Kitchen Science
Week Beginning 08.06.20

Fizzing Lava Lamp

Have you ever caused a chemical reaction by mixing vinegar and bicarbonate of soda? If you haven't here are the instructions-

Activity 1
You will need: A jar, clear vinegar and a spoonful of bicarbonate of soda.

Put your jar in a tray or a sink, then half fill it with vinegar. Sprinkle in a spoonful of bicarbonate of soda and watch what happens.
This is called a chemical reaction the acid (vinegar) reacts with the base (bicarbonate of soda) and forms a new substance a gas (carbon dioxide).

Activity 2
You will need: A glass or clear bottle, vegetable oil, food colouring, water and a soluble vitamin tablet like Berocca or alka seltzer.

Fill about one third of a jar with water then top up the jar with vegetable oil. Take time to pour the oil gently as you don't want too many bubbles to form.
What happens when you pour the oil into the jar?
Drip in some food colour and you should see it sink down through the oil.
Finally drop in pieces of the tablet and watch.
This video will demonstrate for you: https://www.youtube.com/watch?v=7-BYKKtXCGU

Skittles Rainbow

Have you heard of the word dissolve?
What do you know that dissolves?
Sugar dissolves in a cup of hot water when we are making a cup of tea.
We can make a pattern with sugar when it dissolves.
You will need a packet of Skittles, a white plate and some hot water.

First arrange your skittles around a plate. You can use as many or as few as you like.

Then pour a little hot water onto the middle of the plate (enough water to reach out to the sides of the plate). What do you expect to happen?

Watch for a few seconds and see what happens.

Why does the colour travel away from the sweets and not mix with the water from the next sweet? It is all to do with sugar dissolving along with the colour. The sweets are covered by a sugar coating, this sugar mixes with the water and tries to mix with all of the water that does not have sugar in it. The water coming from each sweet has a high concentration of sugar in it already, so they don't mix straight away.
This video will demonstrate for you: https://www.youtube.com/watch?v=BAAr7EvqWPk

Witch's Brew

You will need: A glass or a jar, vinegar, bicarbonate of soda, food colouring, washing up liquid and glitter or sparkles (optional extra).

First you need to half fill your jar with vinegar.
Then add in a few drips of food colouring.
If you are adding glitter or sparkles put in a small amount now.
Next you need to add a good squeeze of washing up liquid.
Lastly, gently stir your mixture.

Look carefully at what you can see. Can you still see the vinegar? The washing up liquid?

Now carefully put your glass/jar of Witches' Brew on a tray or in the sink.
Can you guess what you are going to do now?
That's right, it's time to add a teaspoon of bicarbonate of soda.

Can you describe what happened? What did you see?

What happened you ask? The vinegar and bicarbonate of soda reacted with each other to make bubbles and gas (carbon dioxide).

Now it's your turn to make your own Witches' Brew and do remember to share on the blog so others at home can try to make it too!

Acids and Bases

Have you heard of acids and bases?

Some household products we use every day are acids and bases (even some of our food)! We can use red cabbage to find out what is an acid (PH of below 7), a base (PH of above 7) or neutral (PH of 7).

To make the red cabbage indicator you will need: a red cabbage leaf, some very hot water (please be careful), a jug and a sharp knife or scissors.

Cut up the cabbage leaf into small pieces and put into a jug. Cover the cabbage with very hot water, give it a stir and leave it to cool. You should notice the colour of the water changing very quickly. When it is cool pour off the water into a bottle or jar and throw away the used cabbage leaf. You now have your own indicator.

To test for PH- Mix a little of your test item with some water and put in a clean glass, tub or bowl. Add a small splash of the indicator. The indicator should show one of these colours depending on the PH of your solution.

Red Cabbage Indicator Colour Chart

pH	pH less than 7 = Acid			pH more than 7 = Base		
	2	4	6	8	10	12
Colour	Red	Purple	Violet	Blue	Blu-Grn	Grn-Yel

You can make up solutions to test from around the house. Here are some ideas for items to test- vinegar, lemon juice, bicarbonate of soda, baking powder, washing up liquid, hand soap, shampoo, anti-bac spray, a salt solution using Lo-Salt if you have any. Some of these are neutral so the indicator will stay dark purple, some are acidic so the indicator should go pink and some are alkaline (base) they should go blue or green.

The Water Cycle

Water is very important. We cannot survive without clean water. Have you ever heard of the water cycle? That is the process with which water evaporates from land and sea, rises into the sky, where it condenses and changes back to water droplets and eventually falls back down to earth again as rain or sometimes snow. You can make your own water cycle in a plastic bag.

You will need a zip lock bag, some water (add some blue food colouring to it if you can), a permanent marker, some Sellotape and a sunny window. On the outside of the plastic bag draw some water at the bottom, a cloud and the sun near the top. Put a small amount of water in the bag and seal it up. Stick the bag to a sunny window and leave it to heat up. You should see the water droplets form at the top of the bag and begin to 'rain' back to the 'sea' again.

This video has several demonstrations about weather including how to make your own water cycle in a bag- https://www.youtube.com/watch?v=ZYu3o9goRG4

Melting Ice

Investigate how to melt an ice cube. How would you melt an ice cube. Would you add something to it? Would you put it somewhere different? Would you wrap it up? Try out some different ideas and see what works best. You could then try to preserve your ice cube. Who in your family can keep an ice cube for the longest? (No using the freezer)!!

Ice Sculptures

We can use the properties of water and ice to make sculptures and interesting ice models. You will need to make some blocks of ice by freezing water in different containers. You could use balloons or rubber gloves as well as tubs and boxes to get some interesting shapes. Because saltwater melts at a lower temperature than plain water we can get some interesting effects.

You will need- plastic containers, water, salt, tray, food colouring or watercolour paints and a spoon or paintbrush.

- Fill the different sizes and shapes of containers with water and freeze overnight.
- Remove the ice from the containers and place in a tray.
- Mix food colouring with water and put aside for now.
- Sprinkle salt over the ice or leave small piles of salt and watch the ice begin to crack.
- Using a spoon or paintbrush dot the surface with food colouring or watercolour paints. This won't colour the ice- but will highlight the tunnels that form in the ice as the salt melts it.
- Now it's time to get exploring- add more salt and/or colouring.

The science behind this experiment? Water turns to ice at 0 degrees Celsius. Ice without salt melts due to the difference in temperature of the ice and the air around it. When you add salt, it dissolves into the water on the surface of the ice. Salt water has a lower freezing point than water so there is a bigger difference between the air temperature and ice. This is why ice with salt melts quicker.

Ice Garden

Collect some items from outdoors such as petals, leaves, twigs and small stones. Put a small amount of water into a small plastic tub that can fit in your freezer. Place your items in the water. Some will float and some will sink (you could try to make predictions before adding the items). Put into the freezer. When it is solid add another layer of water to cover over all of the items and freeze again.

Turn the frozen garden and tap it until it comes out (best to do this onto a plate or a tray). Watch what happens over time. If you could take photos of the ice melting, you could even make a stop motion animation!!

Ice and Water

Ice is made from water. When it gets cold it freezes. When it freezes it can float on water. We can use this to make some boats.

Floating Ice Boats

Make some ice cubes or ice boats by freezing some water in different shaped tubs or containers. You could freeze water in balloons or plastic bags to make some interesting shapes. If you want to add sails to your boats, blu-tac a stick to the bottom of the container before filling it with water then make a paper sail to put on later. You could add a little food colouring or paint to the water to make your boats different colours. Put the boats in the freezer until they are solid. When your boats have frozen put some water in a large tub, plastic box or bath and sail your boats. Eventually the water will cause your boats to melt but you could easily make some more!

Which shapes of boats melted the quickest? Which shapes of boats melted the slowest?

Blow Up Balloon

Blow up a balloon without using your own breath.

You will need: a small plastic bottle, vinegar, water, baking soda, a balloon, a teaspoon, a funnel.

The science behind it: this is a reaction between a base (baking soda) and an acid (vinegar). It produces a gas called CO2, one of the gases we breathe out. The gas produced by the reaction cannot escape and therefore fills the balloon.

Lava Lunacy

Create a vigorous reaction inside a bottle using water and oil!

You will need: a plastic bottle a funnel, vegetable oil, water, food colouring (top tip – don't use yellow) and an Alka-Seltzer tablet.

The science behind it: Water and oil do not mix, as you probably know! This is because water is denser than oil, and sinks to the bottom. The food colouring mixes only with the water, which is why the oil stays its normal colour. The Alka-Seltzer tablet falls through the oil and when it reacts with the water it creates tiny bubbles of CO2. This gas floats to the surface because it is much lighter (less dense) than both the water and the oil, carrying drops of coloured water with it. When the bubbles pop and the gas is released, the denser water sinks back down again.

Cornflour Slime

Solid or Liquid? You be the judge.

You will need: cornflour, water, a plastic tray, and a teaspoon.

The science behind it: The cornflour does not dissolve in the water – it creates a suspension called a non-Newtonian fluid. Cornflour consists of billions of tiny irregularly shaped particles of starch. When water is added, the liquid flows around each starch grain and acts like a lubricant, making the mixture runny by helping the particles to slip over each other. When a sudden large force is applied, the starch grains jam together, squeezing some of the water out from between them. Without the lubricating effect of the liquid, the particles cannot slide past each other and so the mixture starts to behave like a solid. However these effects are only temporary. As soon as the force is removed and the mixture is allowed to 'relax', the water surrounds each of the particles again and the mixture becomes runny once more.

Milk Magic

The science behind it: Milk is made up of water, vitamins, minerals, proteins and fats. When the washing-up liquid is added two things happen. First, the washing-up liquid lowers the surface tension of the milk so that the food colouring is free to flow throughout the milk. Second, the washing-up liquid makes the fats and proteins in the milk spread out. This happens very quickly, causing the liquid to swirl. The food colouring molecules bump together, letting us see the activity of the milk.