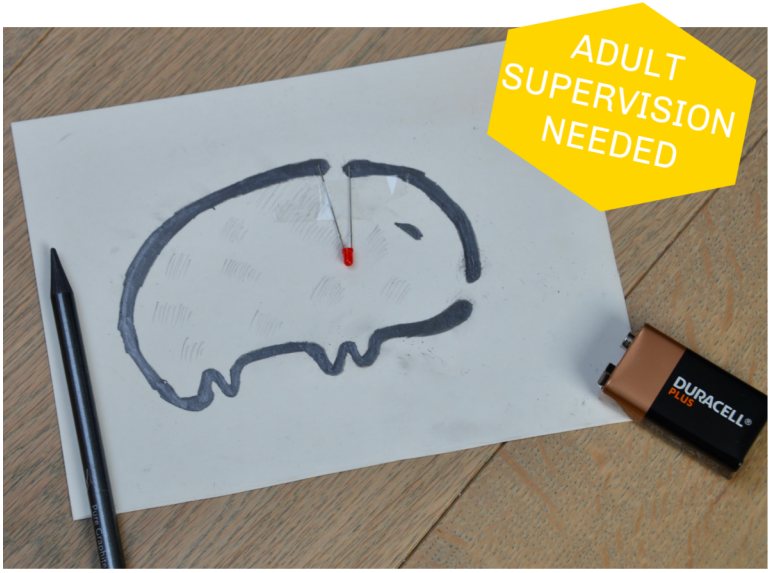
Graphite Pencil Circuit

You will need:

Minimum 6B graphite pencil
Paper or card
Small LED
9V battery
Tape



Instructions

Use the graphite pencil to draw a design on a piece of card or paper.

Leave a gap in two places. One for the battery ends and one for the LED legs.

Attach the LED using tape to one gap in the circuit.

Place the battery over the second gap. The positive end of the battery needs to be in the same segment of circuit as the long leg (positive end) of the LED.

How does it work?

Graphite is made up of carbon atoms with delocalised electrons which are able to move through the graphite. The electrons allow graphite to conduct electricity.

Graphite is an allotrope of carbon made up of layers of carbon atoms. The layers can slide over each other so it is soft and a perfect material for pencils! Another allotrope of carbon is diamond!

Adult supervision required. You are responsible for your own safety.
www.sciencesparks.com

A SALTERS INSTITUTE AND SCIENCE SPARKS COLLABORATION

Method

Test 1 - bicarbonate of soda and vinegar

Drop half a teaspoon of bicarbonate of soda into one small container. Add a teaspoon of vinegar and watch the mixture fizz!

Test 2 - bicarbonate of soda, vinegar and washing up liquid

Drop half a teaspoon of bicarbonate of soda and a small squirt of washing up liquid into a clean container and mix well with a small spoon.

Add a teaspoon of vinegar, this should give you a lovely thick foam!

Test 3 - bicarbonate of soda and lemon/lime

Carefully slice the top off a lemon or lime about one third of the way down. Use the spoon to squish the inside of the lemon/lime up a little.

Drop about half a teaspoon of bicarbonate of soda into the lemon/lemon, it should start to fizz straight away.

Add a little washing up liquid for a thicker foam!

Add food colouring for a colourful eruption

Take care using acidic substances. They may sting skin.

A SALTERS INSTITUTE AND SCIENCE SPARKS COLLABORATION

Lemon or Lime Challenge

Sam wants to create a lemon or lime eruption for a school project and wants to choose the one that makes the most fizz. Can you help?

Remember to make it a fair test.

Things to keep the same
Amount of lemon/lime juice
Amount of bicarbonate of soda

Things to keep the change
Whether lemon or lime juice is used.

What to measure
How high the fizz reaches up the container.
How long the reaction takes before stopping completely.

Method

Squeeze the same amount of lemon and lime juice into two identical containers. About 20ml should be enough

Add half a teaspoon of bicarbonate of soda into each container.

Time how long the reaction lasts and how high up the container the fizz reaches.

Whats happening?

Baking soda and vinegar (or another acid) react to neutralise each other (vinegar is an acid and baking soda an alkali) releasing carbon dioxide which is the bubbles of gas you see.

Science Sparks

Salters' Institute