Unit 1 Happiness

THINK AND DISCUSS
Answers will vary. Possible answers:
1. Happiness can mean different things to different people. I think true happiness is when you are surrounded by people who love you and you feel fulfilled in your life.
2. My friend Janna is someone who seems happy. She likes to laugh and be around other people. She always looks on the positive side of a situation, even when times are tough.

EXPLORE THE THEME

A Answers will vary. Possible answers:
1. Yes, I’ve been to Canada and Mexico. Most of the countries shown here are very scenic and have stunning natural views, so maybe that’s why people from these countries are generally happy.
2. Many countries have high GDPs, but then again, number 1 (Costa Rica) and number 3 (Mexico) don’t, so that can’t be the major reason for happiness. I think this suggests that there are other factors that contribute to happiness.

B provide; secure; standard of living

Reading 1

PREPARING TO READ

A 1. socialize
2. poverty (Note: Social programs are ways to help people in a community with childcare, afterschool programs, or care for the elderly, etc.)
3. access (Note: Access often appears in the phrase have access to: Many people have access to the Internet through smartphones.)
4. financial (Note: Concerned means worried.)
5. equal
6. Freedom (Note: Freedom of speech means that citizens have the right to voice their opinions.)
7. basic necessities (Note: A struggle is something that is very difficult to do.)

B Answers will vary. Possible answers:
1. my classmates and my family
2. access to healthcare, freedom
3. Yes, money is not equally distributed in my country. Some people are very wealthy, but many are very poor. The government is trying to tackle
this problem by setting a national minimum wage.

C Answers will vary. Possible answers: health, friends, an interesting job, money, family, a safe environment

D b (Note: This passage doesn’t talk about how to measure happiness or whether one country is the happiest. It discusses how different things contribute to happiness, so b is the correct answer.)

UNDERSTANDING THE READING

A a (Option b is not mentioned in the reading passage. Option c is incorrect because some people in Mexico don’t have a safe or secure life but are still happy.)

B Mexico d

Singapore b, e

Both a, c

C 1. look after

2. strict

3. decent

4. happy medium

D Answers will vary. Possible answers: I think I would prefer to live in Mexico because I wouldn’t feel comfortable in a place with very strict rules. Or I think I would prefer to live in Singapore because I think it’s very important to feel safe and secure.

DEVELOPING READING SKILLS


B Answers will vary. Possible answer: Being healthy makes people feel happier.

Video

BEFORE VIEWING

A Answers will vary. Possible answers:

They eat healthy food; they stay active; they have hobbies; they have a positive attitude; they have families that take care of them.

B 1. eat healthy foods; exercise; have a positive outlook

2. Answers will vary. Possible answers: When people are unhappy, the stress can cause them to lose sleep and not take care of themselves. This can affect their health. When people are happy, they are more likely to be healthier.

C 1. traditional lifestyle

2. centenarian (Note: The root of this word, cent, means 100. One hundred years is a century, percent is a number divided by 100, and 100 cents make a U.S. dollar.)

3. processed food
WHILE VIEWING
A c (Note: The narrator in the video talks about an aging population, but he doesn’t mention a struggle (option a). Happiness (option b) is not mentioned as the most important factor. Both medicine and lifestyle choices are mentioned, so c is the correct answer.)
B 1. People are living longer.
2. Answers will vary. Possible answers: whales—200 + years; giant tortoises—150 + years; elephants—up to 70 years
3. Answers will vary. Possible answers: They stay active, have hobbies, eat locally grown food, have access to good medical care, and keep their friends and family close.
4. They eat more processed foods and may be less active.

AFTER VIEWING
Answer will vary. Possible answers:
A 1. There are many elderly people in my community. I think this is because we have very good medical care here and a healthy environment.
2. I think this means that some people think of aging as a bad thing, so scientists are trying to find ways to prevent or delay the effects of aging.
B Singapore; they have access to good medical care. Mexico; they have the support of their families.

Reading 2
PREPARING TO READ
A 1. long-term
2. communities; support
3. well-being
4. volunteered; grateful
5. mood; factors
B Answers will vary. Possible answers:
1. My community is very safe and clean, but people don’t talk to their neighbors so it can be lonely if you don’t already have friends.
2. fun friends; exercise; shopping; vacations
C Answers will vary. Possible answers:
Stay Connected—family; friends; Skype.
Keep Active—exercise; walk; sports.
Buy Less—recycle; reuse; save money.
Give Away—donate; volunteer; help others.

UNDERSTANDING THE READING
A b (Note: The answer, b, is found in the first paragraph. Option a is incorrect because the passage is not about different types of people, and option c is incorrect because the author doesn’t say that forming social connections is the
most important factor.)

B 1, 2, 4, and 6 (Note: Scenario 1 is an example of buying less; Scenario 2 is an example of keeping active; Scenario 4 is an example of giving away; and Scenario 6 is an example of staying connected.)

C 1. confident
2. money
3. better
4. less

D Answers will vary. Possible answers:
1. Stay Connected—I can invite friends to dinner once a week, and try to see relatives who live far away as often as possible.
2. Give Away—I can donate clothes that I don’t wear anymore to local charities. Maybe I can even volunteer at the charity thrift store.
3. Buy Less—if I go to the mall less often, I won’t buy as much. Maybe I can meet my friends at a museum or in a park instead of at the shopping mall.

Writing

EXPLORING WRITTEN ENGLISH

LANGUAGE FOR WRITING
B 1. are
2. work
3. offers
4. live
5. go
6. have
7. is
8. cycle
9. reports

C 1. spend
2. are; offers
3. provides; has (Note: Everyone and no one take the third-person singular.)
4. don’t feel; aren’t
5. have; grow; eat

D Answers will vary. Possible answers:
1. I exercise three times a week.
2. I spend time with my family and friends every weekend.
3. I study English every day.

E Answers will vary. Possible answers:
1. My community includes people of over 15 different nationalities.
2. Our government offers tax breaks to parents of young children.
3. My country is a democracy.
**WRITING SKILL**

F 1. In Mexico, family is important.
2. Studies have shown that laughter may be an important factor for happiness and that people who laugh a lot are happier. (Note: This is an example of a strong topic sentence.)
3. It’s important to like your job.

G Answers will vary. Possible answers:
1. In Mexico, close support from family members is an important factor in being happy.
2. Because we spend most of our daily lives at work, having a job that we enjoy can increase our happiness.

**WRITING TASK**

A Answers will vary. Possible answers:
Things people in my community are happy about: safe neighborhoods; green spaces; good schools
Things people in my community are unhappy about: not enough jobs; not enough public transportation; high taxes

B Answers will vary. Possible answers:
Topic Sentence: People in my community are generally happy.
Reason 1: green spaces
Detail(s): three parks in the middle of the city; people go there to relax, enjoy nature, jog, meet friends, walk their dogs

**REVISING PRACTICE**

d, a, c, b

**EDITING PRACTICE**

1. I enjoy the work that I do because it’s very challenging, but I don’t like my boss.
2. My co-workers are supportive, friendly, and fun, and I enjoy spending time with them after work.
3. It’s important to me to spend time with my family members, but it’s difficult because they don’t live close to me.
4. Although my house is not big and fancy, my neighborhood is very safe.
5. My friends and I exercise together every day to stay healthy, and that contributes to our happiness.
6. My grandfather is still very active and spends a lot of time outdoors. (Note: Here, two verbs, is and spends, have the same subject—grandfather.)
7. Most happy people have hobbies like hiking or playing a musical instrument.
Unit 2 Inventive Solutions

THINK AND DISCUSS
Answers will vary. Possible answers:
1. Alexander Graham Bell; he invented the telephone.
2. train; pencil; chalkboard

EXPLORE THE THEME
A Answers will vary. Possible answers:
1. I agree that these are important inventions. I’d add the lightbulb, the airplane, and the ballpoint pen.
2. Six of the inventions were developed within the last 200 years (comparatively recently). I think this is because some of them build on each other. For example, the personal computer, the World Wide Web, and the smartphone are connected and all of them need electricity to work.

B design efficient equipment

Reading 1

PREPARING TO READ

B Answers will vary. Possible answers:
1. Yes; baking cakes 2. sun, wind, nuclear energy, coal, natural gas, water, and thermal

C Answers will vary. Possible answers:
1. cell phone charger 2. lights 3. microwave 4. ceiling fans 5. refrigerator 6. alarm clock

D b (Note: Based on the first paragraph, the answer could be option a, but after looking at the pictures and captions, the correct answer is option b.)

UNDERSTANDING THE READING
A c (Note: Although the article has advice for inventors and is about windmills, the main idea is that William brought electricity to his community.)

B Wording of answers will vary. Correct answers:
1. There was a drought. (Paragraph B)
2. People laughed at his idea and didn’t believe he could do it. (Paragraph D)
3. People used it to get power for their cell phones. (Paragraph E)

C Wording of answers will vary. Correct answers:
Problems:
He couldn’t buy the equipment he needed. (Paragraph D)
Solutions (from left to right):
He went to the library. (Paragraph C)
He looked at the pictures in the book. (Paragraph C)
William built a second windmill to bring water up from underground. (Paragraph E)
William taught other people how to build windmills and created a website. (Paragraphs E and F)

D Answers will vary. Possible answer: He could have looked for a part-time job to earn some money for school fees.

DEVELOPING READING SKILLS
A Answers will vary. Possible answers:
Main Idea: Nils Bohlin invented a new type of seat belt that is in most cars today and has saved many lives.
Detail 1: Before Bohlin’s invention, seat belts were buckled across the stomach.
Detail 2: The buckles often caused injuries during high-speed accidents.
Detail 3: Bohlin’s seat belt has one strap across the chest and one across the hips, with a buckle at the side.

B Answers will vary. Possible answers:
They have to cook over open fires and collect water from wells or streams. (Note: This is an example of what life is like without electricity or running water.)
There was a severe drought, and most families—including William’s—couldn’t grow enough food. (Note: This is the reason why life became more difficult.)
He found a science book there called Using Energy. (Note: This is what the library book was called.)

Video
BEFORE VIEWING
A Answers will vary. Possible answers:
It’s good for the environment, and it won’t run out.
B 1. There is a lot of it (enough to fulfill all the world’s power needs many times over).
2. Answers will vary. Possible answers: solar hot water panels and solar electric panels; solar hot water panels, because they are cheaper and easier to make.

C 1. cut down on
2. go green
3. no-brainer
4. dweller

WHILE VIEWING
A 1, 3
B Answers will vary. Possible answers:
1. local community materials, recycled materials, and some garbage
2. Cairo gets a lot of sunshine.
3. Dust from the nearby desert gets on the panels. A simple solution is to wipe the dust away. (Note: Dust is the term for small particles of earth and other materials that form a powder.)

AFTER VIEWING
A 1. Answers will vary. Possible answer: Yes, they would work well in my country because we have hot weather and sunshine all year round.
2. garbage; treasure. This saying means that some people can use things that other people think are worthless.
B Answers will vary. Possible answers:
Both inventions use renewable energy; they are inexpensive; they are made from recycled materials; the community had to be convinced that the invention would work.

Reading 2
PREPARING TO READ
A 1. indicates (Note: Global demand means the number of people in the world who want to buy or use something.)
2. benefit (Note: Renewable energy sources can be replaced by natural processes, so the supply can’t be used up.)
3. innovations
4. valuable
5. store
6. identify
7. device
8. containers
B Answers will vary. Possible answers:
1. vaccines; artificial limbs; diabetes tests
2. smartphone; headphone; microwave
C Answers will vary. Possible answers:
Infant warmer: to help underweight babies stay
warm
Water container: to make it easier for people to carry water long distances
Health detector: to help doctors in rural places do medical tests

UNDERSTANDING THE READING
A Embrace Infant Warmer: a (See Paragraph C.)
Q Drum: b (See Paragraph E.)
Health Detector: a (See Paragraph G.)
B 1. less than 5.5 pounds (2.5 kilograms)
2. People in developing countries usually have to carry heavy containers of water on their heads.
3. paper; it’s light and easy to carry, so health workers can easily bring it with them to perform tests in patients’ homes.
4. Answers will vary. Possible answers:
   They are inexpensive; they help people in developing countries; they are easy to use; they can work without electricity.
C Answers will vary. Possible answer:
   I’d choose the solar-powered water heater, because it’s very easy to make, it will help keep many people healthy and warm, and it’s good for the environment.

Writing
EXPLORING WRITTEN ENGLISH
A 1. was; became
2. didn’t know; wasn’t; was
3. changed; improved
4. invented
5. came

LANGUAGE FOR WRITING
B 1. was
2. built; didn’t believe
3. taught
4. invented; created; allowed
5. made; gave

C Answers will vary. Possible answers:
1. Before the invention of the motor car, people traveled by horse and carriage.
2. Before the invention of the telephone, people wrote more letters.
3. Before the invention of the smartphone, people socialized with their friends more in person.
4. Before the invention of the freezer, people didn’t store ice cream in their homes.

WRITING SKILL
D 1. D; 2. D; 3. SI; 4. SI; 5. D; 6. SI
E 3, 1, 6, 2, 4, 5
Solar lanterns are better than kerosene lamps for
bringing light to people in developing countries for three main reasons. First of all, solar-powered lanterns are more efficient than kerosene lamps. For example, they produce 50 times more light than kerosene lamps. Another benefit of solar-powered lanterns is that they are good for the environment. They use solar energy, which is a renewable source of power. Finally, solar lanterns are better for our health. The smoke from kerosene lamps can cause lung damage, but solar-powered lanterns don’t use any dangerous chemicals.

WRITING TASK
A Answers will vary. Possible answers:
ballpoint pens; washing machines; dishwashers; the wheel; the printing press

B Answers will vary. Possible answers:
Topic Sentence: Antibiotics dramatically changed human health.
Supporting Idea 1: In the past, many people died from infections—now cured by antibiotics.
Detail(s): Illnesses such as strep throat or bronchitis – often deadly.
Supporting Idea 2: Even if people didn’t die from illnesses, it took them much longer to recover.
Detail(s): Children often missed months of school. With antibiotics, they usually return to school after 24 hours.

REVISING PRACTICE
C, D, A, B

EDITING PRACTICE
1. William Kamkwamba built a windmill using parts he found in junkyards.
2. The people in William Kamkwamba’s village weren’t confident about his plan.
3. Before Nils Bohlin’s invention, most cars had seat belts that were buckled across the stomach.
4. The first car didn’t go very fast.
5. Orville Wright made the first powered airplane flight in 1903.
6. Alexander Graham Bell, inventor of the telephone, started the Bell Telephone Company in 1877.
7. Ts’ai Lun invented paper in the first century A.D., but it wasn’t widely available until many years later. (Note: “… but it didn’t become widely available …” is also correct.)
Unit 3 Connected Lives

THINK AND DISCUSS
Answers will vary. Possible answers:
1. email; use social media; research travel destinations; shop; do homework
2. Yes: We can communicate with people around the world; we can work any time, any place; we can search quickly for information. No: There is less face-to-face communication; people don’t “unplug” (have time off from electronics); people rely on the Internet for information instead of thinking for themselves.

EXPLORE THE THEME
A 1. Google, YouTube, Facebook; Google, a search engine, is the most popular.
2. Answers will vary. Possible answers: Google, Facebook; other popular websites: Snapchat, Instagram, Buzzfeed, Weibo

B search; launch; log in

Reading 1
PREPARING TO READ
A 1. participant (Note: A participant is a person. The action is participation.)
2. investigate
3. Accurate (Note: A synonym for accurate is precise.)
4. collaborate
5. contribution
6. potential
7. feature

B Answers will vary. Possible answers:
1. I log in to social media sites at least once a day. My favorite sites are Facebook and Instagram.
2. Social media helps connect people all over the world. During disasters, social media provides access to relevant and timely information. For example, weather agencies used Twitter to post frequent updates on the path of Hurricane Irma as it approached Florida. After the storm, Florida residents used Facebook and Twitter to reassure family and friends that they were safe.

C Answers will vary. Possible answers: to do group projects for school; to start or join an online petition; to raise money for a project (crowdfunding)

D b (Explanation: Option a is untrue because not everyone involved is an archaeologist. Option c is too specific to be the main idea.)
UNDERSTANDING THE READING

A b
B 1. Mongolia (See Paragraphs B and C.)
2. Genghis Khan (See Paragraphs B.)
3. unusual (See Paragraph D.)
4. Peru (See Paragraph F.)
5. looters (See Paragraph F.)
6. illegal construction (See Paragraph F.)
C 1. b; 2. b; 3. a
D Answers will vary. Possible answers: I’d prefer to join Lin’s project because I’m fascinated by Genghis Khan. OR I’d prefer to join Parcak’s project because I would like to help protect these important sites from looters.

DEVELOPING READING SKILLS

A Participants first watch online videos that teach them how to identify certain features on satellite images. Then they study and flag satellite images on their own. Once enough volunteers say that they see the same thing, ...
... Parcak and her team will check for themselves ...
... before passing the information along to archaeologists on the ground. The “players” receive a score based on how accurate they are.
B 1. online videos
2. flag
3. see the same thing
4. check
5. archaeologists
6. accurate

Video

BEFORE VIEWING

A Answers will vary. Possible answers: because they want to help solve the mystery and be part of history; because Genghis Khan was a powerful leader
B Answers will vary. Possible answers:
1. because he launched violent military campaigns against his enemies
2. a. He devised a system of laws and regulations. b. He allowed freedom of religion.
C 1. tag
2. figure out
3. upload

WHILE VIEWING

A a (Note: This option provides the most complete...
**Pathways 2 • Reading, Writing, and Critical Thinking • Answer Key**

**B Answers will vary. Possible answers:**
1. straight lines
2. It’s too old.
3. Because if citizen scientists can find this tomb, they can probably find other tombs, too.

**AFTER VIEWING**

**A Answers will vary. Possible answers:** Why do you want to find the tomb? What were some challenges you faced in Mongolia? What do Mongolians think about this project? What would you say to Genghis Khan if you could meet him?

**B Answers will vary. Possible answer:** I think Lin means that computers can’t make inferences or notice when things don’t look natural, as people can. In the video, he says that straight lines usually indicate that something is man-made, and he mentions that many citizen scientists tagged an unusual rectangle shape on the satellite map.

**Reading 2**

**PREPARING TO READ**

**A 1. advertise**
2. environmentally
3. tool
4. virtual
5. voting
6. remote
7. global
8. tribe

**B Answers will vary. Possible answers:**
1. The most remote place I have been to is a small fishing village in Iceland. I liked it a lot. The scenery was breathtaking!
2. When I socialize with friends, I generally prefer face-to-face communication.

**Virtual communication**

Advantages: You can communicate with people from all around the world; you can complete other tasks (e.g., read and reply to emails) while chatting with someone online; you can save online conversations and keep a record of them, in case you wish to read them again later on.

Disadvantages: You can’t see people’s faces online or hear their tone of voice, so it’s easy to misunderstand other people’s remarks; if you multitask while chatting with someone online, you can’t give them your full attention; the person on the other end of the chat may not be who they say they are (safety concerns).

**Face-to-face communication**

National Geographic Learning
Advantages: It’s more direct and quicker; you can read other people’s body language when you talk to them and avoid misunderstandings; it encourages deeper, more meaningful relationships. Disadvantages: Shy people find this kind of communication difficult and may be afraid to speak up; you don’t have as much time to consider your reply; most people don’t record face-to-face conversations with friends, so it can be easy to forget what was said.

C Answers will vary. Possible answer: I think the passage is titled “Internet Island” because the idea for Tribewanted.com came from social networking websites. Also, Tui Mali advertised his island online, and the people who worked with the local tribe members were brought together through the Internet.

UNDERSTANDING THE READING
A a, b, e
B 1. Vorovoro (See paragraph C.)
   2. 2006 (See paragraph E.)
   3. $53,000 (See paragraph D.)
   4. Tribewanted.com (See paragraph C.)
   5. email (See paragraph A.)
   6. Bali (See paragraph H.)
   7. local (See paragraph F.)
C From left to right: 5, 4, 1, 3, 2, 7, 6
D Answers will vary. Possible answers:
   1. I think the people who join Tribewanted are adventurous and like to travel. They want to help protect the environment and make a positive contribution to other people’s lives. They are likely to be more interested in work that they enjoy doing and find fulfilling, and are less motivated by money. They also probably like being around a diverse group of people.
   2. I think Tui Mali and his tribe members have become more aware of different cultures and feel more connected with the rest of the world now. Although their island has become more modern, they probably still maintain some important aspects of their traditional culture. (See paragraphs F and G.)

Writing
EXPLORING WRITTEN ENGLISH
A b

LANGUAGE FOR WRITING
B 1. has made (Note: The proper noun Facebook is a singular entity, so we use has instead of have.)
   2. have changed
3. have met
4. have contributed
5. has formed
6. has expanded

C Answers will vary. Possible answers:
1. I have kept in touch with old classmates through Facebook.
2. I have booked hotels and flights using travel websites.
3. My teacher has shown us interesting articles online that are related to the topics in our textbook.

WRITING SKILL

D 1. R (See page 49.)
2. P (See page 53, Paragraph A.)
3. O (See page 53, Paragraph B.)

E Answers will vary. Possible answers:
1. More face-to-face contact with your loved ones will make you feel happier.
2. In summary, reading the news online has many advantages over getting the news from other sources.

WRITING TASK

A Answers will vary. Possible answers: Tribewanted:
founders = Ben Keene and Mark James; 2006—
project started; learned about a project to help develop an island in Fiji; environmentally friendly volunteers; very successful

B Answers will vary. Possible answers:
Topic Sentence: Members of Tribewanted.com have collaborated to create virtual and real-life communities all over the world.
Purpose: to get members to meet and work together to help a community in need
How it works: People sign up online; members go to the island and work with the local people.
What it has accomplished so far: planted crops; set up environmentally friendly power sources on the island; expanded to other locations
Concluding Sentence: The website has successfully brought together people from very different cultures to form a real-world tribe.

REVISING PRACTICE
b, a, d, c

EDITING PRACTICE
1. The Internet has been in existence for several decades now, but we are still discovering creative ways to use it.
2. Now that it’s so easy to share videos, millions of people have posted videos online.
3. Even though I have seen that video a few times, I still find it very funny.
4. Social networks like Facebook and Twitter have changed the way we get our news.
5. The Internet has allowed people to share information and collaborate on projects.
6. Sarah Parcak has spent the last several years using satellite images to identify important archaeological sites.
7. Participants in the Galaxy Zoo project have helped scientists discover new types of galaxies (star systems) in our universe.
Unit 4 Saving our Seas

THINK AND DISCUSS
Answers will vary. Possible answers:
1. The Atlantic Ocean is close to my home. I see it every day, because my house is on the coast.
2. I don’t eat seafood. There isn’t a good reason why I don’t eat it. I just don’t like the taste!

EXPLORE THE THEME
A 1. The map shows the impact that humans have had on the world’s oceans. The colors indicate the level of impact of human activity (ranging from very high to very low).
2. Answers will vary. Possible answers: Fish are disappearing; there are “dead zones” without enough oxygen; water becomes more acidic. Other problems include rising water temperatures and overfishing.
B commercial
survive
species (Note: The word species is used for both the singular and plural forms. There can be one species or three species.)

Reading 1
PREPARING TO READ
A 1. reduce
2. restore
3. estimate (Note: This is the same word for the verb or the noun.)
4. diverse
5. stable
6. quantity
7. doubled
B Answers will vary. Possible answers:
1. Fish need water, oxygen, the correct temperature, and food—either plants or other animals. Humans need water, oxygen, food, shelter, and sleep.
2. dolphins, seals, octopi, squid, mussels, whales
3. by recycling, taking public transportation, using renewable energy, and not littering
C 1, 3, 6

UNDERSTANDING THE READING
A Source of the Problem: b (Explanation: Option a is false.)
Rise of the Little Fish: b (Explanation: Option a is false.)
A Future for Fish?: a (Explanation: Option b is not mentioned.)
B 1. dropped
2. too few
3. increased
4. Too many
C Answers will vary. Possible answers:
1. Commercial fishing companies shouldn’t catch so many large fish.
2. Develop fish farming (aquaculture).
3. Don’t eat overfished species; eat farmed fish instead.
D 1. In 2010, the Census of Marine Life estimated that 90% of the big ocean fish populations are gone. Small fish (e.g., sardines and anchovies) have more than doubled in number. If we continue to overfish the oceans, scientists predict that most of the fish that we catch now will disappear by 2050.
2. Answers will vary. Possible answers:
I think this argument would be more convincing if the writer provided more statistics—e.g., the amount of fish currently produced through aquaculture, the amount of fish caught per week through commercial fishing, the population of bluefin tuna today.

DEVELOPING READING SKILLS
A 1. The graph shows the historical annual catch of Pacific bluefin tuna by country from 1952 to 2012. The colors represent countries that catch the fish.
2. Japan and the United States
3. approximately 15,000 metric tons
4. lowest—1990; highest—1956
B 1. The North Sea and the East China Sea
2. Antarctica and the North Pole / the North and South Poles

Video
BEFORE VIEWING
A 1. They are big and can swim very fast.
2. People like to eat bluefin tuna as sushi or sashimi.
3. Answers will vary. Possible answers: breed more bluefin tuna on fish farms; put a quota on the number of bluefin tuna caught in the sea; stop eating bluefin tuna.
B 1. hatchling (Note: The verb hatch describes the process of emerging from an egg. Baby birds and turtles are also called hatchlings.)
2. captivity
3. breed

WHILE VIEWING
A a
**AFTER VIEWING**

A Answers will vary. Possible answers:
1. The Pacific bluefin population in 2012 was about the same as the population in the early 1970s. This is different from the Atlantic bluefin because in the 1970s, the Atlantic bluefin tuna population was much higher.
2. The Pacific bluefin population in 2012 was about one-fifth the size of the population in the early 1960s.

**PREPARING TO READ**

A 1. individuals (Note: Using the word *individuals* as a plural noun means that there are many individuals who are recognized as different people, not as one large group.)
2. declining; definitely
3. essential (Note: If something *dies out*, it means that the species has become extinct.)
4. informed
5. severe
6. impact
7. rely on

B Answers will vary. Possible answers:
1. clean air; protected areas for wildlife; balanced ecosystems
2. I read articles, listen to lectures, and watch nature shows.
3. rising sea levels; unstable weather patterns

C Answers will vary. Possible answers:
raise awareness about overfishing; donate to charities that protect the oceans; help clean up beaches; make informed choices about seafood; eat farmed fish

**UNDERSTANDING THE READING**

A c (Explanation: Seaver says that people can continue to eat seafood, so option a is wrong. Although he says that the ocean provides an important part of our diet, this is not his main message, so option b is not the correct answer. Seaver wants people to think about their seafood choices, so the correct answer is option c.)

B 1. Y (Paragraph B)
2. N (Paragraph B)
3. NG
4. Y (Paragraph C)
5. NG
6. N (Paragraph D)
7. Y (Paragraph E)

C 1. Answers will vary. Possible answers: Atlantic bluefin tuna; orange roughy; Atlantic salmon
2. carnivores
3. an animal that eats plants
4. anchovies
5. Answers will vary. Possible answers: Alaska pollock; Atlantic herring
6. because they make their own food and produce all the oxygen in the ocean (Note: The answer to this question is not in the illustration. It’s in Paragraph F.)

D Answers will vary. Possible answers:
Fish that are OK to eat: Alaska pollock; Atlantic herring; Japanese flying squid; American lobster; anchovies
Fish we should avoid: Atlantic bluefin tuna; orange roughy; Atlantic salmon

E Answers will vary. Possible answers:
This unit has definitely made me think about my eating choices. I’ll try to eat more farmed fish from now on to protect the ocean’s ecosystem.

Writing
EXPLORING WRITTEN ENGLISH
A 1. DT
2. UT
3. NC
4. UT
5. DT

LANGUAGE FOR WRITING
B 1. increased
2. doubled
3. remained stable

C Answers will vary. Possible answers:
1. In the early 1960s, the Pacific bluefin population peaked at approximately 140,000 metric tons.
2. Between 1961 and 1974, the Pacific bluefin tuna population decreased dramatically.
3. As the graph shows, the Pacific bluefin population rose to almost 50,000 metric tons by 1992.

WRITING SKILL
D 1, 2, 5

E 3. In 2005, total bluefin production was almost 90,000 metric tons; by 2009, that number had fallen to about 60,000.
4. According to the graph, total production of
bluefin tuna decreased steadily between 2005 and 2009.

The graph shows global production for each species of bluefin tuna in metric tons per year. According to the graph, total production of bluefin tuna decreased steadily between 2005 and 2009. In 2005, total bluefin production was almost 90,000 metric tons; by 2009, that number had fallen to about 60,000. As for production level by species, both Atlantic and Pacific bluefin tuna showed some variation between 2005 and 2009. However, production of Southern bluefin tuna remained more or less stable.

WRITING TASK

Answers will vary. Possible answers:
Main idea: Housing prices have increased in every neighborhood in the city.
Detail: Housing prices in Jamaica Plain and the North End doubled between 2010 and 2014.
Most recent piece of data: Housing prices in Roxbury increased by 60% in the 7-year period.

REVISING PRACTICE
d, c, a, b

EDITING PRACTICE
1. As we can see from the graph, global aquaculture production of Atlantic salmon was stable between 1950 and 1980.
5. Production of Atlantic salmon decreased slightly in 2009.
Unit 5 The Travel Business

THINK AND DISCUSS
Answers will vary. Possible answers:
1. My earliest memory is my mother picking me up from my crib when I was about 3 years old.
2. I think some people have better memories because they focus more on what they are doing. But some people are better at remembering pictures, while others are better at remembering facts.

EXPLORE THE THEME
A Answers will vary.
B Answers will vary. Possible answers: According to the graph, memory declines with age. Verbal recall actually increases slightly from the age of 16 to 32, but then declines steadily after that. Visual recall drops approximately 30 percent from the age of 48 to 80.
C technique; gradually; complex

Reading 1
PREPARING TO READ
A 1. familiar; 2. text; 3. internal; 4. external;
5. visualize; 6. memorize; 7. achievement
B Answers will vary. Possible answers:
1. My kitchen is a place that is very familiar to me. It’s a big room with a large wooden table and a green and white floor.
2. I find it difficult to study when people are talking on the phone or watching TV. I also find it difficult to study if the room is messy. I need a clean space to study well.
C Answers will vary. Possible answers:
Things I make lists for: food shopping; household chores; homework assignment due dates
Things I try to memorize: irregular verbs; history dates; passwords; locker combinations
D Answers will vary. Possible answers: technique, loci, visualize, remember

UNDERSTANDING THE READING
A b (Explanation: The passage discusses memorization techniques from the past until now.)
B 1. Answers will vary. Possible answers: The loci method is a way to remember things by visualizing them in different areas of a place that you know well. (See paragraphs B and C.)
2. He was able to memorize religious texts, poems, speeches, etc., and could take them everywhere he went, in his mind. (See paragraph D.)
3. because most people didn’t have books or pens to write notes with, so they had to remember things to preserve their society’s cultural heritage (See paragraph E.)
4. memorizing religious texts or myths and folktales (See paragraph F.)

C 1. I; 2. E; 3. E; 4. I; 5. E
D Answers will vary. Possible answers:
1. I’d separate the words by topic and visualize them around my kitchen. Words about memory could be in my refrigerator. Words about oceans could be near my stove because I cook fish!
2. I’d picture my bedroom and create different areas for one name and one date. For example, 1066 is the date that William the Conqueror conquered England. I would visualize William by my desk, writing 1066.

E Answers will vary. Possible answers: Yes, I think we have lost an important skill. For example, we don’t have to remember phone numbers now because we can store them in our phones. If we lose the phone, we may lose all the phone numbers, too.

DEVELOPING READING SKILLS
A Five cause-effect relationships:
People often use mnemonics—like poems or pictures—because it’s easier to remember rhymes or images than plain facts and lists.
... it may be hard to remember the colors of the rainbow in the order that they appear. Someone therefore made an acronym for this: ROY G BIV. The name Roy G. Biv is meaningless, but it’s short, so it’s easier to remember than the list.
English spelling rules can also be difficult to learn, so some students use rhymes to help them remember the rules. By learning “i before e except after c (where you hear ee),” students of English can remember the spelling of words like niece and receipt.

B Answers will vary. Possible answers:
By using the loci method, he was able to “read” books stored in his memory palaces. (Paragraph D)
A person with a good memory was special because they could help preserve the society’s cultural heritage. (Paragraph E)
We’ve invented devices so we don’t have to store information in our brains. (Paragraph G)

Video
BEFORE VIEWING
A 1. Answers will vary. Correct answer: 18.65 seconds
2. Answers will vary. Possible answer: They could connect the cards with objects around a living room and attach the same number and suit of each card to that object. For example, a mirror on the wall could have 8 hearts on the frame, and it would be the 8 of hearts.

B
1. mental map
2. associated
3. code

WHILE VIEWING
A Step 1: b; Step 2: a; Step 3: e
B 1. girlfriend’s
2. sword
3. dancing
4. boss

AFTER VIEWING
A Answers will vary. Possible answer: Strange or unusual images are more memorable, so they are easier to recall. These images may seem strange to us, but they all have meaning for Dellis. These images are very personal to him based on his life experiences.
B Answers will vary. Possible answer: I’d use a method of association. As I meet each person, I’d try to find an unusual feature—ears, forehead, eyebrows, eyes, nose, mouth, etc. Then I would form an association between this characteristic and the person’s name.

Reading 2
PREPARING TO READ
A 1. drug
2. mental
3. proof
4. state (Note: In this context, the noun state is often followed by “of + noun.” Examples: in a state of excitement, confusion, exhaustion)
5. stress
6. physical
7. transferring (Note: Transfer can be a noun or a verb. Here, it is used as a verb.)
8. routes (Note: This word is related to the word routine.)
B Answers will vary. Possible answers:
1. I like a lot of physical activities. I enjoy cycling, swimming, and skiing. I find these activities fun and challenging.
2. My route from school to home is easy to remember. Routes that are harder to memorize are ones that I don’t use often, like the route to
my friend’s house in the countryside. It’s also hard
to remember this route because there aren’t a lot
of landmarks along the way.

C Answers will vary. Possible answers:
Underlined words: sleep; memory; stages; brain;
lifelong
I think the reading passage is about how stages
of sleep help the brain store long-term memories.

UNDERSTANDING THE READING
A 1; 2; 4
(Note: Option 3 is incorrect; long-term memories
are stored in the neocortex. Option 5 is incorrect;
the rats couldn’t remember the route because
they were given a drug that stopped brain-wave
activity.)
B 1. hippocampus (Note: Paragraph C; this is implied,
though not explicitly stated.)
2. non-REM (Note: In the flow chart, the step after
this is “The brain creates sharp wave ripples ...” As
mentioned in paragraph C, this occurs during the
deepest level of sleep, so Non-REM Stage 3 is the
correct answer here.)
3. hippocampus
4. neocortex

C Answers will vary. Possible answers:
Causes: One group of rats was given a drug that
stopped brain-wave activity; the Rutgers study.
Effects: This improves memory.

D Answers will vary. Possible answers:
acronyms; rhymes; loci method; avoiding stress;
playing games

Writing

EXPLORING WRITTEN ENGLISH
A 1. C
2. E (Note: Remind students of ROY G BIV in exercise
A on page 88.)
3. E
4. E
5. C (Note: Having self-esteem means that you feel
good about yourself.)
6. E

LANGUAGE FOR WRITING
B 1. By getting a good night’s sleep, you help your
brain form long-term memories.
2. You can memorize the order of a deck of cards by
using the loci method.
3. The scientists stopped the rats’ brain waves by
giving them a drug.
4. By making a shopping list, you can remember
what items you need to buy.
C **Answers will vary. Possible answers:**
1. I try to relieve stress by listening to good music.
2. By meditating every morning, I start my day in a relaxed way.
3. By planning all my meals for the day in the morning, I can avoid eating junk food.

**WRITING SKILL**

D a, c, d, e, f, h, i

E g, j, b

F **Answers will vary. Possible answers:**
- You can also memorize a route by creating a mental picture of it. (Note: Sentence f)
- By visualizing the route, you will learn it faster. (Note: Sentence i)
- Many people use driving apps nowadays, so they don’t need to memorize a route. (Note: Sentence b)

**WRITING TASK**

A **Answers will vary. Possible answers:** stop multitasking and concentrate on one task at a time; take naps; take regular breaks from technology; meditate; try new and challenging tasks

B **Answers will vary. Possible answers:**
- **Topic Sentence:** There are many different ways to improve memory, including using the loci method, using acronyms, and getting enough sleep.
- **Supporting Idea 1: loci method (memory palace)**
  - Details: USA Memory champion organizes a deck of cards
- **Supporting Idea 2: acronyms**
  - Details: ROY G BIV (rainbow)
- **Supporting Idea 3: getting enough sleep**
  - Details: brain-wave activity—long-term memory

**REVISING PRACTICE**

b, a, a, d, c

**EDITING PRACTICE**

1. You can’t remember all of the information in a lecture just by listening to it.
2. By taking notes while you **listen**, you can remember information better.
3. By **writing** a summary of your notes after a lecture, you will remember the information more easily.
4. By taking notes and **making** lists, you transfer information from internal to external memory. (Explanation: Both take and make should be in the gerund form. They both are part of the by + gerund phrase.)
5. One study shows that by getting a good night’s sleep, people remember a skill (such as playing the piano) 30 percent better.
6. You can improve your memory by eating a healthy diet and **exercising** regularly.