



BRITISH
SCIENCE
WEEK

8-17 March 2024



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SNEAK PEEK SECONDARY ACTIVITY PACK

Activities for students aged 11-14 (approx.)

britishscienceweek.org



BRITISH SCIENCE WEEK



8-17 March 2024

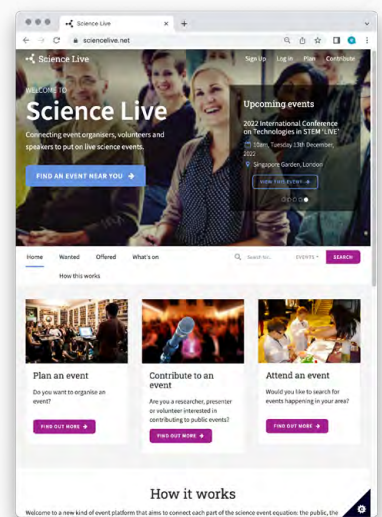
This teaser pack includes an exciting mix of activities and ideas to help teachers, parents, carers, or childminders prepare for British Science Week.

It is designed to give you a taste of our full Secondary activity pack, which will be released in January 2024. Feel free to adapt or extend any of the activities to suit your students' needs or the curriculum you are delivering.

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 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 to find science activities in your local area.



BRITISH SCIENCE WEEK



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We offer Kick Start Grants to eligible, state-funded schools, to support their British Science Week events and activities. To find out more click here: bsa.sc/BSW24-Kick-Start-Grants-taster-pack 



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 students in a fun, imaginative way to get them excited about the Week:

- 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 too, simply look out for the activities



marked with the paintbrush symbol shown to the left!

You can find more information about how to enter on [page 12](#) and at britishscienceweek.org/plan-your-activities/poster-competition.

- Get students 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?

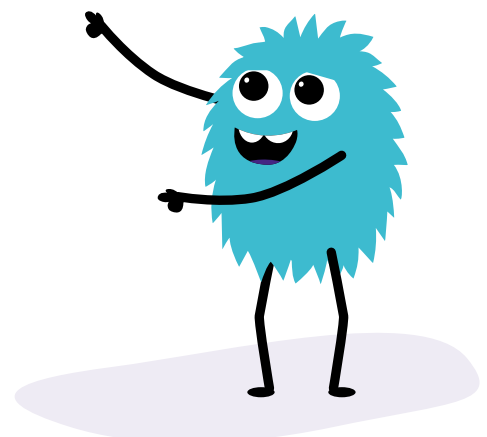
What about things that go very fast (the fastest animals, ways of travelling) or very slow (plants growing, building cities and large structures)?

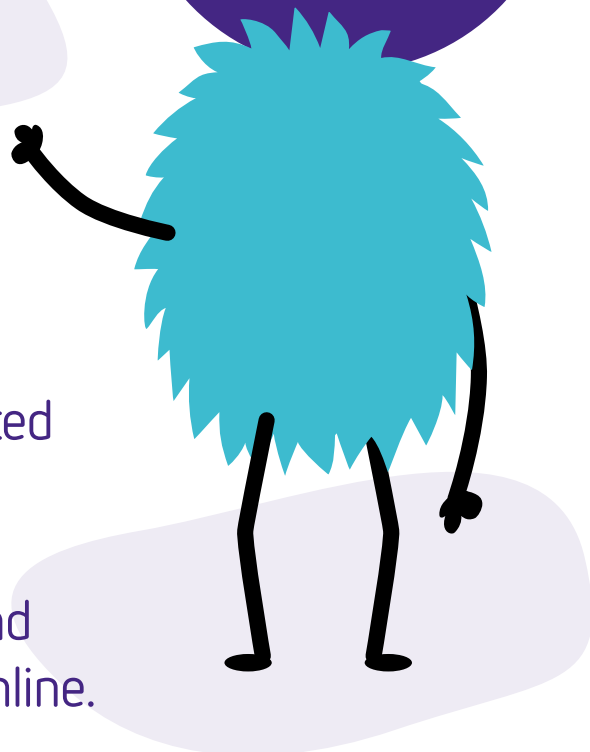
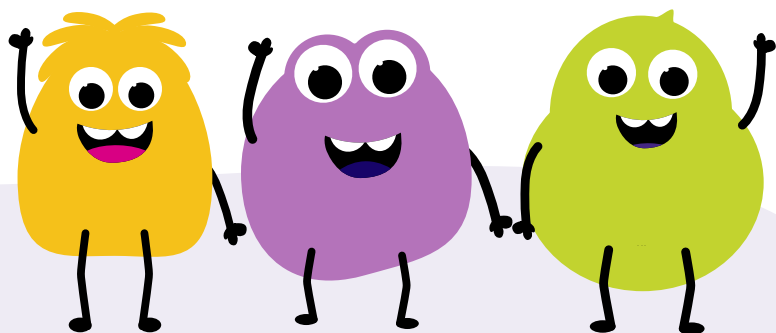
Invite a special guest or someone from the school community to share with students their own experience of time. Are there any watchmakers local to you, or clock towers to visit? Maybe a photographer could talk about capturing 'moments in time'?

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 students 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 students involved and excited about a volunteer speaker and their topic, but don't forget that there are also opportunities to get volunteers and presenters to engage with students 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, to get students anticipating who the next guest will be and what they do. These sorts of experiences can inspire students to think about their future, they're never too young to explore their career options!
- Where available, involve volunteers/Ambassadors who challenge stereotypes the students might have absorbed and promote 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 volunteers/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 students 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 students 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 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 students questions or activities they can do at home.

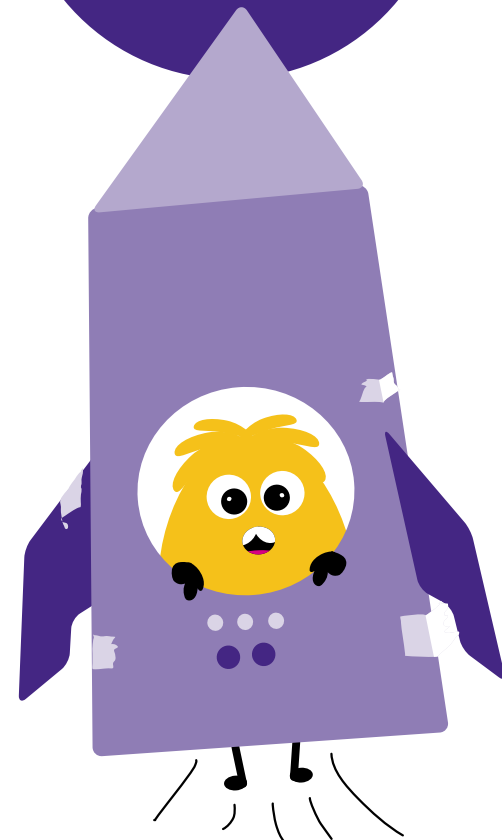
- **Encourage exploring outdoors**, in the community or in local cultural spots. This could be anything from going on a nature walk around local parks to spotting STEM in real life, street lighting engineers or infrastructure like bridges and construction work. Many secondary CREST activities focus on these areas of STEM: secondarylibrary.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 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 Home learning collection: bsa.sc/collections/library-crestawards-low-resource ✨.



GATHERING RESOURCES FOR THE CLASSROOM OR HOME

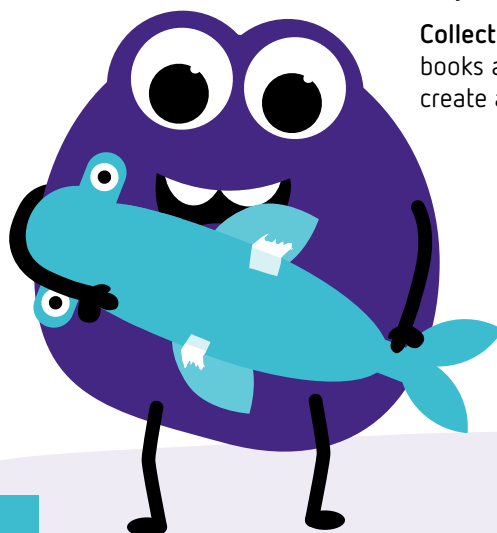
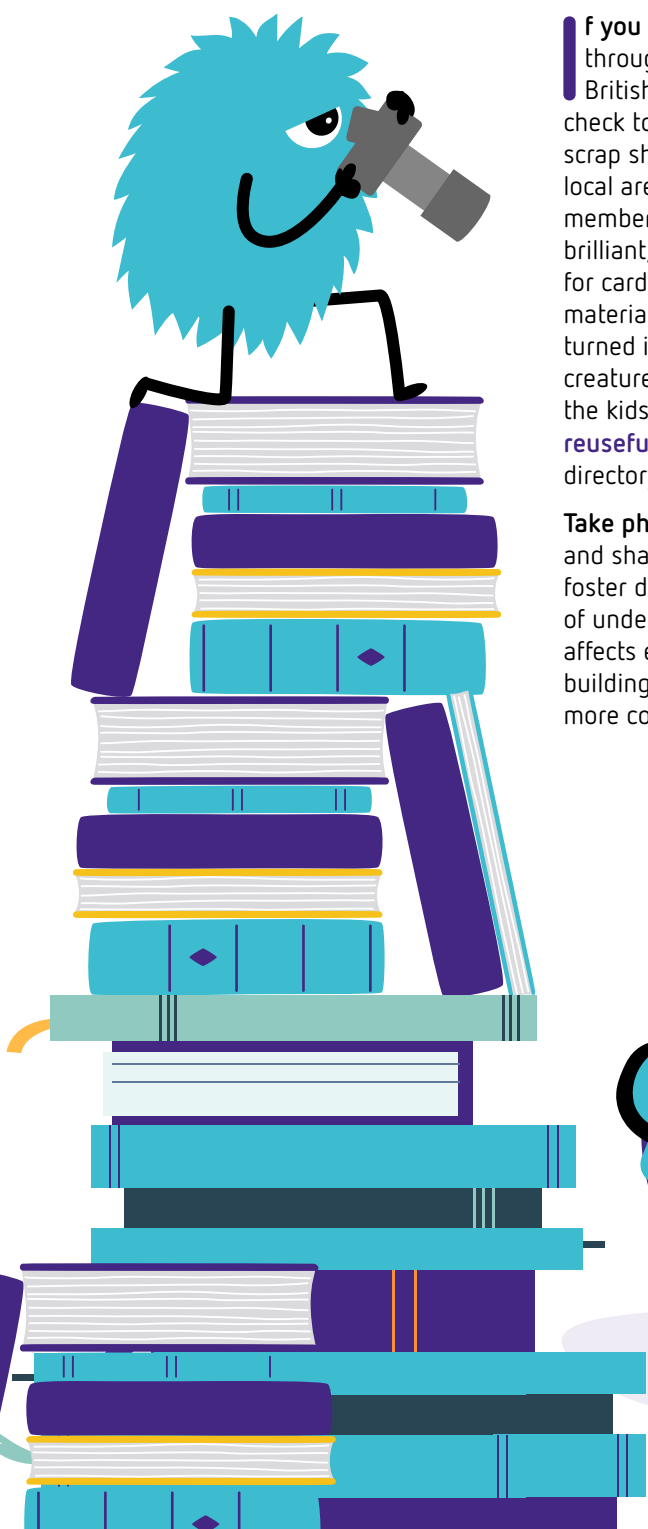


If you can, try to collect materials throughout the year for use during British Science Week. Alternatively, check to see whether there is a scrap shop/store/club open in your local area. These places are often membership-based and can be a brilliant, inexpensive or free resource for card, fabric, and 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 students 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 students 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.



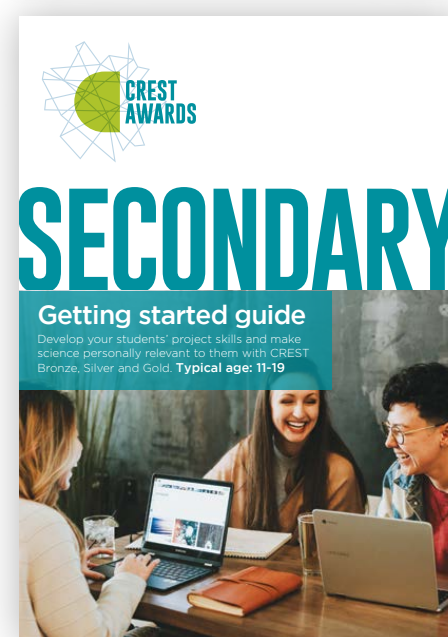
BEYOND THE WEEK

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 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

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

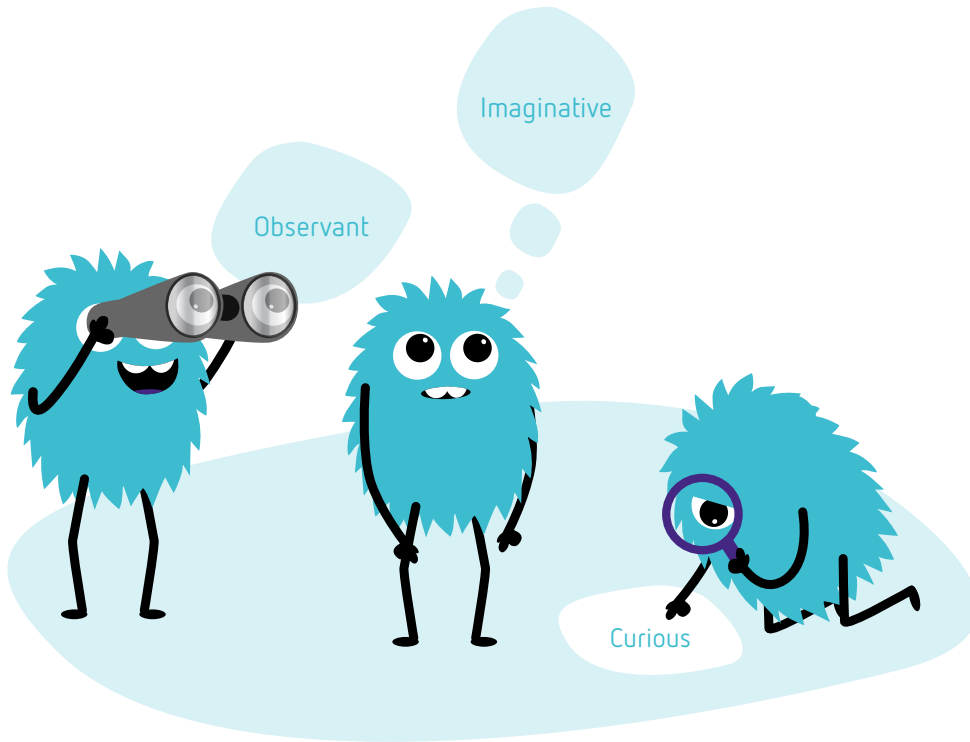
You could, for example, use the **STEM Person of the Week** ✨ activity from NUSTEM at Northumbria University or introduce a scientist from the **Smashing Stereotypes** ✨ campaign. Ask students to identify what

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



MAKE A ROLLERCOASTER FASTER

This activity is designed to get you exploring the relationship between angles, speed and time.

You will build your own prototype rollercoaster and experiment with how you can control the time it takes for the cart to reach the end of the ride, by adjusting the tracks.

 2+ hours



Kit list

Flexible plastic or tubing cut in half lengthways to make tracks

Adjustable clamp to hold the tubing

Toy car/ball bearing/marble that fits on the tracks – as the rollercoaster cart

Measuring tape

Timer

Instructions

- 1 Build your first rollercoaster by attaching the end of a length of tubing to the clamp and making sure the other end touches the floor or a tabletop. Try sketching ideas and thinking of ways to do this first. Find examples of how others have done this using the Internet.
- 2 Use a measuring tape to measure the height of the clamp and record it in a table that has a column for clamp height and a column for time.
- 3 Place your rollercoaster cart at the top of the track and time how long it takes to reach the bottom. It might be helpful to work in pairs – one timer, one rollercoaster operator.
- 4 Add this time to your table.
- 5 Adjust the clamp so that the top of the tube is higher or lower than it was for your first rollercoaster, then roll the cart again and record its time.
- 6 Try the rollercoaster from lots of different heights and record the times. What do you notice about the relationship between the 2 numbers?

Watch out

Make sure to collect any toy cars or ball bearings, as people could trip on them.

Next steps

This activity can be put towards a CREST Bronze Award. For more information, follow this link: crestawards.org/crest-bronze ✨

At home

How do you work out the time it takes for an object to get from one spot to another? Can you use the distance, speed, time equation?

Skills unlocked

Collaborative, hard-working

Career options

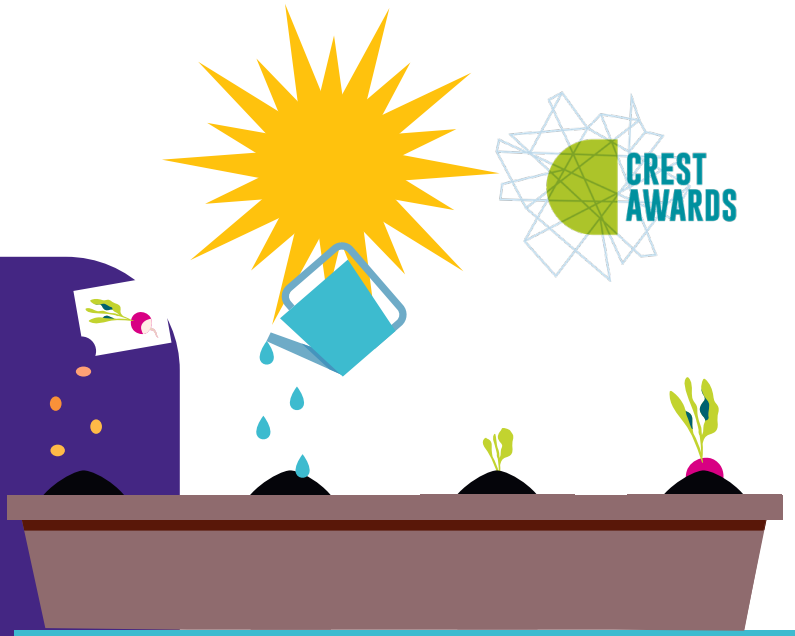
- Structural engineers design and build rollercoasters.
- Engineers build all sorts of impressive structures such as bridges and skyscrapers.



PLANT GROWTH AND NUTRIENTS

Lots of factors influence the time it takes for plants to grow, including the nutrients in the soil. In this activity you will monitor seedlings which are growing in different compost, over 3 or 4 weeks.

🕒 2+ hours



📋 Kit list

Seeds (radish or lettuce because they grow quickly)

Seed trays

Soil

Compost

Propagator lid or makeshift propagator (optional)

📖 Instructions

- 1 Prepare your seed trays with different combinations of compost and soil. Record the proportions in each one.
- 2 Plant your seeds in the seed trays, following packet instructions. Water them and place them in a well-lit location.
- 3 You can help the seedlings to grow by using a propagator lid to maintain humidity. Alternatively, you could use makeshift propagators such as a simple polythene bag inflated around the seed tray, or a plastic bottle cut in half to provide a close-fitting lid.
- 4 Ensure that the soil/compost in the trays remains moist – trays without covers will need regular watering.
- 5 Remember that you want your tests to be fair so make sure all your seeds are in the same conditions of light, temperature, moisture and so on.
- 6 Keep a daily record of the number of seeds that have germinated, plant growth, and observations about plant health such as colour, height and so on. Decide what measurements to use as indicators of plant growth, such as plant height or number and the sizes of leaves.
- 7 You will need to make your measurements daily for about 3 to 4 weeks.

- 8 Choose at least 2 of your indicators of plant growth to plot as graphs to show how the different combinations of compost and soil affect plant growth. Interpret your results with the following questions in mind:

- Did the results align with what you expected?
- Was there a pattern to your results?
- Were your results consistent enough for you to be able to make a conclusion?
- Which of the different ways of measuring plant growth do you think was the most suitable? Why?

⚠️ Watch out

- Always complete a risk assessment before you start your experiment. Use the Student Safety Sheets available online (science.cleapss.org.uk/Resources/Student-Safety-Sheets) to help you to assess the risks (i.e., think about what could go wrong and how serious it might be).
- Make sure you pick soil samples that are not contaminated, such as those containing dog muck or broken glass.
- Always wash your hands thoroughly after handling soil.

🔒 Skills unlocked

Patient, self-motivated

➤➤ Next steps

This activity can be put towards a CREST Bronze Award. For more information, follow this link: www.crestawards.org/crest-bronze



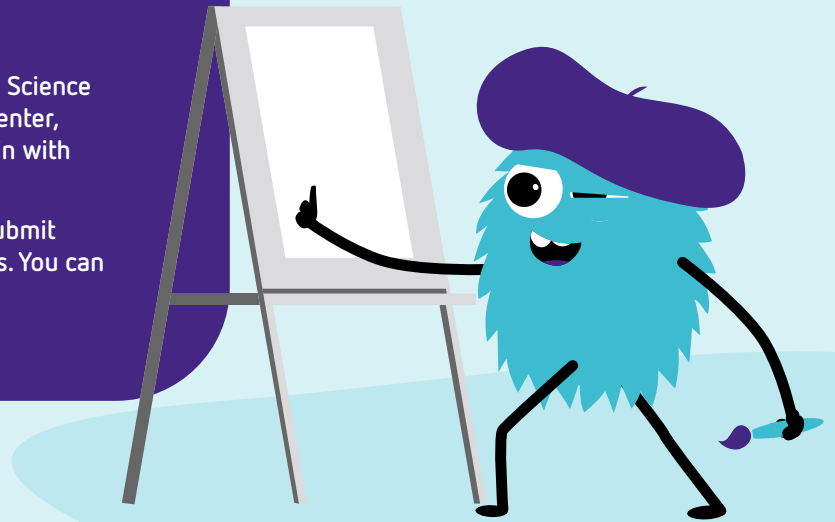


POSTER COMPETITION

Students 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 students to think about time – what it means to them and how it relates to 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 students 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 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.

📄 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 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 ✨



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