Liquid Conductors and Insulators

Electricity All Around Us
Activity
Grade Level: 5-8

Main Objectives

Learners will be provided with a hands-on lesson that will enable them to investigate liquid as a conductor or a non-conductor.

Learning Outcomes

By the end of this activity, learners will:

- understand the difference between conductors and non-conductors,
- classify liquids into conductors and non-conductors
- explain why some liquids conduct and others do not

Length of Activity

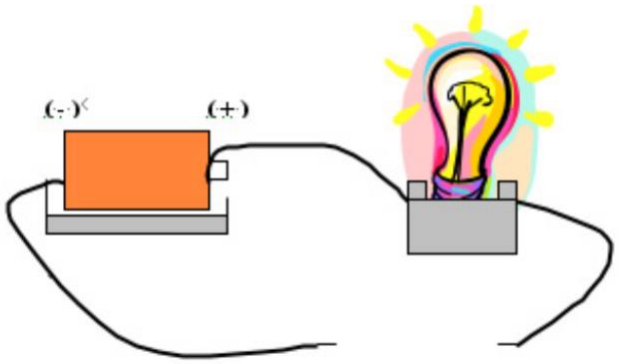
1.5 hours

Materials List

Internet-enabled device
Liquid Conductors and Insulators Worksheet
Battery (1.5 V) and holder
Lightbulb (1.5 V) and holder
3 insulated copper wires stripped at both ends
Distilled water
Salt, milk, soft drink, juice, sugar
5 labelled beakers

Background

Here is a diagram of a circuit tester. When the circuit is open, the light bulb will not be on. When there is a conductor between the wires or the wires are crossed, the electricity will turn the light on. The diagram below is an open circuit.



Why do some materials conduct (act as conductors) and others do not conduct (act as insulators)? Materials such as plastic, which hold their electrons very closely, do not give up their electrons very easily and therefore do not conduct. Other materials such as metal do give up their electrons freely and will conduct electricity. Materials that do not conduct are good insulators are important because they keep us safe from electricity. The wires in our homes all have an insulating plastic coating that prevents us from being harmed by the electricity flowing through them./

Procedure

Prepare the beakers of water and dissolved sugar and other liquids before class.

Step 1:

a. Review the background information provided on the first page.

Step 2:

a. Have each group test the five different beakers of liquids.

Step 3:

b. Explain to the learners that they will not test liquids for conductivity. The groups will record what was in the beaker, predict if it will conduct, do the test, and record their observation on their worksheet.
c. Do one demonstration of a conductivity test.

Tips and Extensions

- Items you might like to have your learners test could include: hangers, spoons, forks, erasers, stapler, wax paper, paper, wood, pins, rocks (some mineral rocks will conduct), pens, plastic cups, polystyrene, coins, nails.
- Have learners use a switch to see how the light bulb and be turned on and off. Explore the concept of an open and closed system.

Comprehension

- What did you find out?
- Did you find that some objects were good conductors?
- Did you find that some objects were insulators?
- Were there any materials that you were not sure would conduct or insulate? Why?
- Why do you think wire has a plastic coating on it?