

Innovating for the future 5-14 March 2021 britishscienceweek.org

PÁCK

A range of activities and ideas to be run with children under the age of 5

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This activity pack is your 'one-stopshop' for supporting you during British Science Week, but it can be used at any time. This pack is a sneak-peek of the full version, which will be available in January. 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. We understand that this academic year is going to be guite different for schools and nurseries and we've adapted this pack to best support you for British Science Week 2021. This year, we've got some activities to complete in your setting, plus some which are specifically designed for children to take part in at home with their families. Please feel free to further adapt activities within the pack to suit to your setting taking into consideration any guarantine of resources, working in bubbles and social distancing needed. We have also added in some suggestions on remote engagement if you are unable to accommodate visitors within your setting.

Find an activity near you:

You can either create your own activity in your class or setting, or see what activities are happening near you. Last year we reached more than 180,000 people. Help us make British Science Week 2021 even bigger and better! Visit sciencelive.net



Enter our competition:

Some of the activities in this pack could be followed up by designing a poster; simply look out for the paintbrush symbol shown to the right. The theme for this year's poster competition is 'Innovating for the future'. For more information on the competition and how to enter, read on further in the activity pack or visit **britishscienceweek.org**



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Introducing the theme

Why not start British Science Week off with a bang, by introducing parents and children to the theme 'Innovating for the future' in a fun way to get them excited about the Week ahead?

- Post your brilliant activity ideas or share images online tagging the British Science Association on Twitter - @ScienceWeekUK - and using the hashtag #BSW21
- Kick start the week with a simple but impressive demo. Try a game, an audio-visual presentation, a mystery or special object, an inventor's box or a pop-up display which communicates the theme 'Innovating for the future.' Here is a video featuring the Rube Goldberg machine which you can show the children. Anything that inspires their inquisitive minds is an epic start.
- Get the children thinking through their imaginative hats and allow them to experience innovation by asking them to come up with machines they would like to invent from readily available scrap or craft materials or even basic toys found in the classroom or setting.
- Engage the children into sharing how innovation is a part of people, materials, animals, nature or anything else in their everyday lives.
- Invite a special guest or someone from the school community to engage the children with their experience of an innovation i.e. a special tool that they use mainly in their job demonstrating how it makes their job more efficient and what could have been without it or feature their favourite innovation. See Page 5 for information on how to get volunteers.



Here are some other ideas to start the week:

- Tell the 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 at your setting first.
- Innovation is around us. Watch an episode of CBeebies Bitz and Bob together and talk about how the characters create amazing things to tackle challenges.
- Launch the poster competition and let parents know about this (see Page 14 of this pack).





Making the most of volunteers

Opportunities for face-to-face engagement with external visitors may be limited this year, but there are opportunities for getting volunteers and presenters to engage the children online.

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 STEM Ambassador website has recently been updated to enable teachers to request online STEM Ambassador support. Any activity created has an 'online' check box as well as a place to enter a link to a video conferencing call if required and STEM Ambassadors from across the UK can respond to any online activity request. Find out more and make a request here: www.stem.org.uk

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.

Things that work well are to:

- Kick off British Science Week with a career talk/demo from one of these inspiring volunteers to engage the children for the rest of the week. The volunteer can highlight a useful tool or innovation which they use in their jobs and how it makes their job easier. Or, the volunteer can highlight their favourite innovation to share what and why that is.
- 2 Schedule two or three different guests for a career talk throughout the week if you can. This will keep children excited and anticipating who the next guest will be, and what they do. Opportunities like this will likely inspire them about what they want to be in the future. Remember, they are never too young to explore their career options.
- 3 Where available, choose volunteers/ambassadors who challenge stereotypes the children might have and promote positive attitude towards science - e.g. female engineers. Let the volunteers/ambassadors share in a simplified talk how their job is making a difference in the world (or an anecdote of what science activity they loved to do as a child).

- 4 Book your visitors early (many speakers get booked up during Science Week), have a clear idea of what you want them to do and communicate this with them ahead of time.
- 5 Volunteers come from a range of careers and experiences, from engineers, designers and architects to scientists and technicians, so get children excited about inspirational career talks; broaden their choices and develop their interest in these careers!

Visit Inspiring the Future's website www.inspiringthefuture.org for some helpful ideas for using volunteers, some of which may be transferable when using remote engagement.



British Science Week at home

Want the children to get involved in British Science Week at home but not sure how? Here are our top tips for engaging parents and carers in the Week:

- 1 Make the most of your parent newsletters, the Parent-Teacher Association (PTA), chat group and text messaging services if you have them. Let all the parents know in advance of the Week (at least a month) what you have planned, and how you'd like them to be involved. They might be able to collect/donate materials and store them 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 the Week or help drum up parent volunteers.
- 2 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).
- 3 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 the British Science Association's CREST activities are quick and easy to do as fun outdoor challenges too: library.crestawards.org
- 4 Send an experiment idea home during the Week which might spark mealtime discussions around STEM. Try and 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.

Why not try these fun science-based activities at home requiring few resources from the CREST Star at home collection collectionslibrary. crestawards.org or you could use the 'Music maker' activity on Page 11 of this pack.



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Gathering resources for your classroom or home

- If you can, try to collect materials all year round that can be cleaned and stored for use during the 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, plastic, bits of material – all sorts. These things can be turned into forests, cars or model people; 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 innovation – machines, materials, building structures, etc. The more colorful, the better. You can also use these photos for an innovation version of the guessing game 'I spy' where you can describe what the innovation is used for and the children will attempt to guess it.
- Collect story books and reference books ahead of time leading to the theme 'Innovating for the future' to create a themed library. You can even organise a read-aloud session of a related story book for circle or carpet time.







Beyond the Week

Once British Science Week is over, this doesn't mean the exploration and curiosity have to stop!

Some ideas for doing this include:

- Children could take part in a CREST Award. CREST is a scheme that encourages young people to think and behave like scientists and engineers and children can complete eight activities to achieve a Star Award which includes a certificate and badge.
- If there are older children at your school or in a school nearby they could earn a higher level of CREST too. Take a look at the different CREST SuperStar challenges here: primarylibrary.crestawards.org
- Consider sharing your British Science Week learnings by running a CPD session for other teachers in your school or, where relevant, academy chain. Think about incorporating the Science Capital teaching approach into your methods: ucl.ac.uk
- If you have the opportunity, then you could consider running a STEM Club or curiosity lab. Find supporting resources at stem.org.uk.







Unlocking skills

A fantastic way to encourage STEM interest in children is to introduce transferable skills used by those working in STEM jobs. These skills will strengthen positive attitudes towards STEM and reduce their stereotypes of those working in the field. You could engage the children in the STEM Person of the Week activity from NUSTEM at Northumbria University (nustem.uk). Ask the children to identify what attributes people working in STEM need. It might include being observant, creative, patient, a good communicator, or curious. See the below table for the complete list developed by NUSTEM that can be used as a talking point or with other members of staff. As an alternative and a little bit of motivation, why not award each of the children with a sticker or certificate for a STEM skill which they identify with very well during the Week?





About this activity

In this activity children will be thinking about what materials reflect light and will unleash their innovative minds into devising something that can be worn to be better seen in the dark.

Kit list

- ✓ A selection of different materials e.g. different coloured T-shirts or fabrics, reflector armbands, foil, shiny paper, black paper, dark/light coloured objects
- ✓ Torches
- A place that you can partially \bigotimes blackout

Time

30 mins

Watch out!

sharp objects.

substances!

of obstacles and dangerous

Innovating for the future Be seen, be safe

Instructions

Ask the children what they think will help them to be seen in the dark. You may want to share the story on the following page about Gem and Cosmic riding their bikes in the dark.

Use some of the 'think and talk about' questions in the next column as prompts for discussion.

Hand out the equipment and let the children explore which materials reflect light and which don't.

As they explore, you could encourage the children to place the materials into different groups.

Finally, ask what materials would they choose to stick to Gem and Cosmic's clothes and bikes to help them be seen better? You could extend the activity by having a selection of light and dark coloured or reflective pieces of paper and ask the children to stick them to an outline of a person or bike.

Think and talk about

- Why do you think Gem and Cosmic couldn't be seen?
- 2 Was it because they didn't have lights on their bikes?
- What are light sources? 3
- 4 Have you noticed what you can see in the dark?

At home

Children can try this activity at different times of the year and see what things they can see that reflect light on their journey home.

Skill unlocked

✓ Creative





Be Seen Be Safe Activity Card

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It is a great day for Gem. Her new bike has arrived. She is going for a ride with Cosmic to visit Aunt Stella. She puts on her favourite black tracksuit and pedals off to meet Cosmic.

A little later, Aunt Stella is SO worried. It's gone as dark as night outside. Where are they?

Suddenly there's a loud knock, rat-a-tat-tat, on the door.

Oh no! It's a police officer with Gem and Cosmic. They are looking very sheepish.

"I nearly knocked these two off their bikes," grumbles the police officer. "They were riding round, no lights and just look at what they are wearing! No wonder I couldn't see them."

"Oh dear!" says Aunt Stella. "We need to make sure you can be seen and be safe in the dark. Now I wonder what we could do? I think we may need some help."



This is one of the British Science Association's CREST Star activities. To find more like this, visit the CREST website: primarylibrary.crestawards. org/#SuperStar



About this activity

In this activity, children will be creating their own innovative instruments using household materials. They can produce different notes with different sized containers; a drum kit made from upturned ice cream tubs and plastic storage boxes, or pan pipes by blowing over the tops of bottles filled with water.

Kit list

- Several containers of different sizes
- Spoons, pencils or other tappers
- Empty tubs, tubes with one end sealed or plastic bottles with narrow necks to blow across

Time

30 mins

Watch out!

Encourage children to tap gently.

Clear up water spills quickly because the floor will get slippery.

Don't let young children play with glass containers unsupervised.

Make sure all containers are clean and dry.

Take it home Music maker



Instructions

This is an activity that parents and carers can do with their children at home. Share the story about Gem and Cosmic's musical breakfast time that the family can read together (page 13).

Encourage parents and carers to provide the children with a variety of different sized containers for them to tap, such as plastic tubs, tubes with one end sealed, or plastic bottles.

They can listen to the different notes they make as they tap and see if they can put the sounds in order from low to high.

They could also use plastic bottles and fill them with different amounts of water then blow across the necks to make different sounds.

You may be able to ask parents and carers to share photos or videos of their creative musical instruments with the school.

Think and talk about

- 1 How did you make a sound?
- 2 Did you notice any change when you changed the size of the container or amount of water?
- 3 Can you think of any other things that you could use to make music?

Next steps

Children could put their instruments on display. Try to make them look interesting by adding coloured water or by decorating them.

Skill unlocked

𝔣 A good communicator





Music Maker Activity Card

Cosmic and Gem are having breakfast with Uncle Astro. Cosmic lifts the fruit juice out of the fridge. Clunk goes the bottle as he puts it down.

> "What a marvellous music maker you are this morning, young Gem," says Uncle Astro, as he tips tea into the mugs.

Gem has an idea. She begins to tap things gently with her spoon. Clink, clink, clink goes her mug. Plunk, plunk, plunk goes the teapot. Clung, clung, clung goes the fruit juice bottle. Tink, tink, tink goes Cosmic's glass.

"Hey, that was a different tune! How did you do that?" asks Cosmic. "I don't know," says Gem. "I'm not sure either," Uncle Astro adds. "Let's find out and then we can play a tune. Cosmic fills his glass almost to the brim with orange juice. "Play it again, Gem," he says. So Gem plays again. Chunk, chunk, chunk goes her mug. Plink, plink, plink goes the teapot. Cling, cling, cling goes the fruit juice bottle. Tunk, tunk, tunk goes Cosmic's glass.

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This is one of the British Science Association's CREST Star activities. To find more like this, visit the CREST website: primarylibrary.crestawards. org/#SuperStar

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Gem thinks the note will be higher when the fruit juice bottle is nearly empty. Cosmic thinks the note will be higher when the fruit juice bottle is nearly full. Uncle Astro thinks the size of the bottle makes a difference.





About this activity

Get creative and enter the British Science Association's annual poster competition. You can make your poster about whatever version of 'Innovating for the future' 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

Ø 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

Innovating for the future Poster competition



Instructions

Get children thinking about ideas to include in their poster.

They could investigate and imagine 'Innovating for the future' and everything that makes it special. Here are some topic ideas to help you get the inspiration started.

- 1 Think about your own innovation – from inventing your own toy that you want to share with your friends to a useful machine that will help your family or the whole world! How will it change the ways of play, sports and leisure, entertainment, communications, work, or even school?
- 2 Feeling futuristic and global? Why not think about an innovation – new ideas, inventions, products or services we have never heard of before that would make the world a better place?
- 3 Do you know someone who is an awesome innovator? Try to showcase their innovations and reflect on how this person's innovations impacted the lives of many.
- 4 Everyday innovations can be easily overlooked. Identify common innovations that you use daily and give a thought on how your life would be without them.





Make your poster

Once you've thought about your idea, it's time to get creative! Your poster must be:

- A4 or A3 size and you need to be able to take a photo of it to send to us online for judging.
- 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, scan or take a photo and go to **britishscienceweek.org for details on** how to send in your entry.

Next steps

Celebrate! For more details, along with the full set of rules and tips for educators, check out our website **britishscienceweek.org**