Name Date

Section 8.2 Summary

# Electric Current

*Textbook pages 280–289*

## *Before You Read*

What is needed for a light bulb to light up? Write your ideas on the lines below.

_____

_____

*Mark the Text*

**Check for Understanding**

As you read this section, be sure to reread any parts you do not understand. Highlight any sentences that help you develop your understanding.

## What is needed for charges to move through an electric circuit?

A continuous movement of charge through a conductor is called **current electricity**. A complete pathway through which electrons can flow is called an **electric circuit**. An electric circuit has the following basic parts:

- There must be a *source* of electrical energy. This may be a battery or a wall outlet.
- There must be a *conductor* through which charges can move. This is usually a metal wire.
- There must be a device, called a *load*, which converts electrical energy into other forms of energy such as light or sound. Light bulbs, speakers, heaters, and motors are examples of loads.
- There may be a *switch*—a device that can control the movement of charges in the circuit by turning it on (closing the circuit) or turning it off (opening the circuit). ✔

*Reading Check*

**1.** What is an electric circuit?

_____

_____

_____

## What is electric current and how is it measured?

An electrical source such as a battery provides energy to push negative charges through the conducting wires in a circuit. This movement of charge is called *current*. **Electric current** is the amount of charge that passes a point in a conducting wire each second.

Electric current is measured in units called **amperes** (A). A current of one ampere (1.0 A) is produced when 1.0 C (coulombs) of charged particles move past a point in a circuit each second. Electric current is measured with a device called an **ammeter**. ✔

*Reading Check*

**2.** What is the name of the device used to measure electric current?

_____

## What does an electric circuit look like?

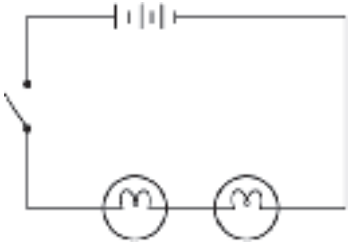
The parts of a circuit can be drawn with symbols to show how the circuit is connected. A picture that is made using these symbols to represent an actual circuit is called a **circuit diagram**.

Examples of symbols used in circuit diagrams:

| | |
|---|---|
| conducting wire | bulb |
| cell | open switch |
| battery | closed switch |
| voltmeter | ammeter |

A

B

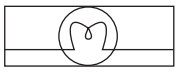


This circuit diagram (B) shows the parts of the circuit (A). Find each of the objects from circuit A in circuit B.

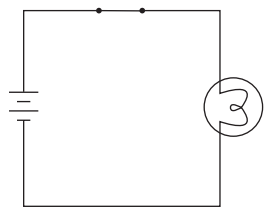
*Use with textbook pages 280–285.*

# Identifying circuit symbols

**Match the Term in the first column with the correct Illustration and Circuit Symbol in the other two columns. Place the corresponding letter and Roman numeral in the blank spaces provided.**

| Term | Illustration | Circuit Symbol |
|---|---|---|
| **1.** bulb _____ _____ | **A.**  | **I.**  |
| **2.** battery _____ _____ | **B.**  | **II.**  |
| **3.** open switch _____ _____ | **C.**  | **III.** _____ |
| **4.** closed switch _____ _____ | **D.**  | **IV.**  |
| **5.** conducting wire _____ _____ | **E.**  | **V.**  |

**List all the parts in the following electrical circuit.**

**6.** 

*Use with textbook pages 280–285.*

# Drawing circuit diagrams

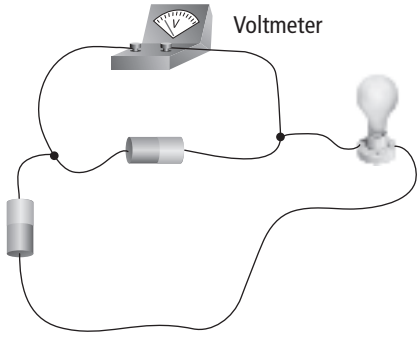
**Use circuit symbols to draw circuit diagrams for each of the following.**

**1.**

**2.**

**3.**

**4.**



*Use with textbook pages 280–285.*

# True or false?

**Read the statements given below. If the statement is true, write "T" on the line in front of the statement. If it is false, write "F" and rewrite the statement to make it true.**

**1.** _____ An electric circuit is a complete pathway through which electrons can flow.

**2.** _____ An electric load transforms light energy into electrical energy.

**3.** _____ Light bulbs, heaters, and batteries are all examples of electric loads.

**4.** _____ The wire through which electric current flows is a conductor.

**5.** _____ A switch is the source of electric potential energy in a circuit.

**6.** _____ Circuit diagrams use circuit symbols to illustrate actual electrical circuits.

**7.** _____ Current electricity is charge that remains stationary on an insulator.

**8.** _____ Electric current is the amount of charge passing a point in a conducting wire each second.

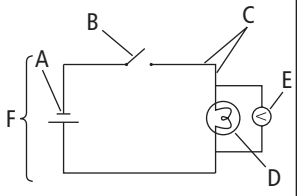
**9.** _____ Electric current is measured in volts.

**10.** _____ An ammeter is used to measure the current in a circuit.

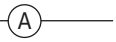
*Use with textbook pages 280–285.*

# Electric current

**Match each Term on the left with the letter on the Diagram on the right. Each letter on the Diagram may be used only once.**

| Term | Diagram |
|---|---|
| **1.** _____ cell<br>**2.** _____ bulb<br>**3.** _____ switch<br>**4.** _____ circuit diagram<br>**5.** _____ conducting wire |  |

## Circle the letter of the best answer.

**6.** What does the symbol  represent?

**A.** a load

**B.** a battery

**C.** a voltmeter

**D.** an ammeter

**7.** Which of the following are correctly defined?

| | |
|---|---|
| I. | ampere: unit for electric current |
| II. | ammeter: device used to measure current |
| III. | electric circuit: an incomplete pathway through which electrons can flow |

**A.** I and II only

**B.** I and III only

**C.** II and III only

**D.** I, II, and III

**8.** Which of the following is not an example of an electric load?

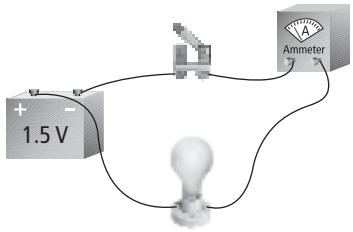
**A.** a motor

**B.** a heater

**C.** a light bulb

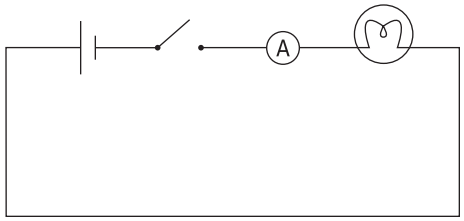
**D.** a generator

## Use the following diagram to answer question 9.

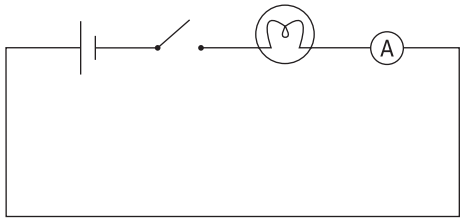



**9.** Which circuit diagram represents the illustration shown above?

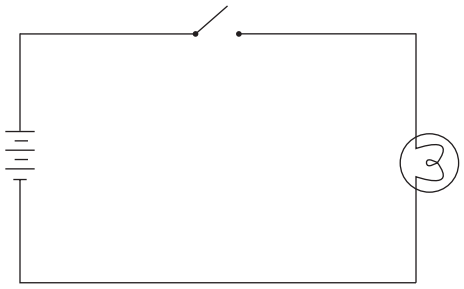
**A.**




**B.**




**C.**



**D.**