



# Why&How?

Autumn 2021: Issue 13

Magazine

FREE sample unit:  
Science In My Pocket

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Primary Climate  
Science Symposium:  
Join the conversation  
about effective climate  
science education

Learning to  
think and explain:  
The power of  
pictures

Supporting excellent teaching and learning in primary science  
Why & How? is the magazine of the Primary Science Teaching Trust



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*PSTT recommends that a full risk assessment is carried out before undertaking in the classroom any of the practical investigations and activities contained in this publication.*

### Why & How? is the brand name of the Primary Science Teaching Trust

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# Welcome

Welcome to the 13<sup>th</sup> issue of Why&How?, and we hope you like its new look!

**Rebranded as a magazine rather than a newsletter, Why and How? will continue to be termly and to bring you free resources, plus a wealth of updates and information.**

In this issue, we particularly want to draw your attention to our climate science section and the free to access Primary Climate Science Symposium that we are hosting in November in parallel with COP26. The programme of live online events for children and teachers offers a range of support for climate science education in primary schools.

Our free resources section includes a picture for talk, and a sample unit from Science In My Pocket, (with a printable set of cards to download) and we also highlight our two newest resources, A Scientist Just Like Me and Play, Observe, Ask (in EYFS).

Hot off the press in our project update pages you will find the much anticipated 'Primary Science Capital Teaching Approach: a social justice model for schools' teacher pack. This is free to download and we encourage you to share it widely.

In our collaborator updates, PSQM describes the impact of its new Hub Leader Development Programme and how facilitating hub leaders to work as a community of practice has led to personal development as well as influenced the PSQM process itself. SSERC shares its newest resource, STEM by the Book which provides a fantastic support for teachers to plan their science through children's picture books.

In an in-depth feature in Wider Collaborations, The Ogden Trust outlines its extensive support for primary schools. We are delighted to be working closely with The Ogden Trust on a number of initiatives including developing support for initial teacher education and early career teachers, and co-funding the Primary Science Capital project. The Ogden Trust has been a valued endorser of the Primary Science Teacher Awards for many years, and it is also playing a key role in supporting the new management of Explorify by PSTT in partnership with STEM Learning.

**Please do pass the magazine on to anyone who has an interest in primary science education.**



**Prof. Dudley Shallcross**  
Chief executive officer



**Dr. Sophie Franklin**  
Research Director



**Peter Sainsbury**  
Cluster Director



**Ali Eley**  
Outreach Director



**Sue Martin**  
Programme Director



# News

## Explorify - New Home!

Many of you will be familiar with **Explorify**, the free digital tool for primary teachers developed by the Wellcome Trust. Explorify supports teachers to deliver science confidently and to motivate children. It is packed with exciting activities and resources which make science accessible to all, inspiring scientific enquiry and thinking skills. Explorify delivers proven impact for pupils and teachers, and there are resources, tips and guidance to support science subject leaders.

We are delighted that, as Wellcome moves into its new strategy, Explorify will continue under the management of **STEM Learning** in partnership with the Primary Science Teaching Trust. The partnership is supported by **The Ogden Trust** and the **Glasgow Science Centre**. In the new Explorify partnership,



WHAT IF...

### Plants could move from one place to another?

Register with Explorify to try one of the "WHAT IF..." activities

STEM Learning is providing the digital expertise to ensure that the product stays safe and up to date. STEM Learning and the Primary Science Teaching Trust will continue to develop and disseminate Explorify content, and will work together to encourage teachers and science leaders to access high-quality resources and to engage in pathways of excellent professional development.

Explorify will continue to be free to use for UK teachers. We look forward to welcoming existing and new users to Explorify in its new home, and to a successful future making science exciting, intriguing and fun for young people.

**Register for Explorify here – it takes two minutes and all the activities are completely free!**



THE BIG QUESTION

### Where does our rubbish go?

Register with Explorify to try one of the "THE BIG QUESTION" activities





## Join the conversation about effective climate science education in primary schools

PSTT is pleased to announce it is holding a Primary Climate Science Symposium from 1<sup>st</sup> to 12<sup>th</sup> November 2021. This is an online event for primary teachers and children and will run in parallel with the United Nations Climate Change Conference of the Parties (COP26) hosted by the UK in Glasgow.

The event is FREE for all teachers and schools – see [page 7](#) for further details.



## XAIDA Project

The Primary Science Teaching Trust is delighted to be contributing to XAIDA, a project supported by the European Union's Horizon 2020 research and innovation programme that seeks to establish or refute possible causal links between events and human influence on climate. The project brings together partners from the UK, France, the Netherlands, Germany, Spain and Switzerland for four years, during which time they will use artificial intelligence to process huge volumes of data to characterise, detect, attribute and project extreme events and their impact, to strengthen scientific knowledge on climate, to improve information



for climate services and decision making and to reduce vulnerability.

As part of this project, the Office for Climate Education (OCE) and the PSTT will develop innovative methods and resources for education on climate and science to secure the following outcomes: to improve scientific understanding of future events and preparedness; to promote climate justice, ethics and

solidarity and to increase the attractiveness of mitigation and adaptation solutions; and to contribute to efforts on climate education emphasised in the Paris agreement (art. 12).

PSTT's CEO, Prof. Dudley Shallcross commented:

*"XAIDA is a cutting-edge research project concerned with improving our understanding of the human impact on Earth's climate. It is a privilege for PSTT to be involved from the beginning of the project, aiding the dissemination of the projects' findings to primary schools and their stakeholders. Alison Trew and I look forward to working with many Fellows during the course of this EU wide endeavour."*



## Primary Science Teacher Awards 2020

We are delighted to welcome our most recent Primary Science Teacher Award winners, those nominated in 2020, as PSTT College Fellows.

In a celebration dinner held at the National Railway Museum in York as part of our annual College Conference on 12<sup>th</sup> October 2021, presentations were made to winners of Awards from both 2019 and 2020.

We would like to thank the organisations that have endorsed Awards this year: the Royal Society of Chemistry, The Royal Society of Biology, The Ogden

Trust, The Wellcome Trust, STEM Learning and Bristol ChemLabS; and also The Royal Society, the Association for Science Education and TTS for their continued support for the Primary Science Teaching Awards.

**Congratulations again to all these outstanding teachers.**

## Primary Science Teacher Awards 2020

### **Carla Wallington**

St Christopher's School,  
London

### **David Rigmand**

Brediland Primary School,  
Paisley, Scotland

### **Gemma Robson**

Wallsend Jubilee Primary  
School. Tyne and Wear

### **Jacklyn Purdon**

Ravenswood Primary School.  
Cumbernauld, Scotland

### **Jane Banham**

Friskney All Saints Primary,  
Skegness, Lincolnshire

### **Kate Penarski**

St Bede CE Academy, Bolton,  
lancashire

### **Kirsten Cunningham**

Horfield CE Primary School,  
Westbury on Trym, Bristol

### **Lowri Harris**

Ysgol Porth y Felin, Ffordd  
Llanrwst, Wales

### **Marjorie Kellas**

St Mary's Primary School,  
Bannockburn

### **Michele McMahon**

St Roch's Primary and Deaf  
School, Glasgow, Scotland

### **Rebecca Riley**

Horbury Bridge CE Academy,  
Wakefield, Yorkshire



# Climate science

## Primary Climate Science Symposium

Join the conversation about effective climate science education in primary schools.



“Once young people are inspired to engage with the biodiversity around them, they are far more likely to want to protect and enhance it.”

DOUG GURR,  
Director of the Natural  
History Museum

As part of PSTT’s Climate Science Project, we are holding the Primary Climate Science Symposium (PCSS). This online event for primary teachers and children will run from 1<sup>st</sup> to 12<sup>th</sup> November 2021 in parallel with the United Nations Climate Change Conference of the Parties (COP26), hosted by the UK in Glasgow.

If you are curious about how to incorporate climate science education into your curriculum and school culture, this event is for you. Sessions are designed to open up the conversation around effective approaches to climate science education for primary pupils through sharing research, examples of classroom practice and providing a forum to ask questions.

- For more information please visit the Primary Climate Science Symposium webpage click [here](#):
- To download and share a Primary Climate Science Symposium poster, click [here](#):
- **Do you have a question?** We would love to hear your questions ahead of the event. To submit your question click [here](#):



“Creativity is key to teaching and understanding the climate crisis. If we let our hands and eyes do some talking we can make space for wider learning and deeper understanding”

ALISTAIR LAMBERT, Artist



### The Programme

The two week programme is being finalised and will be published on the website very soon so please keep checking for updates. The programme includes live classroom sessions for children and twilight teacher CPD events.

### Live classroom sessions for children

**Scheduled for 11am, these live online sessions will bring engaging and interactive presentations for children straight into the classroom.**

■ Threats to Nature – an interactive session with the World Wildlife Fund

■ Can we stop climate change? Yes. How can we do this? – An exciting presentation by Dudley Shallcross from the University of Bristol

■ School of Fish: Upcycle a Sculpture Shoal with artist Alistair Lambert

“There is no greater global issue than the climate crisis and educating our young people about it is every school’s duty.”

PAUL TYLER, PSTT Fellow and Principal Teacher at Kirkhill Primary School





“Education is an extremely important solution to many global issues and the climate crisis is no different. I feel deeply called to teaching and learning and I want to dedicate a big chunk of my life to using this purpose for good.”

JOYCELYN LONGDON, Scientist and Founder of Climate in Colour

## Twilight teacher CPD events

**Scheduled for 4-5pm each evening (except Fridays) these teacher development events will include:**

- The symposium keynote talk ‘Making Climate Conversations More Accessible and Diverse’ delivered by Joycelyn Longdon, Founder of Climate in Colour
- A Teachmeet for sharing activities for teaching climate science or sustainability in the primary setting
- A panel discussion to bring together climate science experts and educators, and where teachers can ask questions

**Examples of workshops and seminars:**

- Workshops and webinars presented by colleagues from across the sector
- Empowering children through co-design, with Joe Boyle, Kate Kirkwood and Laura Copley from RSPB Scotland
- Combatting Climate Change by Eating Seasonally, with PSTT Fellow Michele Grimshaw
- Using Digital Literacy to explore the Climate Crisis, with PSTT Fellow Paul Tyler from Kirkhill Primary School

- I bet you didn’t know... cutting-edge climate science research projects can be shared with primary children, with Alison Trew from PSTT
- Explore: Urban Nature – asking scientific questions, with Laura Soul from the Natural History Museum

**At PSTT, we are committed to supporting effective climate science education for all children and we are therefore making this event available to all teachers and schools at no cost to themselves.**

“A clean energy path will not only be better for the planet but will be better for many disadvantaged communities across the world.”

DUDLEY SHALLCROSS, Professor of Atmospheric Chemistry at the University of Bristol and CEO of PSTT

We are delighted that the symposium is being supported by so many different organisations and we thank them all for their time and commitment to the event.



# Free resources

## Picture for talk



[Click to download image](#)

Figure 1

A picture can be a very good stimulus for children to engage in effective talk in science.

Using pictures is an inclusive approach which facilitates high levels of participation. Pictures can also be used as a starting point for inquiry. The discussions the children have will generate questions that they want to investigate.

Asking the children carefully chosen questions about the picture will support them with learning to:

- Construct explanations and link their ideas with evidence
- Make confident challenges to the ideas of others
- Explore scientific terminology and use it with genuine understanding

Pictures for talk in science activities are designed to be very open ended and usable with any age of children. The activities can be done as a quick ten minute starter, or extended into a longer and more in-depth lesson.





## What to do

Download the image in fig.1 by following the link and either display on a whiteboard or give out printed copies. Ask the children to discuss, in groups of three, the following questions:

### What can you see in this picture?

### How do you think the water has become this shape?

This is a picture of two water droplets colliding. When a droplet of water hits the surface of a pool, it becomes part of the water in the pool. The energy of the falling droplet dissipates into the pool creating ripples in the pool and making a splash. Unlike the splash made when a larger object hits a pool of water - imagine someone jumping into a swimming pool - the splash made by a single droplet is very small. This small splash can take the form of a new single droplet, slightly smaller than the original droplet, which travels upwards away from the pool. Then if a second falling droplet hits this new droplet that is moving upwards, it can result in something like this picture, where the colliding drops are dispersed sideways.

Water molecules are attracted to each other. At the centre of a water droplet, these attractive forces exist between the molecules in all

directions. However, at the surface of the droplet, the water molecules have fewer molecules next to them which results in a stronger attraction to centre of the droplet.

This stronger attraction towards the centre creates surface tension, making the surface of the water behave like a sort of skin. Because of surface tension, the shape of a water droplet tends towards a sphere, as this is the shape with the lowest surface area for a given volume.

### Other questions to generate and promote thinking and explaining

- What shape is a droplet of water? What shape is a raindrop?
- How might the shape of a droplet of water change as it falls?
- What do you think happens when a droplet of water lands in a puddle of water?
- What do you think happens to the surface of the puddle?
- What do you think is the biggest volume that a water droplet can have?
- How do raindrops form? What makes them fall?

### Follow-on discussion ideas

Have a look at other pictures or slow-motion videos of water drops colliding with each other.

Ask the children to discuss what factors might affect the outcome of one water droplet hitting another. These might include:

- Speed of the water droplet
- Height of the water droplet moving upwards
- Time gap between when the two water droplets were dropped
- Point of contact of the collision, i.e. if the centres of the droplets are vertically aligned or offset, temperature of the water, disturbance to the surrounding air, e.g. wind speed and direction.

The children could try observing water droplets hitting a container of water. It is quite hard to see as everything happens very fast, but using food colouring for the water droplets would help them observe more easily.

➡ [Click here for other amazing photographs of water droplets colliding](#)

➡ [Click here for brilliant and super slow-motion video shows two droplets colliding](#)

➡ [Click here to find out more about the technology and process involved in capturing an image of two drops colliding](#)

# Free resources

*From PSTT's own collection*



## A free sample unit from Science In My Pocket.

**S**chools have a critical role to play in supporting children's mental health and emotional well-being. Currently, an average of three children in every primary school classroom in the UK have diagnosable mental health conditions. The classroom can be a challenging place for these children and it often falls to a Teaching Assistant to supervise them and support their learning on a one-to-one or small group basis.

Science In My Pocket offers an invaluable addition to a Teaching Assistant's toolkit. The benefits of using the resource include:

- Children become better at self-regulating their behaviour, enabling them to return to a whole class setting more ready to learn and participate.
- Children's social skills improve as the resource provides a context for the child to communicate positively with their peers.



- Increase in the confidence of teaching assistants to engage children in scientific discussion.

Science In My Pocket is a highly versatile resource. The carefully designed and simple activities in the 10 drawstring pockets can be used with children from nursery up

to year 6. They can be used once or repeated multiple times; they can be used indoors and outdoors, and most involve moving around which suits the needs of many children.





## What is in the resource box?

- 10 numbered drawstring cloth pockets, each containing a set of instruction cards. Each pocket is based on a particular theme
- A guidebook for Teachers and Teaching Assistants
- A poster to guide Teachers and Teaching Assistants with choosing a pocket

### The instruction cards all include:

- The BIG questions
- A list of equipment and materials that need to be added to the pockets before they are ready to use (N.B. all inexpensive everyday items)

- Supporting background knowledge and notes for the Teaching Assistant/Teacher

### Science In My Pocket activities have also been shown to be effective for:

- Speech and language development
- EAL – accessing scientific vocabulary in a safe environment
- Short term emotional disturbance, e.g. if a child arrives at school upset
- Extension work, e.g. children might design their own pockets
- Homework activity

- Development of specific personal habits of mind, e.g. independence, negotiation, resilience
- Developing thinking skills across the curriculum
- Promoting good group work

*Science in My Pocket was developed by PSTT Fellows and Area Mentors Nina Spilsbury and Michele Grimshaw, with Ali Eley (Outreach Director).*

➡ [Click here to find out more about Science In My Pocket](#)

➡ [Click here to download the free sample unit](#)



# Free resources

## *A scientist just like me*

### A Scientist just like me



## Introducing children to a diverse range of scientists and people who work in science-related jobs.

**A Scientist Just Like Me** is designed to raise awareness of diversity in science-related jobs and to provide illustrated examples of a wide range of science-based careers. It consists of a series of short slideshows, each one 'telling the story' of a particular scientist or person working in a science-related job. The people included share details of their work and their everyday lives, making their stories relatable to children. They describe their job, what they like about it, and the challenges they have faced on their career journeys.

The resources focus on the skills, attitudes and habits that are needed to carry out the work, rather than on any expert knowledge, which may be daunting or seem out of reach to children. At the end of each slideshow, the children are encouraged to imagine and discuss what it might be like to do that job.

The slideshows are intended to be used as discussion prompts, guided by a teacher. They can be used in different ways and for different purposes, for example,

- To show children an example of someone from a particular ethnic background working in a science job
- To challenge gender stereotypes about science jobs
- As part of a science topic that relates to the work of the scientist
- As stand-alone fifteen minute discussion activities
- With a small group or the whole class, or in a whole school assembly

Where appropriate, the final slide includes suggestions about possible linked resources that teachers may find useful. The full set of slideshows includes people from a variety of ethnic backgrounds, and from many different fields of science. To download a sample slideshow, please click [here](#). To browse the full set, please click [here](#).

If you would like to read more about PSTT's A Scientist Just Like Me please see the article in **Primary Science\*** (2021) 169, 23-25. We are very grateful to the Association of Science Education (ASE) for making this article open access.

#### Acknowledgements

The A Scientist Just Like Me resource was created by PSTT Fellows, Kulvinder Johal, Alison Trew and Ali Eley, based on an idea by Kulvinder.

#### Development of new slideshows – how to get involved

If you work in a science related career (or know someone else who does) and would like to be included in the resources, we would love to hear from you. Please contact Kulvinder on [kulvinder.johal@pstt.org.uk](mailto:kulvinder.johal@pstt.org.uk) or get in touch via the PSTT office on [info@pstt.org.uk](mailto:info@pstt.org.uk).



# Free resources

*Play, observe and ask (in EYFS)*



Strategies, provision, activities and examples of young children learning science to support early years and foundation stage practitioners.

**T**his new resource focuses on the teaching and learning of science through play. It provides support for adults who are helping very young children (ages 3-5) to explore the world around them with a focus on learning science. Organised into comprehensive sections, the activities and strategies are suitable for use by educators in an Early Years setting or by parents or carers at home.

The **Effective Practice** section explains how you could develop science teaching and learning in your Early Years setting or at home. You will find strategies that you might like to use to develop children's science skills and science vocabulary, as well as their knowledge and understanding of the world around them.

The **Provision Maps** offer ideas for activities and science investigations suitable for Early Years children. These are one-page maps that focus on learning science in an Early Years classroom or outdoors and they are linked to different topics, nursery rhymes and storybooks that are commonly used with this age range.

The **Resources** section contains wildlife games and activities that introduce plants, animals and fungi commonly found in Britain. These are intended to develop children's knowledge of the names and features of living things and their habitats that might be found in their local environment. This will enable children to become familiar with the natural world around them, and through this develop an enjoyment of nature and a desire to care for it.

The **Frequently Asked Questions** cover some commonly asked questions about some of the challenges faced by Early Years practitioners and offer some ideas to overcome these.

### Acknowledgements

This resource was created in 2021 by PSTT Fellows who have extensive experience teaching in the Early Years Foundation Stage: Jane Catto, Chris Lawson, Kathy Schofield, Claire Seeley and Alison Trew (in England), Elaine Stockdale (in Wales), Liz Branniff (In Northern Ireland) and Nicola Connor (in Scotland).

We are also extremely grateful to Susanna Ramsey, founder of **The Nature Collection**, who has freely shared her images and ideas that we have included in the Wildlife materials.

# I bet you didn't know

## Plastics in soil affect the survival of plants and worms



**By Dr. Katharine Pemberton,**  
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For a few years, scientists have known that pollution of the oceans by microplastics is harmful to animals and plants living in the sea.

**W**e know that our soils are polluted with microplastics too. Scientists at Anglia Ruskin University have investigated how these plastics affect plants and animals living in the soil.

Earthworms (Figure 1) and other animals are important to soil because when they burrow in it and feed on it, they help to create its structure. When the worms eat organic matter in the soil, they break it down, releasing nutrients and minerals into the soil that plants need to photosynthesise and grow. Organic matter is any material produced by a living organism such as leaves and other parts of plants or dead animals.

### What are microplastics and where do they come from?

In agricultural land – land used for farming - there are thought to be between 700 and 4000 plastic particles per kilogram of soil. One teaspoon contains about 5g of soil, so you would expect there to be between 3.5 and 20 plastic particles



Figure 1. Several species of earthworms are found throughout the world and many are important in the process of soil formation.

in every teaspoon of soil. Plastics in the soil comes from plastic particles in rainwater; from particles floating in the air; from water used to water plants and from sewage used as fertilizer. Plastic is also used on farmland to cover the soil so that weeds are limited and only the crop grows. This is called plastic mulching and is another source of plastic in soil, even though the plastic is often biodegradable – that means it can break down in the soil. Microplastics

are plastic particles that are less than 5 mm in diameter. There are many different types of plastic including polythene, nylon and acrylic. Polythene is not biodegradable and can remain in the environment for decades. Nylon and acrylic fibres come from our clothing and are washed into the sewage system from washing machines. Some biodegradable plastics are now being used but it takes a very long time for them to break down.



## How did the scientists investigate what happens to microplastics in soil?

In this study, scientists studied the effects of microplastic contamination on the rosy-tipped earthworm (*Aporrectodea rosea*) and a type of ryegrass that is very common in grasslands of northern Europe (perennial ryegrass: *Lolium perenne*) (Figure 2).



© Rasbak, licenced through Creative Commons and accessed here.

Figure 2. Perennial ryegrass is a low growing, tufted grass. It is used for grazing livestock, for hardwearing lawns, and for preventing erosion.

Three different types of microplastics were used in the investigation: nylon and acrylic fibres from clothing; micro-particles of polythene and micro-particles of a biodegradable plastic used in farming. The experiments were carried out in 1.3 litre plant pots and each test pot contained soil, earthworms and a different type of microplastic. The control pots contained no

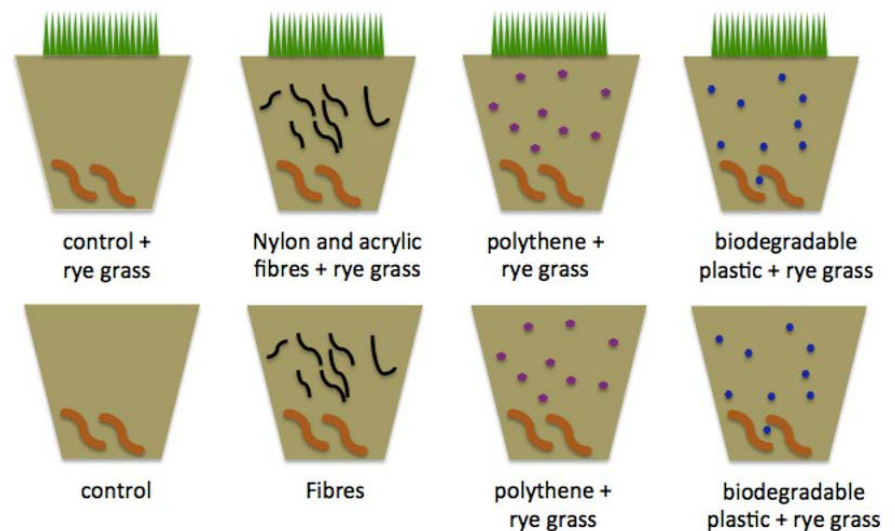


Figure 3. Diagram showing the 8 treatments set up by the scientists.

microplastics. There To set up the investigation, the microplastics were mixed with the soil and both were added to the pots. All the pots were watered and 24 h later, two earthworms were added. Each worm was weighed before it was put in the soil. Ryegrass was then added to the pots that needed it: 200 seeds were sown in each pot. The pots were watered every day for 30 days.

At the end of the investigation, the scientists measured a range of features of the plants:

- How many seeds had germinated in each pot
- Their total mass of shoots and roots
- How moist they were
- Their chlorophyll content

Chlorophyll is the chemical that plants produce to allow them to make their own food by photosynthesis. If they have no chlorophyll, plants cannot photosynthesise and will die.

When plants are under stress, they may produce different amounts or different types of chlorophyll.

The scientists also measured the mass of the worms and some features of the soil:

- The pH (how acidic it was)
- How much organic matter there was
- How moist it was
- How it stuck together to form clumps called 'aggregates'

### How did microplastics affect plants?

The scientists found that the results depended on the type of plastic used. Polythene had no effect on seed germination, but clothing fibres and biodegradable plastics led to a decrease in germination. The plants' shoots were shorter when the pots contained biodegradable plastic, but the overall mass of



shoots was not affected, so they must have grown more, shorter shoots. The plants had 45% more roots when they were grown with polythene particles compared to those exposed to biodegradable plastics. The chlorophyll content of all the plants grown with microplastics was affected. The total amount of chlorophyll did not change but the ratio of the different types of chlorophyll in the plants was very different compared with the control.

### How did microplastics affect earthworms?

All the worms survived but those that were in the pots containing microplastics had lost weight whilst all the worms in the control pots had gained weight. The results were the same with or without the rye grass in the pots.

### How did microplastics affect soil?

The plastics had also affected the soil itself. The soil pH had changed but the type of change varied and the soil in pots containing polythene became more acidic than other pots.

### What did the scientists conclude?

The scientists concluded that different types of plastics had different effects on the plants. This may be due to the different shapes of the microplastics or may be because they contain different compounds and some compounds are more toxic to plants than others.

To get enough nutrients, worms must eat large amounts of soil and it is possible that the plastics damaged their digestion system, stopping them from getting the nutrients they needed to grow. This could ultimately lead to their death.

If soil becomes more acidic, the microbes that breakdown organic matter in it may be damaged and minerals may not get recycled for new plant growth.

### Why is this work important?

These results are important for farms and gardens because the quality and quantity of crop plants depends on the quality of the soil. Even though the scientists do not know why the plants and worms were affected, the study did show that plant growth was changed by microplastics. Because of their important role in processing the soil, earthworms can affect plant growth too so any damage to them may lead to a decrease in plant growth in the long term. There is also the possibility that microplastics could be incorporated into plants as they grow, and this could pose a threat to animals that eat those plants. The amount of plastics could build up in any animal eating lots of plants. This is called bioaccumulation and could ultimately lead to humans ingesting plastic from plants.

### Questions for children to consider:

- What plants do you eat?
- What might happen if these plants contain microplastics?

Practical activities and investigations that enable children to mirror the research of the scientists are described in the accompanying Teacher Guide.

### Glossary

**acrylic** – a type of plastic

**bioaccumulation** – the gradual accumulation of substances in an animal or plant

**biodegradable** – able to be broken down in nature by microbes (which prevents pollution)

**chlorophyll** – the chemical that plants use to trap energy from sunlight, to use in photosynthesis

**microbes** – microorganisms such as bacteria

**microplastics** – plastic particles that are less than 5mm in diameter

**minerals** – substances required by plants and animals in tiny amounts for various functions, for example calcium and copper

**nutrients** – a substance that plants and animals need to survive, for example carbohydrates and proteins

**nylon** – a type of plastic

**organic matter** – any material produced by a living plant or animal, such as leaves or dead animals

**particles** – very small pieces

**photosynthesis** – the process where plants use energy from the sun, with water and carbon dioxide, to create their own carbohydrate or food

**photosynthesise** – when a plant produces its own ‘food’ by photosynthesis

**pollution** – the presence or introduction of a substance to the environment which has harmful effects

**polythene** – a type of plastic

**toxic** - poisonous

### Acknowledgements

This resource contributes to XAIDA – a project supported by the European Union’s Horizon 2020 research and innovation programme under grant agreement No 101003469

**The paper that inspired this work was:**  
*Effects of microplastics in soil ecosystems: above and below ground.*

*By Bas Boots, Connor William Russell and Dannielle Senga Green.*

*Published in Environmental Science Technology (2019) 53, 11496–11506*

*DOI: <https://pubs.acs.org/doi/10.1021/acs.est.9b03304> Accessed 24.9.21*

*All the scientists work at Applied Ecology Research Group, School of Life Sciences, Anglia Ruskin University, Cambridge, CB1 1PT.*



# College Snapshot



**Liz Southwell**  
 South Gloucestershire  
 Primary teacher and  
 primary science consultant  
 Date of Award: 2019



**Carl Luke**  
 Newcastle- Upon-Tyne  
 Lecturer at Northumbria  
 University  
 Science and Computing  
 Lead (Teacher)  
 Date of Award: 2020

**Best science activity for building children’s collaboration and confidence following the disruption caused by the pandemic?**

Using simple ‘explore’ activities as unit or lesson starters, such as exploring a selection of materials, observing a process, sorting or completing simple tests, has helped children to collaborate, discuss and ask questions.

**Best tip for science subject leaders about raising the profile of science in your school?**

Joining in with the **Great Science Share** is a great way to raise the profile of science. The campaign supports teachers to provide opportunities for children to ask their own science questions and to investigate to find the answers.

**Best video for supporting the development of children’s scientific understanding?**

My Year 3 Class loved the **BBC’s animation about how fossils are formed**. Alongside the creation of our own fossils, this video really helped the children to explain a very abstract process.

**Most recommended book for supporting teaching in science?**

I have really enjoyed using and recommending the **PSTT ‘Explore, Engage, Extend’ resource**. It provides great opportunities for exploration and discussion to start a science unit and it helps teachers to identify children’s understanding – and their misconceptions!

**Best tip for science subject leaders about raising the profile of science in your school?**

Provide high quality CPD for staff to develop their confidence. Have exciting and engaging assessment methods to gain the right starting point. Follow children’s interests and build their science capital.

**Most recommended book for supporting teaching in science?**

**See Through Science** - this book is amazing! The pictures develop children’s observation, questioning and discussions skills. I couldn’t live without it.

**Best type of STEM visitor you have had in your school?**

Science students from Newcastle University. They were relatable, knowledgeable and inspirational and their passion for STEM related subjects inspired the children. It is worth contacting your nearest university to find out if any science students would be able to visit your school.



**Alex Farrer**  
South West London  
Head of Science and PSQM  
hub leader  
Date of Award: 2019



**Anna Hammill**  
Howdon, North  
Tyneside  
Assistant Headteacher,  
Year 6 teacher  
Date of Award: 2013

**Best science activity for building children’s collaboration and confidence following the disruption caused by the pandemic?**

A **DIY Faraday Challenge from the IET**. We chose the Lighthouse Keeper Transfer which involved groups of Y5 designing a prototype device that included a working electric circuit. The groups had to assign roles, stick to a budget and give presentations, and the day was great for reconnecting, practical exploration and team work.

**Best tip for science subject leaders about raising the profile of science in your school?**

Definitely Science Selfies! We encouraged all pupils and staff in the school to send in a photo of them “doing” science and encouraged friends and relatives to get involved too. We posted a massive display at the school gates of all of the photos and it was a brilliant way of raising the profile and getting everyone talking about science.

**Most used piece of equipment in your science cupboard?**

We do love our **hand-held microscopes** as they never fail to get a gasp of amazement, but I do also find many uses for aluminum foil! Whether it’s testing heat shields with hairdryers and chocolate buttons, making models of animals or testing for Sun-safe materials with UV beads!

**Best video for supporting the development of children’s scientific understanding?**

I really love seeing **Brian Cox dropping a bowling ball and a feather** in a gigantic vacuum. Fabulous for Y5 forces.

**Best tip for science subject leaders about raising the profile of science in your school?**

Do the **Primary Science Quality Mark**. Working with an experienced hub leader, you learn about different ways of raising the profile of science, through monitoring activities, improving science capital, undertaking and delivering CPD and enhancing the use of resources especially through enquiry.

**Most recommended book for supporting teaching in science?**

**Let’s go! Science Trails**. Each trail provides a learning objective, resource list, health and safety implications and set of ideas and instructions to support outdoor learning. There are 29 trails covering different aspects of the curriculum. It’s great.

**Best STEM visitor you have had in your school?**

Starchaser day. We started off with a whole school space assembly. Then Y2 took part in a rocket building workshop before Y5 had an exciting ‘it came from space’ show with lots of space related artefacts and a Cosmic Chemistry show.



# Project update

## *The Primary Science Capital Teaching Approach: a social justice model for schools*



We are delighted to share with you the new Primary Science Capital Teaching Approach Teacher Handbook.

**T**his comprehensive resource for all primary teachers and school leaders outlines the concept of social justice and science capital. It explains how and why a social justice approach helps learners from diverse backgrounds to engage meaningfully with science. The handbook considers how teachers can plan their teaching by starting with the child and their experiences and interests,

and how they might support the voice and agency of every child.

The handbook includes detailed examples of how the approach works in the classroom, plus clear explanations of successful cascading practices within schools. Teachers show how powerful the approach has been for them and their children: they describe changes they have made to their practice and the positive effects these had on children's engagement and interest in science lessons.

Over the next year the project is continuing into a dissemination phase. The project team will be sharing the outcomes and impact more widely. They will also be leading courses to develop accredited trainers who, through delivering CPD themselves, will support more teachers to embed the approach in their own schools.

*"Jadon finds it difficult to be at school. He's struggling with home life as he was recently taken into foster care. I found out that he had been given a drum kit by his foster parents, and so when we had our lesson on 'sound' I decided to base the lesson around drums. We did a sound experiment outside, where he played a drum and children moved away to see how sound gets softer. I also showed different types of drums and asked Jadon - as the 'expert' in drums - to explain how they might all sound. He was so engaged! He really enjoyed being perceived as an expert in our science lesson. I don't think before I started this approach, that I would have ever thought about including Jadon's drums in my lessons - but this has made such a difference to both him and the whole class!"*

PROJECT TEACHER



**Take a closer look**

**Contextualising or personalising or localising**

**Contextualising** – The importance of flattening a science topic through real-life examples has become widely accepted in science teaching.

For example, to explain the idea of magnets, the teacher shows a video on YouTube of a magnetic levitation train in China. This observed activity exemplifies contextualisation.

**Personalising and localising** – Taking the notion of contextualising a step further, personalising and localising focuses on real-life examples that are personal and local to the child.

For example, the teacher asks students when and how they have used magnets in their lives. Children offer examples of magnets they have experienced, such as fridge magnets and magnetic beads used to make jewellery and accessories.

Close look: How personalising and localising differs from contextualising

**Example**

**Snapchat from a science lesson: personalised hands-on activity**

A Year 5 teacher decided that for the next lesson on fermentation he would discuss breadmaking. He knew that bread was something that all children would be familiar with, as the school neighbourhood had many local bakeries. The teacher brought into the classroom different breads from the local bakeries and supermarket. He felt confident that the children would recognise the supermarket and local breads, and would be willing to participate in the discussion.

The children were then asked to choose any bread of their liking from the different ones he provided. They then talked about the spring structure of the bread as a way of turning the lesson to the idea of bread. Using a newly experiment he had tried, the teacher and children talked about when their parents went to shop. Children also offered examples of TV programmes such as Great British Bake Off, when they had seen the baking process in action. Allowing the children to choose and taste the bread further personalised the lesson. Discussing bread to generalise was a more local and personal starting point than beginning the lesson by explaining the chemical process of fermentation.

Example 7: Personalising and localising in action

**Building science capital**

To help support children's engagement with science, teachers can build their students' science capital by understanding the four areas of science capital assets and throughout their lessons. The table below details the four main components of science capital.

Type of science capital	Ways to build science capital
<b>What you know</b>	<ul style="list-style-type: none"> <li>Help children to understand science concepts, ideas and how science works.</li> <li>Make and build on children's experiential, everyday knowledge.</li> </ul>
<b>Who you know</b>	<ul style="list-style-type: none"> <li>Help children to recognise the broad range of scientific skills and knowledge that already exists in their families, local communities and beyond.</li> <li>Explicitly recognise and value all children's science expertise and encourage them to think of themselves and each other as 'science-y'.</li> <li>Connect children with people who use science in their jobs, ideally through repeated interactions (virtually or in person) with related topics.</li> </ul>
<b>How you think</b>	<ul style="list-style-type: none"> <li>Develop children's science-related attitudes and dispositions through explicit teaching to help them see science as enjoyable and relevant to their own lives and future. Help cultivate the idea that science qualifications are transferable and useful for many areas of life – not just for becoming a scientist, science teacher or doctor.</li> <li>Expand on the idea that a diverse range of people use science skills and education in everyday life in a range of ways. Everyone has science knowledge and expertise, not just scientists.</li> <li>Discuss and help expand the idea that young people can play using their science knowledge and skills in their own lives, and to help their families, communities and wider society.</li> </ul>
<b>What you do</b>	<ul style="list-style-type: none"> <li>Use homework and project work to encourage children to engage in science-related activities outside school.</li> <li>Introduce students regularly to relevant and appropriate science-related media (e.g. TV, online resources, books, magazines, etc.).</li> <li>Create children to take part in local part has, if possible science learning opportunities.</li> <li>Invite students to share their making, creating, repairing, crafting or artistic activities and interests. Value and link that to expertise, interests, knowledge and experiences with lesson content, where applicable.</li> </ul>

**How teacher A adapted a year 2 biology lesson**

Lesson objectives include that animals, including humans, have offspring that grow into adults (Primary, Year 2, KS2).

**Teacher A's original lesson plan**

Teacher Activity	Student Activity
Show video 'parental' on how sex changes in worms.	Open questions from students about the video/animation.
Discuss with the children why they are different to the other 'parental'.	Discuss what that gives about sex.
Students are given images of various different types of animals and asked to group them into 'parental' or 'offspring'.	Students to group through the features of various 'parental' and 'offspring'.

**Teacher A's adapted lesson plan**

Teacher Activity	Student Activity
Ask students the following question: "Who has a parent? (Teacher 'family member')"	Students share examples that happen when an egg joins.
Ask them to discuss the video 'How they are different to the other 'parental' and 'offspring' and how they are different to the other 'parental'."	Children think about how they are different to the other 'parental' and 'offspring'.
Discuss with the children why they are different to the other 'parental'.	Children talk about how sperm and egg cells join to form a new life.
Students are given images of various different types of animals and asked to group them into 'parental' or 'offspring'.	Children to group through the features of various 'parental' and 'offspring'.

**Teacher A's reflection sheet**

How did the science capitalising of my lesson go?

Your group/class: Year 2 Lesson topic: Human offspring. Overall feeling: 😊😊😊

What went well? (Thank you to whom?)

The lesson went well although in the end children engaged with the video. Students shared their own stories that had been told by their parents. For example, Simon said that he had a dog and his mum and his dad had a dog. The same day this was a group story, which was able to focus on and put into the video was working. Also, I was able to extend the lesson and the children to take part in an activity. Children gave very positive responses of themselves.

Even better if?

Next year, I will ask to have more time to discuss the children's own stories and allow them to share their stories and they can draw the animals. This has been to have about 10 minutes to discuss the video, and then to have 10 minutes to discuss the video. The children are engaged, this way to build the science capital, and to have the children to have the opportunity to share their stories to be all shared between.

Sample pages from the Teacher Handbook

The handbook is the result of a two year research and development project led by researchers at the Institute of Education, University College, London and at King's College, London. PSTT Fellows Beth Budden, Tom Jones, Jo Moore, Katharine Pemberton, Kate Redhead, Ruth Shallcross and Tracy Tyrrell were participants in the research. In the second year of the project they each mentored a teacher colleague and conducted professional development sessions for teachers in their schools to embed the approach more fully and sustainably. The project was co-funded by The Primary Science Teaching Trust and The Ogden Trust. The outcomes and impact of the project are also included in the pack.



“Simone in my class has always been disengaged – refusing to take part in lessons. Rather than treating this as a behaviour management issue, I had some exploratory conversations with her and tried to understand more about her, her interests and life. I soon found out that her uncle had diabetes and she knew a lot about the dietary restrictions that her uncle had to follow. I re-thought the upcoming lesson on the digestive system in humans and said that I'd like to draw on her expertise to help teach the lesson. She came running excitedly into my classroom the next Monday – bringing with her a wealth of knowledge.”

PROJECT TEACHER

➡ A copy of the pack can be downloaded [here](#). Please do share this with your school colleagues and across your networks.




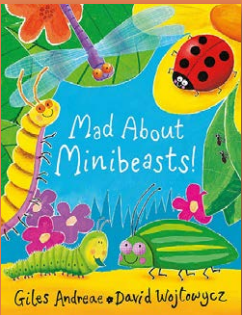
# Collaborator update

## SSERC

Our strategic partner, SSERC, has added an exciting new resource to their collection.

STEM by the Book





**SSERC are delighted to be able to share our new on-line resource STEM by the Book.**

We have taken inspiration from a range of well-known and not so familiar children's books and linked them to a range of SSERC practical activities - designed to support STEM and Literacy.

With an increased emphasis on building literacy skills post-lockdown we feel that this new resource will be really useful in supporting settings across the country.

We are sharing 10 sets of activities initially and we will add more to the website over the coming months. Each activity is closely linked to the story and makes use of easy to access resources. Activities are available at:  
<https://www.sserc.org.uk/subject-areas/primary/primary-resources/stem-by-the-book/>

We have selected books and activities linked to all levels - designed to support reading, listening and talking. With an emphasis on understanding, analysing, evaluating and investigating - the resource aims to engage learners with increasingly complex ideas, structures and specialist vocabulary for different purposes.

**For more information about the STEM by the book resources please email us at [primary@sserc.scot](mailto:primary@sserc.scot)**




Figure 1.

**S**TEM by the Book uses children's picture books as a hook for hands-on STEM lessons, all linked to SSERC's existing practical activities. Based on strong links between literacy and science, 'STEM by the Book' supports children's engagement and learning in both curriculum subjects. See fig.1 for further information and for links to the materials.

You might want to take a look at some other primary STEM resources freely available from SSERC.

➤ **SSERC bulletins linked to the Curriculum for Excellence:** this is a huge collection of topic based ideas for practical investigations, all including supporting resources, background information and comprehensive teacher notes. The bulletins cover a multitude of topics, all the way from a Bundle of Bubbles and Bees, to Wriggly Worms and Windowsill Water Cycles.

➤ **Titanic investigation videos:** The story of the Titanic is an exciting historical context for practical science investigation. **PSTT's Titanic resource**, written by PSTT Fellow Jim McDaid, provides a step by step guide for teachers to carry out engaging cross-curricular science enquiry. The primary science team at SSERC has created a series of short videos to illustrate practical science activities based around the story of the Titanic.

# Collaborator update

## Primary Science Quality Mark

### The Primary Science Quality Mark Hub Leader Development Programme.



Through a partnership with the University of Hertfordshire, PSTT has been a core funder of PSQM for over eight years. Here, the deputy director Helen Sizer describes one of the programme's latest developments.

If you are familiar with the term 'hub leader' it is likely you have heard of the Primary Science Quality Mark (PSQM). Hub leaders are at the very heart of the PSQM organisation and in this article Helen Sizer (PSQM Deputy Director) reflects on who they are and what they do.

Poised to deliver my first talk at the annual PSQM hub leader conference a few years ago, I took a deep breath and surveyed my audience; classroom teachers, professional development consultants, local authority advisors, doctoral researchers, PSTT fellows, even authors of books I had read just weeks before. I was about to talk to some of the very best educators in primary science; inspiring, if perhaps a little nerve wracking! During that conference, I discovered more about the hub leaders' diverse backgrounds and the depth and breadth of their expertise, but despite the wide range of experience, I realised that they were united by an overwhelming passion for primary science education. I left that conference

knowing that hub leaders were the lifeblood of PSQM and wondering how we could further use their collective strength and vitality.

PSQM is a year-long school improvement programme for primary science, raising the profile of science and the standard of teaching and learning through improving the practice of the science subject leader. There are now over 80 hub leaders across the UK who deliver the PSQM programme to clusters of schools – a 'hub'. Each hub becomes a mini community of practice as hub leaders skilfully guide science subject leaders to identify whole school needs, implement actions and deepen reflective practice.

Since that first conference I have been privileged to work with PSQM to create a 'hub leader development programme'. This work has been part funded by The Ogden Trust. It has provided a clear development route for people wishing to become a hub leader through in-house induction, mentoring, workshops and professional discussions. Not

only has this helped existing hub leaders broaden their practice, but it has been exciting to watch subject leaders progress to a hub leader role after completing the quality mark. As PSQM continues to build links with other primary science organisations, it is clear that developing new talent in this way is not only building capability and capacity for PSQM, but for the wider primary science sector too.

This year, hub leaders were invited to take part in professional discussions with a senior regional hub leader. These reflective conversations about their experiences in the role aim to develop expertise as a hub leader and they support the organisational ethos for reflective practice, an approach which is embedded within the PSQM programme. Identifying specific expertise held within the PSQM community now means the hub leader workshop programme is dynamic and sustained with hub leaders supporting hub leaders. The collective feedback is feeding into a critical evaluation of both programme and processes meaning that hub leaders are influencing PSQM organisational strategy nationally.

So it seems that hub leaders have reached a coming of age as an active community of practice where people learn together. With a team of people like this on board, I can't help but wonder, what next...

If you are interested in joining us to become a hub leader please contact Helen Sizer on [h.sizer@herts.ac.uk](mailto:h.sizer@herts.ac.uk)



# Wider collaborations

## *The Ogden Trust*



Find out more about The Ogden Trust's support for primary science, their collaborative partnerships, and how you can access their free resources.

**T**he Ogden Trust exists to promote the teaching and learning of physics and it aims to increase participation in physics for under-represented groups. The priority audiences for the Trust include teachers without a physics background, teachers and students in remote rural areas or in areas of social deprivation, and students on free school meals. In this article, The Ogden Trust explains more about how it enables innovative physics teaching to happen, encourages physics graduates to go into teaching, and supports schools to

work in collaborative partnerships with each other and with universities and other organisations.

### **Working together to achieve more**

Physics helps us to explore how things work from the very smallest particles of matter to the entire scale of the universe. It opens doors to careers and sets people on unexpected journeys of discovery and opportunity. But we know that many young people feel that physics is not for them; they feel discouraged from continuing an early interest and don't take physics further. Engaging primary schools is crucial to effecting

real change in the physics education landscape; we want to build the confidence of non-specialist teachers to deliver hands-on physical science in the primary classroom, and to help primary schools capture and develop the natural curiosity and inquisitiveness of young learners.

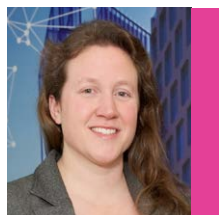
### **Ogden Partnerships**

School-led partnerships are at the heart of the Ogden Trust's ambition to increase the uptake of physics post-16 by supporting physics education and engagement for all young people, particularly those in under-represented groups.



## Who's who at The Ogden Trust

### Clare Harvey, Chief Executive



Clare works with our Trustees, staff, advisers and partner organisations to develop and deliver the programmes that will challenge physics stereotypes, expand access and opportunities, and make physics matter to more people.

"We have worked hard to build our programme of support for primary schools to help them deliver hands-on practical science in the classroom that will help to develop our future physicists. We want pupils to head into secondary education believing they can be scientists; our School Partnerships programme and CPD is helping to enable this, as is our work with partner organisations such as the PSTT."


### Wendy Cox, Head of Education



Wendy oversees the School Partnerships programme, supported by a team of programme managers. She began working with the Trust as a consultant in 2005; in 2014, Wendy took on a full-time role to launch the Ogden primary

programme which is now a core foundation of our partnership work.


"We realised that we needed to work with primary schools if we wanted to make a real difference in physics education. We wanted to help schools capture and develop the natural curiosity and inquisitiveness of young scientists, and to build the confidence of non-specialist teachers to deliver hands-on science in the primary classroom, especially in the physical processes."



Support & funding to build a **culture** of science in schools with positive environments for physics learning & supportive & collaborative teaching communities



Free **CPD** to develop physics subject knowledge & teaching confidence from the Early Years through to Key Stage 3



Investment in partnership physics **enrichment** to enhance & secure physics education & engagement, & develop student science capital

### School Partnerships programme

Partnerships work across primary and secondary schools to build links for transition and progression and are part of a supportive wider network of other Ogden partnerships, advisers, and experts. There are two main strands within the Partnerships programme: local clusters and established collaborations. The Trust is now inviting applications for new partnerships in both strands. Expressions of interest need to be made by 1 February 2022 and successful applications will officially join the programme in September 2022. More information can be found [here](#).

### Local cluster partnerships

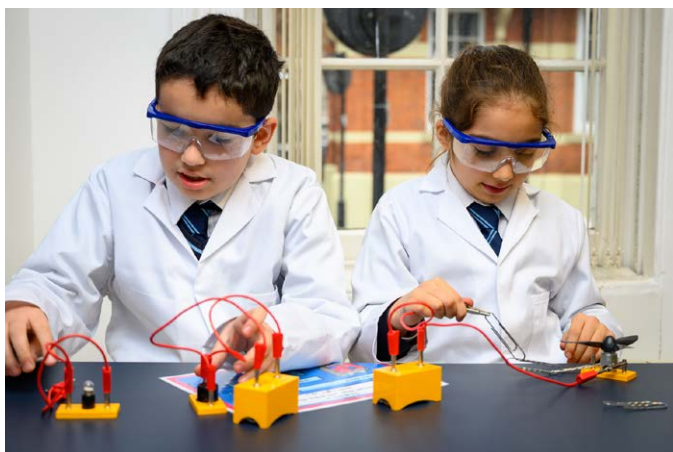
A local cluster partnership is a group of four or more schools within a local area who want to collaborate on projects that enhance the teaching and learning of physics. They are eligible for:

- Up to £2,500 funding per academic year for the first three years
- Up to £1,000 funding in the fourth year
- A time-buy-out of half a day a week for the partnership co-ordinator in the first year

### Established collaboration

An established collaboration partnership is a group of four or more schools associated through a multi-academy trust or similar, who want to collaborate on projects that enhance the teaching and learning of physics. They are eligible for:

- Up to £2,000 funding per academic year for the first three years
- Up to £1,000 funding in the fourth year
- A time buy-out of half a day a week for the partnership co-ordinator in the first two years of a partnership



KS1-2	2021-2022 Light & Sound 	2022-2023 Earth & Space 	2023-2024 Electricity 	2024-2025 Forces 
EYFS	Science Talk (available in the first year of a partnership with primary schools)			

“We hope that the School Partnerships programme helps to increase the number of students going on to take physics at GCSE, A-level and at university, as well as thinking about how physics can contribute to career aspirations,” explains Wendy Cox, Head of Education at the Trust. “To make this happen we need to fully engage and support primary teachers in our partnership programme; giving them the knowledge, confidence and resources to deliver inspiring practical physics to the youngest learners.” Primary schools in the Partnerships programme benefit from annual Phizzi CPD which covers the main areas of the physics curriculum on a four-year cycle. It provides a comprehensive teacher guide and

resources for 10 investigations each year to support scientific enquiry and working scientifically. This Phizzi CPD increases confidence in tackling practical science, improves subject knowledge, and supports teachers in identifying and tackling pupil misconceptions. A programme of Early Years CPD helps build confidence and curiosity in young learners as they develop their communication and language through understanding the world.

### Resources

The Trust has also produced a range of freely available curriculum resources to support practical science in the primary classroom and the development of working scientifically skills. The resources

have been evaluated by The Association for Science Education and awarded the ASE Green Tick.

Why not challenge your pupils to create a till roll timeline to explore the 10 loudest sounds ever heard? Children will need to carefully measure out a 90cm length of till roll to represent the past 180 years. They need to mark one end of the till roll (left) 1840 and the other end (right) 2020. Children can then create a scale marking every 20 years at 10cm intervals. Show the children our list featuring ‘10 of the loudest sounds ever heard’. They need to research the events and mark their findings on the till roll. You can find full instructions and all our other resources on the Ogden [website](#).

“Our Ogden partnership has been an excellent opportunity for us to branch out and work collaboratively with other schools in the area. Working as part of an enthusiastic, supportive and forward-thinking team has supported our development, challenging us to question our delivery and provision of science, and always ask ourselves, how can we improve this? Staff are growing in enthusiasm and our children have noticeably seen the profile of science raised throughout the school, both in terms of lesson delivery and extracurricular opportunities.”

NASHIM PRABATANIM, Partnership Co-ordinator, Swadlincote Partnership





## Head of Education, Wendy Cox, describes how The Ogden Trust and the Primary Science Teaching Trust are working together.

"We engage with lots of organisations who share our ambitions and motivations, including the Primary Science Teaching Trust. We are delighted to work with them to support the Primary Science Capital Teaching project, for example, which is looking at how primary science teaching can be adapted to create a more personalised, localised, and engaging experience. More recently we have been supporting PSTT with

content for its new Primary Science Enhancement Award scheme which has been developed to ensure primary science teaching is part of the initial teacher training.

"We have been longstanding supporters of the Primary Science Teacher Awards. It is always exciting to learn about the fantastic achievements of the teachers who have been nominated and we are delighted to offer our

endorsement to teachers who have made such a positive contribution to their profession.

"We are also really pleased to support the new partnership between STEM Learning and the Primary Science Teaching Trust which has ensured the future of Explorify. Its ethos and resources resonate with our aims to encourage questioning and curiosity in primary science."

"Ogden Phizzi CPD has provided an opportunity for teachers and teaching assistants to learn easy, engaging and practical applications of primary physics-based science, removing the barriers sometimes associated with teaching a subject not in their field of study. The lesson plans and resources that accompany the training have been shared in staff meetings, and feedback has been incredibly positive across the partnership. Teachers feel well-prepared and confident to teach something they otherwise might feel intimidated by."

CHERYL FROST, St Austell Partnership



# Wider collaborations

## STEM Learning



From Oceans to Energy, Engineering to Animals. Engage your pupils with our webinars and quizzes for KS2 this term.

BOOK NOW

## We are pleased to bring you details of the STEM Ambassador KS2 Webinar Series for the Autumn 2021.

**S**TEM Ambassadors are hosting a series of webinars designed for KS2 pupils over the Autumn term. Taking place on Tuesdays or Thursdays, the webinars will see a collection of 3 or 4 Ambassadors talk for no more than 7 minutes each about their job, their industry and themselves, related to the topic of the day. The webinars will not last longer than 45 minutes and they will not be recorded. Topics include medicine, space, animals and energy.

The Ambassador Quizzes are a set of 10 or 12 questions related to the topic of the day. Each question will be read out by the Host or an Ambassador and will come with three possible answers. Pupils will have ten seconds to decide what they think the answer is and then

we will give the answer followed by an explanation. We will leave a little room between the answer and the explanation so you can decide in what way your students will share their joy if they get the right answer (clapping, cheering or a 'yes' for example!).

- You can find information about the webinars and quizzes [here](#):
- Or to go straight to the registration on Eventbrite [here](#):

Webinars and quizzes are open to primary schools from across the UK and will be held on MS Teams (webinar or Teams Live depending on the expected number of sign-ins). If interested please indicate which sessions you would like to attend using the list. There is no maximum, you may attend any or all of the webinars. Links to sign into the

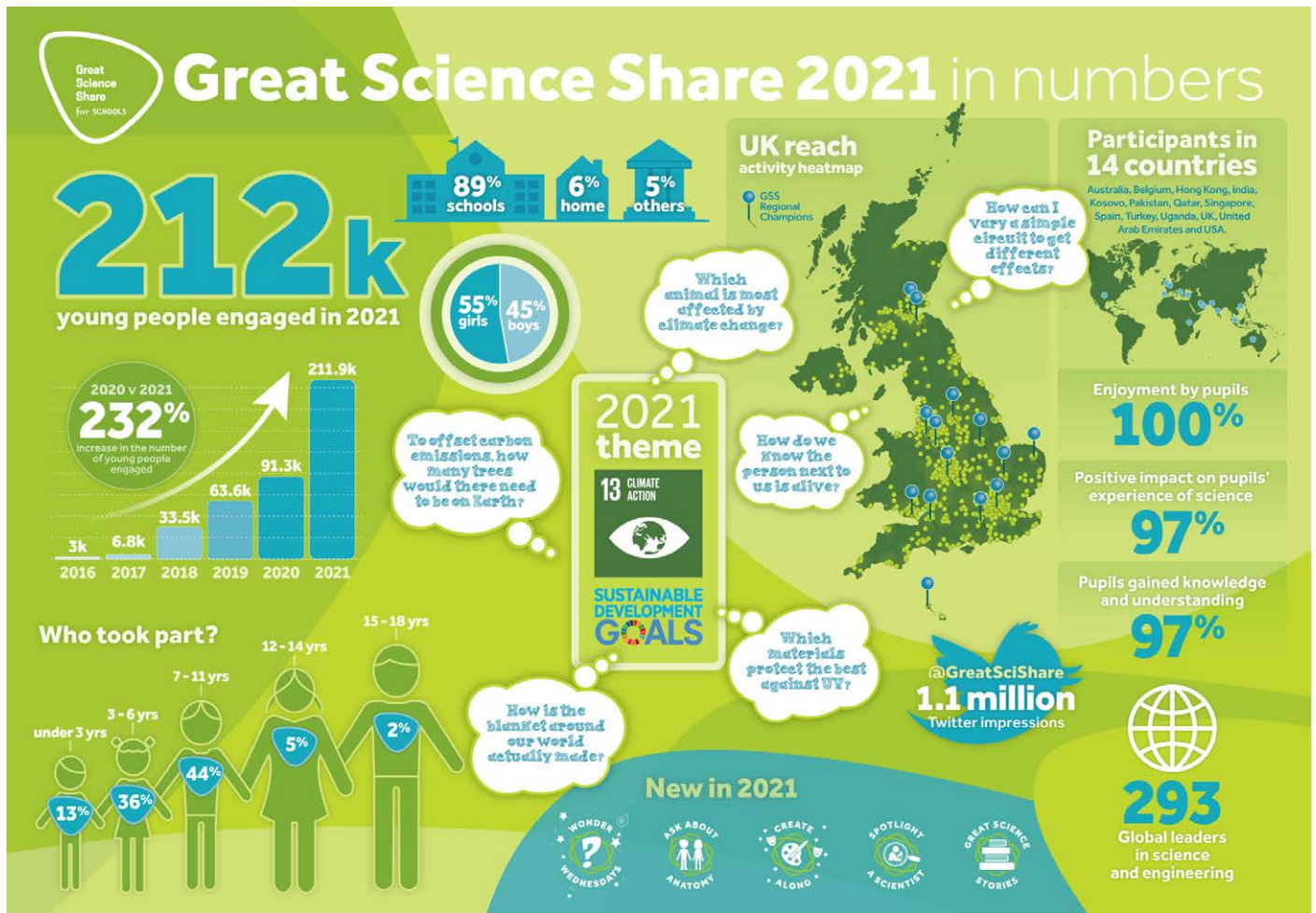
webinars will be emailed to you 24 h before each individual webinar or quiz and you can sign in up to five minutes before the start of the webinar to ensure your connection is working.

During the webinar school cameras will be kept off but we may ask you to turn your microphone on at certain points for any interactive elements. Time permitting, there will be an opportunity at the end for questions which should be submitted via the webinar chat function. You can add these to the chat at any point during the webinar, the host will then pick a selection to ask the participating Ambassadors.

- If you have any queries please contact the London STEM Ambassador Hub [here](#).

# Wider collaborations

## The Great Science Share for Schools



MANCHESTER METRO, BASF, MANCHESTER CITY COUNCIL, SIEMENS, THE ROYAL SOCIETY, COMINO, Why&How?, OPEN UNIVERSITY, Association for Science Education, ESERO, Cityicity, PSQM, GREAT LEADERS, www.greatscienceshare.org

## PSTT’s commitment to the Great Science Share for Schools increased further during 2021.

**A**s an event sponsor, we provided four GSSfS Regional Champions from our Regional Mentor Programme, in addition to continued support and promotion via our Fellows’ network, many of whom arranged events in their own schools and within wider associated schools and organisations.

Our Fellows contributed to and took part in online national webinars, arranged localised activities that supported large and small-scale events, and created resources that were freely accessible to teachers across the GSSfS. For just a few **examples**, take a look at Claire Seeley’s ‘Where is the windiest place?’ video, created in conjunction with children’s TV presenter Naomi

Wilkinson; and check out Jules Pottle and Rufus Thomas’ science and literacy special – the first bespoke Great Science share story, Doffa’s Reindeer.

PSTT now looks forward to the Great Science Share for Schools 2022 and its continued commitment to inspiring young people to share their scientific questions and investigations.



# Wider collaborations

## The Royal Society

### What do you want to know about climate change and biodiversity loss?

The Royal Society has recently launched two new evidence-based classroom resources to enhance your own knowledge and support informed discussions in the classroom. These question and answer format packs come in two ability levels to suit those aged 7 to 18.

#### BASIC (10 Q&A)

Suitable for younger learners where the attractive imagery can be used to stimulate a teacher-led discussion.

#### EXTENDED (20 Q&A)

This pack contains an additional 10 questions and further links to enhance and develop your own knowledge of the topic.

To find out more about these and other free resources, and to sign up to our monthly newsletter, visit [royalsociety.org/teaching-resources](https://royalsociety.org/teaching-resources)

THE ROYAL SOCIETY



To support teachers in schools and colleges across the UK, the Royal Society has developed a number of evidence based resources for use in the classroom, as well as sharing a number of resources developed by teachers.

Linking to the curriculum and focusing on the development of key skills, or current scientific themes such as climate change, green energies and data science, these resources are free to download

and no sign-in is required. There is a range of resources available, including lesson plans, activity sheets, factsheets and videos, covering both primary and secondary levels.

Alongside the resources, teachers will find suggestions for using the resource and further background reading to support their own understanding.

**'Tomorrow's climate scientists'** is an extension to the Society's school funding programme **Partnership Grants**. Introduced in 2020,

Tomorrow's climate scientists aims to give students across the UK not just a voice, but an opportunity to take action themselves to address climate and biodiversity issues – to become the climate scientists of tomorrow. Schools can apply for grants of up to £3,000 to run investigative STEM projects in partnership with STEM professionals from academia or industry.



# Key dates

**1-12**  
**NOVEMBER**  
**2021 ONLINE**

The Primary Climate  
Science Symposium

**14**  
**JANUARY**  
**2022**

Primary Science Teacher  
Awards deadline for  
nominations

**5-8**  
**JANUARY**  
**2022**

Sheffield Hallam University  
Association for Science  
Education (ASE) Annual  
Conference

**14**  
**JUNE**  
**2022**

The Great Science  
Share for Schools

sharing  
& learning

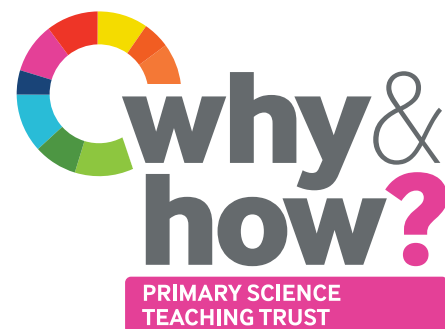
excitement  
& exploration

discovery  
& delight

investigating  
& questioning

[www.pstt.org.uk](http://www.pstt.org.uk)

The Primary Science Teaching Trust  
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**Why & How?** is the brand name of the **Primary Science Teaching Trust**  
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