



EARLY YEARS ACTIVITY PACK

6 – 15 March 2020
britishscienceweek.org



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This resource pack is your 'one-stop shop' for supporting you during **British Science Week**, but it can be used at any time. Feel free to adapt or extend the activities to suit your children's needs and the curriculum you are delivering.

In addition to the activities in this pack, there are lots of other ways to enthuse and engage your children throughout British Science Week. In developing this pack, we have looked for activities which break down the stereotypes surrounding science, technology, engineering and maths (STEM) and promote cross-curricular learning. We 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've got some extra activities to complete in nursery or school, plus some which are designed for children to take part in at home with their families.

Find an event near you

You can either create your own club, class or school event, or search for things happening near you. Last year we reached more than 180,000 people. Help us make British Science Week 2020 even bigger and better! Visit britishscienceweek.org



This year, our activity pack theme is 'Our Diverse Planet' - celebrating the amazing diversity we see across the world. From biodiversity to cultural and societal diversity, from the diversity of knowledge to STEM careers and subjects! There are lots of ways to explore this theme - we'd love to hear some of your ideas too!

#BSW20



Poster competition

Look out for the paintbrush symbol at the top right corner of the page.

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Making the most of volunteers

STEM Ambassadors offer their time and enthusiasm to help bring science and technology subjects to life and demonstrate the value of them in life and careers. The *Inspiring the Future's* website can also match you up with someone with the skills you're looking for.

Volunteers come from a range of careers and experiences, from engineers, designers and architects to scientists and technicians, so get children excited about all the options available to them!

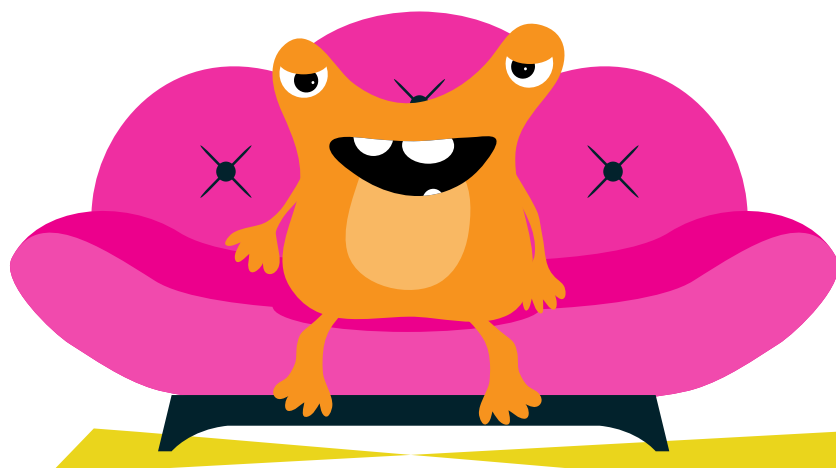
Check out *STEM Learning's* website for some handy tips on how to get a STEM Ambassador: stem.org.uk/stem-ambassadors/find-a-stem-ambassador

Visit *Inspiring the Future's* website for some helpful ideas of events you can use volunteers at: inspiringthefuture.org/schools-and-colleges/resources-and-guides



Here are some ideas and tips on how you could utilise volunteers this British Science Week:

- ✓ Kick off with a volunteer-led talk/demo, getting children excited to take part in the rest of the Week.
- ✓ Invite a different visitor each day to keep children engaged throughout.
- ✓ Where available, choose volunteers/ambassadors who go against stereotypes the children might have of people who work in or engage with science, e.g. female engineers.
- ✓ Reserve visitors early (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 with a brief.



British Science Week at home

Want your children to enjoy British Science Week at home, but not sure how? Here are our top tips for engaging parents and carers so the fun doesn't stop at school:

- 1 Make the most of your parent newsletters, the Parent Teacher Association (PTA) and text messaging services, if you have them. Let parents know in advance of the Week (at least a month before) what you have planned and how you'd like them to be involved. They might be able to collect/donate materials for use during the Week, and if you want them to try any experiments at home, they may need time to plan and collect materials for themselves. The PTA may be able to support you financially to run the Week or help drum up parent volunteers.
- 2 Get parents thinking about how their own jobs might link to science and technology subjects and encourage them to chat with their children about this. You could do this via a newsletter.
- 3 Encourage exploring the outdoors in the community or in local cultural spots. This could be anything from local parks to the streets around children's houses. Parents and families can get involved simply by going on a nature walk, exploring science related events and activities in their local area, or visiting places such as museums or science centres. Many of our CREST activities are quick and easy to do as fun outdoor challenges too: library.crestawards.org/
- 4 If you are conscious that parents may struggle to engage with British Science Week at home, invite them on school trips or use resources such as: bsa.sc/oxford-sparks
- 5 Send an experiment idea home during the Week which may spark mealtime discussions around STEM. Try and make it as low-resource as possible. It can help if it's something the children have tried or seen at school first, so they feel like 'experts' when they do it at home with family, allowing them to lead the learning.
- 6 As well as this pack, there are always lots of other useful downloads for take-home activities, such as: education.gov.scot/parentzone/Documents/lamaScientistMar16.pdf and rigb.org/families/experimental



Gathering resources for your classroom or home

- ✓ Try to collect materials all year round: empty bottles, toilet rolls, cereal boxes, elastic bands, newspapers, etc. This way you will have lots of great things to use during your British Science Week.
- ✓ Alternatively, check whether there is a scrap shop/store/club in your local area. These shops are often membership-based and can provide a brilliant, inexpensive or free resource for card, plastic, bits of material – all sorts. These things can be turned into rockets, cars, spaceships; you name it, the kids will think of it!
- ✓ Look at childrensscrapstore.co.uk to find a UK directory of scrap stores, or, use Google to find your nearest.
- ✓ Look out for the 'At home' tasks in this pack for more ideas.

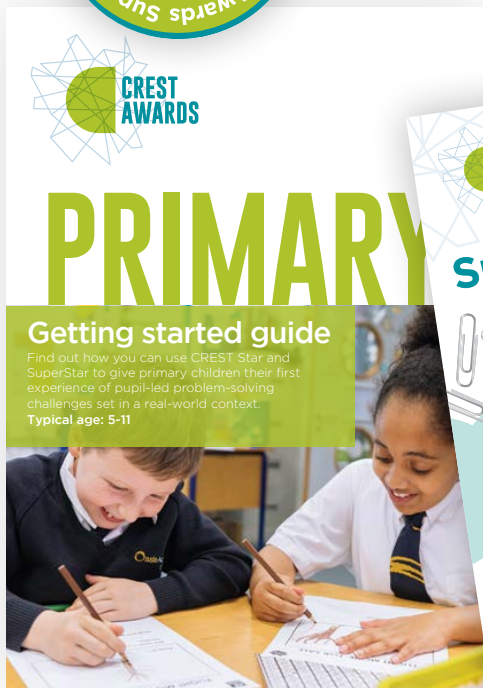


Beyond the Week

The exploration and curiosity doesn't have to stop once British Science Week is over!

Here are some ideas to extend the fun throughout the year.

- ✓ Setting up a STEM club or running a curiosity lab once a month during science class
- ✓ Children could take part in a CREST Award, spending 8 hours on a Star Award. Take a look at the different CREST levels available: crestawards.org/which-level
- ✓ Keep an eye out for the 'Next steps' tasks in this pack for more ideas.



Our Diverse Planet

Rainbow collectors



About this activity

In this activity, children will celebrate the diversity of our environment and will create a rainbow of the colours that they can see around them.

Kit list

- ✔ Colour-collecting palettes – ideally one between two
- ✔ Coloured pens (red, orange, yellow, green, blue, purple)
- ✔ Double-sided tape
- ✔ Use a long white strip of paper divided up into 6 sections to represent a simple rainbow.

Time: 30 minutes

Watch out!

Remind children that they must stay near their helper.

Ensure that you meet your organisation's safety requirements for outdoor activity.

Children must wash their hands thoroughly after this activity. Some organisations may require the children to wear gloves.

Check the area for plants with toxic seeds or plants that might cause irritation.

Instructions

Mark each section of the white paper strips with a coloured dot (red, orange, yellow, green, blue, purple) or you could let children do this after their discussion.

Alternatively you can give each group a plate-sized circle of just one of these colours so that they focus on one colour.

You need to cover the palette with small pieces of double-sided tape. This is where they are going to stick their rainbow samples.

- 1 Choose somewhere for children to look for colour. The activity can take place in any location - ideally outside. It does not need a flower-filled garden or to be out in the countryside.
- 2 This activity helps children to be more aware of colour in their natural environment. Ultimately the activity should focus on natural materials, such as plants, but you can choose to let them add other materials to their palette as well.
- 3 Hand out the colour-collecting palettes, ideally one between two.
- 4 Tell the children about going to look for the rainbow. Make it sound like an exciting adventure.

- 5 Show them examples of the things to collect e.g. bits of flowers and leaves.
- 6 When they return they can share what they have found and create a rainbow by putting their palettes together. These can then be put on display.

Think and talk about

- ✔ Have you seen a rainbow?
- ✔ Which colours did you see?
- ✔ Do you think that you can find all the colours of the rainbow?

Next steps

Children could take some photographs or draw pictures of the different colours they can see around them. If you are engaging parents, you could suggest making a rainbow scrapbook.

At home

Children can try this activity at different times of the year, and could keep a record of how the colours change depending on this. Send children home with this activity sheet to use as homework



Our Diverse Planet

Take it home: Brilliant Bubbles



About this activity

In this activity children will discover the different states of liquids, solids and gases, by experimenting with bubbles. This activity has been specifically designed to be suitable as a take home sheet, 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?

Kit list

- ✔ Plastic trays or bowls
- ✔ Clean drinking straws (preferably reusable) – 1 per child
- ✔ Bubble wands
- ✔ Soft wire (e.g. florist's wire or pipe cleaners) to bend into different shape frames such as a triangle or square
- ✔ Bubble mixture
- ✔ Food colouring

Time: 30 minutes

Watch out!

Children will create a lot of mess with their bubbles, so be prepared for this.

You can colour the mixture with food colouring, but when the bubbles burst the children get sprayed with drops of food colouring, so this is VERY messy.

Instructions

- 1 Ask children if they have blown bubbles before - were they all the same?
- 2 Give out the equipment to children. Explain that they will be using it to test if they can make different shape, size and colour bubbles.
- 3 Put some bubble liquid in a bowl or tray and get children to use a straw to blow some bubbles. Remind them not to share their straw with anyone else and not to suck up any of the liquid.
- 4 Encourage children to try blowing gently and then blowing harder.
- 5 Encourage children to discuss their ideas and how to carry out their investigations on how to make different shapes, sizes and coloured bubbles.
- 6 Children could use the pipe cleaners to make different shape bubble wands. The food colouring can be used to make different colour bubbles.
- 7 Support children to conduct their tests and make their own records of their results. They could also take photographs or make drawings.
- 8 Ask the children to present their findings to the rest of the group, they can be as creative in their presentation as they want – for example, why not try a bubble competition?

Think and talk about

- ✔ Do they think they can make bubbles with different shapes?
- ✔ How will they make sure their test is fair?
- ✔ How will they record their results?
- ✔ Have they ever blown bubbles? Do you think that they were all the same?

Next steps

Children could take this further by finding out how long they can keep a bubble before it bursts. They could also find out whether bubbles float or fall to the ground or how long they can keep a bubble in the air.



Our Diverse Planet

People paper chain



About this activity

In the activity, children make a paper chain of all the people they know! Get them to think about how many people they know and if they are big or small. They can colour in their paper chain to show how different everyone is.

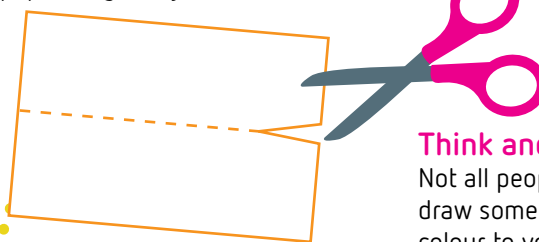
Kit list

- ✓ Pair of safety scissors per child
- ✓ Piece of A3 paper per child
- ✓ Pen per child

Time: 15 - 20 minutes

Instructions

- 1 Help children to fold an A3 sheet of paper lengthways and cut.

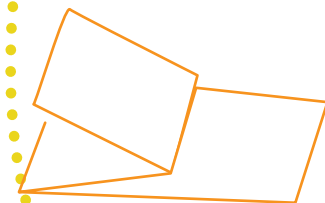


- 2 You will be left with this.



- 3 Help children fold the sheet in half and then half again.

- 4 It should look like this.



- 5 Draw a body shape and cut it out making sure the arms are still connected.

- 6 Children should now have their own paper chain family. If they would like to, they can tape two chains together for a bigger family.

Think and talk about

Not all people look the same, can you draw someone with different hair colour to you?

- ✓ How do you draw someone to show they are old?
- ✓ Try to draw people who look different to you

Next steps

Visit okido.com

At home

You can make more paper chains and staple them together to make a really long one.



Watch out!

An adult should help children use the scissors

Make sure children understand that all bodies are different and that's ok. Be wary of bullying over race, disabilities and any other differences between children

Our Diverse Planet

Make your own animal flip book



About this activity

What's a cat crossed with a monkey and a duck? A catmonkey! Make some crazy animal combinations with this fun flip book activity.

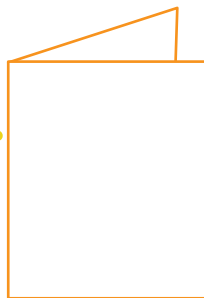
Kit list

- ✓ Ruler per child
- ✓ Four x A4 paper per child (three white, one coloured)
- ✓ Colouring pencils
- ✓ Safety scissors per child
- ✓ Stapler

Time: 15-20 minutes

Instructions

- 1 Fold the A4 pieces of paper in half. Use the coloured one for the cover.



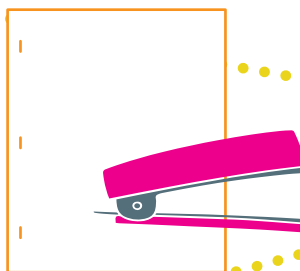
Think and talk about

Can you spot the different animal groups and name them? Can you think of some animals that live in different environments? Some animals have scales, some feathers. Can you think of some?

Next steps

Visit okido.com

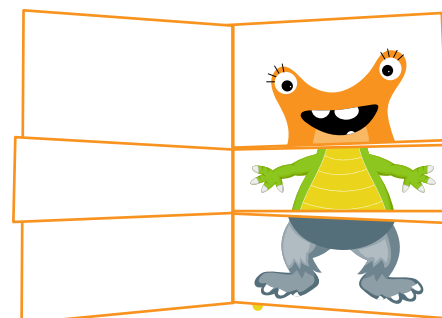
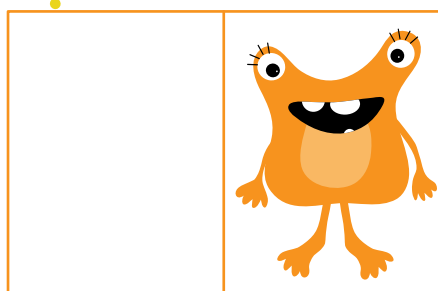
- 2 Put the pieces together and staple them twice on the edge.



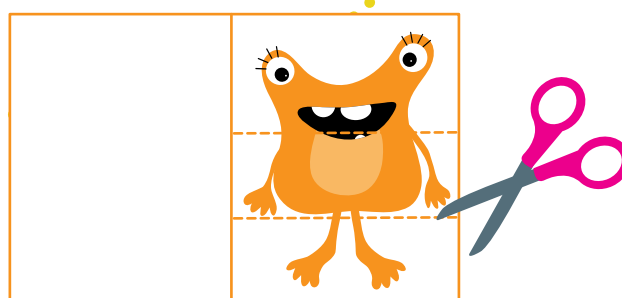
At home

You can add more pages to the activity to create even more animal combinations.

- 3 Draw an animal on each page, with the head at the top and legs at the bottom.



- 4 Cut the three inside pieces of paper up to the fold.



Watch out!

An adult should help children use the scissors and stapler

Our Diverse Planet

What's in the box?

About this activity

In this activity children will learn to use question and answer techniques to make logical guesses about a mysterious item in a box, then draw what they think is inside. It encourages children to make sound, reasoned guesses.

Kit list

- ✓ A medium-sized cardboard box, with some air holes cut into it, folded shut at the top
- ✓ Drawing paper, drawing equipment or small whiteboards.

Time: 20-30 minutes

This exercise was adapted from the book *Drawing for Science Invention & Discovery* by Paul Carney. Visit paulcarneyarts.com

Instructions

- 1 Place a British native plant or animal item inside the box. You will probably use photographs of the items in question.
- 2 Place the cardboard box where the children can see it.
- 3 Tell the children that there is an item of 'native British wildlife' in the box. You might loosely describe it or provide clues if needed.
- 4 Children ask questions and listen to the answers to identify what the object might be. You could use small whiteboards to draw, write and show answers as you go.
- 5 After the children have asked questions for a few minutes, they should draw what they think is in the box.
- 6 Open the box and reveal the photo.
- 7 Children show their drawings and discuss how close they were to guessing correctly.

Think and talk about

- ✓ What does the term 'native British wildlife' mean?
- ✓ Where might we go to see animals that aren't native to Britain?
- ✓ Can you think of an example that is not native to Britain?
- ✓ Can you think of an example that IS British?
- ✓ Why is the size of the box an important clue to what's inside it?

At home

Practise drawing your favourite plants and animals, being careful to identify which are native to Britain and which aren't.

Next steps

For more resources visit nsead.org



Our Diverse Planet

Feely walls

About this activity

In this activity children are encouraged to use their sense of touch as they try to identify a diverse range of fabrics hidden inside a 'feely box'. The same fabrics are displayed on a 'feely wall' and these are used as a comparison when the children are deciding what they can feel inside the box.

Kit list

- ✔ A selection of fabrics of varying texture and thickness. Four or five large pieces for younger children, more for older or more able children
- ✔ As well as getting as wide a range of textures as possible, it also helps to choose some fabrics that feel similar to create a greater degree of challenge.

Time: 20-30 minutes

Instructions

- 1 Cut two squares of the same size out of the fabric to make two identical sets of fabric.
- 2 Keep one set for the 'feely box' and glue the second set to a piece of rigid cardboard or hardboard to make a 'feely wall'.
- 3 Let children touch and talk about the 'feely wall' in pairs. Then, taking turns, the children can explore and discuss the fabric in the 'feely box'.
- 4 After a few minutes, ask if they can match the sample of fabric in the box with one on the 'feely wall', without taking it out of the box.
- 5 Encourage the children to take out the piece of fabric to check it against the fabrics on the wall.
- 6 Start with one sample, or a very small selection of fabrics, in the 'feely box'. If you wish to increase the level of challenge, put all the samples into the 'feely box' or add samples that don't appear on the wall.

Think and talk about

- ✔ What does it feel like?
- ✔ Are there any that feel the same?
- ✔ Why do you think it is that one?
- ✔ Can you make up some words to describe it?
- ✔ Does your partner think it's the same fabric?
- ✔ Is there one that feels like this?

At home

- ✔ Why not encourage children to continue exploring by investigating all the fabrics they have at home?
- ✔ They could even try grouping different fabrics together, explaining why some fabrics are more similar to others.

Next steps

Check out some more Early Years resources:

millgatehouse.co.uk/product/science-sparks

millgatehouse.co.uk/product/smart-pickings

millgatehouse.co.uk/product/science-questions



Our Diverse Planet

Ice blocks

About this activity

In this activity children will work with huge ice cubes made in margarine or ice cream tubs. They will discover that even tepid or cold water is able to melt a hole through the ice cube in a short time.

Kit list

- ✓ Large containers to fill with water and freeze (e.g. ice cream or margarine tubs – do not be tempted to use glass!)
- ✓ Deep trays or washing up bowls to hold ice cubes as they melt
- ✓ Jugs or watering cans
- ✓ Salt
- ✓ Cloth to mop up spills.

Time: 30 minutes

Advance activity

Fill large containers with water and put them in the freezer. They may take several days to freeze.

Watch out!

Large blocks of ice are heavy. Ensure that they don't fall onto toes.

Do not use any water that is warmer than hand hot.

Beware – ice straight from the freezer can stick to skin.

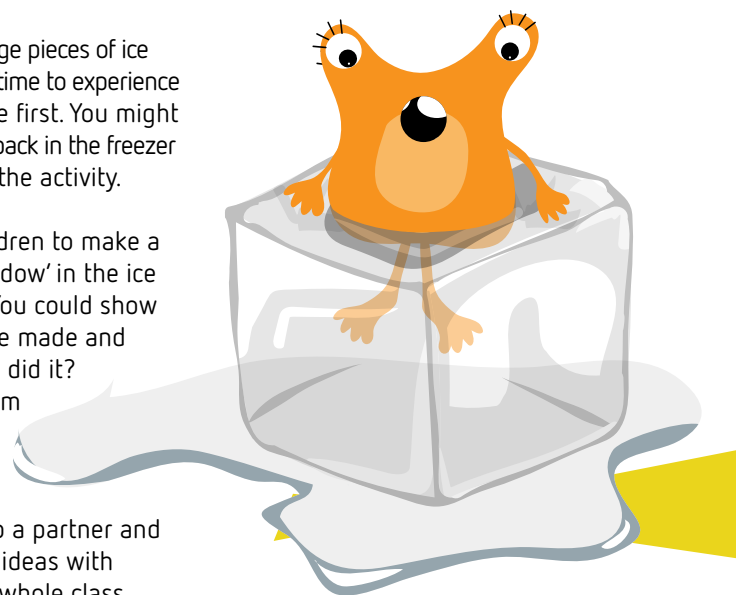
Do not let children hack at ice with sharp instruments – bits of ice may fly off.

Have a cloth handy to mop up any spills and be wary of slippery floors.

If using thermometers for the water temperature, be sure to use spirit or digital ones, not mercury.

Instructions

- 1 Give children the large pieces of ice and allow plenty of time to experience and explore the ice first. You might then want to put it back in the freezer while you explain the activity.
- 2 Challenge the children to make a round hole or 'window' in the ice to peep through. You could show them one you have made and ask them how you did it? You could give them the clue that you used water.
- 3 Let children talk to a partner and then discuss their ideas with a bigger group or whole class. Some children may come up with alternatives, such as rubbing the ice, or adding salt. Help them explore these ideas too, if it is safe to do so.
- 4 Children can work on their own and use a plastic jug to pour water onto their ice, working over a bowl or deep tray. They can count the number of jugs used. They could also see if the temperature of the water makes a difference.
- 5 Encourage them to observe what happens after each jug is emptied. The best holes are made if children keep pouring the water on the same spot. The children will enjoy exploring this for themselves.
- 6 A hole appears quite quickly. Children get great enjoyment from peeping at each other through the hole.
- 7 Securing their ice windows on a windowsill in a bowl or tray, particularly on a bright day, provides a very eye-catching resource. Predicting, and then timing, how long it takes the block to melt completely, can promote thinking and discussion



Think and talk about

- ✓ How can you make a hole and not melt all the ice?
- ✓ What is happening to the ice? Does ice always melt?
- ✓ Would it work with cold water?
- ✓ Would it be faster or slower with cold water?

At home

Encourage children to discuss why we freeze things in our homes.

Next steps

Check out some more Early Years resources:

millgatehouse.co.uk/product/science-sparks

millgatehouse.co.uk/product/smart-pickings

millgatehouse.co.uk/product/science-questions

Assembly ideas

Why not start British Science Week off with a bang, by holding an assembly to get your children excited about the Week ahead? Tell the British Science Association about your assembly ideas by tweeting or sharing images with the hashtag: **#BSW20**

Kick start an assembly with a simple but impressive demo. Make a cloud in a bottle britishscienceweek.org/cloud-in-a-bottle

Remember, a demo is a good way to get children's attention, but it shouldn't be the whole focus of the assembly.

You could reflect on important scientific discoveries or inventions in the last century, with a special focus on the diversity and range of the both the subjects, and the people who discovered or invented them. Try focusing on people from more underrepresented backgrounds, whose work may have been overshadowed at the time. See if there is anyone from your area who fits this bill.

Get the children thinking about how diversity is a part of people, materials, animals, nature or anything else in their everyday lives.

- ✔ Profile a specific person who has contributed in some way to the diversity of a STEM field; from opening doors to underrepresented communities, to contributing new ideas, understanding or knowledge.
- ✔ Invite a special guest or someone from the school community to come talk about a related topic. See [Page 4](#) for information on how to get volunteers.

Here are some other ideas to include during your assembly:

- ✔ Tell your children about the plan for British Science Week and give them a challenge related to the theme. If you are sending home a family experiment, maybe you could introduce/demo it during the assembly.
- ✔ Launch the poster competition (see Page 16 of this pack).



Our Diverse Planet

Poster Competition



About this activity

Get creative and enter the British Science Association's annual poster competition. You can make your poster about whatever version of 'Our Diverse Planet' you like and enter our UK-wide competition with the chance to win an array of prizes. The activities found in this pack could be entered into the poster competition, simply look for the paintbrush symbol. Or you can use them to serve as a source of inspiration to get you started.

Kit list

- ✓ Paper (A4 or A3)
 - ✓ Creative materials e.g. pens, pencils, scissors, glue, watercolours, paint, colouring crayons, pipe cleaners, felt, thread, wool, foil, clay, string, beads, stamps, foam, pompoms
- N.B. try to avoid using straws or glitter - these plastics can damage our planet and harm the diverse creatures and ecosystem that live there

Get children thinking about ideas to include in their poster

They could investigate and imagine 'Our Diverse Planet' and everything that makes it special. Here are some topic ideas to help you get the inspiration started:

- ✓ Why not think about biodiversity? From the diversity in your own garden, to the diversity at the very bottom of the ocean, investigate all the amazing creatures and organisms that live on our planet?
- ✓ The diversity of science and STEM subjects. Have a think about all the diverse ways that science affects our lives and who you know that uses science every day. Remember that science is everywhere, you just have to look for it!
- ✓ Think about other kinds of diversity our planet houses – from the diversity of each and every molecule that make up essential parts of life, to the differences between you and your friends.
- ✓ Our planet is unique, but why not investigate what makes it different from the other planets in our solar system?

Make your poster

Once you've done your research, it's time to get creative!

Your poster must be 2D (flat) – if you make a model, you need to just send us a photo of it on A4 or A3 paper.

You can use pop up pictures, pull out tabs or use materials such as paint, drawing pencils, crayons and paper.

Send us your poster

Posters will be judged on creativity, how well they fit the theme and how well the poster has been made or drawn.

Once the poster is complete, write your children's information on the back, fill in the online registration form, and then post your entry to us at:

**British Science Week Poster Competition,
British Science Association,
165 Queens Gate, London, SW7 5HD**

Next steps

Celebrate! For more details, along with the full set of rules and tips for educators, check out our website britishscienceweek.org/plan-your-activities/poster-competition