper meaning which is generally expressed as a moral at the end of the fable. The professor mentions them to give an example of a well known type of allegorical writing.
- If Melville had wanted to make his novels more popular, he wouldn't have used any allegory at all. In fact, Melville wanted to write more philosophical novels and tried to use allegory in order to please both himself and his publisher. The publisher would have been happier, however, if he had used no allegory at all, since this would have made the book more popular.
- A student still doesn't understand the meaning of the term "allegory," and the professor realizes that he really

didn't explain it very well. His statement can be seen as an apology for not doing a very good job in explaining the term and moving on too quickly to a new topic. He is not apologizing for speaking too quickly, just for moving along too quickly.

- There is a separation between literature and philosophy. Sometimes, however, this distinction is lost and there may be some overlap ("the line blurs"), so it may be hard to separate the two. Novels like *Moby Dick* may be considered as literature even though at the same time they may be expressing strong philosophical ideas.

Listening for Total Comprehension | p.136

Many people think of bone as one solid material, but that's not really true. Bones are a complex composite of various materials, both organic and inorganic. Bones are made of two basic types of bone material: compact bone and cancellous, or spongy, bone. Compact bone is just that, compact. It is very dense and very strong, and, as a result, compact bone material forms the outer layers of a bone, where we require the greatest level of protection. Because of its density, it forms the majority of total bone weight, even though it does not form the majority of bone material by volume. Cancellous bone is less dense and has a sponge-like structure, and can be found in the middle of bones. In some bones, called long bones, there is a hollow tube-like structure in the center of the bone called the medullar cavity. The medullar cavity is filled with bone marrow. Bone marrow is made of stem cells, and is responsible for the production of new blood cells, as well as the re-growth of outer bone tissue.

[Answer]

- Compact bone material is dense, strong, and is found in the outer layers of bone because of the protection it provides.
- Cancellous bone is soft, spongy, and less dense than compact bone material. It is found in the interior of bones.

Summarization Skills _ p.137

[Answer]

The second summary is the correct summary. The first summary contains several inaccuracies and omits important information from the discussion. For example, the first summary incorrectly states that blue crabs require greater numbers because they die more frequently than tigers do. There is no mention of why crabs require greater numbers than tigers in the discussion. Furthermore, the first summary does not describe the role of computer models in calculating the minimum viable population of a species, which is a key part of the discussion.

Integration Skills _ p.138

[Answer]

1. The reading states that being a member of a subculture is an important part of adolescence because it gives teenagers a way to rebel against authority and assert their own independence, which is part of creating their own identity. The reading goes on to say that the opportunity to defy one's parents is often the primary motivation for entering into a subculture, and supports this claim by the citing the fact that many teenagers reject their chosen subculture if it becomes acceptable to mainstream society. This relates to two points made in the discussion. First, the professor suggests that entering into a subculture is often not done by choice, but this reading seems to suggest that it is. Second, the discussion points out that subcultures are fluid, and that something that once was a subculture can be absorbed into mainstream society. The reading discusses this same phenomenon, and uses it as evidence that membership in subcultures is often a conscious choice made by teenagers.

iBT Mini Test 3 _ p.140~145

[Answer]

1. (B)
2. ☐ Submit a bank statement
☒ Prove that he needs money
☒ Fill out an application form
☐ Apply for a job posted on the Internet
3. (A)
4. (A)
5. (C)
6. (C)
7. (B)
8. (D)
9. (C)
10. (B)
11. (A)
12. (D)
13. (A)

14.

1. Scientists wondered if people needed REM sleep.
2. Students were awakened during REM sleep.
3. Students did well on an easy task.
4. Dreams may help creative thinking.

15. (A)
16. (C)
17. (B)

1. The student had a summer job but failed to save enough money to pay for his schooling. He now needs some money. He decides to talk to the Financial Aid Office to find out some information on work-study programs.
2. In order to qualify for the work-study program, the student must fill out an application form and demonstrate financial need. Only after he qualifies should he look for a job. Submitting a bank statement is simply a way of proving he has a financial need.
3. The reason that companies prefer hiring students is simply a financial one: they don't need to pay work-study students as much money as regular employees.
4. In his last statement the student asks where he can get an application form. He is then told he can download the form from the Financial Aid Office website. It appears this is what he will probably do.
5. After the student finds out all he must do to take part in the work-study program, he is not impressed. To him, it seems like a lot of extra work when he still has to apply for a job on his own. He doesn't understand why he shouldn't just apply for a job and forget about the work-study program. In other words, the program does not seem to be such a good idea.
6. There is only one theory given on protostar formation. This theory says that stars and planets formed at around the same time. Our solar system is mentioned only as an example, and its formation is not the main topic of this lecture. The development of gas giants is simply a part of a more general topic.
7. Protoplanetary disks are the gas and dust clouds, the future planets that surround the protostar. They will eventually form planetesimals and are not formed from them. Some of these clouds may become gas giants, but

how often this happens is impossible to say from the lecture.

8. The gas giants that exist in our solar system have nothing to do with proving whether the nebular theory is true or not. The only statistic the professor gives about our solar system is that 99% of the mass is located in the Sun. This also does not prove or disprove the theory. Very little is said about other solar systems. What is given as evidence is the protoplanetary disks that have been discovered around young stars by using infrared telescopes.
9. One theory claims that a gas giant, like Jupiter, could form from an initial large earth-like planet, but not the Earth itself. There is a comment that Jupiter could have become a star if it were bigger, but it was never such a star. The only fact mentioned was that it formed around the same time the Sun was forming.
10. This is an idiomatic phrase often used to see if someone has been following your ideas. In this case, the professor is asking if they understand the process he has just described. He is really not asking for opinions, but this would be a good time for them to ask questions if they wanted to.
11. If some idea is "open for discussion," it means that there may be several different opinions concerning it. In this case, it means that there are several ideas as to what happens when multiple stars form from a gas cloud.
12. First of all, the discussion seems to center around some aspect of dreams because sleep is seldom mentioned. Though Freud and Jung interpreted dreams, they were mentioned only to show the legitimization of dream interpretation. The experiment discussed shows some impact of dreams on health, but that was not the main point. The main point was to discuss that dreams have become an accepted area of scientific research.
13. The answer is A. Freud and Jung were two highly respected psychologists who both believed that dreams were a legitimate area of investigation. They brought some respect into the idea of studying dreams.
15. The main reason the professor gives for the study of dreams is that they make up 20% of sleep or, in other words, a large part of our lives.
16. Any interpretation of dreams can only be that: a subjective interpretation without any real scientific foundation. The professor implies that these men did a good job in making the attempt to connect dreams with past experience, but nonetheless, they were really just educated guesses. Their conclusions could never be scientifically proved.
17. The professor says "first things first" to show that he is getting ahead of himself. He really doesn't want to go into details of MRI at this point in the lecture.

Chapter 7 Stance / Attitude Questions

Basic Drills _ p.150

[Answer]

1-1. (C)

1-2. (A)

1-3. The woman says this in a positive manner. Her voice retains a high pitch and sounds very cheerful. Considering this, what she most likely means is that John is very unique.

2-1. (B)

2-2. (A)

3. The professor has an extremely negative opinion of the theory. He says that it would be laughable (meaning it should not be taken seriously) if not for the horrible uses it was put to. The professor also stresses that the theory lacks any supporting historical evidence.

- 1-1. The woman's voice does not sound enthusiastic, but neither does she sound confused. In addition, the context of the situation does not give any clear indication that the woman should be confused. The man made the decision without her knowledge. Therefore the information must come as a surprise to the woman. Under the circumstances, it would be logical for her to be somewhat hesitant in her answer.
- 1-2. The man's tone of voice is clearly unfriendly. In addition, the woman has stated something fairly obvious (that they should bring an umbrella since rain has been forecast) as if it were a very original idea. Under these circumstances a sarcastic response could be expected from the man.
- 2-1. The way that the man stresses the word "I" in his response suggests that his opinion is different from the woman's. Therefore, the woman must have agreed with the policy.
- 2-2. The woman's tone indicates that she is agreeing with the man. In addition, the expression "no joke" is often used in casual English to agree with something someone has said.

Listening Practice 1 _ p.151

- Girl wants to take prof. course. But has intershp - Thurs class time
- Can she miss class? Knows prof. is strict re: attendance
- Prof. not sure - have to do for everyone
- Not required course, but will help stdnt prep for grad schl.
- stdnt has no time next sem.
- Prof. suggstn: take as audit, then no grade = no prob. for attend

[Answer]

1. (B) 2. (C)

- The professor sounds very hesitant after the student asks him about letting her miss class. He says that once he does that for one student he has to do it for everyone, suggesting he does not want to make any exceptions to his policy.
- The student says that she is planning to go to graduate school, and that the professor's course will help her prepare.

Building Your Listening Skills _ p.152

[Answer]

1. Do you 2. what did you
3. If 4. How about if you

Listening Practice 2 _ p.153

Liver largest organ - locn: below diaphragm, right of stomach
Covered by visc. peritn. - protects liver
Liver regenerates - unique ability
Essential functions:
Aids in digestion - makes bile (dissolve fat)
Metabolizes carbohdrts. in blood & send to body
Store area for extra carbohdrts. - release when needed

[Answer]

1. (B)
2.

	Yes	No
Regulating carbohydrate levels	✓	
Regeneration of body tissue		✓
Removal of poisons from the blood	✓	
Production of digestive fluids	✓	
Production of new blood cells		✓

- The professor says that the division of the liver is based on external appearance, and has nothing to do with its internal functions. He also tells the students not to pay too much attention to this distinction. Combined, these two statements suggest the professor thinks this distinction is misleading.

Building Your Listening Skills _ p.154

[Answer]

- Statement from the lecture: *The liver is kind of a jack of all trades.*
- Statement from the lecture: *The liver also acts as kind of a storage area for excess carbohydrates. The liver will remove some of the carbohydrates from the incoming blood, store them, and release them later when the body needs them.*

- A "jack of all trades" usually refers to a person who has many talents. In this context, the phrase is used to describe the fact that the liver serves many functions.
- The paraphrased statement is essentially a summary of these two statements from the lecture.

Listening Practice 3 _ p.155

All energy = wave
wavelength & freq. - perceptn. of energy
ex. sound - long wavelength = low tone, short = high
light - short wavelength = blue light, long = red
Doppler efct. - wave source moving = change in perctn. of energy
Ex. train coming sound gets higher, leaving sound gets lower
Use in astronomy:
Some stars too red (called redshift) = star is moving away from us
Can measure redshift to find speed of star

[Answer]

1. (A) 2. (B)

- The phrase "you've done your homework" is often used in conversational English to indicate that a person is knowledgeable about something. This suggests that the professor thinks the student is correct.
- The professor uses the example of a train coming towards someone to illustrate the Doppler Effect.

Building Your Listening Skills _ p.156

[Answer]

- (B)
- (A)
- This section of the discussion describes the how the Doppler Effect can be used in astronomy. At the beginning of the lecture, the professor says that she will talk about an important effect of waves (the Doppler Effect) and how it is used in

astronomy. Since she has just finished explaining what the Doppler Effect is, it makes sense that she will now discuss how it is used. Furthermore, the student prompts this part of the discussion by asking the professor what the Doppler Effect has to do with astronomy.

1. A is incorrect because the professor never actually mentions the Doppler Effect in this section. The students need to understand the behavior of waves in order to understand the professor's explanation of the Doppler Effect, so the professor reviews this information first.
2. The professor uses the example of the train to help her explain the Doppler Effect, which is, in effect, the link between wavelength and the perception of energy.

Listening Practice 4 _ p.157

Assess personality very difficult. – people hide illness, not cooperative

Rorschach ink blot test = tool for assess personlty.

Procedure:

- 1) show 10 cards to patient – What do they see?
- 2) exam. each card in detail – explain all answers
- 3) psych. records everything
- 4) evaluate patient answers and compare to normal answers

What does patient focus on? Color? Shading? Shape?

Powerful tool b/c works even w/ uncooperative patient

Ex. psychotic sees violence in pics.

[Answer]

1.

- | |
|--|
| 1. The patient give a quick impression of each consecutive card. |
| 2. The patient examines each card in detail. |
| 3. All words and actions of the patient are documented. |
| 4. The patient's answers are compared to typical responses. |

2. (A)

2. The professor describes the ink blot test as “a powerful tool,” suggesting that he thinks it is very useful.

Listening Practice 5 _ p.158

Two paintings (Van Gogh and Auerbach)

– brushstrokes really strong

Example of impasto tech.

Def. paint applied in thick layers – easy to see

brushstrokes

Proper tech.

- 1) need thick paint – no water colors, oil better than acrylic b/c dry slow
- 2) thick brush or paint knife for applic.
- 3) speed and force crucial b/c brushstrokes very vis.

Different brushstrokes = different feeling, but never tentative

[Answer]

1. (B)

2. (B)

1. The professor says that the impasto technique needs a paint that dries slowly, and that, for this reason, oils are better than acrylics. So while the professor never directly states that acrylic paints dry more quickly, he clearly implies this.
2. The professor says that the type of brushstroke depends on the effect that the artist is looking for. However, he also says that the brushstrokes must never be tentative. This suggests that he thinks self-assurance is very important in using this technique.

Vocabulary Review I _ p.159

[Answer]

1-1. underlying

1-2. metabolize

1-3. forthcoming

1-4. prominent

1-5. subjugate

2-1. are off limits

→ My doctor says that I have to lose some weight, so I guess I can't have any fatty foods or sweets for a while.

2-2. beef up

→ In an attempt to improve its international reputation, the nation has begun to take a more active role in mediating foreign conflicts.

2-3. let her slide

→ The police officer caught Alice speeding, but he did not give her a speeding ticket.

| /BT Practice | _p.160~161

[Answer]

1. (C)

2.

	Yes	No
The work will be unpaid.	✓	
All researchers will need to assist with the analysis of data		✓
Most research positions will only last a week.	✓	
Only political science majors will be accepted.		✓
The experience will be valuable to students in the future.	✓	

3. (B)

4. (A)

5. (C)

- The student says that he saw a sign on the bulletin board saying that the professor is looking for students to help her with a research project this summer, and that he wishes to help her.
- When the professor describes the first part of the research project, the student sounds rather disappointed, and asks her if it is only surveying work. In addition, once the professor explains that there are other things she needs help with, the student seems to be more interested and enthusiastic. This suggests that he wishes to do something more important than surveying.
- Although the professor never directly states this, it is clearly implied. She first asks the student what math courses he has taken, and then says that the courses he has taken should be enough. She then asks if she can speak to his professors. The clear implication is that she wishes to find out how the student did in these courses to determine if he is good enough in math to help her. This is supported by the fact that the student tells the professor that he got good grades in both courses in response to her request.
- The question immediately follows the professor's explanation of the work schedule for the student assistants. This clearly implies that she wants to know if the student can help her during these times.

🎧 Listening for Total Comprehension _p.162

It is one of history's great ironies that one of the nations most heavily involved in the trans-Atlantic slave trade was also the nation most instrumental in its abolition. By the early 18th century, with Spanish naval power in sharp decline, England had taken a leading role in the importation of African slaves for sale not only in its own colonies, but also in those of France and Spain as well. Thus, England was the biggest player in the

slave trade at a time when that trade was reaching its height. Yet, in 1808, England outlawed its own slave trade, and then, over the next 30 years, took an active role in pressuring other European nations to end theirs as well.

While historians have long debated England's motives in ending its slave trade, none have debated the impact of the act itself. While black market slave trading still occurred, the flow of African slaves to the New World significantly decreased. This, in turn, eventually brought an end to slavery in most of the Caribbean colonies, and it was only in the United States that slavery continued to thrive.

[Answer]

- England was the leading nation in importing and selling slaves to New World colonies.
- England first outlawed its own slave trade, and then began to pressure other nations to do the same.

🎧 Summarization Skills _p.163

[Answer]

The second summary is a far better summary of the lecture. While the first summary does not contain any incorrect information, it does not provide a good summary of the procedures for giving and evaluating the ink blot test, which is a key part of the lecture. In this respect, the second summary is far more detailed, and therefore is a better summary.

🎧 Integration Skills _p.164

[Answer]

- The reading describes the techniques of Rembrandt and Titian used for depicting the folds in cloth. Although the reading never directly says so, this technique seems to be the impasto technique described in the lecture. The main difference is the purpose the technique is used for. In the lecture, impasto is used so that the brushstrokes are easily visible, which adds feeling to a painting. According to the reading, Rembrandt and Titian used the heavy application of paint to create a three dimensional effect. The higher portions of the painting cast shadows on the lower parts, making them seem darker. This allowed Rembrandt and Titian to realistically paint the folds in clothing.

Chapter 8 Function Questions

Basic Drills _ p.168

[Answer]

- 1-1. The woman has just invited the man to go to a baseball game but he does not have any money. Telling the woman that he does not get paid until next week is a way of turning down her invitation and explaining why he is turning it down.
- 1-2. The man is finished eating. By telling the waitress that he is done with this (meaning the plate), he is telling her that she should take the plate away.
- 1-3. The man has just told the woman that he intends to make a stop on the way to take her to the airport, but she has very little time before her flight. By reminding him of her flight time, she is objecting to his plan.
2. The woman's response is not meant to be taken literally. The implied meaning is that she does not know where the building is. Several context clues should help you understand this. First, the woman's voice is rather tentative and unsure. Second, the man's response (Thanks anyway) indicates that she has not been able to help him.

 Listening Practice 1 _p.169

- Stdnt: Lost ID card, couldn't get in dorm, house
mangr. told to come secrty. off.
- Dir: if card stolen, other person can use so have to
deactivate
- Stdnt: doesn't want to, but Dir: insists
- Cost = \$25 but stdnt doesn't have - not prob. Can take
from stdnt deposit
- Stdnt can't get \$ back. Stdnt should replace soon to
avoid risk

[Answer]

1. (D)
2. (C)
1. The additional statement “That’s the university policy” has two purposes. First, it reconfirms that there is no way the student can get his money back. But it also serves to distance the director from her refusal. It implies the director has no choice in the matter, and is simply following university policy.

2. Her example is intended to show the student how much he could lose if he waits to get a new card. Her question is intended to reinforce this idea.

Building Your Listening Skills _p.170

[Answer]

1. couldn't even
2. what you all
3. Do you
4. get your

 Listening Practice 2 _p.171

- Most flower need bees for pollintn. so produce nectar, orchids need bees but no nectar
- Bees have excellent mem. How do orchids attract bees?
- Why can't bees learn?
- Orchids smell like female bees, so attract males.
- Orchids use bees b/c cross pollintn better than self-pollintn. = more genetic divrsty.

[Answer]

- 1. (B)**

1. The student's response contains an implied concept. She asks "what would be in it," but what she really means is "what would be in it for the bee." In other words, what would a bee get by visiting a flower with no nectar?
2. The professor knows that if the student thinks about what they have previously said about the memory of bees, he will realize that his statement is very unlikely.

Building Your Listening Skills _p.172

[Answer]

1. Statement from the discussion: *Yeah, that seems to be the sensible answer, but there are flowers that depend on bees that don't give, you know, any nectar in return.*
2. Statement from the discussion: *If the bee found nectar in one blossom, he'd probably visit all the blossoms on the same plant and ... we'd end up with self-pollination*

1. The professor says this in response to the student's statement that bees probably wouldn't visit flowers with no nectar. If the student's answer seems sensible, then the fact that some flowers rely on bees but don't produce nectar must seem illogical.

- This is a pretty direct paraphrase. Only minor vocabulary changes have been made.

Listening Practice 3 _ p.173

- Solar power not new – 1890s – California 30% solar
- 1920s found much gas, so no interest in solar
- 1970s oil shock restarted interest, but not a lot
- US not dedicated to solar, but some use in house design
- Passive solar – sunlight creates heat
- Ex. large S. windows to warm house
- use large windows & matrl. absorbs heat
- Active solar – sunlight create electrotly. – photovoltaic cell
- very expensive, not widespread
- Nighttime no electrcity – storage bats. expensive

[Answer]

- (A)
- (A)

- The professor states that the oil shock of the 1970s briefly generated renewed interest in solar power, but that oil prices dropped enough for people to lose interest again.
- Just before this question, the professor states passive solar is the most common usage of solar energy. His assumption that all students have done this before is meant to reinforce his point.

Building Your Listening Skills _ p.174

[Answer]

- (A)
- (C)
- The purpose of this section is primarily to describe the drawbacks that have prevented active solar power from becoming more widespread.

- The rest of the lecture discusses the two separate types of solar power. This section of the lecture simply notifies the students of this.
- This section of the lecture is primarily concerned with defining the term passive solar, which the professor does through examples.

Listening Practice 4 _ p.171

- Humanism is undercurrent in most Western thought
- Def. focus on human values, abilities, and needs & equality of mankind
- Stdnt explntn: reject religion, focus on people instead of God
- Prof: not exactly right. Humanism & relig. Not incompatible but does focus on people
- Human values: basis of morality = belief in equality of people, not from relig.
- Human abilities: look for own solutions, don't rely on God to solve probs.
- Human needs: not here to serve God, serve needs of humanity

[Answer]

- (C)
- (B)

- The phrase “to be shaky on something” means that a person is unsure of something. The fact that the student says “I understand ... but I'm a kind of shaky on ...” sets up a contrasting relationship that should provide an important clue regarding the student's meaning.
- The professor wants to encourage more participation by asking the other students to answer this question.

Listening Practice 5 _ p.176

- Basket weaving – only women
- Two types: woven, coiled
- Woven: checkerboard pattern, like cloth
- Coiled: like sewing, locked w/ knots
- Basketry not just baskets – kind of technq.
- Decorate w/ dye, shells, patterns
- Why decorate? Maybe related to status
- Some inspiration from tribe.
- Ex. Hopi = snake pattern, Alaska tribes no such pattern.
- Also lots of individ. creativity.

[Answer]

- (A)
- (B)

- The professor does not in any way suggest that this is not an important part of the lecture or that the students do not need to take notes. Therefore B and C are incorrect.
- The implication is that the Alaskan tribes did not use snake motifs, because snakes were not part of their natural environment in Alaska.

Vocabulary Review | _p.177

[Answer]

- 1-1. domain
 1-2. photovoltaic
 1-3. undercurrent
 1-4. incompatible
 1-5. aroma
 2-1. is shaky on
 → The candidate knows a lot about foreign affairs, but does not understand domestic issues as well.
 2-2. swing by
 → The clinic's main hours are from 10am to 4pm, but it remains open late into the night so that people can come when it is most convenient for them.
 2-3. broke down
 → In his closing arguments the attorney explained all the reasons why his client should be found innocent one by one.

/BT Practice | _p.178~179

[Answer]

1. (B)

2.	True	False
CMB is of nearly equal strength in any direction of the sky.	✓	
CMB levels fluctuate widely.		✓
CMB is decreasing in temperature as the universe grows.	✓	
The evidence for CMB remains largely speculative.		✓

3. (C)

4. ☒ The origins of CMB
☒ The discovery of CMB
☐ The effects of CMB on life on Earth
☒ The scientific implications of CMB
☐ The arguments in opposition to CMB

5. (B)

6. (A)

- The main topic of the lecture is the discovery of CMB and what it tells us about the universe.
- The professor states that although CMB was predicted by the Big Bang theory, there was not much interest in it until the 1960s, when scientists at Bell Laboratories were searching for the source of satellite interference.
- Since CMB was predicted by the Big Bang theory, its discovery strongly suggests that the theory is correct.
- The professor realizes that he has not provided the

students with enough information about what exactly CMB is, so he gives them more background information by explaining how it was created.

Listening for Total Comprehension _p.180

In modern times, both the United States and Australia have had to deal with the issue of so called "boat people." Simply put, boat people are citizens of another nation, generally an impoverished one, who seek a better life in the United States or Australia. The catch is that, lacking visas, boat people seek to enter these nations illegally through their poorly patrolled shorelines.

Boat people present two problems for the governments of the United States and Australia. The first is that boat people often seek to claim refugee status once they have reached land. According to US and Australian law, refugees cannot be forcibly returned to their country if that will place their lives at risk. Thus, there must be long and often expensive legal proceedings to determine the risk to boat people before they are deported. The second problem is that the overseas crossing itself is extremely dangerous. Coming from impoverished countries, the boats used to reach the US and Australia are often old and dangerous. Therefore, the governments of the US and Australia wish to discourage boat people from risking their lives in a dangerous and illegal crossing.

[Answer]

- They attempt to claim refugee status because US and Australian law prohibit deporting refugees if there is a risk they will be killed in their home country.
- The second problem is that boat people often seek to cross into the US and Australia in very unsafe boats, and the governments of the two countries don't want people to risk their lives in this way.

 **Summarization Skills** _ p.181

[Answer]

The second summary is the correct summary. Although it is shorter, it retains the original focus of the discussion better than the first summary. The first summary focuses too much on the bees, and not on the flowers. In addition, the first summary says that bees are not able to remember which flowers lack nectar, which is incorrect. Finally, the first summary is rather vague in terms of how exactly flowers are able to trick bees. The second summary is more precise in this respect.

 **Integration Skills** _ p.182

[Answer]

1. The lecture states that active solar power is not widely used because of its expense and the other problems associated with it, specifically the problem that no electricity is produced at night time. The reading, however, describes two common uses of active solar power, and how they overcome these problems. The reading says that many streetlights in the US work on solar power. The reading says this is possible because the streetlights only come on at night, allowing them to charge their batteries during daylight hours. The reading also says that solar panels are often linked into the power grid. Although they can't produce electricity at night, they reduce the amount of oil used in the day so that less total oil is used.

iBT Listening Practice Test _ p.185~220

[Answer]

PART 1

- | | | |
|---------|---------|---------|
| 1. (C) | 2. (B) | 3. (B) |
| 4. (B) | 5. (B) | 6. (D) |
| 7. (A) | 8. (B) | 9. (C) |
| 10. (D) | 11. (A) | 12. (D) |
| 13. (A) | 14. (C) | 15. (B) |
| 16. (D) | 17. (D) | |

PART 2

- | | | |
|---------|---------|---------|
| 1. (D) | 2. (A) | 3. (C) |
| 4. (C) | 5. (A) | 6. (C) |
| 7. (B) | 8. (C) | 9. (B) |
| 10. (B) | 11. (A) | 12. (B) |
13. ☒ A lack of government funding
☐ A sudden drop in population
☐ The success and availability of private schools in educating American youth
☒ The public's perception of the unimportance of formal education
- | | | |
|---------|---------|---------|
| 14. (B) | 15. (B) | 16. (D) |
| 17. (C) | | |

PART 1

- When the student first comes to the help desk he does not yet know that he needs RAM for his computer. He only knows that his Internet connection is not working properly.
- The student says that he has already been to the facilities department, but that they told him there was a problem with his computer, not with the Internet connection. Therefore, they told him to visit the computer help desk.
- The help desk worker says that she can't be sure, but that the most likely problem is that the student does not have enough memory. According to the woman, the fact that the student's computer is slow in general supports this.
- The student will most likely go to the computer store that the woman has told him about to get more RAM installed in his computer.
- The woman is trying to indicate that while she thinks she knows what the problem is, she is not 100% sure. When the student first comes to the help desk he does not yet know that he needs RAM for his computer. He only knows that his Internet connection is not working properly.
- Very little is said about advertising itself. The main point of this lecture is to define a number of ways to approach budgeting for advertising.
- The professor gives some specific statistics as to what percentage of sales is allocated to the advertising budgets of certain types of companies. He specifically mentions pharmaceutical and automobile companies.
- As the name suggests, goal-oriented budgets depend on reaching some target or attaining a specific outcome. This could be either financial or non-financial, such as gaining product recognition. This would not be directly connected to an increase in sales, but might eventually do so. For this reason, the first choice is not really correct. It suggests that increased sales are the only goal in such a budget.
- The professor refers to such budgets as "lazy" in that they don't require much in the way of market or advertising research.
- The professor directly states that this is the worst method for planning a budget. It takes into account no marketing principles at all. If it succeeds, it does so by pure luck, since there is really no plan behind it.
- When someone says "there are no guarantees," they mean that the outcome of something is not predictable. Advertising is not a science. What should work may sometimes not. This does not mean that most advertising is ineffective or that marketing principles do not apply; it simply highlights advertising's unpredictability.
- The California Gold Rush was mentioned, but only because it began to stimulate the need for a transcontinental railroad. A complete picture of life in railway towns was not given. We only know that they were farmers who were trying to survive under the power of the railroads. The expansion of the railroads may be a main topic, but it seems too broad, as only western expansion is discussed. In addition, it does not take into account the politics and social changes that surrounded this expansion. Therefore, answer D best summarizes the entire scope of the discussion.
- The professor gives an example of a town which may be dependent on one crop such as wheat and how its relationship with and dependence on the railway could develop. The farmers may have depended on wheat and the price of wheat, but it is not really related to how they depended on the railway. The two were linked, but the type of dependence was not compared by the professor. No particular town was named, and no real statistics were given.
- Although a student suggests the railroads may have been dishonest, the professor doesn't really agree. He basically states that they made use of some clever advertising and attractive incentives that led people to buy the land. In other words, they were clever businessmen. They could not force anyone to initially buy the land. That would have been their choice.

15. The professor explains that the timing was bad for the expansion of the railroad. The Civil War had just begun, and the government needed to be more careful about how it spent its money, since it seemed likely that much money would be needed to fight this war.
16. If the town grew only wheat and the price of wheat was high, the town would do well. It, perhaps, could be argued that dependence on one crop was a bad farming practice, but, in fact, it was closer to a bad business practice. However, it was only bad in the event of low prices for that one crop. In truth, all of this could be overridden by too much dependence on the railroads. Since the railroads loaned most of these farmers the money to pay for the land, the inability to repay the loan during a bad year could lead to the entire town being abandoned, thus forming a ghost town.
17. The expression "to not take something lying down" means to refuse being pushed around. In this case, the farmers refused to give in to the power of the railroad and even organized to fight it. To emphasize this attitude in the farmers, the professor uses this expression.
8. The professor clearly states that the illnesses of Vietnam veterans turned out to be from exposure to a herbicide that was used in Vietnam, and specifically from a chemical byproduct (DDT) that was in the herbicide.
9. The professor says that there were many toxic substances that soldiers may have been exposed to during the Gulf War, and that as a result, it is harder to diagnose and treat.
10. The professor mentions that the people of Vietnam were exposed to the same herbicide as Vietnam veterans. It is therefore logical to assume that they would experience the same medical problems.
11. To say that someone is "stumped" means that person does not know the answer to something.
12. The discussion focuses on how public schools developed in the America. A is too broad, B is too narrow, and D is not mentioned.
13. The professor says that the early government simply couldn't afford public schools, and that since most people worked on farms, an academic education wasn't really seen as being important.
14. The professor states that Horace Mann created the first public schools, called "common schools," in Massachusetts.
15. The professor says that the story of the American high school will have to wait for another day, suggesting this will be discussed in the future.
16. The professor says that laws were more like legal theory, suggesting that they were not enforced.
17. In conversational English, if someone does not "buy" something, it often means they do not believe it.

PART 2

1. Although the student begins with an explanation of why he was absent last week, his real intention in visiting his professor is to get the work that he missed last week.
2. The professor says that regardless of any letter that was sent out, the student should have personally informed her that he was going to be absent.
3. The easiest part is getting the notes, because there are posted on the Internet. Giving the student the homework from last week will also be relatively simple, and the professor says she will do that in the next class. The most difficult part will be getting ready for the exam next week because the student does not have much time to get caught up.
4. At first, the student is thinking about just skipping the assignments so that he can spend more time getting ready for the exam. But the professor suggests that he do them after the exam. That way, he will at least get partial credit for the assignments.
5. The expression "to cut someone some slack" is commonly used in conversational English to mean "to make an allowance for someone." In this case, the student wants the professor to make an allowance for him concerning the deadlines of the assignments.
6. A and B are too narrow to be the main point of the lecture, and D is never mentioned in the lecture.
7. The author lists several toxic substances, such as asbestos and depleted uranium, that are found in modern battlefields.

Workbook

P. 222~223

Professor (female): OK, today we're going to talk about what's probably the most important life saving technique that you'll learn in this class; Cardiopulmonary Resuscitation or CPR. Uh, before we talk about how you actually administer CPR, let's talk about when and why you administer it.

OK, first CPR should only be administered if a person is: one, not conscious, two, not breathing, and three, has no pulse. If they're not breathing, but have a pulse, no matter how weak, you should perform rescue breathing, which we covered in the last class. OK, so if you have an unconscious person who isn't breathing and has no pulse, you should begin CPR immediately after you call 911. This is important, because what CPR really does is to continue to supply oxygen to the brain. Without a steady flow of oxygen laden blood, brain cells will begin to die. After four minutes, significant brain damage will occur, and after seven minutes, the damage may be irreparable. So it's important to start administering CPR right away.

OK, now, I know that I called CPR a life saving technique, but, actually, it's a life preserving technique. Uh, what I mean is that CPR alone isn't going to save many people. Let's say that you have a guy suffering a heart attack, and you administer CPR. Well, if that guy never receives any medical attention beyond CPR, his chances are pretty slim. What CPR will do is prevent further damage until professional medical personnel arrive and can give more advanced treatment. That's why it's important to call 911 before you start CPR, and why, once you start, you have to continue until the paramedics get there.

OK, the actual procedure for CPR is pretty simple. First, you lay the person flat on their back. Then, you put your mouth over theirs and breathe two one-second long breaths into their lungs. When you do that, you have to make sure your mouth is pressed firmly against theirs so that all the air goes into their lungs, and doesn't simply blow out the side of their mouth. OK, so then, you follow the two breaths with thirty chest compressions. Just put your hand over their heart and press down firmly once per second for thirty seconds. Then you start again with two more breaths, and keep doing that until the paramedics get there.

P. 224~225

Professor (female): Ballet is an art form that combines and synthesizes elements from three other arts: literature, music, and dance. It ...

Student A (male): Uh, excuse me Professor, I get the music and the dance part, but where does literature come into play in ballet?

Professor: A good question. Can anyone answer it?

Student B (female): Well, most ballets tell a story, don't they?

Student A: So they're like musicals.

Professor: Uh, not exactly. OK, perhaps I should clarify a bit before we move on. In a musical, the dancers sing, and often even act, as well as dance. In ballet, the story is told entirely through the choreography and the music ... there's no singing, no lyrics, and definitely no acting.

Student A: Sounds like it'd be pretty hard to follow the story to me.

Professor: Well, actually, most people already know the story before they see a ballet. You see, many of the plots of ballets are taken from popular myths or from well-known fairy tales ... as I'm sure you'll see in a bit when I start naming a couple famous ballets.

OK, I should point out, by the way, that what we're really talking about today is called narrative ballet. There are forms of ballet that don't tell a cohesive story, but the large majority performed are narrative ballets. So, let's talk about some of the major characteristics of narrative ballets. Uh, number one, they're typically pretty high budget performances. They have large, elaborate sets, full costumes, and often require a large number of dancers. Other forms of ballet, in contrast, are far more economical to produce. Another defining characteristic of narrative ballet is that it will have at least two separate acts, and each act is separated by an intermission. Uh, the intermission serves a number of purposes. Number one, it provides the time needed to switch the sets, which, as I said, are often quite elaborate. Uh, from an, uh ... aesthetic point of view it also breaks up the performance into manageable segments for the audience. A full ballet all in one go would probably be a little much for the average person.

In terms of choreography, there are a couple distinctive features of narrative ballet. The first is called a *divertissement*. This is a short departure from the telling of the story in order to showcase the technical skills of a particular dancer. Uh, for those of you familiar with opera, it would be relatively similar to an aria, that's a solo, by the way, for the lead female voice. Uh, the other characteristic element of narrative ballet in terms of choreography would be the *pas de deux*. This is quite simply a duet ... a dual dance by the leading man and the leading lady of the ballet. Since nearly every narrative ballet revolves around a love story there are naturally a lot of these.

OK, to wrap it up, let's talk about stories in some of the most famous narrative ballets. *Swan Lake* would be at the top of that list. In this ballet, a young prince falls in love with a princess. Unfortunately, the princess is turned into a swan every morning as the result of the spell of an evil wizard. In various versions, the power of the young couple's love either breaks the spell, or they die together. The point I want to make about the story though is that, as I said earlier, it is taken from pre-existing myths. The swan maiden is a prominent figure in both Greek and Persian mythology. Another famous narrative ballet, *Beauty and the Beast*, has its roots in a fairy tale that all of you should recognize.

P. 226~227

Professor (female): OK, as you know, inertial energy ... uh, the total energy of an object in motion, is equal to its mass times its velocity. That means that even a very small object can have an extremely high inertial energy, if it is moving fast enough. Today, we're going to talk more about that ... uh, specifically about the physics of impacts at ultra-high speeds. The speeds I'm talking about are those exceeding seven times the speed of sound, uh, what are called hypervelocities. OK, so at around 5,000 mph or higher, the inertial energy of an object far outweighs its structural strength. At these speeds, even the hardest metals behave somewhat like liquids. On impact, all that inertial energy, or at least a great deal of it, is converted to heat energy. Both the impactor and the target will liquefy as a result, and, uh, if the velocity of the impactor is high enough, they may even vaporize. So you can see that such a collision can be incredibly destructive.

Now, on Earth the physics of hypervelocity impacts don't often come into play – not even bullets travel this fast. Where hypervelocity impacts do come into play is in space. Uh, take, for instance, your average satellite in stationary orbit around the Earth. It's going to have a speed of around 22,000 miles per hour. That's well into the hypervelocity range. So let's say that satellite hits something in space ... a meteorite or maybe a loose bolt from another satellite ... whatever. Even a collision with the smallest object could be catastrophic for the satellite. And the thing is, there's not much point in trying to shield the satellite because, as we said, at these speeds inertial energy far exceeds the strength of basically any material. Another point is that at extremely high temperatures, like those produced in a hypervelocity impact, materials may vaporize and enter a plasma state. Plasmas are gases that hold an electrical charge. So even if the impact doesn't completely destroy the satellite, the plasma it creates may knock out all the electronics on board.

P. 228~229

Academic Advisor (female): Hi, come on in. What can I do for you?

Student (male): (*hesitating*) Well, I'm thinking of dropping one of my courses, and I was wondering if you could tell me exactly what I have to do.

Advisor: Sure, but why don't you tell me what the problem is first?

Student: It's my chemistry class. I knew I probably shouldn't have taken it this term because of all the other courses I'm taking, but I thought that I could get it out of the way. But I really don't have much idea about what's happening, and I don't have the time to work on it as much as I'd like. I thought I might as well drop it and take it when I don't have so many other classes.

Advisor: Have you had any tests yet?

Student: Just a few quizzes, but midterms are coming up and I can't risk it. I mean, I did badly on these quizzes, and I can't see myself improving much by midterms.

Advisor: In that case, you'd better hurry and drop the course. I think you've only got a couple of days to do it.

Student: (*surprised*) A couple of days? But I thought I had until four weeks before the end of the term.

Advisor: Well, yeah. But if you wait until then, you'll get a grade for the course. It's no longer considered dropping, but withdrawing from a course. If you're passing and withdraw you'll get a "W," but if you happen to be failing, and from what you've said this is a real possibility, your professor will probably give you an "F" or at best a "U." This will also go on your permanent record. I doubt if you want to take that chance, do you?

Student: No way. So, okay, I want to drop the course in the next two days. What do I have to do? Get some kind of a form and have the professor sign it or what?

Advisor: No, you just need to fill out the form and turn it in. There's no need to get the professor's signature unless you miss the deadline.

Student: Great. Well, I'm sure glad I stopped in here. I could have ended up in real trouble otherwise.

Advisor: Well, just make sure you get that form filled out as soon as possible.

Student: (*leaving*) Thanks. I'm on my way now.

P. 230~231

Professor (female): You know, we've spent a great deal of time talking about the impact of human activities on the global climate. And, certainly, before we start today I want to emphasize the fact that humans and our activities are now the single most important force driving climate change. But today, I want to spend some time talking about ways that animals and plants can affect the earth's climate. To do that I want to look at two vastly different types of organisms: cows and phytoplankton.

Cows are one of the most populous mammals on the earth. In the US alone, there are approximately 100 million cows. That's about one cow for every three Americans. Now, I bring this up because cows are huge methane producers. Cows, in digesting grass, produce methane gas, which they then emit out into the atmosphere. Now, this is significant because methane is a greenhouse gas. In fact, methane is expected to account for 15% of the global warming that occurs in the next 50 years. I should note that other domestic farm animals are significant methane producers as well, but cows out produce all other farm animals combined in terms of methane. Therefore, you can reasonably say that cows are an important contributor to rising world temperatures.

Student (male): But there's only that many cows in the world because we raise them for food and milk. So shouldn't that go under human activities? I mean, if we weren't raising them, there wouldn't be so many emitting methane into the air.

Professor: That's a good point. I guess what I really wanted to show you today is that not all deviations from historic weather patterns are directly related to car emissions or industrial activity. Yes, the raising of cows does represent a form of human activity I suppose, but it's essentially an organic process rather than a mechanical one.

Alright, on to phytoplankton, and this one, by the way, is definitely not a human process. Phytoplankton are little microscopic sea organisms that gain their energy through photosynthesis, much like plants. Just like plants, they release oxygen into the air, but more importantly they release sulfur particles. These sulfur particles are what we call cloud seed particles; they help clouds form. Thus, phytoplankton are essential to alleviating climate change because they contribute to the total amount of cloud cover around the earth. Those clouds, in turn, reflect a lot of the sun's energy back into space.

P. 232~233

Professor (female): OK today, we're going to continue talking about the migration patterns of early humans. Now, we've discussed this concept in some detail already, so let's just review what we've said so far. What are some of the ways that we can trace the migration patterns of early humans?

Student A (male): Well, most early human cultures had their own distinct artifacts. They had their own styles of weapons, tools, pottery ... uh, that kind of stuff. So you can trace the spread of a certain tool style, and that shows you the migration of a culture. Uh, like the migration of the early Native Americans is shown through the spread of a particular kind of spear point.

Professor: Good, looks like you all were paying attention after all. What else?

Student B (female): Uh, I know you said something about tracking languages, but I didn't really get it.

Professor: Yeah, that one's a bit complex. Basically, you track the way that languages change and how new languages form. If you have two groups that speak the same language, but are geographically isolated, over time, their languages will grow apart. Uh, here's a good example. There's a Korean island called Jeju that is pretty far from the mainland. Now, when that island was first settled, the people who lived there spoke just like the other Koreans of their time. But over the centuries, uh, because they were kind of isolated, their language grew apart from the Korean that is spoken on the mainland. So now the Korean spoken on Jeju is a bit different from mainland Korean. They use a lot of words that aren't used on the mainland. Now, if the Koreans on Jeju would have been isolated for long enough, say another thousand years or so, their Korean would have evolved into an entirely new language. Anyway, by tracking those kinds of language changes, we can track the migration of early populations.

OK, so that's a quick review of what we've gone over so far. Now,

what I want to do is talk about a relatively new, and in, uh, in my opinion, quite exciting method of tracking human migration. In the past ten years or so, it has become possible to use DNA to track the migration of early humans.

Student B: Sorry, Professor Schmidt? How's that possible? I thought everyone's DNA was unique.

Professor: Uh, it is ... but parts of our DNA are inherited directly from our parents ... uh, basically without any real change. For example, we get our Y chromosome directly from our father, and our mitochondrial DNA directly from our mother. So, for example, I could track my Y chromosome all the way back through many generations, from my father, to his father, to his father, etc. You can do the same with your mitochondrial DNA and your mother's ancestry.

OK, now, occasionally, the Y chromosome or the mitochondrial DNA will mutate, and uh, when it does ... it's a fairly big event because that mutation will be passed down through the generations after that ... so mutations kind of represent places in the family tree where groups separated. Anyway, by tracking these mutations we can follow the migration of genetically distinct groups across the world. Let me think of an easy example ... Oh, OK. There is a specific Y chromosome mutation called the M 20 mutation that occurred in India about 30,000 years ago. Now, anyone in the world who has this specific mutation ... uh, well, we can be sure that at some point in the last 30,000 years, their male ancestors migrated from India. There's another mutation that arose in Siberia around 20,000 years ago called the M 45 mutation. Now, if someone had both the M 20 and the M 45 mutation, we could start to track the movement of their ancestors ... because their ancestors would have had to move out of India and into Siberia so that they could pick up the second mutation. See how that works? So by tracking the sequences of these mutations in people, we can come up with a kind of broad map of human migration over thousands of years.

P. 234~235

Professor (female): Most plants reproduce through pollination, which we discussed last week. Some plants, however, can reproduce through a secondary, asexual reproductive process called vegetative reproduction. In vegetative reproduction, there need be no seeds, fruit, nor any pollen transfer. In a sense, vegetative reproduction is really just a form of cloning, since the newly created plants will be genetically identical to the original plant.

Student A (male): So is this something that only happens when people do it, like grafting two trees together?

Professor: No, although people certainly do exploit this process for their own purposes. Asexual reproduction in plants occurs quite frequently in natural settings. Uh, the basic requirements for vegetative reproduction are pretty simple. You need a section of plant stem that is underground and horizontal. Normally a vertical stem in open air would produce stem offshoots. But when placed

underground and in a horizontal attitude, many stems will start to produce root structures leading downwards and shoots, like those emerging from a seed, leading upwards. Now, once that starts to happen, you can completely sever that stem from the original plant, and it will continue to grow into an entirely new plant.

Student A (male): Uh, professor, could you give us some examples of plants that do this?

Professor: Sure, tons. Potatoes would be a pretty famous example of vegetative reproduction. Basically all the potatoes you have ever eaten are a product of vegetative reproduction. Farmers just cut up potatoes, replant them in their fields and whalah, a new crop of potato plants shoots up. Roses, Elm trees, uh ... lots of different kinds of grasses. It's a pretty big list.

Student A: And you said that people often exploit this process?

Professor: We sure do. Uh, let's say that you're a farmer, or a florist ... basically anyone growing plants. Now, you got a plant specimen that you're pretty happy with. Uh, it's got all the characteristics you want. If you reproduce that plant though pollination, you're going to mix its genetic make up with that of another plant. So you're not going to get exactly the same plant. Uh, maybe you'll get a better one. or maybe you'll get a worse one. But if you use the plant's natural process of self-replication ... well, as we said, it's basically a form of cloning. So from a genetic standpoint at least, you're going to get exactly the same plant.

P. 236~237

Professor (female): One of the most significant finds in the history of modern archaeology ... uh, especially for those archaeologists interested in the history of the Hebrews, was the discovery of the Dead Sea Scrolls. These scrolls contain some of the earliest known copies of the Old Testament of the Bible, which those of the Jewish faith call the Torah, and regard as the authoritative word of God. Uh, most of the scrolls date from somewhere between 200 B.C. and 100 B.C. Now, those of you familiar with Jewish history obviously know that the Old Testament certainly predates this, but again, these are the oldest surviving copies found.

One of the reasons that the Dead Sea Scrolls are so important, aside from the obvious reason of their antiquity, is that they come from a unique period in the history of the Hebrews. In the second century B.C. the Hebrews retook the territory around Jerusalem from the Syrians, and reconstituted the kingdom of Jerusalem. This is commonly known as the Second Temple Period because they rebuilt the Temple of Solomon, the holiest site in the Hebrew religion, at this time. So, politically, it was an interesting time because it is one of the few times in their early history when the Hebrews achieved an independent state. From a cultural and religious standpoint, it was an interesting time because there were a number of different Hebrew sects at this time, each with significantly different beliefs. One of these sects ... uh, actually this sect was just a small minority ... a fringe group really, was the Essenes.

The Essenes were an ascetic community that lived apart from the rest of the Hebrew community. Their main community, Khirbet Qumran, was located in the same area as the caves where the Dead Sea Scrolls were found. Now, while the Dead Sea Scrolls almost certainly belonged to the Essenes, there is considerable debate about whether the Essenes simply collected the scrolls from other Hebrew sects, you know kind of like an early Jewish library, or, uh, whether they wrote them all themselves. What seems most likely, and remember I said that there is still a good deal of debate going on, is that the scrolls containing the actual books of the Bible were collected from various sects, while the scrolls dealing with community life seem to have mostly been written by the Essenes themselves. Uh, I say this because the Essenes had pretty unique beliefs among the Hebrews ... and uh, many of the Dead Sea Scrolls espouse beliefs that they would not have agreed with.

So, assuming that this view is correct, and many of the scrolls were not written by the Essenes themselves, how did they come into possession of them? Again, there are a number of theories about this. Uh, one theory is that as an ascetic, uh ... sort of monkish, community, the Essenes were simply heavily involved in biblical scholarship and study ... and, this is certainly a plausible theory. But a theory that I find to be more interesting, and a bit more compelling as well, is that the Essenes were given the scrolls for safe keeping. You see, by the time of the birth of Christ, the Hebrew kingdom had been absorbed by the Roman Empire. Now, that wasn't a peaceful absorption. There were periodic revolts against Roman power ... and after one of these revolts in the year 66 A.D. there was a particularly harsh crack down against the Hebrews by the Romans. So, perhaps fearing the destruction of their religious texts by the Romans, the various Hebrew sects delivered their sacred texts to the Essenes, who were somewhat geographically isolated, for safe keeping. The fact that the scrolls were found in caves around Khirbet Qumran, and not within the settlement itself, seems to suggest pretty powerfully that the Essenes felt they needed to be hidden.

P. 238~239

Professor (female): Polymers are a group of large molecules characterized by the following properties. Uh, first, these giants are many times the size of a typical molecule. Second, polymers are made of a series of smaller molecules, called monomers. You can, uh, just think of monomers as the building blocks for their larger brothers. OK, finally polymers form long chains of repeating monomers that are linked by chemical bonds to form a long string.

Here's a pretty simple example. One carbon atom and two hydrogen atoms will bond to form a molecule called ethene. Now, ethene molecules will bond together in a continuous string to form a polymer called polyethene. In that case, the ethene molecules represent the monomer sub-units of the much larger polyethene molecule. A polyethene molecule may include thousands of ethene monomers, so you can see that polymers are huge molecules.

OK, now, I used polyethene as an example because it's a relatively

simple example of these chemicals. It, uh, it only has one type of monomer. Many polymers, however, have more than one type. Proteins would be a good example of this. All proteins are polymers made of monomers called amino acids. There are twenty known amino acids, and these amino acids can arrange themselves in long chains to form thousands of different proteins, depending on the sequence in which they arrange themselves. Umm, that also brings me to my second point about polymers. Their chemical properties depend both on the monomers they are made of and the order in which those monomers bond in the chain.

Student A (male): Uh, excuse me, professor? You said that proteins are polymers. Are all polymers organic molecules?

Professor: No, there are inorganic ones. Uh, for instance, Kevlar and nylon are both inorganic polymers. But organic polymers are far more common. Name almost any important organic compound, and it is probably made of polymers. Carbohydrates? Polymers. Proteins? Polymers. DNA? That's a polymer too. In fact, it wouldn't be a stretch to say that polymers are the foundation of life.

P. 240~241

Professor (male): Today, we're going to talk about a process called soil liquefaction. This is where a seemingly solid soil will undergo a conversion to a liquid, uh, or at least semi-liquid state. If you're familiar with quicksand, you are already familiar with the process of soil liquefaction. In order for soil liquefaction to occur you need two things. Uh, first you need a certain type of soil; a loose unconsolidated sediment. Unconsolidated sediment is a type of soil that is made of small grains rather than of large rocks. Again, sand is a good example of unconsolidated sediment. The other thing you need is water. *(slight pause)*

OK, as you can see in picture 1, in unconsolidated sediment, there are also little pockets of air between the grains. Now, as water soaks into the sediment, it will begin to fill up all these little air pockets. Once all the air pockets have been filled with water, the sediment is said to be saturated; it's absorbed all the water it can and still hold together. If more water is forced into the sediment, it starts to push the grains apart, so that they start floating freely in the water. At this point, soil liquefaction has occurred, and the soil will behave as a liquid rather than as a solid. Add enough water to any unconsolidated sediment and this will occur.

Now, this presents significant dangers to people, and I'm not just talking about stepping into a pit of quicksand while you're on a hike in the woods. When an underground water source takes on too much water, liquefaction can occur. And if that water source happens to be below a building or a city street ... well, the damage can be pretty severe. The foundation of the building will begin to sink into the liquefied soil ... the building may even completely collapse. The risk is particularly severe if liquefaction occurs on a hillside, as the soil will pour downhill, destroying anything in its path.

Of course, in modern times we can monitor the saturation levels of the soil, and if need be, drain water out of the soil before liquefaction

occurs. But liquefaction is still a significant danger during earthquakes, even if the soil is only partially saturated. Uh, to understand why, let's go back and look at picture 1 again.

You see how the grains are stacked on top of each other? If you were stacking cans in your cupboard, would you stack them this way? Of course not. Now, in unconsolidated soil, the friction between individual grains of sand will allow them to stack like this ... and even to support a considerable amount of weight. But the shaking motion of an earthquake will cause them to shift into a position more like what you see here in picture 2. *(slight pause)*

You can see that the grains are a lot more densely packed, right? I mean there's a lot less open space between them. And remember, what's between those spaces? Water. So, as lower layers of the soil settle into this more densely packed configuration, the water in those layers gets pushed up into the next layer, and the next, and the next, until the top layers of the soil do become super saturated and soil liquefaction occurs. This is a considerable danger in quite a few earthquake prone areas. The results of earthquake liquefaction are essentially the same as the results of regular soil liquefaction, uh, collapsed buildings, destroyed roads, mudslides ... but the destruction is usually spread over a much broader area. In 1964, the Japanese city of Niigata experienced an earthquake in which widespread liquefaction occurred. Entire sections of the city were totally destroyed, and the loss of life was considerable. In 1989, the San Francisco area had an earthquake. Again there was widespread liquefaction. The cost? 62 lives lost, almost 4,000 injured, and \$6 billion in damages.

P. 242~243

Professor: In the early 1900s, a geologist named Norman Bowen was investigating mineral formation processes. Now, it was already known that minerals undergo crystallization as molten rock cools. What Bowen did was to heat powdered rock until it melted and then he allowed it to begin cooling. After the rock had cooled to a certain point, Bowen would examine it to see what minerals in the rock had crystallized. He did this again and again, examining the rock samples at successively lower temperatures. From his findings, he put together a list of what minerals crystallize at what temperatures. We now call this list Bowen's reaction series. Now, uh, Bowen's reaction series is an important tool for geologists, but before we talk about why, we should probably take a minute just to look over the series itself.

Alright, the first mineral to form, uh, that is, the one that forms at the highest temperature is olivine. That's a mineral that most of you have probably never heard of, and I'll tell you why that is. Bowen also observed that minerals were most stable at the temperature at which they form. So at lower temperatures, such as those near the earth's surface, olivine is pretty unstable, and so you're not going to find much of it. In fact, it's not until the very bottom of the reaction series that we're going to find minerals that you'll probably recognize, such as quartz.

Let's move on to how we can use Bowen's reaction series. By studying a rock formation and analyzing the minerals found in it we can make inferences about the conditions under which that rock structure formed. Now, remember that I said most of these minerals are unstable at low temperatures, so we're really talking about looking for trace amounts. But anyway, by examining those trace amounts of minerals we can begin to construct a geologic history of rock formation in a certain area.

P. 244~245

Professor (male): If a Harvard student hadn't gotten the measles in 1834, we might never have had one of our most famous novels. I guess I'd better explain. When Richard Dana, the Harvard student I'm talking about, got the measles, it affected his eyesight. Well, in those days it was considered routine for Harvard students to go off and visit Europe. But Dana had other ideas. He somehow believed that going out on a sea voyage would help strengthen his eyes. In any event, he was never the traditional Harvard student and really never had the money to go on a tour of Europe anyway.

So he signed on board a ship to work as a common sailor. And he sailed down around Cape Horn to California on to Hawaii and then back again. The voyage took two years, and during that time, he experienced many adventures all the while writing them down in his journal. You see, his goal was to come back and write a book about the bad treatment of sailors. And so he published the book *Two Years before the Mast* in 1840. It became an instant sensation and is now considered an American classic. But this is not the book that I want to talk about today. I want to talk about someone who read the book and was influenced by it.

Today I want to talk about Herman Melville and his novel *Moby Dick*, considered by many not only one of the greatest American novels, but one of the greatest novels in the English language. Have any of you read it?

Student A (female): Well, I tried, but I kind of got tired of all the descriptions of whaling and all.

Student B (male): I read it, too, and I kind of had the same feeling. Yeah, there are some good parts, but was it really necessary to put in so much information on whaling? Maybe I just missed something.

Professor: Yeah, a lot of the story, actually the whole story, can be considered an allegory. Do you know what that means?

Student A: Isn't that the same as a metaphor? I mean, there's like a double meaning or something, right?

Professor: Well, there is a similarity. Allegories tend to be longer and more involved while metaphors are shorter. I mean a whole story or novel can be an allegory.

Student B: Yeah, but ... I still don't actually understand what an allegory is.

Professor: Yeah, I guess I did kind of skim over that. Okay so, on

the surface you have one story. Let's say you're writing about a tree and its branches, leaves, something like that. But at the same time maybe, under the surface, you're writing about, let's say, society.

Student A: But how do you know the writer's just not writing about a tree?

Professor: Well, he'll usually give you some hints, some references that show what he's doing. I mean, almost all fables are allegories that end with some moral. The moral shows the reader that the fable has actually been referring to something else all along.

Student B: So you're saying that Melville was writing about whaling on the surface, but was trying to say something more, I don't know, important under the surface. But I don't understand why he needed to hide these bigger ideas under the surface. Why not just say them directly?

Professor: Well, you're raising an interesting point, and actually it's a point that separates literature from philosophy, and sometimes the line between them blurs. Philosophy tends to present an organized system of thoughts whereas literature may make similar points without having to give any sort of organized structure to support them. But Melville also had a more practical reason for writing one story on the surface and another below the surface.

You see, Dana had stimulated not only Melville's, but the whole nation's interest in maritime adventure. Melville's first books were very similar to Dana's and were quite popular. But when he tried to write books that were more, well, thoughtful, I guess you could say they were not very well received. So he was stuck. He could write popular books with little philosophical depth, which would make his publishers happy, or he could write the more thoughtful books that he wanted to, and please few people but himself. In my opinion, *Moby Dick* was a way to try to do both in the same book. For the average reader, it gave them whaling stories. For the more thoughtful reader, there were allegory, metaphor, and symbolism.

Student A: Well, did it work?

Professor: Unfortunately, no. When the book came out, it was a complete failure.

P. 246~247

Professor (male): Assessing personality, uh, especially personality disorders, is a notoriously difficult task. Those with personality disorders or emotional problems are often quite adept at hiding their illnesses, and, uh ... they are often not very cooperative or forthcoming during the process of diagnosis. Today, we're going to talk about one of the most widely used tools in the assessment of personality disorders.

Take a look at this picture. Many of you probably recognize it, or at least you've seen pictures like it. This is the first of a series of ten pictures called Rorschach ink blots. They were developed by a Swiss psychologist Hermann Rorschach in the early 20th century. Here's how they work.

First, the psychologist shows the 10 cards to the patient **in a particular order**, asking the patient what he or she thinks each card is. Then, the patient **is asked to examine** each card in detail, and explain all the things they see in the card. Uh ... they also have to explain **what in the card** makes them see those things. Anyway, while they are doing this, the psychologist records **everything the patient says** or does.

The psychologist then analyzes the patient's responses **according to a very specific scoring system**. Uh, there's **a bunch of factors** in this, but some of the most important ones are, uh, obviously, **the patient's responses**, uh, you know what the patient sees in the cards. But just as important as **what the patient sees**, is a comparison with a control group. You see the Rorschach ink blot test has been given to thousands and thousands of people, so we have **a pretty broad data base** of what constitutes a "normal" response. One of the things that psychologists look at is **how far a patient deviates** from that "normal" response. They also look at things like what aspect of the pictures **draws the most attention** from the patient. Is it the colors, the shapes, the shading? That kind of thing.

Anyway, **the ink blot test** is a really powerful diagnostic tool. Even in cases where a patient may be trying **to hide an illness**, the underlying condition will often **come out in their answers**. For example, a person **with psychotic tendencies** may see violent images in the ink blots.

P. 248~249

Student: Hi, Professor Bennett, are you busy now?

Professor: Tom! Hi, no, come on in. **I always got time** for a good student.

Student: *(a little embarrassed)* Thanks. Uh, the other day I saw up **on the department bulletin board** that you were looking for research assistants this summer, and I wanted **to check up on that**.

Professor: Oh, OK. Well let me give you **a quick run down** of what I need, and then I'll answer any questions you have. I'll probably have **a couple for you**, too.

Student: OK.

Professor: **What I'm going to be doing** this summer is running a study **analyzing the relationship** between income, education, and voting patterns. What I need are people to help me **collect the data**.

Student: *(sounding disappointed)* Oh, so you're really only **looking for surveyors**?

Professor: Well, surveying is **part of it**. I'll probably try to get about 10 students or so to help me with that part. But I'll also need a couple students, maybe two or three, who can help me **crunch the numbers**. Uh, do you have any background **in statistical math**?

Student: I've taken Statistics 101 and 201 so far.

Professor: **That should be enough**. Who were your professors? Do

you mind if **I talk with them**?

Student: No, that's fine. I did OK **in both classes**. I had Williams for 101 and Hall for 201.

Professor: OK, the next thing would be **the scheduling**. I'm going to need people every evening for about a week **to conduct the surveys**, and I'll need the number crunchers **two afternoons a week** for pretty much the whole summer. **Is that doable** for you? Are you working this summer?

Student: I got a summer job, but it's just working for my uncle's construction company. I can pretty much **take off whenever I want**. That won't be a problem.

Professor: Great. Uh, now you know that **this is unpaid work** right? I'd like for it be paid, but my research grant **just isn't enough to cover** that.

Student: Yeah, I know there's no money. Again, I'm not really worried about that. I just thought it would **look good on my application** to grad schools.

Professor: Well, **that it will**. I just wanted to make sure you understood the situation. OK, so far everything looks like this will **work out well**. Just let me talk to your statistics professors, and then I'll give you an answer. OK?

Student: Sure, no problem. Thanks again for your time.

P. 250~251

Professor (male): **Continuing our discussion** of Western thought, we're going to talk about one of its most important elements, **the philosophy of humanism**. Uh, you know, actually, **I shouldn't say** that humanism is a philosophy. It's, uh ... well, it's more **like a philosophical undercurrent** that runs through a number of philosophies. Uh, in fact, in modern times this concept is **so pervasive** that you could accurately call it **one of the pillars** of Western thought. So what exactly is it?

Well, in **the broadest terms** humanism is the focus on human values, human abilities, human needs, and the belief **in the commonality** and equality of all mankind.

Student A (female): Professor? I got the part **about the equality of man**, but I'm kind of shaky on the first part. Could you **explain a bit more**?

Professor: Well, let's see if anyone can do that for me. Anyone?

Student B (female): Yeah, I read about **this last semester**. Like, when you say that there's a focus **on human values**, or human needs, or whatever, it means that you reject the supernatural **as a basis for thought**. So humanist thought rejects **the idea of religion**. It's like a focus on people **instead of a focus on God**.

Professor: Uh, you're basically right, but I'd be careful **of wording it** so strongly. Humanism doesn't require **an outright rejection** of religion. You're all influenced by humanist ideals, uh, **whether you realize it** or not, and yet a lot of you are probably religious. So a

philosophy centering on humanity and a belief in God are not incompatible. But Sandy's right; humanism does shift the focus of attention away from the supernatural, and centers on us as people. Uh, let's take my three statements and break them down, and you'll see what I mean.

OK, I said that humanism focuses on human values. What this means is that according to this worldview, concepts of right and wrong are not taken directly from religious doctrine. Instead, belief in the equality of each person, and his or her right to dignity and fair treatment form the basis of morality. The focus on human abilities means that we look for our own solutions to our problems rather than relying on assistance from the supernatural. So, for example, sometimes you'll hear of a person who's sick but refuses to seek treatment ... uh, they might say, "If God wants me to get better, I'll get better." So they're basically trusting in God to solve their problem. That is definitely not humanist thinking. Finally, the focus on human needs means that we are the focus of our lives. Uh, again, it's easier to understand this if we look at an idea that is not compatible with humanism. Let's say that a preacher tells people that we were put here on Earth to serve God. That's not a humanist idea. Humanists believe that we are here to serve our own needs, or in a broader context, the needs of humanity.

P. 252~253

Professor (male): Did you know that space has a temperature? Yeah, I know it's weird to think about. I mean, we think of space as this vast, cold, emptiness, but it's true ... space really does have a temperature ... about 2.7 degrees Kelvin to be exact. Uh, for those of you who don't know, Kelvin is the temperature scale frequently used by physicists. It's based on the movement of atoms. Uh, zero degrees Kelvin, or absolute zero, is the total absence of heat, in Celsius that's minus 275 degrees. So yeah, space is pretty darn cold, but it does have a measurable temperature. Today, we're going to talk about where that temperature comes from, and what it tells us about the universe.

That temperature is part of cosmic microwave background radiation, sometimes known by its initials, CMB. CMB is an ambient energy source that emits over the entire energy spectrum, from heat all the way up to microwaves, where it reaches its strongest point. It comes from the Big Bang ... uh, actually you can think of CMB as kind of the echo of the Big Bang. Hmmm ... maybe it's better if I start at the beginning. Right after the Big Bang, matter was ejected at super high temperatures, uh, billions or maybe even trillions of degrees Kelvin. At these temperatures atoms can't form. The universe was just a kind of hot soup of electrons and protons. After about 400,000 years, the temperature was down to around 3000 Kelvin, and at this point atoms began to form. Further cooling came with further expansion, until the temperature of space reached its current level of 2.7 degrees Kelvin. So CMB is literally the heat left over from the Big Bang.

So how do we know this? Well, one of the predictions of the Big Bang theory, first proposed in the 1920s and further developed in

the late 40s, was that there should be some form of background radiation left over from the Big Bang. For quite a while, not many people were very interested in looking for this background radiation because the Big Bang theory wasn't taken very seriously by a lot of people. It wasn't until the space age that interest in background radiation grew again. But it wasn't because people were interested in the Big Bang. It was ... well, you see there was some form of background radiation that was interfering with satellite communications, and scientists were interested in finding its source. Was it coming from the sun? From a nearby galaxy? Nobody really knew. So a group of scientists working for Bell Laboratories began surveying the sky to find its source. Basically, they looked for the direction from which the radiation was the strongest. Logically, that should be the direction of the source. But, uh, to their amazement ... and everyone else's too, the radiation was of uniform intensity in every direction. It existed everywhere in space. The only explanation for this was that this was the background radiation predicted by the Big Bang.

OK, on to what CMB tells us about the universe. Well, first, and most importantly, it's the best evidence we have to date that the Big Bang theory is correct. Now, that doesn't mean that the Big Bang theory is an undeniable fact ... maybe future discoveries will disprove it. But the presence of CMB, and the lack of any other way to explain it, makes the Big Bang theory the best explanation for the origin of the universe that we have to date. CMB also gives us clues as to how the first galaxies formed. That's because, uh ... because CMB isn't exactly equal in every region of space. There are parts that are slightly warmer or slightly colder. The difference isn't much, only a fraction of a degree, but it's significant. It tells us that there were, uh ... lumps in the Big Bang, uh, areas of greater density. And it's these areas of greater density that we think formed the first galaxies.

