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If you think liquids are boring, then think again! These colourful experiments show you the magical properties of everyday materials.

Fireworks in milk

Break the invisible skin of a liquid to create colourful patterns.

What you need

- Whole milk
- A dish

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- Food colouring
- Cotton bud
- Washing up liquid

How does it work?

Many liquids, such as water and milk, have an invisible film on their surfaces caused by something called surface tension. This surface tension is created by the attraction of water molecules to each other. By sticking close together, they make it more difficult for an object to move through the surface layer of the liquid than to move through the liquid itself. This is the reason why some insects, such as pond skippers, can walk on water. The food colouring sits on top of the milk because of the surface tension of water. The washing-up liquid disrupts this surface tension because it is attracted to fats in the milk. This causes the dye to "explode" across the surface like fireworks.

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Pour a little milk onto your dish so it just covers the surface. Add a few drops of different food colourings.





Take your cotton bud and soak it in some washing up liquid.



Slowly put the cotton bud into the centre of the milk with the food colouring and watch as the colours explode.

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Magic potion

Using just a few household ingredients you can magically change the colour of cabbage water in an instant.

What you need

- Half a red cabbage
- Chopping board
- Knife
- Water
- Pan
- Sieve
- Jug

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- Three glasses
- Spoon
- White vinegar
- Washing powder
- Bicarbonate of soda

TOP TIP! There are lots of tasty meals you can cook with the rest of your red cabbage. Look at a recipe book for some ideas.

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Things to make and do

How does it work?

This magic potion is an acid detector. Acidity is measured on something called a pH scale. Acids have pH values from one to six. Neutral liquids have a pH of seven. Liquids known as a bases have pH values between eight and 14. Red cabbage contains a pigment (a chemical that provides colour to things) called anthocyanin, which changes colour if an acid or a base is added to it. Acids, such as vinegar, make the cabbage water go pink. Bases, such as bicarbonate of soda (baking soda), change the colour to blue. Washing powder is very basic and can turn the cabbage water yellow.

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Put the chopped cabbage into a pan and cover with water. Bring the water to a boil, then turn off the heat and leave it to stand for 10 minutes.



Sieve the cabbage water over a jug. Catch all of the purple water in the jug, and then pour out the cabbage water into three separate glasses.

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In the first glass add 1 teaspoon of vinegar. In the second glass add 1 tsp bicarbonate of soda, and in the third glass add 1 tsp washing powder. Watch what happens.

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