

JR-ENGINEERS

LEMON BATTERY

Do you think you can make a battery out of a lemon? Let's try!

INSTRUCTIONS

STEP 1: Line up your lemons.

STEP 2: Place a nail in one end of each lemon.

STEP 3: Cut a small slit at the other end of each lemon. Place a penny in each slit.

STEP 4: Connect your clips to your lemons.

Start with one clip on a nail and the other end unconnected.

STEP 5: Attach the 2nd clip to the penny on the first lemon and the other end to the 2nd lemon's nail.

STEP 6: Continue with each lemon until you reach the last penny. Leave the other end of the clip unconnected.

STEP 7: Now you should have two unconnected ends now, these are like a car's jumper cables. Don't touch them together.

STEP 8: Attach one of these unconnected cables to one wire of the LED light.

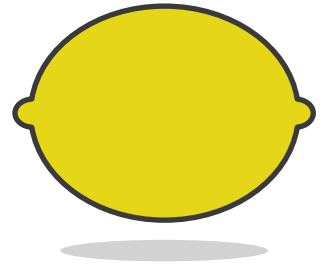
STEP 9: Now watch carefully as you connect the second unconnected wire. You should see light coming from your bulb, powered only by lemons!

SUPPLIES

2-4 lemons
Galvanized nails
Pennies
LED bulb
Metal clips
or
Foil strips
Knife

Lemon Battery Observations

Use this worksheet to process and evaluate your work.

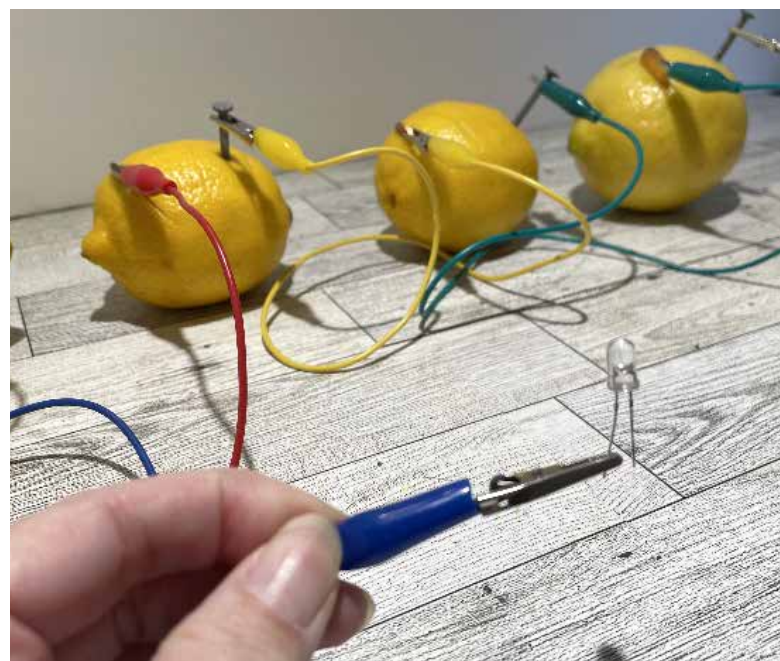
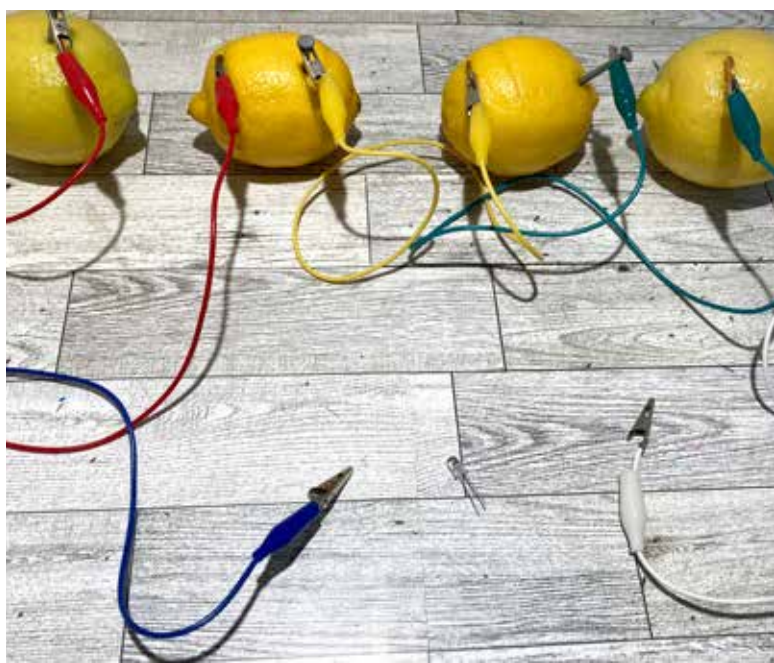
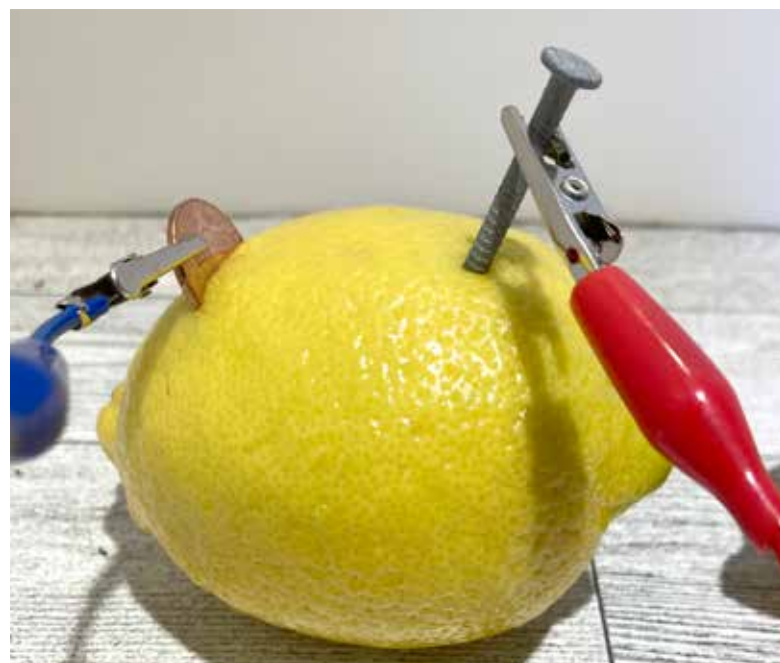


Did your lightbulb turn on? If so, how many lemons did you need?
If not, do you know why it didn't work?

Do you think a dime would have worked instead of a penny? Why or why not?

Do you think other vegetables or fruits would work as well as a lemon?

What did you learn about spectroscopes?



LEMON BATTERY

THE SCIENCE

A lemon battery is a type of battery that you can make at home using a lemon a copper penny, a zinc nail, and a wire. It works through a process called electrolysis. The lemon juice acts as an electrolyte, which is a liquid that can conduct electricity. When the penny and the nail are inserted into the lemon, they become the positive and negative terminals of the battery. The penny is made of copper and acts as the positive electrode, while the nail is made of zinc and acts as the negative electrode.

The zinc and copper electrodes are immersed in the electrolyte lemon juice, and the electrons from zinc atoms flow to the copper atoms which causes a small electrical current. This current is then able to power a small device, such as a light bulb. Lemon batteries are not a practical source of power but it's a simple and fun way to learn about how electricity works.