

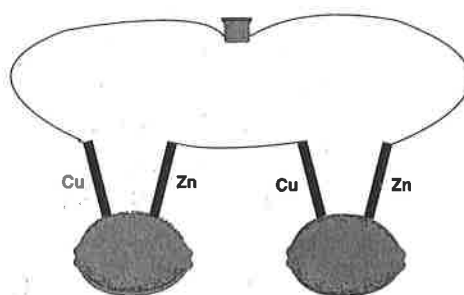
A Lemon of a Battery

A lemon is used in making a battery.

Application Electric Current • Batteries

Theory Two different metals in an electrolyte solution can produce a galvanic cell which will light a flashlight bulb. Two or more of these cells can be connected to produce a battery. A galvanic cell is an electrochemical cell in which a spontaneous oxidation-reduction reaction generates voltage.

Materials Lemons, 2
Copper strips, 2
Zinc strips, 2
Steel wool or sandpaper
Insulated copper wire
Flashlight bulb, 1.5-V
Bulb socket



Safety Precautions Always follow laboratory safety rules while performing demonstrations.

Preparation Clean the surface of the copper and zinc strips with steel wool or sandpaper.

Demonstration Prepare a lemon galvanic cell by inserting a strip of copper and a strip of zinc into a lemon. Attach a wire from each strip to the terminals of a lightbulb. The light should glow.

Prepare a second cell and connect the two cells in series to form a battery. Be sure to connect the zinc electrode from one cell to the copper electrode in the other cell. Use the lightbulb to test the effectiveness of the battery. The battery will cause the lightbulb to glow more brightly than the single cell.

Disposal Place the lemons in a trash container.