

Hello Saint Gregorys' scientists!

Please have look through the PowerPoint for lots of ideas for fun science activities you can do at home with your children.

Each task has 2 slides, 1 to tell you what to do and a second with some additional scientific information and or questions.

Rainbow Magic

- You will need:**
- Kitchen roll
 - Felt tip pens
 - Two bowls of water
 - Paper clip/ bull

Instructions:

1. Cut the kitchen roll into the shape of a rainbow.
2. Attach the bull dog clip to the top of the rainbow and attach thread to this (optional but makes it easier to hold).
3. Colour a rainbow with felt tip pens from the bottom of both the ends of the rainbows up about 2-3 cm.
4. Hold the rainbow over the water, with the ends slightly in the water and watch the colours travel up your rainbow.



The Science

The ink from the coloured pens travels up the paper towel because of capillary action. Capillary action is the ability of a liquid to flow upwards against gravity (the force that pulls towards the centre of the Earth). This is the same thing that helps water travel from the roots to the leaves in trees. The kitchen paper is made up of fibres (called Cellulose) which form lots of little holes. Water likes to stick to other things (adhesion) and the rest of the water also travels through because it likes to stick together (cohesion). As it goes, it sticks to the colour and takes that too. Eventually this process will stop because the water will run out.

Magic Arrow

- You will need:**
- Sheet of paper
 - A large glass of water

Instructions:

1. Draw an arrow onto a sheet of paper.
2. Place the arrow behind the glass of water.
3. You should notice that the arrow flips and now points in the opposite direction.



The Science

The arrow looks like it has changed direction or bent because of something called **Refraction**. Refraction happens when light passes through one **transparent** (clear) thing into another. In this case, from the air through the glass, through the water, back through the glass and then back through the air before hitting the arrow. This has caused the light to bend and made the arrow look like it has been reversed.

Why not try these....

* Try using different shaped glasses * try moving the distance from the

Plastic Milk

You will need:

- 4 tbsp. Vinegar
- 1 cup of milk
- sieve

Instructions:

1. Take 1 cup of milk and warm it in the microwave for about 1 minute 30 seconds. Don't let it boil.
2. Next, stir in 4 tablespoons of vinegar.
3. The milk will start to clump. Stir for about 1 minute.
4. Strain the milk through a sieve. All the clumps will stay in the top– really push them to get all the liquid out.
5. Transfer to some paper towels and press all the liquid out of the lumps. You can then shape it and even add colour!



The Science

This plastic like substance that you are left with occurs from a chemical reaction between the milk and vinegar. Normally the protein molecules (casein) in the milk are folded up. When the casein comes into contact with the vinegar (an acid), the casein and the vinegar don't mix together. The casein molecules unfold and rearrange into long chains called acid casein. This is insoluble in water and comes out as a solid (precipitates).

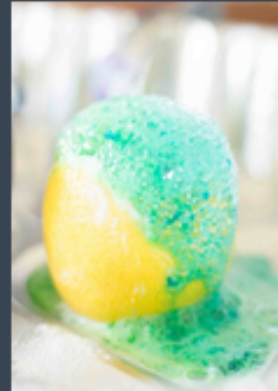
Volcano Lemon

You will need:

- Lemons
- Baking soda
- Food colouring
- Washing up liquid

Instructions:

1. Place half a lemon onto a plate. Squeeze the juice from the other half into a bowl and keep aside.
2. Using a knife (adult help needed) poke holes in the sections of the lemon.
3. Place drops of food colouring on top of the sections of the lemon.
4. Add washing up liquid all over the top of the lemon.
5. You should notice that the arrow flips and now points in the opposite direction.
6. Sprinkle a generous amount of baking soda over the lemon and press it into the sections.
7. Watch your lemon volcano erupt!



The Science

The lemon contains an acid (citric acid) this reacts with the baking soda creating a gas called carbon dioxide. The washing up liquid adds bubbles and foam to this.

Why not using different citrus fruit....

Ice Rescue

Place a small plastic toy or figure (Lego works well) into the container and fill to almost the top with water. Leave in a freezer or ice compartment in the fridge until the water is frozen. Remove the container and leave for 5-10 minutes until the ice loosens and then tip it out onto a plate or tray.

You will need

- ◆ A container
- ◆ Small plastic toy
- ◆ Water
- ◆ Freezer (or ice compartment in the fridge)
- ◆ Salt
- ◆ Warm water
- ◆ Ice cubes



Science Talk

- What happens when you pour a little bit of warm water onto the ice?
- What happens if you put salt on it?
- What do you think would be the fastest way to rescue your toy?
- What could we do to find out which is the fastest way?
- Are bigger toys easier to rescue than smaller toys?

Melting Ice

Freeze several small ice cubes or shapes of the same size. Put them in separate containers and choose different places to leave them. If you can go outside, you could put one in the shade, one in the sunshine and also leave one inside. You could also try making ice cubes out of different liquids like milk, vinegar or cooking oil.

WHAT DO YOU NOTICE?

Things to talk about...

Where does the ice cube melt the most quickly? Why might that be? Can you find the place where the ice cube will take the longest time to melt? Or the shortest time to melt? What happens with frozen cubes made from different liquids?



The Science

Water can be a solid, liquid or a gas. A liquid turns into a solid (freezes) when its temperature drops below its freezing point. For water this is at zero degrees Celsius. Ice melts when its temperature rises above its freezing point. Ice melts faster when salt is added as the salt makes the freezing point of the ice lower. Different liquids have different freezing points. Oil freezes at a lower temperature than water, so an 'ice cube' made of oil will melt faster than one made of water. Did you know? Fresh ice feels sticky because it immediately freezes the moisture in your skin, making it feel sticky to touch.

Leaf Detective

How many of these native tree leaves can you find on your daily walk or in your garden?

Tick them off, draw them, or collect fallen leaves as you go.



Science Talk

- What is the same/different about the leaves you have found?
- Can you sort them into different groups?
- What do you notice about the structure of each leaf, why do you think that is?

Sink the Foil Boat



3. Now fold up the sides to make a simple boat shape.



Float your boat in some water and begin adding the marbles.



Keep Going until your boat sinks, record how many marbles it took to sink your boat.

You will need:

Aluminium foil

A tub of water

Marbles, metal nuts or anything else you want to use as weights

Optional: A scale to measure the weight

A mess bucket and cleaning materials

Science Talk

- Can you reduce the amount of foil and still hold the same number of marbles?
- What happens if you use a liquid other than water?
- Does it matter where you place the weights within the boat?

Pepper and Surface Tension

You will need:

White pepper

One white plate

Clear water

Detergent

A mess bucket and cleaning materials



Pour water into a shallow plate



Sprinkle white pepper over the surface of the water.



Add a drop of detergent into the center of the plate and watch the pepper spread out!

The Science

All liquids have surface tension along the surface of a liquid, caused by inter-molecular forces within the liquid pulling liquid molecules together. Because of surface tension, liquid surfaces act like a kind of 'skin', able to support small insects and materials on their surface.

Your detergent molecules reduced the water surface tension in the centre of the plate and so the higher surface tension at the edge of the plate pulled the pepper outwards. This is an example of the Marangoni effect in action. The Marangoni effect describes how a liquid with a high surface tension pulls more strongly on the surrounding liquid than a liquid with a low surface tension. If you change the surface tension of some parts of the liquid you introduce a difference in surface tension or 'gradient'. A presence of a surface tension gradient will cause the liquid to flow from areas of low surface tension to high surface tension. Put simply, the water surface was pulled outwards!

Make your own Compass

What you need

- A bowl of water
- A paper clip or sewing needle
- A magnet



Rub the needle 50 times, in one direction, against a magnet. This could be your fridge door magnetic strip,



Place the needle on a cork or anything else that will float. Then float it in your water.



The needle should face true north!

The Science

Why does the needle move?

The needle is being affected by the Earth's **magnetic field**. One end points towards magnetic north and the other end points south. You can use a compass to check which direction each end is facing.

The Sun is in the South at about midday, so you can also check your compass is working if one end points in that direction. The other end of the needle will be pointing north, away from the Sun.

Make a Water Filter



Make a cup of dirty water.



Cut the bottom third off each bottle.



Tie the stocking or cloth onto the bottle neck.



In one bottle add sand *then* gravel. In the other add gravel *then* sand



With the bottles upside down in the 2 empty cups, pour dirty water into each. Which will filter the best?



You will need:

Three plastic cups

Two water bottles (to run two different versions

Scissors

A rubber band

Old stocking material (or Kitchen cleaning wipe)

Sand and gravel with material of different sizes

Water and dirt

The science

You have created a simple water filter! The sand and gravel particles act as a sieve, trapping larger material from filtering down with the water as it travels downwards. Filtering such as this occurs in the natural environment as well. There are many communities who rely on underground aquifers which have accumulated over millions of years as water has filtered through the soil to the bedrock.

A classic example of an underground aquifer is [Australia's Great Artesian Basin](#) which covers much of Queensland and South Australia with extensions into the Northern Territory and NSW.

You can create a simple model of soil horizons that produce these natural water filters by alternating different sands and gravel in a clear container.

Can Sound Move Objects?

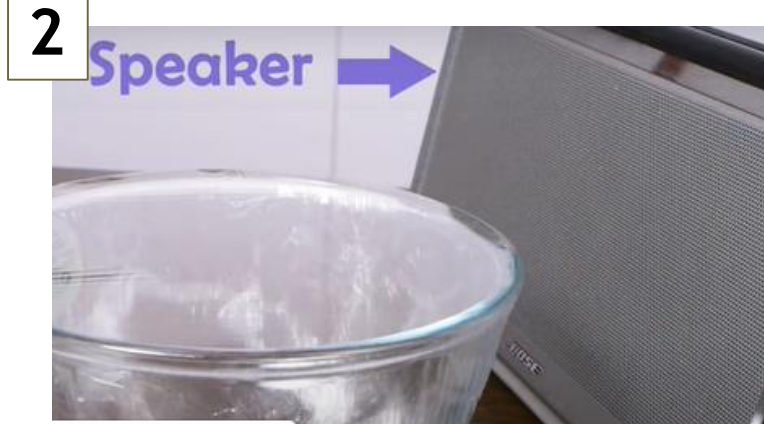
Things you will need:

Cling wrap
An elastic band
A bowl
Rice
Music Speaker

1



2



3



4

Turn on some loud music and watch what happens to the rice!

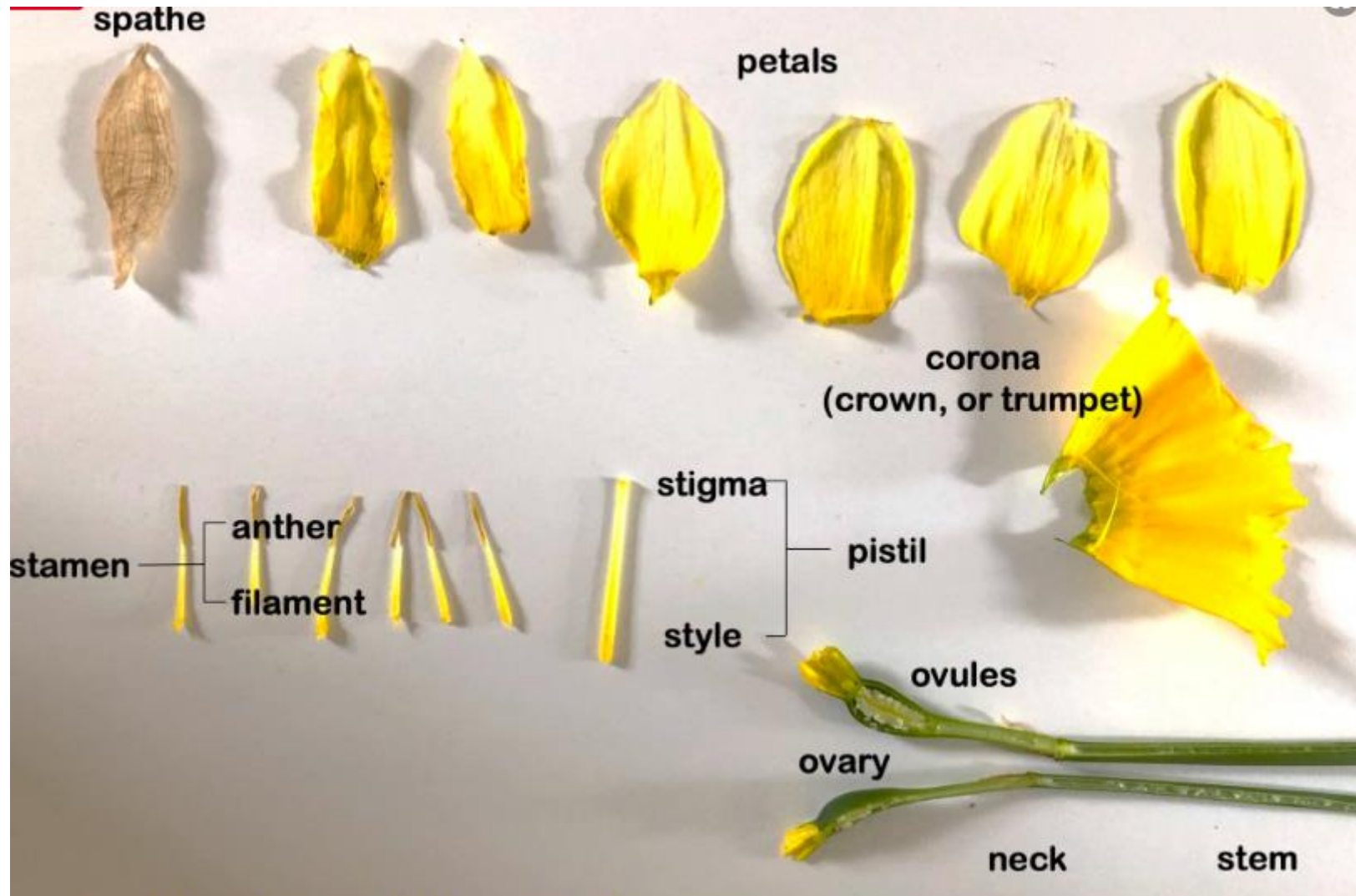
The Science

WHY THIS HAPPENS?

The loud music produces noise which vibrates. This makes the air vibrate as well, producing sound waves.

When these waves hit the bowl, the bowl vibrates, making the rice jump about.

Flower Dissection



You will need:

A flower
Some small scissors

Find a flower that is OK to pick (ask a grown up)

Gently pull apart all the different parts - you may need scissors

Lay them out on a piece of paper.

Can you label them and do you know what they are for?

Science Talk

- Do all flowers have exactly the same parts?
- Can you explain the life cycle of a flower?
- Why are flowers so important for our environment?
- Is it just bees that pollinate flowers?