Chapter 11 Review

Make Your Own Summary

Summarize the key concepts of this chapter using a graphic organizer. The Chapter Summary on the previous page will help you identify the key concepts. Refer to Study Toolkit 4 on pages 566–567 to help you decide which graphic organizer to use.

Reviewing Key Terms

1. A(n) _____ cell consists of two _____ and a(n) _____. (11.1)

2. The lithium ion cell in a camera is classified as a dry cell and a(n) _____. (11.1)

3. If there is no current in a circuit that is attached to a source of electricity, it is a(n) _____. (11.2)

4. The _____ is a unit that is equivalent to a coulomb per second. (11.2)

5. Any device that transforms electrical energy into heat or other forms of energy is called a(n) _____. (11.2)

6. In a(n) _____, the current divides among different pathways. (11.3)

7. When electric charge flows through a material with no resistance, the material is a(n) _____. (11.4)

8. The ratio of potential difference to current is called _____. (11.4)

Knowledge and Understanding K/U

9. Compare and contrast a wet cell and a dry cell.

10. Compare and contrast a cell and a battery.

11. Explain how a fuel cell differs from other types of cells.

12. Which one of these two wires has the greater resistance: a wire that is long and thin, and made of silver; or a wire that is short and thick, and made of copper? Give reasons for your choice.

13. Explain how a circuit with only series connections differs from a circuit with a parallel connection.

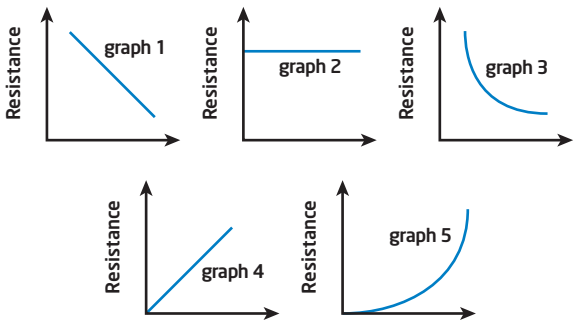
14. Describe two changes you could make to a circuit that would increase the current.

15. State four properties of a wire that affect the resistance of the wire. Describe how a change in each property will change the resistance of the wire.

16. If you connect additional resistors in parallel in the same circuit, will the resistance of the circuit be larger or smaller? Explain your answer.

Thinking and Investigation

17. Examine the graphs below.



a. When the horizontal axis represents the length of wire, which graph best shows the relationship between resistance and length? State your reasoning.

b. When the horizontal axis represents the current, which graph represents a conductor that obeys Ohm's law? Explain your answer.

18. Write Ohm's law in a form that can be used to calculate

a potential difference

b resistance

c current

19. Ayisha was investigating the electric circuit in a flashlight. She wanted to find out the relationships among the number of cells, the potential difference across the bulb, and the current in the circuit. Her data are recorded in the table below.

Measurements in a Flashlight Circuit

Number of Cells	Potential Difference (V)	Current (A)
1	1.52	0.10
2	3.01	0.15
3	4.47	0.18
4	5.99	0.20

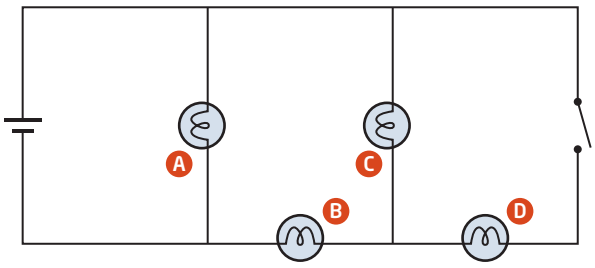
a. Plot the data, with potential difference on the vertical axis and current on the horizontal axis. Give your graph a title.

b. Draw the line of best fit for the data.

c. At first, Ayisha was not sure that the bulb was working because she could not see it glowing with one cell in the circuit. With four cells, however, the bulb glowed brightly. Explain these observations.

d. Explain the shape of your graph.

20. In the circuit diagram below, which bulb(s) will be off if the switch is in the open position? State your reasoning.



21. Two different flashlight bulbs, labeled A and B, with filaments of the same material, are connected in series to a 6 V battery. The filament in bulb A is longer than the filament in bulb B.

a. Which bulb glows brighter?

b. Which bulb has the greater current through it?

c. Which bulb has the greater potential difference between its terminals?

d. Which bulb has the greater resistance?

Communication C

22. BIG IDEAS Is a secondary cell a renewable or a non-renewable source of electrical energy? Explain your answer.

23. BIG IDEAS Write an essay in which you predict the social, economic, and environmental implications of using electrical energy to power vehicles rather than gasoline or diesel.

24. BIG IDEAS Relatively few applications make use of static electricity, while many applications use current electricity. Describe the properties of static and current electricity that account for this difference.

25. A working knowledge of electronics and computers is required in a number of trades, such as automotive service technician. Talk to a technician with these skills and summarize what work they do, the training they received, and their apprenticeship program.

Application A

26. Bulbs that flash on and off are often used in advertising.

a. Draw a diagram of a circuit used for this purpose.

b. What is the effect on the brightness of the other bulbs in a circuit when a flashing bulb is connected in series?

c. What is the effect on the brightness of the other bulbs when a flashing bulb is connected in parallel?

27. A fluorescent light tube contains a gas at low pressure, usually mercury vapour. Research the purpose of a device called a ballast, which is in series with the fluorescent tube and increases the resistance of the circuit.

28. A multimeter can be used to measure the resistance of a load in one step. Outline how this is possible.