**Review: Static Electrcity**

Particle Model of Electricity

Structure of Atoms

Only electrons move. Electrons are negative.

Protons do not move because they are stuck in the nucleus with the neutrons. Protons are positive.

Law of Electrostatics (Law of attraction; Law of repulsion)

Opposite charges attract

Like (same) charges repel

3 Methods of Charging

Friction

– triboelectric series tells you which object gains electrons (stealers) and which one loses electrons

(givers)

Induction

-how to draw the charges in 2 objects being brought close to eachother

-insulators do not allow the electrons to move as freely as conductors do

-when objects are brought close together, they get a positive end and a negative end

(we say the object is polarized)

Conduction

-what happens when electrons start to flow

Predicting Electron Movement

Use the triboelectric series to tell which object gains electrons (better stealers of electrons) and which

object loses electrons (better givers of electrons)

Real-Life Applications

Balloon on the Wall

John Travoltage & the Electric Discharge

Lightning

More on p. 316, 317

**Review: Static Electricity Name:**

You may use your triboelectric series for this review!

Fill in the blanks with the appropriate letter from the lettered list below.

1. Charges that are alike \_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. The device demonstrated that can detect an electric charge is called \_\_\_\_\_\_\_\_\_\_\_\_\_
3. In a neutral material, how do the number of protons and electrons compare?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. If you rub a balloon on your hair, the balloon, which is rubber, will gain a

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ charge.

1. Static charges result from an imbalance of protons and which other subatomic

particle? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. This phrase describes how electrons move in an insulator \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Charging a material without touching but bringing it close to another is called

charging by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Objects can be charged by 3 methods: \_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_ and

\_\_\_\_\_\_\_\_\_\_\_\_\_.

1. Insulators \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ whereas conductors \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Metals, like copper and aluminum, make \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because they

allow \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

1. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_states that “Like electric charges \_\_\_\_\_\_\_\_\_\_ and

unlike electric charges \_\_\_\_\_\_\_\_\_\_”

11. An object with a charge of positive 2 has \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. In your drawings, neutral objects are attracted to charged objects because the electrons in the

neutral object could move close to the object (attract) or far from the object (repel). This type

of charging is called charging by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

13. To protect houses from lightning, we can place a conducting lightning rod to carry the electrons

away from the house and down into the ground. This is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

14. Caused anytime there is a separation of charges \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

15. Caused when there is a charge separation between earth and clouds \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. good insulators b. proton

c. lightning d. electron

1. good conductors f. prevent electron movement
2. electrons to move freely h. positive
3. electrons move only within their atom j. negative
4. equal number of electrons and protons l. neutral
5. more protons than electrons
6. more electrons than protons o, static electricity
7. repel q. attract
8. The Law of Attraction and Repulsion (Electrostatics)
9. The Law of Magnetism
10. an electroscope
11. induction v. friction

w. conduction

x. gained 2 electrons y. lost 2 electrons

z. ground

**Predicting Electron Movement**

1) Based on the demonstration, when a negatively charged rod is brought near an uncharged electroscope, the leaves will:

1. move together b) stay the same

c) move apart d) move together and apart again

2) When a negatively charged object touches a metal doorknob, the electrons will most likely

a) move into the doorknob causing an electric discharge

b) move out of the doorknob into the negatively charged object

3) Lightning involves friction because there is

a) an electric discharge

b) rubbing between ice, dust, hail particles

c) a negatively charged cloud coming near the ground. This repels the electrons in the ground

leaving the top of the ground positively charged

4) Lightning involves induction because there is

a) an electric discharge

b) rubbing between ice, dust, hail particles

c) a negatively charged cloud coming near the ground. This repels the electrons in the ground

leaving the top of the ground positively charged

5) Lightning involves conduction because there is

a) an electric discharge

b) rubbing between ice, dust, hail particles

c) a negatively charged cloud coming near the ground. This repels the electrons in the ground

leaving the top of the ground positively charged

6) Using the triboelectric series, if you rubbed two identical objects together,

a) they attract each other

b) they would repel each other

c) they would neither attracts nor repel eachother

7) Static cling is more likely to result in the clothes drier when clothes made of the same fabric are dried together. a) True

b) False

8) A negatively charges a plastic rod is brought close to a small bit of paper. The paper is attracted to the comb. The object

a) is negatively charged

b) is positively charged

c) is neutral

**Drawings**

9) A balloon is rubbed on your hair and brought near a neutral wall. The balloon

“sticks” to the wall. List the method of charging in each of the steps of this process below.

Draw a diagram showing the type and positions of the charges on the objects as they go through this process. (for the hair, just draw one large strand of hair)

Balloon and hair rubbing Balloon and neutral wall

Method of charging: \_\_\_\_\_\_\_\_\_\_\_ Method of charging: \_\_\_\_\_\_\_\_\_\_\_\_\_

Explain why the charged balloon is attracted to a neutral wall. Use proper vocabulary. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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