

**Electricity** ▪ Guided Reading and Study

**Electric Charge and Static Electricity** (pp. 682–689)

This section describes how electric charges interact and explains what an electric field is. It also explains what static electricity is.

**Use Target Reading Skills**

Before you read, preview the figure *Transferring Electrons* in your text. Then write two questions that you have about the diagram in the graphics organizer below. As you read, answer your questions.

**Transferring Static Electricity**

Q. What are three ways static electricity can be transferred?
A. Charging by friction charging by conduction and charging by induction.
Q. Why does an object become charged?
A. An object becomes charged when electrons are transferred from one location to another.

**Electric Charge** (p. 683)

- The charge on a proton is called POSITIVE.
- The charge on an electron is called NEGATIVE.
- Circle the letter of each statement that is true about interactions between charges.
  - a. Charges that are the same repel each other.
  - b. Charged objects never attract each other.
  - c. Charges that are different attract each other.
  - d. Charged objects always repel each other.
- Why do protons repel protons but attract electrons?  
PROTONS & ELECTRONS HAVE DIFFERENT CHARGES.
- The interaction between electric charges is called  
ELECTRICITY

**Electricity** • Guided Reading and Study**Electric Charge and Static Electricity** (continued)**Electric Force** (p. 684)

6. What is electric force?

The attraction of repulsion between electric charges

7. What is a region around a charged object where the object's electric force is exerted on other charged objects?

electric field

8. Electric field lines are drawn with arrows to show the direction of the electric force.

9. Is the following sentence true or false? The greater the distance from a charged object, the stronger the electric field. false

10. When there are two or more charges, the electric fields of each individual charge combine by repelling or attracting.

**Static Electricity** (p. 685)

11. Circle the letter of the sentence that explains why there is no overall electric charge in a neutral object.

- a. In the object's atoms, each positive charge is balanced by a negative charge.
- b. The object's atoms contain no charged particles.
- c. The positive charges are attracted to other positive charges.
- d. In the object's atoms, negative charges outnumber positive charges.

12. How can an object become charged?

It can be charged by gaining or losing electrons

13. The buildup of charges on an object is called

Static electricity

14. If an object gains electrons, what will be its overall charge?

Negative

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**Transferring Charge** (pp. 686–688)

15. What law states that charges are not created or destroyed?

The law of conservation of charge

16. Complete the table about methods of transferring charge.

Transferring Charges	
Method	Definition
a. Friction	The transfer of electrons from one object to another by rubbing
b. Conduction	The transfer of electrons from a charged object to another object by direct contact
c. Induction	The movement of electrons to one part of an object by the electric field of another object

17. Suppose you dry your clothes in a dryer, and when you take them out they cling to one another. Why do they stick together?

In a dryer electrons from one fabric rubs off onto another.

18. An electric charge can be detected by an instrument called a(n)

electroscope

19. Why do the leaves of an electroscope repel each other when a charged object touches the metal knob?

The electric charge from the object travels from the knob, along the rod, and into the leaves. Since the charge on both leaves is the same, the leaves repel each other & move apart

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**Electric Charge and Static Electricity** (continued)

**Static Discharge** (pp. 688–689)

20. What happens when a negatively charged object and a positively charged object are brought near each other?

Electrons transfer until both objects have the same charge

21. The loss of static electricity as electric charges transfer from one object to another is called \_\_\_\_\_

Static discharge

22. Is the following sentence true or false? Lightning is an example of static discharge.

True