



BRITISH SCIENCE WEEK

8-17 March 2024



Delivered by



BRITISH
SCIENCE
ASSOCIATION

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PRIMARY ACTIVITY PACK

Activities for children aged 5-11 (approx.)

britishscienceweek.org



BRITISH SCIENCE WEEK



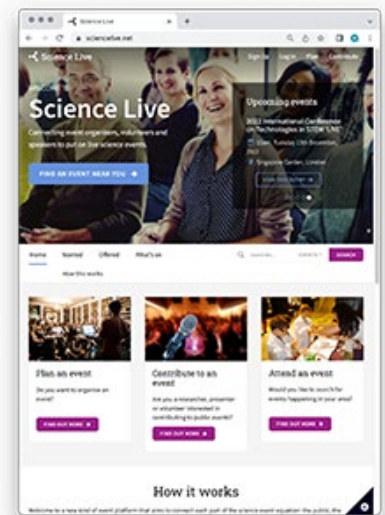
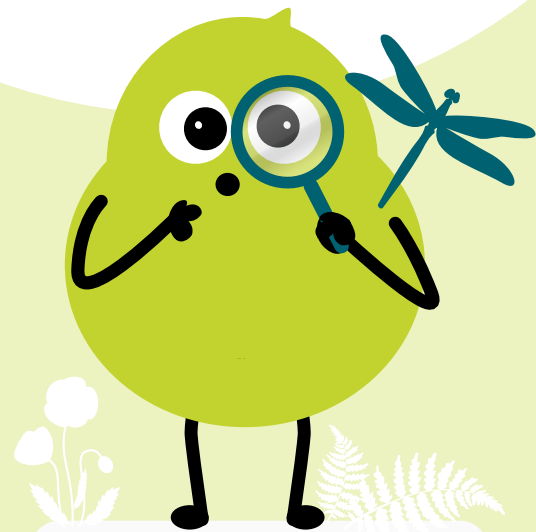
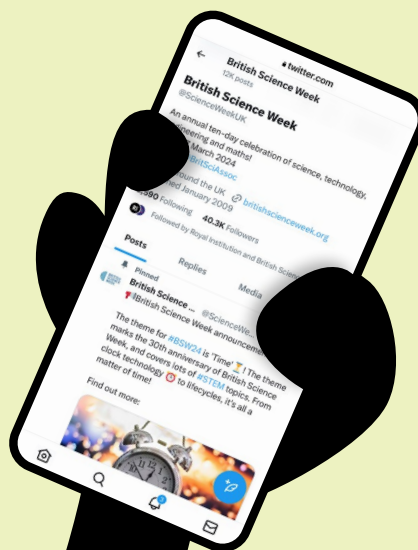
8-17 March 2024

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

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 children's own backgrounds, lives, and interests.

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

You can 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 🌟) and using the hashtag #BSW24.



Find an activity near you

Last year, hundreds of thousands of people participated in activities around the UK. Help us make British Science Week 2024 even bigger and better! Visit [sciencelive.net](https://www.sciencelive.net) 🌟 to find science activities in your local area.

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The theme this year for British Science Week is 'Time!' It's the 30th anniversary of British Science Week – we want you to celebrate this huge milestone with us, thinking about time since the Week began, and looking to the future!

Here are some ways you can introduce the theme to children in a fun, imaginative way to get them excited about the Week:

- Ask children 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 too, simply look out for the activities marked with the paintbrush symbol shown above!



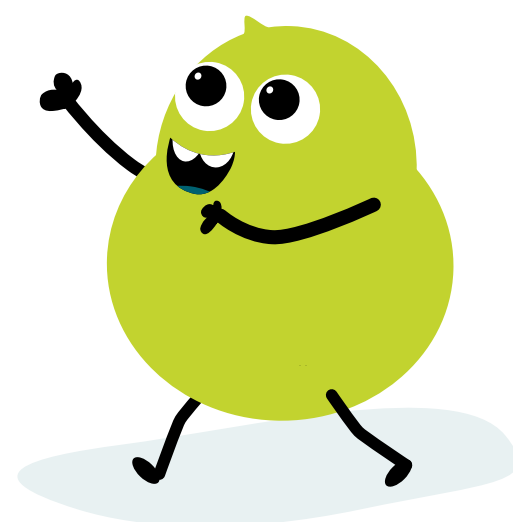
You can find more information about how to enter on [page 31](#) ✨ and at britishscienceweek.org/plan-your-activities/poster-competition ✨.

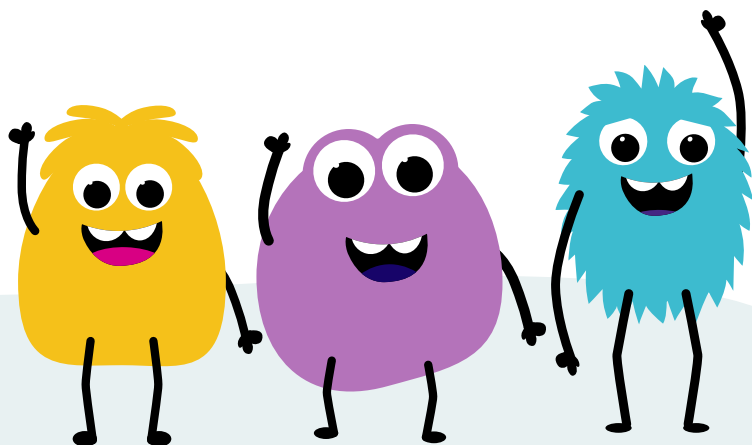
- Get children talking about what time means to them. How do they tell the time, and how does it differ from the way their parents or grandparents told the time? What about things that go very fast (the fastest animals, ways of travelling) or very slow (plants growing, building cities and large structures)?

Invite a special guest or someone from the school community to share with children their own experience of time. Are there any watchmakers local to you, or clock towers to visit? Maybe a photographer could talk about capturing 'moments in time'? See [page 5](#) ✨ for information on how to get volunteers.

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

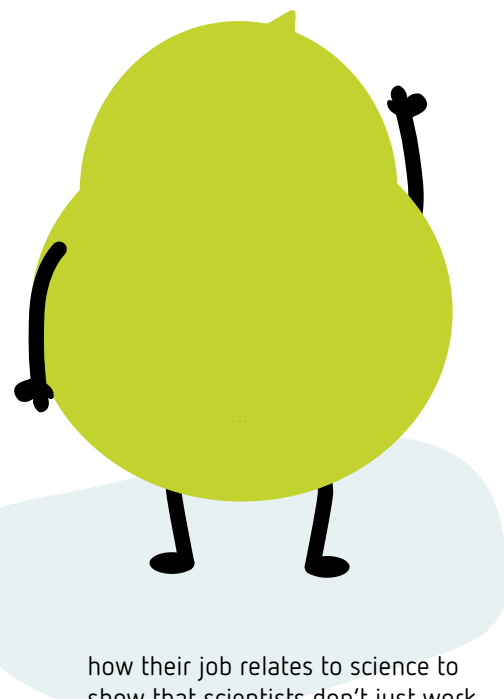
- Tell children about the plan for the Week and give them a challenge related to the theme. If you are sending home an experiment, maybe you could introduce or demonstrate it first.
- Time affects every part of our lives. Has 'time' as a theme been in the news recently, or do you have an example from the local area? Are there any historic sites you can talk about, and through which you can explore previous eras?





MAKING THE MOST OF VOLUNTEERS

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



STEM Ambassadors are volunteers who offer their time and enthusiasm to help bring STEM 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:

- Schedule two or three different guests to talk about their jobs or science-related hobbies during the Week. If possible, get children anticipating who the next guest will be and what they do. These sorts of experiences can inspire children to think about their future, they're never too young to explore their career options!
- Where available, involve volunteers/Ambassadors who challenge stereotypes the children might have absorbed and promote a positive attitude towards science. For example, women engineers, people early on in their careers, and those in roles not typically linked to science but still involve it – such as chefs, tech start-ups, gardeners, sportspeople etc. Ask volunteer /Ambassadors to share

how their job relates to science to show that scientists don't just work in labs!

- 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 ahead of time.

Volunteers come from a range of careers and experiences, from engineers, designers, and architects to scientists and technicians, so get children looking forward to inspirational career talks which broaden their choices and 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 children carry on participating in British Science Week at home? Here are our top tips for engaging parents and carers with the Week:

- **Make the most of parent newsletters**, the Parent-Teacher Association (PTA) and chat group and text messaging services, if you have them. Let parents and carers know what you have planned for British Science Week at least a month in advance, and how you'd like them to be involved.

Ask them to collect or donate materials and tell them what they will need to get involved in any experiments at home, so they have time to plan themselves. The PTA may be able to support you financially to run activities during the Week or help to drum up parent volunteers.

- **Ask parents and carers to think** 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 children questions or activities they can do at home.

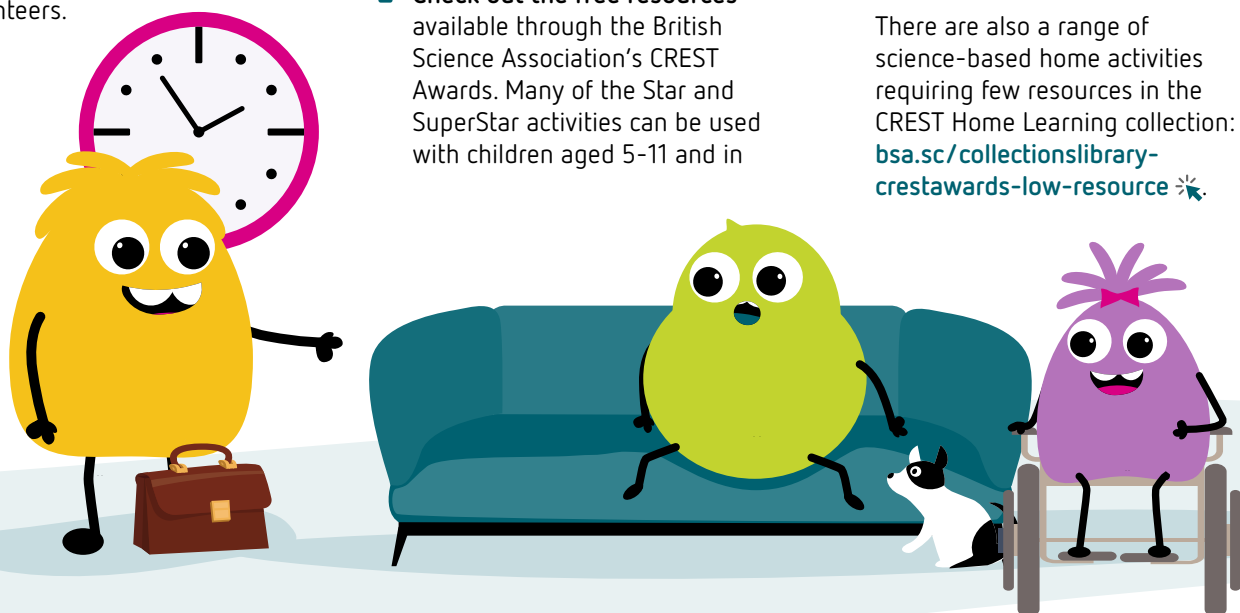
- **Encourage exploring outdoors**, in the community or in local cultural spots. This could be anything from going on a nature walk around local parks to spotting STEM in real life, street lighting engineers or infrastructure like bridges and construction work.

- **Check out the free resources** available through the British Science Association's CREST Awards. Many of the Star and SuperStar activities can be used with children aged 5-11 and in

an outdoor setting. Check out the CREST Primary challenges collection: primarylibrary.crestawards.org ✨.

- **Send an experiment idea home** during the Week to spark discussions around science. Try to make it as low-resource as possible. It can help if it's something the children 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 Home Learning collection: bsa.sc/collectionslibrary-crestawards-low-resource ✨.



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 places are often membership-based and can be 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 reusefuluk.org ✨ to find a UK directory of scrap stores.

Take photographs when out and about and share these with the children to foster discussion and raise their level of understanding about how time affects everything around us, in plants, building structures, and so on. The more colourful, the better!

The photos can be a reference point for future activities. For example, you could gather photos of a certain type of technology, televisions perhaps, (using images from internet if you need to) and ask children try to put them in chronological order of when they were invented.

Collect story books and reference books around the theme of time to create a themed library.



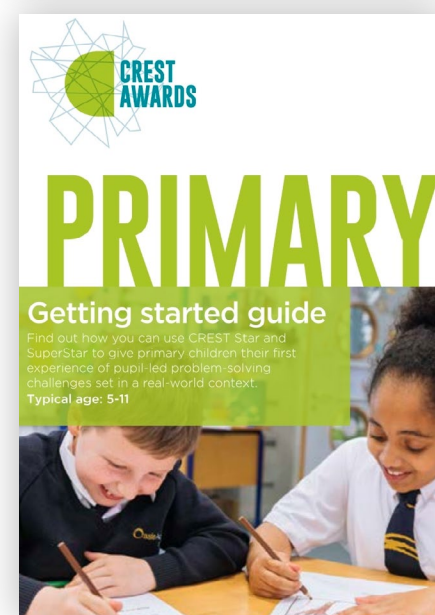
BEYOND THE WEEK

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 children take part in a CREST Award. CREST is a scheme that encourages young people to think and act like scientists and engineers. Children can complete eight activities to achieve a Star or SuperStar Award, which will see them receive a certificate and badge. Look out for the CREST logo to see which activities can be put towards a CREST Award. Older children could also work towards a higher-level CREST Award. Take a look at the different primary CREST challenges here: primarylibrary.crestawards.org

- If you have the opportunity, consider running a STEM club or curiosity lab. You can find supporting resources at stem.org.uk/secondary/enrichment/stem-clubs
- Find ways to link time into other subjects. In history, you could explore how our understanding of science and the world has changed over time. In PE, you could think about the speed of athletes and how time is important in other aspects, such as reaction times. In geography, you could talk about seasons and the weather.



UNLOCKING SKILLS



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



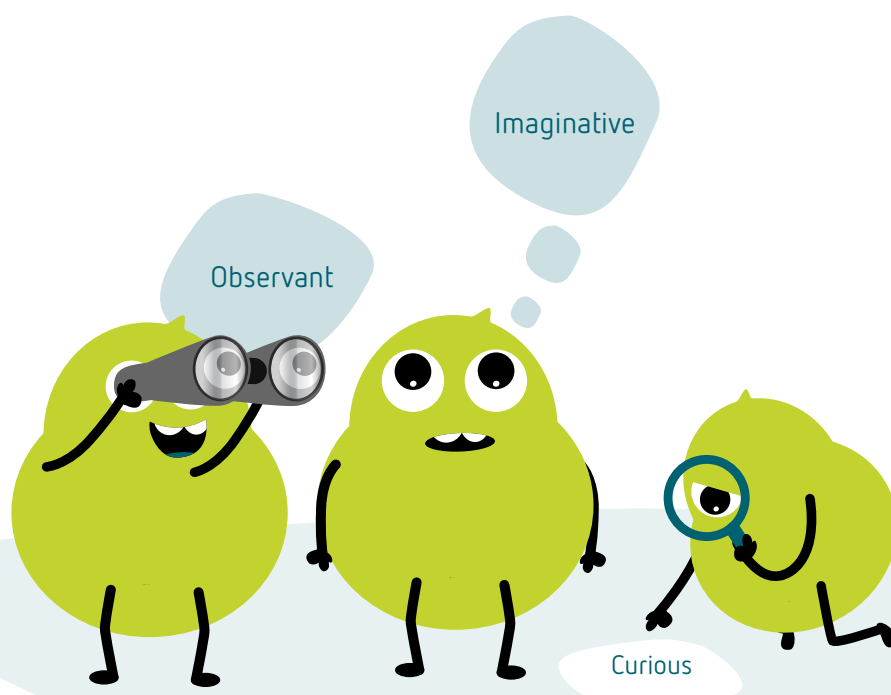
These skills will strengthen positive attitudes and reduce stereotypes of those working in the field.

You could, for example, use the **STEM Person of the Week** ✨ activity from NUSTEM at Northumbria University or introduce a scientist from the British Science Association's **Smashing Stereotypes** ✨ campaign. Ask children

to identify what characteristics 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.

The table opposite has a complete list of attributes developed by NUSTEM to use as a talking point or to share with other teachers.

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

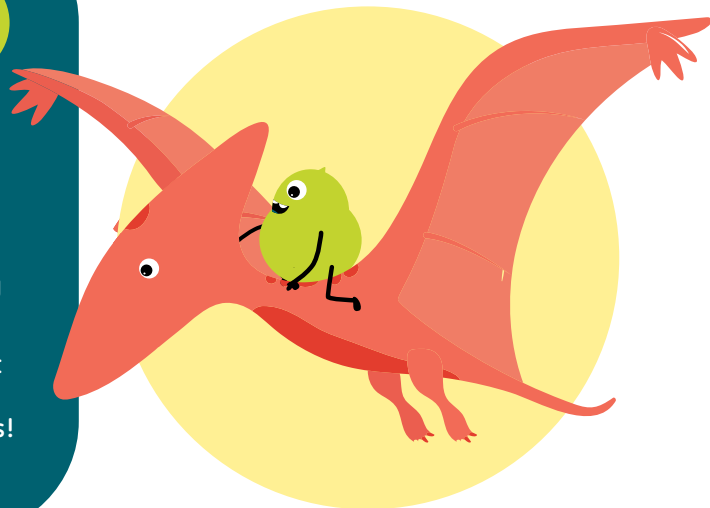


DISAPPEARING DINOS

This activity is designed to get you researching and debating the extinction of the dinosaurs.

A long time ago, dinosaurs roamed our planet, but they don't exist anymore. Over time, other animals evolved that might have not been able to live alongside dinosaurs – like humans!

🕒 45 minutes



Kit list

Access to the internet and/or books

Pen and paper



Instructions

- 1 You will be researching the extinction of dinosaurs and planning a class debate.
- 2 Before you look on the internet or in books, discuss your ideas about what might have happened to the dinosaurs all that time ago. This is how scientific theories come about.
- 3 Conduct your investigation using the resources you have and record your results. Remember, you'll need evidence to back up a scientific theory.
- 4 Present your findings to your group – be as creative as you like. You could use diagrams, a presentation, or create a booklet. You might find your classmates have other ideas about what could have happened!

Watch out

There is lots of information on the internet, and unfortunately not all of it is accurate! Make sure an adult supervises you while you look online, and only use verified websites.

Next steps

This activity is one of the CREST SuperStar challenges. Why not try some of the other activities with your children? You can find out more and download all the resources you need here: bsa.sc/CREST-SuperStar-Challenges ✨

If you are an adult wanting to run CREST Awards with your pupils, visit crestawards.org ✨ for advice on how to get started.

At home

If you're interested in dinosaurs and how they became extinct, you could visit a museum and see some dinosaur fossils!

Skills unlocked

Open-minded, clear communicator

Career options

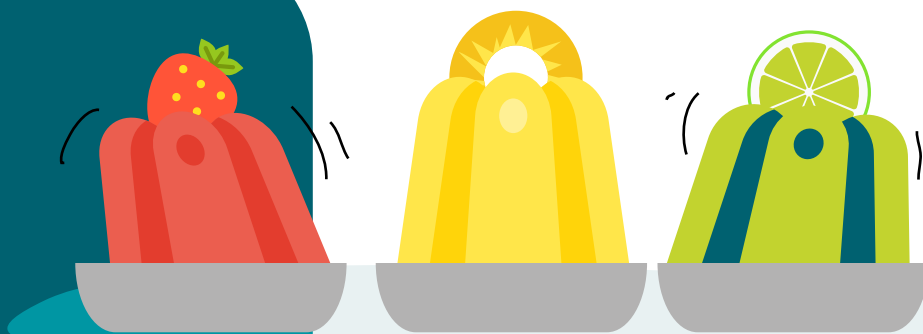
- Palaeontologists study dinosaurs and other ancient life.
- Archaeologists also study ancient life and dig up fossils, but they focus on humans.
- Museum curators put together exhibitions about dinosaurs.
- Historians research and investigate things that happened a long time ago.

GET SET JELLIES

This activity is designed to get you making and testing jelly recipes.

Jelly sets over time, but can different methods for preparing it slow that process down? Try out delicious fruits in your mixture to find out!

🕒 45 minutes



📋 Kit list

Jelly
(any flavour will do)

Kettle and water

Spoons

Measuring jugs

Little dishes to
put the jelly in

Pineapple –
fresh and tinned

Other types of fruit
(optional)

📖 Instructions

- 1 Get all the equipment ready – you'll be making different jelly recipes!
- 2 Make sure you make the jelly according to the instructions (with the help of an adult). You should focus on adding different fruits, not changing the recipe for the jelly itself.
- 3 Time your different jellies to see how long it takes them to set. Do different fruits slow down the process, or even stop the jelly from setting all together?
- 4 Ensure you make one jelly that has no fruit in it, to compare to the jellies with fruit – scientists call this a control.
- 5 Design a way to record your results.
- 6 Present your findings to your group – be as creative as you like. Then enjoy the delicious results!

⚠️ Watch out

For different reasons, some children might not eat gelatine – an animal product used in most jellies. Make sure to use a vegetarian option if needed.

Primary children must not use kettles to heat/transfer water.

Do not carry hot jelly around until it has set.

Clear up any spillages straight away.

➡ Next steps

This activity is one of the CREST SuperStar challenges. Why not try some of the other activities with your children? You can find out more and download all the resources you need here: bsa.sc/CREST-SuperStar-Challenges ✨.

If you are an adult wanting to run CREST Awards with your pupils, visit crestawards.org for advice on how to get started.

🏠 At home

You can carry on the jelly experiment at home! Try using different sized and shaped bowls and see if this changes the time jelly takes to set.

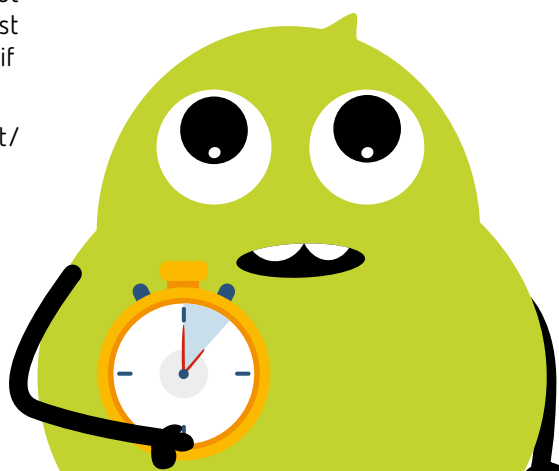
🔒 Skills unlocked

Observant, curious

↔ Career options

Timing is very important for all cooking – not just jelly! Understanding how long food takes to cook or set depending on the ingredients used is a skill used by:

- ➡ chefs
- ➡ bakers
- ➡ recipe developers.



MAKE YOUR OWN PENDULUM TIMER!

Get ready to become an engineer! In this activity you're going to learn about pendulums by making one yourself. You'll experiment with ways to slow down its swing and even explore different types of swings. Are you up to the challenge?

⌚ 20 – 30 minutes.



Kit list

String or wool

Something small and heavy that can be tied to a string, such as a key

Card

Sticky tape

Ruler

Timer

Scissors

For step-by-step instructions, watch the video below:



Instructions

- 1 Attach a small, weighty object to a 50cm piece of string.
- 2 Steady the string by holding it or tying its top to a stable object like a table or chair, allowing the weighted end to swing freely.
- 3 Time how long it takes for your swinging object to come to a stop. If timing multiple swings, always start from the same angle.
- 4 Next, attach a piece of card to your weighted object.
- 5 Record the duration of your pendulum's swing with the card attached. Experiment with cards of different sizes!
- 6 Challenge time! Can you get exactly 10 swings in 30 seconds? Be sure to think about the weight at the end of the string as well as the length of your string.

More videos to get started with practical enquiry can be found here: pstt.org.uk/resources/starters-for-science ✨

Watch out

Children must stand at least a metre away from each other while swinging their pendulums.

Next steps

Visit PSTT's Whistlestop Science Week's page and download the 'Time' theme where you'll find daily suggestions for short science activities, questions and challenges that you can do at home or in school. pstt.org.uk/resources/whistlestop-science-weeks ✨

At home

Explore different ways to measure time. For instance, try rolling a ball between 2 people and count how many times you can roll in 30 seconds. Can you invent a method to track 30 seconds more accurately?

Skills unlocked

Creative, logical

Career options

Mechanical engineers make and maintain physical products that are used by everyone.

Find out about mechanical engineer, Rafsan Chowdhury, in PSTT's 'A Scientist Just Like Me' resource: pstt.org.uk/download ✨

Watch a video of Rafsan talking about his job: vimeo.com ✨

You can find out about other engineers here: pstt.org.uk ✨

ACTIVE ADAPTATIONS

In this activity, you will investigate animals, their variations and how they adapt to their environment over time. Evolution by natural selection is the process of changes in a species over time to suit their environment. Although adaptations can happen within our lifetimes, evolution that creates entirely new species takes millions of years.

⌚ 45 minutes – 1 hour.



Kit list

Salt dough/clay

Access to a variety of natural materials such as leaves, twigs, moss, grass etc.

Marker pens (for creating detail)

Instructions

- 1 Make a moth using salt dough and natural materials or use the template provided on the next page.
- 2 Head outside and choose 4 different coloured areas (e.g., green grass, grey wall).
- 3 The teacher plays the 'predator', hunting moths!
- 4 Flutter your moth around freely.
- 5 When the predator calls 'habitats', place your moth in one of the corners.
- 6 The predator chooses a corner to inspect.
- 7 Did they spot your moth?
- 8 If unseen for 30 seconds, you're safe to fly again. If spotted, you're 'eaten' and 'out'.
- 9 Play until half the moths survive.
- 10 Observe surviving moths – are there any common traits?
- 11 Create a new moth, an offspring of survivors, using their successful traits.
- 12 Try again with your evolved moth and see how many of your adapted moths make it this time!

Watch out

Children must not taste the dough.

Children must wash their hands with soap and water after the activity.

Next steps

What would happen to your moth if the environment changed?

Now research a different animal, finding out about its adaptations to its environment.

If you're an adult looking for more fun and engaging outdoor science activities for your pupils, look at our blog: alfrescolearning.co.uk/blog/outdoor-ideas-for-british-science-week-2024 ✨

At home

Let's go on a butterfly and moth hunt! Using your observational skills, search for butterflies and moths and see which ones are tricky to spot. Can you guess why some are easier to find than others?

Skills unlocked

Observant, creative

Career options

- Ecologists study links between plants, animals, and the environment.
- Conservationists educate others on the importance of preserving natural habitats for plants and animals to survive.
- Entomologists study insects and their role in our environment. If you have an interest in insects, this could be the career for you!

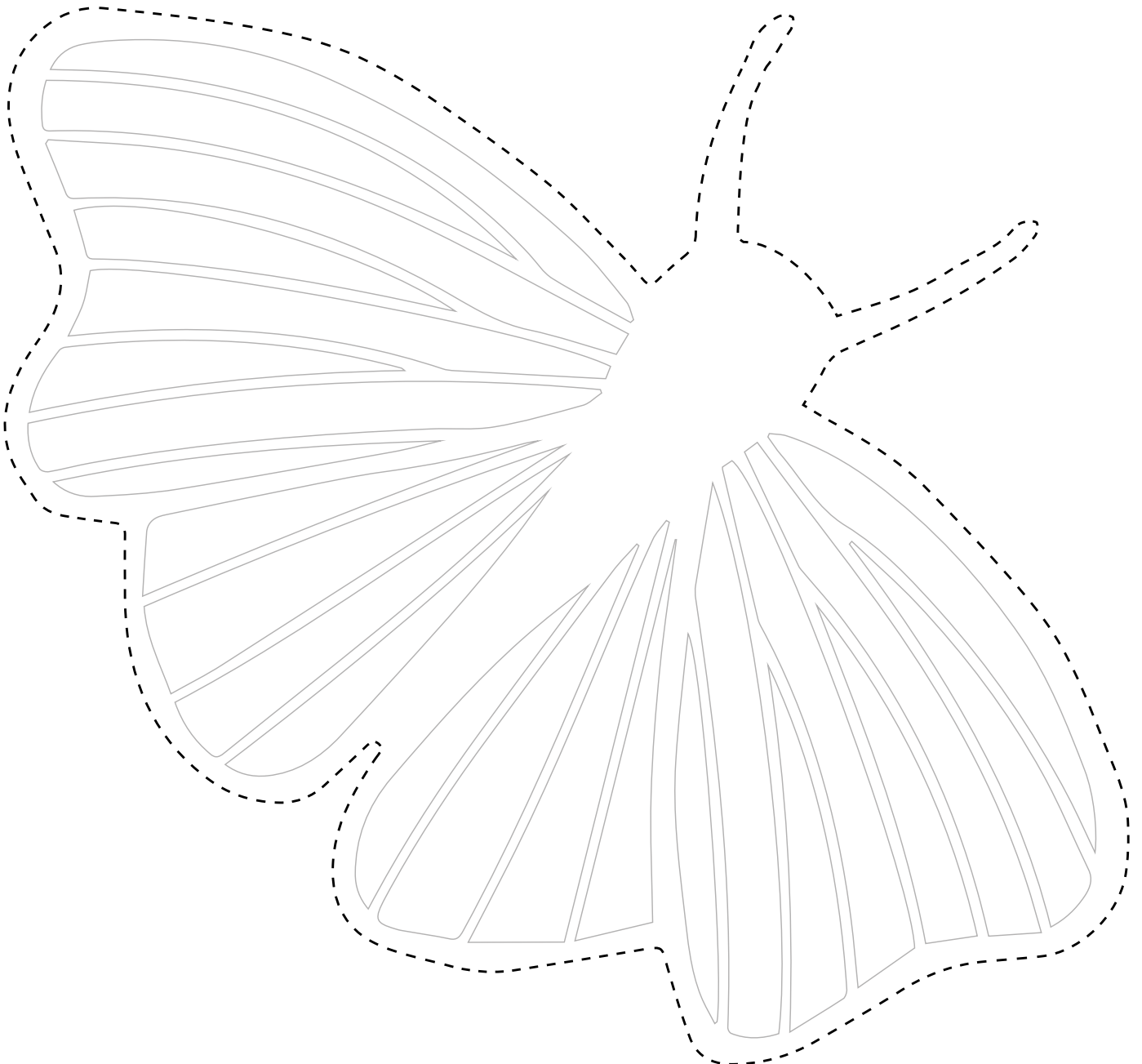




----- Cut along dotted line



Colour in



EFFECT OF PARTICLE SIZE!

In this activity, you'll explore how different-sized particles interact with our respiratory system, using a fun, hands-on model to simulate how we breathe in and filter the air around us.

 30 minutes



Kit list

At least 3 sieves of different size holes (or large paper sheets with holes made)

Bowl

Spoon

Dried pasta, dried chickpeas, rice, and sand

A large plastic mat for floor protection

Instructions

- Begin by considering these points:
 - The air around us contains particles of different sizes.
 - Our airways decrease in size from upper to lower regions.
- Predict the behaviour of different-sized particles when they're inhaled and how you could experiment with the provided materials:
 - How would you simulate the airways and does the sequence of the equipment matter?
 - What would you use to represent particles of various sizes?
 - What do you predict will happen to the different particles when you "breathe" (pour) them into your model airway?
- Set up your models and 'breathe' in the particles:
 - Mix all variously sized "particles" into a large bowl.
 - Arrange a group of volunteers to hold the sieves of different sizes, with the largest at the top (mimicking upper airways) and the smallest at the bottom (representing lower airways).
 - Pour the 'particles' and observe the results, keeping track of where different-sized particles land (on sieve 1, 2, 3, or the floor).

- Record your predictions and observations in a table like the one below. Add columns for more airway regions if you have more than 2 sieves, and more rows for each particle you try!

- Discuss:

- Was your prediction accurate?
- What does this experiment tell us about particles and our airways?

Watch out

Children must not taste or put any food samples near their mouths.

Next steps

Did you know our airways have evolved to perform a specialised function. Particles in the air have changed over time. The size of particles can affect how far they can go into the airways and lungs and this can impact our health. For example, larger pollen particles get stuck in our noses and can cause hayfever vs smaller pollens and fungal spores that can reach the lower airways and trigger asthma symptoms.

At home

Use paper with holes of various sizes if you do not have a sieve at home and test what's in your cupboards. Teach what you have learned to an adult!

Skills unlocked

Collaborative, curious

Career options

- Medical professionals need to understand the size of particles when helping people with respiratory conditions.
- Toxicologists and exposure scientists investigate potential adverse impacts from these particles on the health of humans, animals, and the environment.

If you enjoyed learning about the impact of particle sizes on our health, one of these careers could be for you!



EFFECT OF PARTICLE SIZE! OBSERVATION TABLE



HPRUDA
in Environmental
Exposures and Health

	Upper airway	Lower airway
Dried pasta 	Prediction: Observation:	Prediction: Observation:
Dried chickpeas 	Prediction: Observation:	Prediction: Observation:
Grain of rice 	Prediction: Observation:	Prediction: Observation:
Sand 	Prediction: Observation:	Prediction: Observation:

COMMUNICATE TO PROTECT

It has been a very wet winter and the risk of damp and mould in houses is high. In this activity, you will create a campaign poster with a slogan, to advise the public on actions they can take to reduce their risk of exposure to mould, and any associated health effects.

🕒 1-2 hours



Kit list

Paper

Pens

Mould information
sheet

Your imagination!

Instructions

This activity involves working in pairs or a small group to create an impactful campaign about the risk of indoor mould.

- 1 Read the information sheet provided on the next page.
- 2 Think about why it's important to tell people about risks at the right time. You wouldn't want to only hear about cycle helmets after you've already fallen off your bike! Think about how communicating with people effectively can help them protect themselves. Ask your teacher or other adults about how health messages have evolved over time.
- 3 Identify WHAT the key message is. In this case, it's the risk and effects of indoor mould.
- 4 Determine WHO your main audience is. How old are they? What sort of house might they live in? Might they be more vulnerable?
- 5 Figure out WHEN to communicate the message. Think about the ideal time or season for this campaign.
- 6 Decide HOW to communicate it. Would it be on TV, in magazines, social media, or maybe something different? What would your campaign look like?
- 7 Look at examples of campaigns, such as 'Stop, Drop, and Roll' for what to do if you're on fire, or 'Hands, Face, Space' to protect

against spreading COVID-19. Do you think they communicate their messages well?

- 8 Now, using the scenario provided, work in small groups to create a campaign and slogan to protect the public from mould.
- 9 Present your campaign to the class and hear what they think!

Next steps

More information on moulds and other biological particles within the air and their effects on health is available via the links below:

le.ac.uk/cehs/hpru/our-research/bioaerosols-and-health ✨

youtube.com/watch?v=EVhfpL5sJII ✨

bioairnet.co.uk/resources-2/ ✨

[government guidance for landlords on damp and mould](#) ✨

At home

Is there any mould in your home? How might you remove or prevent it?

Skills unlocked

Good communicator, collaborative

Career options

This activity shows you what it might be like to work in public health science, risk communication or marketing.

- As a public health scientist, you'd investigate health risks like indoor mould.
- As a risk communicator, you'd effectively relay health information to the public to help them make informed decisions.
- As a marketer, you'd create persuasive campaigns.



COMMUNICATE TO PROTECT WORKSHEET



HPRUDA
in Environmental
Exposures and Health



What is mould?

Moulds are tiny organisms that belong to the fungus kingdom, in the same family as yeasts and mushrooms. These tiny organisms are invisible to the human eye, yet when they congregate, they create noticeable spots or patches. These spots, which frequently appear fuzzy or slimy, might be any colour, including green, black, or white. They may be on cheese, bread, or damp indoor areas.

Recognising mould growth

Moulds have a superpower which allows them to endure harsh environments. However, moist, and dark areas are what they love the most. Moulds might consider your home to be the ideal living space if it's frequently humid or if there's a leak somewhere. Additionally, they require food in order to grow, and they enjoy eating organic items such as wood, paper, and even some forms of glue.

The dangers of mould

Moulds are necessary in nature to decompose dead things, but they don't perform well indoors. To multiply, moulds send out microscopic spores into the atmosphere. These spores can irritate our respiratory system when we breathe them in. Allergic responses, including sneezing, runny nose, red eyes, and skin rash, might be brought on by this irritation.

If we are exposed to some moulds over an extended period of time they may cause major health problems in sensitive people.

Keeping mould out of our homes

Although it may seem frightening, there are many things we can do to keep mould from forming in our houses! Here are a few tips:

- **Keep it dry:** Mould loves moisture, so a clever place to start is to keep your home dry. Inform an adult to fix any leaks you find and use fans or open windows to dry the room after a bath or shower.
- **Let the air flow:** Regularly let fresh air circulate through your house by opening windows and doors. By lowering humidity, your home becomes less appealing to mould.
- **Regular cleaning:** Vacuum and clean your home frequently, paying specific attention to damp areas like the kitchen and bathroom.
- **Keep an eye on the humidity:** If you live in an especially humid region, you might want to use a dehumidifier. These devices can lessen air moisture, which will aid in preventing the growth of mould.

Mould removal

If you see mould, don't worry! Small areas can be cleaned by an adult with a basic bleach and water solution or a mould-cleaning product. Remind the adult to always use gloves and safety glasses when cleaning mould since it might irritate your skin and eyes.

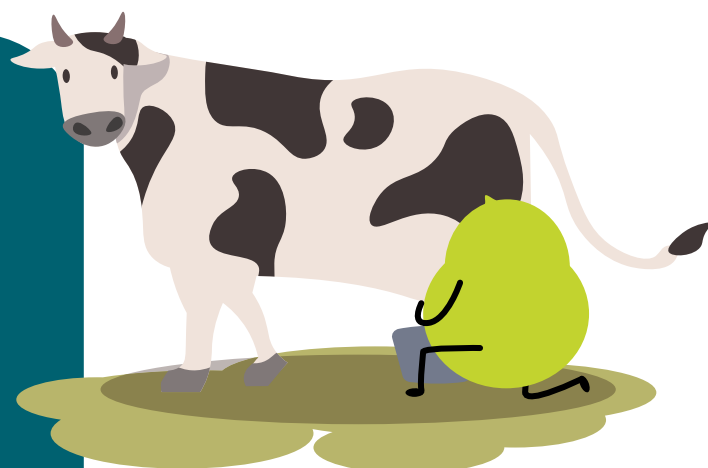
If the mould is widespread or continues returning despite cleaning, it might be time to call in the experts. They can address serious mould issues thanks to their knowledge and equipment, keeping your house mould-free.



DESIGN A FARM OF THE FUTURE!

Farming is often described as the 'world's oldest profession', but what does the future hold for farming? There are over 8 billion people on Earth, up from only 1 billion in the year 1800. In this activity you will explore how farmers can rise to the challenge of feeding everyone whilst also looking after our planet.

🕒 60 minutes



📦 Kit list

An internet connected device

Paper

Craft materials

Any of the following: 2D/3D design software, Minecraft, building bricks, modelling clay or any other design medium you can imagine

📖 Instructions

- 1 Use your internet connected device to research all about future farming innovations.
The [NFU Education website](https://www.nfueducation.com) ✨ is a great place to start. You could look at topics such as drones and robotics, sustainable farming, and precision agriculture.
- 2 Decide what kind of farm you would like to design. Will it grow crops? (arable), grow fruit and vegetables (horticulture), raise animals (livestock), supply milk (dairy) or a combination of those things (mixed)?
- 3 Use your research to decide which innovative inventions and farming practices your farm would have, and then get designing!
- 4 Make sure you label your design so people can understand what is happening on the farm.
- 5 Think about:
 - What makes your farm sustainable?
 - What makes your farm productive? (Remember we need to feed lots of people!)
 - How can you make sure there is a balance between the 2?

Schools can share their designs using the hashtag [#ScienceFarmLIVE](https://twitter.com/ScienceFarmLIVE) ✨.

➤ Next steps

Sign up for our brand new live lessons for British Science Week at [nfueducation.com](https://www.nfueducation.com) ✨.

Request a farmer or agricultural engineer to visit your school by emailing education@nfu.org.uk ✨.

Discover the amazing Engineering Educates: Farmvention Challenge at [engineeringeducates.org](https://www.engineeringeducates.org) ✨ (ideal for a whole school science week!).

🏠 At home

With so much food needed, food waste is a massive challenge. How could you combat this at home? Maybe you could write a new recipe to use up leftover food!

🔒 Skills unlocked

Imaginative, passionate

↔ Career options

Could a career in farming be for you? There are lots more jobs in farming than just being a farmer! Farmers work in partnership with professionals such as:

- vets
- agronomists
- agricultural engineers
- contractors
- accountants
- land agents
- scientists and researchers
- supermarket buyers and many more.

NATURE'S FUTURE

Nature in the UK is in trouble - it's future is in our hands. Can you imagine a better future for nature on your school grounds? Then take action together with others at your school and in your local community to make a change!

🕒 30 minutes



📋 Kit list

Pen and paper to record your thoughts

Device to take a photograph

📖 Instructions

- 1 Look around your school grounds and write down which parts have lots of different plants growing, and which only have grass or nothing growing at all.
- 2 Think about how often people use different areas of your school grounds - what do they use each area for?
- 3 Join with a partner or group and discuss which parts of the school you could add more plants or wildlife to.
- 4 Take a photograph to compare to the same place in future seasons to see how it changes.
- 5 Think creatively: what kind of nature would you like to see there in the future? How could you attract more wildlife?
- 6 Who would you need to persuade to help you make those changes at your school?
- 7 Sketch out your ideas and share them with the rest of your class.

⚠️ Watch out

Follow employers safety guidance on working outdoors.

➡️ Next steps

Is your school part of the National Education Nature Park? Ask your teacher to learn more and join so you can add your ideas to a national map here: educationnaturepark.org.uk 🌱

🏠 At home

What small changes could you make to help nature's future at home? Flower window boxes or bug hotels are a good place to start!

🔓 Skills unlocked

Self-motivated, creative

↔️ Career options

Explore a multitude of career paths inspired by this activity:

- Cultivate a love for plants with horticulture.
- Unravel the mysteries of species with a biodiversity scientist role.
- Channel your creativity as a designer, landscape gardener, or urban planner.
- Advocate for important causes as a campaigner.

The possibilities are endless!



TIME TRAVELLING PROGRAMMERS

In this activity, you will explore the concept of time, its measurement, and how important it is in computing careers. The activity will also let you put your thinking cap on by creating a time-travel-themed coding project!

🕒 45 minutes – 1 hour

Kit list

Pens

Paper

Drawing materials

Computer or tablet

Instructions

- 1 Have a look at the prompts and discuss units of time before brainstorming ideas related to time. Click here for the attached sheet: bsa.sc/time-travelling-idea-prompts ✨.
- 2 Next you will look at how important time is within computing. Use the Scratch user guide to create a simple interactive program that simulates time travel. Click here for the guide: bsa.sc/scratch-instructions-example ✨.
- 3 In a small group, come up with ideas for your time-travelling coding project. Consider the questions:
 - Where would you like to travel in time?
 - What significant events or periods of history would you like to explore?
 - How can you represent the experience of time travel in your program?
- 4 Share your program with the class and provide feedback.

Next steps

If you have done some programming before, you can use Python or any other programming language that you are comfortable with.

At home

Spark a discussion with adults you know on the role time plays in their jobs and daily routines. Understanding how they manage time can offer valuable insights and strategies for our own time-based decision-making.

Skills unlocked

Imaginative, logical

Career options

This activity is an introduction to exciting careers in computing that are directly linked to the concept of time including:

- software developers
- game designers
- data analysts
- system administrators.

LessonUp is a fantastic online toolkit which boosts pupil engagement through meaningful interactive activities. The LessonUp team have created an interactive lesson to accompany this activity. We hope you enjoy it!

For even more activities to support British Science Week, click here: [LessonUp Inspiration](#) ✨.

CAN YOU USE THE SUN TO TELL THE TIME?



Before clocks were invented, people told the time using sundials. Sundials use shadows cast from a central upright portion, called a gnomon. In this activity, you are going to make a gnomon from a selection of materials and observe how the shadow cast by it changes during the day.

⌚ 30 minutes to design and position the sundial, and 10 minutes every hour during the day to place the markers.

Kit list

Sticks, pencils, pens, rulers of varying sizes

Stones, marbles, coins, counters

Plasticine, modelling clay

Chalk

Clock/watch

A sunny day

An open space without other shadows

Camera (optional)

Instructions

- 1 Plan which materials you will use to build the gnomon, and to mark the hours of your sundial. How will you know where to put the hour markers?
- 2 Select a suitable open space for your gnomon. Mark the position of the shadow, measure its length and note the time. Think: when do you need to check on the position of the shadow again?
- 3 At regular intervals, return to your sundial and mark the new positions of the shadow and its length. Can you work out where the hour markers will go?
- 4 You could take photographs.
- 5 Discuss the following questions:
 - How is the position of the shadow changing throughout the day?
 - How is the length of the shadow changing during the day?
 - Could you use your sundial to tell the time?
 - What are the good things, bad things, and interesting consequences of telling the time with a sundial?

» Next steps

Go to explorify.uk to create a free account and watch the video in this 'Light and time' activity which explains how sundials work: explorify.uk/en/activities/whats-going-on/light-and-time.

Another activity 'What if there were two suns?' gets you thinking about the effects of a planet having more than one sun: explorify.uk/en/activities/what-if/there-were-two-suns.

At home

Investigate which parts of your home get sun at which times of the day. Are there some parts that don't get any sun? Remember, never look directly at the Sun!

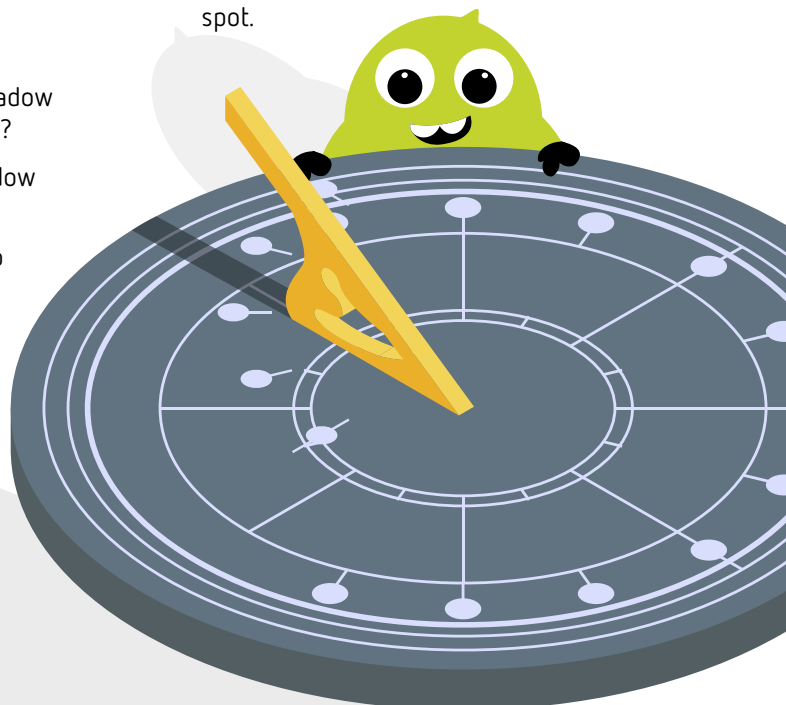
Skills unlocked

Observant, patient

Career options

Understanding the position and movement of shadows is important for:

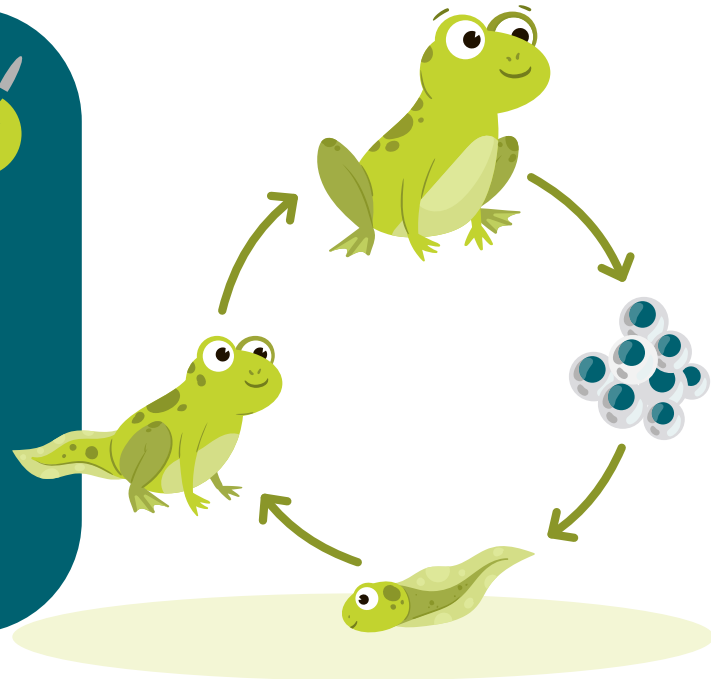
- photographers and camera operators to create good images
- architects to use this knowledge when positioning buildings and choosing places for windows
- gardeners to know where different plants will grow best – in the shade or in a sunny spot.



METAMORPHOSIS MAYHEM

Explore the life cycle and metamorphosis of a pond frog through this fun interactive game! The aim is to go through all the life stages of a frog before becoming frogspawn again. The game ends when the first player has completed a life cycle or players can sit out when they become frogspawn and wait for others to finish.

🕒 15 minutes



Kit list

A large space
(preferably outdoors)

Instructions

- 1 Think about the life cycle of a frog, do you know the different stages? Check out the diagram on the next page.
- 2 All players start as frogspawn and play a game of 'rock paper scissors' with another player. The winner grows into the next stage i.e. frogspawn becomes tadpole. You can only play 'rock paper scissors' with someone who is at the same stage as you.
- 3 Each stage of a frog's metamorphosis has a corresponding action. To be frogspawn you should be low to the ground with hands over your head, to be a tadpole you need to wiggle your body, to be a froglet you need to walk around moving your arms as if swimming and to be a frog you need to jump on all fours and make a 'ribbit' sound.

Next steps

Can you come up with a similar version of this game for another animal that undergoes metamorphosis, for example, a dragonfly or a butterfly?

At home

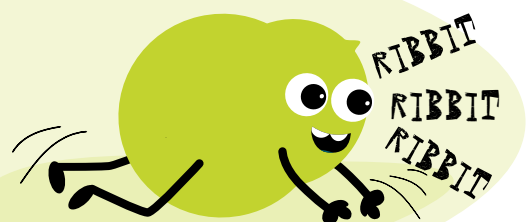
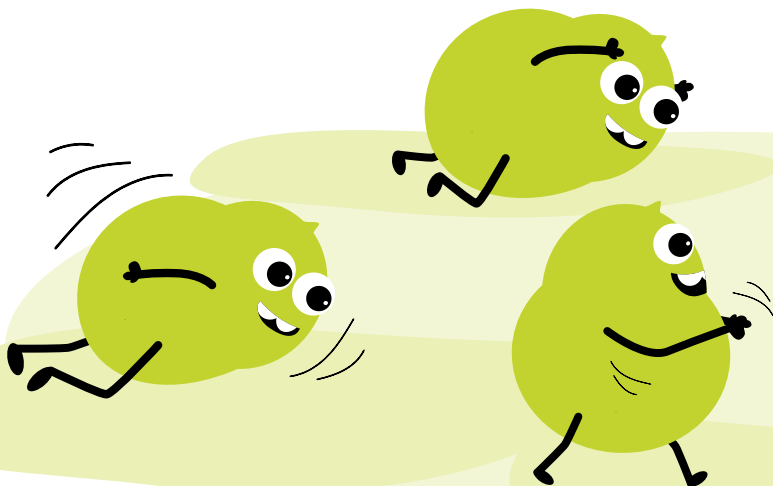
Think about how humans develop and all the things you must learn. What is the same and what is different to the frog? Find more classroom resources from WWF here: www.wwf.org.uk/get-involved/schools/resources ✨

Skills unlocked

Logical

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!





METAMORPHOSIS MAYHEM A FROG'S LIFECYCLE

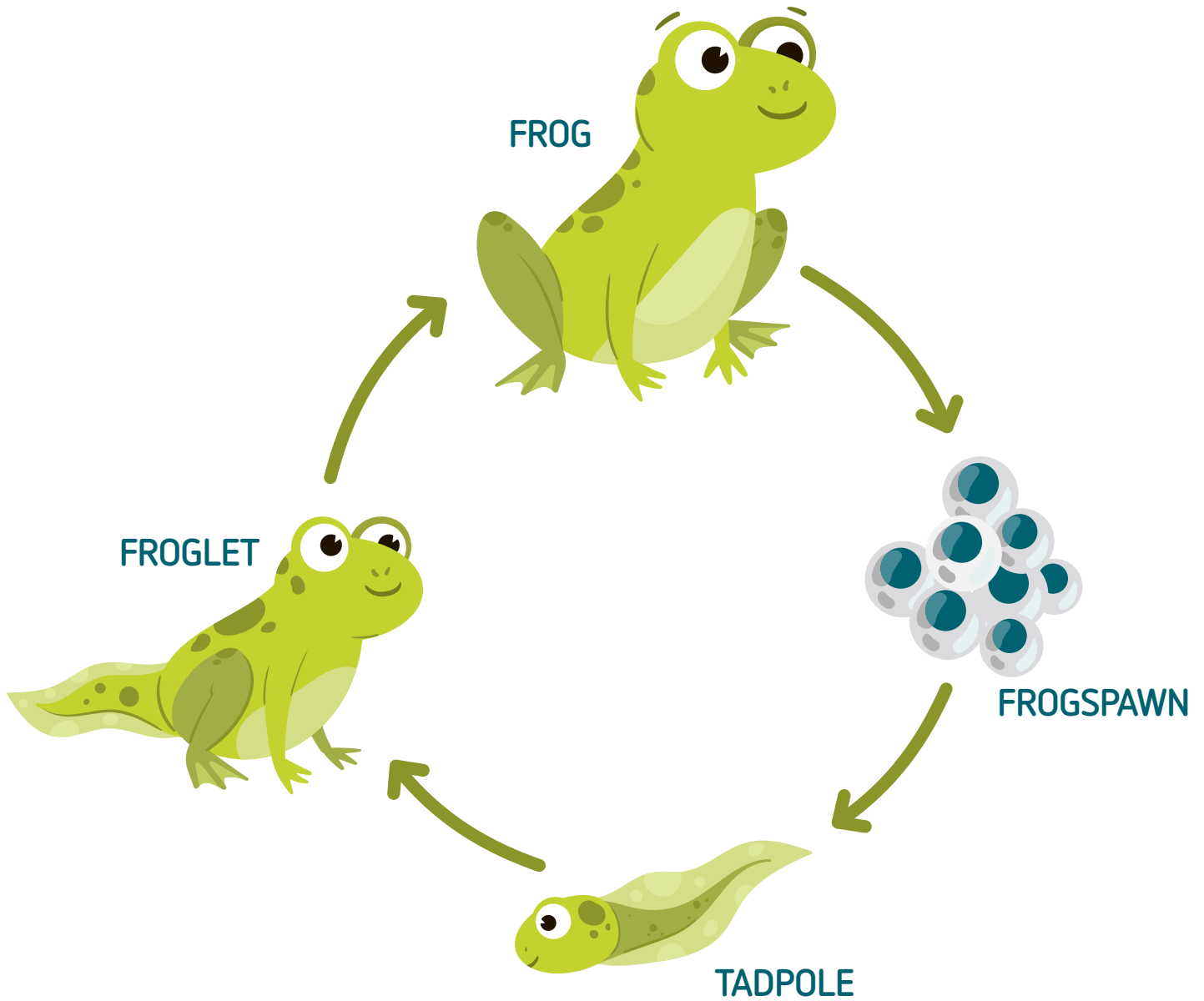


FROG

FROGLET

FROGSPAWN

TADPOLE



MAKING BIODEGRADABLE PLASTIC

Did you know that every plastic bag that you have ever seen still exists? This is because plastic takes many years to decompose; this causes pollution in the sea and on land. In this activity, you will find out how you can make environmentally friendly plastic from simple household ingredients. This activity can be safely carried out using the equipment from cookery lessons.

 30 minutes

Kit list

3 grams of cornflour

2 ml of white vinegar

2 ml of glycerine

30 ml of water

Plastic or glass
beaker

Spoon

Saucer

Instructions

- 1 Thoroughly mix the cornflour, vinegar, glycerine, and water together in a beaker until there are no lumps.
- 2 An adult should transfer the mixture into a small saucepan. Watch the liquid being heated and stirred all the time, looking for bubbles and the change from an opaque to a translucent liquid. It should also become much more viscous (thick, rather than runny).
- 3 Watch as the adult carefully pours the mixture into a saucer and spreads it out using the spoon.
- 4 Leave the plastic in a warm place to harden. This may take a couple of days.

Watch out

Adults will need to take responsibility for all the stages from heating to pouring and spreading the mixture. The liquid will remain hot for some time after removing it from the heat source and could burn if it comes into contact with skin. Children must not stand near the saucepan while the adult is heating the mixture.

Next steps

CIEC's Potatoes to Plastics includes instructions for making plastic from potato peel and a card game that showcases science solutions for a range of environmental problems.

york.ac.uk/ciec/resources/primary/potatoes-to-plastics ✨

At home

How many 'single use plastics' do you have at home? What could you use to replace 'single use plastics' in your home?

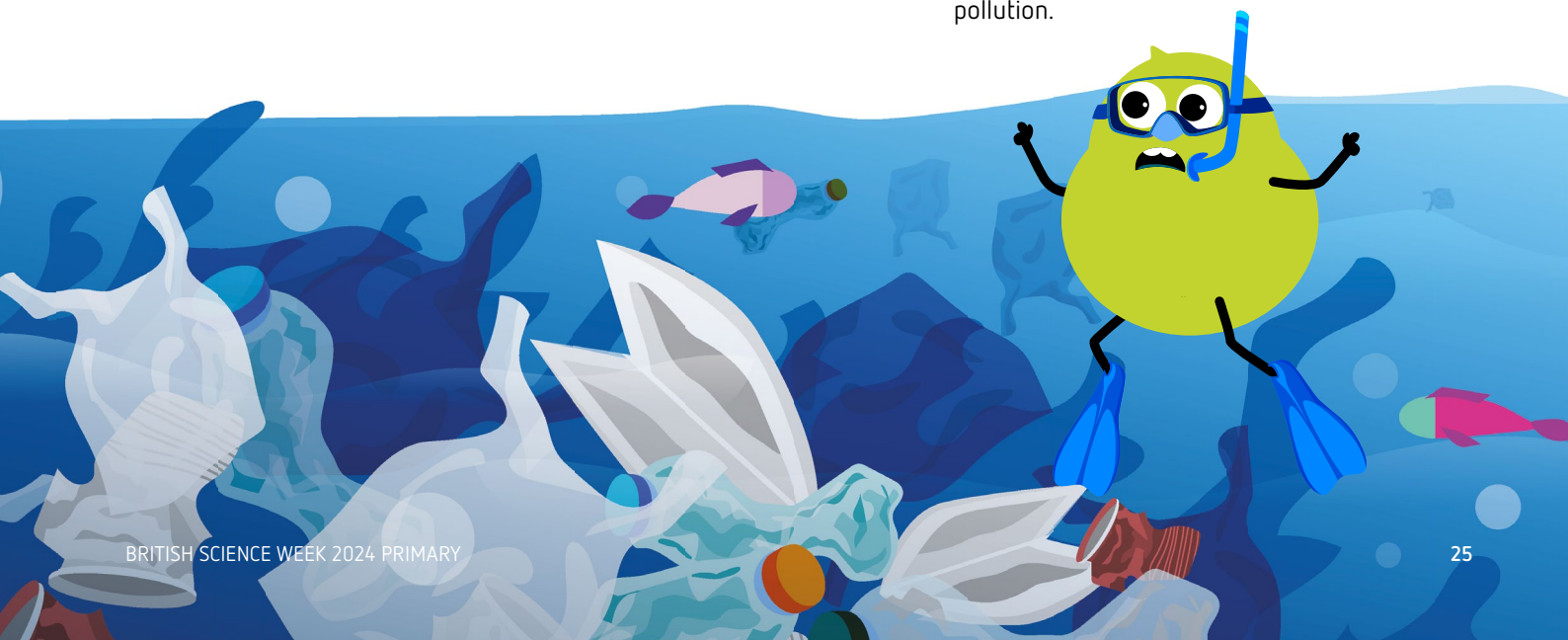
Skills unlocked

Imaginative

Career options

This activity is an insight into working as a scientist investigating more sustainable ways of living.

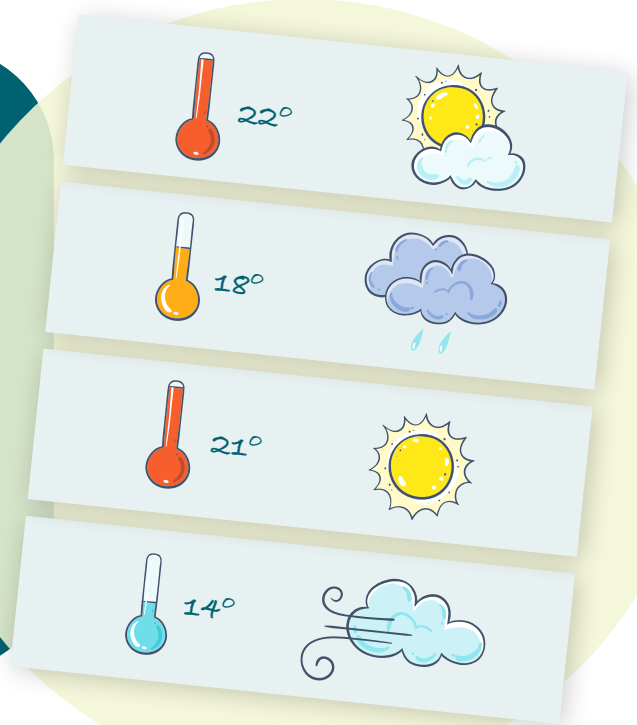
Discovering how to make bioplastic is just one way that scientists have invented to overcome environmental problems such as plastic pollution.



ICE CORE DETECTIVES

Polar scientists investigate ice cores to discover what happened in the past. They drill down into the ice to remove cores that can be metres to kilometres deep. Particles and bubbles trapped in these cores help researchers understand what the climate was like and what was happening at the time.

🕒 5 minutes a day over a week or more



Kit list

Strips of paper or cardboard

Pencil

Thermometer

Instructions

- 1 On your first paper strip, write down today's temperature at the bottom. Then, draw a picture of the weather! Is it sunny? Rainy? Cloudy?
- 2 Every day, take a new strip and do the same thing. Write the temperature and draw the weather.
- 3 Put your new strip just above yesterday's so you can see both. Keep adding every day!
- 4 After a week, you'll see a layer of weather pictures. What do you think it will look like after a month or even a year?
- 5 Talk with your friends about the weather patterns you see. Are there more sunny days or rainy days?

Think and talk about

What is a layer? Can you think of anything which is in layers? For example, a sandwich, tiers in a cake, a brick wall, leaves falling from the ground on top of soil, volcanic lava building up.

How might studying layers help us understand the past?

Next steps

The next time you are out and about, look for layers. What secrets might they hold for future researchers? You can also research the difference between climate and weather. If you would like to learn more about Antarctica, you can also research ice cores and the UK Antarctic Heritage Trust.

At home

Talk to people older than you and ask them the following questions: What was it like when they were your age? What has changed and what has stayed the same? Have a go at making your own time capsule!

Skills unlocked

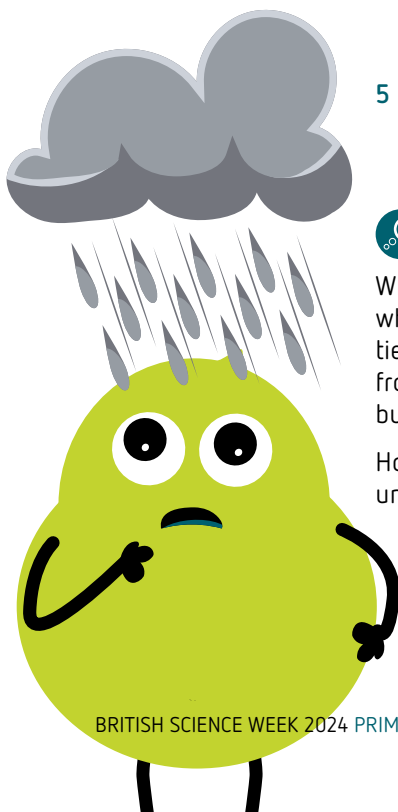
Patient, observant

Career options

Jobs in Antarctica vary a lot. You can be:

- a scientist who studies ice and wildlife
- an electrician, chef or carpenter on an Antarctic base.

In the past, some people spent over 2 years working in Antarctica with limited communication with home! Sea ice prevented them from leaving, but they collected early important data which helps us to understand climate change today.



WATER CLOCK

In this activity you will make a simple water clock. Water clocks are one of the oldest timekeeping devices and use the flow of water into, or out of, a vessel to measure the amount of time that has passed.

🕒 30 minutes



🧰 Kit list

2 litre clear plastic bottle

Children's scissors

Water

Food colouring (optional)

Marker pen

Stop watch/ watch/ phone

Large glass

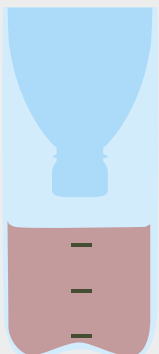
Compass/ drawing pin

📖 Instructions

- 1 With the help of an adult, cut the plastic bottle in 2 about a third of the way down.
- 2 Remove the bottle top and ask an adult to poke a hole through it with a compass or drawing pin. Screw the lid back down.
- 3 Flip the top piece of the bottle upside down and place it into the bottom half.
- 4 Fill your glass with water and add some drops of food colouring.
- 5 Pour the water into the top of the bottle and then start timing.
- 6 Each time a minute passes, draw a line on the side of the bottom half of the bottle at the water line.
- 7 Once all the water has passed through, pour it back into the top of the bottle and observe the water flow indicating minutes passed!

⚠️ Watch out

Clear up any spillage straight away.



🧠 Think and talk about

- What is a force?
- What is gravity?
- Could you use a water clock in space?
- Can you think of any other ways to tell time without a clock?

➡ Next steps

You can discover more about how forces and gravity works on earth and in space by exploring our online resources rmg.co.uk/schools-communities/schools-resources 🌟

🏠 At home

Could you leave a water clock outside in the winter? What would happen if you left the clock to stand in direct sunlight in summer?

🔒 Skills unlocked

Patient, observant

↔ Career options

The skills learnt in this activity include problem solving and understanding the world around us. This can help develop what you need for lots of different careers, including:

- scientist
- teacher
- historian
- astronomer
- astronaut.

THE BIG PLASTIC COUNT: IT'S TIME FOR CHANGE

The Big Plastic Count (11-17 March) is the UK's biggest household plastic waste investigation. Join thousands of schools and households across the UK by counting how much plastic waste you throw away for a week, gathering vital evidence to present the true scale of the problem to the government.

🕒 5-10 minutes per day over 1 week



Kit list

Tally sheet

Pencil or pen

Phone, computer or other device with access to the internet

Instructions

- 1 Sign up your class to take part in The Big Plastic Count at: act.gp/41bt00A ✨
- 2 Once signed up visit thebigplasticcount.com/schools ✨. Download the 'Let's Count Tally Sheet' and 'Letter to Home' from the dashboard and print these out.
- 3 Hang up the tally sheet somewhere noticeable, like on the fridge or next to the bin – somewhere it's easy to remember.
- 4 Ask everyone at home to count and record their plastic packaging items on the tally sheet.
- 5 Count on-the-go and at home: wherever you are – the park, a friend's house or at home – you need to record every piece of plastic that you throw away. Either keep it with you in a bag, or make a note of it while you're out on the go.
- 6 Submit your findings via your unique class magic link (found on the dashboard on the website).
- 7 Discover your class' plastic footprint!



Think and talk about

Think about the plastic packaging that you encounter each day. Try and come up with some plastic-free alternatives that these could be replaced with, both at home and at school.

How much of our plastic waste is actually recycled, and what do you think happens to the rest of it?

Next steps

- Write a letter to your MP, persuading them to take urgent action on the plastic crisis.
- Speak to students and teachers about reducing plastic waste in school. Commit to goals that you can work towards together!

At home

Talk to your family about the plastic crisis; what you've been doing to tackle it, and persuade them to get involved too. As a family, can you commit to goals that you can work towards together?

Skills unlocked

Passionate, good communicator

Career options

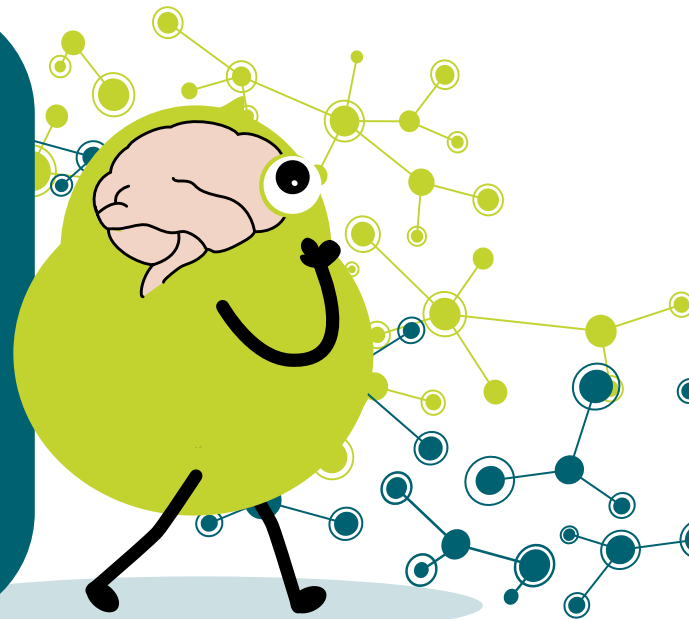
If you feel passionate about the plastic crisis, these careers might be perfect for you:

- Environmental campaigners put pressure on organisations and the government to make the best decisions for the environment.
- Environmental consultants advise their clients on environmental issues to reduce environmental damage.

OUR AMAZING BRAINS: HOW WE LEARN

Neurons are cells in the brain which send signals within the brain and throughout our bodies. The signals tell us what to do, like to drink when we're thirsty. Groups of neurons make connections with each other when we learn something. Over time, our brains change based on our experiences and the number of connections grows. The connections are collectively named the 'connectome'. Let's draw one!

🕒 30 minutes



📋 Kit list

Brain outline

Piece of paper

Coloured pens,
pencils, crayons etc

📖 Instructions

- 1 Trace the outline of the brain onto a piece of paper. Around the perimeter of the brain, draw dots using your coloured pens/pencils making them as evenly spaced as you can.
- 2 Compare your dots to your friends' dots. Did you use just one colour or a rainbow of colours? Who has drawn the most dots?
- 3 Consider the different ways you could connect the dots. Explore connecting dots of the same colour or linking one dot to several others. Could you create connections from the bottom to the top?
- 4 Make up a rule (you can use inspiration from step 3) and use one colour to connect those dots. Remember, the connections are in the brain so the lines must stay within the outline!
- 5 Make up 3 more rules and use a different colour to connect those dots each time.

🧠 Think and talk about

Think about how your brain looked after you drew the lines from the first rule. Were there more or fewer lines than after the final rule? What do you think happens in your own brain as you learn new things?

➡ Next steps

Dreamachine is an artwork exploring the power of our minds and how we all experience the world differently. Just like each of your classmate's connectome pictures, everyone's brain is different! Discover more free activities like this one through Dreamachine's major learning programme and resources: dreamachine.world/for-schools ✨.

🏠 At home

Ask family or friends to draw the brain connectome using your rules. Does their brain look different to yours? Why do you think this is?

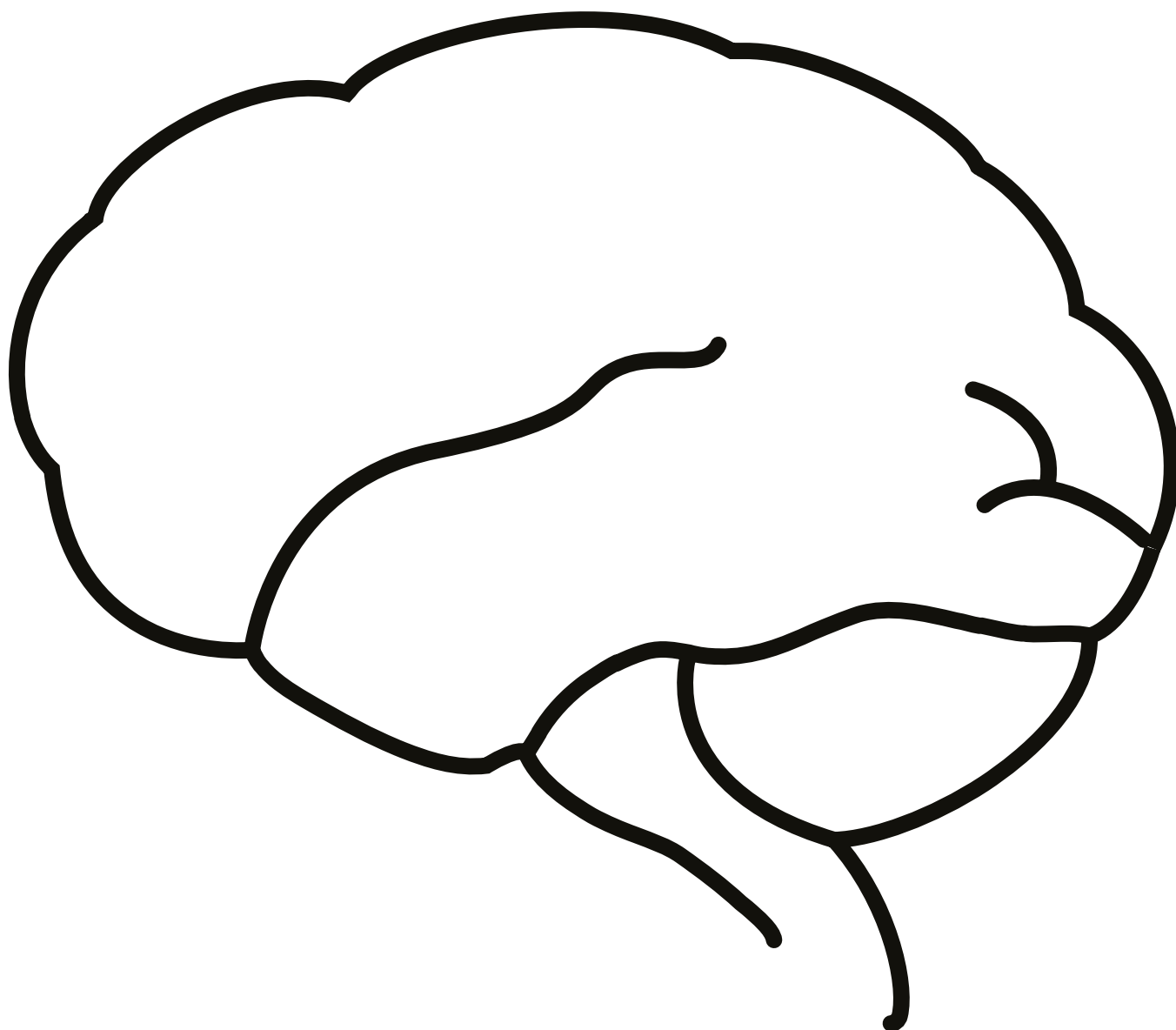
↔ Career options

- Neuroscientists study the brain as well as the spinal cord and nervous system, which all work together to help our body understand the world and make decisions.
- Philosophers, psychologists and artists working on the Dreamachine project are finding out how different people's brains affect their lives.

🧠 Skills unlocked

Logical, imaginative

>> OUR AMAZING BRAINS: HOW WE LEARN
BRAIN OUTLINE



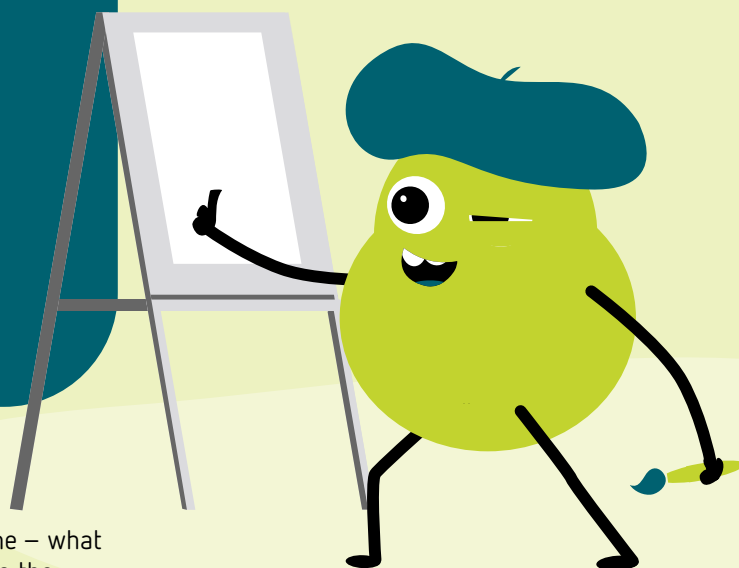


POSTER COMPETITION

Children can get creative and enter the British Science Week annual, UK-wide poster competition! To enter, they simply need to create a poster which fits in with the theme of 'Time'.

Schools then select the 5 best creations and submit them for a chance of winning an array of prizes. You can use the activities in this pack for inspiration!

🕒 2+ hours



Kit list

Paper (A4 or A3)

Creative materials
such as:

pens
pencils
scissors
glue
watercolours
paint
crayons
pipe cleaners
felt
thread
wool
foil
clay
string
beads
stamps
foam
pompoms

Instructions

Encourage children to think about time – what it means to them and how it relates to the science they've learnt about – to come up with ideas to include in their poster. Here are some points and questions to get you going:

- Get children to think about their own time – how do they spend it? At home, out playing in the park, arts and crafts, learning at school?
- What about time in the world, and beyond? How do we measure time – seconds, days, seasons, centuries? What about time in space?
- Are there any scientists they know of whose work relates to time? What about time travel in films, TV and music?

Make your poster

Once they've done their thinking, it's time for children 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. Children can use pop-up pictures, pull out tabs or materials such as pencils, paints, crayons and paper to create their posters.

Send us your poster

Posters will be judged on creativity, how well they fit the theme, how well they have been made or drawn, and how engaging they are. Once a child'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 ✨



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