JELLY LENSES

You will need:

- 1 pack of jelly
- ¾ cup of water
- Round-bottomed measuring spoons and measuring cups
- A paper towel
- A cutting board or tray

Instructions:

1. Get an adult to help you with this one-we're dealing with near-boiling water! Start by heating the 3/4 cup of water in the microwave for a minute and a half.
2. Pour the jelly powder into a bowl, then pour the hot water over the powder. Mix them together for two minutes.
3. Let the liquid cool for about ten minutes.
4. Cover a cutting board or a flat tray with a paper towel.
5. Scoop out some liquid with the small measuring spoons, then place them on the paper towel.
6. To fill the larger measuring cups, place the empty cups on the paper towel and carefully pour the jelly liquid in. Try not to spill, this stuff makes a pretty sticky mess to clean!
7. Carefully move your tray or cutting board to the fridge. Wait 4 hours for it to cool completely.
8. After four hours, you can gently remove your lenses from the spoons and cups. Wash your hands in the sink before your touch them, wet hands mean the jelly won't stick to your skin while you are pulling them out.
9. Add a little water to the bottom of a glass plate or bowl. Then place a lens inside, flat side down.
10. Move the bowl over different things to see them up close!

Why does this happen?

Lenses bend light as it moves through them. Your jelly lenses work just the same way as telescopes, microscopes, binoculars and glasses.

INVISIBLE INK

You will need:

- Lemon juice
- Paint brush or cotton swab
- Plain paper

Instructions:

1. Add about 1 tablespoon of lemon juice to the cup. Fresh squeezed or bottled juice will work just fine.
2. Soak an end of the cotton swab or put the paint brush into the lemon juice. You'll use this to write your message.
3. Write your message on the plain paper. You'll be able to see it as long as the paper is wet so let the lemon-juice message dry completely.

4. There's no rush to reveal the message but there are several methods. Whichever method start at the bottom of the message and work your way up since heat rises. YOU WILL NEED AN ADULT.

Here are some options:

You can hold the paper over an incandescent light bulb with OK results. It may be hard to tell if the bulb is hot enough, so you may not know whether your paper is blank or whether you just can't see the message yet.
You can "iron" your paper but don't use the steam setting. This may be the best method. A clean rag between the iron and the paper helps keep the iron's hot surface clean.
Hold the paper over a hot burner on a stove. There will be some distortion of the paper as it gets hot and the message appears. Watch your fingers!

Why does this happen?

Most invisible ink messages can be revealed by heating either side of the paper on which they're written. The message discolours before the rest of the paper gets hot enough to do so. When you wrote your message using the lemon juice, carbon-based compounds in the juice were absorbed into the paper's fibres. Also, since lemon juice ink is a weak acid, it softened the fibres in the paper. The added heat caused some of the chemical bonds to break down in the dried juice and some carbon was cut loose. When the carbon came into contact with air, it burned or oxidized. One effect of oxidation is things turn a darker colour. (Some oxidation doesn't need heat to occur; it just needs a little air. Think of a piece of apple, banana, or pear left out on a plate for a while.)

Lemon juice – like most fruit juice – contains carbon compounds. These compounds are pretty much colourless at room temperature. Heat breaks down these compounds and releases the carbon.
When carbon comes in contact with air (specifically oxygen), oxidation occurs, and the substance turns light or dark brown. If it oxidizes long enough, it can go all the way to black.

DANCING RAISINS

You will need:

- Raisins
- Still water
- Sparkling water
- Two clear plastic cups

Instructions:

1. First, carefully pour some still water into a clear, plastic cup.
2. Gently, drop a raisin into the water. Did it float or sink?
3. Next, pour some fizzy water into a different clear, plastic cup.
4. Gently drop a raisin into the water. Did it float or sink?
5. What was the difference between the two reactions. Why do you think this was?

Why does this happen?

In the still water cup, the raisin sinks because the raisin is denser than the water. In the sparkling water cup, the raisin is again denser than the water. However, the bubbles get trapped in the grooves of the raisin, helping it to float back to the surface. When the bubbles pop, the raisin sinks back down.

MAKE YOUR OWN VOLCANO

You will need:

- Vinegar
- Washing up liquid
- Plastic cup
- Red food colouring
- Baking soda

Instructions:

1. Fill your glass just over half full with water, add 3 tea spoons of baking soda and give it a good stir until most of the baking soda dissolves. Then add 3 drops of red food colouring and stir until it turns red.
2. Add a good squirt of washing up liquid into the cup and once again give it a stir.
3. Make sure your volcano is in the kitchen or outside (or somewhere you don't mind making a mess).
4. Quickly pour in just under a quarter of a cup of vinegar and enjoy your very own volcanic eruption!

Why does this happen?

You just made a chemical reaction! By mixing the acid (vinegar) and the alkali (bicarbonate of soda), bubbles of carbon dioxide (CO_2) were released like in a pyroclastic flow. These move very fast and are extremely dangerous, whilst lava flows move slowly and aren't much of a threat.