





Some things just don't get along well with each other...
Try mixing oil and water together and see what happens.

What you'll need:

• small soft drinks bottle •water •food colouring •cooking oil

- · Add a few drops of food colouring to the water.
- F
- Pour 2 tablespoons of the coloured water and 2 tablespoons of cooking oil into the bottle.
 - Give the bottle a good shake.
- What happens? What can you see? Why do you think this is happening?







People say that wearing black in Summer is a bad idea and to wear light colours instead... Is it true?

What you'll need:

- 2 identical glasses water thermometer 2 elastic bands white paper
- black paper

- Fill 2 glasses with the exact same amount of water.
- Wrap a piece of white paper around one glass and a piece of black paper around the other. Hold the paper in place using an elastic band.
- Leave the glasses out in the sun for a couple of hours before returning to measure the temperature of the water in each glass.
- What did you find out? Is it true?
- Try other colours. What colour keeps you coolest?
 - What happens? What can you see? Why do you think this is happening?







They say opposites attract. Find out if that's true with these fun static electricity experiments.

What you'll need:

- 2 inflated balloons (with string attached) your hair aluminium can
- woollen fabric

- Rub the 2 balloons one by one against the woollen fabric, then try moving the balloons together, do they want to or do they repel each other?
- Rub 1 of the balloons on your hair then slowly pull it away, what happens?
- Put the aluminium can on its side, on a table. After rubbing the balloon on your hair again, hold the balloon close to the can and watch what happens.
- Move the balloon away from the can. What happens?
 - What happens? What can you see? Why do you think this is happening?





As disgusting as it might sound, let's make some fake snot! Mucus actually serves an important purpose in your body.

What you'll need:

boiling water • a cup • gelatin • golden syrup or liquid glucose
(corn syrup) • a teaspoon • a fork

- Fill half a cup with boiling water (let an adult do this).
 - Add 3 teaspoons of gelatin to the water and let it soften before stirring with a fork.
- •Add a quarter of a cup of golden syrup then stir again with your fork and look at the long strands of gunk that have formed.
- As the mixture cools, slowly add more water (small amounts).
 - What happens? What can you see? Why do you think this is happening?







Now you can be a top secret agent with this magic, invisible ink formula.

What you'll need:

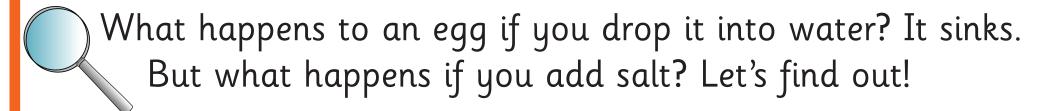
- half a lemon •water •spoon •bowl •cotton bud •white paper
- lamp or other light bulb

- Squeeze some lemon juice into the bowl and add a few drops
 - of water, then mix with your spoon.
 - Dip the cotton bud into the mixture and write a
 - message onto the paper. Now wait for it to dry.
- Pass it to a friend and let them heat the paper.
 - What happens? What can you see? Why do you think this is happening?









What you'll need:

•one egg •water •salt •a tall drinking glass

- Pour water into the glass until it is about half full.
 - Stir in lots of salt (about 6 tablespoons).
 - Carefully pour in plain water until the glass is nearly full (be careful not to disturb or mix the salty water with the plain water).
- Gently lower the egg into the water. What happens?
 - What happens? What can you see? Why do you think this is happening?





We all know that some foods taste better than others but is it just our tongue that tastes the flavours? Let's find out.

What you'll need:

• a small piece of peeled potato • a small piece of peeled apple

Instructions:

· Close your eyes and let a friend mix up the piece of potato and

the piece of apple so you don't know which is which.

•Hold your nose tight and eat each piece, can you tell the difference?

- •Try other foods. Can you taste the difference?
 - What happens? What can you see? Why do you think this is happening?









Have fun making dry ice bubbles that will grow and grow.
You'll need an adult to help with this one!

What you'll need:

water • a large bowl (with a lip) • a strip of material • soapy mixture (water and washing up liquid) • dry ice

Instructions:

- Adult Place your dry ice in the bowl and add some water.
- Soak the material in your soapy mixture and run it around the

lip of the bowl, before dragging it across the top of the

bowl to form a bubble layer over the dry ice.

• Stand back and watch your bubble grow.

• What happens? • What can you see? • Why do you think this is happening?









Does an orange float or sink when placed in water? Seems like a simple question, but is it?

What you'll need:

•an orange •a deep bowl •water

Instructions:

• Fill the bowl with water.

Put the orange in the water and watch what happens.

• Now peel the skin/rind from the orange and try the experiment again. What happens this time?

Does the same thing happen to other fruits

that have skins?

• What happens? • What can you see? • Why do you think this is happening?









Turn your glasses of water into musical instruments! See how many different songs you can create.

What you'll need:

•5 or more drinking glasses or bottles •water •a wooden stick

Instructions:

• Line the glasses up next to each other and fill them with

different amounts of water.

•Hit the glass with the least amount and the greatest amount of water and listen.

• Which one makes the higher sound/note?

• Have a go at creating a tune.

What happens?What can you see?Why do you think this is happening?



Teacher's Notes

A huge part of carrying out any science investigation is not just the observing and enjoyment, it's also the understanding that is gained from participating - that's where you come in.

So we've also included some simple explanation notes for each of the 10 experiments that you will hopefully find useful.



Mixing oil and water

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.



Wearing black in Summer

What's happening?

Dark surfaces such as the black paper absorb more light and heat than the lighter ones such as the white paper. Lighter surfaces reflect more light, that's why people wear lighter coluored clothes in the summer, it keeps them cooler.

Teacher's Notes



What's happening?

This involves negatively charged particles jumping to positively charged objects. When you rub the balloons against your hair or the fabric they become negatively charged, they have taken some of the electrons from the hair/fabric and left them positively charged.

They say opposites attract and that is certainly the case in these experiments, your positively charged hair is attracted to the negatively charged balloon and starts to rise up to meet it. This is similar to the aluminium can which is drawn to the negatively charged balloon as the area near it becomes positively charged, once again opposites attract.

Making fake snot

What's happening?

Mucus is made mostly of sugars and protein. Although different than the ones found in the real thing, this is exactly what you used to make your fake snot. The long, fine strings you could see inside your fake snot when you moved it around are protein strands. These protein strands make snot sticky and capable of stretching.

Teacher's Notes



M Invisible ink

What's happening?

Lemon juice is a substance that oxidizes and turns brown when heated. Diluting the lemon juice in water makes it very hard to notice when you apply it the paper, no one will be aware of its presence until it is heated and the secret message is revealed. Other substances which work in the same way include orange juice, honey, milk, onion juice, vinegar and wine.



Floating eggs

What's happening?

Salt water is denser than ordinary tap water, the denser the liquid, the easier it is for an object to float in it. When you lower the egg into the liquid it drops through the normal tap water until it reaches the salty water, at this point the water is dense enough for the egg to float. If you were careful when you added the tap water to the salt water, they will not have mixed, enabling the egg to amazingly float in the middle of the glass.

Taste testing without smell

What's happening?

Holding your nose while tasting the potato and apple makes it hard to...CONTINUE



Teacher's Notes



KS1 cream!

Taste testing without smell

What's happening?

...CONTINUED - tell the difference between the two. Your nose and mouth are connected through the same airway which means that you taste and smell foods at the same time. Your sense of taste can recognize salty, sweet, bitter and sour but when you combine this with your sense of smell you can recognize many other individual tastes. Take away your smell (and sight) and you limit your brains ability to tell the difference between certain foods.

Dry ice bubble - please ensure gloves are worn! What's happening?

Dry ice is carbon dioxide (CO2) in its solid form. At temps above -56.4 °C, dry ice changes directly from a solid to a gas, without ever being a liquid. This process is called sublimation. When dry ice is put in water it accelerates the sublimation process, creating clouds of fog that fill up your dry ice bubble until the pressure becomes too much and the bubble explodes, spilling fog over the edge of the bowl. Dry ice is sometimes used as part of theater productions to create a dense foggy effect. It is also used to preserve food, freeze lab samples and even to make ice

Teacher's Notes



Sink or float oranges

What's happening?

The first time you put the orange in the bowl of water it probably floated on the surface, after you removed t he 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 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.



Making music

What's happening?

Each of the glasses will have a different tone when hit with the pencil, the glass with the most water will have the lowest tone while the glass with the least water will have the highest. Small vibrations are made when you hit the glass, this creates sound waves which travel through the water. More water means slower vibrations and a deeper tone.