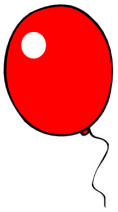
A-day: Due Wed., Apr 8
B-day: Due Thurs., Apr 9

2009 Electricity 4

Name: _____



1. A. Is a balloon a conductor or an insulator?
   B. If the left side of the balloon is rubbed with fur, does it become positive or negative?
   C. Can electrons move across the balloon?
   D. What is the charge of the right side of the balloon?

2. This time two balloons are rubbed with fur on all sides.
   A. What happens when the two balloons hang next to each other?

   B. The balloons are charged by _____.

3. One of the charged balloons is then moved next to a stream of water coming out from a water faucet.
   A. What happens?

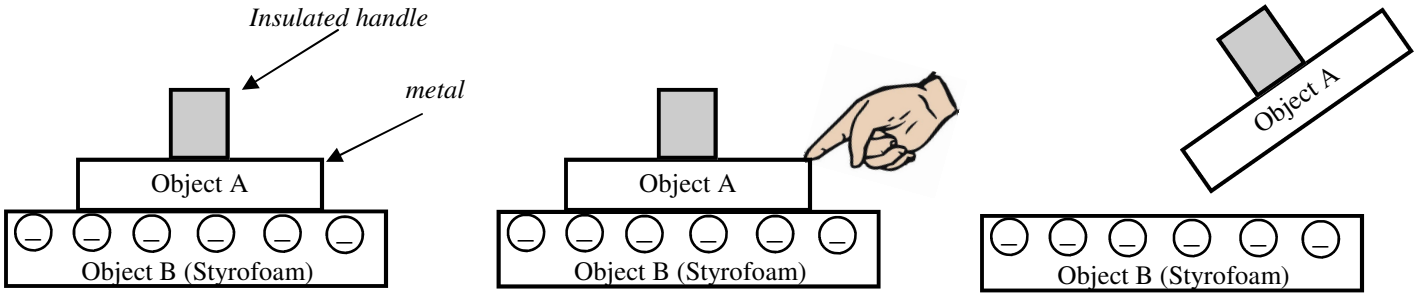
   B. Why? (*Be sure to talk about the properties of water*)

From the "Separating Charge" notes:

4. By contact, induction, or polarization?

   A. ____ Can only occur with conductors.
   B. ____ Can only occur with insulators.
   C. ____ Rubbing is a form.
   D. ____ No charges are lost or gained.
   E. ____ Charge is given an alternative path to escape.
   F. ____ Why a balloon sticks to a wall.

5. A positive rod is brought close to a metal object, which is then charged by induction. Afterwards, is the metal positively or negatively charged?



6. A piece of Styrofoam is rubbed with fur to impart (to give it) electrons.
   A. In the first diagram above, draw where electrons will go on the piece of metal.
   B. In the second diagram, a person touches the metal. Show what happens.
   C. In the third picture, when the metal object is lifted off of the Styrofoam, what is its charge?
   D. The object was charged by:

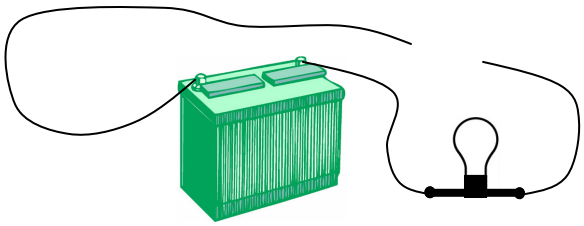
7. A 12 volt battery pushes against a 4 Ω resistor. How much current flows thru the circuit?

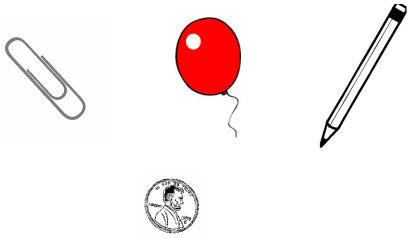
$$\text{Current (in } amps\ [A]) \rightarrow I = \frac{V}{R} \leftarrow \text{Voltage (in } volts\ [V])$$

$$\text{Resistance (in } ohms\ [\Omega])$$

Current equals the voltage divided by the resistance.

8. How much resistance is in a circuit that has a 6 volt battery and 0.5 amps flowing?





Car battery

9. A. Will the light bulb light up or not?
   B. Why or why not?
   C. Is it an open or closed circuit?
   D. Which of the objects would complete the circuit?
   E. Will the light come on if you touch the two pieces of wire together?

   Electricity is like water. Voltage is the push from a pump. Current is how much water flows. Resistance is a restriction in the pipe (like kinking a water hose) or like a dam holding back water.

10. Imagine a large flexible bag filled with water. When would it give more voltage if you pushed on it with your hands or if you sat on it?

11. Which has more voltage: a water hose with a nozzle on it, or without?

12. Compare the slow moving Mississippi river and a fire hose.
    A. Which one has more voltage (push)?
    B. Which one has more current (water flowing)?

13. Which would have more resistance for water: a large water hose (big opening) or a small water hose?

    Check back to the formula on the front page, if you have to...

14. Give the units for the following.
    A. Current—
    B. Resistance—
    C. Voltage—

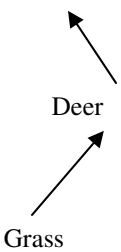
    TAKS—

15. Give three illnesses that are caused by viruses.

16. Give an example of good bacteria in our body.

17. What do antibiotics kill?

18. Why do doctors tell us to take the entire course of antibiotics, even when we feel better?



19. Notice the three names at the left with arrow.
    A. What do the arrows mean?

    B. Is it a food web or food chain?
    C. Why?
    D. If 20 J of energy is gained by the human, how much grass energy was eaten by the deer?

20. Draw a food web at the right with at least 6 organisms. Make sure the web intersects at least once.