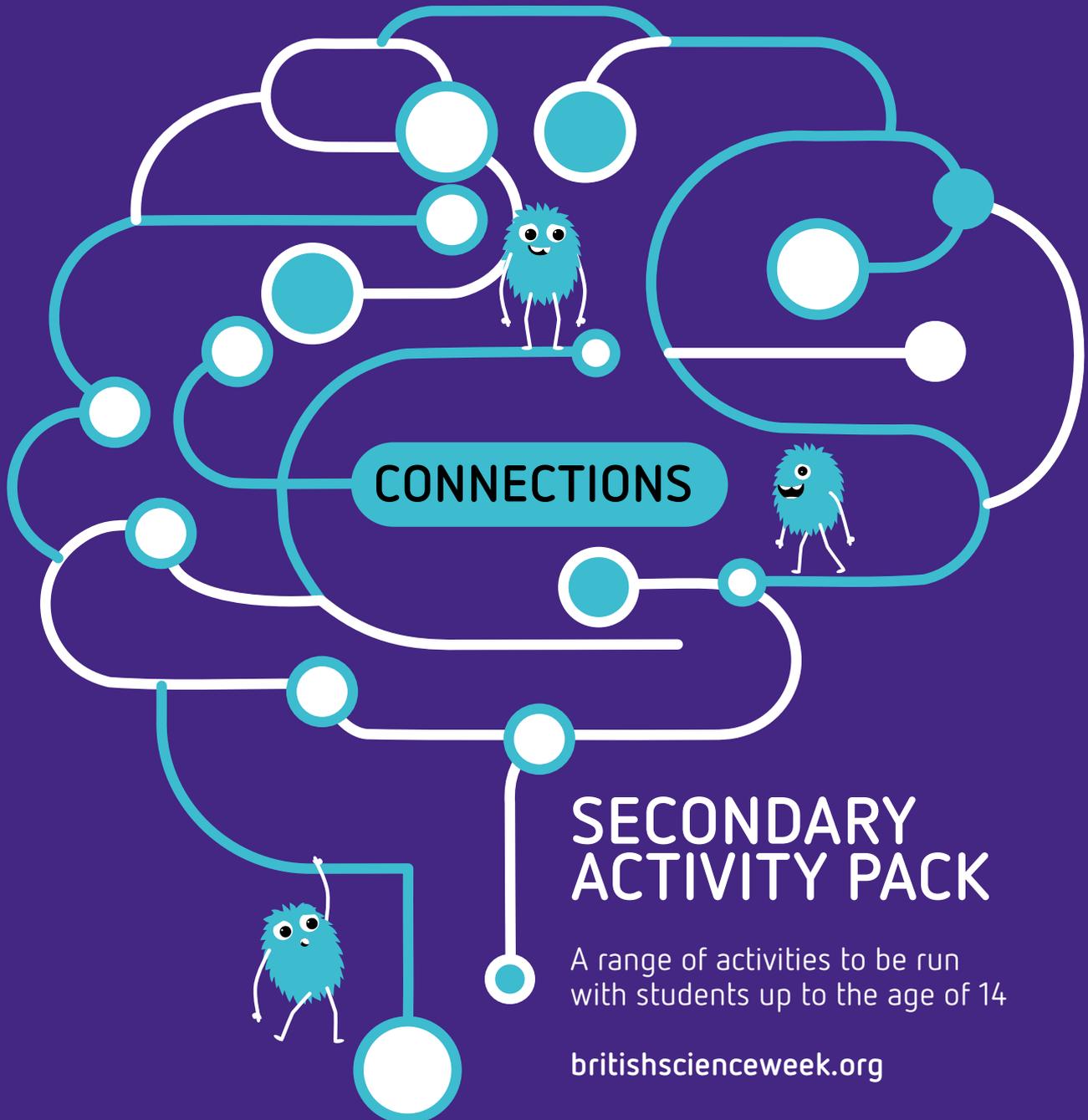




BRITISH SCIENCE WEEK

10-19 March 2023



Delivered by



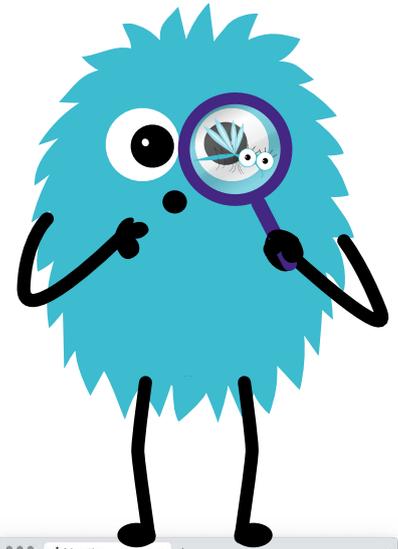
Supported by





BRITISH SCIENCE WEEK

10-19 March 2023



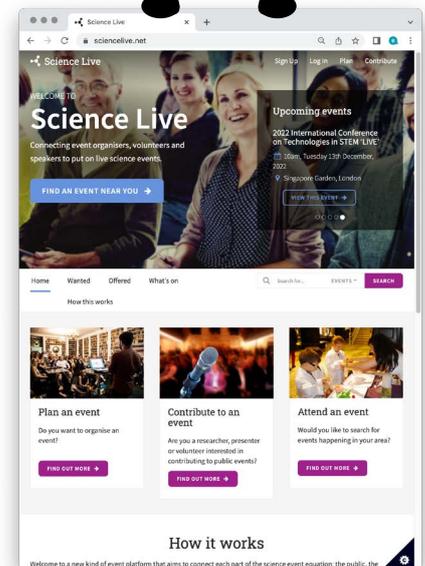
This activity pack is a one-stop shop to support you during British Science Week, and you can use it all year!

When developing this pack, we looked for activities which promote cross-curricular learning and break down the stereotypes surrounding science, technology, engineering and maths (STEM). We therefore encourage you to use British Science Week as an opportunity to link STEM to other curriculum subjects and to your students' own backgrounds, lives and interests.

We have included activities for students to complete in any setting, whether that's their school, a club, an organisation or at home with their families.

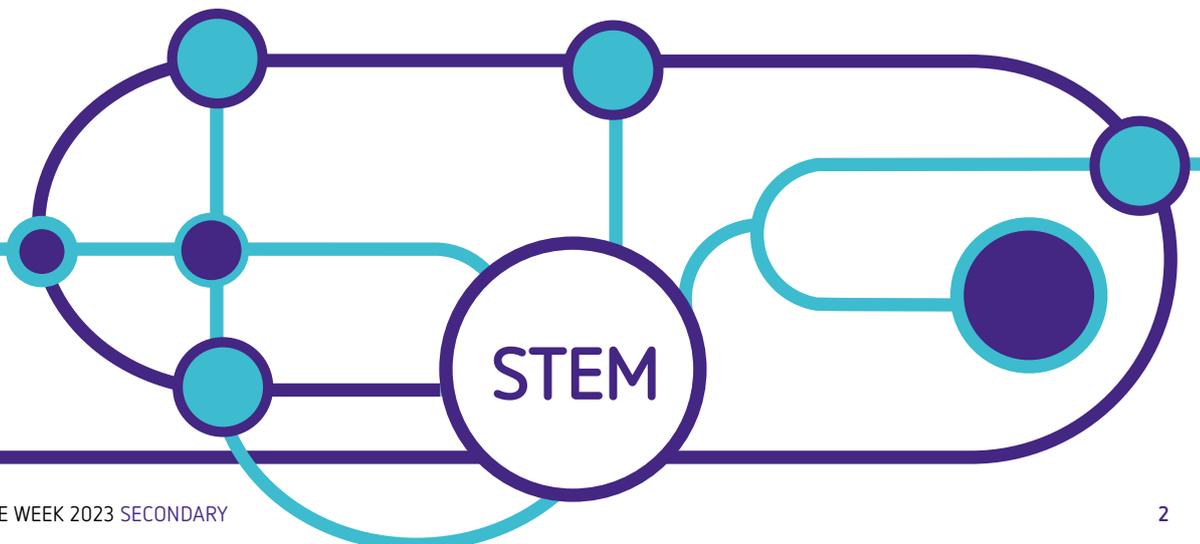
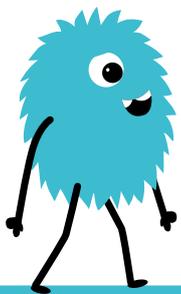
Share your brilliant activities, vlogs or images on social media! Join the conversation or see what's happening during the Week by tagging British Science Week on Twitter ([@ScienceWeekUK](https://twitter.com/ScienceWeekUK)) and using the hashtag [#BSW23](https://twitter.com/BSW23).

All activities (excluding links) have been health and safety checked and include a list of 'Watch out' instructions for students to follow. Find out more information at: britishscienceweek.org/plan-your-activities/activity-packs



Find an activity near you

You can either create your own activity, or see what activities are happening near you. Last year we reached more than 100,000 people. Help us make British Science Week 2023 even bigger and better! Visit sciencelive.net to find science activities in your local area.



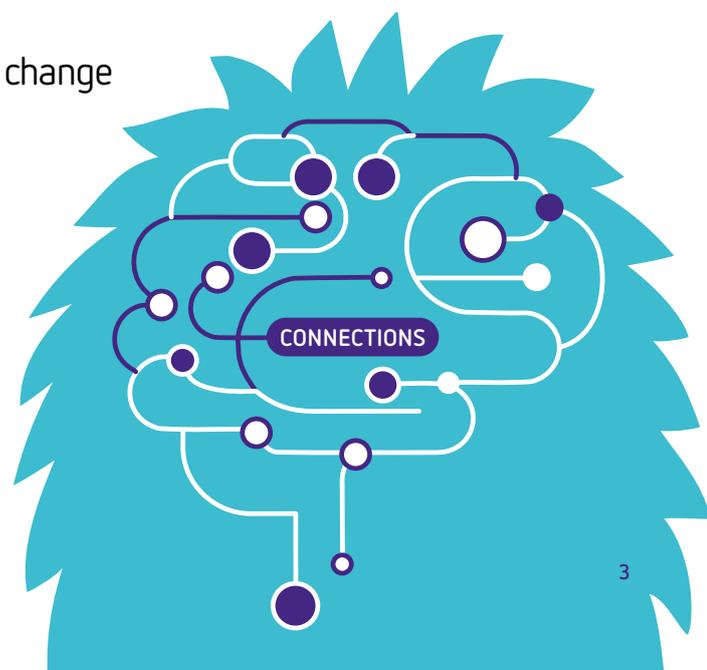
CONTENTS

We want to hear from you!
Tell us what you think of the
activities using our survey...



Visit bsa.sc/activitypacksurvey 

- 4 Introducing the theme
- 5 Making the most of volunteers
- 6 British Science Week at home
- 7 Gathering resources for classroom or home
- 8 Beyond the Week
- 9 Unlocking skills
- 10 Take it home: Sustainable solutions
- 11 Taught by technology
- 12 Build a Brooklands glider
- 14 Replacing animal research
- 16 Love to communicate
- 17 Reading Sparks making connections
- 19 Making manifestos
- 20 Build your own barometer
- 22 Data Detective
- 23 SAWstitch: Stitching self-avoiding walks
- 24 Ecosystem connections
- 26 How clean is our air?
- 28 Radiation is all around us
- 30 Connections between food and climate change
- 32 How are we connected to the ocean?
- 34 UNBOXED: Draw a scientist
- 37 Connect with nature
- 38 Poster competition



INTRODUCING THE THEME

CONNECTIONS

The theme this year for British Science Week is 'Connections'! Introduce the theme to students in a fun, imaginative way to get them excited about the week ahead. Check out some ideas below:

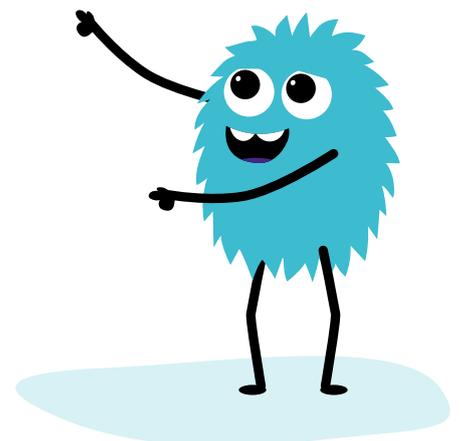
- Ask students to design a poster based on this year's theme and enter it into our poster competition for the chance to win some fabulous prizes. Some of the activities in this pack can provide inspiration, simply look out for the activities marked with the paintbrush symbol shown below! The theme for this year's poster competition is 'Connections', and you can find more information on how to enter on [page 38](#) ✨ and at britishscienceweek.org/plan-your-activities/poster-competition ✨.



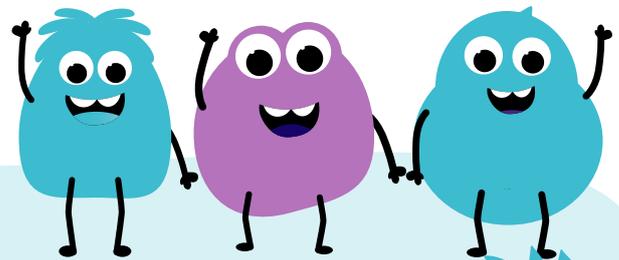
- Try a game, give an audio-visual presentation, explore a mystery or special object, or create a pop-up display which communicates the theme of 'Connections'. These activities are great to use as fun warm-ups, and are a fantastic way to start British Science Week.
- Engage students by discussing how connections happen between people, animals, in construction and engineering, countries and other things in their everyday lives. What are good examples of connections?
- Invite a special guest or someone from the school community to share with students their own experience of connections (for example, how they made connections when started their career, or how connections are an important part of their field), showing how great things can start from small beginnings. [See page 5](#) ✨ for information on how to get volunteers.

Here are some other ideas to include at the beginning of British Science Week:

- Tell students about the plan for the Week and give them a challenge related to the theme. If you are sending home a family experiment, maybe you could introduce or demonstrate it at your setting first.
- Connections are all around us. Where has the topic of connections been in the news or your local area? What are examples of good and bad connections? Is there any way you can encourage conversations about this with students?



MAKING THE MOST OF VOLUNTEERS



Face-to-face engagement is a great way to get students involved and excited about a volunteer speaker and their topic, but don't forget that there are still opportunities to get volunteers and presenters to engage with students online.



STEM Ambassadors are volunteers who offer their time and enthusiasm to help bring science and technology subjects to life, and to demonstrate their value to young people. It is now possible to request both in-person and remote STEM Ambassador support, meaning that Ambassadors from across the UK can inspire young people wherever they are.

Find out more and make a request for STEM Ambassador support here: stem.org.uk/stem-ambassadors/find-a-stem-ambassador ✨

You can also look for presenters and volunteers via Science Live (sciencelive.net ✨) or ask parents and carers if they work in STEM-related jobs to describe what they do in more detail.

You could also try some of the following things:

- Schedule two or three different guests for careers talks during the Week, if possible, to get students anticipating who the next guest will be and what they do. These sorts of experiences can inspire students to think about what they want to be in the future. Remember, they are never too young to explore their career options!
- Where available, choose volunteers/Ambassadors who challenge stereotypes about scientists the students might have absorbed, and promote positive attitude towards science - like female engineers. Let the volunteers/Ambassadors share how their job is making

a difference in the world, or an anecdote of a science activity they loved to do as a child.

- Book your visitors early (as many speakers get booked up during British Science Week). Have a clear idea of what you want them to do and communicate this with them ahead of time.

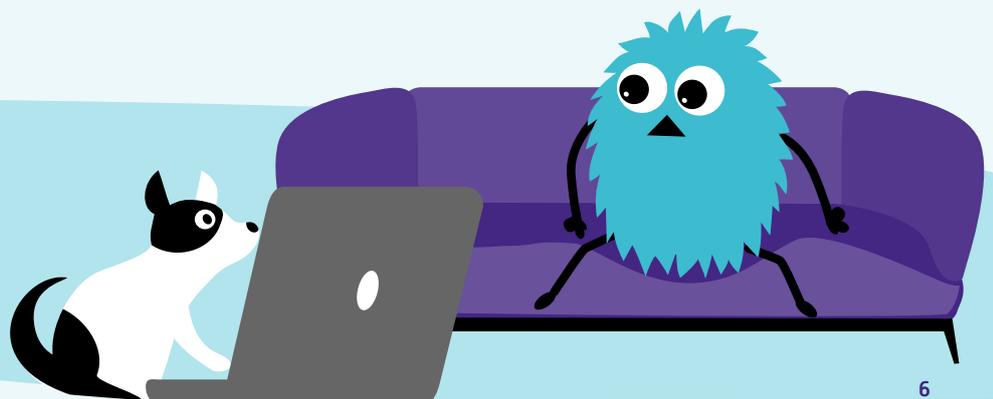
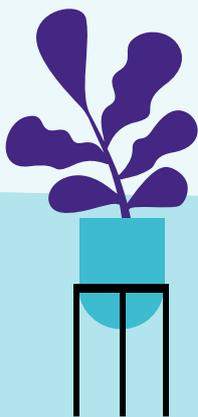
Volunteers come from a range of careers and experiences, from engineers, designers and architects, to scientists and technicians, so get students looking forward to inspirational career talks which broaden their choices and develop their job interests!

Visit the Inspiring the Future website (inspiringthefuture.org ✨) for some helpful ideas for using volunteers.

BRITISH SCIENCE WEEK AT HOME

Do you want to help students carry on participating in British Science Week at home, but are not sure how? Here are our top tips for engaging parents and carers with the Week.

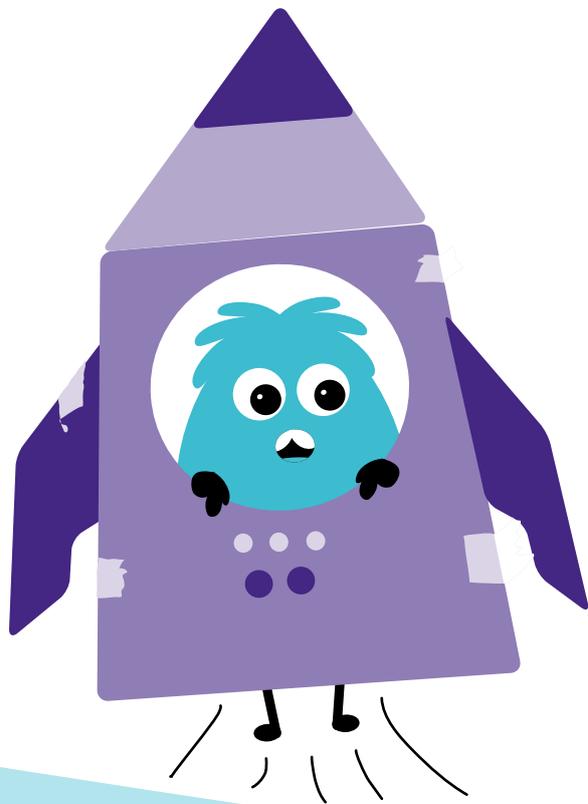
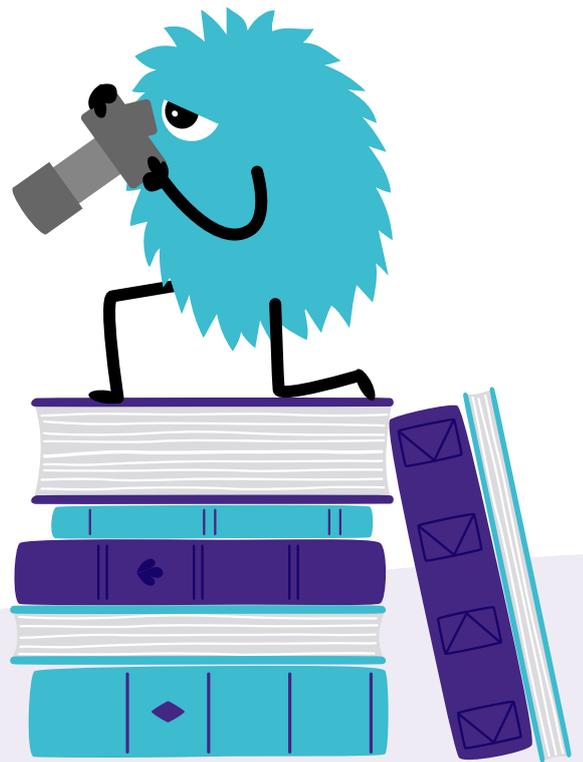
- **Make the most of parent newsletters**, the Parent-Teacher Association (PTA), chat group and text messaging services, if you have them. Let all the parents and carers know at least a month in advance of the Week what you have planned, and how you'd like them to be involved. They might be able to collect or donate materials for use during the Week, and if you want them to get involved in any experiments at home they may need time to plan and collect materials themselves. The PTA may be able to support you financially to run activities during the Week or help to drum up parent volunteers.
- **Get parents and carers thinking** about how their own jobs might link to STEM subjects, and encourage them to chat with their children about this. You could do this via a newsletter or send students home with activities they can do with their families, which may then lead onto further conversations. [See page 10](#) ✨ for a great take-home activity.
- **Encourage exploring outdoors**, in the community or in local cultural spots. This could be anything from going on a nature walk around local parks, to spotting STEM in action on the streets around students' homes. Many secondary CREST activities focus on observing and protecting natural resources and environments: secondarylibrary.crestawards.org ✨.
- **Send an experiment idea home** during the Week to perhaps spark mealtime discussions around science. Try to make it as low-resource as possible. It can help if it's something the students have tried or seen at school first so that they feel like the 'experts' when they do it at home with family, allowing them to lead the learning. Some of the activities in this pack have been adapted to be easily run at home, so they are a great place to start! There are also a range of science-based home activities requiring few resources in the CREST at home collection: collectionslibrary.crestawards.org/#11-18 ✨.





BRITISH
SCIENCE
WEEK
2023

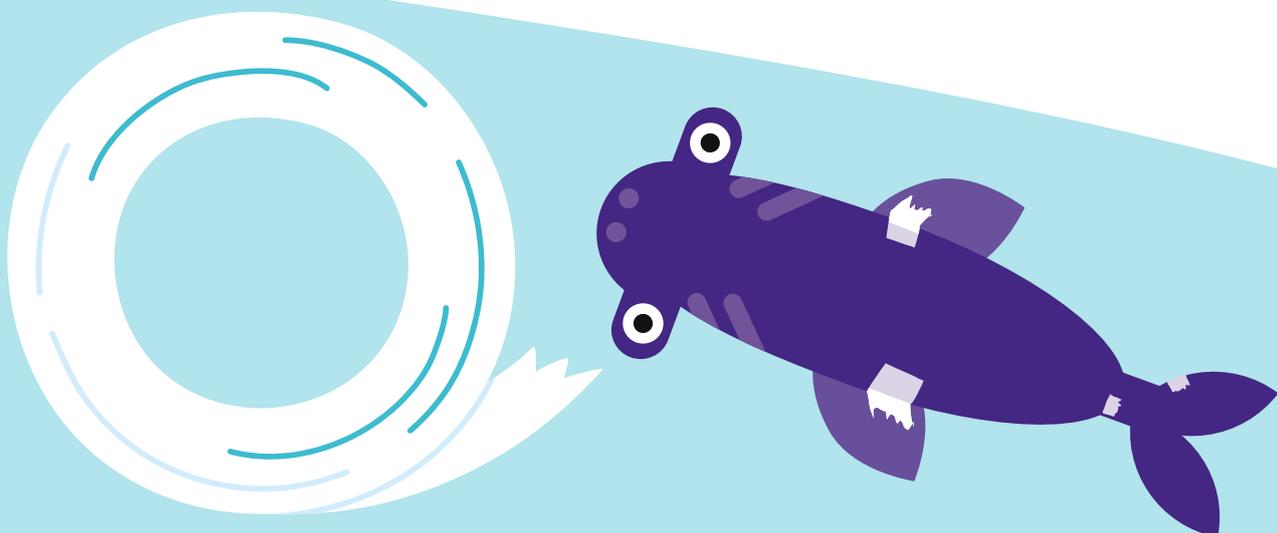
GATHERING RESOURCES FOR THE CLASSROOM OR HOME



If you can, try to collect materials throughout the year for use during British Science Week. Alternatively, check to see whether there is a scrap shop/store/club open in your local area. These shops are often membership based and can provide a brilliant, inexpensive or free resource for card, fabric and other bits of material. Salvaged materials can be turned into spaceships, trees, sea creatures and more; you name it, the kids will think of it! Look at childrensscrapstore.co.uk to find a UK directory of scrap stores.

Encourage students to take and share photographs when out and about to foster discussion and raise their level of understanding about the connections in building structures, between animals and so on. The more colourful, the better!

Collect fiction books and reference books around the theme of 'Connections' to create a themed library.





The exploration and curiosity don't have to end once British Science Week is over!

Some of the following ideas could help you to expand the learning beyond the Week.

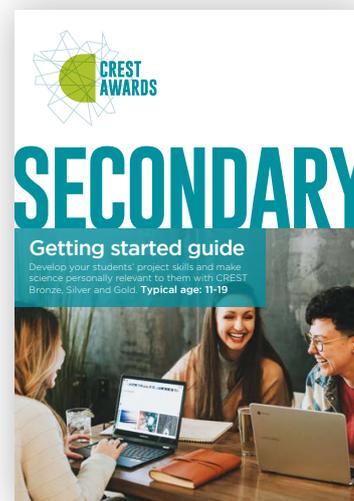
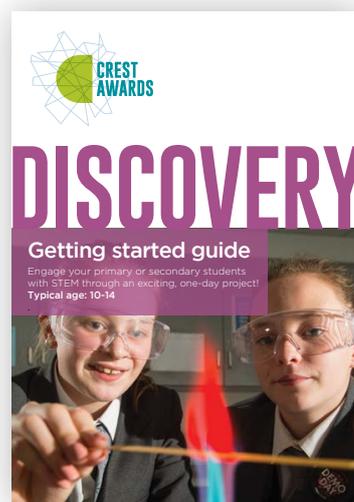
Have students take part in a CREST Award. CREST is a scheme that encourages young people to think and act like scientists and engineers. To achieve a CREST Award, students complete hands-on projects to suit their abilities, interests and age groups. Take a look at the secondary-level Bronze, Silver and Gold projects here: secondarylibrary.crestawards.org

Consider sharing what you learned during British Science Week by running a Continuing Professional Development (CPD) session for other teachers in your school or, where relevant, academy chain. Think about incorporating the Science Capital teaching approach into your methods:

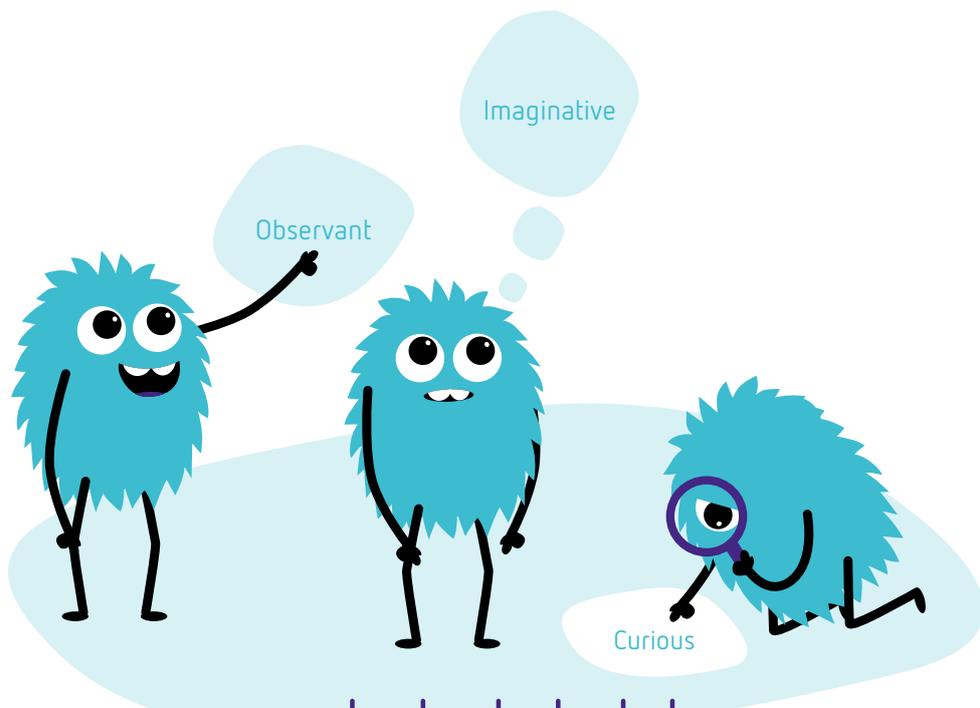
ucl.ac.uk/ioe/departments-and-centres/departments/education-practice-and-society/science-capital-research/science-capital-teaching-approach

If you have the opportunity, consider running a STEM club or curiosity lab. You can find supporting resources at stem.org.uk/stem-clubs

Look out for the 'Inspired? Find out more about CREST' logo, shown below, on some of the activities in this pack. This logo indicates that this activity is a perfect jumping off point for designing your own CREST Awards project!



UNLOCKING SKILLS



A fantastic way to encourage students to take an interest in STEM is to introduce transferable skills used by those working in STEM-related jobs.

These skills will strengthen positive attitudes and reduce stereotypes of those working in the field.

You could, for example, engage students in this **STEM Person of the Week** ✨ activity from NUSTEM at Northumbria University. Ask students to identify what attributes people working in STEM need. These might include being observant, creative, patient, good at communication, or curious. Look out for the skills unlocked tags for each activity in this pack.

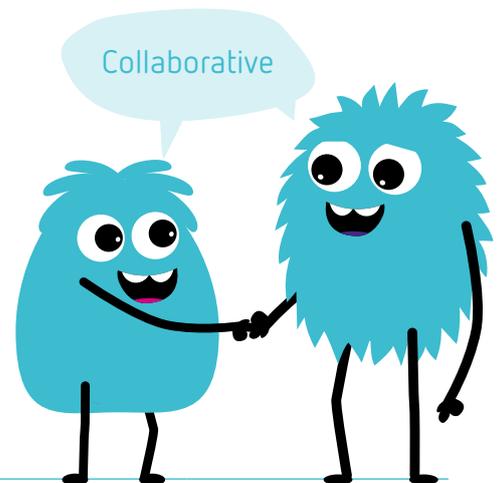
See the table below for the complete list of skills developed by NUSTEM to use as a talking point or to share with other teachers. Or, as a little bit of motivation, why not award each of the students with a certificate for a STEM skill which they demonstrate very well during the Week?

Get students leading the way

A great way to encourage students' interest in STEM is by letting them lead the way. Here's how you can help them along:

- **Encourage students to run their own activities** during British Science Week. They could either run activities for other members of the class or run some CREST at home activities with their family, taking photos back to present to their class. Check out the CREST resource library for inspiration: secondarylibrary.crestawards.org ✨
- **Get students to run their own CREST projects** and then use them as inspiration for a mini science fair in class. There are lots of handy CREST resources on the website: library.crestawards.org ✨

- **Ask students to research** how connections have influenced the way we live our lives today and then write a report for the school newsletter or website.
- **Encourage students to design** and create their own display, such as a display of scientists through time. This could be a photo exhibit that emphasises the diversity of scientists, and which helps to overcome the 'scientist in a white lab coat' stereotype.



Observant	Open-minded	Committed	Curious	Logical
Creative	Imaginative	Patient	Self-motivated	Collaborative
Resilient	Communicator	Passionate	Hard-working	Organised

TAKE IT HOME: SUSTAINABLE SOLUTIONS



This activity explores the connection between industrialisation and sustainability. Your challenge is to come up with an idea for a sustainable start-up business linked to your local community.

🕒 2+ hours

Skills unlocked: Curious, Imaginative, Open-minded

📦 Kit list

Access to computers for internet research

Writing/drawing materials



This activity is part of the Sustainable Solutions CREST Discovery Award. View the pack here.

📖 Instructions

- 1 Research the effects of climate change. How might this affect your community in the future? How could you use STEM to solve these problems?
- 2 Your start-up business must be either a **PRODUCT** or a **SERVICE**.
 - **Design a product:** Think about products that you use regularly. Are they environmentally friendly? Do they have a lot of packaging? Are they disposable? If not, can you think of an alternative? Will your product be made using sustainable materials? You could research how to use local, recycled or upcycled materials.
 - **Design a service:** Think about services you use on a regular basis. Could you think of a way to offer environmentally friendly transport? Or a sustainable restaurant that produces no waste? Or an app that helps people to reuse things or buy things locally? Could you provide locally generated energy?
- 3 Create a poster or slides showcasing your start-up business.

➤ Next steps

This activity is part of the Sustainable Solutions CREST Discovery Award. You can view the full activity pack here: bsa.sc/CREST-Discovery-Sustainable-solutions-pack 🖱️

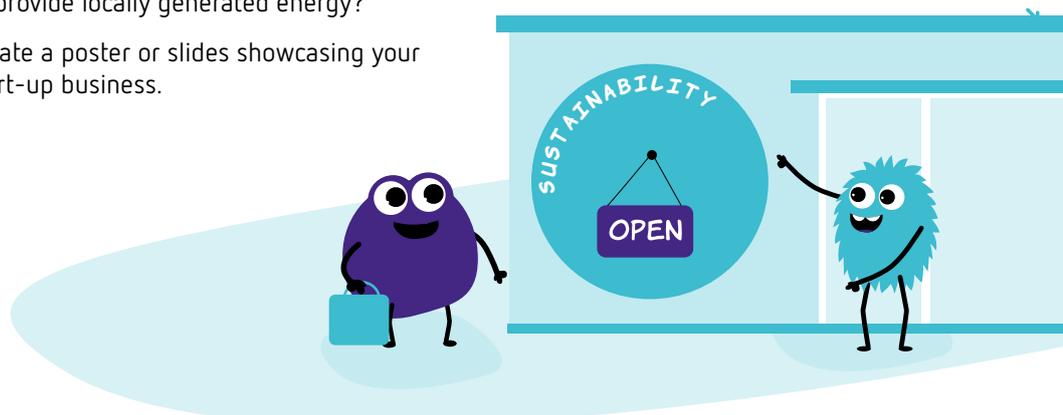
If you are an adult wanting to run CREST Awards with your students, visit the website for advice on how to get started: crestawards.org 🖱️

🏠 At home

Present your start-up business to your friends/family. Do they have any feedback to help improve your product/service? How do businesses collect feedback on their products/services?

↔ Career options

- If you enjoyed designing your sustainable start-up business, then you may be interested in a career in engineering.
- Engineering jobs cover a wide range of topics from renewable 'green' energy to providing clean drinking water.
- Engineers need to be creative, good at problem-solving and data research.



TAUGHT BY TECHNOLOGY

This activity looks at the connection between humans and technologies. Artificial intelligence (AI) in education generally focuses on identifying what users do and don't know through testing, and developing personalised curricula based on students' specific needs.

Your challenge is to conduct an investigation comparing and evaluating AI powered education apps.

🕒 5+ hours

Skills unlocked: Curious, Logical, Resilient

📦 Kit list

Access to computers
for internet research

Access to iPads/
devices with
relevant apps



🌟 This activity is part
of the Machine
Learning CREST
Bronze Award.
View the pack here

📖 Instructions

- 1 Start by choosing either a musical instrument (e.g. flute, guitar) or a language (e.g. British Sign Language, French).
- 2 You now need to find some apps that teach you how to play your chosen instrument or learn your chosen language. Do some research online and pick at least 2 apps to compare.
- 3 Recruit participants for your experiment. There will be lots of variables in your experiment. Where possible you should try to control these, or make sure you are only changing one at a time.
 - Try to find people with no previous knowledge in the subject, so that everyone is starting from the same point.
 - Try to make sure each group has a similar number and type of participants.
- 4 Before starting your experiment, make sure you have planned how you will measure your results and how you will keep your test fair.
- 5 Now test the apps and see how well people learn when using them. How do you think it compares to learning from a teacher?



➤ Next steps

This activity is part of the Machine Learning CREST Bronze Award. You can view the full activity pack here: secondarylibrary.crestawards.org/machine-learning-bronze/63955424 🌟

If you are an adult wanting to run CREST Awards with your students, visit the website for advice on how to get started: www.crestawards.org 🌟

🏠 At home

How do educational apps compare to learning from a teacher? Do you think educational apps should be used more in the classroom?

↔ Career options

- Software engineers build computer programmes that allow the user to carry out specific tasks, such as adding something to an online cart. This requires a good knowledge of computing and plenty of patience!
- Data scientists analyse trends in data and use these insights to help machines work better.

BUILD A BROOKLANDS GLIDER

The connections between the forces of flight allow an aircraft to soar – you can't have one force without the others! In this activity, you will master the forces of flight to design a go-further paper glider which optimises lift and lessens drag to fly further and better!

 30 minutes

Skills unlocked: Resilient, Self-motivated, Creative



Kit list

Coloured piece of
A4 paper

Paper straws

Blu tack

Wooden skewers or
thin dowels

Scissors

Sellotape

Optional: Device with
internet access

Instructions

- 1 Cut the paper according to the diagram (see next page). The large piece will be the wing, and one of the small pieces will be the tail.
- 2 Fold and tape down the long edge of the wing to strengthen it, slotting in a skewer or two. Repeat for the tail, leaving space either side to fold the edges up. Use the diagram to help you.
- 3 Reinforce the wing by taping on shorter pieces of skewer that go from the leading edge (front) to the trailing edge (back) to create struts.
- 4 Use your scissors to halve one straw. Snip into the opening of that straw, inserting another full-length straw and taping where they join.
- 5 Tape the wing and tail at opposite ends, leaving some straw sticking out in front of the wing. Add a ball of blu tack on the tip of this straw. If your aircraft is unbalanced, experiment adding blu tack to the front or back to control the pitch motion.

Watch out

- Check your test area before you fly your aircraft – make sure there is plenty of space clear of people and things that could be knocked over.
- Be careful when using scissors to trim skewers or wooden skewers/dowels – it can leave rough edges.

Next steps

Visit the Brooklands Museum website to learn about the development of early aircraft at Brooklands:
www.brooklandsmuseum.com ✨

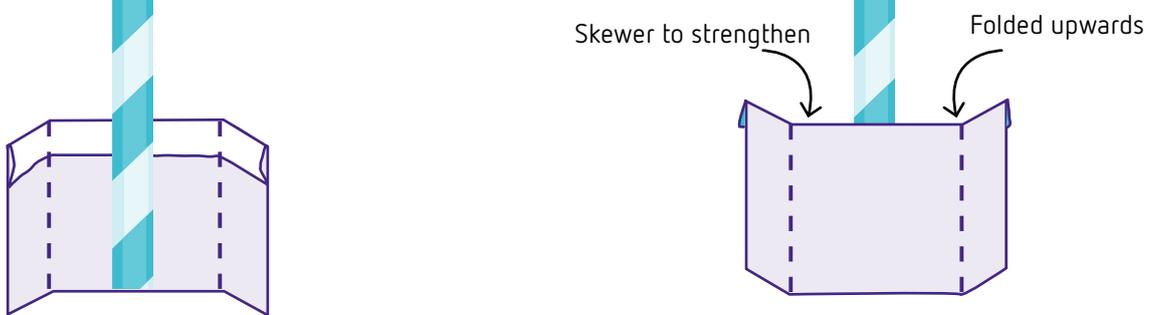
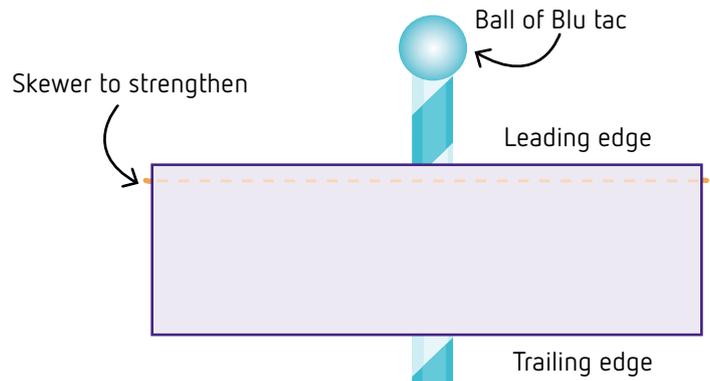
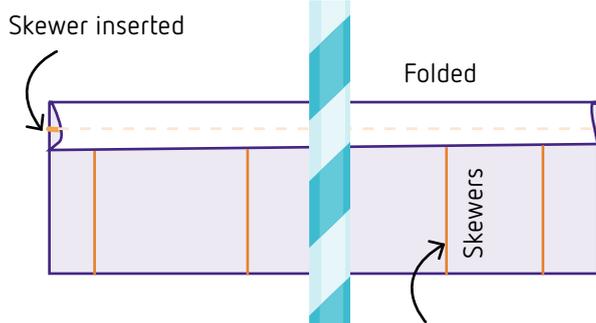
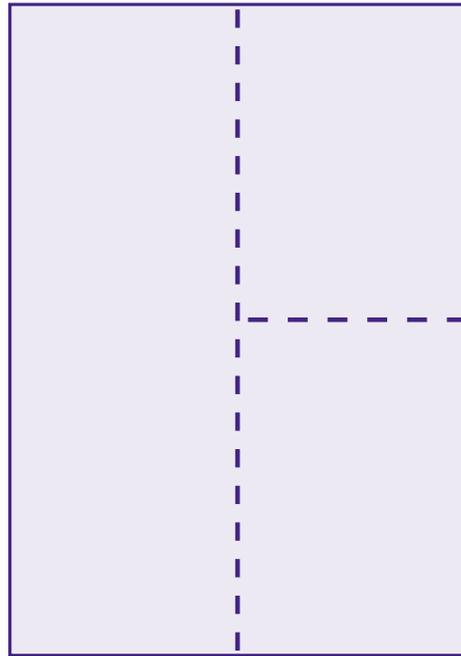
Engineers know you can get better results by modifying your original design. Think about how you could adjust your aircraft to send it further. You can tell Brooklands Museum how far your plane flew at: [@brooklandsmuseum](https://www.instagram.com/brooklandsmuseum) ✨ or [@brooklandsmuseum](https://www.tiktok.com/@brooklandsmuseum) ✨

At home

Find out how gliders and passenger airliners use the Bernoulli principle to fly! Discover more here: bsa.sc/YouTube-How-do-planes-fly ✨

Career options

- Aircraft designers work with all aspects of engineering and design. You can work on an aeroplane's appearance, the systems that run it, or the engines that give it thrust, as well as many other areas. Aircraft designers often use computer aided design (CAD) to help them.



REPLACING ANIMAL RESEARCH

Millions of animals are still used around the world in tests to check the safety of chemicals and medicines. In this activity you will see how connections between different scientists are key to developing new testing approaches to replace animal tests.

🕒 30 minutes

Skills unlocked: Creative, Logical, Collaborative

📦 Kit list

Computer with internet access

Pen

Paper

📖 Instructions

- 1 Read the background information below:

You are a researcher who has developed a new medicinal drug 'Shrinkazine', which has the potential to shrink lung cancer tumours when inhaled directly into the lungs via an inhaler. You need to collect evidence for the UK medicines regulatory body, the Medicines and Healthcare products Regulatory Agency (MHRA), to show 'Shrinkazine' will be non-toxic to patients, or anyone else who breathes it in. Imagine a recent ban on animal use for medical research is preventing you from using animal tests.

- 2 You need to create an 'in vitro' (outside of the body) model of the lung using human cells. The model must reflect the physiology of the vessels, in particular the alveoli and the blood vessels around it, and allow the absorption of

particles between them. Scientists often collaborate to solve problems. You can call on others for advice, information and help. Who would you need to speak to and why? Use the worksheet on the next page to help you.

- 3 Write a step-by-step plan for designing this model.

➤ Next steps

A lung-on-a-chip model was the first organ-on-a-chip device to be developed. These have already been adapted to incorporate the mechanical and physiological properties you looked at in this activity. This was done in 2010. Read more here: [Living, Breathing Human Lung on a Chip, Harvard Medical School](#) 🌟

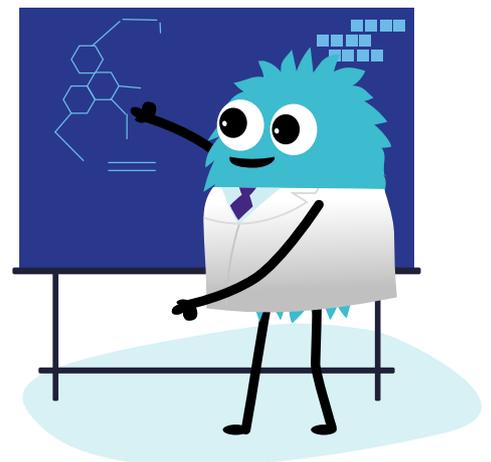
🏠 At home

List some products in your house that may contain chemicals (not household cleaning chemicals). You could research if the companies use animal testing when making these products. How could they test these products without using animals?

↔ Career options

Developing new biological approaches can involve a variety of scientists including:

- cell culture scientists
- bioengineers
- chemists
- nurses
- surgeons.



>> REPLACING ANIMAL RESEARCH KEY FACTS



You have experience of growing mouse lung cells in the lab, but for this you will need lung cells from a human patient. These human cells are much better for a lung model but they are tricky to grow.

You know a lung surgeon in a local hospital, Dr Inspiration, who has access to patient tissue during surgery and could collect samples. But she is very busy!

Patients need to give ethical approval and fill out paperwork to agree for their tissue to be taken for research. There are nurses at the hospital that are trained and have the time to do this.

Your friend Professor Knowledge has many years' experience of culturing and growing human tissue including lung (alveoli) cells in the lab.

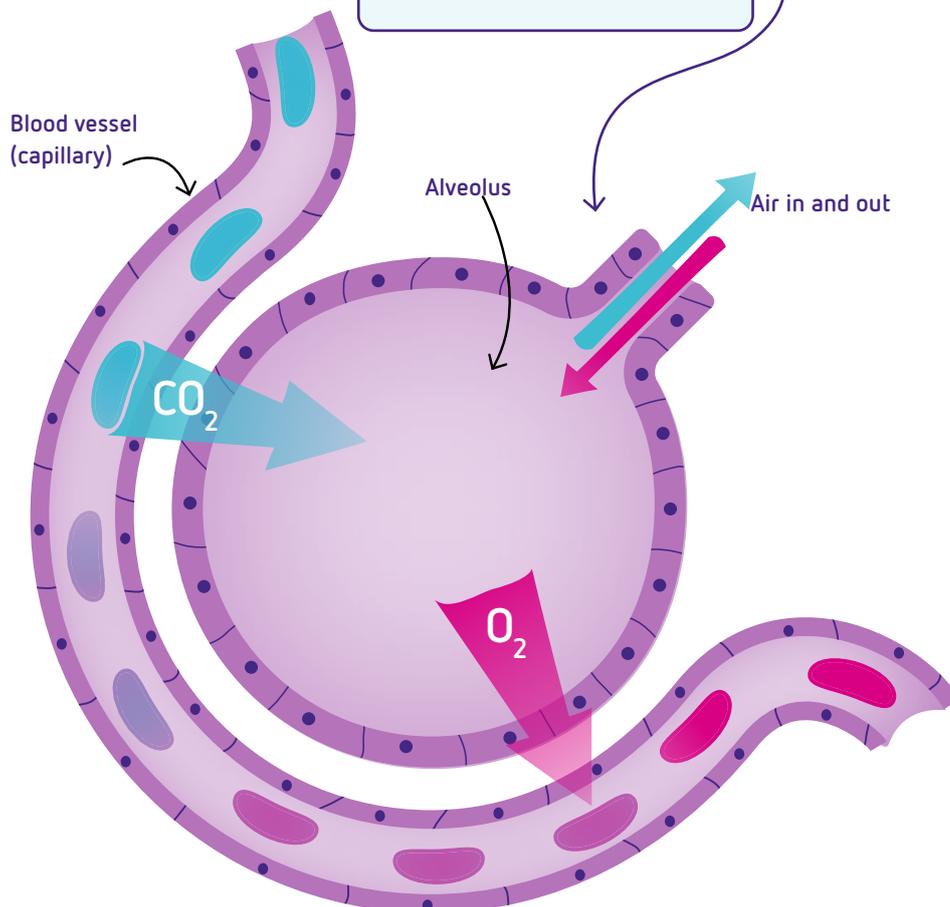
You have heard of 'organ-on-a-chip' devices where cells from an organ are grown on a tiny chip. They incorporate a semi-permeable biomaterial, which the cells sit on to grow. The biomaterial lets oxygen and nutrients through.

Dr Substance is a local chemistry researcher working on the development of biomaterials which support cell growth.

You recently read an article by Dr Developer, who is working on an in vitro (in the lab) blood capillary model, using human endothelial cells.

A single alveolus in the lungs inflates as you breathe in and deflates as you breathe out. **Check out the diagram below to learn about the structure of an alveolus.**

'Shrinkazine' would have to be absorbed when it is breathed into the lungs, it would be absorbed through the cells of the alveolus and the cells of the capillary to reach the bloodstream. Both the layers of cells are 'semi-permeable'. This means they let some things through but not others.



LOVE TO COMMUNICATE

A popular TV programme challenges participants on 2 islands to set up a way to communicate with each other. The islands are too far apart to use sound and strong currents will sweep away anything like a message in a bottle. Participants can use either light or electricity to transmit a message in Morse code.

🕒 30 minutes

Skills unlocked: Creative, Collaborative, Resilient

🧰 Kit list

Torch

Power pack

2 bulbs

Switch

Wires

Copies of the Morse Code, e.g. International Morse code - Morse code - Wikipedia 🌐

📖 Instructions

- 1 You will need to work in groups. Some will be using light and others will be using an electrical circuit to communicate.
- 2 Split the group in 2. One half are the transmitters and the other half are the receivers.
- 3 If you are using light then you will be flashing a torch. If you are using a circuit you will need to set the circuit up so that the transmitters have the switch and the receivers have the bulb.
- 4 The transmitters need to decide on the message they are going to send (don't tell the receivers!) e.g. "Watch the next episode at 9pm tonight."
- 5 The transmitters need to set up on the opposite side of the room to the receivers, and start transmitting the message using Morse code. Each letter will be converted into dots and dashes.
- 6 The receivers will need to write down the message received and convert it back into text.

⚠️ Watch out

- Be careful not to shine bright lights in people's eyes. The torches should not be high powered, and the light transmitter group should be a good distance from the receiver group.



- Be careful with trailing leads. Wires should be guided along tabletops and not across places where people will walk.

➤ Next steps

Compare the 2 methods of communication; which is better and why?

Morse code is less commonly used these days. Find out how ships in distress communicate today.

Find out more about how light and circuits are explored in the new Collins **KS3 Science Now** 🌐 series. Each unit also has ideas about careers opportunities.

🏠 At home

Think about various different communication systems you use, including one directional (e.g. TV), 2 directional (e.g. texting) and sharing (e.g. Instagram). What are the pros and cons of each system?

↔️ Career options

- Communications technology employs thousands of people all over the world in both hardware and software in everything from writing code to siting phone masts.
- Lighting engineers have to understand how light behaves and use it to achieve desired effects.
- Electricians install and maintain systems in a wide range of settings.



READING SPARKS MAKING CONNECTIONS

At Reading Sparks, they love making connections between books and STEM. In this activity you will help younger children get excited about both books and STEM by creating some exciting media.

🕒 3 or 4 x 30 min sessions

Skills unlocked: Imaginative, Creative



📦 Kit list

Recording equipment – this could be a tablet, microphone or camera

Access to a library

Advance activity for adults

The activity below asks your students to select themes from books – you may wish to do this in advance, and provide students with pre-selected themes and formats, to speed up the activity process.

📖 Instructions

- 1 Your first task is to find a book suitable for someone in primary school. You might find something at home or your local library. It can be a story, non-fiction, or picture book. Whatever you choose, the book will need to have some sort of STEM topic, such as nature, space or inventions.
- 2 Read the book and have a think about some of the themes it explores.

You will now produce some media to help engage a reader with one of the themes you've identified. This could be a film, podcast, song or something else. If you are stuck for inspiration, then work through your ideas using the table (see next page), or see what Reading Sparks young people's groups have created at www.readingsparks.org.uk ✨.

When you have created your piece, you can share it with your library, younger siblings or the local primary school alongside the books you used.

⚠️ Watch out

- Make sure you are careful when creating your media piece – be aware of your surroundings such as tripping hazards and traffic.

➤ Next steps

Why don't you share your work with your local librarians and STEM Ambassadors? See what they think of your creative exploration of books and their STEM themes.

🏠 At home

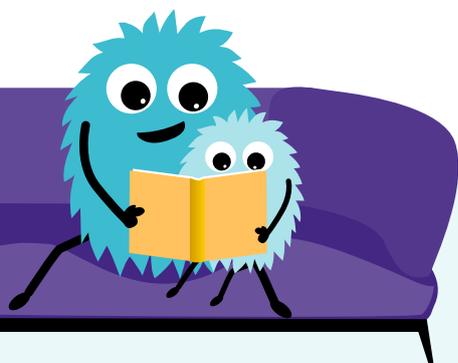
Visit your local library and see what else you can find – there's more besides books, and it's a great place to study or meet friends.

↔️ Career options

There are lots of roles in media production:

- Directors have the creative overview.
- Producers manage the production.

Other production roles include screenwriters, set designers, camera operators, sounds recordists, make-up artists and post-production editors.



When you look through your book, you might identify lots of different themes. For example, a book about animals might include themes such as different habitats, if they migrate or travel, their appearance such as different coloured fur or feathers, or what sort of shelter they build.

Now take one theme you've identified and see how it would fit with the creative formats in the table opposite. Write down your ideas beside each format. Try it again with a different theme. Do any work particularly well?

Pick one idea from your list opposite to work with and get creative – we look forward to seeing or hearing what you produce!



Theme	
<p>1. Observational</p> <p>A very simple observation-type film or presentation – a description of something, such as looking closely at an object, or pointing something out on a walk.</p>	
<p>2. Quiz style</p> <p>Something that asks questions, either to the viewer or someone on screen.</p>	
<p>3. Drama</p> <p>Acting, fiction, off-the-wall ideas!</p>	
<p>4. Instructional</p> <p>Doing and making – giving a demonstration on how to create something, such as making an origami animal.</p>	
<p>5. Animation</p> <p>Instead of using people in your video, you can try animating objects. Or design a flip book.</p>	
<p>6. Music and song</p> <p>Can you make up a song about your theme?</p>	

MANIFESTO MAKING



Before a general election, all the parties release a manifesto which is full of the things they would do if they were voted into government. Now it's your turn! If you could create your own party, what would be in your manifesto? How would you connect with people?

🕒 30-60 minutes

Skills unlocked: Communicator

📦 Kit list

A computer, or a piece of paper

A pen or pencil

Sharpies/coloured pens



📖 Instructions

Using a piece of paper or a computer, make a poster for your party. You can design your poster however you want – be as colourful and creative as you like!

- 1 Decide on a name for your party.
- 2 Design a logo for your party.
- 3 Write a slogan for your party. This needs to be catchy so people remember it, and it needs to quickly communicate what your party is all about!
- 4 Write your 3 main policy points. What are the 3 things that you would most want to do if you were leading the country? You can go into as much detail as you would like. Would you have any specific policies on STEM? This could be anything from the environment to how you would work with technology companies.

➤ Next steps

You could do this activity with your friends or family. Once you've each made a poster, why not take it in turns to present your new party to the group? Then you can have a vote and see who would be your next government!

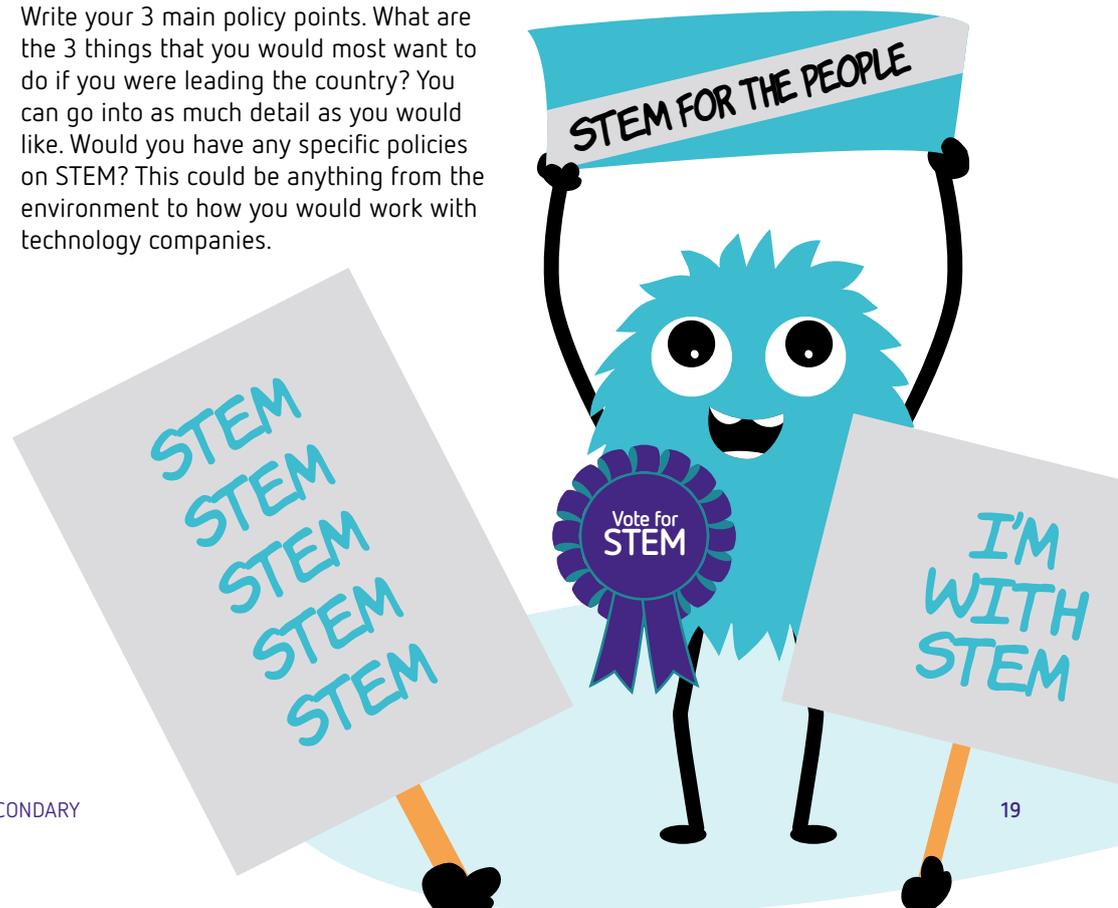
You could look up some of the policies of existing political parties in the UK. What stance do they take on important STEM topics?

🏠 At home

Talk to the people you live with about what they would like to change if they were in charge of the country. Do you agree?

↔ Career options

- You could become a politician, either in your local government or a Member of Parliament.
- There are lots of jobs that require careful thought, debate and good communication. For example, you could work in the Civil Service, helping to research and support policies.



BUILD YOUR OWN BAROMETER

Antarctica is like the Earth's barometer; what happens there tells us how the world's climate will change in the future. A barometer is used to measure atmospheric pressure. This influences rainfall, temperature, winds and storminess. In this activity you will make your own barometer to measure the atmosphere around you.

🕒 1 hour

Skills unlocked: Observant, Creative, Collaborative

🧰 Kit list

A 2-litre see-through plastic water bottle (empty)

Clear plastic tubing (approx. 50 cm)

Ruler and pen

Sticky tape and blu tack

Water

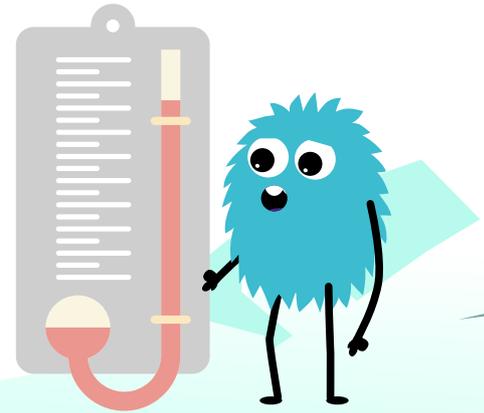
Food colouring

Scissors



📖 Instructions

- To build your own barometer:
 - Cut off the curved upper part and neck of the bottle.
 - Fix the ruler on the inside with the numbers going up.
 - Tape the tube inside the bottle a few centimetres from the bottom to allow water to be sucked through it. Secure the tube near the top of the bottle using tape, making it in line with the ruler. The rest can be left to hang loose.
 - Fill the bottle up to the halfway mark with water and add food colouring to make it easier to see.
 - Now suck water halfway up the tube and trap it with your tongue. Use blu tack to seal the end of the tube and lock the water in. You are now ready to get measuring!
- The water level will rise and fall depending on the air pressure. When there is higher pressure, the water will rise. This means there is increased chance of clear weather. When air pressure lowers, the water will fall. This means there is increased likelihood of clouds and rain. Monitor the changes for a set period of time – this could be a week, a month or a whole term. Make a note of what the weather was like following the reading. How good is your barometer at predicting changes in the weather?



⚠️ Watch out

- Take care when using materials, particularly when cutting the plastic bottle and using glues and tapes.
- Ensure the equipment you make is used safely and responsibly.
- In the interest of hygiene, choose one person to suck water through the tube rather than passing this around.
- Store somewhere it won't get knocked over.

➡️ Next steps

The UK Antarctic Heritage Trust (UKAHT) is a unique charity working to help everyone discover, understand, value and protect Antarctica. They care for 6 historic bases on the Antarctic Peninsula representing the birthplace of British climate science on the continent. Find out more at www.ukaht.org ✨

🏠 At home

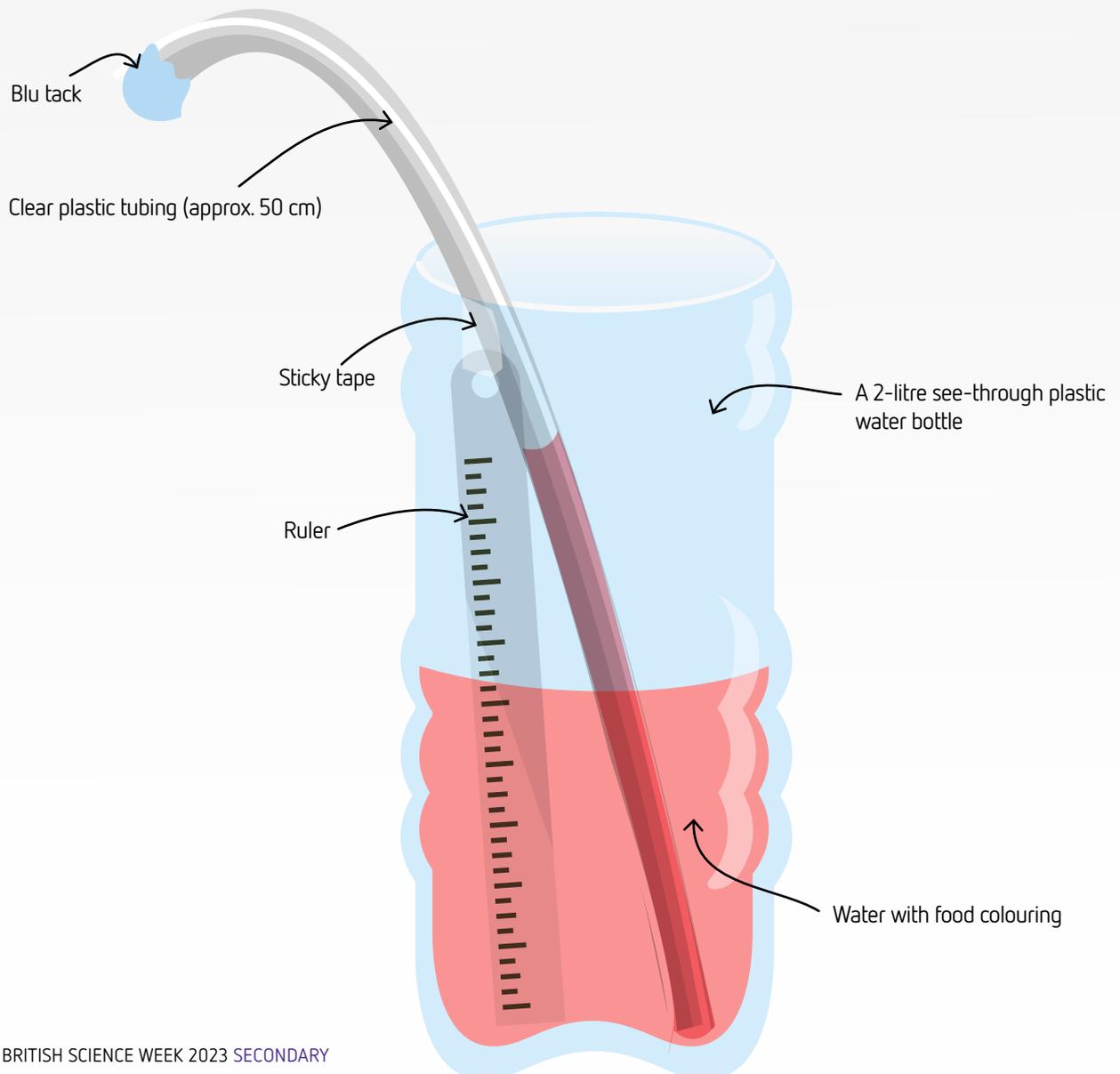
You can make your own barometer and carry out your own weather monitoring at home. Do you get different measurements at home compared to school?

↔️ Career options

Lots of different types of people are needed to monitor and protect the climate in Antarctica:

- Biologists, geologists and meteorologists collect and study data.
- Conservators, carpenters and electricians look after the historic bases.
- Architects, engineers and inventors design new buildings and equipment.

>> BUILD YOUR OWN BAROMETER DIAGRAM



DATA DETECTIVE

Data Detective is an online game which shows you how to link data securely to help stop the spread of a mystery disease. You will learn how and why data are connected and shared in research.

🕒 10 minutes

Skills unlocked: Collaborative, Logical



📦 Kit list

Access to the internet:
datadetective.sphsu.gla.ac.uk ✨

OR printed Data Detective materials:
datadetective.sphsu.gla.ac.uk/downloads/ ✨

📖 Instructions

- 1 Go to datadetective.sphsu.gla.ac.uk ✨. Click 'Play Now' and follow the instructions on screen.
- 2 You will be randomly assigned to 2 teams, each with different data.
- 3 You will then asked to complete some simple sums to identify which school is going to be targeted next by the outbreak of an infectious disease.
- 4 You may find you need to share and link data securely with the other team!

➤ Next steps

Check out other activities from the University of Glasgow on the theme of population health and wellbeing:

www.gla.ac.uk/researchinstitutes/healthwellbeing/research/mrccsocialandpublichealthsciencesunit/sharingourevidence/publicengagement ✨

🏠 At home

Why do you think it's so important that data like health records are stored securely and only shared under a strict set of conditions?

↔ Career options

Working with data is a useful skill in lots of jobs. There are many different paths into public health research.

- Statisticians use data to identify people at risk of disease and understand what the causes are.
- Geographers map the spread of diseases and environmental influences.
- Medical professionals treat patients and research the effectiveness of drugs and therapies.
- Health economists evaluate how resources are used within the health service.
- Psychologists study human behaviours and mental wellbeing.

Meet some of the University of Glasgow team and find out how they became public health researchers: gla.ac.uk/publichealthresearcher ✨



SAWSTITCH: STITCHING SELF-AVOIDING WALKS

The world is made up of all sorts of networks and we live in them every day: social, biological, physical, digital... but have you ever thought about how networks form and their impact on our day-to-day life? This activity encourages you to think about networks using self-avoiding walks through hand embroidery.

🕒 30 minutes

Skills unlocked: Creative, Observant, Curious



🛒 Kit list

Access to internet

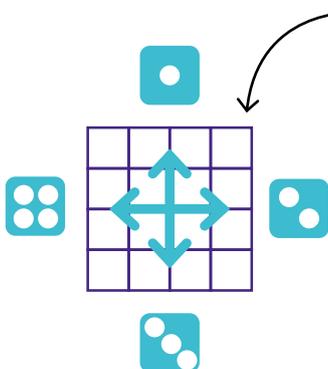
Cross stitch fabric

Needle

Thread

Dice or a dice app

Optional: An embroidery hoop



📖 Instructions

A self-avoiding walk (SAW) is a sequence of moves on a grid that does not visit the same point more than once. You can find out more about SAWs here:

www.creatematerialsinnovation.com/post/self-avoiding-random-walks ✨

- 1 Place your fabric in the embroidery hoop (📺 [How to mount fabric in a hoop](#) ✨).
- 2 Thread your needle and tie a knot at the end (📺 [How to thread a needle](#) ✨).
- 3 Use the needle to insert the thread into a hole in the centre of hoop.
- 4 Make one stitch in the fabric using 'backstitch' (📺 [How to do backstitch](#) ✨).
- 5 Roll the dice to determine the direction of next stitch. Each dice number has a direction on the fabric:
 - 1 (up),
 - 2 (right),
 - 3 (down),
 - 4 (left),
 - 5 and 6 (ignore) and ignore any rolls of the die that would lead to the stitch overlapping with the pattern.
- 6 Keep going until you reach an edge or have no options to move because of surrounding stitches.

⚠️ Watch out

- Be careful when poking the needle through the fabric, as the end is sharp.
- Do not leave needles lying around as people may stand or sit on them accidentally.

➡️ Next steps

You could share a photo of your self-avoiding walk on social media and tag #SAWstitch.

For more help you can view this video from the University of Leeds: youtu.be/4xIPc9hzivY ✨.

You can read more about the #SAWstitch collaborative project here: creatematerialsinnovation.com ✨.

🏠 At home

Next time you go for a walk, could you use a SAW to find a new route?

↔️ Career options

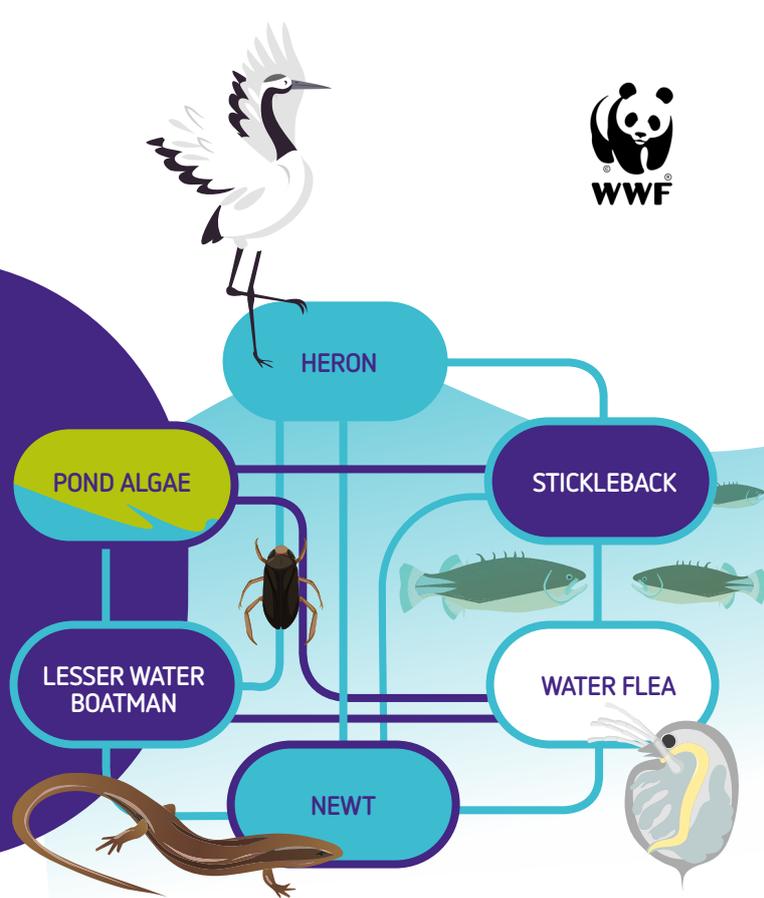
- Scientists explore the pathways and networks formed by nanoscale molecules and use this information to create new materials that improve our lives.

ECOSYSTEM CONNECTIONS

Ecosystems are communities of living and non-living things in an environment. Around 1 in 10 animals rely on freshwater ecosystems, but they are under threat from climate change, unsustainable farming practises, pollution and water demand. This activity demonstrates how everything is interdependent and that the loss of one connection has knock-on effects.

🕒 15 minutes

Skills unlocked: Collaborative, Observant, Imaginative



🧰 Kit list

Scissors (to cut out ecosystem elements, see next page) OR white boards and board pens (to write out ecosystem elements)

Ball of string



📌 Instructions

- 1 Everyone forms a circle and chooses one 'ecosystem element'.
- 2 One player holds the string and tells the group their ecosystem element. If you have a connection to this element, explain why. The player with the string decides which connection best fits and lets out the string to that player.
- 3 The next player does the same. As the game progresses a web of ecosystem connections will form.
- 4 Keep strings tight and stop when you run out of connections or string!
- 5 Think about how human actions impact freshwater ecosystems. How does climate change (higher temperatures, more extreme weather events, rising sea levels) affect your ecosystem connections? Decide which would be most affected and have the student holding it let go of all their strings.
- 6 As each student leaves, what happens to your ecosystem web? How do you think the remaining plants and animals will be affected? Is there anything you can do to help your local ecosystems around school?

⚠️ Watch out

- Be careful not to trip over the string or tangle anyone up in it.

➤ Next steps

Create and observe your own freshwater ecosystem in your school grounds by building a mini bucket pond! Find instructions on page 8 of the WWF [Freshwater Educator Guide](#) 🌟.

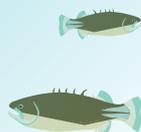
Find further education resources on nature, climate change and sustainability at: www.wwf.org.uk/schools 🌟.

🏠 At home

Freshwater is the most precious resource on Earth, but we waste thousands of litres of it each year! Are there any ways in which you can save more water at home or at school?

↔️ Career options

- There are lots of different careers and jobs that relate to UK nature and ecosystems including being an ecologist, climate scientist, environmental scientist, policy advisor, wildlife conservation officer, sustainability officer, responsible investor, fundraiser, sustainable farmer, land use officer, product designer and environmental educator.





Pond water

- ↳ Absorbs oxygen from the air
- ↳ Essential for plants to grow and for aquatic animals to breathe and swim



Grey heron

- ↳ Bird
- ↳ Eats small fish, insects, amphibians, mammals and reptiles



Common newt

- ↳ Amphibian
- ↳ Eats insects, tadpoles, water snails and small crustaceans



Common darter dragonfly

- ↳ Insect
- ↳ Predator - adults eats smaller insects
- ↳ Dragonfly larvae
- ↳ Eats water snails, tadpoles, water fleas and small fish



Pond substrate

- ↳ Mud, sand, stones and debris at bottom of pond provide habitat for many pond creatures



Backswimmer

- ↳ Insect
- ↳ Predator - eats small insects, tadpoles and small fish



Pond algae

- ↳ Photosynthesises using sunlight and carbon dioxide



Water flea

- ↳ Crustacean
- ↳ Microscopic in size - eats algae and other small organic particles



Lesser water boatman

- ↳ Insect
- ↳ Herbivore - eats algae and plant debris
- ↳ Lives mainly on the pond substrate



Common frog

- ↳ Amphibian
- ↳ Predator - eats insects and molluscs
- ↳ Lays frogspawn in ponds



Tadpoles

- ↳ Amphibian
- ↳ Juvenile frogs, eat pond algae, plants and small insects



Three-spined stickleback

- ↳ Fish
- ↳ Eats invertebrates, tadpoles and other small fish. Lays eggs in nest built on the pond substrate.

HOW CLEAN IS OUR AIR?



This activity explores air pollution, its causes and effects and how your journey to school can contribute.

You will get a picture of travel habits in your school and local area, comparing these with travel habits in schools across the country, and think about ways to help improve air quality.

 4+ hours (either in one session or spread over a number of sessions)

Skills unlocked: Collaborative, Communicator, Open-minded

Kit list

(per team of 4)

Computers with internet access

Optional: information sheet (see next page)

Spreadsheet software

Teacher school email account

Registration number of your school bus (if applicable)

Your postcode

Instructions

- 1 In your teams, research pollutants emitted by different types of transport, the problems associated with transport and some potential solutions. You could use the information sheet (see next page) as a starting point.
- 2 Discuss what you have found as a team.
- 3 Ask people at school how they get to and from school, using the provided [online survey](#) . Plan how you can get as many responses as possible.
- 4 The results of the survey will be available in a spreadsheet from the start of British Science Week. You will then be able to download the spreadsheet here: bit.ly/bsw-schools-responses . You will be able to filter data for just your school, for your region or nationally. Any questions, please email bsw@futurecoders.org.uk .

- 5 Create a chart from your responses to show the number of people in your school using each type of transport. Think about the connections between different variables, e.g. you could plot each type of transport against distance from school or other charts you think are interesting.
- 6 As a team, identify changes in behaviour that might help to reduce traffic-related air pollution around your school. Think about how we can all help each other to do this.

Next steps

Why not do some further research on air pollution and make a poster to raise awareness of pollution caused by road transport? Organisations like the [BBC](#)  and [NASA's Climate Kids](#)  website have great resources that could help. You could also include ways people can help reduce traffic related air pollution.

At home

Ask your family/friends to take the survey and talk about travel options. Invite your family/friends to make a promise.

Career options

-  futureCodersSE CIC specialise in building coding and data analysis skills. Coding and data analysis are great skills for any career, helping with understanding of technology and data and confidence using them to solve problems (e.g. creating insights from data, building apps to help interpret what is going on).



Our air is made up of a combination of different gases, mainly nitrogen and oxygen. It also contains small amounts of other gases and very small particles of solid materials, known as particulate matter (PM).

Other ingredients can include carbon dioxide (CO₂) and nitrogen oxides (Nox) both of which can have a variety of unwanted effects.

Particulate matter - which comes from vehicle exhausts, brakes and tyres - can cause health problems. It can make some people more susceptible to asthma attacks and developing lung problems. Some research suggests particulate matter increases the risks of strokes, heart problems and cancers.

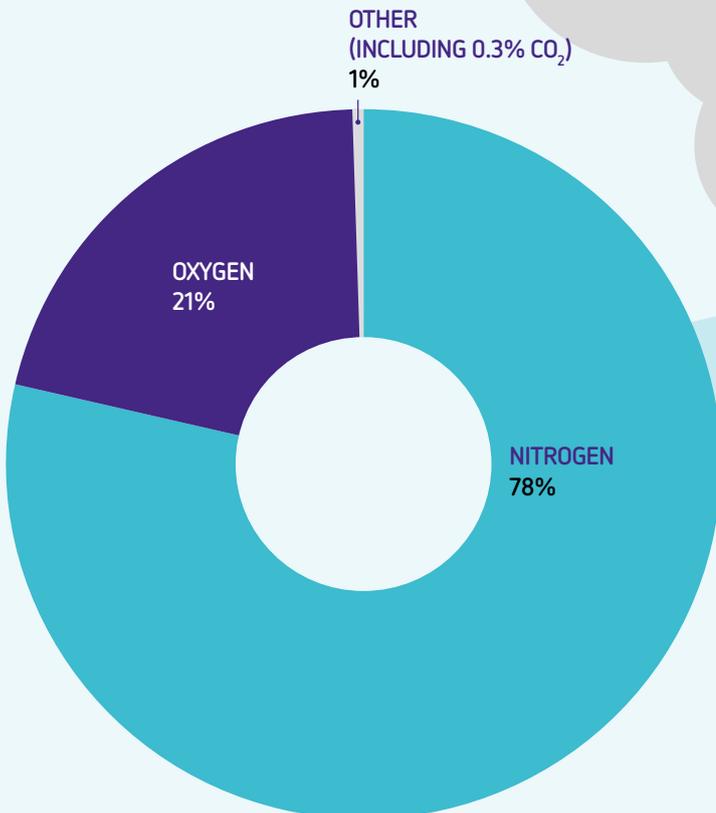
Pollutants such as nitrogen dioxide and carbon dioxide (both generated by traffic) are greenhouse gases.

UK government information on air quality  has more information and a link for you to look up air quality in your area

In July 2022 the UK experienced its highest temperatures ever recorded. Greenhouse gases, such as those generated from traffic, are recognised contributors to heatwaves, floods, and other changes in weather patterns.

35% of all particulate matter emissions comes from road transport

35% of all nitrogen dioxide emissions comes from road transport



What can we all do to help reduce pollution from road traffic?

RADIATION IS ALL AROUND US

Atoms are the building blocks of all matter; they connect everything. Everything is made of atoms - even you! Atoms are the smallest particle of an element, which are far too small to see. Even the most powerful microscopes cannot visualise a single atom. In this activity you will learn that some atoms are radioactive, and are all around us!

 10-20 minutes

Skills unlocked: Observant, Curious, Open-minded



Kit list

Printed and cut out activity cards, OR a physical version of each item on the activity cards

Timer

Pen

Paper

Instructions

- 1 Radioactivity refers to a type of atom which has too much energy, making it unstable. It gives off energy as it tries to become stable. It is this energy we can detect.
- 2 What comes to mind when you hear the word 'radioactive'? Discuss in groups/ your class.
- 3 To visualise a radioactive atom, imagine a wet dog. To become comfortable the dog shakes the water off. The water on the dog represents energy; the atom will 'shake off' energy until it is stable.
- 4 Radiation is all around us. Look at the everyday items you've been given as cards or objects. Do you think they are radioactive? Discuss why/why not with your group.
- 5 Rank the items from most to least radioactive. Each group should start at the same time, your teacher will time you.
- 6 Raise your hand when you have finished. You will be racing against other groups to see who can decide first. Your teacher will check your answers, with a 10 second penalty for every wrong answer.

Next steps

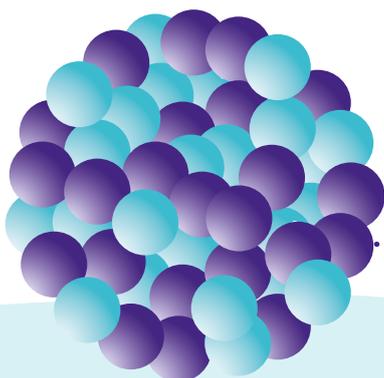
You can find more information on radiation research here: crukradnet.colcc.ac.uk  and  @radiation_hotstuff .

At home

Can you think of any more everyday items that might be radioactive? You could take photos of them and tag them on Instagram  @radiation_hotstuff .

Career options

- Radiation researchers ask questions and carry out studies to advance our knowledge and understanding of radiation, improving diagnosis and treatments for patients.
- Radioactive imaging is used to help diagnose disease. Therapeutic radiographers, nuclear medicine physicians, and medical physicists work in hospitals treating cancer patients.
- Radiation Protection Advisors ensure there are adequate levels of radiation shielding and rules to protect people.



 Energy

Radiation

 Particle



Rock
(part of Cornwall/
south-west
England)



Watch
(old watch with
a glow in the
dark dial)



Smoke alarm



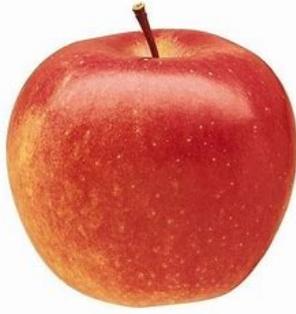
Brazil nuts



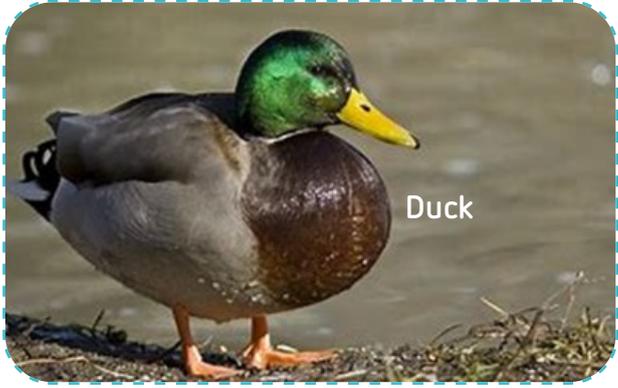
Lo-Salt



Banana



Apple



Duck

CONNECTIONS BETWEEN FOOD AND CLIMATE CHANGE

Did you know that food production contributes 30% of all greenhouse gas emissions, and the production of different foods cause very different amounts of emissions? For example, a portion of beef causes 10 times more emissions than a portion of baked beans, on average. This means our food choices can make a difference!

🕒 30 minutes

Skills unlocked: Curious, Logical, Observant

Carbon emissions



📋 Kit list

Pencil

Paper

Setting up your
lunch worksheet
(see next page)

📖 Instructions

On the next page, you can find information about the climate impact, water use and health benefits of some foods. The impacts were calculated by adding up the different processes to produce the food, e.g. for toast this includes producing and applying fertiliser to the wheat, milling and cooking the bread, and toasting it; for steak it includes methane from cow burps and poo, as well as the impact of growing food for the cow.

- 1 First, look at the ingredients to build your own lunch on the "Setting up your lunch" worksheet (see next page). Choose one bread, one protein, one salad item and one fruit.
- 2 Now, use the information on each food card to calculate the total climate impact of your lunch; add up the "Emissions" gCO₂e numbers (in black) for each food you chose.
- 3 Could you have chosen different options to make a more climate-friendly (lower gCO₂e), healthy meal?

➤ Next steps

You can watch a demonstration of the activity here bsa.sc/YouTube-Take-a-bite-out-of-climate-change 🌟

Perhaps you prefer different foods? You can download the full set of Climate Food Flashcards here: www.takeabitecc.org/flashcards.html 🌟

Find more activities here: www.takeabitecc.org/athome.html 🌟 and information: www.takeabitecc.org 🌟

🏠 At home

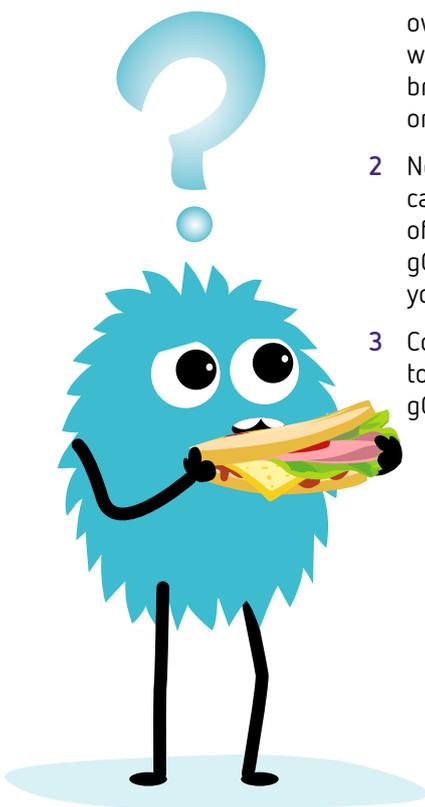
Can you find out the ingredients of your favourite dish and use the flashcards to calculate their climate impact?

Flashcards available here: www.takeabitecc.org/flashcards.html 🌟

↔ Career options

In the UK more than 1 in every 20 people work to get food onto our plates, including:

- the farming industry
- those working in technology to improve farming systems
- people processing harvested crops produce
- cooks and chefs
- dieticians and nutritionists.



CONNECTIONS BETWEEN FOOD AND CLIMATE CHANGE SETTING UP YOUR LUNCH



More flashcards available here:
www.takeabitecc.org/flashcards.html

CHOOSE ONE CARBOHYDRATE OPTION

Toast
Two slices (64g)



CO₂e
0.5
minutes driving

Emissions	90 gCO ₂ e
Water	30 litres
Fibre	5 g
Calories	190 kCal
Protein	6 g

Bread
Two slices (80g)



CO₂e
0.4
minutes driving

Emissions	60 gCO ₂ e
Water	30 litres
Fibre	6 g
Calories	190 kCal
Protein	7 g

CHOOSE ONE PROTEIN OPTION

Baked beans
From a can (200g)



CO₂e
3
minutes driving

Emissions	430 gCO ₂ e
Water	115 litres
Fibre	25 g
Calories	162 kCal
Protein	10 g

Cheese
Three slices (100g)



CO₂e
10
minutes driving

Emissions	1590 gCO ₂ e
Water	139 litres
Fibre	0 g
Calories	416 kCal
Protein	25 g

Steak
Portion, fried (100g)



CO₂e
29
minutes driving

Emissions	4723 gCO ₂ e
Water	668 litres
Fibre	0 g
Calories	242 kCal
Protein	30 g

CHOOSE ONE VEGETABLE OPTION

Tomato
Heated greenhouse (80g)



CO₂e
6
minutes driving

Emissions	1002 gCO ₂ e
Water	0.8 litres
Fibre	3 g
Calories	11 kCal
Protein	0 g

Tomato
Seasonal, medium (80g)



CO₂e
0.1
minutes driving

Emissions	13 gCO ₂ e
Water	0.8 litres
Fibre	3 g
Calories	11 kCal
Protein	0 g

Lettuce
Seasonal (30g)



CO₂e
0.3
minutes driving

Emissions	44 gCO ₂ e
Water	4 litres
Fibre	1 g
Calories	3 kCal
Protein	0 g

CHOOSE ONE FRUIT OPTION

Strawberries
Seasonal, handful (80g)



CO₂e
1
minutes driving

Emissions	136 gCO ₂ e
Water	17 litres
Fibre	3 g
Calories	24 kCal
Protein	0 g

Strawberries
By air, handful (80g)



CO₂e
2
minutes driving

Emissions	408 gCO ₂ e
Water	14 litres
Fibre	3 g
Calories	24 kCal
Protein	0 g

Banana
Small (80g)



CO₂e
0.3
minutes driving

Emissions	55 gCO ₂ e
Water	43 litres
Fibre	2 g
Calories	65 kCal
Protein	1 g

HOW ARE WE CONNECTED TO THE OCEAN?

In this activity you'll discuss why the ocean matters, and take a deep dive to find out more with a short film. You'll then create a display about what's going on beneath the waves, and discuss what we can do to protect our oceans for the future.

 45 minutes

Skills unlocked: Collaborative, Logical, Open-minded

Kit list

A3 or A4 paper

Pens

Pencils

Printed copies of the worksheet (see next page)

Screen, laptop or tablet with internet access (to show a film)

Instructions

- 1 Why do we need the ocean? It helps regulate the Earth's temperature, provides a livelihood for millions of people, and we can visit the seaside for fun and sport. The ocean is important for environmental, economic and social reasons. Work in groups to see how many you can think of in 5 minutes.
- 2 Watch the video, My Dad the Fisherman at www.msc.org/uk  and listen out for the key terms on the worksheet and match them with their definition.
- 3 Thinking back to the film, use the diagram on the worksheet to create a Consequences Kelp in groups. Start with the problem "**some species of fish are under threat**" and write down the environmental, scientific, social and economic causes and consequences. Think about how these human and physical processes interact to change the ocean environment. You could focus on food webs, livelihoods, biodiversity, and

climate change. Ask 'why, why, why?' and investigate from different perspectives.

- 4 Finally, think about what **science, technology, consumers, and fishers** can do to help.

Next steps

Do you want to know more about how scientists and fishers are working together, using scientific techniques to make fishing more sustainable? Check out this interactive dive into the ocean www.msc.org/uk/an-msc-ocean . Or why not find out whether the food in your school canteen is sustainably caught, by emailing your catering manager?

At home

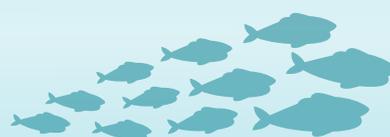
Can you explain what sustainable fishing means, to a friend or family member? Can you explain to them the role that the MSC ecolabel plays in ocean sustainability?



Career options

You could become:

-  an engineer inventing sustainable fishing gear or tech to reduce plastic pollution
-  a marine biologist studying ocean life
-  environmental campaigner
-  a care worker serving sustainable fish for supper
-  a policymaker changing how we look after ocean resources
-  a business owner making sustainable products.



>> HOW ARE WE CONNECTED TO THE OCEAN? KEY TERMS IN SUSTAINABLE OCEANS



Can you match these **terms** with their **definitions** ?

Fishery

Maximum sustainable yield

Quota

Overfishing

Bycatch

Food web

Sustainable fishing

Fish stocks

When a certain species of fish are fished too much, they are unable to reproduce their numbers back to a healthy number and begin to decline.

This happens when fishing boats catch fish and animals that they don't really want or shouldn't take. It can also include young or undersized fish.

Each animal relies on the others to survive.

An area of the sea where fish are caught for commercial purposes.

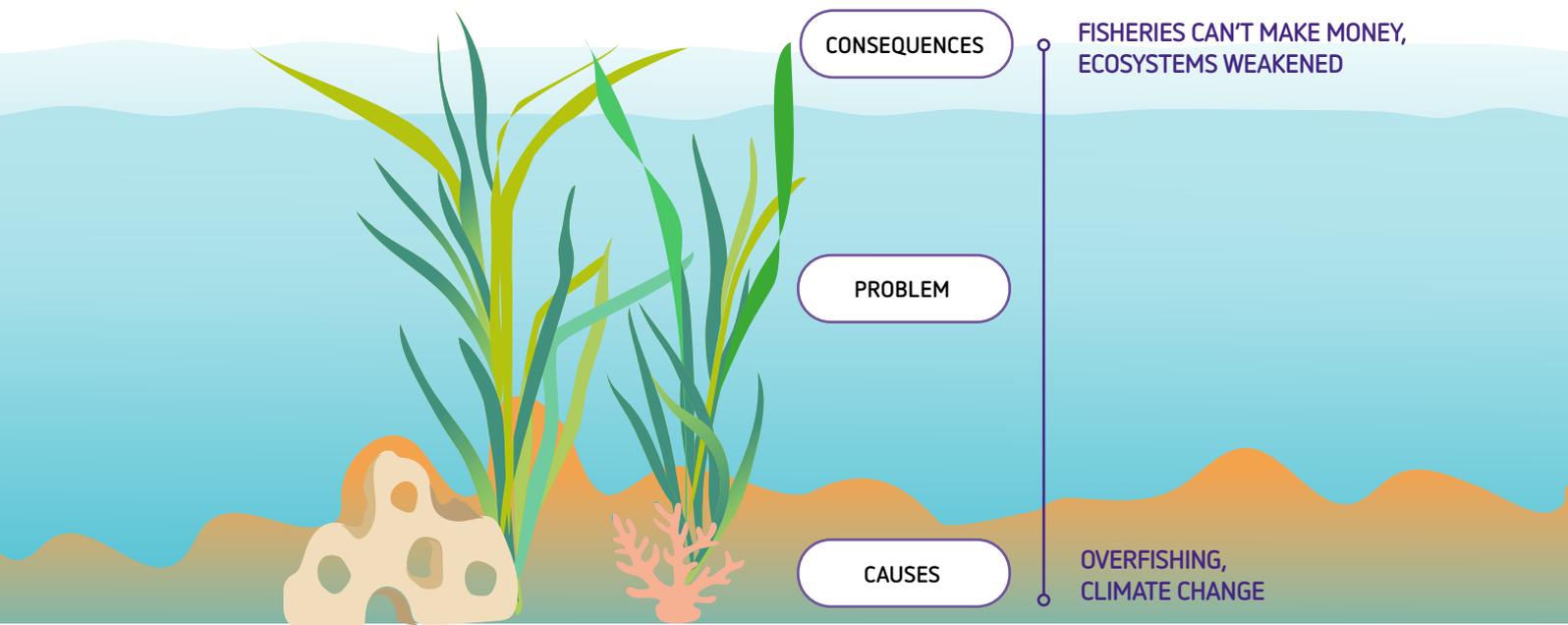
Fishing for a certain number of fish per year.

The amount of fish living in our oceans that could be caught by fishers.

A scientific calculation that shows fishers how much they can catch without overfishing.

Fishing in a responsible way, making sure that fish populations don't drop below levels where they cannot reproduce and grow faster than they are caught.

CONSEQUENCES KEMP



UNBOXED: DRAW A SCIENTIST

Growing up you will learn and develop lots of new skills. Whilst some jobs, like a bus driver and a dentist, are very different to each other, you will find that many skills needed are the same.

In this activity you will explore the skills and creativity in STEM.

🕒 30–45 minutes

Skills unlocked: Open-minded, Collaborative



📋 Kit list

Plain A3 paper
or a couple of
sheets of A4

Pencils

Crayons

Job profiles
(see next page)

Optional: ruler

📖 Instructions

- 1 Look at the job profiles of the different scientists involved in UNBOXED (see next page).
- 2 In the middle of your paper, draw a scientist. Be as creative as you want! Remember, all scientists look different and do different jobs.
- 3 Next, think about what skills your scientist needs to do their job. Write these around your drawing. Try to think of as many skills as possible.
- 4 Now think about an artist. What skills do they need? Put a tick by the skills you think an artist also has.
- 5 Hopefully you have listed creativity for both scientists and artists, as well as lots of other skills.
- 6 In a different coloured pen / pencil, put another tick by the skills that you have.
- 7 If you are doing this activity at school or in a group, you could all share your pictures. Are there similarities between the skills you all listed?

➡ Next steps

This activity is part of the UNBOXED Creations CREST Discovery Award.

View the full resource here:

bsa.sc/CREST-Awards-Discovery-projects ✨

If you want to investigate more scientists and the skills they use, check out the 'Smashing Stereotypes' webpage:

britishscienceweek.org/plan-your-activities/smashing-stereotypes ✨

🏠 At home

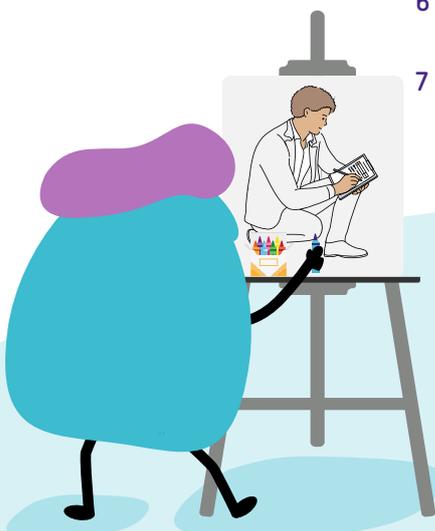
Discuss at home what skills your parents, carers or other people you know have.

Do they have to be creative in their jobs?

Do they have to work with people with different skills?

↔ Career options

UNBOXED: Creativity in the UK saw STEM and arts professionals working together to create 10 exciting projects across the UK. This included a magical forest-garden in Birmingham city centre and an art sculpture of a SEE Monster in the sea! Skills learnt in these STEM subjects can be applied to many different jobs.



Name

Dev Joshi

Job title

Technical Director



What is my job?

I am responsible for directing the technical development and delivery for the Dreamachine. The Dreamachine project is an immersive magical experience of light and music exploring a colourful world unfolding behind your eyes. I work with our team and partners, to ensure seamless delivery of the project from, audience experience, ticketing, participant research and everything in between.

How is my job linked to creativity?

I collaborate with specialists and the creative team to build the tools and processes which we work with to create the Dreamachine's specialist media. There's always testing, problem solving and decision making to do as well as continuing research and development tasks.

Name

Leah Gowing

Job title

Architectural Trainee



What is my job?

An architect's job is to look into the fine details – making sure everything is neatly built, accessible for all, and structurally sound. For the Pollinations project (a city centre architectural forest) I spend time in the studio creating render images for marketing, social media and the website. When I'm on site, I work on floor plans, as well as getting involved in the planting, building, and decorating.

How is my job linked to creativity?

My job is filled with creativity, it includes a lot of creative problem solving and thinking ahead to what issues or opportunities may arise. I have to be creative in my thinking, how can I design a building that's adaptable and shaped by the community, rather than creating a concept that is alien to its surroundings?

Name

Annabelle Ohene

Job title

Graduate Engineer



What is my job?

My job is within the system architects team and I'm responsible for looking at different pieces of technology and bringing them together to create the best possible outcomes. I worked with a team to develop an innovative, geo-locating lighting system called Geolights.

How is my job linked to creativity?

A huge part of my role as a graduate engineer with SIEMENS is proving how the science, technology and arts industries can complement each other. I work with people across science, technology, engineering, arts and maths and this allows me to be creative within my role.



UNBOXED: DRAW A SCIENTIST JOB PROFILES

OUR PLACE IN SPACE



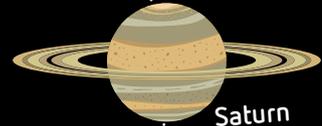
Pluto



Neptune



Uranus



Saturn



Jupiter

Name

Name

Nicole Stott

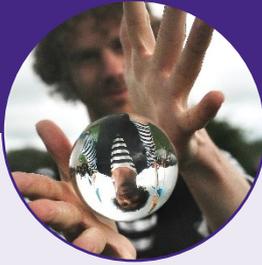
Luke Blakely

Job title

Job title

Astronaut, Aquanaut
and Artist

Educator/Performer



What is my job?

In my main job, I coordinate and deliver circus workshops and creative education programmes. I also work as a street theatre performer, performing science themed circus shows where I try to get to the heart of scientific concepts and highlight the beauty and magnificence of these to the audiences.

What is my job?

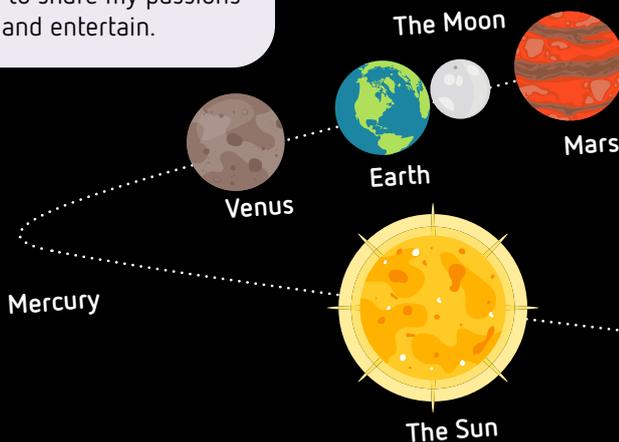
As an astronaut, I have had the experience to fly in space and explore the heights of outer space as well as exploring the depths of our oceans as an aquanaut where I lived underwater for an extended period of time on the Aquarius undersea habitat.

How is my job linked to creativity?

Working in the disciplines of science and creative arts allows the two to be combined, science has always interested me but so has music, performing arts and circus arts. Every day is unique and I have freedom when creating new material for my job to be able to share my passions to inspire and entertain.

How is my job linked to creativity?

As an artist I creatively combine the awe and wonder of my spaceflight experience with my artwork to inspire everyone's appreciation of our role as crew mates here on Spaceship Earth.



CONNECT WITH NATURE

Our towns and cities are full of connected life. In urban areas a single tree often provides habitat for thousands of other species. Ecosystems in urban areas can be particularly impacted by human actions in different ways. In this activity you will become a scientist and check the health of your local trees to help urban biodiversity flourish.

🕒 30 minutes

Skills unlocked: Observant, Creative, Curious

🧰 Kit list

Paper and pen or device to record your observations.

Device to access the tree health checklist and identification guides and apps at www.nhm.ac.uk/schools/explore-urban-nature/bsagoexplore.html

Disposable gloves

Optional:
a white tray or sheet

📄 Instructions

- 1 Find the seasonal tree health checklist at nhm.ac.uk/bsagoexplore and look through the images to prepare for your search.
- 2 Find a tree! This can be anywhere in your neighbourhood, in a park, your school or your street. One where the branches and leaves are within reach is best, and bushes will work too.
- 3 Work through the checklist noting down which signs of health tree ecosystems you find, as well as any signs that your tree might have a problem.
- 4 To learn even more about your tree ecosystem you can hold your tray or sheet under a branch and very gently shake it. You should see animals fall out, for example insects or spiders. Use the ID guides or app to try and work out what species you've seen.
- 5 Submit your findings to us using the tree health check quiz on the website!

⚠️ Watch out

- Urban nature, particularly trees, can be exposed to many pests and diseases. Try to avoid spreading any of them by wearing gloves when touching trees, avoiding touching plants or animals and cleaning your shoes.
- Throw disposable gloves away.
- Wash your hands afterwards.



➡️ Next steps

Go to our website www.nhm.ac.uk/schools/explore-urban-nature.html to learn more about the challenges urban nature is facing and what you can do to support it.

🏠 At home

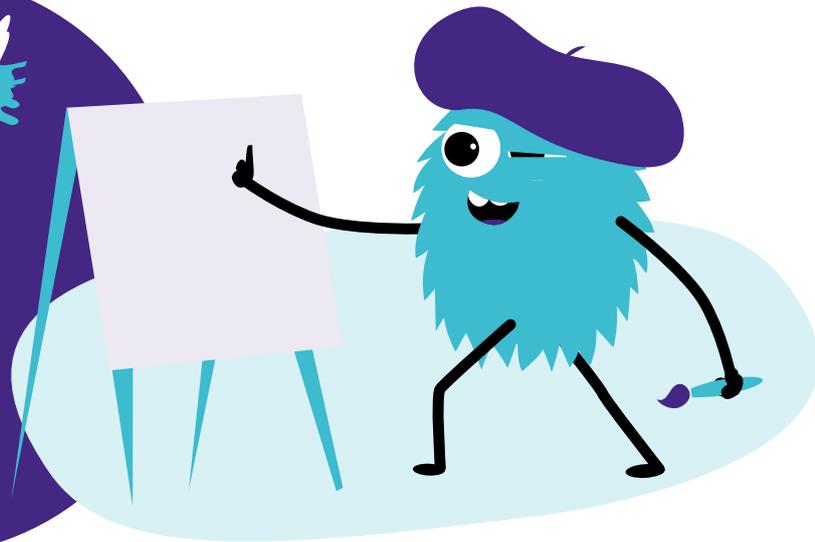
What could you do in your community to advocate for urban nature? Are there local conservation organisations you could join? How could you encourage others to act sustainably?

↔️ Career options

Many jobs in the future will require an understanding of how to make observations of nature and use it to understand the impact humans are having on ecosystems in towns and cities. Governments, technology companies, environmental charities, and scientists are just a few examples.

POSTER COMPETITION

Students can get creative and enter British Science Week's annual, UK-wide poster competition! They can make a poster about any version of 'Connections' that they like and be in with the chance of winning an array of prizes. Each school can enter the 5 best posters!



Kit list

Paper (A4 or A3)

Creative materials,
such as:

pens
pencils
scissors
glue
watercolours
paints
crayons
felt
thread
wool
foil
clay
string
beads
stamps
foam
pom-poms

Instructions

Encourage students to think about different areas of 'Connections' so they can come up with ideas to include in their poster. Here are some points and questions to get you going:

- Get students to think about their personal experience of connections – from studying the connection between eco-friendly choices and a cleaner planet, to connecting with a classmate to learn how working with others can help people overcome challenges that they thought they could not do! How has it helped them to become stronger, braver, kinder or more accomplished?
- How do students think connections impact the world? You could help them to consider the family tree that connects all living creatures, how their body parts are connected, or even how internet connection is changing how we communicate. What are examples of good connections?
- Can students think of people they have connected with who have helped or inspired them? Perhaps they could create a portrait of them to show this?

From the learning of new skills to the development of places and ideas that enable us to do things more efficiently in our everyday lives, connections are everywhere!

Making the poster

Once they've done the thinking, it's time for students to get creative! Posters must be A4 or A3 in size and you'll need to be able to take a photograph of each one so it can be sent to us online for judging. Students can use pop-up pictures, pull out tabs or use materials such as pencils, paints, crayons and paper to create their posters.

Submitting the poster

Posters will be judged on creativity, how well they fit the theme and how well they have been made or drawn, and how engaging they are. Once a student's poster is complete, take a photo of it and complete the online form to submit it as an entry.

Next steps

Celebrate! For more details, along with the full set of poster competition rules and tips, check out our website:

britishscienceweek.org/plan-your-activities/poster-competition ✨



Look out for the activities in this pack marked with a paintbrush symbol, they can be a source of inspiration!



We want to hear from you!
Tell us what you think of the
activities using our survey...



Visit bsa.sc/activitypacksurvey 

Delivered by



Supported by

