Name _____ Date _____

CONCEPTUAL INTEGRATED SCIENCE | **Activity**

Electricity and Magnetism: Conductors and Insulators

Charging Ahead

Purpose

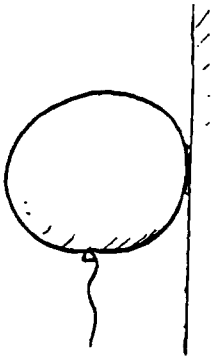
In this activity, you will observe the effects and behavior of static electricity.

Required Equipment and Supplies

two new balloons
Van de Graaff generator
several pie tins (small)
several Styrofoam bowls
bubble-making materials (solution and wand)
matches

Discussion

Scuff your feet across a rug and reach for a doorknob and zap—electric shock! The electrical charge that makes up the spark can be several thousand volts, which is why technicians have to be so careful when working with tiny circuits such as those in computer chips!



Procedure

Step 1: Blow up a balloon. After stroking it against your hair, place it near some small pieces of Styrofoam or puffed rice. Then place the balloon against the wall where it will "stick," as shown to the right. On the drawing, sketch the arrangement of some sample charges on the balloon and on the wall.

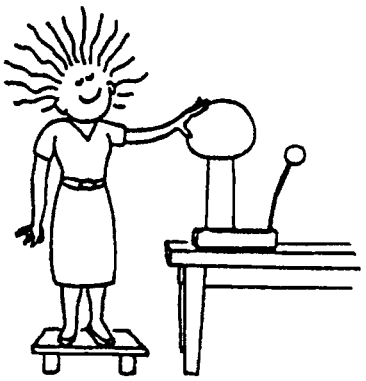
Step 2: Blow up a second balloon. Rub both balloons against your hair. Do they attract or repel each other?

Step 3: Stack several pie tins on the dome of the Van de Graaff generator. Turn the generator on. What happens and why?

Step 4: Turn the generator off and discharge it with the discharge ball or by touching it with your knuckle. Stack several Styrofoam bowls in the generator and turn the generator on. What happens and why?

Step 5: With the Van de Graaff generator off and discharged, blow some bubbles toward it. Observe the behavior of the bubbles. Then turn the generator on and blow bubbles toward it again. Watch carefully. What happens?

Step 6: Stand on an isolation stand (or rubber mat) next to a discharged Van de Graaff generator. Place one hand on the conducting sphere on top of the generator and have your partner switch on the generator motor. Shake your head as the generator charges up. What do you experience?



Summing Up

Which of the demonstrations in this activity are better explained by the principle that like charges repel and opposites attract? Which are better explained in terms of the differences between conductors and insulators?

Going Further

Light a wooden match and move it near a charged sphere on top of the generator. What happens and why?