



Curiosity Guide #709

Static Electricity

Accompanies Curious Crew, Season 7, Episode 9 (#709)

Static Discharge

Investigation #7

Description

Do you want to make a shocking discovery? Try this activity!

Materials

- Scarf
- Plastic report folder or acetate
- Scissors
- Ruler
- Large paper clip
- Lump of clay
- Table

Procedure

- 1) Press a lump of clay onto the surface of the table.
- 2) Insert one end of the paper clip into the clay so that most of the clip is standing up straight.
- 3) Cut a two-inch strip across the bottom of the acetate sheet.
- 4) Charge the acetate strip with the scarf. Pull the strip through the scarf and repeat several times.
- 5) Immediately hold the acetate strip close to the tip of the paper clip.
- 6) What do you notice?

My Results

Explanation

Rubbing the plastic strip through the scarf charges the plastic with extra electrons taken from the scarf. As a result, the plastic becomes negatively charged. The paper clip is neutrally charged and supported by the clay, which doesn't conduct electricity. When the negatively charged plastic moves toward the metal tip, some of the clip's electrons move down and try to repel away. This changes the tip of the clip to a positive charge. Once the attraction between the opposite charges is great enough, the air between the plastic and clip also gets charged and makes a path for electrons. The spark is the movement of those electrons and is called a **static discharge**. Discharges can happen slowly, but our example is an abrupt transfer that can be seen and heard.

Investigate further. Try the activity with a piece of vinyl. What would happen if you charged a balloon and held the balloon close to the paper clip? Can you think of other materials to try?

Think about this. Have you ever walked across the carpet in your socks and then shocked yourself on a doorknob? Depending on what you are wearing on your feet, you are either stealing or losing electrons to the carpet. Either way, you begin to become charged. The more you shuffle your feet, the greater charge you have. That metal doorknob is a great conductor of electricity. So when you touch the knob, the extra electrons jump off or onto you, and that's called a static discharge. Now that's shocking!

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