

REVIEW AND REINFORCEMENT GUIDE
CHAPTER 5 ■ *Energy: Forms and Changes*

SECTION

5-1

Nature of Energy

(pages 108–111)

KEY CONCEPTS

▲ Energy can be defined as the ability to do work.

▲ The five main forms of energy are mechanical, heat, chemical, electromagnetic, and nuclear.

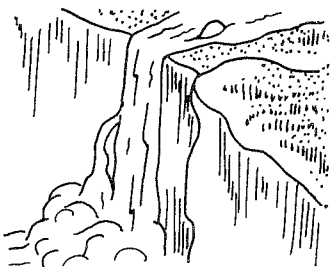
■ Building Vocabulary Skills: Understanding Definitions

Use your understanding of the term **energy** to complete the following sentences.

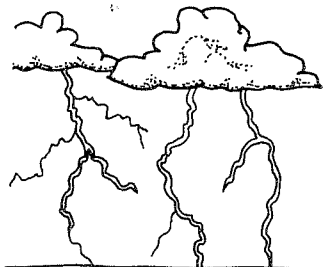
1. Energy appears in many _____.
2. Energy is the ability to do _____.
3. Energy is measured in _____.
4. Energy associated with motion is called _____.
5. An object gains energy when _____.
6. The internal motion of atoms is called _____.
7. Nuclear energy is released when _____.
8. Light and electricity are forms of _____.
9. When atomic bonds are broken, _____ is released.
10. Sound is a type of _____ energy.

■ Forms of Energy: Understanding the Main Ideas

Identify which of the five main forms of energy is present in each situation. There may be more than one form.



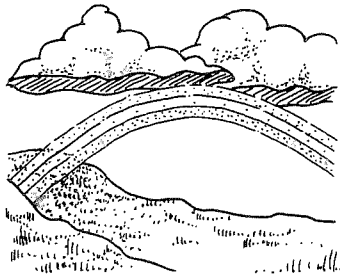
1. _____



2. _____



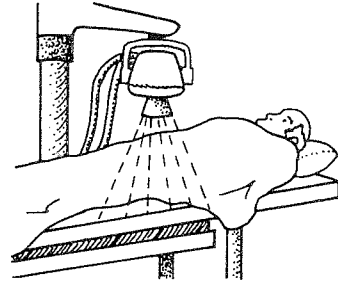
3. _____



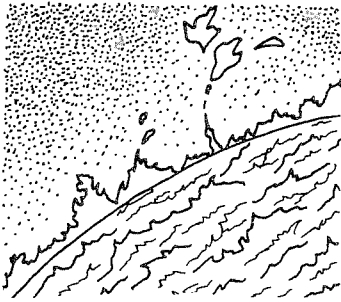
4. _____



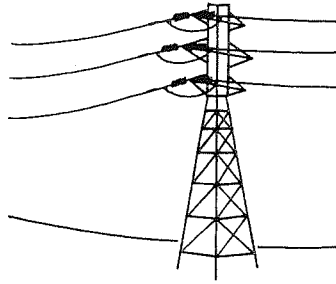
5. _____



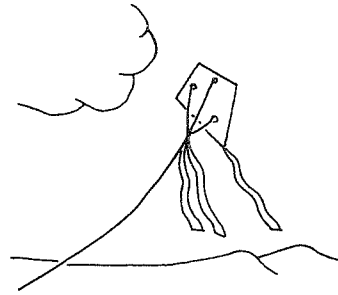
6. _____



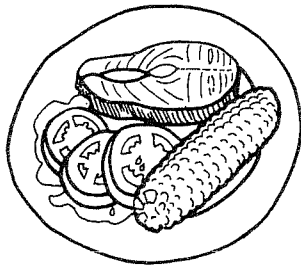
7. _____



8. _____



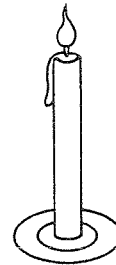
9. _____



10. _____



11. _____



12. _____

SECTION

5-2**Kinetic and Potential Energy**

(pages 111–115)

KEY CONCEPTS

▲ The energy of motion is called kinetic energy.

▲ Potential energy is energy of position.

■ Building Vocabulary Skills: Applying Definitions

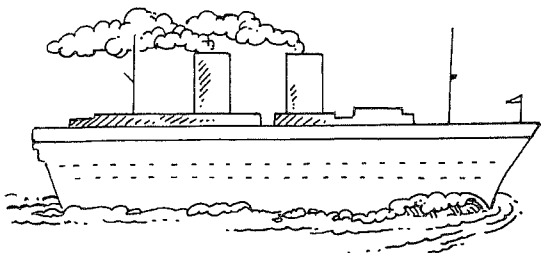
Decide whether each item below describes kinetic energy or potential energy. If the item describes kinetic energy, write KE in the space before the number. If the item describes potential energy, write PE.

- _____ 1. an airplane circling in preparation for a landing
- _____ 2. a pile of coal that will be used for fuel
- _____ 3. a flag blowing in the wind
- _____ 4. a hatbox stored on the top shelf of a closet
- _____ 5. an unlit firecracker
- _____ 6. a hammer held above a nail
- _____ 7. a marble rolling down the aisle of your science classroom
- _____ 8. a new car battery
- _____ 9. glucose stored in plants as a result of photosynthesis
- _____ 10. an ant crawling across a sandwich at a picnic
- _____ 11. a tennis racket about to crash down on a ball near the net
- _____ 12. an eyelash fluttering

Kinetic Energy: Applying the Main Ideas—Part 1

In each pair shown below, the items have the same kinetic energy. The masses and velocities, however, are quite different. Use your knowledge of kinetic energy to calculate the missing variable for each pair.

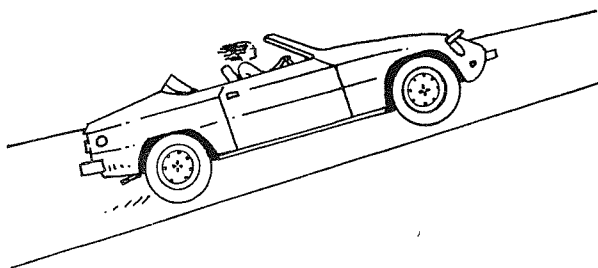
1.



$$m = 1900 \text{ kg}$$

$$v = 8 \text{ m/sec}$$

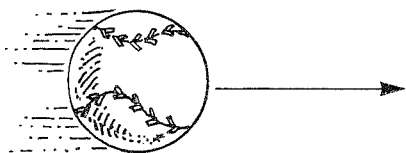
$$KE = KE$$



$$m = ?$$

$$v = 10 \text{ m/sec}$$

2.



$$m = 0.1 \text{ kg}$$

$$v = 30 \text{ m/sec}$$

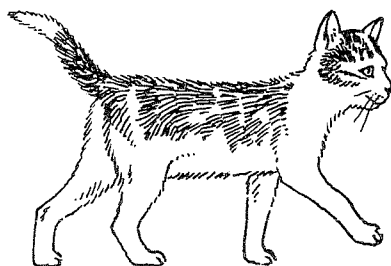
$$KE = KE$$



$$m = 250 \text{ kg}$$

$$v = ?$$

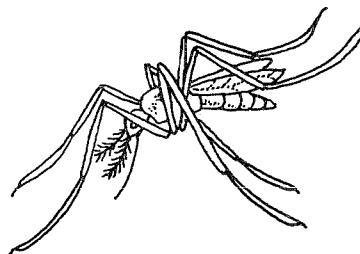
3.



$$m = 2 \text{ kg}$$

$$v = ?$$

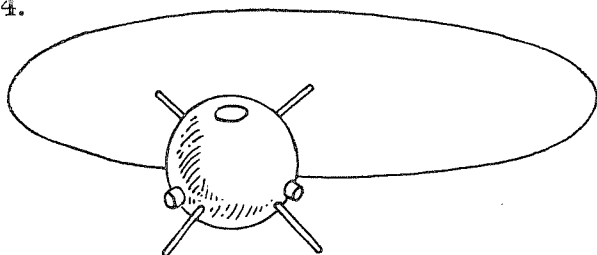
$$KE = KE$$



$$v = 10 \text{ m/sec}$$

$$m = .005 \text{ kg}$$

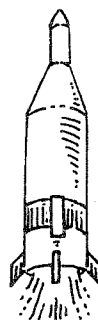
4.



$$m = ?$$

$$v = 8000 \text{ m/sec}$$

$$KE = KE$$

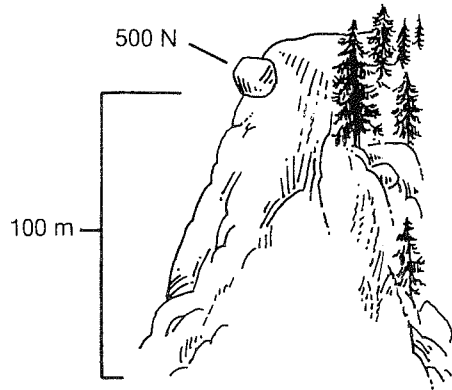


$$m = 48,000 \text{ kg}$$

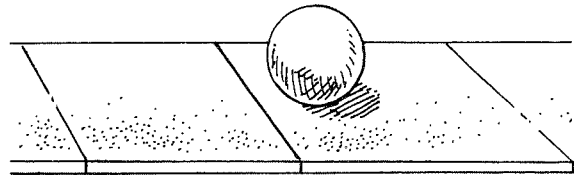
$$v = 2000 \text{ m/sec}$$

■ Potential Energy: Applying the Main Ideas—Part 2

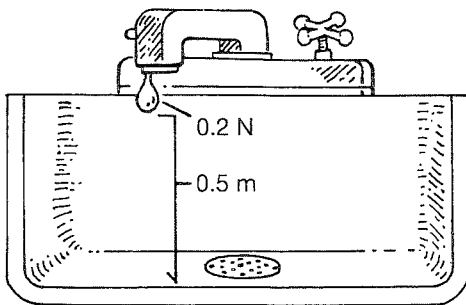
Calculate the gravitational potential energy for each situation. Be aware that the GPE *could* be zero in some cases.



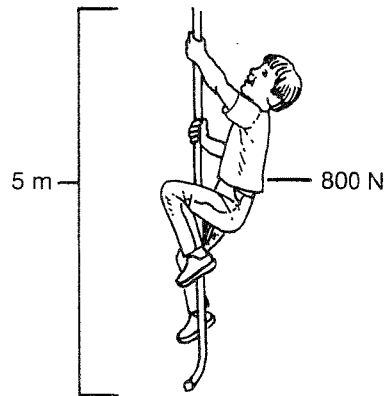
1. _____



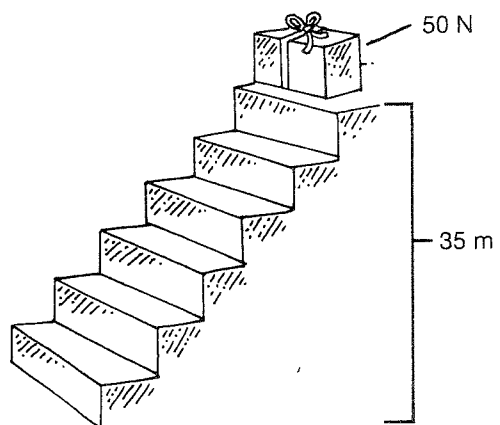
2. _____



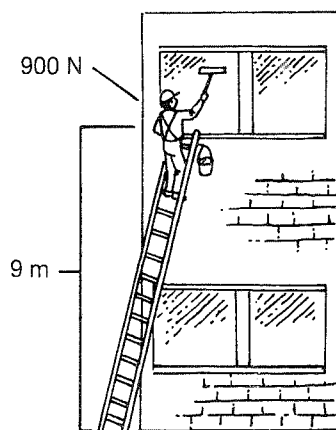
3. _____



4. _____



5. _____



6. _____

SECTION
5-3

Energy Conversions

(pages 116–119)

KEY CONCEPTS

▲ One of the most common energy conversions involves the changing of potential energy to kinetic energy or kinetic energy to potential energy.

▲ All forms of energy can be converted to other forms.

Building Vocabulary Skills: Expanding Definitions

Using the following words, write a paragraph in which you discuss the meaning of the term **energy conversion**.

change

potential

forms

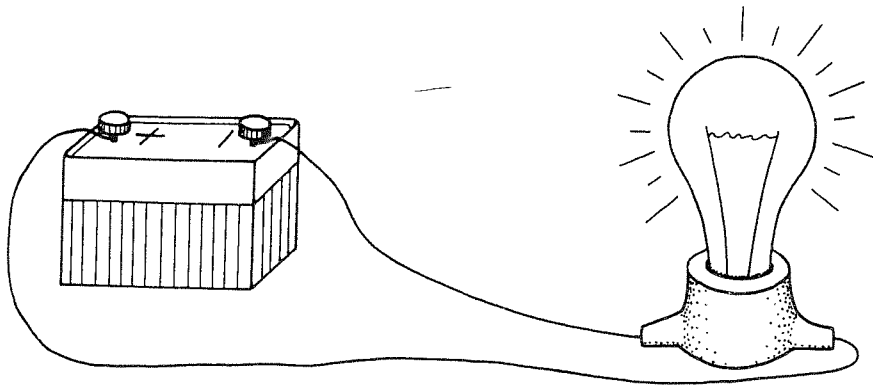
kinetic

Tracking Energy Conversions: Understanding the Main Ideas

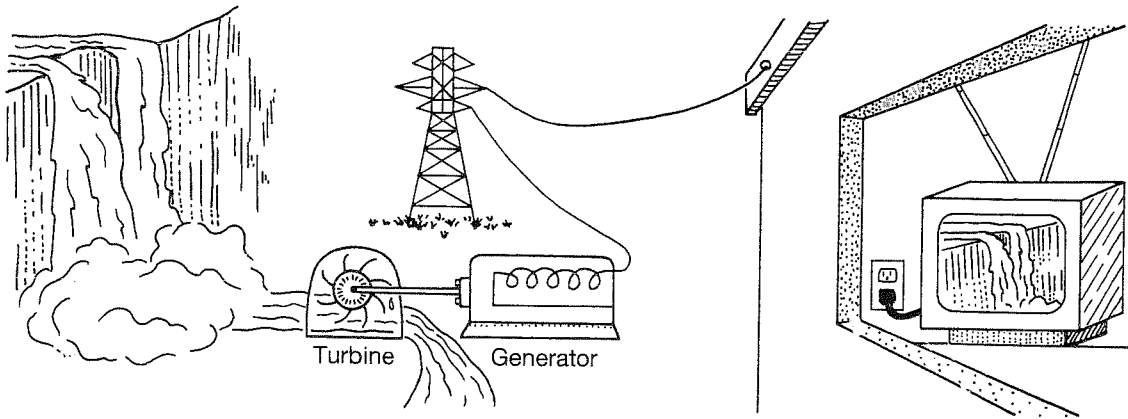
Describe the energy conversions that are occurring in each of the following situations.



1. _____



2. _____



3. _____

SECTION

5-4 Conservation of Energy

(pages 119–121)

KEY CONCEPTS

- ▲ The law of conservation of energy states that energy can be neither created nor destroyed by ordinary means.

■ Conservation of Energy: Using the Main Ideas

Tell how each situation described below can be explained by the law of conservation of energy. Be sure to consider Einstein's modification of the law as you write your explanations.

1. After running your computer printer for several minutes, you notice that the printhead is very hot.

2. A machine in a box factory that has 7,000 Joules of work put into it produces only 5,000 Joules of useful work.

3. The nucleus of a uranium atom splits, producing a krypton nucleus, a barium nucleus, and energy.

4. You push a heavy box across the floor, managing to move it only about 1.5 meters. You are exhausted. As you look behind you, you see burn marks on the floor where the box has been.

5. In the sun, 4 hydrogen nuclei come together and produce a helium nucleus, 2 positrons (positively-charged electrons) and a huge amount of energy.

SECTION

5-5 Physics and Energy

(pages 121-125)

KEY CONCEPTS

- ▲ The topic of energy is essential to learning about any subject in physical science.

Physics and Energy: Using the Main Ideas

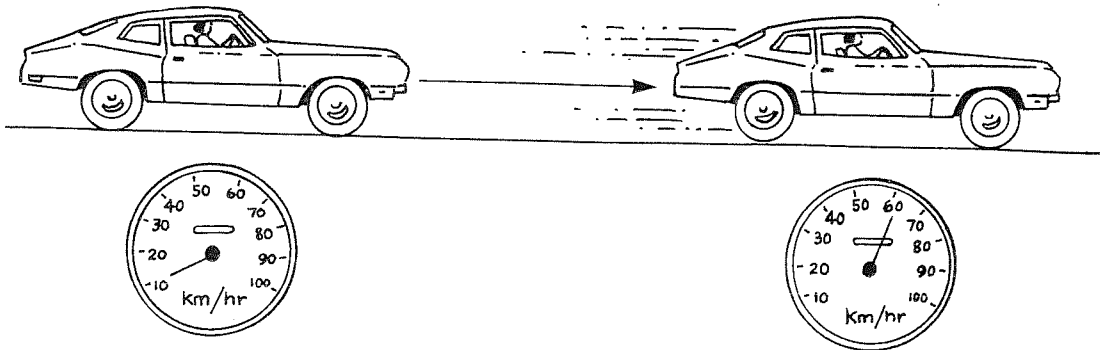
For each of the situations pictured below, tell how energy is related to one of the following physical principles:

force

momentum

power

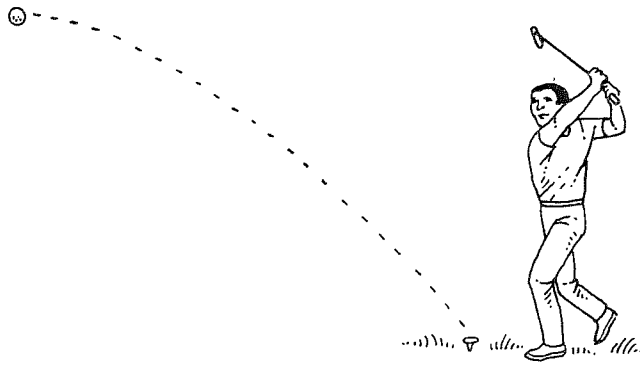
speed



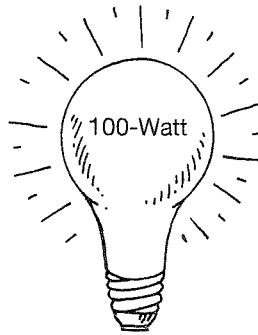
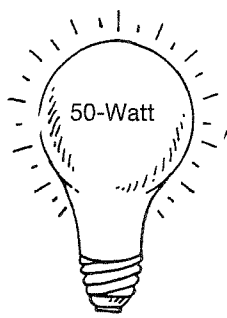
1. _____



2. _____



3. _____



4. _____

