

UNIT 1 RISE AND FALL

WARM UP

Possible answer(s):

1. The Ancient Greeks, the Romans, the Aztecs, the Incas, Rapa Nui
2. Many were conquered by other civilizations. Others maybe succumbed to disease or famine.

READING 1A SECRETS OF THE MAYA

Before You Read

- A.** Possible answer(s): they built pyramids; they developed a writing system; they had a calendar system
B. Possible answer(s): I think cenotes were important as a water source.

Reading Comprehension

- A.** 1. c (Para A); 2. b; 3. a; 4. a; 5. c (Para I); 6. d (Para J); 7. a
B. 1. b; 2. a; 3. c; 4. g; 5. e

Critical Thinking

Possible answer(s): **1.** They could have acted as a sundial and timekeeper. **2.** They were a place to make offerings to their water god and give thanks for a good harvest. **3.** They were the door to Chaak's world. **4.** They are the only permanent source of fresh water. **5.** They may have determined where to site buildings.

Reading Skill

- A.** 1. b; 2. d; 3. c; 4. a
B. 1. T; 2. F (During the sun's zenith, its rays are vertical.); 3. F (It's 70 meters from ground level to the bottom of the cenote.); 4. T; 5. F (The broken jaguar man was found on the floor of the cenote.)

Vocabulary Practice

- A.** 1. flourished; 2. grueling; 3. demise; 4. inspected; 5. soil
B. 1. jump in suddenly; 2. religious leader; 3. killing; 4. parts that form it; 5. enters it
C. 1. journey; 2. training; 3. schedule

READING 1B THE COLLAPSE OF ANGKOR

Before You Read

- A.** Jayavarman II; northern Cambodia; 1300s
B. foreign invaders, a religious change of heart, a shift to maritime trade; Possible answer(s): disease, climate change, natural disaster, migration

Reading Comprehension

- A.** 1. b; 2. c; 3. c; 4. d; 5. d; 6. d (Para L); 7. b
B. 3. "Theravada Buddhism gradually took over from Hinduism, and its principles of social equality may have threatened Angkor's elite" (Para E); 5. "The most logical explanation is that the dam failed" (Para K); 6. "The world around Angkor was changing. Society was moving on. It would have been a surprise if Angkor persisted." (Para N)

Critical Thinking

- Possible answer(s): **1.** Ayutthaya conquered Angkor. **2.** Buddhism gradually took over from Hinduism and threatened the elite in Angkor and might have led to a worker rebellion. **3.** The system of canals might have failed, and there was no longer a steady supply of water.
- Possible answer(s): I think drought is a big problem in the world today that threatens many modern civilizations.

Reading Skill

- A.** 1. f; 2. b; 3. e; 4. c; 5. a; 6. d
B. Possible answer(s): may have, some, not likely, might have, maybe, most likely
C. I think the most likely argument is climate change, which resulted in a lack of food.

Vocabulary Practice

- A.** 1. mechanism; 2. channels; 3. dispersing; 4. reservoirs
B. 1. cleverness; 2. destroyed; 3. after; 4. harsh; 5. weaken; 6. by force
C. 1. regalia; 2. regimented; 3. regulations; 4. regularity

VIDEO LEGACIES OF THE MAYA

Before You Watch

A. 1. c; 2. d; 3. a; 4. b

B. 1. Mexico and Central America; 2. 250–900 AD; 3. corn; 4. drought

While You Watch

A. See answers in Before You Watch B.

B. 1. 40; 2. 50,000; 3. pyramid temples; 4. zero; 5. calendar system; 6. pottery; 7. 900; 8. volcanic eruption; 9. seven million; 10. agricultural

Critical Thinking

Possible answer(s): My grandmother and I make traditional food that has been passed down from my ancestors. We also wear traditional dress at ceremonies and celebrations.

UNIT 2 HIGH ACHIEVERS

WARM UP

Possible answer(s):

1. skiing, snowboarding, mountain climbing, rock climbing, abseiling
2. Mountains are steep, so it's exhausting to go up. Snow can be icy and dangerous. Avalanches are possible. There is less oxygen at higher altitudes. The terrain is difficult.

READING 2A THE SKY RUNNER

Before You Read

- A.** Possible answer(s): physically fit, strong leg muscles, stamina and endurance, big lungs, patience and tolerance
B. Possible answer(s): She had to overcome her family's expectations that she would stay in her village and continue doing what all females before her had done.

Reading Comprehension

- A.** 1. b; 2. b (Para A); 3. c; 4. a; 5. d; 6. b; 7. c
B. 1. conventional; 2. bags of rice; 3. training; 4. first trail race; 5. potential; 6. role models; 7. gender equality

Critical Thinking

Possible answer(s): Malala Yousafzai is another strong woman who became successful after overcoming hardships in her life. She has become an activist for female education and even won the Nobel Peace Prize after having been shot by the Taliban in her native Pakistan.

Reading Skill

- A.** 1. a; 2. b; 3. b; 4. b; 5. b
B. 1. know one's place; 2. on a mission; 3. at a snail's pace
C. Possible answer(s): 1. My best friend passed her exam, against all odds! 2. My brother broke the mold when he decided to open his own company instead of finishing college. 3. I'm on a mission to get a good job when I graduate.

Vocabulary Practice

- A.** 1. merely; 2. rural; 3. throughout; 4. gear; 5. pace
B. 1. humble; 2. pursue; 3. odds; 4. stereotype; 5. persistent
C. 1. merely stopped; 2. merely trying; 3. merely mentioning

READING 2B THE FREE SOLOIST

Before You Read

- A.** Possible answer(s): The rock face is very steep, and he has no rope. It's very dangerous. He might get tired and fall at any point.
B. Possible answer(s): stamina, endurance, strength, determination, will, grit, willing to take risks, bravery

Reading Comprehension

- A.** 1. d; 2. c; 3. d; 4. b; 5. b (Para H); 6. c; 7. a
B. 1. h; 2. f; 3. c; 4. e; 5. a; 6. g; 7. d; 8. b
C. 1. hailed; 2. lash; 3. squint; 4. jerky

Critical Thinking

Possible answer(s): I think Honnold's main reason was to prove to himself that he could do it. In paragraph J, the author says that he doesn't think Honnold wanted to do it on a whim or boast about it, so I don't think the main reason was for "reckless showmanship."

Reading Skill

- A.** 1. c; 2. c; 3. d; 4. a
B. Possible answer(s): I don't think the focus is on whether Honnold completed the climb successfully. The focus is on what went into the planning and training to prepare for this challenge.

Vocabulary Practice

- A.** 1. contemplate; 2. ascended; 3. artificial; 4. delicate; 5. plummet; 6. stamina
B. 1. scheme; 2. devoid of; 3. successive; 4. tackle
C. 1. price; 2. popularity; 3. temperatures

VIDEO SOLOING SAFELY

Before You Watch

A. 1. b; 2. c; 3. d; 4. a

B. Possible answer(s): They could climb in small groups or pairs. They could put a net underneath to catch them in a fall.

While You Watch

A. climbing over water, climbing over a net

B. 1. Maddaloni mentions *sneezing* to show how dangerous free soloing is. If you sneeze, you might fall and die.

2. He wanted to push the physical and mental challenge. **3.** He set up a trapeze net. **4.** He's not like the main group of climbers.

Critical Thinking

- Possible answer(s): Yes, I think many climbers would be inspired by the movie to free solo. **Positive:** It could challenge them and push them outside their comfort zone. **Negative:** It's very dangerous, and they may not prepare adequately.
- Possible answer(s): I think promoting extreme sports can be a problem because more resources need to go into rescuing those athletes that get injured. Also, more people will die as a result.

UNIT 3 SCIENCE AND PROGRESS

WARM UP

Possible answer(s):

1. Scientific facts are difficult to dispute. Science gives us tools to prove why things are as they are, and to make advances in technology.
2. Science has not yet fully answered the question of how life began on Earth. We also do not yet know if there is life elsewhere in the universe.

READING 3A THE AGE OF DISBELIEF

Before You Read

1. Possible answer(s): They are concerned that vaccines are not safe, and believe that these vaccines are poisoning their children.
2. Possible answer(s): It's easy to get misinformation on the Internet. People don't trust the government or scientists. Example of skepticism: Modern biology makes no sense without the concept of evolution, but some people believe that creationism should be taught as an alternative to evolution.

Reading Comprehension

A. 1. d; 2. d (Para M); 3. b (Para G); 4. c (Paras H and I); 5. c (Para J); 6. b; 7. d

B. Egalitarian: b, f, g; **Hierarchical:** a, d, e;

Both: c

Critical Thinking

- Possible answer(s): I believe that wealthy people should pay higher taxes, the government should regulate industry, and we should accept the findings of climate scientists. All of these things are necessary for a society to function as a whole and make the world a better place.
- Possible answer(s): I am more of an egalitarian / community-minded person.
- Possible answer(s): Yes, unfortunately the world today is much more polarized than ever before. It's easier to divide people into these two groups.

Reading Skill

A. 1. b; 2. b; 3. c; 4. a; 5. c

B. 1. Doubters have declared war; an evil villain had put something in the water; 2. Images of mad scientists running wild; 3. a cluster of cancer cases ... caused the cancers; 4. She has personal experience with this: ...

C. Possible answer(s): Figurative language is used to make the reader feel a stronger connection to the text. These examples help the reader see the author's point of view.

Vocabulary Practice

A. 1. fundamental; 2. exposed; 3. implication; 4. retain; 5. consensus

B. 1. has strict rules; 2. banks and universities; 3. different than; 4. clear

C. 1. b; 2. c; 3. a

READING 3B GOALKEEPERS FOR THE PLANET

Before You Read

A. Possible answer(s): 1. ending poverty and hunger, providing quality education to all; 2. getting access to modern energy for all; achieving gender equality

B. Possible answer(s): I predict we have made the most progress in reducing poverty and providing quality education.

Reading Comprehension

A. 1. a; 2. b; 3. d (Para D); 4. b; 5. c; 6. c (Para F); 7. a

B. 1. F (It was produced by the Gates Foundation.); 2. NG; 3. F (As the century moves forward, over half the young people will be there, but this is not the case now.); 4. T; 5. F (Poverty has decreased.); 6. F (It is below the world average.); 7. NG

Critical Thinking

Possible answer(s): I think the most important goals for my country are Goals 3, 4, and 13. **Goal 1:** Good Health and Well Being: We should provide after-school programs so children will stay off their devices and provide healthy eating classes and sports activities. We should also provide more support for the elderly to be involved in their communities. **Goal 2:** Quality Education: We need to provide support to inner city schools and make further education courses accessible to people living in poverty. **Goal 3:** Climate Action: We should provide more tax incentives for clean energy, and make solar panels more affordable.

Reading Skill

A. 1. a; 2. b; 3. d; 4. c

B. Possible answer(s): **1.** In 2015, at the United Nations, world leaders adopted 17 Sustainable Development Goals. **2.** We think that the news isn't really out there. We want to make sure that we hold people accountable for that progress. **3.** but they have learned the lessons of what has helped people make progress from around the world; **4.** That's one of the longest-standing pieces of global health research we have ...

Vocabulary Practice

A. 1. investments; 2. instability; 3. initiative; 4. productive; 5. outlier

B. 1. accountable; 2. initially; 3. intervention; 4. innovation; 5. Dynamics

C. 1. take the initiative; 2. global initiatives; a lack of initiative

VIDEO ENERGY ENTREPRENEUR

Before You Watch

A. 1. The forests are being lost and smoke from indoor cooking causes respiratory diseases. **2.** This could be addressed by finding cleaner fuels for cooking which does not involve cutting trees down.

While You Watch

A. Sanga Moses's company turns farm waste into clean cooking fuel. His products have helped to reduce the number of trees being felled for firewood, have enabled farmers to make some money from their farm waste, and helped local women to earn a living by selling the fuel back to their community.

B. 1. He saw that his sister was unable to go to school because she had to collect wood for fuel, and he wanted to improve people's lives. **2.** One of his university professors was supportive, asking his class who could help Sanga fix the energy crisis. **3.** 16.6 million households **4.** environmental benefits: cleaner fuel and stopping deforestation; economic benefits: farmers and local people can earn a living; educational benefits: more children in education

Critical Thinking

- Possible answer(s): I think Sanga Moses faced many challenges to try and solve Uganda's energy crisis. He first had to quit his job to start the project, and find people who could help him achieve his idea. He had a very small amount of money to finance the project, and had to sell his belongings. He had to figure out how to turn farm waste into a cheap and clean fuel. Finally, he had to persuade the local community of the benefits of using this alternative fuel.
- Possible answer(s): I think the most difficult challenge must have been to develop the fuel so that it was cleaner, cheaper, and preferable to firewood. A lesser product would have been more difficult to sell to poor communities.

UNIT 4 SAVING CITIES

WARM UP

Possible answer(s):

1. New Orleans, the coasts of Florida, Bangladesh, and Mozambique
2. People might need to evacuate, roads can be washed away, and houses can be damaged.

READING 4A CITY UNDER SIEGE

Before You Read

A. 1. 20,000,000; 2. 25 cm; 3. feeding pigeons

B. b

Reading Comprehension

A. 1. c; 2. c; 3. a; 4. b; 5. b (Para H); 6. b (Para I); 7. a

B. 1. b; 2. c; 3. a; 4. b; 5. a

Critical Thinking

- Possible answer(s): **Positive:** tourists bring money; **Negative:** tourists leave trash behind, they are replacing the locals, everything is for sale, the city is only affordable to the rich and elderly, it's too crowded
- I don't think the positive effect of tourism outweighs the negative. If locals are pushed out of Venice, the city will become a museum to the past and won't be a real working city.

Reading Skill

A. 1. L; 2. F; 3. L; 4. L; 5. L; 6. L; 7. F; 8. F

B. 1. mirage, head: a; 2. just short of the stratosphere: b; 3. surged, schools, snapping up, wake: a; 4. theme park for the rich: a

Vocabulary Practice

A. 1. framed; 2. inflicts; 3. elevated; 4. implemented; 5. inadequate

B. 1. so-called; 2. maximize; 3. sentimental; 4. complement; 5. impose

C. 1. complimented; 2. complement; 3. complement; 4. compliments

READING 4B RISING SEAS

Before You Read

A. Possible answer(s): Coastal communities may suffer damage due to rising sea levels and will need to consider ways of protecting themselves.

B. **Storm of the Century:** the damage Hurricane Sandy caused; **Coastlines at Risk:** ways to try and prevent coastal storm damage; **Retreat from the Coast:** moving away from coastal areas; **Dutch Lessons:** how the Dutch reduced their threat by building a sea barrier

Reading Comprehension

A. 1. a; 2. d (Para A); 3. d; 4. a; 5. b; 6. b (Para N); 7. a

B. 1. h; 2. f; 3. a; 4. e; 5. b; 6. d; 7. g; 8. c

Critical Thinking

Possible answer(s): If I were Mayor of New York City, I would want to try to prevent another sea surge by putting in local measures to help each area, such as dams, dikes, and levees. Another possibility is building storm-surge barriers in areas where they would be most effective. I think increasing the height of sea walls and building a chain of barrier islands might be too costly for the length of the coastline.

Reading Skill

A. **Main Argument:** First sentence of the excerpt. **Supporting Details:** Columbia University geophysicist Klaus Jacob sees most of Manhattan's population fleeing to higher ground ... At different times in different countries, engineering solutions will no longer be enough. ...

B. 1. Possible answer(s): very important; dramatically, will drastically, if not sooner, people will have to, we'll have to, we may have to, will no longer be; 2. Possible answer(s): There is no source information in the first sentence. I would like to know how we can change course and what will happen if we don't. What scientific evidence is there to prove this assertion? 3. Wanless: He works at the University of Miami's Department of Geological Science so his opinion is valid. Klaus Jacob: He is a geophysicist at Columbia University so his opinion is valid.

4. Possible answer(s): When I read the main argument in the first sentence, I thought the author sounded biased due to the pessimistic language used. He does back up his claims with expert opinions though. Maybe he could have given other expert opinions with different ideas and views.

Vocabulary Practice

A. 1. envision; 2. vulnerable; 3. dire; 4. take for granted; 5. withstand; 6. retreat

B. 1. follow; 2. determined; 3. away from; 4. increase

C. 1. take advantage of; 2. take for granted; 3. take it seriously; 4. take sides

VIDEO HURRICANES

Before You Watch

A. 1. c; 2. d; 3. b; 4. a

B. 1. warm; 2. "eye"; 3. 74; 4. storm surges

While You Watch

A. Check answers in Before You Watch B.

B. 1. late summer; 2. thunderstorms; 3. ring of clouds; 4. potential damage; 5. the equator; 6. early warning

Critical Thinking

- Possible answer(s): volcanoes, tornadoes, earthquakes, tsunamis, forest fires
- Possible answer(s): I think a tsunami can kill thousands of people. The terrible tsunami in 2004 killed more than 230,000 people.

UNIT 5 ENERGY CHOICES

WARM UP

Possible answer(s):

1. Fossil fuels, solar power, wind power, nuclear power; fossil fuels are still used the most in my country, but wind power is becoming more important.
2. The advantages are that renewable energy is unlimited and is also kinder to the environment than fossil fuels; the disadvantages are that they can be weather dependent and the initial set-up costs are high.

READING 5A OUR ENERGY DIET

Before You Read

A. Possible answer(s): I drive myself to school every day, I use air conditioning in the summer and central heating in the winter, I have a lamp by my desk and turn lights on when in a room, and I have a fridge that is constantly running.

B. Possible answer(s): **1.** The author wants to see if he and his wife can track and cut back their CO₂ emissions for one month. **2.** He found out that with little or no hardship and no major cash outlays, they could cut day-to-day emissions of CO₂ in half—mainly by using less energy at home and on the highway.

Reading Comprehension

A. **1.** b; **2.** c; **3.** a (Para C); **4.** d (Para E); **5.** d; **6.** b; **7.** d

B. **1.** one; **2.** 80; **3.** 13; **4.** 30; **5.** two; **6.** 32; **7.** 50

Critical Thinking

Possible answer(s): I think it would be easiest to require that all students recycle by installing recycling bins throughout the school. It might also be easy to require all food and drink be locally sourced by only providing that type of food in the cafeteria (although the cost to students could be greater). It would be most challenging to stop using fossil fuels, because changing the current heating system would involve a major overhaul. I think providing incentives to walk or cycle to school could have the greatest impact because this could result in a reduction in the number of car journeys and the amount of fossil fuel used.

Reading Skill

A. Possible answer(s): **The author performed an experiment to see** how much he and his wife could reduce their carbon emissions. They analyzed where their main sources of energy loss were and started to make changes in order to meet their goal.

B. **1.** f, a; **2.** c, g; **3.** d, e; **4.** b, h

Vocabulary Practice

A. **1.** threshold; **2.** incentive; **3.** commonplace; **4.** audit; **5.** obstacles

B. **1.** utility; **2.** appliances; **3.** mode; **4.** compact, commute

C. **1.** present; **2.** major; **3.** overcome

READING 5B PLUGGING INTO THE SUN

Before You Read

A. **1.** 27 percent; about 7 percent; **2.** It is much higher than the United States (12 percent) and China (21 percent).

B. Possible answer(s): the weather, the funds available for the financial investment, the willingness for people to make the switch

Reading Comprehension

A. **1.** c (Para D); **2.** d; **3.** b; **4.** c; **5.** c; **6.** a; **7.** c

B. **1.** b; **2.** f; **3.** a; **4.** d; **5.** c

Critical Thinking

Possible answer(s): **Idealist:** People who are concerned about the environment; people who feel that ethically and morally we must find a way to reduce our dependence on non-renewable fossil fuels. Some incentives could be to produce material to prove how solar power will work and create ways to make it affordable for everyone.

Financially-motivated: People who want to reduce their bills or make money from having a PV system. Some incentives could be to give them tax breaks and other financial programs to show them they can benefit financially.

Reading Skill

A. Germany: a, b, f, g; **USA:** c, e, h; **Both:** i; **Neither:** d

B. Possible answer(s): I think the solar energy industry in Germany is more advanced and widespread than it is in the United States. The initial investment costs are coming down in the United States though, so I think it might be possible for the United States to catch up. Because it is such a vast country with large areas of sunshine, perhaps they could be energy leaders in the future (so long as the government is able to see the importance of protecting the environment).

C. Possible answer(s): My country offers tax incentives for people to install solar panels on their roofs and buy cars that are hybrid or run on battery power. If you own this type of car, you can drive in special lanes with less traffic. There are also incentives to buy energy efficient appliances and lightbulbs.

Vocabulary Practice

A. 1. renewable; 2. ingenious; 3. circulates; 4. offset; 5. premium

B. 1. deadline; 2. subsidy; 3. yield; 4. panel; 5. subtract

C. 1. unbelievable; 2. unrespectable, disrespectful, disrespected; 3. indescribable; 4. subconsciously, unconsciously; 5. reorganization, disorganization; 6. unequally, inequality

VIDEO ECO-DETECTIVES

Before You Watch

A. 1. b; 2. d; 3. c; 4. a

B. Possible answer(s): make sure hot and cold air cannot leak out, use energy efficient lightbulbs and appliances, use solar panels to collect energy from the sun

While You Watch

A. 1, 4

B. 1. houses and buildings; 2. The outside of the freezer feels too cold. 3. appliances that continuously use energy; 4. It doesn't need a furnace.

Critical Thinking

Possible answer(s): To make my home more energy efficient, I could get energy-efficient appliances and lightbulbs, only use the heating at certain times, take shorter showers, unplug appliances, seal doors and windows, and use solar panels.

UNIT 6 SURVIVAL AND PROTECTION

WARM UP

Possible answer(s):

1. Asian elephant, Bengal tiger, rhino, bluefin tuna, Irrawaddy dolphin, mountain gorilla, poison dart frog, polar bear, snow leopard, sloth. They are endangered because they are losing their habitats.
2. I think all animals should be equally protected. The challenge is to make people aware of and care about the smaller animals.

READING 6A QUICKSILVER

Before You Read

Before You Read

A. Possible answer(s): tuna is a popular food, it's a big powerful swimmer; overfishing is probably its biggest threat

B. Possible answer(s): **The King of Fish:** Bluefin tuna are large and powerful. **Tagging a Giant:** People catch and tag the huge fish. **Bluefin Migration:** bluefin tuna movements around the world; **Uncertain Future:** the possibility that the bluefin tuna will become extinct

Reading Comprehension

A. 1. c; 2. d; 3. b; 4. c; 5. d (Para K); 6. c (Para N); 7. a

B. 1. They need to be moving through the water in order to extract oxygen from it. 2. Cranial cavity, red muscle, and internal organs; 3. large tail, tapered body, and fins pull in; 4. A mackerel swims side to side, and it has less red muscle. 5. They stabilize the fish.

Critical Thinking

- Possible answer(s): The relationship between humans and tuna lately has been detrimental to the bluefin. They are among the most overfished species. If more than a handful are to see the 22nd century, things have to change before they plunge past the dotted line representing sustainable yield and are headed for zero.
- Possible answer(s): **Ban all commercial fishing of bluefin tuna:** pros: the numbers will start to increase; cons: people will eat other fish, which means another species may become endangered; **Protect key bluefin tuna habitat areas:** pros: they'll be able to thrive; cons: there may then become an overabundance of tuna, which could harm the ecosystem; **Forbid restaurants and stores from selling bluefin tuna:** pro: people will stop expecting to eat tuna; cons: there will be an illegal market for tuna; **Only use bluefin tuna from sustainable fish "farms":** pros: the fish will be cheaper and easier to control; cons: the fish might not be as healthy and it's an unnatural environment for them

Reading Skill

A. 1. a; 2. a; 3. a; 4. b; 5. a; 6. b; 7. b; 8. a; 9. b; 10. b

B. 1. (n) time period when something significant happened; 2. (n) enclosure full of water for a sea creature; 3. (prep) such as; 4. (adj) obvious

Vocabulary Practice

A. 1. startling; 2. collaboration; 3. Scholars; 4. detrimental; 5. hauled

B. 1. protection; 2. no one lives; 3. mix together; 4. sudden and violent; 5. worrying

C. 1. turbulent; 2. disturb; 3. perturb

READING 6B BUILDING THE ARK

Before You Read

A. Possible answer(s): 1. Zoos can keep endangered animals safe and encourage them to breed. 2. cost, how endangered the animal is, climate, space

B. Sumatran rhinoceros: Cincinnati Zoo; American bison: Bronx Zoo; red wolf: Miller Park Zoo, Kihansi spray toad: Bronx Zoo; Amur leopard: San Diego Zoo

Reading Comprehension

A. 1. c; 2. c (Para B); 3. b; 4. a (Para H); 5. d; 6. C (Para K); 7. b (Para M)

B. 1. conservation; 2. expensive; 3. large; 4. save; 5. declared; 6. habitat; 7. cells; 8. vials

Critical Thinking

Possible answer(s): **Arguments for saving a few large, popular species:** people love them and will donate a lot of money to survival efforts; they may be better studied and understood so saving them might be an easier task;

Arguments for saving many smaller unpopular species: people can learn to love them; it may be cheaper and easier to save a smaller species; by saving many species it helps keep a wide diversity of species

Reading Skill

A. 1. a; 2. b; 3. b; 4. a; 5. c

B. 1. self; 2. earth; 3. write; 4. study of; 5. sound; 6. distant; 7. hear; 8. speak; 9. carry; 10. feel; 11. earth; 12. see

Vocabulary Practice

A. 1. shrinking; 2. struggle; 3. imminent; 4. refuge; 5. extinction

B. 1. supplement; 2. captive; 3. state-of-the-art; 4. tide; 5. Oblivion

C. about to happen; approaching; forthcoming; impending; looming

VIDEO LIFE ON ICE

Before You Watch

A. 1. e; 2. d; 3. h; 4. f; 5. a; 6. c; 7. b; 8. g

B. Possible answer(s): 1. Researchers can use the frozen samples at any time in the future to do genomic or toxicology work, for example. 2. The specimens are stored in liquid nitrogen at -190° .

While You Watch

A. See answers in Before You Watch B.

B. 1. sequencing the genomes; 2. liquid nitrogen; 3. painless; 4. silk and poison; 5. drying and pinning; 6. 200,000–500,000

Critical Thinking

Possible answer(s): I think using zoos as modern-day conservation “arks” is the best way to conserve animals as long as all animals are given an equal chance.

UNIT 7 HUMAN BODY

WARM UP

Possible answer(s):

1. People can use smart devices to monitor their health. Lost limbs can be replaced with prosthetics. Doctors use advancements in medical technologies in surgery.
2. People might be able to have “bionic” body parts, which will allow them to push past human strength as we know it today.

READING 7A SECRETS OF THE BRAIN

Before You Read

A. 1. Possible answer(s): Brain researchers might hope to learn about how the brain functions, where memories are stored, how involuntary movement occurs, and how people think in different ways. **2.** Possible answer(s): A greater knowledge of the brain could help cure certain medical conditions. It could predict how different groups of people might react to certain situations.

B. Possible answer(s): I think the passage will be about a man who had his brain studied in detail, and what the findings were.

Reading Comprehension

A. 1. c (Para C); **2.** d; **3.** b (Para H); **4.** a (Para K); **5.** c; **6.** d (Para P); **7.** d

B. 1. radio signals; **2.** electron microscope; **3.** grain of salt; **4.** neurons; **5.** MRI scanner; **6.** transparent; **7.** motor cortex; **8.** full-body exoskeletons

Critical Thinking

- Possible answer(s): I don't think I could sit still and stay calm for as long as Zimmer did. So I wouldn't do it. / I think this research is really exciting. I'd love to see a map of my brain showing all the nerve fibers.
- Possible answer(s): If the test or procedure was noninvasive, I might consider it if I felt strongly that it could help someone.

Reading Skill

A. is then used, are put in order, is built, is revealed; the scientists

B. 1. a; **2.** a; **3.** b; **4.** a; **5.** a

Vocabulary Practice

A. 1. forefront; **2.** organ; **3.** neural; **4.** originate; **5.** scrutinize

B. 1. never; **2.** abnormally; **3.** difficult; **4.** beautifully; **5.** impressed

C. 1. detail; **2.** opportunity; **3.** scale

READING 7B HUMAN BIONICS

Before You Read

A. 1. Possible answer(s): **1.** A robot arm that replaces a lost limb; perhaps your brain sends signals that the arm can sense, in order to make it move; **2.** Possible answer(s): It must be very difficult to make the arm move the way you want it to move.

B. 1. She lost her arm in an accident. **2.** Make a sandwich; feel how hard she's grabbing; differentiate between materials she touches; pick up small objects; **3.** feel sensation; clap in time to the songs the children are singing

Reading Comprehension

A. 1. a; **2.** b; **3.** d; **4.** b (Para F); **5.** c; **6.** a; **7.** a

B. 1. phantom; **2.** bionic arm; **3.** nerve fibers; **4.** tingles and twitches; **5.** lifelike; **6.** tools; **7.** trials

Critical Thinking

Possible answer(s): **1.** 3; **2.** 3; **3.** 2; **4.** 1; **5.** 2

Possible answer(s): I don't agree much with any of the statements. I think bionic limbs are great tools for people who have suffered a loss of a body part. I don't think they'll be used by choice to improve the lives of people who don't need them.

Reading Skill

A. 1. F; **2.** O; **3.** F; **4.** F; **5.** O; **6.** O; **7.** F; **8.** O

B. 2. Tommy Kitts; **5.** the author; **6.** Kuiken; **8.** Joseph Pancrazio

Vocabulary Practice

A. 1. sensations; 2. intricate; 3. embedded; 4. compatible

B. 1. simple and basic; 2. sensible; 3. better; 4. small, quick; 5. given to; 6. qualification

C. 1. reason; 2. concern; 3. data; 4. point

VIDEO A GIANT STEP

Before You Watch

A. 1. b; 2. d; 3. a; 4. c

While You Watch

A. 1. in a motorcycle accident; 2. stand and walk; 3. position his feet to support himself and maintain his balance; 4. It's overwhelming, but it makes her feel her son is whole again.

B. 1. an important moment; 2. not likely to succeed; 3. doing well; 4. doing something amazing

Critical Thinking

- Possible answer(s): exploration: humans could survive in space; military: bionic eyes could see in the dark; medical: people could have new working body parts; sports: people could be stronger and fitter than ever before; transportation: people could fly
- Possible answer(s): Bionic technology isn't natural, and it could create a new subset of humans.

UNIT 8 SOCIAL BEHAVIOR

WARM UP

Possible answer(s):

1. concern about style (haircut, clothing, body image), celebrating events, humor
2. apes, elephants, wolves

READING 8A THE GENIUS OF SWARMS

Before You Read

Possible answer(s):

A. 1. advantages: They attack together so they stay safe. They help provide warmth and locate food more easily in a group. disadvantages: There is competition for food and space.

B. Maybe researchers are interested to see if there are similarities between the social behavior of insects and that of humans.

Reading Comprehension

A. 1. b; 2. a; 3. c; 4. c; 5. b; 6. c; 7. c

B. 1. b; 2. b; 3. c; 4. a; 5. c; 6. b

Critical Thinking

Possible answer(s):

- Collaborative encyclopedias like Wikipedia are a good example. Government by democracy is also a form of collective intelligence.
- The results are usually positive. An exception, for example, could be when people in a country elect a leader who doesn't do a good job.
- Pros: Huge numbers of people use the Internet, so applying the ideas of swarm intelligence should be very effective. Cons: Fake news and false conspiracy theories spread quickly via the Internet. An online "swarm" of people who believe false information cannot really be considered intelligent.

Reading Skill

A. 1. c; 2. c; 3. b; 4. b; 5. b

B. Students' own answers

Vocabulary Practice

A. 1. territory; 2. coherent; 3. aggregate; 4. criteria; 5. protocols

B. 1. imitate; 2. index; 3. procedure; 4. faculty; 5. code

C. 1. whole; 2. message; 3. strategy

READING 8B OF ANTS AND HUMANS

Before You Read

A. 1. b; 2. c; 3. a

B. Possible answer(s): how Wilson became a naturalist, similarities between ants and humans, Wilson's opinion on young people today, lessons we have learned from ants, whether ants be saved from extinction

Reading Comprehension

A. 1. b (Para C); 2. d (Para E); 3. a (Para F); 4. c (Paras I and J); 5. b; 6. c; 7. b (Para M)

B. 1. T (Para B); 2. NG (Para E); 3. NG; 4. T (Para K); 5. NG; 6. NG; 7. F (Para R: They are all female); 8. T

Critical Thinking

- social behavior; division of labor
- Possible answer(s): I think ants are similar to humans in two ways. We live together in social groups, and we can share jobs to get the work done.

Reading Skill

A. 1. b, d; 2. b, c; 3. b, c; 4. b, e

Vocabulary Practice

A. 1. exemplify; 2. solitary; 3. fatal; 4. organic

B. 1. different from; 2. the same; 3. real; 4. an extreme; 5. produce young; 6. unselfish

C. 1. accident; 2. illness; 3. shootings

VIDEO CRANE MIGRATION

Before You Watch

A. 1. e; 2. c; 3. a; 4. d; 5. b

B. 1. migrations; 2. coexist; 3. resilience; 4. adapted; 5. abundant

While You Watch

A. See answers in Before You Watch B.

B. 1. at least 10,000 years; 2. eating and socializing with other cranes; 3. grain from corn; 4. loss of their habitat; 5. They're arriving about 30 days earlier than they did 20 years ago. 6. They were overhunted and lost a lot of habitat, so the United States legislated to protect them and other native birds.

Critical Thinking

Possible answer(s): Sandhill cranes might use swarm intelligence for their migration patterns, finding food, and protecting themselves.

UNIT 9 CREATIVITY

WARM UP

Possible answer(s):

1. artists such as da Vinci, Monet, van Gogh, and Matisse
2. I think you need to be born with the desire to create, but the skill with which you express your creativity can be learned in classes such as art, music, or dance.

READING 9A DECODING LEONARDO

Before You Read

A. Possible answer(s): He painted the famous Mona Lisa, and he was also an inventor and drew sketches of many different machines.

B. Possible answer(s): Mona Lisa, Virgin of the Rocks, The Last Supper, the bronze horse, his sketches for innovative machines

Reading Comprehension

A. 1. b; 2. c; 3. d; 4. c (Para L); 5. d; 6. a; 7. a

B. 1. (Vinci) 1452, countryside; 2. (Florence) 6; 3. (Milan) 1482, self-portrait, notebooks; 4. (Florence) 1513, mural; 5. (Rome) 1513; 6. (Amboise) 1519

Critical Thinking

- painting: Mona Lisa, Virgin of the Rocks, The Last Supper; sculpture: bronze horse; engineering / architecture / science: parachute, landing equipment, aerial screw, armored carriage, sail shredder, giant crossbow
- Possible answer(s): In my opinion, the accomplishment that stands out above the others is engineering, because I believe he was the first person to consider modern-day flight.
- Possible answer(s): I think Bill Gates excels in multiple fields, because he's a computer genius as well as a philanthropist.

Reading Skill

A. 1. 2; 2. armored carriage; 3. by including a man inside it

B. 1. a; 2. a; 3. a; 4. b

C. Possible answer(s): I think there weren't the resources needed to build them, they weren't realistic for the time, and people didn't take them seriously.

Vocabulary Practice

A. 1. commissions; 2. concurrently; 3. denying; 4. drafts; 5. preliminary

B. 1. academy; 2. parameter; 3. implicit; 4. arbitrary; 5. ideology

C. 1. access; 2. payment; 3. opportunity

READING 9B THE POWER OF WRITING

Before You Read

A. Possible answer(s): My language is similar to English because it conjugates verbs and it uses perfect tenses. Verbs come after subjects, too. It is different from English because nouns are either male or female, adjectives come before nouns, and there are more letters in the alphabet.

B. Possible answer(s): the history of writing, the history of letters, tools used to write

Reading Comprehension

A. 1. b (Para B); 2. a; 3. d (Para E); 4. c (Para F); 5. c; 6. a (Para M); 7. d (Para R)

B. 1. e; 2. c; 3. b; 4. a; 5. d; 6. c; 7. a; 8. b; 9. e; 10. d

Critical Thinking

Possible answer(s): **Pros:** reduced cost; less pollution; it can be reused; **Cons:** made with plastic; people like traditional pen and paper; I think overall it will have a positive effect on writing.

Possible answer(s): I think writing will be condensed into a form of shorthand. There might be one universal alphabet, so all languages are written in the same way.

Reading Skill

A. 1. Sumerians; 2. 3,500; 3. Latin; 4. 5th century; 5. Aristotle; 6. standard writing system; 7. pages; 8. Spaces between words; 9. phonetic; 10. 15th century; 11. printing press

B. Possible answer(s): I think the use of pages and spaces between words was very significant, and then the invention of the printing press allowed books to be readily accessible—which made reading a standard practice in many communities.

Vocabulary Practice

A. 1. incorporated; 2. format; 3. correspond; 4. integrated; 5. duration

B. 1. Literacy; 2. superior; 3. manually; 4. constraint; 5. alleviate

C. 1. b; 2. c; 3. d; 4. a

VIDEO INFINITY ARTIST

Before You Watch

A. 1. b; 2. a; 3. c; 4. e; 5. d

B. 1. renowned; 2. hallucination; 3. stifled; 4. reputation; 5. installations

While You Watch

A. See answers in Before You Watch B.

B. 1. It is a prestigious art prize that was given to Kusama. 2. It was part of a recurring hallucination than inspired Kusama's polka dot designs. 3. Kusama moved here when she was 27. 4. They are two artists Kusama became friends with. 5. Kusama sometimes worked for 50 hours without rest. 6. Kusama has lived here since 1973.

Critical Thinking

Possible answer(s): Kusama's artistic style is abstract and relatively modern whereas Leonardo da Vinci had a traditional and technical style. I prefer the work of Leonardo da Vinci as I like the classic styles of the old artists.

UNIT 10 NEW DISCOVERIES

WARM UP

Possible answer(s):

1. He's studying possible spacesuit materials. He's probably part of a team that's planning a way to get humans to travel to Mars.
2. I think he meant that you have to have a reason to invent something new.

READING 10A COSMIC DAWN

Before You Read

1. Possible answer(s): ALMA is different to regular telescopes because it can detect radiation of long wavelengths.
2. Possible answer(s): **An Eye on the Heavens:** how telescopes work; **The Perfect Location:** finding the best place on the Earth for ALMA; **Assembling the Array:** the building of the observatory and how scientists grouped the telescopes together; **Early Discoveries:** what astronomers have seen with ALMA

Reading Comprehension

A. 1. b (Para A); 2. b; 3. a (Para E); 4. b; 5. d; 6. c; 7. a

B. 1. b; 2. a; 3. b; 4. c; 5. b; 6. a; 7. b

Critical Thinking

Possible answer(s): There is a salt flat in Bolivia, which is the flattest place on earth. I'm not sure how easy it is to get to, but I know that the elevation is high; about 12,000 feet above sea level. The climate is dry with small levels of rainfall between December and February.

Reading Skill

A. Students read the text in chunks.

B. Possible answer(s): The new image / is the stunning achievement / of the Event Horizon Telescope project, / a global collaboration / of more than 200 scientists / using an array of observatories / scattered around the world, / from Hawaii to the South Pole. / Combined, / this array acts like a telescope / the size of Earth. / It was able to collect / more than a petabyte of data / while staring at M87's black hole / in April 2017. / It then took two years / for scientists to assemble the shot.

C. Possible answer(s): The scientific parts of the passage about how telescopes work are more difficult to read quickly because it's important to focus on the specific details. The parts of the passage that are more narrative and tell about how the site was found are easier to read quickly.

Vocabulary Practice

A. 1. operation; 2. positioned; 3. emit; 4. precision; 5. distort

B. 1. companion; 2. interpret; 3. coordinate; 4. deduce; 5. prototype

C. 1. omit; 2. transmit; 3. submit

READING 10B ELEMENT HUNTERS

Before You Read

A. 1. Possible answer(s): I know basic elements such as oxygen, nitrogen, helium, hydrogen, and iron. I know that O is oxygen and H is hydrogen, and that H₂O is water.

2. Possible answer(s): Maybe they want to create new elements so that new medicines and technology can be invented.

B. 1. b; 2. c; 3. a

Reading Comprehension

A. 1. c (Para B); 2. d (Para E); 3. a (Para N); 4. a (Para H); 5. c (Para I); 6. c; 7. b

B. 1. d; 2. a; 3. c; 4. b; 5. a; 6. c; 7. b; 8. d

Critical Thinking

- Possible answer(s): **Gunpowder:** It's an explosive, and it's used to fire a gun. **Oil:** It does not mix with water, it's used for heating and cooking, and it's a fossil fuel. **Electricity:** It's a form of energy, and it results from charged particles. **Penicillin:** It was discovered accidentally, and it's an antibiotic produced by mold.
- Possible answer(s): **Gunpowder: Pros:** helped advance certain technologies; **Cons:** led to deadlier weapons of war; **Oil: Pros:** has helped fuel many important industries, e.g., transport; **Cons:** has created large amounts of pollution; **Electricity: Pros:** relatively cheap power that can be easily delivered to homes; **Cons:** mainly generated by fossil fuels; **Penicillin: Pros:** life-saving drug; **Cons:** some people allergic to penicillin
- Possible answer(s): I think electricity has had the greatest positive effect on the world because it allowed people to work more efficiently (and continue working after the sun went down). I think gunpowder had the most negative effect because it allowed for the development of deadlier weapons.

Reading Skill

A. 1. a. Glenn Seaborg; **b.** the plutonium bomb; **c.** at the end of the war; **2. a.** U.S. physicists; **b.** rivals; **c.** give him a small amount of plutonium; **3. a.** Berkeley and Dubna; **b.** as far as element 106; **c.** by shooting light atoms against heavy ones with force; **d.** They created a single superheavy nucleus.

Vocabulary Practice

- A. 1.** quest; **2.** collision; **3.** bind; **4.** charged; **5.** attributes
B. 1. disagreement; **2.** win; **3.** is similar to yours; **4.** usually; **5.** create a copy of
C. 1. embarked; **2.** abandoned; **3.** aided

VIDEO BLACK HOLES

Before You Watch

- A. 1. b;** **2. a;** **3. d;** **4. c**
B. Possible answers(s): You can't see a black hole. There's a black hole in our galaxy. Dying stars create black holes. Some black holes are really big.

While You Watch

- A. 1.** about 10–20 times the mass of the sun; millions; **2.** millions or billions times bigger than the sun; **3.** supermassive; at the center of the Milky Way; **4.** 1971
B. 1. quasar; **2.** accretion disk; **3.** event horizon **4.** singularity

Critical Thinking

Possible answer(s): It was such an achievement because it meant that scientists could check if all their theories about black holes were correct. It was the first ever image of a black hole, which is significant because it is a huge step forward in technology. Scientists are interested in studying black holes because of a desire to push the boundaries of science. Black holes were predicted through Einstein's Theory of Relativity and, ever since then, scientists have been fascinated by them.

UNIT 11 CULTURAL ENCOUNTERS

WARM UP

Possible answer(s):

1. The mosques are the most important cultural places in my country today because people still use them to worship.
2. Muhammad is one of the most respected religious leaders in my country's history. He was a kind, gentle, and generous man who helped the poor and the destitute. Because of him, we are now an Islamic nation.

READING 11A THE WORLD OF SÜLEYMAN THE MAGNIFICENT

Before You Read

A. Possible answer(s): **1.** parts of Europe, south east of Italy, Turkey, Saudi Arabia, North Africa to Iraq; **2.** Possible answer(s): He led the empire from 1494–1566. He expanded its territory throughout Europe, Asia, and Africa and created a powerful navy.

B. **1.** c; **2.** a; **3.** d; **4.** e; **5.** f; **6.** b

Reading Comprehension

A. **1.** b; **2.** c (Para F); **3.** b (Para H); **4.** c; **5.** d; **6.** a; **7.** d (Para W)

B. **1.** the Aegean Sea; **2.** horsemanship and archery; **3.** father Selim's death; **4.** God on Earth; **5.** silver coins; **6.** sultan's foot; **7.** Christian defenses; **8.** siege; **9.** avenge; **10.** heart; **11.** myth

Critical Thinking

Possible answer(s): **Süleyman was a wise leader:** He had been carefully prepared for his role as a future world leader, he ordered a tomb, mosque, and school built in honor of his father, and he created a new code of laws.

He was humane: He freed 1,500 Egyptian and Iranian captives, he paid back merchants for goods his father had taken from them, and he gave legal protection to minorities. **He was known for his piety:** He consulted theologians on crucial decisions. He was just, allowing no corruption or injustice to go unpunished. **He was**

generous: He allowed knights to leave Rhodes freely within 12 days and citizens could depart at any time within three years.

Reading Skill

A. Para A: g; **Paras B–I:** a; **Paras J–N:** f; **Paras O–S:** e; **Paras T–Z:** c; **Paras AA–BB:** b

B. Possible answer(s): **Para A:** present day; Szigetvár; Sultan Süleyman was buried here; **Paras B–I:** birth to 1520; the Aegean Sea, Constantinople; Süleyman brought Ottoman Empire to the peak of its power; **Paras J–N:** popular approval; but it didn't last long; **Paras O–S:** during his reign; Topkapi Place; he looked regal but we don't know what he was thinking; **Paras T–Z:** during his reign; Rhodes, Malta, Vienna, Szigetvár; 73 years old, campaign diaries written in third person; **Paras AA–BB:** 1566 to the 19th century; Russian expansion, European dominance of southern Asia, Mediterranean possessions lost, the Ottoman Empire was the "Sick Man of Europe," the people would never see his like again

Vocabulary Practice

A. **1.** reign; **2.** hierarchy; **3.** successor; **4.** infer; **5.** consulted

B. **1.** nostalgia; **2.** confide; **3.** console; **4.** biased; **5.** absolute

C. **1.** biased; **2.** bias; **3.** biased; **4.** bias

READING 11B WHEN THE MOORS RULED SPAIN

Before You Read

A. **1.** creed; **2.** prophet; **3.** shrine; **4.** clergy; **5.** cathedral

B. origins of the Moors, how the Moors came to Spain, Moorish architecture, Moorish poetry, how the Moorish era ended

Reading Comprehension

A. **1.** b (Para G); **2.** c (Para G); **3.** a (Para D); **4.** a; **5.** c; **6.** a; **7.** c

B. **1.** Arabia; **2.** 638; **3.** 711; **4.** Toledo; **5.** capital; **6.** Reconquest; **7.** 1236; **8.** southeast coast; **9.** Alhambra; **10.** Spanish Inquisition; **11.** 1492; **12.** 1609

Critical Thinking

Possible answer(s): **Language:** Argentina has a strong Spanish influence; the language is Spanish. **Food:** There are many similarities with the food. **Music:** You can see flamenco dancers and hear guitars. **Architecture:** Much of the historical Spanish architecture has been preserved too. **Customs:** People take siestas during the day.

Reading Skill

A. Toledo: positive: liberal, tolerant; **the rule of Ferdinand and Isabella:** negative: dark, persecute, cruelty; **Andalucia:** positive: warm, gentle; **Córdoba:** positive: blossomed, greatest; **the cathedral:** negative: banal, disappointment, commonplace; **Arabic language and poetry:** positive: wealth of vocabulary, distinctive, flowing; **changes to the Alhambra:** negative: abused, eroded, neglect, suffered; **tablaos shows:** negative: threatened, commercialization, loud

B. d

Vocabulary Practice

A. 1. splendid; **2.** liberal; **3.** initiated; **4.** empirical; **5.** persecuted; **6.** violated

B. 1. c; **2.** d; **3.** b; **4.** a

C. 1. law; **2.** privacy; **3.** agreement

VIDEO CROSSROADS OF THE WORLD

Before You Watch

A. 1. a; **2.** d; **3.** e; **4.** b; **5.** c

B. 1. fusion; **2.** bustling; **3.** divides; **4.** contrasting; **5.** dominating

While You Watch

A. See Before You Watch B.

B. 1. Europe and Asia; **2.** boat ride along the strait; **3.** 1348; **4.** 67; **5.** church; **6.** mosque; **7.** museum;

8. The Bosphorus Strait; **9.** checkpoint; **10.** weddings; **11.** 1550 and 1557; **12.** Süleyman the Magnificent

Critical Thinking

Possible answer(s): In my city, you can see the oldest church in the main square. It was built in the 1800s and then extended in the early 20th century. People have been bringing goods to sell to the main building on the square for centuries, and today there are open air markets and stalls every weekend. The train station was built in the early 1900s and is still as important today because many people take public transportation into the capital city, which is about 200 miles away.

UNIT 12 PRECIOUS RESOURCES

WARM UP

Possible answer(s):

1. precious metals such as gold, silver, and platinum; diamonds and other jewels
2. I think the resources are considered so valuable because there is such a small supply of them on Earth, and they are so difficult to find.

READING 12A GOLD FEVER

Before You Read

A. Possible answer(s): medical procedures, electronics, dentistry

B. 1. b; 2. a; 3. c; 4. e; 5. d

Reading Comprehension

A. 1. b; 2. d; 3. c; 4. b (Para M); 5. b; 6. c (Para U); 7. b

B. 1. hundred million tons; 2. practical uses; 3. gold standard / value of gold; 4. China and India; 5. 20 tons; 6. ten million weddings; 7. jewelry; 8. 1980s; 9. financial crisis

Critical Thinking

Possible answer(s): **Pros:** The mine could make a lot of money for the community, it could create jobs, and it could mean new infrastructure would be built. **Cons:** The mine would be bad for the environment, it could bring too much unwanted traffic and pollution, and it would make people greedy.

Students' own answers

Reading Skill

A. 1. the tales; 2. when she saw the mine; 3. the world's richest deposits; 4. gold's appeal; 5. social or environmental damage; 6. three gold necklaces

B. 1. legends; 2. Caterpillar / vehicle; 3. the yellow metal

Vocabulary Practice

A. 1. grade; 2. auspicious; 3. depleted; 4. unrestrained; 5. filed; 6. hardship

B. 1. merger; 2. explicit; 3. reprising; 4. convene

C. 1. membership; 2. scholarship; 3. partnership

READING 12B THE RUSH FOR WHITE GOLD

Before You Read

A. Possible answer(s): Lithium is used to make batteries that can store a large amount of energy. Bolivia probably wants to extract it to make money.

B. Possible answer(s): Bolivia's vice president probably feels positive about lithium mining because it will make his country richer. Uyuni's mayor probably feels negative about it because he might worry the government will take all the money from his people and that the mining will destroy the environment. The Bolivian chemical engineer probably feels positive because he understands the issues and the challenges and the work might be exciting to him. The Bolivian geologist probably feels negative because of the environmental impact on the area.

Reading Comprehension

A. 1. c; 2. b; 3. d (Para K); 4. c; 5. d; 6. c; 7. a

B. 1. South America; 2. Chile; 3. brine; 4. the west

C. 1. R; 2. O; 3. Q; 4. M; 5. P; 6. S

Critical Thinking

- **Dealing with waste: Government's view:** It has a unique processing method that will reduce waste.
Expert's view: It's hard to know the truth because the magnesium content in Bolivian lithium is very high. The regulations and laws in Argentina and Chile are much stricter than in Bolivia. **Lack of water:**
Government's view: 90 percent will come from salt water rather than underground. **Expert's view:** They will need vast quantities of water; more than any other mine in Bolivia.
- Possible answer(s): I think the expert's views are more convincing because they are realistic and based on factual evidence.
- Possible answer(s): No, I don't think so. I worry too much about the environmental damage this will cause to such a remote and beautiful place on Earth.

Reading Skill

A. Gold: a, d, g, j; **Lithium:** c, e, f, i; **Both:** b, h

B. Possible answer(s): **1.** I think the extraction of gold causes more environmental damage. However, the full extent of lithium mining probably hasn't been realized yet. **2.** I think the demand for lithium will rise more in the future as technology improves and batteries become more powerful. **3.** I would invest in lithium because it seems to be the way of the future.

Vocabulary Practice

A. 1. rival; **2.** infinite; **3.** salvation; **4.** proceed; **5.** exploited; **6.** commitment

B. 1. surprising and unknown; **2.** certain; **3.** varies from other forms of the same thing; **4.** have doubts about

C. 1. c; **2.** d; **3.** b; **4.** a

VIDEO THE LURE OF LITHIUM

Before You Watch

A. 1. b; **2.** c; **3.** a; **4.** e; **5.** d

B. Possible answer(s): Lithium is a heat-resistant metal. It's used in batteries and in the car industry.

While You Watch

A. 3. The most popular use of lithium is in batteries. **4.** Lithium melts at a very high temperature. **5.** Lithium is capable of storing large amounts of energy.

B. 1. 1817; **2.** stone; **3.** metal; **4.** smartphones; **5.** laptops; **6.** resistant; **7.** reactive; **8.** energy; **9.** sea water; **10.** brines

Critical Thinking

- Possible answer(s): oil, coal, uranium
- Possible answer(s): I think it depends on the rate it's being mined, whether new stores are found, or whether we gradually start using less of the resource. I think oil would have the greatest impact on the economy if it ran out, because it is used to make plastic and gas, which are used in so many things we buy today.