

VOLUME 2

SCIENCE ON YOUR DOORSTEP

FAMILY ACTIVITY PACK

LOOK
INSIDE!

As part of this year's Discovery Day celebrations, our 2nd volume of the family activity pack brings you more ideas for science in and out the home!

Looking for something great to do over half-term? Whether you like to get crafty or prefer mind boggling experiments, we're bringing the fun to you with this activity pack.

Rediscover our **Family Zone**, with even more eye-popping activities to keep you busy, and don't forget to tune in on 2nd June for Discovery Day itself for the chance to win a mega prize by taking part in our Science Scavenger Hunt!

From us all at the Crick

The Crick is a research institute in King's Cross, which works to expand what we know about how life works, and finding out how we can treat, diagnose and prevent human diseases.

THE
FRANCIS
CRICK
INSTITUTE

WELCOME TO YOUR ACTIVITY PACK!

HOW TO USE THIS PACK

We've listened to your feedback on our previous Activity Pack – we hope that this volume will be even better and easier to use!

Although our activities have been designed with primary-aged children in mind, we believe they can be enjoyed by everyone. Do bear in mind that older children might want to explore our suggestions further, whilst younger children will require a bit more support.

With all our activities, the adult in charge is responsible for ensuring children use items (e.g. scissors) safely and do not use anything they are allergic to.

Here's a key to the icons you'll see throughout the pack:



HOME
ACTIVITY



OUTDOOR
ACTIVITY



ONLINE
ACTIVITY



ACTIVITY
TIME



NEEDS ADULT
SUPERVISION

Please do share any comments or images by emailing education@crick.ac.uk. Or share your experiences with us on Instagram via [@TheFrancisCrickInstitute](https://www.instagram.com/TheFrancisCrickInstitute).



WE'RE BACK IN SCHOOLS!

Now that schools have reopened, we're delighted to be able to come and visit again. We have lots of exciting workshops, from designing electric circuits to following the journey of a germ, which we deliver to Years 1-6.

If we haven't been to your school yet, look out for us very soon! Until then, why not try some of the ideas in this pack? You can tell us all about them when we visit!

ARGYLE WINS OUR SCHOOLS COMPETITION!

Volume 1 of our Family Activity Pack featured the opportunity to win £250 worth of science equipment for your school. We're pleased to announce that the winner of this prize is Argyle Primary School! The school chose lots of useful items, from torches to thermometers, which will help enhance practical science lessons.

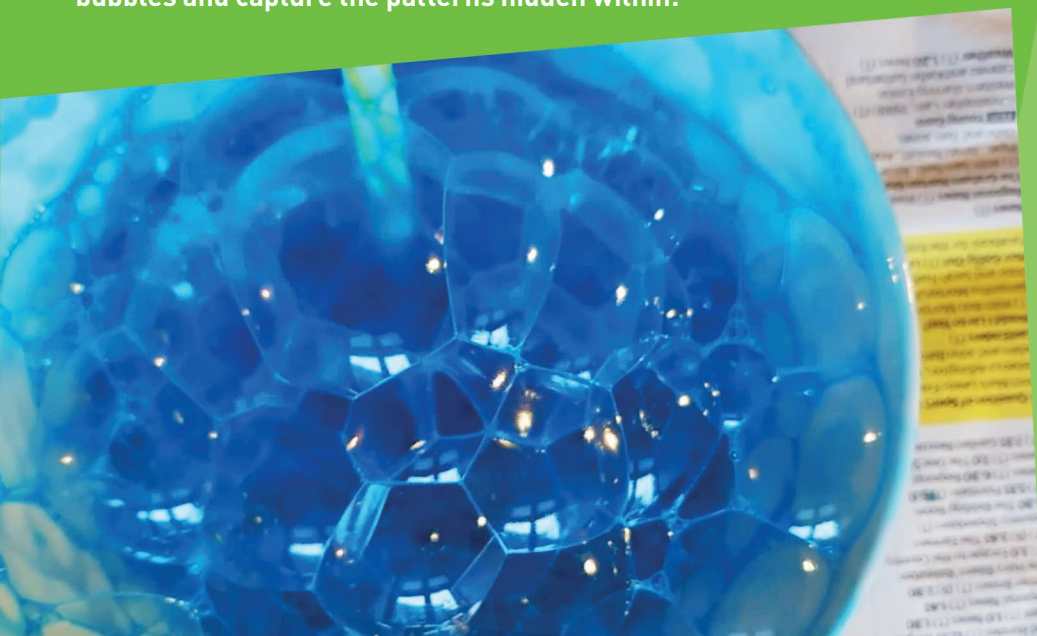
Sign up for our
What's On Newsletter
to find out more about
our family events!

[crick.ac.uk/news/
newsletters](https://crick.ac.uk/news/newsletters)

CREATE YOUR OWN BUBBLE ART



In this activity you can use soap and paint to make some colourful bubbles and capture the patterns hidden within!



You'll need:

- Poster paints, any colours you like
- Washing up liquid or hand soap
- Water
- Bowls
- Spoons
- A drinking straw

SAFETY TIPS

- Spills can be messy, but also very slippery. Cover surfaces with something like old newspaper and clean up any spills straight away.
- Be careful not to inhale any of the bubbles or liquid.

1 Squirt some paint into a bowl.

2 Add a few drops of washing up liquid or hand soap into the paint and mix together.

3 Add a small splash of water to your bowl, just a little at a time.

4 Gently blow bubbles into the mixture with the straw. If the bubbles don't stay, add a tiny bit more water.

5 Once you're able to blow bubbles in your paint mixture, blow so many that they bulge above the bowl.

6 Hold your paper above the bowl and lower it down, keeping it level. It will pop the bubbles, but that's ok.

7 Lift your paper and take a look – you should have bubble prints on your paper! Once it's dry, use your paper to make cards, art for your wall or just admire the patterns!

TOP TIP

If your bubbles haven't left any colour, try adding more paint to your mixture!

THE SCIENCE

Have you ever tried making bubbles with only water? It just doesn't work. Water likes to pull itself together as tightly as it can, which is no good for bubbles. When soap is mixed with water, it makes the water a bit more 'stretchy' and we can stretch it out to make bubbles.

It's all to do with the molecules, the tiny particles that make up everything. Water molecules like grouping together, but there are two sides to a soap molecule. One side sticks to water, and the other side pushes water away. This means the soap molecules stop the water molecules from clinging together tightly, which is where that stretchiness comes from.



Watch this video to see our friend Dan make his own bubble art
<https://youtu.be/bnVgxiefNxM>



BRIGHTEN UP OUR BEAKERS!

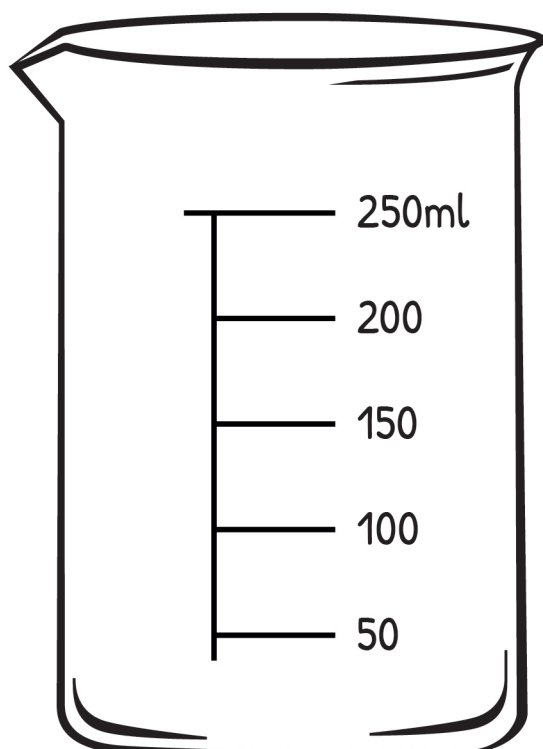
Soap is not only great for making bubble art, it's perfect for cleaning too!

Our scientists need plenty of flasks, beakers and test tubes for carrying out experiments and it is the job of our Glasswash team to keep this equipment clean. They clean 750,000 bits of equipment every year!

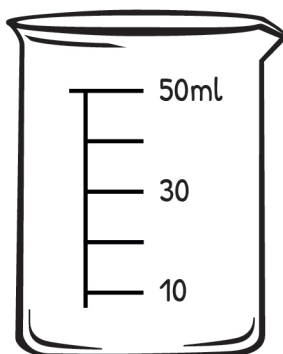
Scientists use beakers to hold the liquids they need for their experiments. Can you colour the right amount of liquid in each beaker? You can use any colours you like.

You'll find all of these activities plus loads more on our online Family Zone. Check out www.crick.ac.uk/familyzone for our latest experiments and virtual events.

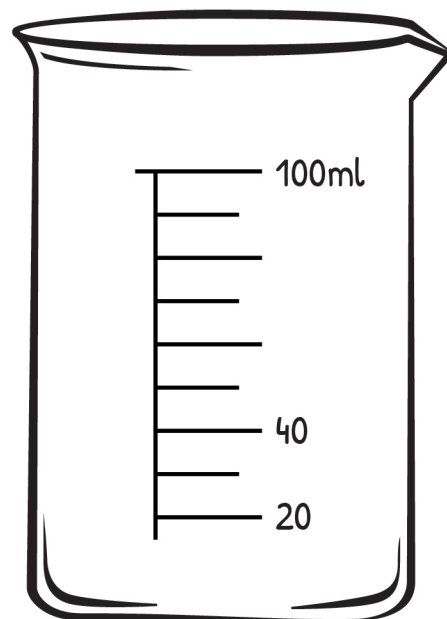
Start by colouring in 100ml of liquid in this beaker.



Where would 40ml of liquid go up to on this beaker? Colour it in to show us!



Can you work out what the missing numbers are on this beaker? Now try colouring in 75ml of liquid.



SINK OR FLOAT?

This activity makes for a great quiz round! You'll need to test out some different items to find some that sink and some that float. Then gather your family or friends to take part!



You'll need:

- A washing up bowl or a sink of water
- Objects to test
- Pen and paper (optional)
- Family or friends take part in your game!

IDEAS FOR THINGS TO TRY

- Fruits and vegetables.
- Plastic toys.
- Cans or bottles of drink.

Only use objects that are safe to place in water and won't be damaged. Check with an adult first! If you spill any water, clean it up straight away so you don't slip over. Do the activity outside if you can!



1 Fill your bowl or sink with water.

2 Try out each object to see if they sink or float. Try to get a good mixture of things that float and things that sink.

3 You might like to take a note of what each object does, or you can just try to remember.

4 Gather your family/friends to take part.

5 Show your audience the first item. Ask them to guess whether they think it will sink or float. You could get them to vote by raising their hands.

6 After everyone has voted, place the item in the bowl or sink of water and reveal the answer!

7 Repeat this with all of your items.

8 See who wins the quiz!

THE SCIENCE

Whether an object sinks or floats is all to do with something called density.

Everything is made up of tiny building blocks called particles. Some objects are made up of particles that are tightly packed together. These objects have a high density. Other objects are made up of particles that are spread out. These objects have a low density.

If an object is denser than water then it will sink, if it is less dense than water it will float.

Don't forget **Discovery Day**, taking place on **Wednesday 2nd June**. You'll find quizzes, scavenger hunts and lots more!



**ONLINE
ACTIVITY**

www.crick.ac.uk/discoveryday

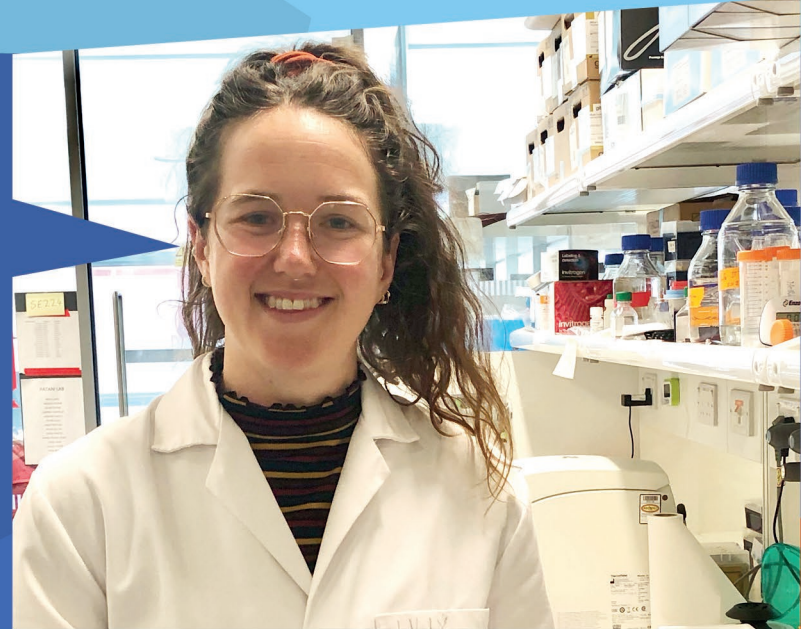
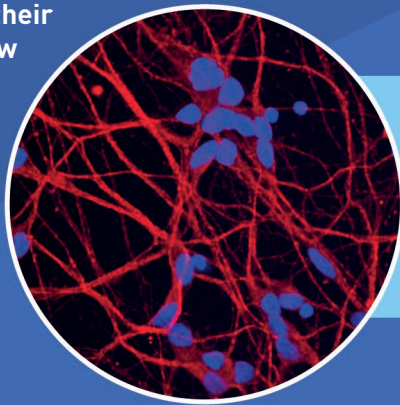
MEET A SCIENTIST!

At the Crick, more than 1000 scientists are working hard to understand why people get sick and to find new ways to make them better. Have you thought about being a scientist when you're older?

Hi, I'm Jasmine!

I study motor neuron disease, which is caused when the cells that send messages from our brain to our muscles die. Without these cells, which are called motor neurons, people cannot move or carry out everyday activities.

As a scientist, I try to answer important questions. My question is: what goes wrong in motor neuron disease? To answer this, I plan and carry out experiments in the lab. I grow motor neurons in a dish and look after them. This involves feeding them with a sweet and salty liquid and changing their home when they grow too much.



Here's a photo of some motor neurons, which I took with a special microscope. Photos like this one help me to understand how the cells work and to answer my question. With this information, myself and other scientists can look for new ways to prevent and treat motor neuron disease.

BOGGLE YOUR BRAIN!

Your brain is a fascinating organ and there are lots of ways to challenge it.

In this activity, known as the Stroop test, the aim is to complete each of the two rounds as quickly as you can.

Round 1: Say out loud what each word says. For example, for **RED** you would say 'red'.

Round 2: Say out loud the colour of the text not what the word says. For example, for **RED** you would say 'blue'.

Which round did you find harder?

In both rounds, your brain is dealing with two lots of information, the colour of the text and what the word says. However, you probably noticed that round 2 was more difficult. Scientists aren't entirely sure why this is, but one idea is that our brains are quicker at understanding words than they are at recognizing colour.

RED

BLUE

GREEN

YELLOW

GREEN

PURPLE

ORANGE

RED

BLUE

YELLOW

RED

PURPLE

ORANGE

GREEN

PURPLE

BLUE



YouTube

Take a journey through the brain in this video featuring Jasmine and science presenter Greg Foot. The video is a recording but you can still join in with all the fun games and puzzles!

<https://youtu.be/fmsQ3pbHglk>

How quickly can you react? Who has the fastest reaction times in your family? Put your brain to the test again in this activity, which involves catching a falling ruler as quickly as you can!



TEST YOUR REACTIONS!

You'll need:

- A 30cm ruler (a 15cm ruler might work too, but you'll have to react faster!)
- A partner to help you

1 Position your hand out in front of you, with your thumb and first finger held open.

2 Your partner needs to hold the ruler at the 30cm end and position the 0cm end in the gap between your thumb and finger. Make sure you aren't touching the ruler!

3 Without giving you a warning, your partner needs to drop the ruler.

4 Catch the ruler, as quickly as you can, using just your thumb and finger. If you miss, watch out for your face or toes! And then have another go.

5 Record the point at which you caught the ruler. Measure from the bottom of your thumb.

6 The smaller the measurement, the faster your reaction time.

THE SCIENCE

The time between noticing something (the ruler falling) and then responding to it (catching the ruler) is known as reaction time.

When your eyes detect that the ruler has been dropped, a message is sent via nerve cells, or neurons, to your brain. The brain processes this information, decides what to do next and then sends a message to the muscles in your hand to contract and catch the ruler.

In just a fraction of a second, your amazing body was hard at work so that you could catch the ruler in time!

GET INVESTIGATING!

If you've got to grips with the ruler drop test, try finding out more about reaction times and what might affect them.

Why not head outside? Does your reaction time change when doing the ruler drop test outside, in bright light, compared to when you're inside, in dim light?

Here are some other ideas: Does your reaction time get better with practice? How do the adults in your household compare to the children?



Watch some of our Crick scientist test their reaction times – can you beat them?!

<https://youtu.be/7yhH5trTFj8>

MAKE A SCIENCE SPINNER!



These discs spin so fast your eyes and brain will see pictures that aren't really there.

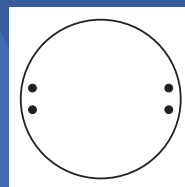


You'll need:

- Card or stiff paper
- String
- Pens and pencils
- Scissors

1 Carefully cut a circle out of your card. It should be around 10cm, or draw around a baked bean tin!

2 Carefully poke two pairs of holes on opposite edges of the circle.

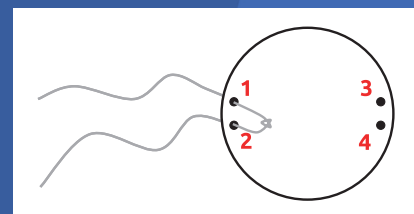


3 Design your picture! One side should have a space for something to go in, and the other side should have the thing you want to appear in that space. **Important:** one picture will need to be upside down so it appears the right way up when the disc is spinning.

4 Cut two lengths of string, about 50cm each.

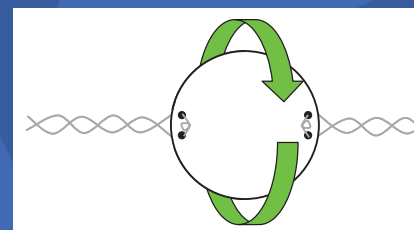
5 Tie a knot in the middle of each of your strings, don't tie them together though!

6 Thread one piece of string through hole 1 until you get to your knot. Then thread the other end of the string through hole 2.



7 Repeat step 6 with the other piece of string and holes 3 and 4. It doesn't matter what side the knots are on.

8 With a pair of strings in each hand, whirl the disc around to twist the strings. When they're really twisted, pull the strings tight. The disc will spin and your picture will be revealed.



THE SCIENCE

Your eyes and brain work together so you can see things moving without you having to think too much about it. But it's actually a surprisingly complicated process. First you see something in one place, then you see it in another place, then you compare those things.

When something is moving really fast, your brain can't quite keep up and starts to mix up the things you are seeing. The disc is spinning so fast that the two sides blur into one and, to your eyes and brain, there seems to be a single picture.

