



Make a Lemon Battery

(recommended for ages 8-11)



Watch the instructional video at www.librariesni.org.uk or www.ni.sciencefestival.com.

You will need:

1. 2 lemons
2. 4 copper coins
3. 4 Zinc-plated screws
4. 1 LED bulb
5. 5 Alligator clips
6. Knife

Method

1. Cut the 2 lemons in half so you have 4 equal sized portions and set them onto plates or in bowls.
2. With a knife (be careful!), cut a small hole in each lemon the size of a copper coin.
Insert one copper coin halfway into each slit.
3. Insert 1 screw halfway into each lemon close to the coin, but not touching it.
These 3 things (lemon, coin, screw) complete a battery.
4. Connect the screw in lemon #1 to the coin in lemon #2, using an alligator clip.
5. Then connect the screw in lemon #2 to the coin in lemon #3.
6. Connect the screw in lemon #3 to the coin in lemon #4.
7. To complete a circuit, connect the zinc screw in lemon #4 to one leg of the LED bulb.
8. Connect the coin in lemon #1 to the other end of the LED bulb. If it lights up, 'Hurray!', but if it doesn't light up, swap the legs of the bulb around. If it still doesn't light up, check all your clips, coins and screws to make sure you haven't connected to coins together or two screws together. And if it still doesn't work, it could be the LED bulb is faulty or the screws are rusted (they only work for a certain length of time).

The Science:

Batteries consist of 2 different metals suspended in an acidic solution. The zinc screw and copper coin are called **electrodes**. The lemon juice is called **electrolyte**. All batteries have a "+" and "-" end. Electric current is a flow of atomic particles called electrons. Electrons will flow from the "-" towards the "+" electrode of a battery, through the electrolyte. Your lemon battery should generate about 4 volts (a **volt** is the force of moving electrons). A battery states how many volts (V) it has. Have a look at any batteries in your home to see how many batteries 4 volts would be equivalent to.

****Caution: Choking hazard. Keep out of reach of children under 3.****

