

Electricity • Guided Reading and Study

Electric Current (pp. 692–699)

This section explains how an electric current is produced, and what conductors and insulators are. It also describes how electric charges flow in a circuit.

Use Target Readings Skills

As you read, make an outline about electric current. Use the red headings for the main ideas and the blue headings for the supporting ideas.

Electric Current	
I.	Flow of Electric Charges A. What is Electric Current? B. <u>Current in a Circuit</u>
II.	<u>Conductors and Insulators</u> A. <u>conductors</u> B. <u>insulators</u>
III.	<u>Voltage</u> A. <u>Charges Need Energy to Flow</u> B. <u>Voltage Sources</u>
IV.	<u>Resistance</u> A. <u>Current Depends on Resistance</u> B. <u>Factors that Determine Resistance</u> <u>Path of least Resistance</u>

Flow of Electric Charges (pp. 693–694)

1. What is electric current?

The continuous flow of electric charges through material

2. Circle the letter of each word or abbreviation that represents the unit for the rate of current.

- a. amp
- b. A
- c. charge
- d. ampere

3. Is the following sentence true or false? The number of amps describes the amount of charge flowing past a given point each second. True

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Electric Current (continued)

4. What must occur to produce electric current?

Charges must flow continuously from one place to another.

5. A complete, unbroken path through which electric charges can flow is a(n)

electric circuit.

Conductors and Insulators (p. 695)

6. Is the following sentence true or false? Electric charges flow easily through every material. false

7. Complete the table about conductors and insulators.

Conductors and Insulators		
Material	Description	Examples
a. <u>conductors</u>	A material through which charges can flow easily.	b. <u>aluminum Copper Silver iron</u>
c. <u>Insulators</u>	A material through which charges cannot move easily.	d. <u>Rubber glass Sand</u>

8. Why are conduction electrons able to move throughout a conductor?

In a conductor, atoms contain electrons that are loosely bound

9. On an appliance cord, what is the conductor and what is the insulator?

The inner wire is the conductor, and the rubber coating is the insulator

Voltage (pp. 696–697)

10. What is the energy an object has as a result of its position?

Potential Energy

11. Is the following sentence true or false? Charges in an electric circuit flow because of a difference in electrical potential energy. True

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12. Circle the letter of each term for the difference in electrical potential energy between two places in a circuit

- a. current
- b. voltage
- c. voltage source
- d. potential difference

13. The unit of measure of voltage is the Volt (V)

14. Is the following sentence true or false? Height causes current in an electric circuit.
 False

15. What is a voltage source?

A device that creates a potential difference in an electric circuit.

16. Circle the letter of each example of a voltage source.

- a. motor
- b. generator
- c. battery
- d. conveyor belt

Resistance (pp. 698–699)

17. What is resistance?

The measure of how difficult

18. Is the following sentence true or false? The greater the resistance, the less current there is for a given voltage. True

19. The unit of measure of resistance is the Ohm (Ω)

20. What are four factors that determine the resistance of a wire or any object?

- a. The material from which the wire is made
- b. length
- c. Diameter
- d. Temperature of the wire

21. Circle the letter of each statement that is true about resistance in a circuit.

- a. Long wires have more resistance than short wires.
- b. The electrical resistance of most materials decreases as temperature increases.
- c. Thick wires have more resistance than thin wires.
- d. Conductors have low resistance.

22. Is the following sentence true or false? If an electric charge can flow through either of two paths, more charge will flow through the path with the higher resistance.

False