



FRUITY ELECTRICITY

SCIENCE WEEK

10-17 NOVEMBER 2013
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You can get a bulb or LED to light by connecting it to a battery. The first battery was made by Alessandro Volta in 1800. He created a voltage between a piece of copper and a piece of zinc placed in a solution of salt water. The voltage can be measured using a voltmeter. The voltage generated can be used to light a small torch bulb or LED. The simplest form of electrical cell or battery uses copper and zinc in a solution of dilute acid.



You are going see if batteries can be made using metals and the acid in fruit.

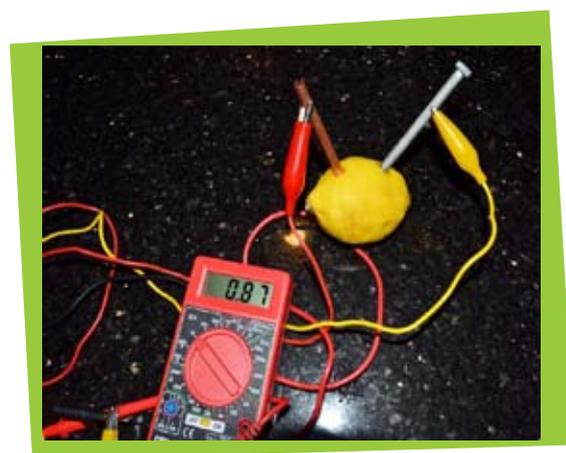
You will use a number of combinations of different metals and a number of different fruits. The electricity generated will be measured using a voltmeter. You can also use the electricity to light a LED.

MATERIALS NEEDED:

- Lemon, orange, lime, apple, potato
- Strips of copper, zinc, lead, iron. It may be possible to get copper, iron, lead and zinc nails in your local hardware shop
- Electrical leads and crocodile clips
- Digital voltmeter
- LED

PROCEDURE

- 1 Put the lemon on a table and gently roll it around to soften it up. You want the juice to be flowing inside the fruit without breaking its skin. Alternatively, you can gently squeeze the fruit with your hands.
- 2 Push the zinc and copper into the lemon so that they are about 5 cm apart. Don't let them to be touching each other. Do not push them through the end of the fruit.
- 3 Connect leads to the metals using crocodile clips.
- 4 Connect the other end of the leads to the voltmeter. Read the voltage. You have generated electricity!
- 5 Remove the leads from the voltmeter and connect them to the LED. You may have to change the leads around when connecting. What happens?
- 6 What does this tell you?



Which combination generates the greatest voltage?

What is in the fruit to help generate the electricity?

Look at one of your cells. Does the distance the metals are apart affect the voltage produced?

Voltage when metals are 2 cm apart

Voltage when metals are 5 cm apart

Voltage when metals are 10 cm apart

Does distance between the metals make a difference?

How could you use fruit batteries to generate a voltage of 6 volts?

Try out your idea.

