The super-easy 6

6 Super-easy Super-cool Super-colourful Science Experiments

In this free download, we've put together 6 of our favourite experiments.

We've chosen these 6 because they are so easy to do at home and produce amazing colourful reactions.

They provide good starter activities to get your family doing science at home.

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6 Super-Easy Steps into Science...

1 Inky Explosions

FREE download from www.devonscience.co.uk

Mix up your imagination and create these amazing pieces of art! To make your colours bloom you will separate out large and small molecules. It's so easy even your mum and dad can do it!

WHAT YOU NEED

- Coffee filter paper - plain white ones are best
- Large mug or bowl - smaller diameter than the filter paper
- Felt tip pens - regular and water-based
- Pipette
- Cup of water

BEFORE

AFTER

HOW TO DO IT

1) Grab your filter paper and open it out so its a flat circle (you may need to cut it open depending on the type you bought).

2) Draw bold pattern on to the paper with you felt tips. Try smiley faces, crazy patterns, hearts, stars and snowflakes.

3) Lift the filter paper and put it on top of your mug or bowl. Try and get it nice and central over the mug's middle.

4) Pipette or flick drops of water on to the filter paper...and watch the colours bloom!
Don't add too much water - you need just enough drops to spread across the paper, dragging the different colours with it.

5) Let it dry and you will see you have created a wonderful colourful piece of art! Either display your masterpiece as it is or make greeting cards or book marks with it or whatever you fancy!

THE SCIENCE-Y SPOT

This awesome colour experiment is called chromatography. It shows that the ink in the felt tips are actually a mixture of colours which are separated out by the moving water. Some of the ink molecules are large and some are small. The smaller ones spread out in further on the filter paper and the larger ones don't travel so far. Which of your colours is the smallest?

WHAT ELSE CAN I DO?

Why not try creating art using felt tips that aren't water-based, such as permanent markers, mixed with the regular felt tips. Pemanent ink doesn't move in the water. so you'll have some bold areas of colour with the spreading ink too!

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2 Rainbow Fizz

FREE download from www.devonscience.co.uk

Let's make an exciting fizzy rainbow ! This is such an easy little experiment that takes no time at all, and it makes the most beautiful pastel colours ever!

WHAT YOU NEED

- Baking soda or bicarbonate of soda or sodium bicarbonate
- Bowl and plate or tray
- White vinegar
- The primary colours in liquid form: red, yellow, blue food colouring
- 3 x pipettes or syringes or tea spoons - something to add drops of colour
- washing up liquid

HOW TO DO IT

1) Sprinkle a layer of baking soda into your bowl, enough to cover the bottom and make it about half a centimetre deep!

2) Scatter a few drops of the 3 primary colours on to the baking soda.

3) Squirt vinegar onto the baking soda using a pipettes or syringe (those syringes from kids' cold medicines work well for this!)

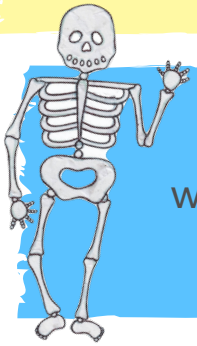
4) Watch the fizzing reaction! Can you spot how all your primary colours mix to make the secondary colours - green, purple & orange.

5) Keep going with the vinegar until the colours look muddy, then you can add a dash of washing up liquid and see what happens!

WE MADE AN ACTUAL RAINBOW!

THE SCIENCE-Y SPOT

The cool stuff happening here is the reaction between the acidic vinegar and the alkaline baking powder. In Rainbow Fizz carbon dioxide gas forms from the reaction and this is what makes it bubble and fizz. The primary colours mix to make the secondary colours as a total fizz-bomb bonus!



WHAT ELSE CAN I DO?

What happens when you add you vingar in fast - a big slosh of it?
Washing up liquid makes the reaction foam up more, so adding this makes the reaction a bit messier!
Can you make fizz-bubble patterns into shapes or animals, like unicorns?!

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3 Rainbow Skittles

FREE download from www.devonscience.co.uk

Get ready to roll out a real rainbow tasty treat! This is such a simple experiment! It'll show you how diffusion makes molecules go from high to low concentration, and then create bands of blended colours

WHAT YOU NEED

- Large packet of skittles
- White plate or flat bowl
- Jug or cup of water

Watch the video here

HOW TO DO IT

1) Empty your bag of skittles out on to the table, so you can see all the colours easily.

2) Choose your fave colours or use lots of random ones. Up to you!

3) Take your time laying out the skittles in fun, symmetrical patterns on the white plate, keep them spaced apart though!
You could try shapes like a smiley face, arrows and hearts.

5) Gently pour water on to the plate (at the side is best so it doesn't splash) up to about half the height of the skittles.

6) Sit back and watch as the skittles' colouring seep out into the water and create beautiful waves of colour!

THE SCIENCE-Y SPOT

Molecules like to spread out on their own away from a high concentration of themselves towards an area of low concentration until they are evenly spread out. The Skittles' colour molecules move away from their highest concentration on the skittles, through the "solvent" (the water) and spread themselves out to make the beautiful patterns.
Keep watching, see how the colours stop moving when they bump into each other?

WHAT ELSE CAN I DO?

Try making different patterns to see just how colourful you can make your artwork! Set up a camera to film the diffusion happening and edit the video after! To demonstrate diffusion through air, squirt perfume into the air at one side of the room. The smell will diffuse through the air to the other side of the room!

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4 Colour Changing Cabbage

FREE download from www.devonscience.co.uk

Who knew a red cabbage could be so amazing! Well, it is! It's a brilliant natural pH indicator. This purple veg will get you experimenting to see what substances are acidic or alkaline.

WHAT YOU NEED

- Adult supervision
- Hot water
- A red cabbage
- Knife & chopping board
- Sieve
- Heatproof glass bowl
- Paint tray or ice cube tray or test tubes
- Pipettes, syringes or spoons
- Safe household substances, like soap, detergent, vinegar, juice, mayonnaise, fruit.

HOW TO DO IT

1) Chop up a chunk of the cabbage & boil a kettle.

2) Chuck the bits of cabbage into a heatproof bowl and (with an adult's help) pour on boiling water to cover the cabbage.

3) Wait very patiently for this cabbagey water to cool down.

4) Pour the contents through a sieve. Keep the purple water and recycle the cabbage.

5) Choose safe substances from around the home & place these in separate wells of your ice cube or paint tray.

6) Gently pipette droplets of the purple cabbage water on to these ingredients and watch the cabbage water change colour!

If it's alkaline the cabbage water turns green or bluey-green, if its an acid it'll turn red/pink. If it doesn't change colour, then your ingredient is neutral (it's neither acidic nor alkaline).

THE SCIENCE-Y SPOT

The purple pigment, called anthocyanin, in the cabbage changes colour when it mixes with acids and alkalis. Acidic substances turn anthocyanin red/pink colour, alkaline ones turn it blue/green, A very strong alkali will turn the cabbage juice yellow. The change in colour is due to anthrocyanin changing shape due to the acid/alkali reaction.

WHAT ELSE CAN I DO?

Can you predict what colour your substance will change to.
Find out why cleaning products are mostly alkaline, and why are so many foods acidic? (looking at the ingredients may help!)

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5 Slime Time!

FREE download from www.devonscience.co.uk

Squish and squelch your way through making perfect slime! By using the right ingredients, turning glue into playful, slippery slime is so easy.

WHAT YOU NEED

- PVA craft glue
- Cups/bowls for mixing
- A mixing stick/spoon
- Slime activator = a solution of sodium tetraborate, if you don't have any you can buy ours here: www.devonscience.co.uk/shop
- Food colouring or kids craft paints
- Glitters, sequins, beads - anything fun to mix in!

Read how to make fluffy slime (blog)

Watch the video tutorial here

1) Dollop a large spoonful of glue into the cup.

2) Add some paint to your glue and stir it up! You can add glitter now or leave it out until later.

3) Squirt in a little bit of activator solution and mix vigorously. Repeat this until the glue starts to form a gloopy slime! Keep going until it starts to pull away from the sides of the cup.

4) When you've added enough activator, the slime is ready for the final stage - working and kneading it in your hands.

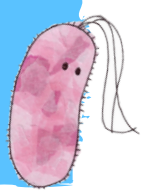
5) Scoop the slime out of the cup into your hands and squish, stretch and work it in your hands. Add more activator if it feels too sticky. Too much activator and the slime gets rubbery and less stretchy. So experiment to get it to how stretchy or squishy you want it.....and don't be scared to get slimed...!

THE SCIENCE-Y SPOT

Slime is made from glue because sodium tetraborate (sometimes called "borax") in the activator binds the glue's PVA molecules to each another to make glue less runny and more slimey! The glue turns into a semi-solid, called a non-newtonian fluid - this means it acts like a solid (you can snap slime) but also acts like a liquid (slime also flows).

WHAT ELSE CAN I DO?

Slime turns out different each time. This doesn't mean you made it wrong – you just have to experiment with different amounts of activator, colouring and glue to make it harder, softer or stretchier. Why not measure out the amounts you put in, then keep a record of them so you know what makes your perfect slime?



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6 Super-Easy Steps into Science...

6 Fireworks in a Jar

FREE download from
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Wanna make your own mini Bonfire Night in a glass? Well, you can! It's really easy to do, and you can create safe, watery fireworks at your kitchen table.

WHAT YOU NEED

- Oil (cooking or olive oil)
- A glass
- Water
- Food colouring (various colours)
- Pipettes

Read the blog here

HOW TO DO IT

1) Grab a glass and fill it with water.

2) Gently pour oil in so there is about a 0.5 - 1cm layer of oil resting on top of the water.

3) Squeeze your pipette into one of the food colouring pots & carefully drop three or four spots of colour onto the the oil in the glass.

4) Repeat with other colours

5) Watch closely as the colours stay together in the oil for a moment (some colours are heavier than others, so they may go through quicker).

6) They will eventually fall through the oil and explode into the water. This creates mini-fireworks that tumble, bubble and burst in all directions. Don't forget to make "oooh" and "aaaah" firework display noises!

Watch the video here

THE SCIENCE-Y SPOT

Oil is lighter than water, so it floats on water. The oil doesn't mix with the colouring or the water because it is hydrophobic (this means it doesn't like water), and so the colour globules hold together as they pass through the oil. The colour molecules diffuse (remember this word from earlier?) out into the water and gracefull descend through the water, for a cool, colourful firework display!

WHAT ELSE CAN I DO?

You could record which colours pass through the oil quickest (meaning they're the heaviest). Mix up some of the primary colours to make new ones to add in. Whilst the mini-fireworks dance around in the glass, take a pic or a movie to edit afterwards, like we did in the link above!