

# Build an Electroscope

NAYGN: Kits for Kids

## Ingredients

- Bottle with medium-width mouth
- Cork or stopper for bottle
- Coat hanger wire
- Thin aluminum foil
- Glue
- Table salt
- Plastic comb
- Gas lantern mantle made with thorium

## Description

Build an electroscope to detect ionizing radiation

## Procedure: Building an Electroscope

- 1) Choose a bottle with a medium-width mouth and a cork or stopper that fits. Clean and dry the bottle
- 2) Remove the paint from a 6-inch piece of coat hanger wire. Bend a loop in the top and push the wire carefully through the bottle cork or stopper. Bend the end of the wire into a  $\frac{1}{2}$ -inch-long hook or L.
- 3) Cut a strip of thin aluminum foil  $\frac{1}{2}$  inch wide and 6 inches long. Fold the strip in half. Cut notches into the fold to make the leaves flexible.
- 4) Glue the fold onto the wire hook. Do not use much glue. Be sure the foil touches the wire.
- 5) Heat a spoonful of table salt in an oven at 350 degrees, then drop the salt into the dry bottle. This will absorb moisture from the air in the bottle.
- 6) Insert the stopper tightly. Push the wire down until the foil leaves are about  $\frac{1}{2}$  inch from the bottom.

## Procedure: Using the Electroscope

- 1) Comb your hair with a plastic comb and touch the comb to the wire's top loop. This gives the leaves electrical charges alike. They will repel each other. As they lose their charge, they will come back together. This process takes about five minutes.
- 2) Obtain a piece of a gas lantern mantle made with thorium, a radioactive material.
- 3) Put the piece of mantle into the electroscope and charge it as before.
- 4) Compare the amount of time it takes to discharge the electroscope with the radioactive material in it and without the radioactive material. Does thorium radiation discharge the electroscope? (*Hint: If you ionize the air, the charge will leak faster. Radiation will ionize air.*)