

Electricity • Guided Reading and Study

Electrical Safety (pp. 715-717)

This section describes measures that help protect people from electrical shocks and short circuits.

Use Target Reading Skills

Before you read, write what you know about electrical safety in the graphic organizer below. As you read, write what you learn.

What You Know
1. An electric shock can be dangerous.
2. 3 Prong switch
3. Circuit Breaker

What You Learned
1. Fatal, fires with electricity in people
2. 3 prong plug helps protect people
3. Circuit breaker trips if it gets too hot.

Personal Safety (pp. 715-716)

1. What are three potential dangers when high-voltage wires are damaged?
 - a. Short circuits
 - b. electric shocks
 - c. ungrounded wires
2. What is a short circuit?
A connections allows current to take path of least resistance

Electricity • Guided Reading and Study**Electrical Safety** (continued)

3. Circle the letter of the sentence that explains why current can be very high in a short circuit.
- The current goes back to the electric plant.
 - The intended path has less resistance than the unintended path.
 - The resistance is highest in high-voltage wires.
 - The unintended path has less resistance than the intended path.
4. Why can an electric shock interfere with the body's functioning?
Electrical signals in human body
control breathing/heartbeat/and
muscle movement.
5. Is the following sentence true or false? The severity of an electric shock depends on the current. True
6. Most buildings have a wire that connects all electric circuits to the ground.
7. A plug's round prong, which connects any metal pieces of an appliance to the ground wire of a building, is called the 3 prong.
8. Circle the letter of the sentence that explains what it means when a circuit is electrically grounded.
- Charges always flow from the intended path to the unintended path.
 - Charges are able to flow through the ground instead of through water in the event of a short circuit.
 - Resistance increases throughout a parallel circuit in the event of a short circuit.
 - Charges are able to flow directly from the circuit into the ground connection in the event of a short circuit.

Breaking a Circuit (p. 717)

9. What might happen if the electric current in an overloaded circuit becomes too high?
Overloaded circuit might heat wires
10. In order to prevent circuits from overheating, what are added to circuits?
Fuses / Circuit Breakers
11. What is a fuse?
Device that contains a thin
strip of metal that will melt
if there is too much current.

Electricity • Guided Reading and Study

12. Circle the letter of places where fuses are commonly found.

- a. cars
- b. new buildings
- c. old buildings
- d. circuit breakers

13. Is the following sentence true or false? A disadvantage of using a circuit breaker is that once it burns out, it must be replaced. False

14. What is a circuit breaker?

A reusable safety switch that breaks the circuit when current gets too high

15. Complete the table about fuses and circuit breakers.

Fuses and Circuit Breakers		
Device	What Happens When Overloaded	To Restore Current to Circuit
a. <u>Fuse</u>	Metal strip melts.	b. <u>Replace fuse</u>
c. <u>Circuit Breaker</u>	Metal band bends away from wires.	d. <u>Pull back switch</u>

Electricity • Key Terms

Key Terms

Match each definition in the left column with the correct Key Term in the right column. Then write the number of each term in the appropriate box below. When you have filled in the boxes, add the numbers in each column, row, and two diagonals. All the sums should be the same.

- | | |
|---|---|
| <p>A. The movement of electrons to one part of an object by the electric field of another object</p> <p>B. A device that contains a thin strip of metal that will melt if there is too much current through it</p> <p>C. The difference in electrical potential energy between two places</p> <p>D. The transfer of electrons from a charged object to another object by direct contact</p> <p>E. An electric circuit with only one path for current to take</p> <p>F. A device that measures current</p> <p>G. The rate at which energy is transferred from one form to another</p> <p>H. An electric circuit with several paths for current to take</p> <p>I. A substance that conducts electric current in an electrochemical cell</p> | <p>1. fuse</p> <p>2. power</p> <p>3. ammeter</p> <p>4. electrolyte</p> <p>5. series circuit</p> <p>6. induction</p> <p>7. conduction</p> <p>8. voltage</p> <p>9. parallel circuit</p> |
|---|---|

A <u>6</u>	B <u>1</u>	C <u>8</u>
D <u>7</u>	E <u>5</u>	F <u>3</u>
G <u>2</u>	H <u>9</u>	I <u>4</u>

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