



e-SMARTkids

An illustration of a series of utility poles with power lines stretching into the distance against a yellow sky. The poles are black and the lines are thin black lines.

Conductors and insulators

EXPERIMENT TIPS

This basic experiment appears in the section *Travels of electricity*.

Materials

Students will need 1 D-cell battery, 1 1.2-volt light bulb, 1 matching light bulb base, one 12-inch piece and two 4-inch pieces of insulated solid strand 18-22 gauge copper wire with 1 inch of insulation removed at each end, and masking tape. Students will also need a variety of things they think might conduct electricity, such as toothpicks, rubber bands, paper clips, plastic, fruit, etc.

Safety first

- Students should be supervised by an adult while doing this experiment.
- A teacher or another adult should be responsible for stripping insulation from wires.

Experiment tips

Teachers should strip the wires ahead of time and make sure the batteries are fresh. Though the illustration does not show it, use tape to stick the wires to the ends of the battery.

Students are likely to know that metals are good conductors, but they may be unaware that things with a lot of liquid in them also conduct well. Some things to have on hand include lemons, pickles, and potatoes. When testing these, make sure students stick wires into the wet part of the item.

The key in the conduction of electricity is the movement of electrons. Metals are elements that freely share electrons. In liquids, dissolved ions can carry a charge as well. That is why water helps in the conduction of electricity. Salty water, loaded with sodium and chloride ions, helps even more.

Objective

Students will learn the difference between conductors and insulators.

Getting it across

1. Have students bring in things they think might conduct electricity.
2. Have teams read the information and follow the steps on the page.
3. Students should first test their circuit by connecting it without any trial material.

Questions and answers

- Ask teams to share their predictions and results. Were the results the same? If not, why not? (Answers will vary. Be sure the experimental setup was not at fault.)
- What conclusions can students draw about conductors and insulators? (Answers will vary. Students might generalize that metals are good conductors or plastic is a good insulator.)