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## **EARLY YEARS**ACTIVITY PACK

11-20 March 2022 britishscienceweek.org A range of activities to be run with children under the age of 5

Delivered by

BRITISH SCIENCE ASSOCIATION Supported by





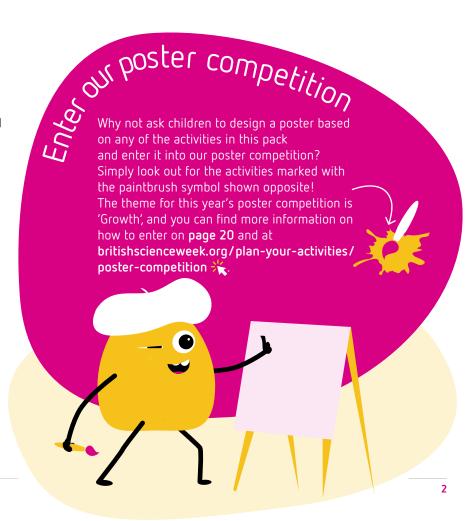
This activity pack is a one-stop shop to support you during **British Science Week**, and you can use it all year! Feel free to adapt or extend any of the activities to suit your children's needs or the curriculum you are delivering.

hen 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.

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

#### Find an activity near you

You can either create your own activity, or find out what activities are happening near you. Last year we reached more than 100,000 people. Help us make British Science Week 2022 even bigger and better! Visit sciencelive.net \* to find science activities in your local area.





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he theme this year for British Science Week is 'Growth'! Introduce the theme to children in a fun, imaginative way to get them excited about the week ahead. Check out some ideas on how to do this 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 to use as fun warm-up activities and are a fantastic way to start British Science Week.
- Get children to dress up to personify 'Growth'. They can come to school as their favourite scientist (and feel free to think outside the box – the costume can be more than a white laboratory coat!), or perhaps as an innovation

that drove positive growth. Invite them to share the story behind their costume with the class.

- ➤ Encourage children 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 children 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 children 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.

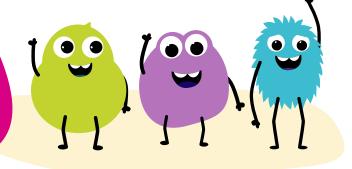
Here are some other ideas to include at the beginning of British Science Week

- Tell children 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 children?
- ➤ Launch the poster competition and let parents know about this. See page 20 ¾ of this pack for more details.





## 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 children online.

TEM 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:

- with a career talk or demo from from an inspiring volunteer to engage the children. 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 children anticipating who the next guest will be and what they do. These sorts of experiences can inspire children 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 children might have absorbed and promote positive attitude towards science, like female engineers. Let the volunteers/ambassadors

- share how their job is making a difference in the world, or an anecdote of a science activity they loved to do as a child.
- Book your visitors early (as many speakers get booked up during British Science Week). Have a clear idea of what you want them to do and communicate this with them ahead of time.

Volunteers come from a range of careers and experiences, from engineers, designers and architects to scientists and technicians, so get children 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.



## Do you want to help children 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 children 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 children's houses. Many of our CREST activities are quick and easy to do as fun outdoor challenges too. Check out the CREST Star challenges collection:
- Send an experiment idea home during the Week to perhaps spark mealtime discussions around science. Try to make it as lowresource 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. We have a range of science-based home activities requiring few resources in the CREST at home collection at bsa.sc/CREST-Primary-Home-Collection \*.

In addition to this pack, there are lots of other useful ideas for take-home activities from the series such as this one from The Royal Institution:
rigb.org/families/experimental \*\*\*.





- 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 places are often membership based and can be a brilliant, inexpensive or free resource for card, fabric and other bits of material. These things can be turned into rockets, cars, spaceships and more. You name it − the kids will think of it! Look at childrensscrapstore.co.uk 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 the growth of plants, building structures and so on. The more colourful, the better! You can also use these photographs for the guessing game 'I spy', where you can describe your observation of growth and the children can attempt to guess it.
- ➤ Collect story books and reference books around the theme of 'Growth' to create a themed library. You can even organise a read-aloud session of a story book for circle or carpet time.





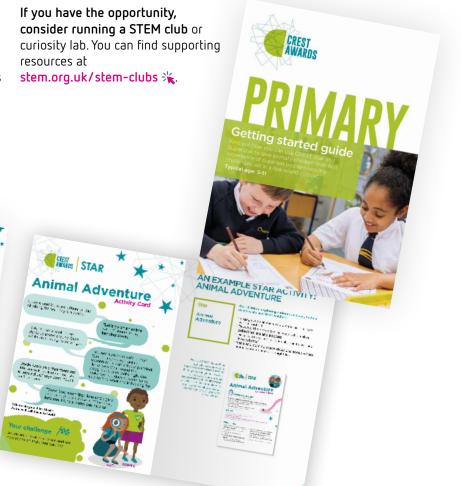


# The exploration and curiosity don't have to end once British Science Week is over! Some of the following ideas could help you to expand the learning beyond the Week.

Get children to 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 Award, which will see them receive a certificate and badge. Older children could also work towards a higher-level CREST Award. Take a look at the different CREST Star challenges here: primarylibrary.crestawards.org

CREST STAR

Challenges

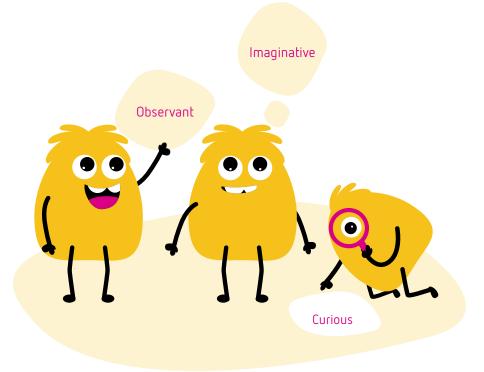




# A fantastic way to encourage children to take an interest in STEM is to introduce transferable skills used by those working in STEM-related jobs.

ou 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 children 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 children with a sticker or certificate for a STEM skill which they demonstrate very well during the Week? You can download and print the stickers from britishscienceweek.org/britishscience-week-marketing-pack \*\*.



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

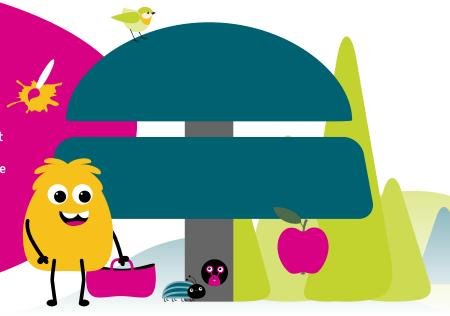


#### **DISCOVERY BAG**

In this activity, children will be thinking about trees, where they grow and the life that they support. This activity will also help them to be aware of the differences between trees and identify natural and man-made objects.

(5) 30 mins

Skill set: Communicator, curious, observant





#### Kit list

Pencils, crayons, paper and glue

Magnifying glasses

Photographs of trees and/or tree guides

Large cloth or paper bag\*

containing parts from a minimum of two different trees (e.g., twigs with leaves, bare twigs, bark, fruits, cones, or things such as galls) and other interesting items not from trees

\*Include enough materials to fill the bag — it doesn't matter if parts of the same tree are repeated

#### **Instructions**

- Explain to the children that they will be exploring their own discovery bag. Give out equipment to the children.
- 2 Encourage children to discuss their ideas and how to carry out their investigations. Talk about how each different type of tree has unique parts. Show them how to use the magnifying glass to make close observations. Discuss sorting, grouping and matching the tree parts, using prompt questions.

  - > Which item is not a part of a tree?
  - How many types of trees do you know?
  - > Does everything come from trees?
- **3** Help children to conduct their tests and record their results.
- 4 Ask the children to present their findings to the rest of the group they can be as creative in their presentation as they want.

#### Think and talk about

- How will you find out whether all the things have come from trees?
- Have you seen trees growing? Where have you seen them?
- Do trees all look the same?
- > What else can you find on a tree?

#### △ Watch out

- Some plant parts can be toxic, such as Laburnum seeds, or have sap that can irritate the skin. Check that your tree parts are safe to use.
- ➤ Remind children not to eat anything and to wash their hands afterwards.

#### Next steps

- Get children to draw a picture of what they think one of the trees may look like.
- Encourage them to make a leaf or bark rubbing.

#### At home

- Ask children to discuss with their parents which animals make their homes in the trees.
- See if the children can find and name any of the trees growing nearby.



### Take it home: PLANT DETECTIVES

In this activity, children will become plant detectives and think about where plants grow. This activity has been specifically designed for home settings, using equipment most parents should be able to source easily and cheaply. Why not print this sheet and send children home with it to encourage parents to get involved during British Science Week?

**30** mins

Skill set: Observant, open-minded, patient





An outdoor environment

Access to a safe outdoor environment, ideally with a variety of surfaces such as brick walls, paving, concrete and grass

Magnifying glass or digital microscope (optional)

Identification guide (can be found on the internet, an app or in a book)

Phone camera(s) or drawing equipment

#### Instructions

- 1 Talk with the children about where they can search for plants, encouraging them to think of unusual places to look. Warn children not to eat any part of the plants that they find.
- 2 Encourage children to think about how the plants they find have got there.
- 3 When the children finish hunting, let them share their clues about what they have discovered. Can they decide how the plants got to their locations?

#### Think and talk about

- Where is the strangest place you can find a plant growing?
- Do you notice anything about where you find plants growing?
- How are plants dispersed in different locations?

#### △ Watch out

- > Follow the organisation's guidelines for outdoor work.
- Children must not put any plants in their mouths.
- ➤ Ensure children wash their hands when they have finished.

#### Next steps

- ➤ The plants that children find during the hunt will vary depending on the time of year. You can repeat this activity in different seasons so they can find out how the plants change.
- ➤ Encourage children to try to discover the names of the plants that they found.
- Ask children to try to find out if plants always need soil to grow.





### DRAWING PARTNERS

In this activity, children are asked to look closely at, and sketch, a partner's face. Children will be astounded by how much better their work is after they have observed carefully. There's plenty of growth to develop their drawing skills and at the same time, to respect each other's differences!

(5) 30+ minutes

Skill set Creative, observant, patient





#### 📤 Kit list

Some drawing materials

Viewing windows – small rectangular windows that allow the user to focus on what can be seen just through the cut out part



#### Instructions

- Ask children to work in pairs and draw each other with little initial guidance given.
- After 10 minutes, collect their work in and then call one child to the front of the class. Ask the class to look very carefully at the child's features and quide them to focus on eye shape, position of ears, hair texture, etc.
- Pairs then will do a second drawing of each other, this time looking carefully on their partner's features, like in Step 2. Afterwards, compare the first and second sketches and talk about improvements.
- Over the next day/s, allow children to use viewing windows, which will allow them to focus on one feature at a time, such as the eye or the mouth. A third and final drawing will be made and then the children could review their work overall.

#### Think and talk about

- Most children may have drawn a circle for the eyes. Are eyes really round? Did they put eyebrows and eyelashes?
- For a particular drawing, does the hair grow away from the forehead or towards it?
- What features are similar or different between themselves and their classmates?

#### △ Watch out

Sharp pencils can cause small cuts or stabs to skin. Discuss with children on how to safely handle pencils.

#### Next steps

Create a gallery of before and after drawings. Talk about the improvements the children can see in their classmates' work. Write these on post-it notes and stick them next to their work to celebrate each other's achievements.

#### At home

Encourage children to draw themselves at home using a mirror. Remind them to take care if using glass mirrors. They can discuss with parents/guardians/minders how they are similar or different in their facial features.





## GROWING WITH PATTERN

In this activity, children will be introduced to repeat patterns using print. They are encouraged to look for examples of patterns in the natural and man-made environment, prior to experimenting with printing from simple objects.

(5) 15 to 40 minutes

Skill set Creative, logical, observant



A collection of objects

Different coloured papers

Water-based printing ink

Trays

Rollers

A large sponge

An old towel

Polythene

#### **i** Instructions

- 1 Cover a table with polythene then roll out some water-based ink on a flat plastic tray. Use three different colours. Put some of the objects in each of the trays.
- 2 Give out a piece of paper to each child and let them choose an object from a tray of coloured ink. Let them make a print on the top left of their paper.
- 3 Ask them to choose a new colour and make another print next to the first one. Make a third print next with the first two, in a colour they haven't used. Let them repeat the order of the colours to make a coloured pattern.
- 4 Remind the children to keep checking their paper to decide on what comes next. Encourage them to repeat the sequence all the way down the paper. Make sure there is plenty of space for the prints to dry as soon as they are finished.



#### Think and talk about

- Is anybody wearing a pattern? Can you describe how it 'grows'?
- Can you see any patterns in the room? Are there any shapes, colours, pictures or objects that are repeated?
- Why should patterns repeat and grow? Is this a kind of visual hiccup or is it necessary to cover larger areas of space like walls, tables, people or buildings?

#### △ Watch out

- Only use water-based printing inks.
- Children should wear old clothes or protective aprons.
- Have a large damp sponge to wipe sticky fingers and an old towel for damp hands.
- Remind the children that they must always put the inky object back in the ink tray. This is a rule.

#### Next steps

- These prints can make a spectacular backing for a display, or be used as wrapping paper. Try using pre-coloured and printed papers, including newspaper, for the children to print on.
- Visit the NSEAD resources pages for ideas of how to take the activity further nsead. org/resources/units-of-work ¾

#### **At home**

Ask each child to see if they can find something at home that has a pattern. They might find fabric off cuts, wrapping paper or packaging that has a pattern.





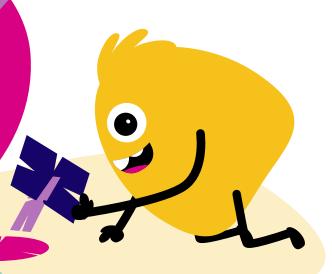


## CARDBOARD BUILDING SHAPES

In this activity, children will make building blocks by cutting out shapes from recycled cardboard, which they can then slot together to create structures using their imagination. This interactive activity will give them the opportunity to be creative and develop resilience.

🔥 About an hour

Skill set Committed, creative, resilient





#### 📤 Kit list

Cardboard, such as empty delivery boxes

Scissors

A pencil and ruler

Felt tip pens, colouring pencils, crayons or paint

A flat surface to work on

#### Instructions

- Help the children cut out the cardboard into shapes like squares, rectangles, circles and triangles. You can also try more complicated shapes like stars, ovals or hexagons. Make about four of each shape.
- Get the children to colour or paint the shapes. If painting, leave time for the shapes to dry properly before use.
- Cut short slots like a thin triangle out of the card. The slots can be about the width of an adult's finger. You can choose how many slots you cut in each shape. A good idea is to count the sides of the shapes and use that as a guide e.g. three slots in a triangle and four in a rectangle.
- Start building. Let them choose two shapes and slot them together. Make sure they are pushed all the way into each other. Let them join more shapes onto these shapes.

#### Think and talk about

- Which shapes balance the best? Which make the best bases for building on?
- > Which shapes slot together easily? Are there any that you can't slot together?
- What do you need to do to make a taller structure?

#### △ Watch out

- If children are cutting the shapes, use children's/safety scissors and always supervise them when cutting – no running or walking about with the scissors. Otherwise, you might want to be in charge of the cutting.
- Cover and protect the surface you are working on when using paint or felt tip pens.
- Lids from felt tip pens are a choking hazard. Take the lids off before use and keep them out of reach of the children.

#### Next steps

To find out more about structural engineers and discover additional building activities that the children can do at home, visit our Structural Engineer nustem.uk/activity/the-structuralengineer 💥 activities page.

#### At home

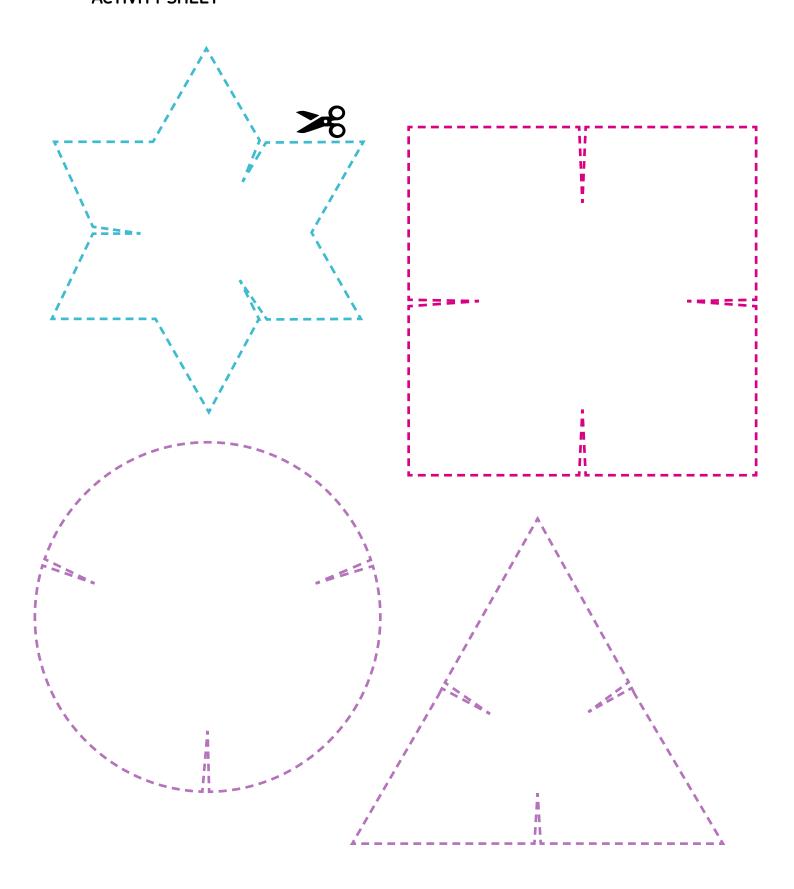
Ask the children to also do the activity at home with the help of their parents and try some of these building challenges:

- Make the tallest structure
- Make the widest structure
- Make a structure that looks like a person, or a tree, or a house.











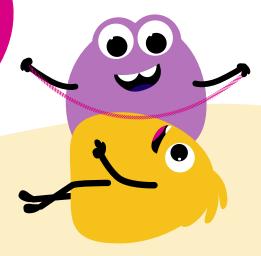


#### **MEASURE YOURSELF**

Physical growth is usually measured with an increase in height or weight. This fun activity will introduce children to the concept of height and show how their height compares with the size of other objects around them.

30 minutes

Skill set Logical, observant, organised





📤 Kit list

A ball of string

Scissors



- 1 If you have a roll of plain paper or mat, roll it out on the floor.
- 2 Let each child lie down on the paper/ mat one at a time and ask someone to cut a piece of string the length of the child's body.
- With the piece of string, they can now measure themselves against other objects! Ask these questions:
  - How many shoes can fit the length of the string?
  - How many drink cartons?
  - How many exercise books?
- 4 Ask the children to record results in a table.
- 5 Help the children to measure things around the room with their strings. For example, ask how many times can their string fit along the table?
- 6 Now, ask them to hold the string as wide as their arms. The arm width is often the same as the height!

#### Think and talk about

- Everything is measured in centimetres and metres. Use the ruler at the bottom of the next page to work out how many centimetres tall they are by measuring the length of their string.
- What objects in the room are bigger or smaller than them?

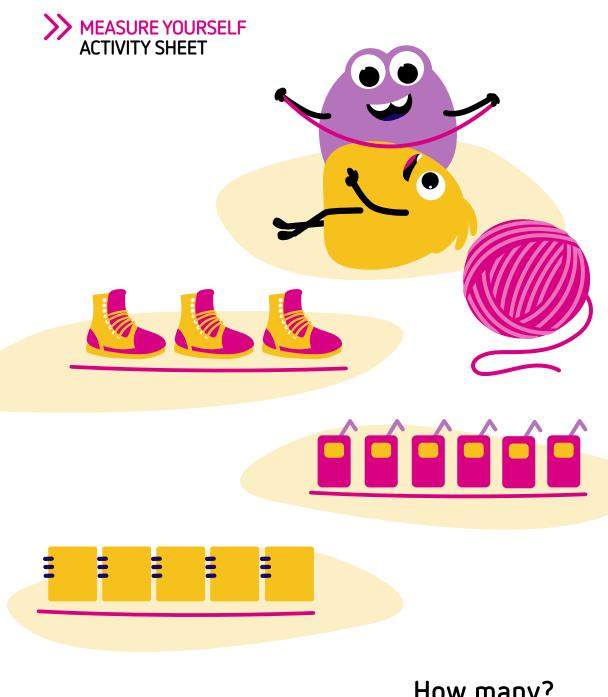
#### △ Watch out

- Strings can be a tripping hazard or can lead to strangulation. Be careful when children are wandering around with hanging strings.
- Make sure that the area is cleared of obstacles and dangerous substances!

#### At home

- Encourage children to draw all the things that are bigger than them.
- They can also look around inside the house and draw all the things that are smaller than them.





How many?

Shoes

Drink cartons

**Books** 

25

22

15

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9

5

3

2

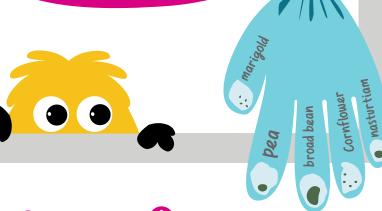




#### A HANDY GARDENER

In this fun activity, children will make their own handy glove greenhouses! By observing, they will discover how seeds germinate and seedlings grow. Young learners will be intriqued to learn that all seeds are different, some are speedy growers and others take their time – just like them!

(5) 30 minutes (15-minute activity with three 5-minute sessions to check in on growth) Skill set Curious, observant, patient





Large sized clear plastic gloves

A range of different seeds (five minimum)

Permanent marker pens

Cotton wool balls

Water

Pencil or wooden lollypop stick

Sticky tape

Pipette or paper straw for watering

#### **Instructions**

- Let the children soak the cotton wool balls and then gently squeeze them out. They need to be just damp.
- The children can decide which five seeds to use. Collect the gloves and write the seed labels on the fingers of the glove with a marker pen.
- Help the children to push a cotton wool ball into each finger of the glove using the rubber end of a pencil or wooden lollypop stick then gently poke a seed into each finger.
- Attach the glove to a window pane with the sticky tape.
- Allow the children to observe the glove daily.
- Add drops of water if the cotton wool looks too dry - either use a pipette or paper straw to do this. Open up the top of the glove if the seedlings need more space!
- Ask the children to record the changes in a group diary with photos and pictures.

#### Think and talk about

- Which seedling grew first? Which seedling was the slowest to grow?
- What happens first when the seedlings grow?
- Will the seeds grow if the glove is in the dark or in a cold place? Can you find this out?

#### △ Watch out

- Be careful to check that the children don't have any allergies to seeds before using
- Plastic gloves and seeds can be choking hazards for young children so ensure these are kept out of their reach while doing this activity. If children are making their own handy glove greenhouse, make sure an adult helps them.
- Wipe up any water that is spilled when soaking the cotton wool balls or when watering the glove. Water is a slip hazard and could cause injuries.
- Make sure children wash their hands after handling seeds.

#### Next steps

- Let the children choose five seeds they would like to grow. This will help them recognise that seeds come in different shapes, colours and sizes.
- Want to test out even more seeds? Try our Germination race schoolgardening. rhs.org.uk/Resources/Activity/ Germination-race ¾. Race seeds against each other to find out which grow first.

#### At home

Get children to talk about what a seed needs to grow.





## MAKE YOUR OWN SEED BOMB

When seeds grow into plants, they support humans and animals by producing oxygen. In this activity, children will be making their own seed bombs and growing their own plants.

(5) 30 mins

Skill set Curious, imaginative, patient





Recycled coloured/ white card or paper

#### Seeds

Food colouring (optional)

Lots of water

Mixing bowl

Old tea towel

Ice cube tray or mould

Food blender

Paper shredder (optional) or scissors

#### Instructions

- Help the children shred or cut up paper/ card. Let it soak in a bowl of water for at least five minutes.
- Add the paper and water to a blender in small amounts and blend to a pulp. Make sure to keep the blender out of reach of children.
- Remove the pulp from the blender and transfer back to the bowl. Allow the children to add food colouring (optional) and the seeds. Mix a little more.
- Strain the excess water from the pulp using a tea towel.
- Squash the paper and seed pulp into an ice cube tray or moulds.
- Let the seed bombs dry as quickly as possible, by placing them somewhere warm such as a radiator, to prevent early germination.
- Now the children can spread seed bombs in the garden and watch the plants grow!

#### Think and talk about

- How do plants spread their seeds?
- What do they need to grow?
- What are the different parts of plants and what are they for?

#### Watch out

- Be careful when using scissors to cut your card or paper!
- Make sure a responsible adult is in charge of shredding and blending.
- In case of spillages, clean up immediately and leave the floor dry.

#### Next steps

For more ideas and inspiration, check out Little Learners, YPO's FREE early years magazine packed with engaging activities: ypo.co.uk/littlelearners 💥.

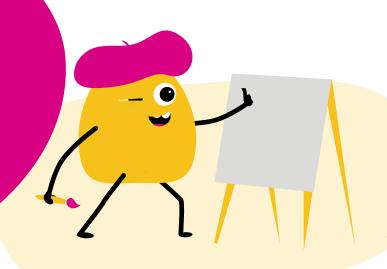
#### At home

Go outside to your garden or to the local park or green space. How many different types of plants can you see?



### POSTER COMPETITION

Children 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 children started.





#### Paper (A4 or A3)

Creative materials such as: pens pencils scissors alue watercolours paints crayons pipe cleaners felt thread wool foil clay string beads stamps foam pompoms

#### **Instructions**

Encourage children 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 children 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 children 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 children 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 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 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 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 %.