

FRUIT BATTERIES SCIENCE EXPERIMENT

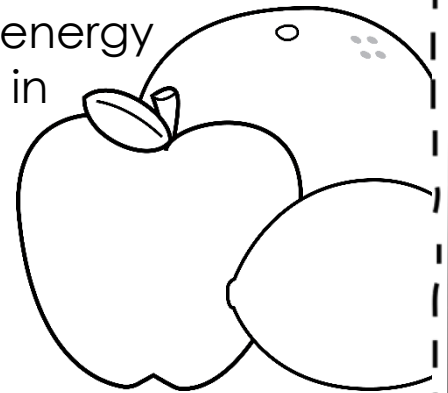


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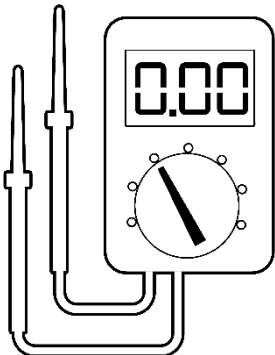
Think of an everyday battery, like the kind you put in a TV remote. It's actually a surprisingly simple invention. At each end of that battery is a metal electrode. An electrical current enters and exits the battery through these two electrodes, which are suspended in an acidic solution inside the battery. The same basic idea applies to fruit batteries.

The kind of battery described above is called a voltaic battery. Voltaic batteries convert chemical energy into electrical energy. The chemical energy in fruit comes from what's inside the fruit, well, what's found in *some* fruit. Certain fruits are very acidic. This acidity is especially true for citrus fruits like lemons and limes. The acid inside such fruits allows an electrical current to flow between two nails. In the case of the fruit battery, the zinc and copper nails serve as the electrodes where electrical current enters and exits the fruit.



All on their own, the fruit and nails aren't going to power anything. The electrical current isn't yet activated because the circuit is still "open". For electricity to work, it must travel a complete path. It needs somewhere to go. A completed

circuit is what releases the electrons from the power source to activate a light, motor, or voltmeter. That's why the voltmeter needs to be attached to *both* electrodes to work. Doing so is what completes the circuit.

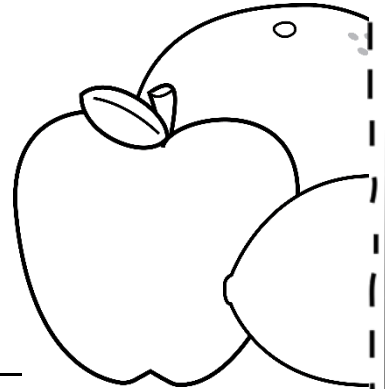


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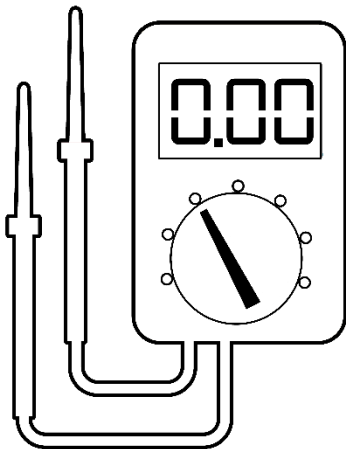
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1. What makes up a voltaic battery?

2. Why do lemons and limes have the ability to “run” or power an object?



3. What activates an electrical current, and why is that important?



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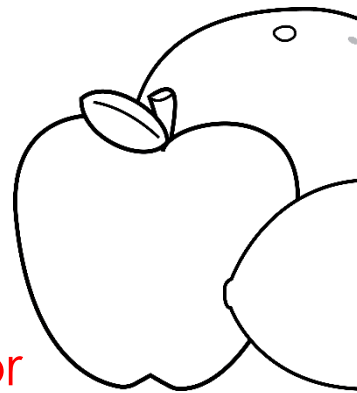
ANSWERS

1. What makes up a voltaic battery?

A voltaic battery has two metal electrodes, one at each end. Inside the battery is an acidic solution through which electrical current flows (in at one electrode and out the other).

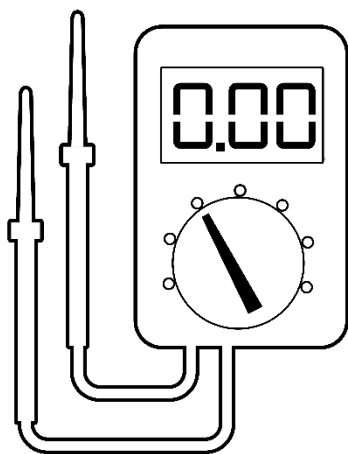
2. Why do lemons and limes have the ability to “run” or power an object?

Lemons, limes, and other citrus fruits are particularly acidic. The acid in these fruits is a chemical energy that allows for an electrical current to flow through the fruit.



3. What activates an electrical current, and why is that important?

A current needs a closed loop or path. This completed path or circuit allows power to be “brought” into the loop so that it can flow to the thing needing the power. If the loop is open, there is no power flowing.



FRUIT BATTERY Science

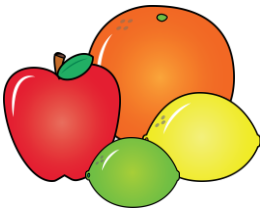
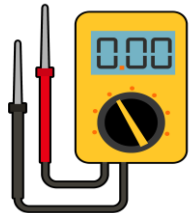


Name _____ Date _____

FRUIT	VOLTS
apple	
grapefruit	
kiwi	
lemon	
lime	
orange	
tomato	



Fruit Batteries Science Experiment

WHAT YOU NEED

 <p>FRUITS</p>	 <p>VOLTMETER</p>
 <p>COPPER</p>	 <p>NAIL (ZINC)</p>



Fruit Batteries Science Experiment



Roll the fruit around on the counter to get the juices flowing.



Fruit Batteries Science Experiment



Insert the piece of copper into the fruit. Then, insert the nail into the fruit at least an inch away from the piece of copper. If you insert them at an angle, make sure that the pieces do not touch each other inside the fruit.

3



Fruit Batteries Science Experiment



Turn on the voltmeter. If you are using a multimeter, make sure it is set to measure volts.

Touch the red wire to the copper and the black wire to the zinc. Firmly hold them still for a few seconds until the voltage stops on a number.

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Fruit Batteries Science Experiment

FRUIT BATTERY Science

Name _____ Date _____

FRUIT	VOLTS
apple	
grapefruit	
kiwi	
lemon	
lime	
orange	
tomato	

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Write down the voltage on your sheet and test the next fruit.

Which fruit had the highest voltage?

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Thanks!
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