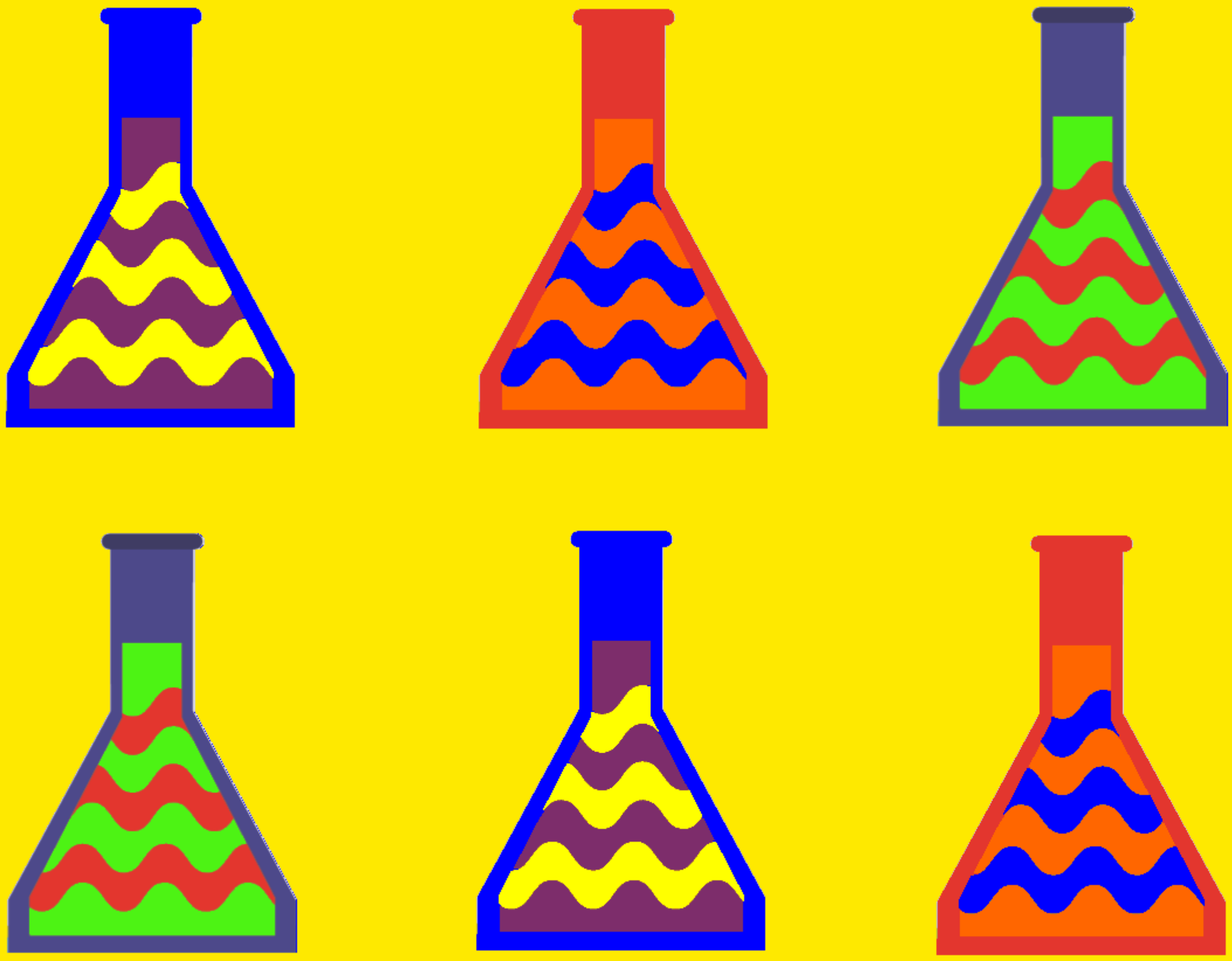

Fun Science

At Home

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www.fun-science.org.uk

Contents

About Us

Here at Fun Science, we believe that children are born scientists and want to make sure their natural curiosity is harnessed and encouraged. We aim to achieve this through birthday parties, workshops, after school clubs and holiday clubs across the country.

This book was created for parents to use with their children to continue the learning experience at home. All activities have been designed to be suitable and safe for children aged 3+, however things can go wrong and experiments should be conducted under parental supervision. We expressly disclaim any liabiity for any injury, death or damage to property that should arise from conducting any of the experiments in this book. By reading this book and carrying out the experiments you assume all liability and conduct the experiments at your own risk.

For more information about local services and franchise opportunities please visit the website below

www.fun-science.org.uk

Chromatography Socks

Brighten up a pair of socks science style! This simple experiment is easy and fun to do and best of all you can wear your socks when you have finished.

You will need:

- A pair of white socks
- Rubbing alcohol (70% or above)
- Permanent markers in various colours
- Newspaper / tablecover
- Eye dropper / pipette

Step 1: Before you start, cover your work surface with newspaper or a tablecover that you don’t mind getting messy. Old clothes are recommended for this experiment Make sure you are in a well ventilated area.

Step 2: Draw a design on part of your sock e.g. the heel or toe. Lots of circles inside each other or different coloured dots work well.

Step 3: Use your pipette or eye dropper to suck up some rubbing alcohol. Squirt this into the centre of your design and watch the colours move outwards and even see new colours appear!

Step 4: Repeat step 3 on different parts of your sock until it is covered in colours! Repeat on a second sock to make a pair.

Step 5: Hang your socks up to dry. Once they are dry, ask an adult to iron your socks on a medium heat before you wear or wash them, to fix the colour.

Step 6: When you come to wash your socks, hand wash them in lukewarm water to stop the colours running.

<u>The science bit</u>

When pens are made in the pen factory, the inks are actually made from a mixture of different colours. The different inks (scientists call them pigments) have different weights. When you squirt the alcohol in the centre of your design it moves outwards through the fabric of the sock and takes the ink with it. Lighter pigments move further than heavier pigments and so we are able to see all the colours that were used to make your pen. Blacks and browns tend to work better because more colours are mixed together to make them.

Walking Water

Make water walk from one cup to another! This experiment uses materials you are likely to find in your kitchen and only takes around 5 minutes to set up.

You will need:

- 6 paper kitchen towels
- 7 cups (clear plastic cups work well)
- 2 or 3 different food colourings
- A jug of water

Step 1 - Place all your cups in a line. Using your jug of water carefully fill every other cup at least half way up, starting from cup 1. The cups on the outside do not need to be as full as the ones on the inside.

Step 2 - Add a generous amount of food colouring to the cups filled with water and stir. These can be any colours you like.

Step 3 - Take one piece of kitchen towel, fold it in half lengthways and then fold it in half again.

Step 4 - Bend this kitchen towel and place it so that one end is in one cup, and the other end is in the other cup. Repeat this for each cup until your experiment looks like the picture below.

Step 5 - Leave your experiment for approximately two hours and let the magic happen.

<u>The science bit</u>

The paper towel is very absorbent which means that there are enough gaps in its fibres for the water to move through it. This causes the water to move up the kitchen towel through something called ‘capillary action’. This is the same process by which water moves up a plant’s stem. The water moves up the kitchen towels and down into the next cup until all the cups have the same amount of water in them. Because the water is coloured, the different colours mix in the empty cups to make new colours!

Tabletop Hovercraft

Head to the future with this easy to make, tabletop hovercraft and learn about friction at the same time!

You will need:

- Old / blank CD
- Glue gun / super glue
- Pop up bottle lid
- Balloon

Step 1: Place your CD flat on a table or floor and try pushing it around. There is a lot of friction between the CD and the surface which stops it moving very far. Try it on a few surfaces.

Step 2: Go and find your adult to help with this step. Use your glue gun or super glue to stick the bottle lid to the centre of the CD, covering the hole. Ensure that the bottle lid makes a tight seal with the CD and that there are no gaps. Leave for 20-30 minutes to allow to dry.

Step 3: Blow up the balloon but don’t tie it. Make sure the cap is closed and fit the neck of the balloon over the cap.

Step 4: Put the hovercraft on a smooth surface, pop open the cap, and push the CD around the surface. It should move much faster and further than before!

The science bit

The air coming out of the balloon creates a cushion of moving air between the disc and the surface. This lifts the disc and reduces the friction between it and the surface which allows it to move much more easily.

Naked Egg

Did you know, you can remove the shell from an egg without breaking it? Eggs are covered in a thin membrane that normally breaks when you crack an egg. In this experiment, you will dissolve the shell of an egg, leaving a bouncy, naked egg!

You will need:

- A fresh egg
- Vinegar
- Lunchbox big enough for your egg to fit in

Step 1: Place your egg in the lunchbox and carefully pour in vinegar until the egg is covered.

Step 2: Put the container somewhere safe and leave it alone for 48 hours.

Step 3: Once the time is up, remove the egg carefully. What has happened? Your egg should be slightly bigger and the shell will have worn away. If some shell is still left, try gently wiping it away or leave the egg in the vinegar for another 24 hours.

Step 4: Try dropping the egg from around 5cm above a table/floor. Do this on a wipe clean surface in case the egg breaks!

The science bit

Vinegar is acidic and the shell of an egg is made of calcium carbonate. The acidic vinegar dissolves the calcium carbonate of the shell but is unable to dissolve the membrane inside, leaving you with a naked egg! The egg also absorbs some of the vinegar which makes it grow bigger. Try shining a torch through the egg, you should be able to see the yolk.

Exploding Sandwich Bag

This is a simple and fun experiment with lots of fizzing and popping! Things can get messy so it is best to do this experiment outdoors but if that’s not possible, the kitchen sink or bath will be fine.

You will need:

- Sealable food bag x 2 (the cheaper the better)
- 1 cup of vinegar
- ½ cup of warm water
- Bicarbonate of soda

Step 1: Put 2 tablespoons of bicarbonate of soda into one of the food bags.

Step 2: Pour all the vinegar and all the warm water into the other lunch bag.

Step 3: Keep the bag of vinegar/water open and place it the right way up inside the bag of bicarbonate of soda. The bicarbonate of soda and vinegar should not mix yet!

Step 4: Seal the outside bag (the one containing bicarbonate of soda) but keep the inside bag (containing vinegar and water) open.

Step 5: Turn the whole thing upside down and shake vigorously. The vinegar and bicarbonate of soda will mix and start to create carbon dioxide which will fill the bag. As the bag starts to fill up, drop it onto the floor or into a sink/bath and watch it explode!

<u>The science bit</u>

So, what causes all that fizzing and popping? The vinegar and bicarbonate of soda mix together to produces a gas called carbon dioxide and the warm water helps to speed this process up. The carbon dioxide takes up a lot more space than the vinegar and bicarbonate of soda did and the bag begins to expand, like a balloon being filled with air. As more and more gas is created, eventually the pressure inside the bag is enough to make it go POP!

If your bag did not explode, try using a bit more water, vinegar and bicarbonate of soda. Make sure the outside bag is fully sealed before mixing the chemicals together.

Leak Proof Bag

This experiment looks just like magic but is actually a pretty nifty trick involving polymers. It is best done over a sink or bath or outside.

You will need:

- Sandwich bag
- Jug of water
- Sharp pencils

Step 1: Fill your sandwich bag at least ¾ of the way up with water.

Step 2: Hold the bag over a sink or bath or take this experiment outside.

Step 3: Take a sharp pencil and push it into the side of the sandwich bag, into the water. Keep pushing until the pencil comes out of the other side of the bag. The water should stay inside!

Step 4: See how many pencils you can push into the bag before it leaks.

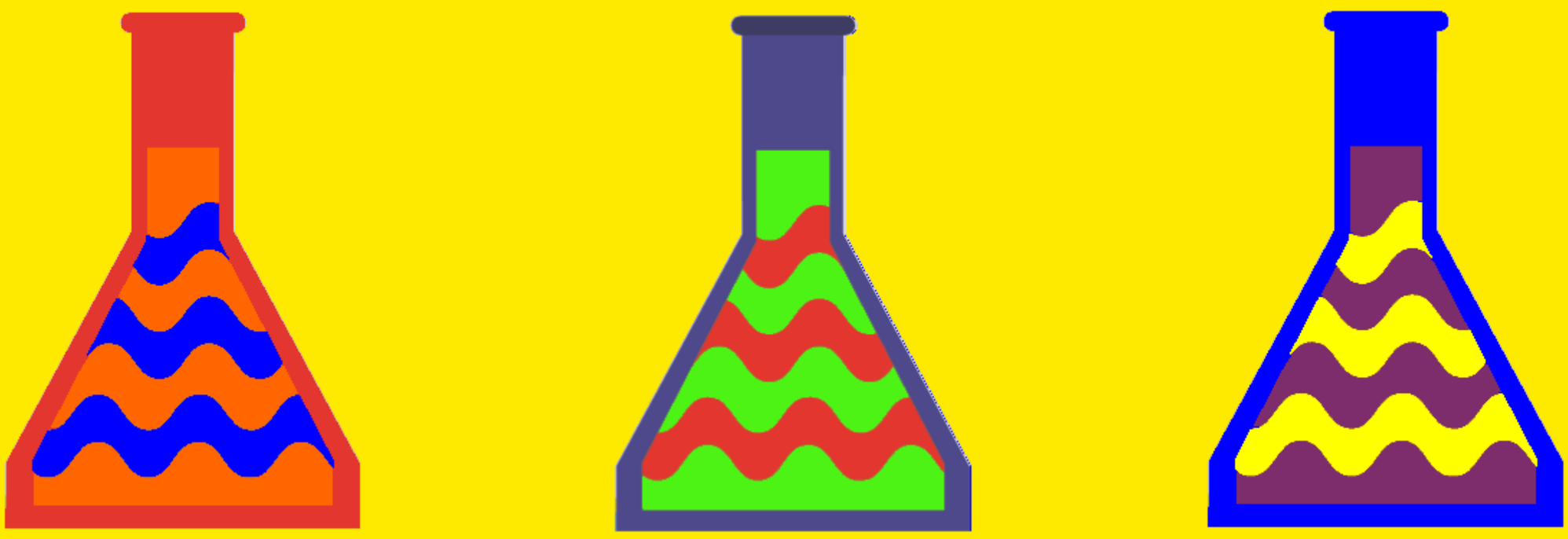
The science bit

Food bags are made of plastic and plastic is something called a polymer. Polymers are made up of lots of long strings of molecules placed side by side. When you push the pencil into the bag, the strands of molecules separate to allow the pencil to get through. The strands then ‘hug’ the pencil, creating a temporary seal which keeps the water in. Try the experiment with round pencils and with hexagonal pencils. Which keeps the most water in?

Fun Science

At Home

This book contains six fun and easy experiments for budding scientists to try at home. Make a bouncy egg, create some very scientific socks and even make an explosion!



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