

## Activity 5

# Conductor or Insulator?

### Materials

- 1 GENECON with output cord
- 1 bulb (3.8 V, 0.3A) in socket with leads
  - o Variety of objects made of metal, wood, plastic, rubber, glass etc.

### Procedures

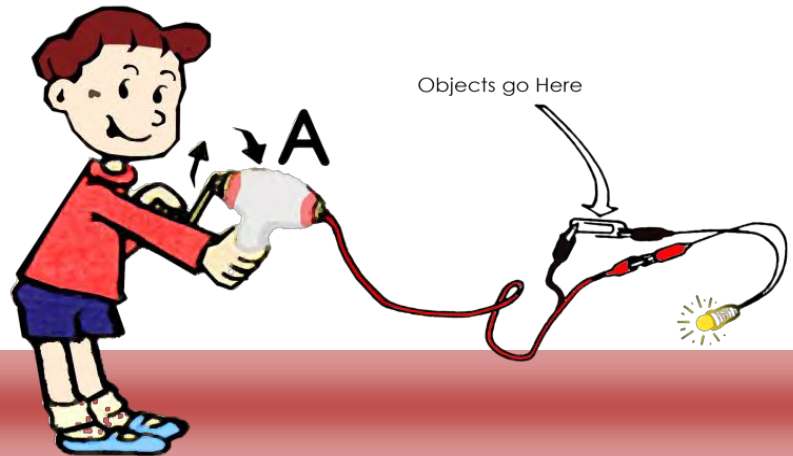
1. Prepare a "circuit tester" by connecting one lead of the GENECON. With one student operating the GENECON, have another touch the two loose leads together closing the circuit and lighting the bulb. Now separate the leads, thereby breaking the circuit. If conductive material is placed between these leads, the bulb will light.
2. Have the students test the conductivity of a variety of objects with the GENECON circuit tester.

### Key Concepts

1. Materials which allow an electric current to pass through them easily are called conductors.
2. Materials typically are excellent **conductors**.
3. Materials which do not conduct electricity very well are called **insulators**.

### Teaching Tips

1. Compare the results of this activity to materials which are purposely used as conductors and insulators in our environment
2. Include among the items to be tested some "tricky" materials, like pipe cleaners and metal-coated wrapping paper.



## Activity 6

# Mystery Circuit Boxes

### Materials

- GENECONs with output cord
- 1 Bulb (3.8V, .3A) in socket with leads
  - o Several small, sturdy cardboard boxes
  - o Brass brads
  - o Bell wire

### Procedure

1. Construct several "mystery circuit boxes" by sticking 8 brass brads through the box lids in a pattern similar to the sketch below. Number each brad on the lid.
2. Turn the lid over and connect short lengths of bell wire between selected brads. Make sure there is good electrical, metal-to-metal contact between the bell wire and the selected brad tabs. Wrap the wire around the tabs, and then bend the tabs back firmly to the cardboard lid. Close the boxes and secure with a rubber band.
3. Provide the students with a GENECON circuit tester (consult Activity #5) and challenge them to locate the mystery circuits.

### Key Concepts

1. Brads which are connected by bell wire will complete a circuit and light the bulb.
2. Deciding on a systematic strategy for checking all possible circuit combinations will be more effective and efficient than hit-or-miss testing.

### Teaching Tips

1. Set up different circuits in each of the several boxes.
2. Select at least one box with a metal-coated top. The results may be quite surprising!
3. Have the students record the results of their investigation in the following format. "1,7"; "6,7" etc. If students had reported those particular successful combinations, would they be able to predict that brads 1 and 6 would have to work also?

