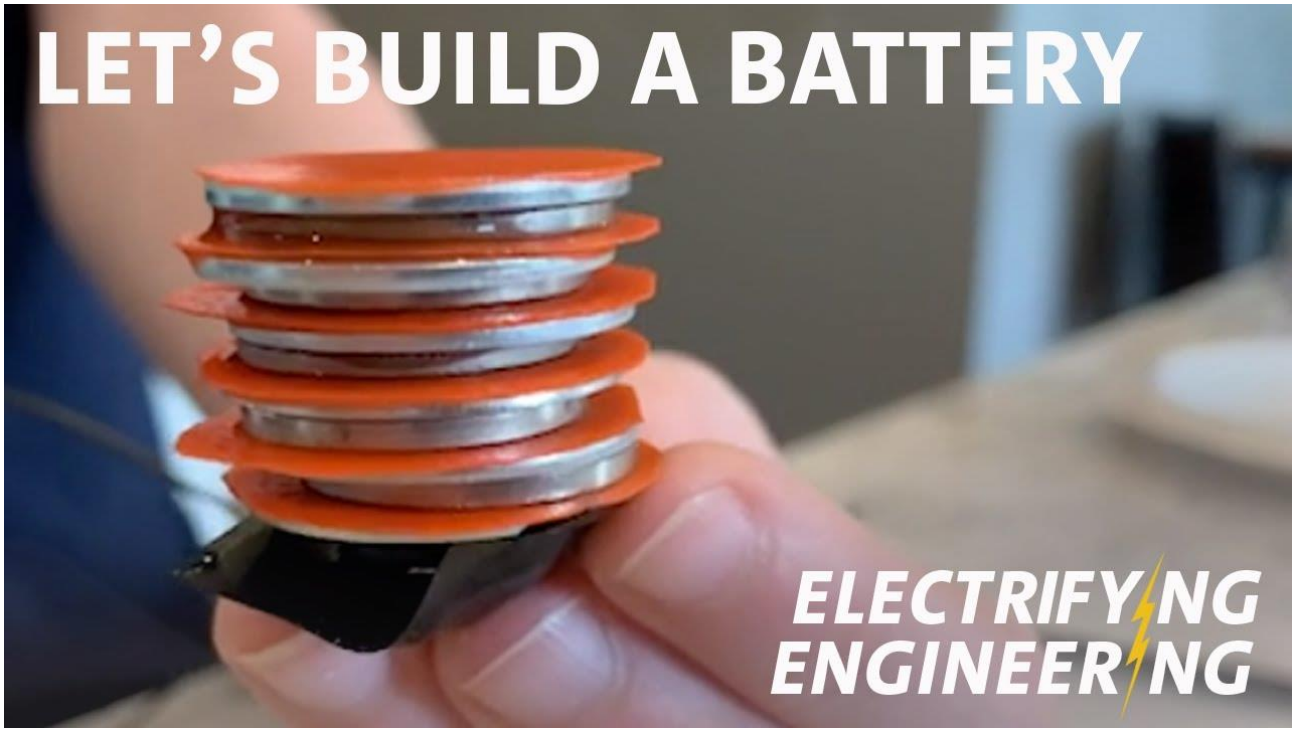
How Batteries Work - Building a Battery at Home

Adapted from GM's Electrifying Engineering Series
1-2 HOURS | INDOOR ACTIVITY | AGES 7+



SUMMARY

General Motors Battery Engineer Andy Oury and his son show students how to make a battery at home and explain how batteries work in this online engineering STEM lesson.

OBJECTIVES

Students will

- Construct a working battery out of household materials
- Identify and explain the functional parts of a battery

MATERIALS

- 8 pennies (or zinc washers), 8 nickels
- clear distilled vinegar
- salt
- paper towels
- kitchen foil
- two wires
- crocodile clips (optional)
- tape - electrical or household
- dish large enough to hold 10 pennies
- notebook
- measuring tape or flexible ruler
- consistent access to the internet
- construction paper
- scissors and tape

ESSENTIAL QUESTIONS

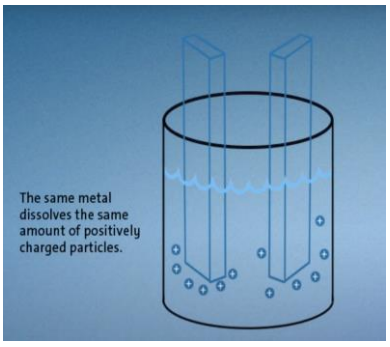
1. What batteries are a part of your everyday life?
2. What purpose do batteries serve? Name at least three.
3. How do batteries work?

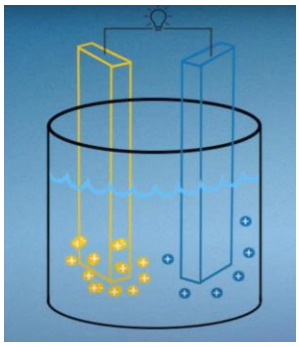
Lesson – How do batteries work?

INTRODUCTION

How do batteries work?

Batteries store chemical energy.
It is like a tug of war between two pieces of metal dipped in liquid over positively charges ions.





Sugar and salt are two everyday kitchen items that easily dissolve. Metal also dissolves when dipped in a liquid.

If we dip two metals of the same material, nothing happens. If we dip two different metals, one metal pulls harder on the positively charged molecules than the other metal. This is a voltage, and our tug of war starts to move in one direction.

When you have voltage in a battery, you can hook it up to something to do work.

Activity – Making a Battery

PREPARATION

Before beginning, you will need to clear a space in your home that can get dirty – e.g., kitchen counter or dining table.

SAFETY NOTE: You may want to wear protective gloves and eyewear if available. Ask an adult for help when handling vinegar as it can irritate the skin.

BUILD A BATTERY

- Sand pennies with sandpaper until they are silver OR
- Put coins into a bowl of vinegar, mixed with a bit of salt. Leave for a few minutes, then rub dry until shiny.
- Using a penny as a template, cut out nine card circles from construction paper.
- Soak the card circles in vinegar
- Take the tinfoil and fold it over itself 4-5x to create two wires
- Tape the two tinfoil wires to two different coins to start. Keep them separate for now.
- Build up a stack in this order: coin, damp card circle. Continue until you have at least five layers on one of your wires.
- Place your second wire and coin on top of your stack.
- Tape your stack of coins and construction paper together.
- Take a wire and stick one end to the top coin surface. Take another wire and attach an end to the bottom coin surface. Add tape to secure the battery.
- Connect the free ends of the wires to your LED if you have one.

More Information on batteries,
https://www.youtube.com/watch?v=DSb2XPjfMls