Name _____ Class _____ Date _____

Skills Worksheet Chapter 9 – Energy and Energy Resources

Directed Reading A

Section: What Is Energy?

ENERGY AND WORK: WORKING TOGETHER

_____ 1. What is the ability to do work called?
- a. movement
- b. energy
- c. power
- d. force

2. Work is a transfer of _____.

3. How is energy transferred when one object does work on another?

_____

4. What units are used to express this energy transfer?

_____

KINETIC ENERGY

_____ 5. Which of the following is the energy of motion?
- a. potential energy
- b. mechanical energy
- c. kinetic energy
- d. gravitational energy

_____ 6. In the formula for kinetic energy, what does the m stand for?
- a. more
- b. moving
- c. mass
- d. meter

7. How does increasing mass affect kinetic energy?

_____

8. Why are car crashes more dangerous at higher speeds than at lower speeds?

_____

_____

POTENTIAL ENERGY

9. The energy an object has because of its position is called _____ energy.

10. When you lift an object, energy is transferred to the object, which gives the object _____.

11. The amount of gravitational potential energy that an object has depends on its weight and _____.

12. What formula is used to calculate gravitational potential energy?

_____

13. The amount of force that must be used on an object to lift it is _____.

14. What is an object's height a measure of?

_____

MECHANICAL ENERGY

_____ **15.** Which of the following types of energy equals the total energy of motion and position?

a. mechanical energy
b. kinetic energy
c. potential energy
d. moving energy

16. What is the formula used to find mechanical energy?

_____

17. The juggler moves the pin with his hand and gives _____ energy to the pin.

18. As the juggler's pin leaves his hand, the pin's kinetic energy begins to change to _____ energy.

19. How can you tell that the kinetic energy is decreasing as the juggler's pin rises?

_____

OTHER FORMS OF ENERGY

Match the correct description with the correct term. Write the letter in the space provided. Some terms will not be used.

_____ **20.** energy caused by an object's vibrations

_____ **21.** energy that comes from changes in the nucleus of an atom

_____ **22.** all of the kinetic energy due to random motion of the particles that make up an object

_____ **23.** energy of moving electrons

_____ **24.** energy of a compound that changes as its atoms are rearranged

_____ **25.** energy produced by the vibrations of electrically charged particles

a. sound energy
b. chemical energy
c. nuclear energy
d. light energy
e. electrical energy
f. mechanical energy
g. thermal energy

26. How do particles move at higher temperatures compared to how they move at lower temperatures?

_____

27. Chemical energy is a form of _____ energy because it depends on the position and arrangement of the atoms in a compound.

28. How is electrical energy produced at power plants?

_____

_____

29. When you stretch a guitar string, what kind of energy does the string store?

_____

30. When you release a guitar string, what kind of energy makes the string vibrate?

_____

31. What form of energy can travel through a vacuum?

_____

32. What is the difference between fission and fusion?

_____

_____

Name _____ Class _____ Date _____

Skills Worksheet

Directed Reading A

Section: Energy Conversions

1. A change from one form of energy to another is called

a(n) _____

KINETIC ENERGY AND POTENTIAL ENERGY

_____ **2.** When the skateboarder reaches the top of the half-pipe, which of the following types of energy is at its maximum?
- **a.** mechanical energy
- **b.** kinetic energy
- **c.** potential energy
- **d.** elastic potential energy

_____ **3.** As the skateboarder speeds down through the bottom of the half-pipe, which of the following types of energy is at its maximum?
- **a.** mechanical energy
- **b.** kinetic energy
- **c.** potential energy
- **d.** elastic potential energy

_____ **4.** Which of the following types of energy is present in the wound-up rubber band in a toy airplane?
- **a.** mechanical energy
- **b.** kinetic energy
- **c.** potential energy
- **d.** elastic potential energy

5. When the rubber band on the airplane is released, the stored energy becomes _____ energy, spinning the propeller.

6. A stretched rubber band stores _____ energy.

CONVERSIONS INVOLVING CHEMICAL ENERGY

_____ **7.** Which of the following types of energy comes from the food you eat?
- **a.** chemical energy
- **b.** thermal energy
- **c.** light energy
- **d.** nuclear energy

_____ **8.** When you are active, chemical energy of food is converted into which of the following types of energy?
- **a.** kinetic energy
- **b.** thermal energy
- **c.** mechanical energy
- **d.** potential energy

_____ **9.** Which of the following types of energy from food is used to maintain body temperature?
- **a.** chemical energy
- **b.** thermal energy
- **c.** light energy
- **d.** nuclear energy

_____ **10.** Which of the following types of energy do plants use to make chemical energy?
- **a.** gravitational energy
- **b.** thermal energy
- **c.** light energy
- **d.** nuclear energy

11. When you eat food, you are taking in energy that first came from the _____.

12. Define photosynthesis.

_____

_____

_____

13. How is the chemical energy from a tree converted into thermal energy?

_____

_____

_____

_____

WHY ENERGY CONVERSIONS ARE IMPORTANT

14. Give two examples of energy conversions that take place within a hair dryer.

_____

_____

_____

15. Name two common energy conversions that involve electrical energy.

_____

_____

_____

_____

ENERGY AND MACHINES

16. Work is made easier when a(n) _____ changes the direction or size of the force needed to do the work.

17. When riding a bike, your legs transfer _____ energy to the pedals by pushing them around in a circle.

18. Energy from the sun is measured using a(n)_____.

19. In a radiometer, which vanes absorb the most light energy? What happens after the light is absorbed?

_____

_____

_____

_____

Name _____ Class _____ Date _____

Skills Worksheet

Directed Reading A

Section: Conservation of Energy

WHERE DOES THE ENERGY GO?

_____ 1. Which of the following forces opposes motion between two surfaces that are touching?
a. friction
b. kinetic energy
c. potential energy
d. current

_____ 2. When a roller coaster moves, which of the following helps to overcome friction?
a. friction
b. current
c. energy
d. movement

_____ 3. Which of the following causes some of the potential energy of a moving roller coaster to be converted to thermal energy?
a. movement
b. thermal energy
c. friction
d. sound energy

4. Name two locations where there is friction on a roller coaster.

_____

_____

5. On a roller coaster, where is the potential energy the greatest?

_____

6. The kinetic energy at the bottom of the first hill on a roller coaster is less than the _____ energy at the top of the hill.

ENERGY IS CONSERVED WITHIN A CLOSED SYSTEM

7. When a group of objects transfer energy only to each other, a(n) _____ is created.

8. On a roller coaster, some mechanical energy is always converted into _____ energy.

9. What three types of energy from a roller coaster are added together to equal the total amount of original potential energy?

_____

_____

_____

10. The rule that energy cannot be created or destroyed is explained by the _____.

11. The total amount of _____ in a closed system is always the same regardless of how many conversions take place.

12. In a light bulb, some energy is converted to _____ energy, making the bulb feel warm.

NO CONVERSION WITHOUT THERMAL ENERGY

13. Any time energy is converted into another form of energy, some of the original energy is converted into _____ energy.

14. The thermal energy due to _____ is not useful energy.

15. What happens to the wasted thermal energy in a car?

_____

_____

16. A machine that puts out exactly as much energy as it takes in is a(n) _____.

17. What is needed to keep a machine moving?

_____

18. What energy does the "drinking bird" use to evaporate water from its head?

_____

19. Define energy efficiency.

_____

_____

20. New cars have a smooth _____ that reduces friction between the body of the car and the air.

21. A car with high _____ can go farther than other cars with the same amount of gas.

22. There is less wasted energy when energy _____ are more efficient.

Name _____ Class _____ Date _____

Skills Worksheet

Directed Reading A

Section: Energy Resources

1. A natural resource that can be converted into other forms of energy to do work is called a(n) _____.
2. The source responsible for most other energy resources is the _____.

NONRENEWABLE RESOURCES

_____ 3. Which of the following energy resources cannot be replaced or is replaced more slowly than it is used?
- **a.** usable resource
- **b.** reusable resource
- **c.** nonrenewable resource
- **d.** energy resource

_____ 4. Which of the following energy resources are formed from buried plants and animals?
- **a.** fossil fuels
- **b.** fossil resources
- **c.** renewable fuels
- **d.** animal fuels

5. What are the three most common fossil fuels?

_____

_____

6. The plants and animals that form fossil fuels stored _____ from the sun.
7. A common use of coal in the United States is to generate _____.
8. Name three products that come from petroleum.

_____

_____

9. Name two uses for natural gas.

_____

_____

10. To convert the chemical energy in fossil fuels into electric energy, a(n) _____ is used.

11. In an electric generator, a magnet spins to generate a(n) _____ in the wire.

12. A nuclear power plant generates _____ energy that boils water to produce steam.

13. The spinning generator of a nuclear power plant converts _____ energy into electrical energy.

14. Nuclear energy is generated from _____ elements.

15. The nucleus of a uranium atom is split into two to release nuclear energy in a process called _____.

16. Why is nuclear energy considered a nonrenewable resource?

_____

_____

RENEWABLE RESOURCES

_____ **17.** Of the following energy resources can be replaced over a relatively short period of time?

a. usable resource
b. reusable resource
c. nonrenewable resource
d. renewable resource

18. Name three types of renewable resources.

_____

_____

_____

19. Solar energy can be changed into electrical energy through _____.

20. Through what can houses passively collect solar energy?

_____

21. The potential energy of water in a reservoir can be changed into _____ energy as the water flows downhill.

22. How does a hydroelectric dam change kinetic energy into electrical energy?

_____

_____

23. What causes wind?

_____

24. What kind of energy of wind turns the blades of a windmill?

_____

25. Wind turbines convert the kinetic energy of air into _____ energy by turning a generator.

26. The thermal energy caused by the heating of Earth's crust is called _____.

27. Some geothermal power plants pump water underground next to hot _____.

28. Organic matter that can be burned to release energy is called _____.

THE TWO SIDES TO ENERGY RESOURCES

29. Name one disadvantage of fossil fuels.

_____

30. Why can't solar energy be used to meet the energy needs of large cities?

_____

_____

31. Why is hydroelectric energy not always a desirable energy resource?

_____

_____