

<b>Main Topic</b>	Electricity
<b>Subtopic</b>	Current Electricity
<b>Learning Level</b>	Middle
<b>Technology Level</b>	Low
<b>Activity Type</b>	Student

Description: Use a Genecon or other voltage source to test the conducting properties of various materials.
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Required Equipment	Genecon, Mini Bulb Base, Mini Bulb, 1 Alligator Lead, various materials
Optional Equipment	Other voltage source such as a D Battery in a holder

This lab is excerpted from the Genecon Experiment Manual, from Arbor Scientific's Complete Genecon Experiment Set (P6-2635).

## Educational Objectives

- Determine which materials conduct electricity and which do not.

## Concept Overview

Electricity is the flow of electrons through a substance. Those materials permitting this flow are called conductors; those which do not are nonconductors (or insulators). Among those materials which are conductors, some are better at conducting electricity than others. In this exercise, we will study a number of materials to see whether or not they are conductors.

In general, among solid substances, metals are conductors and nonmetals are not. Distilled water is not a conductor. Solutions containing ions (salt water, acids, tap water) are conductors.

## Lab Tips

The Genecon is a safe and convenient way to test the conducting properties of materials. This activity is primarily intended for early levels of physical science. It is a good idea to **discourage** students from testing each other in this activity. Teach them safe habits with electricity early.

As always, when just one bulb is connected to the Genecon, turn the handle carefully to avoid burning out the bulb.

The Substance column on the student page is intentionally left empty. Fill it in with the substances students are to test, or let them choose from a selection of substances.

Some materials you may wish to try:

1. Metals of all types.
2. Paper, glass, erasers, chalk, or other handy classroom materials.
3. Salt water solutions. (Use straightened paper clips attached to the wires to dip into the solution.)
4. Household acids like lemon juice and vinegar.
5. Distilled water. (Be careful not to contaminate it!)
6. Other materials you or your students think of.

# Conductors and Insulators

Name: \_\_\_\_\_

Class: \_\_\_\_\_

## Goal:

Determine which materials conduct electricity and which do not.

## Materials:

Genecon (or other voltage source), Mini Bulb Base, Mini Bulb, 1 Alligator Lead, various materials

## Procedure:

1. If your teacher has not done so, choose substances to test and fill in the first column in the table below. Choose a variety of materials, including solids and liquids.
2. Predict, in the second column, whether each substance will conduct electricity (Conductor) or not (Insulator). Do this before you do any experiments.

Substance	Prediction Conductor or Insulator?	Experimental Result Conductor or Insulator?

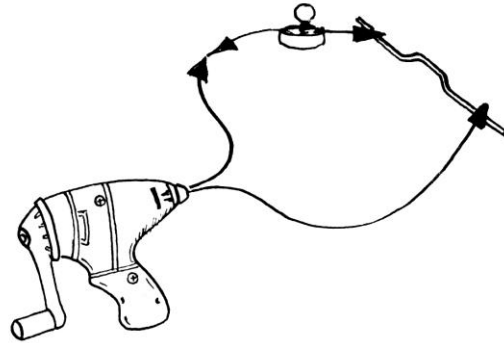
3. Connect the voltage source directly to the bulb, to see how much power it takes to light the bulb. This is the amount of power you should use for each trial.

# Conductors and Insulators

Name: \_\_\_\_\_

Class: \_\_\_\_\_

4. Assemble the circuit as shown here. You may place any material you want to test in the wire clips. (A paper clip is shown being tested here.)



5. Turn the handle as you did before and see if the bulb lights. Record in the data table whether the material is a conductor or an insulator.

6. If the material to be tested is a liquid, connect a straightened paper clip to each end, and dip the two paper clips carefully into the liquid.

7. What trends did you notice? What types of materials tend to be conductors?

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