Includes instructions for children and parents!

My Little Book of Kitchen Science!

Name:_____

Dear Parents/Carers,

Inside this booklet, you will find a huge range of 'kitchen' science experiments your child can do at home. Please encourage your child to do as many of these as you can, asking them to record their 'science skills' and their observations and findings however they like! The background science for each activity is provided.

To support you and them in identifying their skills, please use these symbols and descriptors, which show the ways in which we can use science:

For each activity, they can circle the skills logo they are using (they will probably be using more than one each time!) They can then record their thinking and finding on the recording pages provided.

We thank you greatly for your support in this difficult time,

Mrs Claire Loizos

Make an Egg Float in Salt Water

An egg sinks to the bottom if you drop it into a glass of ordinary drinking water but what happens if you add salt? The results are very interesting and can teach you some fun facts about density.

What you'll need:

- One egg
- Water
- Salt
- A tall drinking glass

Instructions:

1. Pour water into the glass until it is about half full.

2. Stir in lots of salt (about 6 tablespoons).

3. Carefully pour in plain water until the glass is nearly full (be careful to not disturb or mix the salty water with the plain water).

4. Gently lower the egg into the water and watch what happens.

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.

Melting Chocolate

Enjoy this simple melting chocolate experiment! You will have seen chocolate melting on a hot day, so let's do some experiments to recreate these conditions. At what temperature does chocolate go from a solid to a liquid? Is it different for white and dark chocolate? Give this fun science experiment a try and find out!

What you'll need:

- Small chocolate pieces of the same size (chocolate bar squares or chocolate chips are a good idea)
- Paper plates

Instructions:

1. Put one piece of chocolate on a paper plate and put it outside in the shade.

2. Record how long it took for the chocolate to melt or if it wasn't hot enough to melt then record how soft it was after 10 minutes.

3. Repeat the process with a piece of chocolate on a plate that you put outside in the sun. Record your results in the same way.

4. Find more interesting locations to test how long it takes for the chocolate pieces to melt. You could try your school bag, hot water or even your own mouth.

5. Compare your results, in what conditions did the chocolate melt? You might also like to record the temperatures of the locations you used using a thermometer so you can think about what temperature chocolate melts at.

What's happening?

At a certain temperature your chocolate pieces undergo a physical change, from a solid to a liquid (or somewhere in between). On a hot day, sunlight is usually enough to melt chocolate, something you might have unfortunately already experienced. You can also reverse the process by putting the melted chocolate into a fridge or freezer where it will go from a liquid back to a solid.

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? Take this fun experiment a step further and find out how bringing oil and water together can help you do your dishes.

What you'll need:

- Small soft drink bottle
- Water
- Food colouring
- 2 tablespoons of cooking oil
- Washing up 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 washing up liquid. 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 washing liquid utakes the oil and grime off the plates and into the water, yay!

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.

What you'll need:

- A plastic bag or light material
- Scissors
- 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 whole 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 that uses air resistance to slow it down. The larger the surface area the more air resistance and the slower the parachute will drop.
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 Lemonade Fizzy Drink

There's a lot of people out there that like drinking fizzy drinks, so why not do a fun science experiment that leaves you with your own lemon soda to drink afterwards! A bit of lemon here and a bit of baking soda there and before you know it you'll be an expert at making your own fizzy drinks. Make your own lemonade soft drink with this fun experiment for kids.

What you'll need:

- Lemon
- Drinking glass
- Water
- 1 teaspoon of baking soda
- Some sugar to make it sweet

Instructions:

1. Squeeze as much of the juice from the lemon as you can into the glass.

2. Pour in an equal amount of water as lemon juice.

3. Stir in the teaspoon of baking soda.

4. Give the mixture a taste and add in some sugar if you think it needs to be sweeter.

What's happening?

The mixture you created should go bubbly and taste like a lemonade soft drink, if you added some sugar it might even taste like a lemon flavoured soft drink you've bought at a shop. The bubbles that form when you add the baking soda to the lemon mixture are carbon dioxide (CO_2). These are the same bubbles you'll find in proper fizzy drinks. Of course they add a few other flavoured sweeteners but it's not much different to what you made. If you are wondering how the carbon dioxide bubbles formed, it was because you created a chemical reaction when you added the lemon (an acid) to the baking soda (a base).

Baking Soda & Vinegar Volcano

Use baking soda and vinegar to create an awesome chemical reaction! Watch as it rapidly fizzes over the container and make sure you've got some towels ready to clean up.

What you'll need:

- Baking or bicarbonate of Soda (make sure it's not baking powder)
- Vinegar
- A container to hold everything and avoid a big mess!
- Paper towels or a cloth (just in case)

Instructions:

1. Place some of the baking soda into your container.

2. Pour in some of the vinegar

3. Watch as the reaction takes place!

What's happening?

The baking soda (sodium bicarbonate) is a base while the vinegar (acetic acid) is an acid. When they react together they form carbonic acid which is very unstable, it instantly breaks apart into water and carbon dioxide, which creates all the fizzing as it escapes the solution.

Take it further:

Try wrapping the baking soda/bicarbonate in a thin tissue paper to create a 'time seal', pour the vinegar in a sandwich bag, then drop your wrapped powder into the sandwich bag – seal and wait! You've just created your own bomb!

Taste Testing Without Smell

We all know that some foods taste better than others but what gives us the ability to experience all these unique flavours? This simple experiment shows that there's a lot more to taste than you might have first thought.

What you'll need:

- A small piece of peeled potato
- A small piece of peeled apple (same shape as the potato so you can't tell the difference)

Instructions:

1. Close your eyes and mix up the piece of potato and the piece of apple so you don't know which is which.

2. Hold your nose and eat each piece, can you tell the difference?

What's happening?

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

Diet Coke & Mentos Eruption

One of the most popular experiments of modern times is the Diet Coke and Mentos Geyser. Made popular by Steve Spangler, this experiment is a lot of fun and sure to amaze your friends and family (assuming you do it outside rather than in the living room).

What you'll need:

- Large bottle of Diet Coke
- About half a pack of Mentos

Instructions:

1. Make sure you are doing this experiment in a place where you won't get in trouble for getting Diet Coke everywhere. Outside on some grass is perfect, please don't try this one in your family lounge!!

2. Stand the Diet Coke upright and unscrew the lid. Put some sort of funnel or tube on top of it so you can drop the Mentos in at the same time (about half the pack is a good amount). Doing this part can be tricky so get someone to help

3. Time for the fun part, drop the Mentos into the Diet Coke and run like mad! If it works a huge fountain of Diet Coke should come flying out of the bottle, it's a very impressive sight. The record is about 9 metres (29 feet) high!

What's happening?

Although there are a few different theories around about how this experiment works, the most favoured reason is because of the combination of carbon dioxide in the Diet Coke and the little dimples found on Mentos candy pieces. The thing that makes soda drinks bubbly is the carbon dioxide that is pumped in when they bottle the drink at the factory. It doesn't get released from the liquid until you pour it into a glass and drink it, some also gets released when you open the lid (more if you shake it up beforehand). This means that there is a whole lot of carbon dioxide gas just waiting to escape the liquid in the form of bubbles. Dropping something into the Diet Coke speeds up this process by both breaking the surface tension of the liquid and also allowing bubbles to form on the surface area of the Mentos. Mentos candy pieces are covered in tiny dimples (a bit like a golf ball), which dramatically increases the surface area and allows a huge amount of bubbles to form.

Blowing Up Balloons With CO2

Chemical reactions make for some great experiments. Make use of the carbon dioxide given off by a baking soda and lemon juice reaction by funnelling the gas through a soft drink bottle and in to your awaiting balloon!

What you'll need:

- Balloon
- About 40 ml of water (a cup is about 250 ml so you don't need much)
- Soft drink bottle
- Drinking straw
- Juice from a lemon
- 1 teaspoon of baking soda

Instructions:

1. Before you begin, make sure that you stretch out the balloon to make it as easy as possible to inflate.

2. Pour the 40 ml of water into the soft drink bottle.

3. Add the teaspoon of baking soda and stir it around with the straw until it has dissolved.

4. Pour the lemon juice in and quickly put the stretched balloon over the mouth of the bottle.

What's happening?

If all goes well then your balloon should inflate! Adding the lemon juice to the baking soda creates a chemical reaction. The baking soda is a base, while the lemon juice is an acid, when the two combine they create carbon dioxide (CO2). The gas rises up and escapes through the soft drink bottle, it doesn't however escape the balloon, pushing it outwards and blowing it up. If you don't have any lemons then you can substitute the lemon juice for vinegar.

Make Your Own Quick Sand

Quick sand is a fascinating substance, make some of your own and experiment on a safe scale. Amaze your friends by demonstrating how it works.

What you'll need:

- 1 cup of cornflour
- Half a cup of water
- A large plastic container
- A spoon

Instructions:

1. This one is simple, just mix the cornflour and water thoroughly in the container to make your own instant quick sand.

2. When showing other people how it works, stir slowly and drip the quick sand to show it is a liquid.

3. Stirring it quickly will make it hard and allow you to punch or poke it quickly (this works better if you do it fast rather than hard).

4. Remember that quick sand is messy, try to play with it outside and don't forget to stir just before you use it.

5. Always stir instant quicksand just before you use it!

What's happening?

If you add just the right amount of water to cornflour it becomes very thick when you stir it quickly. This happens because the cornflour grains are mixed up and can't slide over each other due to the lack of water between them. Stirring slowly allows more water between the cornflour grains, letting them slide over each other much easier.

Poking it quickly has the same effect, making the substance very hard. If you poke it slowly it doesn't mix up the mixture in the same way, leaving it runny. It works in much the same way as real quick sand. We call this type of fluid, a non-Newtonian fluid! It works with custard powder too!

Use a Straw to Stab a Potato

Is it possible to stab a potato with a drinking straw? Find out with this fun science experiment for kids that shows how air pressure can be used in surprising ways.

What you'll need:

- Stiff plastic drinking straws
- A raw potato

Instructions:

1. Hold a plastic drinking straw by it sides (without covering the hole at the top) and try quickly stabbing the potato, what happens?

2. Repeat the experiment with a new straw but this time place your thumb over the top, covering the hole.

What's happening?

Placing your thumb over the hole at the top of the straw improves your ability to pierce the potato skin and push the straw deep into the potato. The first time you tried the experiment you may have only pierced the potato a small amount, so why are you more successful on the second attempt?

Covering the top of the straw with your thumb traps the air inside, forcing it to compress as you stab the straw through the potato skin. This makes the straw strong enough to pierce the potato, unlike the first attempt where the air is pushed out of the straw.

Dissolving Sugar at Different Heats

Learn about solutions as you add more and more sugar cubes to different temperature water. This easy experiment shows that you can only dissolve a certain amount and that this changes as the water gets hotter.

What you'll need:

- Sugar cubes
- Cold water in a clear glass
- Hot water in a clear glass (be careful with the hot water)
- Spoon for stirring

Instructions:

1. Make sure the glasses have an equal amount of water.

2. Put a sugar cube into the cold water and stir with the spoon until the sugar disappears. Repeat this process (remembering to count the amount of sugar cubes you put into the water) until the sugar stops dissolving, you are at this point when sugar starts to gather on the bottom of the glass rather than dissolving.

3. Write down how many sugar cubes you could dissolve in the cold water.

4. Repeat the same process for the hot water, compare the number of sugar cubes dissolved in each liquid, which dissolved more?

What's happening?

The cold water isn't able to dissolve as much sugar as the hot water, but why? Another name for the liquids inside the cups is a 'solution', when this solution can no longer dissolve sugar it becomes a 'saturated solution', this means that sugar starts forming on the bottom of the cup.The reason the hot water dissolves more is because it has faster moving molecules which are spread further apart than the molecules in the cold water. With bigger gaps between the molecules in the hot water, more sugar molecules can fit in between.

Making Music with Water

Have you ever tried making music with glasses or bottles filled with water? I bet you favourite band hasn't. Experiment with your own special sounds by turning glasses of water into instruments, make some cool music and find out how it works.

What you'll need:

- 5 or more drinking glasses or glass bottles
- Water
- Wooden stick such as a pencil or wooden spoon

Instructions:

1. Line the glasses up next to each other and fill them with different amounts of water. The first should have just a little water while the last should almost full, the ones in between should have slightly more than the last.

2. Hit the glass with the least amount of water and observe the sound, then hit the glass with the most water, which makes the higher sound?

3. Hit the other glasses and see what noise they make, see if you can get a tune going by hitting the glasses in a certain order.

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.

Bucket Spinning

You might think that an upside down bucket of water above your head would end up with you getting very wet but what if the bucket is spinning quickly in a circular motion? Give this fun science experiment for kids a try and see what happens while learning a thing or two about centripetal force.

What you'll need:

- A reliable bucket with a strong handle
- Water
- An open area outside where spilling some water is ok.

Instructions:

1. Fill the bucket until it is around half full with water.

2. Hold the bucket by its handle with your arm extended and start spinning it by your side towards the sky and back to the ground in a circular motion, make sure to spin it fast enough to keep the water inside the bucket. Be prepared to get a little wet as your technique improves.

3. Stop spinning before your arm gets tired, watching out for splashes as you carefully bring the bucket back to rest on the ground.

What's happening?

There's half a bucket of water spinning upside down above your head and yet it's not falling out and getting you wet, what's going on? This experiment makes use of something called 'centripetal force', which is a force acting on an object moving in a circular path, directed towards the centre around which it is moving. This type of force can also be seen on roller coasters or by satellites in orbit around a planet.

As you spin the bucket you might feel that it wants to fly off in a straight line away from you (you might even accidentally let go of it), this is a demonstration of Newton's first law of motion, that an object will continue in a straight line unless an outside force (in this case your arm) acts upon it.

Test Your Dominant Side

Check out this cool experiment that will teach you more about how your body and brain work together. Test your dominant side by completing a series of challenges. Which hand do you write with? Which foot do you kick with? Do you have a dominant eye? Do you throw with one side of your body but kick with the other? Are you ambidextrous? Answer these questions and much more with this fun science experiment for kids.

What you'll need:

- A pen or pencil
- Paper or a notepad to write your findings on
- An empty tube (an old paper towel tube is good)
- A cup of water
- A small ball (or something soft you can throw)

Instructions:

1. Write ‘left’ or ‘right’ next to each task depending on what side you used/favoured.

2. When you’ve finished all the challenges review your results and make your own conclusions about which is your dominant eye, hand and foot.

Eye tests:

1. Which eye do you use to wink?
2. Which eye do you use to look through the empty tube?
3. Extend your arms in front of your body. Make a triangle shape using your fore fingers and thumbs. Bring your hands together, making the triangle smaller (about the size of a coin is good). Find a small object in the room and focus on it through the hole in your hands (using both eyes). Try closing just your left eye and then just your right, if your view of the object changed when you closed your left eye mark down ‘left’, if it changed when you closed your right eye mark down ‘right’.

Hand/Arm tests:
1. Which hand do you use to write?
2. Pick up the cup of water, which hand did you use?
3. Throw the ball, which arm did you use?

Foot/Leg tests:
1. Run forward and jump off one leg, which did you jump off?
2. Drop the ball on the ground and kick it, which foot did you use?

What's happening?

So what side do you favour? Are you left handed or right handed? Left footed or right footed? Is your right eye dominant or is it your left?

Around 90% of the world's population is right handed. Why most people favour the right side is not completely understood by scientists. Some think that the reason is related to which side of your brain you use for language. The right side of your body is controlled by the left side of your brain, and in around 90% of people the left side of the brain also controls language.

Others think the reason might have more to do with culture. The word 'right' is associated being correct and doing the right thing while the word 'left' originally meant 'weak'. Favouring the right hand may have become a social development as more children were taught important skills by right handed people and various tools were designed to be used with the right hand.

Around 80% of people are right footed and 70% favour their right eye. These percentages are lower than those who are right handed and this could be because your body has more freedom of choice in choosing its favoured foot and eye than that of its favoured hand. In other words you are more likely to be trained to use your right hand than your right foot and even more so than your right eye.

It's not strange to find people who favour the opposite hand and foot (e.g. left hand and right foot), and some people are lucky enough to be ambidextrous, meaning they can use their left and right sides with equal skill.
Try testing others and coming to your own conclusions about what side the human body favours and why.

Extra: Are you more likely to be left handed if one of your parents is left handed? What are some of the possible disadvantages for left handed people? (Tools, writing materials etc) Do left handed people have an advantage in sports?

Interesting fact: In 2009, only 7% of the players in the NBA (basketball) were left handed while in 2008 around 26% of footballers were left handed.

Is it better to be left handed in some sports than others? What do you think?

Invisible Ink with Lemon Juice

Making invisible ink is a lot of fun, you can pretend you are a secret agent as you keep all your secret codes and messages hidden from others. All you need is some basic household objects and the hidden power of lemon juice.

What you'll need:

- Half a lemon
- Water
- Spoon
- Bowl
- Cotton bud
- White paper
- Lamp or other light bulb

Instructions:

1. Squeeze some lemon juice into the bowl and add a few drops of water.

2. Mix the water and lemon juice with the spoon.

3. Dip the cotton bud into the mixture and write a message onto the white paper.

4. Wait for the juice to dry so it becomes completely invisible.

5. When you are ready to read your secret message or show it to someone else, heat the paper by holding it close to a light bulb.

What's happening?
Lemon juice is an organic 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. Invisible ink can also be made using chemical reactions or by viewing certain liquids under ultraviolet (UV) light.

Bending Water with Static

Here's an easy and fun science experiment that's great for helping kids learn about static electricity. Try bending water with static electricity produced by combing your hair or rubbing it with an inflated balloon, can it really be done? Give it a try and find out!

What you'll need:

- An inflated balloon
- A narrow stream of water from a tap
- Dry hair

Instructions:

1. Turn on the water so it is falling from the tap in a narrow stream (just a few millimetres across but not droplets).

2. Rub the balloon back and forth against your hair for a few seconds.

3. Slowly move the balloon towards the stream of water (without touching it) while watching closely to see what happens.

What's happening?

The static electricity you built up by rubbing your hair against the balloon attracts the stream of water, bending it towards the comb or balloon like magic!

Negatively charged particles called electrons jump from your hair to the comb as they rub together, the comb now has extra electrons and is negatively charged. The water features both positive and negatively charged particles and is neutral. Positive and negative charges are attracted to each other so when you move the negatively charged comb (or balloon) towards the stream, it attracts the water's positively charged particles and the stream bends!

Will the Ice Melt and Overflow?

At first thought you might think that an ice cube sitting at the very top of a glass would eventually melt and spill over the sides but is this what really happens? Experiment and find out!

What you'll need:

- A clear glass
- Warm water
- An ice cube

Instructions:

1. Fill the glass to the top with warm water.

2. Gently lower in the ice cube, making sure you don't bump the table or spill any water over the edge of the glass.

3. Watch the water level carefully as the ice cube melts, what happens?

What's happening?

Even though the ice cube melted the water doesn't overflow. When water freezes to make ice it expands and takes up more space than it does as liquid water (that's why water pipes sometimes burst during cold winters). The water from the ice takes up less space than the ice itself. When the ice cube melts, the level of the water stays about the same.

Egg Bubbles

This science experiment for kids focuses on some of the interesting characteristics of eggs. Prove the existence of a small air pocket inside an egg as well as thousands of small holes in the shell called pores, while learning what air does as it is heated.

What you'll need:

- A clear glass or jar
- Hot water (adult supervision when using hot water!)
- An egg
- A magnifying glass

Instructions:

1. Place the egg carefully into the glass or jar.

2. Carefully pour hot water into the glass or jar until it is nearly full.

3. Leave the glass or jar on a table or flat surface and watch the egg closely for a few minutes (the glass may become hot so be careful).

4. Use your magnifying glass to closely examine what is happening.

What's happening?

After surrounding the egg with hot water you will notice tiny bubbles forming on the egg shell which eventually bubble their way to the surface. An egg contains a small air pocket at its larger end between the shell and egg white. When the air trapped inside this small pocket begins to heat up it expands and tries to find a way out of the shell, but how does it escape?

They're too small to see under normal conditions but with the help of a magnifying glass you can see that egg shells contain thousands of small holes called pores (human skin has pores too).

The pores allow air to pass through the shell, making it look like the egg is breathing as the air expands and is forced through the shell.

Measuring the Speed of Light

Your microwave can be used for all sorts of things. Not just reheating food, but also measuring the speed of light. We may not be able to travel that fast, but we can see its effects in action.

What you'll need:

- Microwave
- Microwave proof dish (at least 5-6 inches across)
- Mini-marshmallows
- Ruler
- Calculator

Instructions:

1. Place the mini-marshmallows in the dish one layer thick.
2. If your microwave has a rotating platform, remove it. We don't want the dish to rotate.
3. Put the dish in the microwave for 10 seconds.
4. When you remove the dish, you'll notice only certain parts are melted. *(Time may depend on the microwave – if all or none of your marshmallows melted, adjust the time accordingly.)*
5. Measure the distance between melted marshmallows using your ruler. Measure in centimetres. This is half the wavelength of a microwave.
6. Look for a sticker on your microwave that tells you its frequency in Hertz (Hz). **1 MHz = 1,000,000 Hz.**
7. Use the following equation to find the speed of light:

Speed of light = 2 x (distance between melted spots) x (frequency of the microwave)

8. The actual speed of light is 3.00×10^{10} cm/s.

How close were you?

Investigating Friction

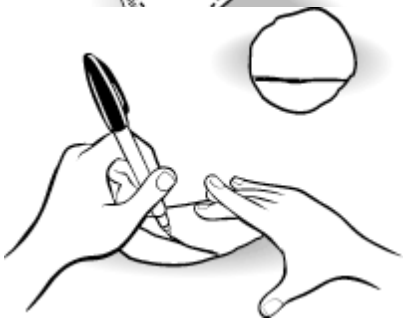
are a great example of how man has overcome friction. In this experiment ble to build your own hovercraft, and explore how different factors affect nce.

What you'll need:

- Water bottle top
- Blue-Tac
- Balloon
- CD or DVD

Instructions:

1. Roll the Blue-Tac into a sausage shape and press it down around the edge of the hole at the centre of the CD. Push the bottle top down onto the Blue-Tac so that it sticks to the CD with no gaps for the air to escape.
2. Blow up the balloon and then twist the bottom round several times. This will prevent the air from escaping. Now carefully attach the balloon to the base of your hovercraft.
3. Untwist the balloon and watch your hovercraft at work. Try pushing your hovercraft gently and watch how far it glides.



Take it further:

- Try adding extra weight to your hovercraft (such as Blue-Tac) to see what happens.
- Blow more/less air into the balloon.
- Can you think of a way to extend/shorten the base of the hovercraft?

Exploring Chromatography

Chromatography is used to separate different substances. It is a really important technique in forensics to analyse blood samples. It can tell you what's in someone's blood, or whether they have been poisoned. Here you will investigate chromatography for yourself, to find out what colours are hidden in a black marker pen.

What you'll need:

- Scissors
- White coffee filter paper
- Black marker (not permanent)
- Water
- Mug/cup

Instructions:

1. Cut a circle out of the coffee filter. (It doesn't have to be a perfect circle, just a round shape that's about as big as your spread-out hand.
2. With the black marker, draw a line across the circle, about 1 inch up from the bottom.
3. Put a little water in the cup, enough to cover the bottom. Curl the paper circle so it fits inside the cup. Make sure the bottom of the circle is in the water.
4. Watch as the water flows up the paper. When it touches the black line, you'll start to see some different colours.
5. Leave the paper in the water until the colours go all the way to the top edge. How many colours can you see?

You can repeat the experiment using different coloured pens or food gs.

Extracting your DNA

Deoxyribonucleic acid (DNA) is stored in every one of your cells and contains your body's genetic material. Most bodily fluids contain DNA, including saliva, blood, semen, urine, and faeces. There are numerous ways to extract DNA, but many involve visiting a lab to submit a sample of blood or other bodily fluids. If you want to extract your DNA at home, saliva is the easiest, most non-invasive, and most sanitary DNA source to sample.

Equipment

- 500ml water
- 3 x clear plastic cups/glasses
- Clear washing up liquid
- 1 tbsp table salt
- 100ml rubbing alcohol (isopropyl alcohol) – *available from pharmacists or chemists*
- Food colouring
- Tooth pick/chop stick

Method

1. Mix the water with the salt in a cup. Stir until salt is dissolved.
2. Transfer 3 tbsp of the salt water into a separate cup.
3. Gargle the salt water for 1 minute. **Don't swallow it!**
4. Spit the water back into the cup.
5. Add one drop of washing up liquid to the salt water. Stir gently. *Try not to create any bubbles.*
6. In a separate cup, mix the rubbing alcohol and 3 drops food colouring.
7. Gently pour the alcohol and food colouring mixture into the salt water cup. Tilt the salt water cup as you pour, so the alcohol mixture forms a layer on top of the salt water.
8. Wait for 3 minutes (may take up to 10). You should see white clumps and strings forming.
9. Use a tooth pick to extract the clumps.

The white clumps and strings are your DNA!