

Chapter 20 Electricity

## Section 20.2 Electric Current and Ohm's Law

(pages 604–607)

*This section discusses electric current, resistance, and voltage. It also uses Ohm's law to explain how voltage, current, and resistance are related.*

### Reading Strategy (page 604)

**Predicting** Before you read, write a prediction of what electric current is in the table below. After you read, if your prediction was incorrect or incomplete, write what electric current actually is. For more information on this Reading Strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.

Electric Current	
Electric Current Probably Means	Electric Current Actually Means
Sample answer: Current is moving charge.	Electric current is a continuous flow of charge.

### Electric Current (page 604)

1. What is electric current? Electric current is a continuous flow of charge.
2. Use the words in the box to complete the following table about electric current.

Two directions	Flashlight
One direction	Home or school

Electric Current		
Type of Current	How Charge Flows	Examples
Direct	One direction	Flashlight
Alternating	Two directions	Home or school

### Conductors and Insulators (page 605)

3. What is an electrical conductor? An electrical conductor is material through which charge can easily flow.
4. What is an electrical insulator? An electrical insulator is material through which charge cannot easily flow.
5. Is the following sentence true or false? Metals are good conductors because they do not have freely moving electrons. false

**Chapter 20 Electricity**

Match each material to the category of a conductor or insulator.

Material	Category
<u>  a  </u> 6. Copper	a. conductor
<u>  b  </u> 7. Plastic	b. insulator
<u>  b  </u> 8. Rubber	
<u>  a  </u> 9. Silver	
<u>  b  </u> 10. Wood	

**Resistance (page 605)**

11. Circle the letter of each factor that affects a material’s resistance.

- a. its length
- b. its temperature
- c. its thickness

12. What is a superconductor? A superconductor is a material that has almost zero resistance when it is cooled to low temperatures.

**Voltage (page 606)**

Match each term to its definition.

Definition	Term
<u>  c  </u> 13. A device that converts chemical energy to electrical energy	a. flow of charge
<u>  a  </u> 14. Requires a complete loop	b. voltage
<u>  b  </u> 15. The difference in electrical potential energy between two places in an electric field	c. battery

16. Is the following sentence true or false? Three common voltage sources are batteries, solar cells, and generators.   true  

**Ohm’s Law (page 607)**

17. Is the following sentence true or false? According to Ohm’s law, the voltage in a circuit equals the product of the energy and the resistance.

  false  

18. Is the following sentence true or false? Doubling the resistance in a circuit will halve the current if voltage is held constant.

  true