THINK AND DISCUSS
Answers will vary. Possible answers:
1. Humans have developed a lot of the planet’s land and used its resources. With the rapid increase in this activity of humans over the last century, the planet’s climate has changed.
2. Although human activity has had many negative impacts—such as causing pollution, using up the Earth’s resources, and contributing to climate change—in modern times, people are also working hard to make a positive impact by helping to protect the environment, clean the oceans, and preserve wildlife.

EXPLORE THE THEME
A 1. deforestation, desertification, pollution, cities
2. The eastern part of North America, much of northern Europe, and Southeast Asia have experienced significant deforestation. Desertification is seen most in the Middle East; northern, southern and central parts of Africa; the southern part of India; Australia; the northwest section of North America; and the eastern part of South America. Pollution is especially evident on the coastlines and on major shipping routes.
3. Air pollution is caused by industrial plants and expanding urban areas. Deforestation is caused by trees being cut down for fuel and farming. Desertification is caused by overuse of land by farmers and herders.
B atmosphere; fertilizer; erosion

Reading 1
PREPARING TO READ
A 1. dramatic
2. devoted to
3. eliminate
4. perspective
5. profound
6. consequence
B 1. criteria
2. concept
3. essentially, transform
4. satisfy
5. current  
C Answers will vary. Possible answers:
1. Humans have used up the planet’s resources and developed its land.
2. I think the most dramatic consequence might be climate change.
3. Some current efforts to deal with these consequences include attempts to reduce pollution and deforestation.

D Answers will vary. Possible answers:
We know about plants and animals because of fossils that have been found and studied. These fossils have helped us understand what used to be living on Earth. We can also study rock layers and deposits to learn about how the land on Earth has transformed.

E Answers will vary. Actual answers:
1. b
2. b
3. c

UNDERSTANDING THE READING

A 1. epoch
2. Answers will vary. Possible answer: Anthropocene refers to the current time period, during which humans are having a major impact on the natural environments of the planet.
3. cities, farming, deforestation, composition of the atmosphere

B How We Are Changing the Planet: Before

Paragraph G
Tracing the Origins of the Anthropocene: Before

Paragraph L
A New Perspective on Earth’s History: Before

Paragraph A
C 1. in the 1870s; the Anthropozoic; other scientists found the idea unscientific (Paragraph C)
2. because the human impact on the world is more obvious now than it was in Stoppani’s time (Paragraph C)
3. Deforestation increases sedimentation through erosion, and habitat loss leads to the extinction of species. (Paragraph I)
4. As temperatures increase, some plants and animals are shifting their ranges to the Poles. Others are expected to become extinct due to climate change. Sea levels may rise up to 20 feet or more. (Paragraph J)

D 1. man-made materials / steel, glass, concrete, brick (Paragraph G)
2. erosion (Paragraph G)
3. 38 (Paragraph H)
4. yes (Paragraph H)
5. pollen (Paragraph H)
6. cutting down / leveling (Paragraph I)
7. extinctions (Paragraph I)
8. change in composition of (Paragraph J)
9. the fossil record; oceans (Paragraphs J and K)

E 1. Era: Cenozoic
   Period: Quaternary
   Epoch: Holocene or Anthropocene
2. The Cenozoic Era started 65 million years ago.
3. Epochs are determined based on changes in sedimentary rock.

F Answers may vary. Possible answers:

Evidence For: Other scientists find the concept useful [C, D, E]; stratigraphers think that the human impact will be “stratigraphically significant” [F]; the pollen record will show agricultural focus on a limited range of plants [H]; erosion from deforestation increases the amount of sediment [I]; habitat loss will lead to extinctions that will show up in the fossil record [I]; similarly, the fossil record will show shifts in habitat due to global warming [J]; CO₂ acidifies oceans so that coral cannot form reefs [K]

Evidence Against: Many of the effects of humans on the planet may be transient [G]; cities will not survive erosion [G]; use of fertilizers will leave only subtle traces for future geologists [H]; dams on rivers are disrupting the natural sedimentation process [I]

1. There is more evidence for than against.
2. Answers may vary. Possible answer:
   Yes, I think the information is reliable. The article is from a reputable magazine, and the author is well known. The opinions expressed are backed up by quotes from experts in the field.

G 1. e
2. f
3. c
4. b
5. d
6. a

DEVELOPING READING SKILLS
A 1. c
2. a

B 1. the term Anthropocene
2. fossilized organism
3. change
4. mass extinction
BEFORE VIEWING
A Answers will vary. Possible answers:
Deforestation affects both plant and animal life. Animals lose their natural habitats. Plants are destroyed and perhaps become extinct as a result.
B 1. animal habitat and resources such as fruits, spices, and medicinal plants
2. Answers will vary. Possible answers: If we destroy rain forests, we will not only lose ingredients used to make current medicines, we will also lose the chance to find new medicinal plants that may cure serious illnesses.
C 1. combat
2. dwelling
3. destruction

WHILE VIEWING
A 1. F (Explanation: less than, not more than)
2. T
3. F (Explanation: Agriculture is the primary cause.)
B 1. cutting down trees
2. absorb greenhouse gases
3. habitats for plant and animal life
4. food and shelter
5. Agriculture
6. wood and paper
7. urban sprawl / land development

AFTER VIEWING
A The first sign is in regard to sedimentation. Increased sedimentation is happening because of massive soil erosion, while at the same time, a lack of sedimentation is happening because of dams. The second sign is loss of habitat and extinction of animal species. (See Paragraph I.)

Writing
EXPLORING WRITTEN ENGLISH
A 1. avert
2. determine
3. tasked with
4. Preservation
5. relatively
6. subtle
B 1. the debate
2. the process
3. the Anthropocene
4. carbon dioxide, the oceans
5. impact

LANGUAGE FOR WRITING
C Answers will vary. Possible answers:
1. these
2. agriculture
3. actions/things/impacts
4. reduction
5. harmful

WRITING SKILL
D b; It is the best choice because it presents a focused main idea—environmentally friendly food choices.
E c, d, e (Explanation: Each of these choices is good for the environment.)
F Answers will vary. Possible answers:
One way that our food choices can help heal the planet is by not contributing to pollution. Another way is making food choices that don’t negatively affect endangered species. Finally, we can make food choices that use few resources such as water.
G Answers will vary. Possible answers:
The quality of life could be improved at our school with more community events.
seasonal events on campus
mixed department activities
opportunities to work with the local community

WRITING TASK
A Answers will vary. Possible answers:
Organization: Surfrider Foundation
Activities: organizes coastal and beach cleanups; tests water to record pollution levels; provides easy ways for people to contact government representatives about legislation
Impacts: protects coastal areas and beaches; spreads public awareness about water pollution with aim of improving water quality; puts pressure on government for better laws to protect the environment
B Answers will vary. Possible answers:
Thesis Statement: The efforts of the Surfrider Foundation have made a positive impact locally, globally, and in government to help protect marine environments.
Notes for Introduction: focused on protecting oceans, waves, beaches; connects experts and people for local and national projects; uses this activist network to create positive change
Body Paragraph 1
Topic Sentence: The foundation organizes beach and coastal clean-ups, which gets the local community involved in protecting nearby marine
environments.
Details: Clubs across the country organize cleanups; locals become involved and aware; keeps beaches accessible.

**Body Paragraph 2**
Topic Sentence: Surfrider’s efforts to test and record pollution in the ocean have led to increased public awareness of marine pollution around the world.
Details: tests bacteria levels in water; educates about plastic pollution; encourages people to change habits related to use of plastic.

**Body Paragraph 3**
Topic Sentence: Finally, the group’s grassroots efforts to get people involved in contacting politicians about supporting laws that protect the oceans have succeeded in the passage of important legislation.
Details: California Coastal Act; plastic bag ban; Beach Act.

**Notes for Conclusion:** ongoing efforts, campaigns across U.S. and other countries; local, global, and government impact.

**REVISING PRACTICE**
1. c, a, b
2. Answers will vary. Possible answers:
   a. These spaces / They
   b. These
   c. Organic fruits and vegetables are increasingly available in many cities.

**EDITING PRACTICE**
1. One reason to limit the use of pesticides is that it *contains they contain* harmful compounds.
2. Some people are installing rooftop gardens and using solar panels in their homes. *They / This* can save money and resources.
3. Many fish species have become extinct, and as a result, there is less biodiversity in our oceans. *They / This decrease in biodiversity* is a problem, because *they upset it upsets* the natural balance of the oceans’ ecosystems.

**UNIT REVIEW**
1. Answers will vary. Possible answers: deforestation, desertification, atmosphere pollution, extinction of species, bleaching of coral reefs.
2. Forests remove greenhouse gases from our atmosphere, are home to more than 80% of the land animals on Earth, and provide humans with various plant-based medicines.
3. Answers will vary. Possible answers: referents /
reference words / pronouns and demonstratives, synonyms, word forms
4. Answers will vary.
Unit 2 On the Edge

THINK AND DISCUSS
Answers will vary. Possible answers:
1. Some species I know that are endangered include the green sea turtle, the snow leopard, the monarch butterfly, the giant panda, the rhinoceros, the orangutan, and the gorilla.
2. Some reasons these animals are endangered include loss of habitat, poaching, and disease.

EXPLORE THE THEME
A 1. the tiger; its status is listed as endangered and there are fewer than 4,000 remaining in the wild
2. These animals play an important role in nature and the food chain, in addition to being important cultural assets in many countries.
B predators, prey, poaching, feasible, secretive

Reading 1
PREPARING TO READ
A 1. assessed
2. lethal
3. resolve (Note: The vocabulary word is the noun form of resolve.)
4. project (Note: The verb project is stressed on the second syllable when pronounced: project. However, the noun is instead stressed on the first syllable: project.)
5. dedicated
B 1. authority
2. apparently
3. acknowledge
4. hypothetical
5. priority
C Answers will vary. Possible answers:
1. Some organizations I know that are dedicated to protecting wildlife include the World Wildlife Fund, Greenpeace, and the Jane Goodall Institute.
2. I think the animals that are most endangered should be a priority, such as the rhinoceros. Sadly, once a species disappears, we will never get it back.
D Answers will vary. Actual answers:
A physical description of tigers; reasons why they are endangered; tiger conservation efforts; the future for tigers

UNDERSTANDING THE READING
A 1, 3, 4
B 1. e (Paragraph E)
2. g (Paragraph E)
3. i (Paragraph F)
4. b (Paragraph F)
5. f (Paragraph G)
6. a (Paragraph M)
7. j (Paragraph M)

**C Problem: Tigers are endangered.**

**Possible Reasons:** Past conservation efforts were not successful; growth of human populations [E]. Tigers’ rareness is part of their mystique, so people accept it [D]; poaching [E]; loss of habitat [E]; black market demand for tiger parts [E]; infrastructure projects [H]; “mission drift” with conservation agencies [K]

**Possible Solutions:** Tiger reserves need recognized corridors of land for safe passage between them [G]; safeguarding core breeding populations [K]; systematic patrolling and monitoring of sites [L]

D a. 3 (Paragraph E)
b. 5 (Paragraphs I–M)
c. 1 (Paragraphs A–C)
d. 4 (Paragraphs F–H)
e. 2 (Paragraph D)

**E Answers will vary. Possible answers:**

1. I found the opening effective; it made me want to read on. I felt like I was there watching the tiger, and it communicated how majestic these animals are, which is one reason why they’re worth protecting.

2. Perhaps the article could have started with reasons that tigers are endangered and ended with a description of the power and mystery of tigers.

**F 1.** c (Then she turns to regard us with a look of bored indifference.)
2. h (The tiger is powerful enough to kill and drag prey five times its weight, yet it can move through high grass, forest, and even water in unnerving silence.)
3. b (The tiger has been a threatened species for most of my lifetime, and its rareness has come to be regarded—like its dramatic coloring—as a defining attribute.)
4. d (In the early 21st century, tigers in the wild face complete annihilation.)
5. f (Less acknowledged are decades of botched conservation strategies.)
6. e (The tiger population, dispersed among Asia’s 13 tiger countries, ...)
7. a (An unwelcome revelation of the new census is that nearly a third of India’s tigers live outside ...)
tiger reserves, ... )
8. g (Central to this approach is the need for systematic patrolling and monitoring of sites assessed as harboring defensible core tiger populations.)
G Answers will vary. Possible answers:
I feel it’s very important to protect endangered species. The planet benefits from having balance in the natural world, and when species become extinct, this balance begins to wobble. Eventually, it will have devastating effects on the natural world and our lives as well.

DEVELOPING READING SKILLS
A 1. Appositive: one of 40 in India; refers to: Ranthambore Tiger Reserve
2. Appositive: co-founder of Panthera, refers to: Tom Kaplan; Appositive: an organization dedicated to big cats, refers to: Panthera
3. Appositive: here-and-now, flesh-and-blood tigers, refers to: tigers
4. Appositive: the kind of development that often destroys habitat, refers to: infrastructure projects
5. Appositive: the Year of the Tiger, refers to: 2010
B Answer will vary. Possible answers:
(Paragraph A) The conference chairman kept referring to the Holocene, the epoch that began 11,500 years ago, at the end of the last ice age, and that—officially, at least—continues to this day.

Video
BEFORE VIEWING
A Answers will vary. Possible answers:
habitat loss, expanding human populations, poaching, botched conservation efforts, black market for parts
B 1. They mostly live in forested areas in the very cold climate of the Russian Far East. The low population density means the tigers are more remote from humans.
2. Answers will vary. Possible answers: poaching, black market for parts, logging
C 1. stabilize
2. dominant
3. food chain

WHILE VIEWING
A a
B 1. It has a longer, thicker coat (to survive the extreme cold).
2. Female: 200 square miles; Male: 500 square miles
3. logging and poaching

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4. The decline has stabilized since the mid-1990s.

**AFTER VIEWING**

**A** Answers will vary. Possible answer:
Maybe they need a larger territory for hunting.
Also, perhaps because the male tigers are more
dominant than females, they take more territory.

**B** Answers will vary. Possible answers:
The Siberian tiger is endangered just like other
species of tiger. Unlike some other species of
tiger, the Siberian tiger lives far away from people
and towns. However, these tigers are still losing
habitat as a result of logging. While the Siberian
tiger population has stabilized in recent decades,
Siberian tigers still face a threat of extinction
because their numbers are still low.

**Writing**

**EXPLORING WRITTEN ENGLISH**

**A** 1. Funding
2. threatened
3. Components
4. exacerbated
5. Initiatives
6. Safeguarding
7. strategy
8. sacrifice

**LANGUAGE FOR WRITING**

**B** Answers will vary. Possible answers:
1. The Bengal tiger, India’s national animal, is one of
India’s most popular attractions.
2. In addition to tigers, other animals—monkeys,
deer, wild boars, owls, and parakeets—live in
Ranthambore.
3. Ranthambore, a former private hunting estate, is
home to 41 tigers.
4. Fateh Singh Rathore, the assistant field director of
the reserve, used to work at Ranthambore when
it was a hunting estate.
5. Zaw Win Khaing, the head ranger of a tiger
reserve in Myanmar, once saw a tiger in 2002.

**WRITING SKILL**

**C** 1. a (Explanation: It presents opinions and expresses
the ideas that will be explained in the body
paragraphs.)
2. a (Explanation: It presents an opinion/position
and includes a reference to the reason for it.)

**D** Answers will vary. Possible answer:
My opinion: Governments should spend more
money to protect tigers.
Reason 1: Tigers are an important cultural asset

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for the countries in which they live.
Reason 2: Tigers help bring visitors to countries, which helps support a country’s economy.
Thesis statement: Governments need to spend more money to protect tigers because these animals are not only a cultural asset, but also a way to bring money into the nation’s economy.

WRITING TASK
A Answers will vary. Possible answers:
Animals: sea turtles, lemurs, rhinos
Natural places: Amazon Rain Forest, Great Barrier Reef
B Answers will vary. Possible answers:
Introduction:
Information about the animal/habitat/place: rain forest in Borneo, world’s third largest island
How is it valuable? home to Sumatran tiger, Sumatran rhinoceros, pygmy elephant, Bornean orangutan, plus other species of animal and plant life
Why is it in danger? logging, forest fires, and development
Thesis Statement: We need to protect Borneo because it is home to so many different species and because the rain forest helps reverse damage from climate change.
Body Paragraph 1
Topic Sentence: It is important to protect Borneo so that we can save all the different forms of life that live on the island.
Supporting Detail: thousands of species of plants, animal, and insect life; wildlife like the pygmy elephant unique to the island; new species still being found that can have medicinal use
Body Paragraph 2
Topic Sentence: We also need to protect Borneo in order to protect the globe from climate change.
Supporting Detail: One of the last rain forests in the world; we need rain forests to counter climate change; rain forests absorb carbon dioxide and produce rain
Conclusion: What can be done to protect it?
With a combination of international and local efforts, Borneo may be saved from destruction.

REVISING PRACTICE
1. c, b, a
2. a. Visitors to Borneo can enjoy its beautiful beaches and mountains.
b. Answers will vary. Possible answer: We also need
to protect Borneo—home of one of the world’s last remaining rain forests—in order to protect the globe from climate change.

c. Answers will vary. Possible answer: The Borneo Project, an international organization, provides support to local communities.

EDITING PRACTICE
1. Tigers, they are an endangered species, live throughout Asia.
2. Ranthambore, a tiger reserve, is in India.
3. Tiger conservationists, people who protect tigers, are looking for new solutions. / Tiger conservationists—people who protect tigers—are looking for new solutions.
4. Corridors, are paths for safe travel, may help tigers survive in wild areas.
5. There are fewer than 4,000 tigers—the biggest cats in the world.

UNIT REVIEW
1. Answers will vary. Possible answers: loss of habitat, poaching, killing
2. Answers will vary. Possible answers: safeguard breeding areas; establish safe corridors for animals to pass between the reserves; better patrolling and monitoring of tiger population
3. a position on a topic and references to reasons for that position
4. Answers will vary.
Unit 3 Beauty and Perception

THINK AND DISCUSS
Answers will vary. Possible answers:
1. For me, it’s about the feeling I get when I look at something. Something that I think is beautiful gives me a positive feeling.
2. There’s a building downtown that is one of the most beautiful things I have seen. It’s an old brick building that’s actually quite simple but still beautiful.

EXPLORE THE THEME
A 1. Aesthetics is the branch of philosophy concerned with the study of beauty.
2. The factors that affect aesthetic principles include proportion, symmetry, and order.
3. Answers will vary. Possible answers:
I think it’s beautiful. The lighting in the picture makes the girl glow. You feel drawn to her eyes as you look at her portrait. Maybe I am also being affected by the geometric proportions as the passage says!
B principles, proportion, geometric

Reading
PREPARING TO READ
A 1. pursue
2. expose to
3. crucial
4. context
5. insight
6. violate
7. notion
8. composition
B 1. Depression
2. Ethics
3. balance
4. imperfect
C Answers will vary. Possible answers:
1. Being talented is the most crucial skill. You also need drive and determination.
2. I think it’s hard to make a career out of making art. But I do think that there are many career choices connected to art, such as working at a gallery or being an agent for artists. So maybe it’s worth pursuing a career in art if you can stay open minded about the type of job or role you’ll have.
D Answers will vary. Possible answers:
I think my pen is beautiful. It has a really cool, colorful design.
E Answers will vary. Actual answers:
light, composition, the moment (when the
UNDERSTANDING THE READING

A 1. light, composition, the moment
2. palette, time, wonder
3. Paragraph G

B Answers will vary. Possible answers:
1. It has expanded our notion of beauty by honoring things formerly regarded as trivial and revealing them as beautiful. (Paragraph A)
2. Light refers to the quality of light and reflections in a photograph. (Paragraph C) Composition refers to how the shapes and lines of the scene are placed within the frame of a photograph. (Paragraph D) Moment refers to pressing the shutter at exactly the right time. (Paragraph E)
3. Griffiths explains that colors set the mood of a photograph, and the mood affects the emotional reaction of viewers. (Paragraph G)
4. The element of time helps us see moments in a way we usually can’t with our own eyes. (Paragraph H)
5. Wonder refers to the sense of awe we feel when we see an image and our excitement about it. (Paragraph I)
6. Photography has given us a new way of seeing, which in turn has affected other art forms by broadening our notion of beauty. (Paragraph K)

C 1. Paragraph J; Answers will vary. Possible answer:
The painting The Birth of Venus by Botticelli is an example of a painting made to be aesthetically pleasing instead of capturing reality.
2. Paragraph J: Answers will vary. Possible answer:
The photo on page 59 of the gauchos going through the water on their horses shows the water splashing up and the sun glaring behind them. It’s a messy yet beautiful scene.

D 1. ordinary; Items formerly considered trivial, and not worth an artist’s paint, have been revealed and honored by photographs: things as pedestrian as a fence post, a chair, a vegetable. (Paragraph A)
2. work well together; When the three—light, composition, and moment—are in concert, there is visual magic. (Paragraph B)
3. essential; Ironically, the definition of what makes a picture aesthetically pleasing often comes down to mathematics: the geometric proportions of objects and their placement within the frame. (Paragraph D)
4. quickly; Light is usually best when it is fleeting or dappled, razor sharp or threatening, or atmospheric. (Paragraph C) Capturing that
perfect moment may be a photographer’s biggest challenge, because most important moments are fleeting. (Paragraph E)

5. both the positive and negative; Photographers became interested in the real world, warts and all, and it was the accidental detail that was celebrated. (Paragraph J)

6. brought it into being; It is to photography’s credit that it has found beauty in the most humble places, and that it has ushered in a new democracy of vision. (Paragraph K)

7. different; People from all walks of life are able to feast their eyes on subjects remote and grand. (Paragraph K)

E Answers will vary. Possible answers:
The light in this picture is quite striking with the bright sun coming up behind the gauchos. Captured at sunrise just as they are crossing a river, the moment is special. And we see time moving forward, since it’s a motion shot. I feel a sense of awe and wonder as I look at this picture. I want to be in the scene.

DEVELOPING READING SKILLS
A Answers will vary. Possible answers:
composition: structural choices in frame; geometric proportions make it pleasing; balance of mathematical proportions is key; Stanfield photo: child looks small next to striking architecture of building
moment: when the shutter is pressed; storytelling; gives meaning to the image; may be photographer’s biggest challenge
wonder: human response to something fresh, new; insight and curiosity; childlike sense
time: freezing or blurring; we can see a choreography of movement even though it’s a still frame; gift to both art and science
palette: selection of colors; sets mood for image; Kerr’s image has a soothing palette
B Answers will vary. Possible answers:
Middle circle of concept map: The
Anthropocene
Is the term relevant?: new epoch related to human impact on world; term coined by Paul Crutzen in 2002; geologists take closer look to see whether term is valid and decide that it is
Cities: man-made materials; land erodes over time; not going to make a big geological impact
Farming: 38% of land on planet used for agriculture; only subtle traces will be left on land; pollen record will show effects

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Deforestation: massive soil erosion increasing sedimentation in some areas; dams holding back sedimentation in other areas; higher rates of extinction of plant and animal life

Atmosphere: composition is changing; carbon dioxide is causing global warming; species shifting toward Poles will affect fossil record

**Video**

**BEFORE VIEWING**

A Answers will vary. Possible answers:
The light and composition in this photo are quite striking. I also like the subdued color palette. It’s an everyday moment but makes us stop in wonder. I think it’s a great photograph.

B Answers will vary. Possible answers:
1. The story I see is one of people in an enclosed space very close to each other physically, yet all in their own worlds in some way. I see couples chatting, people reading on their smartphones, people staring off into space—there’s one big story and then many individual stories as well.
2. He says it’s like an archaeological dig, where you never know what you’ll find. I think with photography, sometimes you don’t know what you’ve captured until after the picture is taken. Among the many pictures, you find one gem.

C 1. surreal
2. chaotic
3. foreground
4. tone

**WHILE VIEWING**

A b, c, d, f, g
B 1. c
2. a
3. b
4. d
5. e

**AFTER VIEWING**

A Answers will vary. Possible answer:
For me, a “gut reaction” refers to that immediate feeling you get when you first see something. It’s your instinct.

B Answers will vary. Possible answers:
In my opinion, the wildebeest photo was the best. It was taken at just the right moment, and the composition was unforgettable for me. It left me with a sense of awe and wonder.

**Writing**

**EXPLORING WRITTEN ENGLISH**

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A 1. atmospheric
2. aesthetically pleasing
3. within the frame
4. illuminate
5. gradation
6. Pastels
B Answers will vary. Possible answers:
1. to give more information about a noun
2. who, that, which, whose (relative pronouns)
3. a, c, d; These sentences still make sense because the clauses were just providing extra, nonessential information.

LANGUAGE FOR WRITING
C Answers will vary. Possible answers:
1. Vivian Maier was a photographer whose work was only discovered after her death.
2. Ansel Adams, who is an American photographer, was most known for his images of the California wilderness.
3. Aesthetics were important to the ancient Greeks, who believed beautiful objects were intrinsically beautiful.
4. Vincent van Gogh, who made a copy of Hiroshige’s print *Sudden Storm Over Shin-Ohashi Bridge*, was influenced by Japanese art.
D Answers will vary. Possible answers:
It’s the subtleness of the light on the train that makes the scene feel otherworldly.
The gauchos, who are riding horses, seem to be a natural addition to the morning sunrise.
The blurred line, which the cowboy’s horse walks next to, is actually the cars going by.

WRITING SKILL
E Fallingwater, the western Pennsylvania house designed by Wright, is a perfect example of the organic approach to architecture due to its surroundings and its materials.
1. two
2. surroundings, materials
F Body Paragraph 1
Topic sentence: The way Fallingwater is assimilated into its natural environment is an example of organic architecture.
Body Paragraph 2
Topic sentence: The organic approach is also shown in the natural materials Wright used to build Fallingwater.
G a. 1
b. 1
c. 2

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d. 2
e. 1
f. 1

WRITING TASK
A Answers will vary. Possible answers:
Type of art: photograph
Criteria: light, moment, wonder
Name of piece of art: A Node in the Dark
Description: A packed train at a theme park. People are close to each other, but most are actually in their own worlds, talking to friends, reading on their phones, or lost in thought.
Evaluation
1. The subtle light in the photo makes it feel otherworldly.
2. The moment is a snapshot of an everyday experience, yet it seems unreal.
3. We’re left to wonder about each of the people and their thoughts.
B Answers will vary. Possible answers:
Notes for introduction:
Thesis Statement: Brian Yen’s photograph makes an everyday scene seem surreal because of the lighting, the moment he captured, and the sense of wonder the scene inspires.
Body Paragraph 1
Topic Sentence: The subtle lighting makes it feel like this train ride is happening in another world.
Details: soft blue light; strange glow; real scene but feels unreal
Body Paragraph 2
Topic Sentence: The picture was taken at just the right moment, making the everyday seem unreal.
Details: at a theme park; taken in a tunnel?; everyone is caught up in their own world
Body Paragraph 3
Topic Sentence: The photograph leaves its viewers with a sense of wonder.
Details: You find yourself wondering about each person; photo tells a story about each; gives us a sense of wonder about people, life, proximity, etc.
Notes for conclusion: Even a real scene that we experience every day can feel unusual when captured with the skill of a good photographer and leave us with a sense of awe about life.

REVISING PRACTICE
1. c, a, b
2. a. The Rostonville Library, which is built entirely of granite—a hard and very tough stone—is an example of durability.

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b. Growth from the rooftop garden, which cascades down the sides of the building, adds to the aesthetics of the building.
c. The library was built on the edge of the city park, which was designed using only native plants.

EDITING PRACTICE
1. This image is an excellent example of composition, which is the way objects are arranged in a photograph.
2. That photograph, that which I like best of all, is Berenice Abbott’s *Pennsylvania Station*.
3. Another important element is light, that which illuminates the objects in a photograph.
4. Moment, which captures time in a photograph, helps to tell the image’s story.

UNIT REVIEW
1. Answers will vary. Possible answers: light, composition, moment, palette, timing, wonder
2. Answers will vary. Possible answer:
   I think light is the most important element because it sets the atmosphere and mood of a scene.
3. A nonrestrictive clause offers nonessential information about the noun in a sentence.
4. Answers will vary.
THINK AND DISCUSS
Answers will vary. Possible answers:
1. Some of the most successful businesses in my country are tech related, such as businesses that develop apps for the public.
2. These businesses have been successful because they are very innovative. They are different to other companies in that they are prepared to take risks and try something new.

EXPLORE THE THEME
A 1. China exports the most clothing. Australians spend the most on clothing.
2. Answers will vary. Possible answers: I find it interesting that Australians spend the most money yearly on clothes. I thought it was going to be the Japanese because I once read an article about how much young people in Tokyo spend on clothes.

Reading
PREPARING TO READ
A 1. competitive
2. found
3. executive
4. brand
5. headquarters (Note: The word headquarters is both a singular and a plural noun.)

B 1. Marketing
2. competitor
3. outsources
4. shortage
5. merchandise
6. supply chain

C Answers will vary. Possible answers:
1. Uniqlo, H&M, Gucci, Chanel, Modparade
2. I think Chanel was founded in France around 100 years ago. I guess their headquarters are in France, too.

D Answers will vary. Possible answer:
Most of the brands of clothing I like are affordable, which is why I buy them. But my favorite brand is Modparade, which is special because it makes unique clothes. It’s a smaller brand from my home country of Singapore.

E Answers will vary. Actual answers:

UNDERSTANDING THE READING
A b
B a (Paragraph F); d (Paragraph E); f (Paragraph C)
C 1. b; so most of Zara’s marketing serves as a reminder for shoppers to visit the stores. (Paragraph D)
2. b; In contrast, Zara once again deviated from the norm. By concentrating more than half of its production in-house ... (Paragraph E)
3. b; Because of the greater flexibility and speed this approach affords, Zara does not worry about missing the boat when it comes to trends. (Paragraph F)
4. a; Also, it runs its supply chain like clockwork with a fast but predictable rhythm: ... (Paragraph F)
5. a; ... “but I would have to knock my company down and rebuild it from scratch.” (Paragraph G)

D 1. around 6 (Explanation: In paragraph A, we learn that: Since its initial public offering (IPO) in 2001, Inditex ... has quadrupled its sales to US$25.7 billion. If sales have quadrupled to $25.7 billion since 2001, then in 2001 sales must have been roughly a quarter of this figure, that is, just over 6.)
2. 17 (Explanation: In London, shoppers visit the average store four times a year, but frequent Zara 17 times.) (Paragraph C)
3. around 20 (Explanation: Zara makes and offers shoppers about 20,000 different items per year, about triple what stores like Gap do.) (Paragraph C)
4. 0.3 (Explanation: It devotes just 0.3 percent of its sales to ads.) (Paragraph D)
5. Zara: 15, Competitors: 60 (Explanation: This means it can design, produce, and deliver a new item of clothing to its stores in a mere 15 days, a pace that is unheard of in the industry. The best speed most of its rivals can achieve is two months.) (Paragraph E)
6. Zara: 15, Industry Average: 40 (Explanation: The industry average is to offer 40 percent discounts across all merchandise. In contrast, Zara’s ability to design and make new clothes quickly means shorter lead times and an ever-changing inventory. So it sells more at full price, and—when it discounts—averages only 15 percent.) (Paragraph E)

DEVELOPING READING SKILLS
A Paragraph C: From Zara’s point of view ... ; At Zara, ... ; By giving just a short window of opportunity to purchase a limited quantity of merchandise, ... ; In London, ... ; “At Gap, ...”; “Buying from Zara, ...”
Paragraph D: Traditionally, ...
Paragraph E: In contrast, ... ; By concentrating more than half of its production in-house, ... ; In contrast, ...
Paragraph F: By producing products in large
quantities, ... ; Because of the greater flexibility and speed this approach affords, ... ; When new trends emerge; From Spain, ...

Video

BEFORE VIEWING
A Answers will vary. Possible answers:
I know the designer Stella McCartney is known for being an animal activist in addition to being a famous fashion designer. She doesn’t use fur or leather or other materials from animals in her designs.
B 1. The company makes apparel for men and women. They are particularly known for their cashmere sweaters.
2. Answers will vary: I think a fashion brand has to make quality products while staying on trend or be forward thinking enough to be the one to influence those trends.
C 1. eponymous
2. high-end
3. enlightened
4. artisan

WHILE VIEWING
A a, b
B 1. Staff get a 90-minute break for lunch, their workday ends at 5:30, and they are not allowed to check e-mail after they leave the office.
2. He has funded a theater, library, and school in the village.

AFTER VIEWING
A Answers will vary. Possible answer:
I think he means that taking time to enjoy beauty and nature keeps us fulfilled and makes us better workers.
B Answers will vary. Possible answers:
Both companies operate quite differently than most other fashion companies. They are similar in that they are both based in small towns instead of big cities, and they keep production local. Unlike Zara, Brunello Cucinelli is made for a high-end market. We didn’t learn a lot about how Zara treats its employees, so perhaps they are different in this regard too.

Writing
EXPLORING WRITTEN ENGLISH
LANGUAGE FOR WRITING
A Similarities: both, equally, have in common, in the same way (that), likewise, similarly, the same is
true for

**Differences:** although, conversely, however, in contrast to), instead of), on the contrary, on the other hand, whereas, unlike

**B** Answers will vary. Possible answers:

1. When H&M opened for business in 1947, it only sold women’s clothes.
2. In 2009, Karl-Johan Persson became H&M’s CEO.
3. Until the spring of 1971, BRS distributed shoes for a Japanese shoemaker.
4. When BRS’s relationship with the Japanese shoemaker ended, the company’s name was changed to Nike.

**WRITING SKILL**

**C** Answers will vary. Possible answers:

*Organization method: Block*

**Notes for introduction:** Apple and Samsung are both highly successful tech companies; Apple founded in Silicon Valley; Samsung founded in Korea

**Thesis statement:** Although Apple and Samsung are both highly successful, these tech companies have each taken a different approach in reaching that success.

**Body Paragraph 1**

*Topic sentence:* Apple’s approach to marketing and developing new products has worked well for the company.

*Details:* direct marketing, taking time to create innovative products

**Body Paragraph 2**

*Topic sentence:* Samsung refined its own unique approach to marketing and product development, which has also led to success.

*Details:* social media, celebrity endorsements; respond quickly to consumer interest

**Notes for conclusion:** quite a different approach to marketing and product development; both have been successful

**WRITING TASK**

**A** Answers will vary. Possible answers:

*Industry: Technology*

*Company 1: Apple*

*Company 2: Samsung*

*Similarities: household names, dominate mobile phone industry*

*Differences: marketing strategies, product development*

**B** Answers will vary. Possible answers:

*Organization Method: block*
Notes for Introduction: products, history
Thesis Statement: Although the two companies have certain features in common, they differ in terms of history, marketing styles, and the way they develop their products.

Body Paragraph 1
Topic Sentence: Apple is a hugely influential company in the tech world.
Details: history (Silicon Valley), marketing strategies (TV ads), product development (takes long time)

Body Paragraph 2
Topic Sentence: Today, as a large conglomerate owning multiple companies, Samsung is one of the largest businesses in Korea.
Details: history (trading company), marketing strategies (celebrity endorsements), product development (quicker than Apple)

Notes for conclusion: both leaders, but different strategies; they challenge each other to make better products

REVISING PRACTICE
1. b, c, a
2. a. Founded in 1976 in the heart of Silicon Valley, Apple ...
b. Founded in 1938 by Lee Byung-Chul, ...
c. Finally, likewise whereas / while ...

EDITING PRACTICE
1. In 1975, Steve Wozniak and Steve Jobs built the first Apple computer.
2. Founded in 1949, Adidas is now one of the world’s leading sports brands.
3. Offering innovative tech products, Samsung is one of the most successful business in Korea.

UNIT REVIEW
Answers will vary. Possible answers:
2. Brunello Cucinelli is a high-end brand. Brunello Cucinelli’s main product is cashmere.
3. the block method and the point-by-point method
4. Answers will vary.
Unit 5 Working Together

THINK AND DISCUSS
Answers will vary. Possible answers:
1. In my case, I work in teams at work to solve issues or problems that our clients are having. I think families are teams, too. Families always have to work together to make decisions and work through tensions if they want to live happily together.
2. Large groups will have a diverse range of ideas and opinions, most likely, so this is good for considering different sides of a situation. However, it’s hard to come to an agreement in a large group, so that’s one disadvantage.

EXPLORE THE THEME
A Answers will vary. Possible answers:
1. The people in the photo are all working together to build a tower made of humans.
2. Early humans collaborated when finding food and raising children. They did this to survive.
3. Modern examples of collaboration are common in the business world. People in organizations collaborate to be productive.
B accomplish, collectively, complex

Reading
PREPARING TO READ
A 1. defense
2. manipulate
3. simulation
4. capabilities
5. unpredictable
6. emergent
7. precisely
B 1. declare
2. relevant
3. coordinate
4. realistically
5. Complementary
C Answers will vary. Possible answers:
1. A group can carry out a complex task by breaking it down into smaller tasks performed by individuals. Physically, a group is also stronger than the individual and can accomplish feats like the one in the picture on page 95.
2. I belong to a volleyball club team. The skills of the individuals on my team are complementary. We have to work together, using each other’s strengths and supporting each other’s weaknesses, to win a game.
3. Actually, I prefer to work by myself. I like to work efficiently, and I find that working with others
makes a project take longer. When I work in teams, we often get behind and miss important deadlines.  
D Answers will vary. Possible answers:  
1. Bees work together in their hive. Also, elephants live together in herds. They travel this way and share the responsibility of taking care of younger elephants.  
2. Teamwork is important in a lot of jobs. For example, collaboration is very important for firefighters. If they don’t work well together to put out a fire and rescue people, lives could be lost. But collaboration is also very important in office jobs. For example, consultants have to work in teams to solve problems.

E Answers will vary. Actual answers:  
1. insects (bees and ants), birds (pigeons), fish  
2. smart swarm / hive mind, collaboration  
3. robots, Internet search engines, online encyclopedias  
4. to inform / to explain a specific animal behavior that has relevance in the human world

UNDERSTANDING THE READING  
A Answers will vary. Possible answers:  
1. The “smart swarm” is a group of living things that move and react in a manner that protects its members and makes them able to coordinate a successful response to unexpected circumstances. (Paragraph B)  
2. Being part of a large group aids the survival of the animal group, as well as the species. Animals that travel in groups are more likely to warn each other when predators are nearby, find mates in the group, find food, and locate a migration route. (Paragraph O)  
3. The key aspects of swarm intelligence are responding simply to others, responding to the local environment, and having no leader. (Paragraphs B, C, R)  
4. Search engines are an example of collaboration because they survey billions of websites at once to find the most relevant information, then rank each according to popularity. (Paragraph T) An online encyclopedia is an example of collaboration because it uses the collective intelligence of its many contributors. (Paragraph U)  

B 1. T–U  
2. R  
3. V  
4. O–Q  
5. B–C  
6. D–N  
C 1. d; How do the simple actions of individuals add up to the complex behavior of a group?
2. c; The result, when set in motion on a computer screen, ...
3. f; ... Reynolds was also blazing the trail for robotics engineers.
4. g; ... —just as ants are able to come up with various options by trial and error.
5. a; If they could, teams of robots might someday be sent into a hostile village to flush out terrorists or locate prisoners.
6. e; For these animals, coordinating their movements with one another can be a matter of life or death.
7. b; ... the bottom line is that our actions matter, even if we don’t see how.

D 1. birds/pigeons (Paragraph B)
2. leader (Paragraph C)
3. the bird next to them (Paragraph C)
4. fly in the same direction as others (Paragraph D)
5. stay close to others (Paragraph D)
6. take its place (Paragraph F)
7. local information (Paragraph G)
8. foot-bots (Paragraph I)
9. hand-bots (Paragraph I)
10. eye-bots (Paragraph I)
11. information (Paragraph I)
12. prisoners (Paragraph M)
13. earthquakes (Paragraph M)
14. waste (Paragraph M)

E 1. G
2. P
3. U

1. Vijay Kumar is a professor of mechanical engineering at the University of Pennsylvania; Daniel Grunbaum, a biologist at the University of Washington; Thomas Malone of MIT’s Center for Collective Intelligence; they all appear to be experts in their field and are currently researching and developing ideas relating to smart swarms.
2. a. 2; b. 3; c. 1

F 1. For crowd intelligence to work, the author says that members need to act responsibly and make their own decisions.
2. recycling
3. Answers will vary. Possible answers: crowdfunding, recycling, a company/business

DEVELOPING READING SKILLS
A 1. Taking this idea one step further (dependent clause), computer scientist Marco Dorigo’s group in Brussels is leading a European effort to create a “swarmanoid” (main clause), a group of cooperating robots with complementary abilities.

National Geographic Learning
(dependent clause). subject: computer scientist Marco Dorigo’s group in Brussels
verb: is leading
object: a European effort to create a “swarmanoid”
   a. building a swarmanoid
   b. a group of collaborative robots

2. The result (main clause), when set in motion on a computer screen (dependent clause), was a convincing simulation of flocking (main clause), including lifelike and unpredictable movements.
   (dependent clause)
subject: the result
verb: was
object: convincing simulation of flocking
   a. a convincing simulation of flocking
   b. lifelike and unpredictable movements

3. Zipping down the main hallway (dependent clause), the foot-long (30 cm) red robots pivoted this way and that on their three wheels (main clause), resembling a group of large insects (dependent clause).
subject: red robots
verb: pivoted
   a. red robots
   b. a large group of insects

B Answers will vary. Possible answers:
Paragraph K: As they spread out, entering one room after another, each robot searched for objects of interest with a small camera. When one robot encountered another, it used wireless network gear to exchange information.
Paragraph M: The demonstration was part of the Centibots project, an investigation to see if as many as a hundred robots could collaborate on a mission.
Paragraph U: Wikipedia, a free collaborative encyclopedia, has also proved to be a big success, with millions of articles in more than 200 languages about everything under the sun, each of which can be contributed by anyone or edited by anyone.
Paragraph V: When a group is being intelligent, whether it’s made up of ants or attorneys, it relies on its members to do their own part. For those of us who sometimes wonder if it’s really worth recycling that extra bottle to lighten our impact on the planet, the bottom line is that our actions matter, even if we don’t see how.
BEFORE VIEWING
A Answers will vary. Possible answers:
I’ve seen ants carry food back to their nest. They work together to do it.
B 1. They create rafts to survive when their homes are flooded. They do it by joining themselves together to create a pizza-like shape. 2. They work together by coordinating their movements, staying close but also not causing problems in each other’s space.
C 1. recruitment 2. consensus 3. inspect

WHILE VIEWING
A a. find out how ants make decisions b. choose a new home c. one hour
B 1. to record their movements, to see who collects information, how they communicate, and how a consensus is reached 2. They brush antennae and release chemicals called “pheromones.” 3. when one ant leads another to the new nest

AFTER VIEWING
A Answers will vary. Possible answer:
I guess that if an animal is just copying the actions of another animal, this probably doesn’t qualify as teaching. To qualify as teaching, I suppose there has to be some intent on behalf of one animal to make the other animal learn something.
B Answers will vary. Possible answer:
Like the ants, the company would probably check out a couple of different places before deciding on one to move to. Unlike the ants, it might be harder to make decisions together. A few employees might be asked for their opinions, but ultimately, I think the head of the company would decide where to move.

Writing
EXPLORING WRITTEN ENGLISH LANGUAGE FOR WRITING
A 1. b; 2. a; 3. c
B Answers will vary. Possible answers:
1. If one group member stopped functioning properly, it could be replaced by others.
2. The robot stopped and sent out a message to the human in charge of it.
3. The trial was declared successful by the
researchers who carried it out.

**WRITING SKILL**

C Students should conclude that summary A is more successful.

1. A
2. A
3. A, B
4. A, B
5. A

**WRITING TASK**

A Answers will vary. Possible answers:

**Author’s main idea; one example:** Swarm intelligence can be useful in robotics; pigeons

**Technology:** Robots can be programmed to behave in similar ways.

**Animals:** Animals are able to protect themselves when being attacked.

**Humans:** Humans use it in search engines and online encyclopedias.

**Individuals in human smart swarms?:** act responsibly and make their own decisions

C 1. urges
2. discusses
3. disputes
4. questions
5. provides

D Answers will vary. Possible answers:

**Introduction**

Thesis Statement: In the “Smart Swarm,” author Peter Miller explains how this behavior in the animal world is affecting technology in the human world.

**Body Paragraph 1:** What is a smart swarm?

Topic Sentence: A smart swarm is a group with no leader in which members react and coordinate movements together to deal with changing environments.

Details: pigeons, synchronized flying; follow easy rules to stay coordinated; watch nearby pigeons

**Body Paragraph 2:** How can smart swarm be used in technology?

Topic Sentence: Swarm intelligence is being used to design smart robots.

Details: programmed to follow basic smart swarm ideas: stay close but don’t crowd or collide with others while flying nearby; success with robots reacting to the unexpected, acting on local information; possibly used in future in military operations and rescue efforts by first responders

**Body Paragraph 3:** How are human “smart
swarms” being used now and going forward?
Topic Sentence: While not as common in human society yet, the online environment is providing some opportunities for people to be part of a smart swarm.
Details: online encyclopedias, results from search engines; instant crowdfunding
Notes for conclusion: for smart swarms to work well, individuals have to be responsible in their motivations and choices; use recycling as an example

REVISING PRACTICE
1. C and D should be switched
2. For example, the Save the Tiger Fund gave more than $17 million in grants for tiger protection between 1995 and 2009.
3. b

EDITING PRACTICE
Answers will vary. Possible answers:
1. in a flash = suddenly
2. in the field = to practical use
3. scattering = running away

UNIT REVIEW
Answers will vary. Possible answers:
1. for crowdsourcing projects, to create advanced robots, in computer simulations
2. to create rafts, to carry food, to make decisions
3. to avoid plagiarism
4. Answers will vary.