

CHAPTER

9

DIRECTED READING WORKSHEET

Energy and Energy Resources

As you read Chapter 9, which begins on page 212 of your textbook, answer the following questions.

Strange but True! (p. 212)

1. What vast treasure-troves have been buried at sea for millions of years?
 - a. gold
 - b. gas hydrates
 - c. salt
 - d. sodium bicarbonate
2. Scientists suspect that large areas off the coasts of North Carolina and South Carolina may contain _____ times the natural gas consumed by the United States in 1 year.
3. What happens when you hold a flame near icy formations of water and methane?

What Do You Think? (p. 213)

Answer these questions in your ScienceLog now. Then later, you'll have a chance to revise your answers based on what you've learned.

Investigate! (p. 213)

4. What will you find out in this activity?

Section 1: What Is Energy? (p. 214)

5. Where do you think energy is being transferred as the tennis game is played?

Energy and Work—Working Together (p. 214)

6. Energy is the _____ to do work.



Chapter 9, continued

- 7. When you hit a tennis ball with a racket, energy is transferred from the racket to the ball. True or False? (Circle one.)
- 8. Work and energy are both measured in _____ .

Kinetic Energy Is Energy of Motion (p. 215)

- 9. Does the tennis player have kinetic energy if she isn't moving? Explain.

- 10. In Figure 2, on page 215, swinging a hammer gives the hammer energy to do work. True or False? (Circle one.)
- 11. Which of the following have kinetic energy? (Circle all that apply.)
 - a. a falling raindrop
 - b. a rolling bowling ball
 - c. a plane in the sky
 - d. a parked car
- 12. Which of the following is NOT true of kinetic energy?
 - a. The faster something moves, the more kinetic energy it has.
 - b. The lower the mass is, the higher the kinetic energy.
 - c. Speed has a greater effect on kinetic energy than mass has.
- 13. The truck and the red car in Figure 3, on page 215, are traveling at the same speed. So why does the truck have more kinetic energy?

Potential Energy Is Energy of Position (p. 216)

- 14. Why does a stretched bow have potential energy?

Chapter 9, continued

- 15.** Take a moment to look at Figure 5, on page 216. Which of the following would have more gravitational potential energy than a diver on a platform? (Circle all that apply.)
- a.** a diver with the same mass on a lower platform
 - b.** a diver with the same mass on a higher platform
 - c.** a diver with more mass on the same platform
 - d.** a diver with less mass on the same platform
- 16.** What two measurements do you multiply together to get gravitational potential energy?
- _____

Mechanical Energy Sums It All Up (p. 217)

- 17.** The mechanical energy of the juggler’s pins in Figure 6 is the total energy of motion and position of the pins. True or False? (Circle one.)
- 18.** Potential energy plus gravitational energy equals mechanical energy. True or False? (Circle one.)

Review (p. 217)

Now that you’ve finished the first part of Section 1, review what you learned by answering the Review questions in your ScienceLog.

Forms of Energy (p. 218)

- 19.** List the six forms of energy.
- _____

- 20.** The total potential energy of all the particles in an object is known as thermal energy. True or False? (Circle one.)
- 21.** In Figure 7, on page 218, the particles in ocean water have less kinetic energy than the particles in steam. Why?
- _____
- _____
- _____
- _____



Chapter 9, continued

Choose the type of energy in Column B that best matches the definition in Column A, and write the corresponding letter in the space provided. The type of energy may be used more than once.

Column A	Column B
<p>___ 22. energy produced by vibrations of electrically charged particles</p> <p>___ 23. energy of a compound that changes when its atoms are rearranged to form a new compound</p> <p>___ 24. energy caused by an object's vibrations</p> <p>___ 25. energy of moving electrons</p> <p>___ 26. energy used in radar systems</p>	<p>a. chemical</p> <p>b. electrical</p> <p>c. light</p> <p>d. sound</p>

27. Nuclear energy can be produced only by splitting the nucleus of an atom. True or False? (Circle one.)

28. Where does the sun get its energy to light and heat the Earth?

29. The nucleus of an atom can store _____ energy. (potential or kinetic)

Review (p. 221)

Now that you've finished Section 1, review what you learned by answering the Review questions in your ScienceLog.

Section 2: Energy Conversions (p. 222)

1. When you are hammering a nail, what is one type of energy conversion that is taking place?

2. An energy conversion can happen between any two forms of energy. True or False? (Circle one.)

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As you read Chapter 9, which begins on page 212 of your textbook, answer the following questions.

Strange but True! (p. 212)

- What vast treasure-troves have been buried at sea for millions of years?
 - gold
 - gas hydrates
 - salt
 - sodium bicarbonate
- Scientists suspect that large areas off the coasts of North Carolina and South Carolina may contain _____ **70** _____ times the natural gas consumed by the United States in 1 year.
- What happens when you hold a flame near icy formations of water and methane?

The methane ignites, making the hydrate look like a burning ice cube.

What Do You Think? (p. 213)

Answer these questions in your ScienceLog now. Then later, you'll have a chance to revise your answers based on what you've learned.

Investigate! (p. 213)

- What will you find out in this activity?

I will find out what happens when energy stored in matter is released.

Section 1: What Is Energy? (p. 214)

- Where do you think energy is being transferred as the tennis game is played?

Accept all answers. Students will learn more about the transfer of energy

as they work through the section.

Energy and Work—Working Together (p. 214)

- Energy is the _____ **ability** _____ to do work.

Chapter 9, continued

7. When you hit a tennis ball with a racket, energy is transferred from the racket to the ball. **True** or False? (Circle one.)
8. Work and energy are both measured in _____ **joules** _____.

Kinetic Energy Is Energy of Motion (p. 215)

9. Does the tennis player have kinetic energy if she isn't moving? Explain.

Sample answer: Yes; the tennis player is still breathing, her eyes are blinking, and her heart is beating. So she still has kinetic energy even if she's standing still.

10. In Figure 2, on page 215, swinging a hammer gives the hammer energy to do work. **True** or False? (Circle one.)
11. Which of the following have kinetic energy? (Circle all that apply.)
- a.** a falling raindrop **c.** a plane in the sky
b. a rolling bowling ball **d.** a parked car
12. Which of the following is NOT true of kinetic energy?
- a.** The faster something moves, the more kinetic energy it has.
b. The lower the mass is, the higher the kinetic energy.
c. Speed has a greater effect on kinetic energy than mass has.
13. The truck and the red car in Figure 3, on page 215, are traveling at the same speed. So why does the truck have more kinetic energy?

The truck is more massive, so it has more kinetic energy.

Potential Energy Is Energy of Position (p. 216)

14. Why does a stretched bow have potential energy?

The bow has potential energy because work was done on it to change its shape.

Chapter 9, continued

15. Take a moment to look at Figure 5, on page 216. Which of the following would have more gravitational potential energy than a diver on a platform? (Circle all that apply.)
- a. a diver with the same mass on a lower platform
 - b. a diver with the same mass on a higher platform
 - c. a diver with more mass on the same platform
 - d. a diver with less mass on the same platform
16. What two measurements do you multiply together to get gravitational potential energy?

weight and height

Mechanical Energy Sums It All Up (p. 217)

17. The mechanical energy of the juggler's pins in Figure 6 is the total energy of motion and position of the pins. True or False? (Circle one.)
18. Potential energy plus gravitational energy equals mechanical energy. True or False? (Circle one.)

Review (p. 217)

Now that you've finished the first part of Section 1, review what you learned by answering the Review questions in your ScienceLog.

Forms of Energy (p. 218)

19. List the six forms of energy.

thermal, chemical, electrical, sound, light, and nuclear

20. The total potential energy of all the particles in an object is known as thermal energy. True or False? (Circle one.)
21. In Figure 7, on page 218, the particles in ocean water have less kinetic energy than the particles in steam. Why?

The particles in ocean water have less kinetic energy than the particles in steam because the particles of steam move around more rapidly than the particles in ocean water.

Chapter 9, continued

Choose the type of energy in Column B that best matches the definition in Column A, and write the corresponding letter in the space provided. The type of energy may be used more than once.

Column A	Column B
<u> c </u> 22. energy produced by vibrations of electrically charged particles	a. chemical b. electrical c. light d. sound
<u> a </u> 23. energy of a compound that changes when its atoms are rearranged to form a new compound	
<u> d </u> 24. energy caused by an object's vibrations	
<u> b </u> 25. energy of moving electrons	
<u> c </u> 26. energy used in radar systems	

27. Nuclear energy can be produced only by splitting the nucleus of an atom. True or False? (Circle one.)

28. Where does the sun get its energy to light and heat the Earth?

Sample answer: When hydrogen nuclei join together to make helium nuclei, the reaction releases a huge amount of energy.

29. The nucleus of an atom can store _____ potential energy. (potential or kinetic)

Review (p. 221)

Now that you've finished Section 1, review what you learned by answering the Review questions in your ScienceLog.

Section 2: Energy Conversions (p. 222)

1. When you are hammering a nail, what is one type of energy conversion that is taking place?

Answers should include one of the following: kinetic energy to sound energy, kinetic energy to thermal energy, or chemical energy to kinetic energy.

2. An energy conversion can happen between any two forms of energy. True or False? (Circle one.)