Flying Leaves

In the laboratory, scientists measure static charge with an electroscope, a tool that shows the relative strength of a charge. Here’s an inexpensive electroscope that you can build at home.

Materials
- A clear plastic cup
- Aluminum foil
- A metal paperclip
- Modelling clay
- A balloon
- A pair of scissors

*Hint: The stout tumbler-type plastic cups work best.*

To Do

Make a small hole in the center of the cup’s bottom. The hole must be wider than the wire of a paper clip.

Cut two small strips of aluminum foil about 1/4 inch (6 mm) x 1 1/2 inches (3.75 cm). Use an unbent paper clip to punch a tiny hole near one end of each strip. Press and flatten the foil. These foil pieces are the "leaves.”

Open a paper clip and bend it to form a long "j.”

Hang the leaves on the bottom part of the "j.” Insert the shaft of the paper clip into the underside of the cup. Make sure that the leaves clear the rim of the cup. Use a small lump of clay to secure the clip in place.

Roll a piece of aluminum foil into a small ball. Secure the ball to the end of the paper clip.

Charge a balloon by rubbing it with a piece of wool or fur. Slowly bring the balloon toward the cup. What happens to the leaves of the electroscope? Pull the balloon away. How do the leaves react?

The Science

As you brought the balloon near the electroscope, it induced a charge. The balloon’s negative charge repelled the electrons in the ball of aluminum foil. These electrons travelled down the clip into the leaves. Both leaves acquired a negative charge. Since like charges repel, the leaves flew apart.

Check It Out! Design and construct a similar electroscope that uses a material other than aluminum foil.