



## What you will need:



- Lemon juice
- 9 1" square pieces of paper towel
- 5 shiny, clean pennies
- 5 zinc-coated washers, 3/4 inch (available at hardware stores)
- Voltmeter (battery tester)

# Lemon Battery

## Overview and Objective

There are different types of batteries, and the lemon battery is a type of battery called voltaic. Voltaic batteries are made of two different metals placed inside an electrolyte. In this case, the coins and washers act as electrodes, and the lemon juice is the electrolyte. When a battery runs out of the electrolyte or metal, then it will no longer create a reaction and will stop working.

Try creating an electrical current yourself with this experiment! And after you try it, you can take the experiment further and test it with other metals and electrolytes.

## Process:

1. Cut paper towel into nine, one inch squares.
2. Saturate the paper towel squares with lemon juice.
3. Create a stack of alternating items: washer, paper towel, penny, and paper towel again.
4. Repeat stacking in that order until you have used all the items.
5. Complete the circuit by holding the entire stack between two fingers.
6. Test the charge using a voltmeter.





# Lemon Battery

## Overview and Objective

Batteries are used in many household items, but did you know they are used in many other devices as well? They come in a huge variety of shapes, sizes, and strengths. Some examples you may not have thought of are in pacemakers and other medical equipment, radio devices, small forklifts, cars, and cell phones.

**Take the experiment further.** What other acidic liquids could you use in the place of lemon juice? Here are some ideas to test:

- Vinegar
- Lime juice
- Orange juice
- Grapefruit juice
- Soda (seltzer water)



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