

## Chapter 5

Use with Text Pages 124–133

## STUDY GUIDE

## ● Energy and Work

Match the items in Column I with the terms or phrases in Column II. Write the letter of the correct term or phrase in the blank on the left.

## Column I

- \_\_\_\_\_ 1. work
- \_\_\_\_\_ 2. energy
- \_\_\_\_\_ 3. mechanical energy
- \_\_\_\_\_ 4. potential energy
- \_\_\_\_\_ 5. kinetic energy
- \_\_\_\_\_ 6. law of conservation of energy

## Column II

- a. total amount of kinetic and potential energy in a system
- b. energy may change from one form to another, but it cannot be created or destroyed under ordinary conditions
- c. stored energy
- d. transfer of energy through motion
- e. energy in the form of motion
- f. the ability to cause change

Use the definitions of kinetic energy and potential energy to decide what kind of energy each example listed below has. Write KE for kinetic energy and PE for potential energy.

Kinetic energy is energy in the form of motion. Potential energy is stored energy. The amount of potential energy in a sample of matter depends on its position or condition.

- \_\_\_\_\_ 1. a moving skateboard
- \_\_\_\_\_ 2. a rock at the edge of a cliff
- \_\_\_\_\_ 3. a glass of milk
- \_\_\_\_\_ 4. gasoline
- \_\_\_\_\_ 5. a basketball passing through the hoop
- \_\_\_\_\_ 6. a dry cell of a battery
- \_\_\_\_\_ 7. an acorn hanging from an oak tree
- \_\_\_\_\_ 8. a person climbing a ladder
- \_\_\_\_\_ 9. a piece of celery
- \_\_\_\_\_ 10. blowing wind

Complete the chart below by listing each of the examples of potential energy above in the correct column.

Gravitational Potential Energy	Chemical Potential Energy

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# ● Temperature and Heat

In each of the following statements, the italicized term has been scrambled. Unscramble the term and write it on the line provided.

- \_\_\_\_\_ 1. A measure of the average kinetic energy of the particles in a sample of matter is an object's *pemtarerute*.
- \_\_\_\_\_ 2. The total energy of the particles in a material is *matherl genrey*.
- \_\_\_\_\_ 3. Energy that flows from something with a higher temperature to something with a lower temperature is *eath gyener*.
- \_\_\_\_\_ 4. Thermal energy includes both kinetic energy and *toplaiten nrgyee*.
- \_\_\_\_\_ 5. As the temperature of a material increases, the particles move faster and their average *cteinik rengey* becomes greater.

For each group of three terms, write a sentence that explains how the terms are related. Underline the terms in your sentences.

1. thermal energy, particles, energy

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2. temperature, particles, kinetic energy

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3. heat energy, temperature, flow

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4. joules, heat, work

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5. thermal energy, kinetic energy, potential energy

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# ● Thermal Pollution: Waste You Can't See

Write the vocabulary term from this section that best completes each statement in the space provided.

1. When waste thermal energy significantly changes the temperature of the environment, it is called \_\_\_\_\_.
2. In some factories, water is cooled by fans or by evaporation before being released into the environment by \_\_\_\_\_.

Use the words in the box to fill in the blanks.

temperature	25°C	buildings	pollution	heat	plants
factories	hours	raising	ocean	species	fish
animals	lake	increases	equipment	thermal	

Thermal \_\_\_\_\_ is a problem caused when waste \_\_\_\_\_ energy raises the \_\_\_\_\_ of the environment. Power plants and \_\_\_\_\_ use water to cool their \_\_\_\_\_ and \_\_\_\_\_. Dumping this water, after \_\_\_\_\_ the temperature, into a nearby river, \_\_\_\_\_, or \_\_\_\_\_ adds \_\_\_\_\_ and may cause problems for \_\_\_\_\_ and \_\_\_\_\_. Animals especially sensitive to \_\_\_\_\_ in water temperature are \_\_\_\_\_. Some \_\_\_\_\_ of fish will die within \_\_\_\_\_ in water warmer than \_\_\_\_\_.

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## ● Measuring Thermal Energy

In the blank, write the term that best completes each statement.

1. The amount of energy it takes to raise the temperature of 1 kilogram of a material 1 Celsius degree is called \_\_\_\_\_.
2. Another term used for specific heat is \_\_\_\_\_.
3. Specific heat is measured in \_\_\_\_\_ per kilogram per degree Celsius.
4. Specific heat can be used to measure changes in \_\_\_\_\_.
5. Thermal energy is the \_\_\_\_\_ energy of the particles that make up a material.
6. In the equation  $Q = m \times \Delta T \times C_p$ , the symbol  $\Delta$  means \_\_\_\_\_.
7. A measure of the average kinetic energy of the particles in a sample of matter determines the matter's \_\_\_\_\_.
8. The transfer of energy from something at a higher temperature to something at a lower temperature is called \_\_\_\_\_.
9. In the equation  $Q = m \times \Delta T \times C_p$ , the change in thermal energy is shown by \_\_\_\_\_.
10. Heat always flows from \_\_\_\_\_ temperatures.
11. Work and heat both involve \_\_\_\_\_ of energy.