

Why not have a go at these simple fun science activities in your own home.

In this pack you will find 10 different science activities that require minimum fuss and equipment.

Always remember safety comes first

Ask a grown up to help you!

Check out these fun science websites.

<https://www.stem.org.uk/missionx>

Train Like an Astronaut

<https://mooncampchallenge.org/>

<http://www.sciencefun.org/kidszone/jokes/>

Cool colour-changing milk experiment



What you will need for this colour-changing milk experiment

- A large plate (white if possible)
- A cotton bud
- Full fat milk (approx. 100ml)
- Food colouring
- Washing up liquid

Step 1

Gather everything you're going to need for the experiment on a flat surface. Make sure you put a wipeable table cloth or some newspaper down in case of any spillages!

Step 2

Pour the milk onto the plate and add 2-3 drops of food colouring into the middle of the milk.

Step 3

Take a cotton bud and dip one end into washing up liquid.

Step 4

Place the tip with washing up liquid on into the centre of the milk and watch the display.

Step 5

Keep going until the milk stops moving. Pour it away down the sink and start again making sure the plate is clean and dry and free from soapy residue.

How to Make a Homemade Spectroscope

Materials for Homemade Spectroscope

- Empty paper towel roll
- Scissors (to be used under adult supervision)
- Blank or old CD
- Pencil
- Small piece of cardboard
- Tape
- Paint (optional)

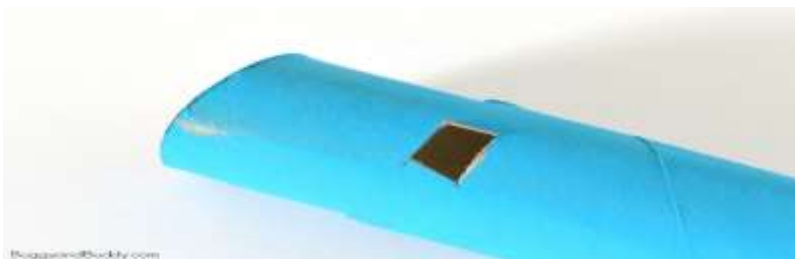
Making a Homemade Spectroscope

1. If you'll be painting your paper towel roll, you'll want to do that first and let it dry. (This step isn't necessary, but it's hard for us to pass up an opportunity to paint something!)

2. Use scissors (an adult should do this) to cut a thin slit at a 45° angle toward the bottom of the cardboard tube



3. Directly across from the slit, make a small peephole or viewing hole using your scissors (another step for an adult).



4. Trace one end of your paper towel roll onto your small scrap of cardboard. Cut it out.

5. Cut a straight slit right across the centre of your cardboard circle.

6. Tape the circle to the top of your spectroscope.



7. Insert the CD into your 45° angled slit with the shiny side facing up



Start by taking your spectroscope outside. Point the top slit up at the sky (NOT directly at the sun). Look through the peephole. You will see a rainbow inside!



Now try your spectroscope with other light sources like fluorescent light, neon light and candle light. Compare what you see!

What's going on?

A CD is a mirrored surface with spiral tracks or pits. These tracks are evenly spaced and diffract light (separating the colours). Because the CD's surface is mirrored, the light is reflected to your eye.

Dry Erase



Materials:

- A glass plate, bowl, or picture frame
- Dry erase marker
- Water

Instructions:

1. Draw a simple picture on the glass. A stick figure is a good one to start with
2. Pour water onto the plate or into the bowl slowly to lift up the drawing
3. Swirl the water around to make the picture dance and move

Water Fireworks



Materials:

- Water
- Oil
- Food Colouring (Any colour of your choosing)
- A clear glass
- Another clear glass
- A Fork

Instructions:

1. Fill the tall glass almost to the top with room-temperature water.
2. Pour 2 tablespoons of oil into the other glass.
3. Add 2 drops of food colouring to the glass with the oil.
4. Stir the oil into the food colouring using a fork. Stop once you break the food colouring into smaller drops.
5. Pour the oil and colouring mixture into the tall glass.
6. Now watch! The food colouring will slowly sink in the glass, with each droplet expanding outwards as it falls. Looks like fireworks!



Make Your Own Rainbow

Learn how to make a rainbow with this fun science experiment.

What you'll need:

- A glass of water (about three quarters full)
- White paper
- A sunny day

Instructions:

1. Take the glass of water and paper to a part of the room with sunlight (near a window is good).
2. Hold the glass of water (being careful not to spill it) above the paper and watch as sunlight passes through the glass of water, refracts (bends) and forms a rainbow of colours on your sheet of paper.
3. Try holding the glass of water at different heights and angles to see if it has a different effect.

What's happening?

While you normally see a rainbow as an arc of colour in the sky, they can also form in other situations. You may have seen a rainbow in a water fountain or in the mist of a waterfall and you can even make your own such as you did in this experiment.

Rainbows form in the sky when sunlight refracts (bends) as it passes through raindrops, it acts in the same way when it passes through your glass of water. The sunlight refracts, separating it into the colours red, orange, yellow, green, blue, indigo and violet.



Mixing Oil and Water

Some things just don't get along well with each other. Take oil and water as an example, you can mix them together and shake as hard as you like but they'll never become friends.....or will they?

What you'll need:

- Small soft drink bottle
- Water
- Food colouring
- 2 tablespoons of cooking oil
- Dish washing liquid

Instructions:

1. Add a few drops of food colouring to the water.
2. Pour about 2 tablespoons of the coloured water along with the 2 tablespoons of cooking oil into the small soft drink bottle.
3. Screw the lid on tight and shake the bottle as hard as you can.
4. Put the bottle back down and have a look, it may have seemed as though the liquids were mixing together but the oil will float back to the top.

What's happening?

While water often mixes with other liquids to form solutions, oil and water does not. Water molecules are strongly attracted to each other, this is the same for oil, because they are more attracted to their own molecules they just don't mix together. They separate and the oil floats above the water because it has a lower density.

If you really think oil and water belong together then try adding some dish washing liquid and see what happens. Washing up liquid is attracted to both water and oil helping them all join together and form something called an emulsion. This is extra handy when washing those greasy dishes, the detergent takes the oil and grime off the plates and into the water.



Design and Test a Parachute

Learn about air resistance while making an awesome parachute! Design one that can fall slowly to the ground before putting it to the test, making modifications as you go. (Will require adult supervision)

What you'll need:

- A plastic bag or light material
- Scissors (to be used under adult supervision)
- String
- A small object to act as the weight, a little action figure would be perfect

Instructions:

1. Cut out a large square from your plastic bag or material.
2. Trim the edges so it looks like an octagon (an eight sided shape).
3. Cut a small hole near the edge of each side.
4. Attach 8 pieces of string of the same length to each of the holes.
5. Tie the pieces of string to the object you are using as a weight.
6. Use a chair or find a high spot to drop your parachute and test how well it worked, remember that you want it to drop as slow as possible.

What's happening?

Hopefully your parachute will descend slowly to the ground, giving your weight a comfortable landing.

When you release the parachute the weight pulls down on the strings and opens up a large surface area of material.

This uses air resistance to slow it down.

The larger the surface area the more air resistance and the slower the parachute will drop.

Did you know?

By cutting a small hole in the middle of the parachute will allow air to slowly pass through it rather than spilling out over one side, this should help the parachute fall straighter.



Make a Tornado in a Bottle

Learn how to make a tornado in a bottle with this fun science experiment. Using easy to find items such as dish washing liquid, water, glitter and a bottle you can make your own mini tornado that's a lot safer than one you might see on the weather channel. Follow the instructions and enjoy the cool water vortex you create!

What you'll need:

- Water
- A clear plastic bottle with a cap (that won't leak)
- Glitter
- Dish washing liquid

Instructions:

1. Fill the plastic bottle with water until it reaches around three quarters full.
2. Add a few drops of dish washing liquid.
3. Sprinkle in a few pinches of glitter (this will make your tornado easier to see).
4. Put the cap on tightly.
5. Turn the bottle upside down and hold it by the neck. Quickly spin the bottle in a circular motion for a few seconds, stop and look inside to see if you can see a mini tornado forming in the water. You might need to try it a few times before you get it working properly.

What's happening?

Spinning the bottle in a circular motion creates a water vortex that looks like a mini tornado. The water is rapidly spinning around the centre of the vortex due to centripetal force (an inward force directing an object or fluid such as water towards the centre of its circular path). Vortexes found in nature include tornadoes, hurricanes and waterspouts (a tornado that forms over water).



Does an Orange Float or Sink?

Does an orange float or sink when placed in water? Seems like a fairly straight forward question, but is it? Give this fun density science experiment for kids a try and answer the question while learning a unique characteristic of oranges.

What you'll need:

- An orange
- A deep bowl or container
- Water

Instructions:

1. Fill the bowl with water.
2. Put the orange in the water and watch what happens.
3. Peel the rind from the orange and try the experiment again, what happens this time?

What's happening?

The first time you put the orange in the bowl of water it probably floated on the surface, after you removed the rind however, it probably sunk to the bottom, why?

The rind of an orange is full of tiny air pockets which help give it a lower density than water, making it float to the surface. Removing the rind (and all the air pockets) from the orange increases its density higher than that of water, making it sink.

Density is the mass of an object relative to its volume. Objects with a lot of matter in a certain volume have a high density, while objects with a small amount of matter in the same volume have a low density.



Storm in a Glass

Materials

Shaving cream

A large glass

Water

Food colouring

A spoon

Instructions:

1. Fill the glass $\frac{1}{2}$ full with water
2. Spray some shaving cream on top of the water to fill the glass to $\frac{3}{4}$ full.
3. Use your finger or a spoon to spread the shaving cream evenly over the top of the water. The top of the shaving cream should be flat.
4. Mix $\frac{1}{2}$ -cup water with 10 drops of food colouring in a separate container. Gently add the coloured water, spoonful by spoonful, to the top of the shaving cream. When it gets too heavy, watch it storm!

How does it work?

Clouds in the sky hold onto water. They can hold millions of gallons! The layer of shaving cream is our pretend cloud in this experiment. The shaving cream layer can also hold onto water. Clouds can't keep storing more and more water forever, eventually they get too heavy. When that happens, the water falls out (precipitates) as rain, snow, sleet, or hail.

Further Experiments

Try more water and less shaving cream, or less water and more shaving cream. Which one looks more like a drizzle, and which one looks like a downpour?