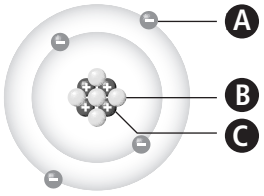
Use with textbook pages 248–254.

Static charge

Match each Term on the left with the corresponding Diagram label on the right. Each label may be used more than once.

Term	Diagram
1. _____ proton **2.** _____ neutron **3.** _____ electron **4.** _____ has no charge **5.** _____ has a positive charge **6.** _____ has a negative charge **7.** _____ can move from one atom to another **8.** _____ and _____ make up the nucleus (name 2 parts of the atom)	

Circle the letter of the best answer.

9. A neutral object has exactly the same number of

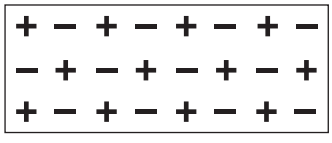
A. protons and neutrons

B. protons and electrons

C. neutrons and electrons

D. protons, neutrons, and electrons

Use the following diagram to answer question 10.



10. What is the electric charge on the object shown above?

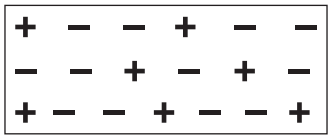
A. neutral

B. positive

C. negative

D. It is impossible to tell.

Use the following diagram to answer questions 11 and 12.



11. What is the electric charge on the object shown above?

A. neutral

B. positive

C. negative

D. It is impossible to tell.

12. Which of the following describes the object shown above?

A. It lost protons.

B. It lost electrons.

C. It gained protons.

D. It gained electrons.

13. A vinyl rod is rubbed with a cotton cloth. The vinyl rod becomes negatively charged and the cotton cloth becomes positively charged. Which of the following describes the cotton cloth?

A. It has gained electrons.

B. It has more electrons than protons.

C. It has more protons than electrons.

D. It has the same number of protons as electrons.

14. Which of the following is a good conductor?

A. glass

B. wood

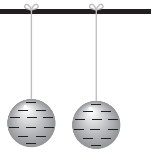
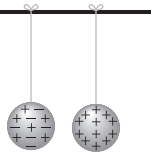
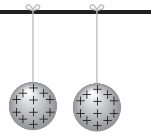
C. copper

D. fur

Use with textbook pages 258–262.

Electric force

Match each Diagram on the left with the best Descriptor on the right. Each Descriptor may be used more than once.

Diagram	Descriptor
1. ____  2. ____  3. ____  4. ____ 	**A.** suspended spheres will move away from each other **B.** suspended spheres will move toward each other **C.** suspended spheres will not move

Circle the letter of the best answer.

5. Which of the following applies to a neutral object?

I.	It is attracted to a positive surface.
II.	It is attracted to a negative surface.
III.	It has the same number of protons as electrons.

A. I and II only

B. I and III only

C. II and III only

D. I, II, and III

6. A negatively charged ruler is brought near a suspended ball. The ball is repelled by the ruler. What can you conclude from this observation?

A. The ball is neutral.

B. The ball is positively charged.

C. The ball is negatively charged.

D. The ball is either neutral or positively charged.

7. Two suspended balloons repel each other when brought close together. What can you conclude about the balloons?

A. They have opposite charges.

B. They both have the same charge.

C. One balloon is neutral and the other balloon is positively charged.

D. One balloon is neutral and the other balloon is negatively charged.

8. How does the electric force change as the amount of charge is increased?

A. It increases.

B. It decreases.

C. It stays the same.

D. It increases and then decreases.

9. Which of the following statements is true about the relationship between distance and electric force?

A. If the distance between charged objects decreases, the electric force decreases.

B. If the distance between charged objects decreases, the electric force stays the same.

C. If the distance between charged objects increases, the electric force increases.

D. If the distance between charged objects increases, the electric force decreases.

Use with textbook pages 270–275.

Electric potential energy and voltage

Match each Term on the left with the best Descriptor on the right. Each Descriptor may be used only once.

Term	Descriptor
1. _____ electrochemical cell	**A.** battery terminal
2. _____ potential energy	**B.** conducts electricity
3. _____ potential difference	**C.** converts chemical energy into electrical energy
4. _____ electrode	**D.** another name for voltage
5. _____ electrolyte	**E.** energy from motion
	F. stored energy

Circle the letter of the best answer.

6. Which of the following could be used to measure the amount of potential difference in a circuit?

A. electrode

B. voltmeter

C. electrolyte

D. electroscope

7. What is the unit for measuring potential difference?

A. volt (V)

B. second (s)

C. metre (m)

D. coulomb (C)

Use the following diagram to answer questions 8 and 9.

8. What is shown in the diagram above?

A. dry cell

B. wet cell

C. voltmeter

D. electroscope

9. Which of the following describes the electrolyte used in the object shown above?

A. a fluid

B. a moist paste

C. an acid solution

D. a copper electrode

10. Which of the following are different names for the same thing?

I.	battery
II.	electrochemical cell
III.	electric potential difference

A. I and II only

B. I and III only

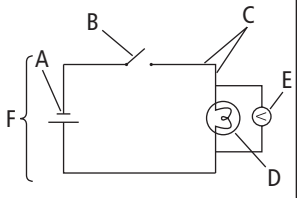
C. II and III only

D. I, II, and III

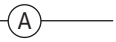
Use with textbook pages 280–285.

Electric current

Match each Term on the left with the letter on the Diagram on the right. Each letter on the Diagram may be used only once.

Term	Diagram
1. _____ cell **2.** _____ bulb **3.** _____ switch **4.** _____ circuit diagram **5.** _____ conducting wire	

Circle the letter of the best answer.

6. What does the symbol  represent?

A. a load

B. a battery

C. a voltmeter

D. an ammeter

7. Which of the following are correctly defined?

I.	ampere: unit for electric current
II.	ammeter: device used to measure current
III.	electric circuit: an incomplete pathway through which electrons can flow

A. I and II only

B. I and III only

C. II and III only

D. I, II, and III

8. Which of the following is not an example of an electric load?

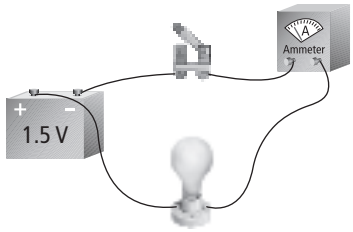
A. a motor

B. a heater

C. a light bulb

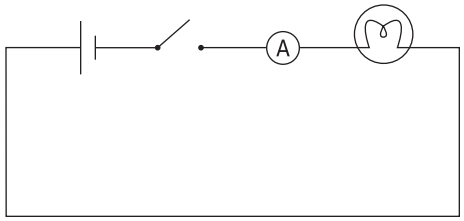
D. a generator

Use the following diagram to answer question 9.

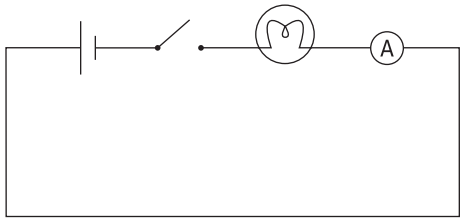


9. Which circuit diagram represents the illustration shown above?

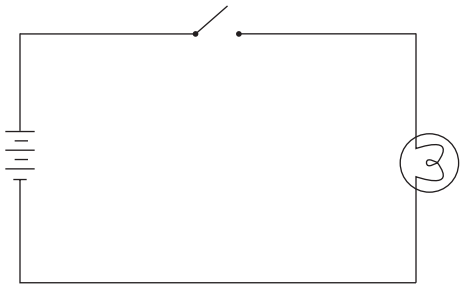
A.



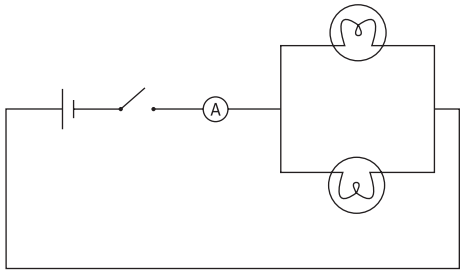
B.



C.



D.



Use with textbook pages 290–297.

Resistance and Ohm's law

Match the Formula or Unit on the left with the best Descriptor on the right. Each Descriptor may be used only once.

Formula or Unit	Descriptor
1. _____ $I = V \div R$	**A.** unit for voltage
2. _____ $R = V \div I$	**B.** unit for current
3. _____ $V = I \times R$	**C.** unit for resistance
4. _____ volts (V)	**D.** formula for voltage
5. _____ ohms (Ω)	**E.** formula for current
6. _____ amperes (A)	**F.** formula for resistance

Circle the letter of the best answer.

7. Which of the following correctly matches the devices with what they measure?

	Ammeter	Ohmmeter	Voltmeter
A.	current	voltage	resistance
B.	resistance	current	voltage
C.	voltage	resistance	current
D.	current	resistance	voltage

8. What is the name of the law given to the mathematical relationship between voltage, current, and resistance?

A. Ohm's law

B. Voltage's law

C. Ampere's law

D. Electricity's law

9. Which of the following describes resistance?

I.	It resists the flow of electrons.
II.	It speeds up the current flow in a circuit.
III.	It causes the electron's electrical energy to be converted to heat and light energy.

A. I and II only

B. I and III only

C. II and III only

D. I, II, and III

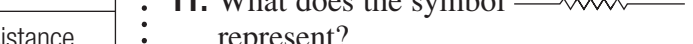
10. Which of the following occurs if resistance is increased in a circuit?

A. Both voltage and current will increase.

B. Both voltage and current will decrease.

C. Voltage will increase and current will decrease.

D. Voltage will decrease and current will increase.

11. What does the symbol  represent?

A. a load

B. a resistor

C. a voltmeter

D. an ammeter

12. A 6 V battery is connected to a 10 Ω resistor. What is the current flowing in the circuit?

A. 0.6 A

B. 1.67 A

C. 4 A

D. 60 A

Use with textbook pages 306–313.

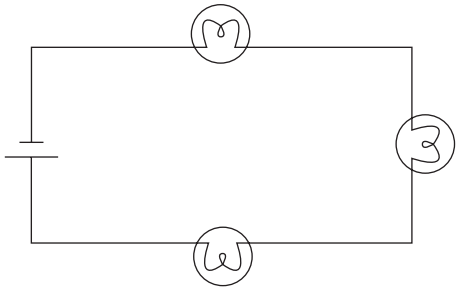
Series and parallel circuits

Match each Description on the left with the Circuit on the right. Each Circuit may be used more than once.

Description	Circuit
1. _____ Resistors decrease the total resistance of the circuit. **2.** _____ Resistors increase the total resistance of the circuit. **3.** _____ The voltages across each of the loads in the circuit add up to the voltage supplied by the source. **4.** _____ The voltages across each of the loads in the circuit are equal to each other and to the voltage supplied by the source. **5.** _____ The current through the whole circuit is the same throughout and is equal to the total current supplied by the source. **6.** _____ The current through each pathway of the circuit adds up to the total current supplied by the source.	**A.** series circuit **B.** parallel circuit

Circle the letter of the best answer.

Use the following diagram to answer questions 7 and 8.



7. The light bulbs are connected in parallel.

A. The statement is correct.

B. The statement is incorrect.

C. The diagram does not show whether the statement is correct or incorrect.

8. The current is the same throughout the entire circuit.

A. The statement is correct.

B. The statement is incorrect.

C. The diagram does not show whether the statement is correct or incorrect.

9. Which of the following statements applies to a series circuit?

I.	There are junction points in the circuit.
II.	There is only one path for electrons to flow.
III.	The total resistance is equal to the sum of the individual resistances.

A. I and II only

B. I and III only

C. II and III only

D. I, II, and III

10. Which of the following applies to a parallel circuit?

A. There is only one path for electrons to flow.

B. Adding a resistor to the circuit increases the total resistance.

C. The sum of the voltages lost on the resistors equals the total voltage supplied by the battery.

D. The total current entering a junction point must equal the sum of the current leaving the junction point.