



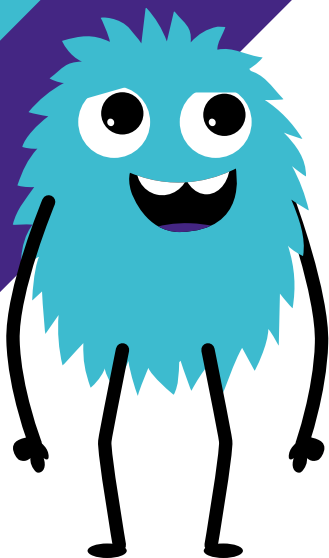
GROWTH

SNEAK PEEK SECONDARY ACTIVITY PACK

11-20 March 2022

britishscienceweek.org

A range of activities to be run
with pupils up to the age of 14



Delivered by



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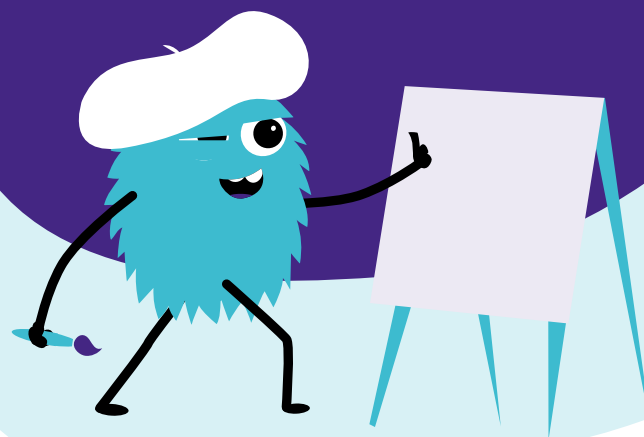
This teaser pack includes an exciting mix of activities and ideas to help teachers, parents or guardians prepare for British Science Week. It is designed to give you a taste of our full Secondary activity pack, which will be released in January 2022. Feel free to adapt or extend any of the activities 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.

This year, 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.

Enter our poster competition

Why not ask students to design a poster based on any of the activities in this pack and enter it into our poster competition? Simply look out for the activities marked with the paintbrush symbol shown opposite! The theme for this year's poster competition is 'Growth', and you can find more information on how to enter on [page 12](#) and at britishscienceweek.org/plan-your-activities/poster-competition 🖌️.

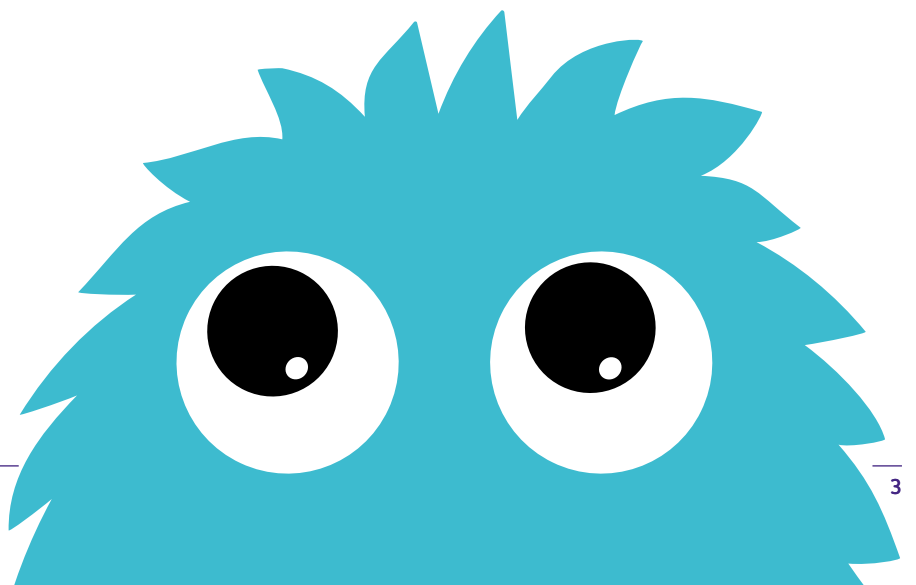




BRITISH
SCIENCE
WEEK
2022

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INTRODUCING THE THEME

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

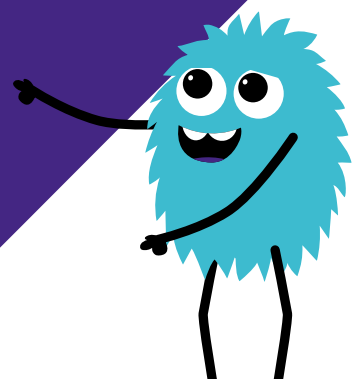
- **Share your brilliant activities, vlogs or images on social media!**
Join the conversation or see what's happening during the Week by tagging the British Science Association (@ScienceWeekUK ✨) and using the hashtag #BSW22.
- **Try a game,** give an audio-visual presentation, explore a mystery or special object, or create a pop-up display which communicates the theme of 'Growth'. These are great options to use as fun warm-up activities, and are a fantastic way to start British Science Week.

- **Encourage students to come up with an acrostic poem** for GROWTH by asking them what comes to mind when they hear it. You can even turn their acrostic poem into a jingle which you can sing with them throughout the Week to help them remember their ideas.
- **Engage students** by discussing how growth is part of people, plants, animals, materials, countries and other things in their everyday lives. What are good examples of growth?
- **Invite a special guest** or someone from the school community to share with students their own experience of growth (for example, how they started their career and gained their expertise), showing how great things can start from small beginnings. See [page 5 ✨](#) for information on how to get volunteers.

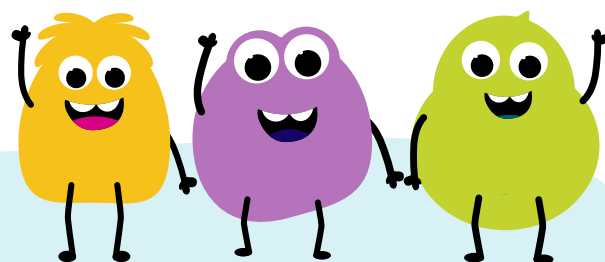
Here are some other ideas to include at the beginning of British Science Week.

- **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 demo it at your setting first.
- **Growth is all around us.** What are examples of good and bad growth? Is there any way you can encourage conversations about this with students?
- **Launch the poster competition** and let parents know about this. See [page 12 ✨](#) of this pack for more details.

GROWTH



MAKING THE MOST OF VOLUNTEERS



While face-to-face engagement with external visitors is now possible, 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 at 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 if they work in STEM-related jobs to describe what they do in more detail.

You could also try some of the following things.

➤ **Kick off British Science Week with a career talk** or demo from an inspiring volunteer to engage the students. The volunteer could highlight how they grew to be an expert in their field, or what significant contributions they have made to bring about that growth.

➤ **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 the students might have absorbed, and promote positive attitudes towards science, like female engineers. Let the volunteers/ambassadors share how their job is making

a difference in the world, or an anecdote about science activities 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, some of which may be transferable when using remote engagement.

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) and chat group and text messaging services if you have them. Let all the parents 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 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 parents, which may then lead onto further conversations. (See page 11 🦋 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 of our CREST activities (collectionslibrary.crestawards.org/#11-18 🦋) are quick and easy to do as fun outdoor challenges too.
 - **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. We have a range of science-based home activities requiring few resources in the CREST at home collection (collectionslibrary.crestawards.org/#11-18 🦋).
- In addition to this pack,** there are lots of other useful ideas for take-home activities from series such as this one from *The Royal Institution*: rigb.org/families/experimental 🦋.



GATHERING RESOURCES FOR THE CLASSROOM OR HOME

- **If you can, try to collect materials all year round** that can be cleaned 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.

These things can be turned into rockets, cars, spaceships – you name it, the students 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 growth of plants,

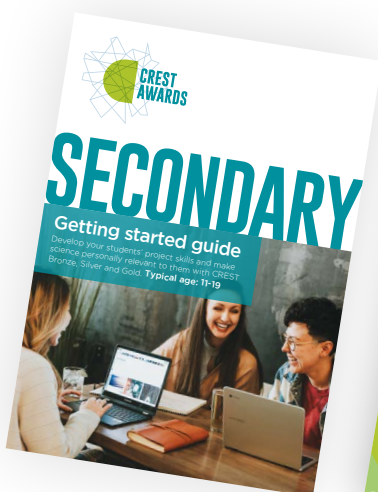
building structures and so on. The more colourful, the better!

- **Collect fiction books and reference books** around the theme of Growth to create a themed library.

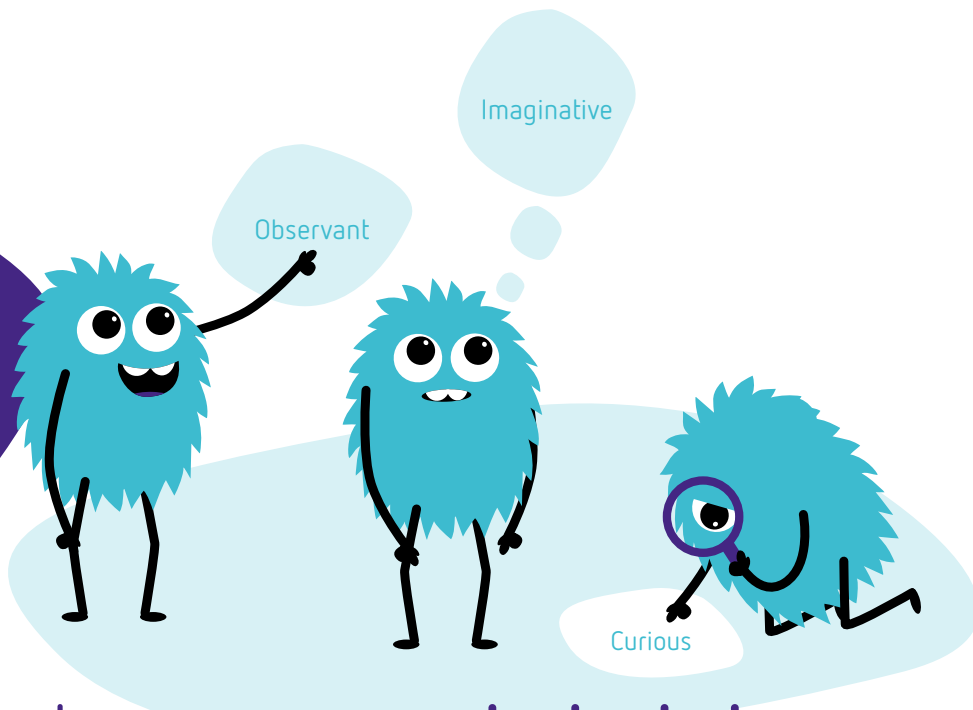


The exploration and curiosity don't have to end once British Science Week is over! Some of the following ideas could help you to expand the learning beyond the Week.

- Get students to 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 at secondarylibrary.crestawards.org 🚀
- Consider sharing your British Science Week learnings 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. Find out more at ucl.ac.uk/ioe/departments-and-centres/departments/education-practice-and-society/stem-participation-social-justice-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 🚀



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* (nustem.uk/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 set 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 to present back to their class. Check out the CREST resource library (secondarylibrary.crestawards.org ✨) for inspiration.

➤ **Get students to run their own CREST projects** and then use them as inspiration for a mini science fair in class. We have lots of handy CREST resources at library.crestawards.org ✨.

➤ **Ask students to research** how growth has 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	Tenacious
Creative	Imaginative	Patient	Collaborative
Resilient	Communicator	Passionate	Organised
Curious	Self-motivated	Hard-working	Logical

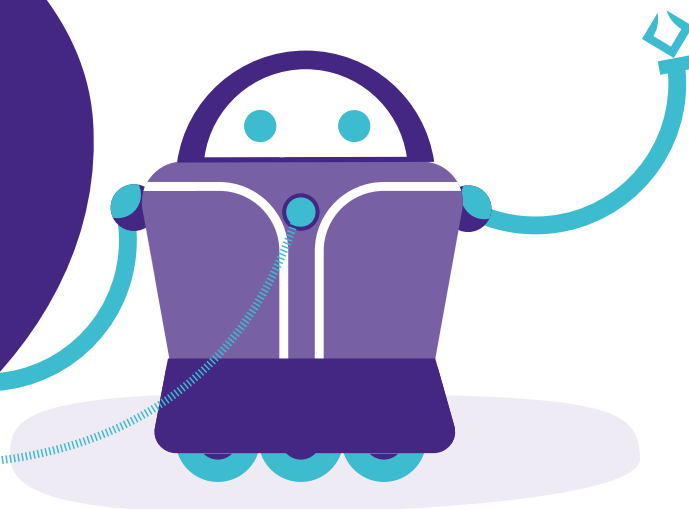
FUTURE JOBS

It is difficult to imagine a career sector which won't be affected by these major industrial trends: an **ageing society**, **artificial intelligence**, **clean growth** and **the future of mobility**.

In this activity, you will explore how one career sector might be affected by one or all of these global trends. You will make recommendations about the changes needed in your chosen sector which could possibly lead to the growth of new industries or technologies.

 2+ hours

Skills set: Communicator, curious, self-motivated



Kit list

Safety sheet 

[science.cleapss.org.uk/
Resources/Student-
Safety-Sheets](https://science.cleapss.org.uk/Resources/Student-Safety-Sheets) 

Computer (optional)

Internet access
(optional)


Instructions

- 1 Select a career sector to focus on. Keep it broad rather than specific to a job. For example, you could choose healthcare, agriculture, construction, or TV and media – whatever you are most interested in.
- 2 Research your chosen sector. Find out what its purpose is, how many people are employed in this area, the latest technology being used and the impact of the sector on the environment. You could focus on a few key jobs and use a careers website to help you.
- 3 Consider how the global trends might impact on jobs and ask yourself some questions.
 - Will some jobs be replaced by machines?
 - What kind of environment will people work in?
 - If people are living longer and there are more older people, what problems and opportunities might there be?
- 4 Search for evidence to support your ideas. You could use scientific magazines such as *New Scientist* and *Wired* to search for relevant articles.
- 5 Ask your teacher to help you to contact someone in a relevant job who you can interview. Prepare a list of questions


which will enable you to learn more about their current job and how they think it will change in future.

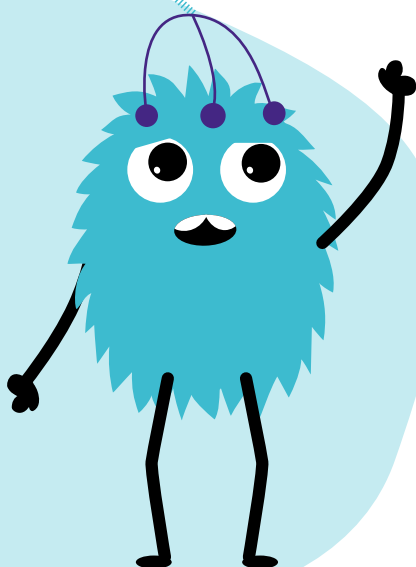
- 6 Reflect on what you have found out from your research and from your interview. Consider the following questions.
 - What are the new opportunities and challenges in this sector?
 - How do you think it will look in ten years' time?
 - What is the wider impact of your research? What changes do you think need to happen to help your chosen sector to prepare for the future?

Watch out

Always complete a risk assessment before you start this activity. Use the Student Safety Sheets available online at 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).

Next steps


This activity can be put towards a **CREST Bronze Award**. For more information, go to crestawards.org/crest-bronze. 



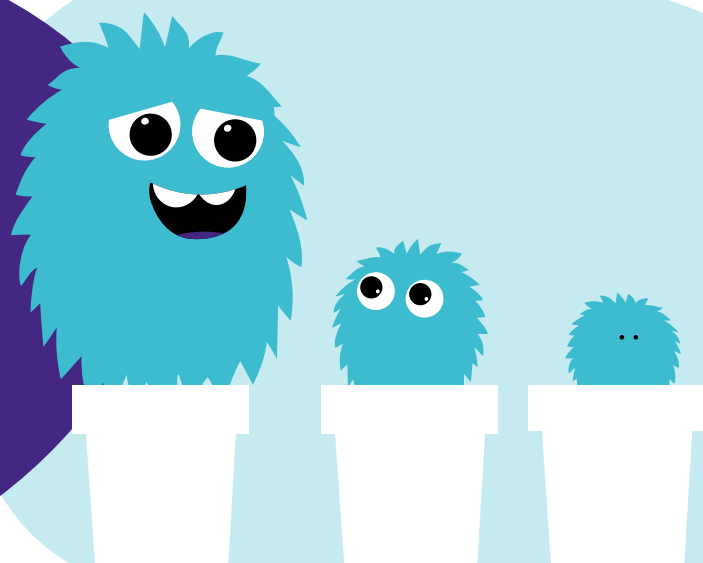
Take it home:

PLANT GROWTH AND NUTRIENTS

A plant's growth rate is affected by different factors like light, temperature, moisture and soil nutrients. In this activity, you will investigate how the nutrients in compost affect the rate of the growth of seedlings.

 2+ hours

Skills set: Observant, organised, patient



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.
- 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 and height. Decide what measurements to use as indicators of plant growth, such as plant height or the number and sizes of leaves.
- 7 You will need to make your measurements daily for about three to four weeks.
- 8 Choose at least two 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 agree 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 at 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.

Ensure you do not eat and drink in science practicals.

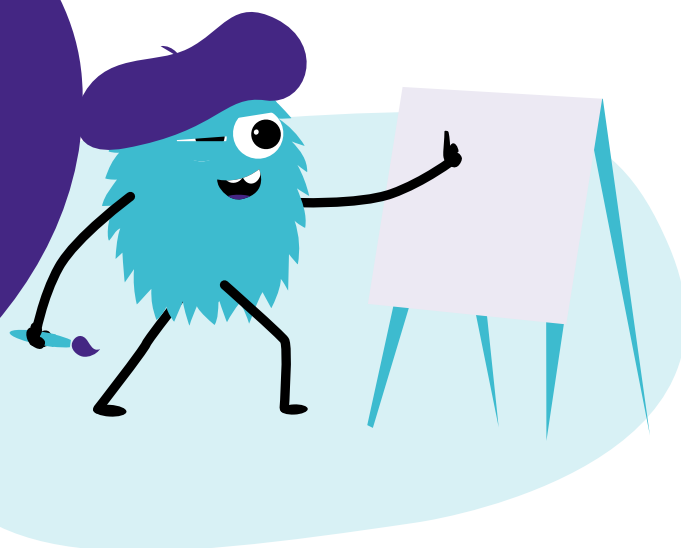
Always wash your hands thoroughly after handling seeds and soil.

Next steps

This activity can be put towards a CREST Bronze Award. For more information, go to crestawards.org/crest-bronze .

POSTER COMPETITION

Students can get creative and enter the British Science Association's annual, UK-wide poster competition! They can make a poster about any version of 'Growth' that they like and be in with the chance of winning an array of prizes. The activities found in this pack, marked with a paintbrush symbol, could all be used as a source of inspiration to get students started.



Kit list

Paper (A4 or A3)

Creative materials

such as:

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

Instructions

Encourage students to think about different areas of growth 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 growth** – from growing their own cress plants to overcoming a challenge that they thought they could not do! How has it helped them to become stronger, braver, kinder, or more accomplished?
- **How do students think the world has grown?** You could help them to consider population growth, plant growth, economic growth or even the growth of cities and society. What is an example of good growth?
- **Can students think of people who have helped or inspired them to grow?** 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, growth is 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. 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 🎉.