

Chapter 20 Electricity

Section 20.3 Electric Circuits

(pages 609–613)

This section describes circuit diagrams and types of circuits. It also explains calculation of electric power and electric energy and discusses electrical safety.

Reading Strategy (page 609)

Relating Text and Visuals As you read about household circuits, complete the table by listing three things the diagram in Figure 13 helps you understand about circuits. 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.

Understanding a Circuit Diagram
What Can Be Seen in the Circuit Diagram?
Wire bringing current from outside

Circuit Diagrams (pages 609–610)

- Circuit diagrams use _____ to represent parts of a circuit, including a source of electrical energy and devices that are run by the electrical energy.

Match each symbol to what it indicates on a circuit diagram.

Symbol	What Symbol Indicates
_____ 2. +	a. The direction of current
_____ 3. -	b. A negative terminal
_____ 4. →	c. A positive terminal

Series Circuits (page 610)

- Is the following sentence true or false? In a series circuit, if one element stops functioning, then none of the elements can operate.

- Explain why the bulbs shine less brightly when more bulbs are added to a series circuit. _____

Parallel Circuits (page 610)

- Is the following sentence true or false? Circuits in a home are rarely wired in parallel. _____
- If one element stops functioning in a parallel circuit, the rest of the elements _____.

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Power and Energy Calculations (pages 611–612)

9. The rate at which electrical energy is converted to another form of energy is called _____.
10. The SI unit of electric power is the joule per second, or _____, which is abbreviated _____.
11. Is the following sentence true or false? Electric power is calculated by multiplying current times voltage. _____
12. Write the formula for calculating electrical energy.

13. The unit of energy usually used by electric power companies is the _____.

Electrical Safety (pages 612–613)

14. Circle the letters of what could happen if the current in a wire exceeds the circuit’s safety limit.
 - a. The wire could overheat.
 - b. The wire could get cooler.
 - c. A fire could start.
 - d. A fuse could blow.
15. Explain how a fuse prevents current overload in a circuit. _____

16. A switch that opens to prevent overloads when current in a circuit is too high is called a(n) _____.
17. Explain why touching an electrical device with wet hands is dangerous. _____

18. Is the following sentence true or false? A ground-fault circuit interrupter shuts down the circuit if the current flowing through the circuit and current returning to ground are equal.

19. The transfer of excess charge through a conductor to Earth is called _____.
20. Complete the following table about equipment used to prevent electrical accidents.

Equipment to Prevent Current Overload	Equipment to Protect People from Shock	Equipment to Prevent Short Circuits
a. Circuit breaker	b. c. Grounding wire d.	e.