Electrostatics – Charging by Induction and Conduction

Part I: Building an Electroscope

1. Using a binder clip and two clean, dry strips of overhead transparency (acetate).
2. Rub your fingers quickly down the two strips.

What happens?

What is the charge on the two strips? Use the Triboelectric Series chart to help you. Explain why they have that charge.

To check whether your electroscope is functioning properly do the following:

* Put a plastic pen between the plastic strips. What happens? NOTHING! Why does that make sense – What type of material is the plastic?
* Now put a piece of copper wire or an iron nail between the strips. What happens? What type of material is the nail? Why does the metal cause the electroscope to react?
* How should we neutralize the electroscope? Because of the plastic’s nature the best way to remove the charge is to use a wet paper towel to wipe off plastic strips. The polarity of water allows it to grab electrons and help remove them. If we were using an electroscope made with conducting materials we could simply GROUND it.
* Recharge your electroscope. Using the triboelectric series and charging by friction, make a negative object and a positive object. Check the electroscope’s ability to determine the charge of each object accurately. (The object should be brought near (but NOT touch) the area between the plastic strips.)

How did it do? How does it react when a positive object is brought near? A negative object?

Part II: Charging Neutral Objects

1. Charging a Neutral object (aka pop can) negatively by INDUCTION.



1. Tape a pop can to a Styrofoam cup so that you can move the pop can without grounding it. The cup will act like a handle.
2. POLARIZE the can by bringing a ***positively*** charged object towards the left side of the can. Describe and draw what happens to the can in this step.
3. Now, touch the right side of the can – GROUND it. You are the ground – what does this mean? Describe the behavior of electrons in this step.
4. Use your electroscope to determine if in fact you made the can negatively charged without touching it to a charged object. How did you do? What do you notice about the new charge on the can and the charge on the object we used to induce it??
5. Now neutralize the can and make it positively charged using INDUCTION.
6. Describe the steps – be specific – that you performed to complete this task.
7. Check your can with the electroscope. Successful? How do you know?



1. Now try using a two can system….. first, negatively charge can X then positively charge can X.

Describe how you complete the tasks – be sure to explain what you did differently to negatively charge it versus positively charge it.

1. Charging by CONDUCTION

Charging by conduction involves the touching of a charged object to a neutral object or charging by contact.

1. Start with a neutral can. Charge the other can. Use the electroscope to determine its charge. What charge is on the second can? \_\_\_\_\_\_\_\_\_\_\_\_

What charge will the neutral can become when they are touched together?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Explain.

1. Repeat but charge the other can the opposite charge. Explain what happens.
2. Finish this sentence. When charging by conduction, the two objects will always be the \_\_\_\_\_\_\_\_\_\_\_ charge.
3. True or False: The net charge of Can 1 + Can 2 = Can (1&2)
4. Did you notice that to charge by conduction we had to use two conductors? Why is that?
5. GROUNDING
6. Make one can negatively charged. Check it with the electroscope.
7. Now touch it with a plastic straw. Check it with the electroscope again. Is it still negative?? Why or why not?
8. Try it again with a different material. What did you use? Did it work? Why or why not?
9. Try again but start with a positively charged can. Explain how electrons moved in BOTH cases.
10. In your own words, what is a ground?