

sciencemuseumoutreach

Kitchen Science 1

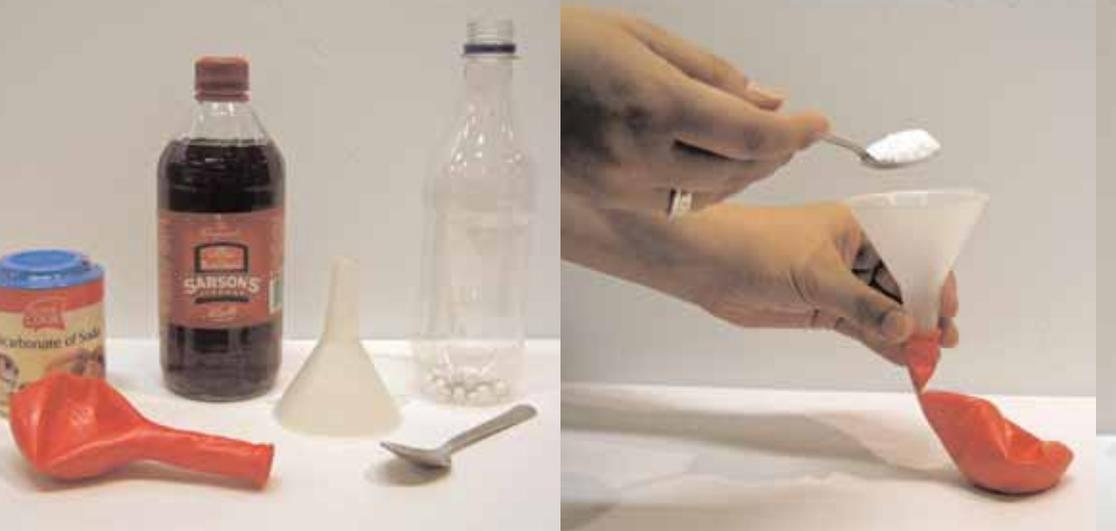
Demonstrations to do at home



The Creative Canal Project (CCP) is part of the Science Museum's Outreach Department, which works with teachers, students, families and a huge range of community groups. CCP itself is a partnership between The Science Museum, The London Canal Museum and Beauchamp Lodge Settlement who run the largest floating classroom boat on Regent's Canal. The aim of the project is to excite people about science by making it fun and accessible. We work with groups close to Regents Canal in order to give them a different perspective of their local environment and encourage them to use it. CCP helps to bring new audiences to the Canal Museum and the Science Museum, making people aware of the resources available to them.

Kitchen Science is a collection of demonstrations that people can do at home, with everyday ingredients available from the supermarket or the chemist. We want to show that demonstrations do not have to be done in a laboratory, by people in white coats. Instead, science is involved in all aspects of people's lives.

Please try this at home!



Blow up Balloon

Props

- 1 small plastic bottle
- vinegar
- baking soda/bicarbonate of soda
- 1 balloon
- teaspoon
- paper funnel

Demonstration

1. Put 1cm of water into the bottle, and then add about 2cm of vinegar.
2. Then use a paper funnel to put 2 teaspoons of baking soda into the balloon.
3. Carefully place the balloon over the mouth of the bottle, making sure none of the baking powder falls into the bottle.
4. Then lift the end of the balloon and pour all the baking powder into the bottle in one go.



5. Shake it well and then watch the balloon inflate all by itself!

Science

This is a reaction between a base (baking soda) and an acid (vinegar). This reaction produces a bi-product, a gas called carbon dioxide or CO_2 , one of the gases we breathe out. The gas produced by the reaction cannot escape and therefore fills the balloon.

Top Tips.

- Remember the more vinegar and baking soda you use the more extreme the reaction!



Alka-Seltzer Rockets

Props

- empty film canisters
- Alka-Seltzer tablets
- teaspoon
- water

Demonstration

1. Remove the canister lid and put 2-3 teaspoons of water into the empty canister.
2. Break off $\frac{1}{4}$ of an Alka-Seltzer tablet and put it in the lid.
3. Tip the $\frac{1}{4}$ tablet into the canister and shut the lid tightly.
4. Shake the canister for a few seconds and place lid down on a flat surface.
5. Stand well back and wait!



Science

The Alka-Seltzer tablet reacts with the water and produces a gas called carbon dioxide or CO_2 . Pressure builds up in the canister as more gas is released, and the lid is eventually forced off. Sir Isaac Newton's third law of motion states, 'For every action there is an equal and opposite reaction' and this demonstration demonstrates it clearly: the lid pushes down against the desk, and the canister pushes upwards in the opposite direction, shooting off into the sky!

Safety Warning: Do not stand over the rocket. If it does not go off approach it from the side.

Top Tips.

- Try varying the temperature of the water, the hotter the water you use the faster the reaction will happen, and the higher the rocket will go!



Lava Luncy

Props

- 1 litre plastic bottle
- funnel
- vegetable oil
- water
- food colouring
- Alka-Seltzer tablets

Demonstration

1. Fill a clean bottle $\frac{1}{3}$ with water.
2. Add a few drops of food colouring.
3. Fill the rest of the bottle with vegetable oil.
4. Break up an Alka-Seltzer tablet and add it to the bottle, about half a tablet at a time.
5. Watch the lava blobs!



Science

Water and oil do not mix, as you probably know! This is because water is denser than oil, and therefore sinks to the bottom. The food colouring mixes only with the water, which is why the oil stays its normal colour. The Alka-Seltzer tablet falls through the oil and when it reacts with the water, it creates tiny bubbles of carbon dioxide or CO_2 . This gas floats to the surface, carrying drops of coloured water with it. When the bubbles pop and the gas is released, the denser water sinks back down.

Top Tips

- Don't use yellow food colouring; it doesn't show up against the oil!
- Try using salt instead of Alka-Seltzer; add about 2 teaspoons at a time.
- You can also try adding things like glitter to the mix if you want your lamp to look even prettier!



Corn flour slime

Props

- cornflour
- bowl
- teaspoon
- water

Demonstration

1. Put about 4 tablespoons of cornflour in the bowl.
2. Add the water a small amount at a time until the cornflour resembles a very thick liquid.
3. Try stirring the cornflour slowly and then quickly. Is it a liquid or a solid?
4. Put some of the mixture in your hands and roll it into a ball; what happens when you stop rolling it?



Science

The cornflour does not dissolve in the water – it creates a suspension called a colloid. The cornflour particles are very fine and roll over each other which means that the mixture acts like a liquid. However, when energy is added to the mixture (by stirring or rolling in the hand) the particles of cornflour lock together and the water between the particles is pushed out of the way, so the slime behaves like a solid.

Top Tips

- Try adding food colouring to create different coloured slime, but be warned, this can get messy...!



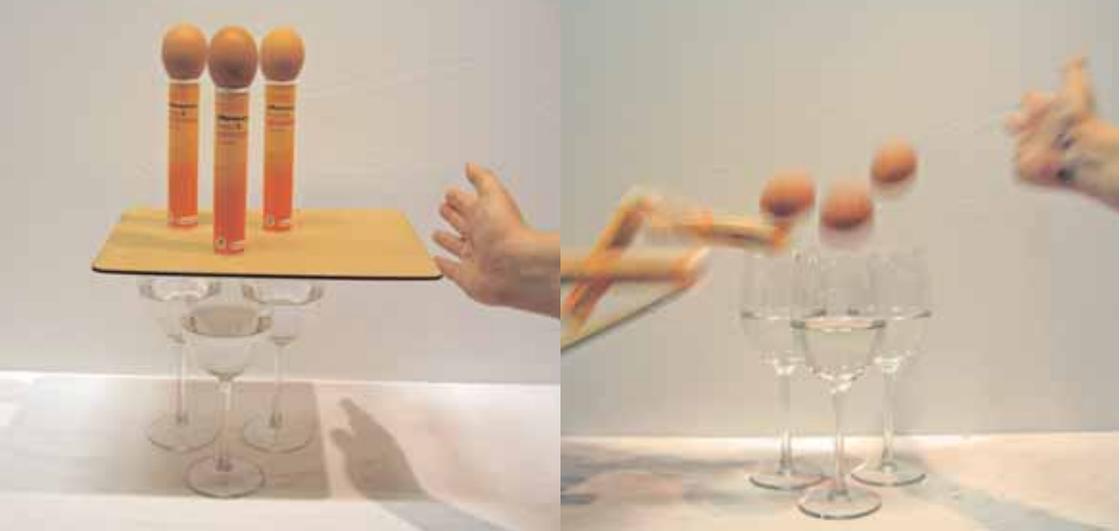
Stupid Egg Trick

Props

- 3 eggs
- 3 empty Vitamin tablet tubes
- 3 wine glasses
- 1 cork backed place mat
- water

Demonstration

1. Half fill the wine glasses with water and arrange them in a triangle.
2. Put the place mat on top of the glasses with the shiny side facing down, and the cork side facing upwards.
3. Carefully balance the tubes on top of the place mat, open end up, so each is directly over the centre of a wine glass.
4. Place an egg on top of each tube.
5. Now comes the scary bit; give the board a short, hard slap and it will slide out of the way, letting the eggs fall into the glasses!



Science

The placemat has a smooth side and a rough side. The smooth side is face down on the glasses and slides over them with little friction. The cork side is face up and grips the vitamin tubes, dragging them along as there is more friction between the surfaces. The eggs are heavy and gravity pulls them down into the glasses. The water stops the eggs breaking the glasses.

Top Tips

- Hit the board quite hard!
- If you are right handed allow the placemat to stick out more on the right-hand side, and vice versa if you are left-handed.

Glossary

acid – a substance which reacts with other things and often burns or dissolves them.

base – the chemical opposite of an acid. They react with acids to make salts.

carbon dioxide or CO₂ – a gas made when people and animals breathe out, or when carbon is burned.

density – the relationship between the weight of something and its size.

energy – is something which cannot be made or destroyed but can change from one form to another. We can experience it in lots of different ways, for example movement, heat, light or electricity.

float – to stay on the top of a liquid instead of sinking to the bottom.

gas – a substance, like air, that is not solid or liquid.

gravity – a natural force that makes objects fall to the ground.

liquid – a substance, like water, that is not a solid and can be poured easily.

pressure – the force made by a liquid or gas when it presses against an area.

reaction – a change which happens when two or more things are put together.

rough – uneven or opposite of smooth. e.g.: The ground was very rough so it was hard to walk on.

sink – to go down or make something go down under the surface of water and not come back up.

smooth – a regular surface that has no lumps or holes in it. The woman had soft smooth hands.

solid – a substance or object that is not a liquid or a gas.

suspended – something hanging from somewhere or in something.

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