

20-4

What are two kinds of electric current?

Objective

Differentiate between direct current and alternating current.

Key Terms

electric current: flow of electric charge through a conductor

direct current: current in which electrons always flow in the same direction

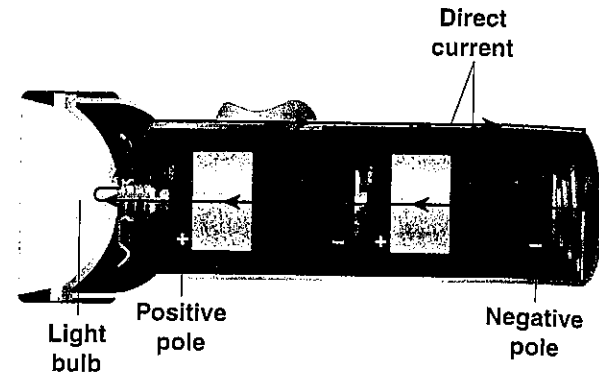
alternating current: current in which electrons constantly change direction at a regular rate

Useful Electricity You have learned that the electric charges that build up on objects with static electricity do not flow. Instead, these negative charges can jump between objects. Static electricity cannot be used to run the electrical appliances in your home. In order for electricity to be useful, the electric charges must flow steadily.

When a conductor is connected to an appliance and to the opposite poles of a battery, electrons will flow steadily through the conductor. The flow of electric charge through a conductor is called an **electric current**. An electric current is like a stream of water. However, instead of a flow of water, it is a continuous flow of electrons.

1 **EXPLAIN:** Why can static electricity not be used to run electrical appliances?

Direct Current An electric current in which charges flow in one direction only is called **direct current (DC)**. The current produced by electrochemical cells, including dry cells, is direct current. Figure 20-11 shows two dry cells in a flashlight. When the flashlight is turned on, the electric current produced by the dry cells keeps the bulb lit. Notice that the current flows in one direction.

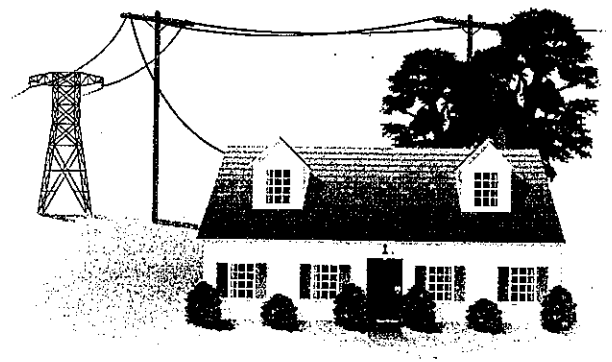


▲ Figure 20-11 The arrows show the path followed by direct current in a flashlight.

2 **DEFINE:** What is direct current?

Alternating Current A second type of electric current does not flow in one direction only. An **alternating current (AC)** constantly changes direction at a regular rate. Most of the electricity found in homes, schools, and businesses is alternating current.

The main advantage of alternating current over direct current is that alternating current can be transported more easily over long distances. Another advantage is that the voltage of an alternating current can be increased or decreased.



▲ Figure 20-12 Electricity from power plants travels as alternating current to homes.

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Lesson Review

Write *true* if the statement is true. If the statement is false, change the underlined term to make the statement true. Write your answers in the spaces provided.

- _____ 1. An electric current is the flow of electric charges through an insulator.
- _____ 2. Direct current flows in only one direction.
- _____ 3. Most homes use direct current.
- _____ 4. The current that comes from a wall outlet is alternating current.
- _____ 5. Alternating current changes direction at a regular rate.
- _____ 6. It is easier for machines that generate electricity to produce direct current.
- _____ 7. Batteries provide direct current.
- _____ 8. Alternating current cannot be changed to direct current.

Skill Challenge

Skills: *applying, classifying*

PART A Decide whether each statement below describes direct current or alternating current. If the statement describes direct current, write *DC* in the space provided. If the statement describes alternating current, write *AC*.

- _____ 1. You go to the beach and take your battery-operated portable radio.
- _____ 2. In science class, you construct an electric circuit with a lemon battery.
- _____ 3. You plug in your hair dryer and dry your hair.
- _____ 4. An electric power company in your area uses long cables to send power to homes, schools, and offices.
- _____ 5. You watch a video on a VCR that is plugged into a wall outlet.

PART B Think of at least three items you have used today that required an electric current. List these items below. Then, write *AC* or *DC* to indicate the kind of current these items use.

1. _____
2. _____
3. _____