

Chapter 16

Using Key Terms

Define and then use each of the following terms in a separate sentence.

1. *mineral*
2. *placer deposit*
3. *smelting*
4. *subsidence*
5. *reclamation*

For each pair of terms, explain how the meanings of the terms differ.

6. *element* and *mineral*
7. *ore mineral* and *gangue mineral*
8. *placer deposit* and *dredging*
9. *subsurface mining* and *surface mining*

Understanding Key Ideas

10. Which of the following statements does *not* correctly describe a mineral?
a. A mineral is a naturally occurring substance. b. A mineral is an organic substance.
c. A mineral is a solid substance. d. A mineral has a characteristic chemical composition.
11. Gold, silver, and copper are
a. nonmetallic minerals. b. native elements. c. compounds. d. gangue minerals.
12. Ore deposits form from
a. the cooling of magma. b. the evaporation of water that contains salts.
c. the circulation of hot-water solutions in rocks. d. All of the above
13. Which of the following economically important elements is *not* a metal?
a. zinc b. titanium c. copper d. sulfur
14. Which of the following methods is *not* a subsurface mining method?
a. quarrying b. solution mining c. longwall mining d. room-and-pillar mining
15. Which of the following mining methods would most likely be used to mine salt?
a. solution mining b. open-pit mining c. solar evaporation d. both (a) and (c)
16. Dredging would *not* be used to mine
a. diamonds. b. coal. c. heavy minerals. d. gold.
17. Which of the following elements in minerals causes soil to become acidified?
a. potassium b. calcium c. sulfur d. barium
18. Which of the following pieces of federal legislation established a program for regulating coal mining on public and private lands?
a. the Comprehensive Response and Liability Act b. the Clean Air Act
c. the Clean Water Act d. the Surface Mining Control and Reclamation Act of 1977
19. What is the difference between native elements and compounds?
20. Describe the solar evaporation process.
21. What are the surface and subsurface methods by which coal is commonly mined?
22. Explain why undersea mining has been largely unsuccessful to date.
23. Describe how reclaimed soil may become degraded.
24. Explain the purpose of a state bond forfeiture program.

Chapter 17

Define and use each of the following terms in a separate sentence.

1. *fossil fuels*
2. *petroleum*

- 3. *oil reserves*
- 4. *nuclear fission*
- 5. *nuclear fusion*

For each pair of terms, explain how the meanings of the terms differ.

- 6. *petroleum* and *oil reserve*
- 7. *turbine* and *electric generator*
- 8. *nuclear fission* and *nuclear fusion*

Understanding Key Ideas

- 9. Which of the following statements provides a reason for the widespread use of fossil fuels?
 - a. Fossil fuels are a renewable source of energy.
 - b. Fossil fuels are readily available and inexpensive.
 - c. Fossil fuels are not harmful to the environment.
 - d. all of the above
- 10. Which of the following pairs are design features that nuclear power plants and coal-fired power plants share?
 - a. fuel rods and containment buildings
 - b. turbines and generators
 - c. combustion chamber and reactor cores
 - d. none of the above
- 11. The main reason for the worldwide slowdown in the construction of nuclear power plants is that
 - a. we have run out of uranium fuel.
 - b. the electricity from nuclear power is generally more expensive to produce than electricity from other sources.
 - c. nuclear reactors are inherently unsafe.
 - d. nuclear reactors release large quantities of greenhouse gases.
- 12. Which is an example of the direct use of fossil fuels?
 - a. a nuclear reactor
 - b. an oil-fired furnace
 - c. a wood-burning stove
 - d. an electric generator
- 13. Which of the following statements describes the process by which modern nuclear power plants use nuclear energy?
 - a. Power plants use nuclear fusion to split uranium atoms and release nuclear energy.
 - b. Power plants use nuclear fusion to combine atomic nuclei and release nuclear energy.
 - c. Power plants use nuclear fission to split uranium atoms and release nuclear energy.
 - d. Power plants use nuclear fission to combine atomic nuclei and release nuclear energy.
- 14. If fossil fuels are still forming today, why are they considered nonrenewable resources?
 - a. Fossil fuels are broken down by natural processes faster than they form.
 - b. We are depleting fossil fuels much faster than they form.
 - c. The fossil fuels being formed today are deep under the ocean, where they cannot be reached.
 - d. The only fossil fuels being produced are methane hydrates, which we cannot use yet.
- 15. Which of the following is *not* a concern about nuclear energy?
 - a. the difficulty of safe storage of nuclear waste
 - b. the high levels of air pollution produced
 - c. the high costs of nuclear energy
 - d. the possibility that a nuclear chain reaction can get out of control
- 16. Why have fossil fuels become our primary energy resource?
- 17. How did the Three Mile Island accident affect nuclear safety in the United States?
- 18. What factors make nuclear power expensive?
- 19. What is the difference between oil reserves and oil deposits?

Chapter 18

Using Key Terms

Use the correct key term to complete each of the following sentences.

- 1. Much of the energy needs of the developing world are met by _____, such as fuelwood.
- 2. A _____ converts the potential energy of a reservoir into the kinetic energy of a spinning turbine.
- 3. Turning off the lights when you leave a room is an example of _____.

Define and use each of the following terms in a separate sentence.

- 4. *renewable energy*
- 5. *geothermal energy*
- 6. *alternative energy*
- 7. *energy conservation*

Understanding Key Ideas

- 8. Which of the following forms of renewable energy uses the sun's energy most directly?

- a. biomass fuel b. passive solar heating c. geothermal energy d. a hydrogen fuel cell
9. Which of the following energy sources is useful in most parts of the world?
a. tidal power b. OTEC c. geothermal energy d. active solar energy
10. A house that uses passive solar heating in the Northern Hemisphere will
a. be built of a material such as concrete or adobe that stores heat well.
b. have little insulation. c. have large north-facing windows.
d. have an overhang to shade the house from direct winter sun.
11. A passive solar house in the Southern Hemisphere will face
a. north. b. south. c. east. d. west.
12. Photovoltaic cells convert the sun's energy into
a. heat. b. fuel. c. electricity. d. light.
13. In a developing country, you are most likely to find biomass used
a. to generate electricity. b. for manufacturing. c. for heating and cooking. d. as a source of hydropower.
14. Which of the following is *not* true of fuel cells?
a. They produce electricity. b. They will work with many different fuels.
c. They are more energy efficient than most engines used today. d. They cannot be fueled by hydrogen.
15. Which renewable energy source is the fastest growing energy source in the world?
a. oil b. wind c. biomass d. photovoltaic cells
16. Which statement describes why geothermal heat pumps work?
a. They are located in areas with abundant geothermal energy.
b. The ground is warmer than the air in summer and colder than the air in winter.
c. The ground is colder than the air in summer and warmer than the air in winter.
d. They run on hydrogen fuel cells.
17. Rivers are recharged by the water cycle, so what is the original source of hydroelectric energy?
18. Salt water corrodes metals rapidly. What effect is this likely to have on the cost of electricity produced from tidal power?
19. Why is it likely that hydroelectric energy will be generated increasingly by microhydropower plants rather than by large hydroelectric dams?

Chapter 13

Define and use the following terms in separate sentences

1. *latitude*
2. *El Niño*
3. *chlorofluorocarbons*
4. *polar stratospheric clouds*
5. *Kyoto Protocol*

For each pair of terms, explain how the meanings of the terms differ.

6. *weather* and *climate*
7. *El Niño* and *La Niña*
8. *ozone layer* and *ozone hole*
9. *greenhouse gases* and *global warming*

Understanding Key Ideas

10. The belt of prevailing winds that is produced between 30° and 60° north latitude and 30° and 60° south latitude is called the
a. doldrums. b. westerlies. c. polar easterlies. d. trade winds.
11. Which of the following statements about El Niño is true?
a. El Niño is the cold phase of the El Niño–Southern Oscillation cycle.
b. El Niño is a long-term change in the location of warm and cold water masses in the Pacific Ocean.
c. El Niño produces storms in the northern Pacific Ocean.
d. El Niño produces winds in the western Pacific Ocean that push warm water eastward.
12. Polar stratospheric clouds convert the products of CFCs into
a. carbon dioxide. b. hydrochloric acid. c. nitric acid. d. molecular chlorine.

- 13.** Which of the following is *not* an adverse effect of high levels of ultraviolet light?
- a. disruption of photosynthesis b. disruption of ocean food chains
c. premature aging of the skin d. increased amount of carbon dioxide in the atmosphere
- 14.** In which season (in the Northern Hemisphere) does carbon dioxide in the atmosphere decrease as a result of natural processes?
- a. fall b. winter c. summer d. spring
- 15.** Which of the following gases is a greenhouse gas?
- a. carbon dioxide b. water vapor c. methane d. all of the above
- 16.** Which of the following substances is *not* a source of methane?
- a. fossil fuels b. sewage c. fertilizer d. rice
- 17.** The average global temperature increased by how many Celsius degrees during the 20th century?
- a. 0.4°C b. 0.6°C c. 0.8°C d. 1.0°C
- 18.** Which of the following countries decided not to ratify the Kyoto Protocol?
- a. Russia b. United States c. Canada d. Australia
- 19.** Name three properties of air that are important for understanding how air circulation affects global climate.
- 20.** Explain how local geography can influence the local pattern of precipitation.
- 21.** Describe the properties chlorofluorocarbons possess that made them seem like miracle chemicals when they were discovered.
- 22.** Explain why stratospheric ozone protection has been considered an environmental success story.
- 23.** Explain the general process scientists use to make computer models of global warming.
- 24.** Describe some of the environmental problems that rising sea level might cause.
- 25.** Describe what is currently known about the state of the climate system as reported in the 3rd Assessment Report of the Intergovernmental Panel on Climate Change.