

Name _____ Date _____ Period _____

Lab: Investigating Charged Rods and Neutral Pith Ball

CHAPTER 20: STATIC ELECTRICITY

Background: Static electricity is the situation where electrical charges build up on the surface of a material. It is called “static” because there is no current flowing as in AC or DC electricity. Static electricity is usually caused when materials are rubbed together. The result is that objects may be attracted to each other or may even cause a spark to jump from one object to the other. Common examples of static electricity in action are static cling, flyaway hair and the sparks that can occur when you touch something.

Procedure:

1. Open the following website: <http://physics.weber.edu/amiri/director/dcrfiles/electricity/pithBallS.dcr>
2. Read the directions concerning the “Button Glossary”
3. Answer the questions below utilizing the simulation provided on the website

Questions:

1. What are the two rods that can be selected in this simulation?
2. What is the charge on each type of rod?
3. What is the initial charge on the pith ball?
4. Click on the negatively charged rod until a hand appears holding it. Use your mouse to move the negative rod toward the neutral pith ball. Which way does the pith ball move relative to the rod?
5. What migration of charge is illustrated on the surface of the pith ball as the negative rod moves near the pith ball? Illustrate this in the diagram below.
6. Touch the negative rod to the pith ball. What charge does the pith ball now have? Why?

7. How does the simulation illustrate the increase in the electrostatic force as the negative rod is placed closer to the pith ball?

8. Press the reset button at the top of the screen. How is the charge removed from the pith ball?

9. What is the charge on the pith ball after grounding (touching it with your hand)?

10. Select the glass rod. What is the charge on the glass rod? _____ Pith ball? _____

11. Bring the glass rod near the pith ball without touching it. Is the pith ball attracted toward the glass rod? Why does this occur?

12. Touch the glass rod to the pith ball. What is the charge on the pith ball after the touch?

13. Explain which charge appears to be transferred during the time when the charged rod touches the pith ball.

14. If a glass rod is brought near a negatively charged pith ball will they attract or repel?

15. If a rubber rod is brought near a negatively charged pith ball will they attract or repel?

16. When will the pith ball be attracted to a glass rod? (2 conditions needed for this question!)