Engage Teacher Conference

Small hands, big ideas: discover free STEM resources for ages 3-7

Leaders from the STEM sector are coming together to showcase their top free primary resources. Find inspiration for your lessons.

Sarah Dagnell, Explorify

Catherine Davies, CREST

Marissa Rauth and Peter Jeffrey-Bourne, Science Museum Group

Carol Davenport, NUSTEM

Chris Lawson, Primary Science Teaching Trust

Engage Teacher Conference

Engage

Welcome, please be aware:

- Talks are recorded.
- There will be time for questions at the end.
- You can send messages in the chat or raise your hand.

Engage

Explorify

Sarah Dagnell
Primary STEM Lead,
STEM Learning

www.stem.org.uk/explorify

What is Explorify?

Explorify is an extensive and totally free digital resource of engaging, creative science activities for primary and early years teachers designed to stimulate curiosity, discussion, and debate in the classroom.

- Planning support
- Assessment
- Inclusion

https://www.stem.org.uk/explorify

Explorify
POWERED BY STEM LEARNING

STEM LEARNING

Explorify
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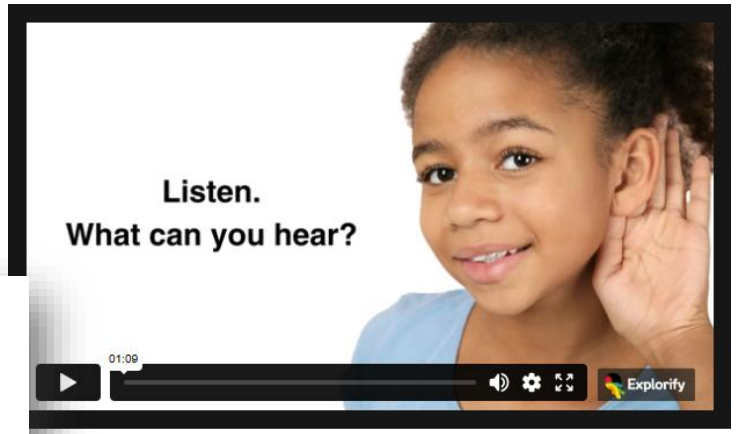
STEM LEARNING

Teacher activity support

- Activity overview
- Run the activity
- Background science
    - Watch out for
- Take it further
    - Outside
    - Sensory
    - Investigate
    - Role play
    - Construction
    - Storytime
    - Watch/Listen etc.

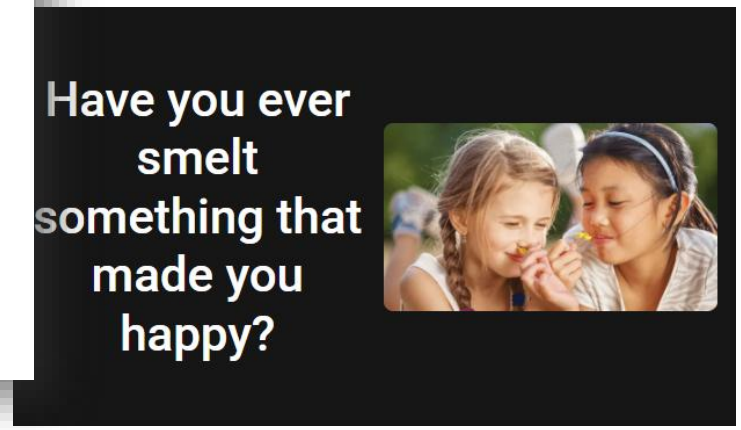
Explorify
POWERED BY STEM LEARNING



Early Years

Explorify planning support

Curriculum statements	Explorify activities		Details
Animals			
Name and describe some plants and animals children are likely to see, encouraging children to recognise familiar plants and animals whilst outside. **Development Matters - England** I have observed living things in the environment over time and am becoming aware of how they depend on each other. **Scotland** I can recognise that plants and animals are living things which grow. **Wales**	Have you ever cared for a baby animal?	HYE	Get your children chatting about something they have all experienced.
	Black tips	ZIZO	Dog
	Stripes and patches	ZIZO	Dog
	Wavy hair	ZIZO	Donkey
	Watery home	ZIZO	Frog
	Spiky spikes	ZIZO	Hedgehog
	Grooved lines	ZIZO	Goat
	Fluffy and ginger	ZIZO	Horse
	Speckled and soft	ZIZO	Horse
	Brown hair	ZIZO	Rabbit
	Fluffy and white	ZIZO	Rabbit
	Curly locks	ZIZO	Sheep
	Green scales	ZIZO	Snake
	Small and hairy	ZIZO	Spider
	Thin strands	ZIZO	Squirrel
	Tangled up	ZIZO	Squirrel
	Shiny sections	ZIZO	Worm
	Dawn to dusk	LWCY	Birds
	Out and about	LWCY	Woodpecker, aeroplane, person walking through leaves and birds singing
	Life in the wild	LWCY	Elephant, rattle snake and chimpanzee
	Old MacDonald	LWCY	Cow, sheep and pig



Explorify
POWERED BY STEM LEARNING

https://www.stem.org.uk/explorify/explorify-planning-support

Engage

CREST Awards

Catherine Davies
Education Resources Manager.
The British Science Association

www.crestawards.org

CREST AWARDS | STAR

Introducing CREST Star...

For young learners at the beginning of their STEM journey, getting hands-on with engaging investigations is key!

With **over 25 challenges to choose from at Star level**, covering a range of STEM topics and themes, all **CREST resources are free to browse and download** from the online Resource Library

Children can track their progress as they work through the activities using a Star Passport

Once they've completed **at least 6 challenges**, they can be recognised and **rewarded with a CREST Award certificate**!

CREST AWARDS | STAR

Colourful, fun and engaging resources

Choose from **a range of topics and themes**, all with **real-life contexts,** allowing children to make links with their own experiences

Flexible plans and editable versions of some resources mean that **challenges can be adapted** to the needs of your learners, ensuring that everyone can access the activities

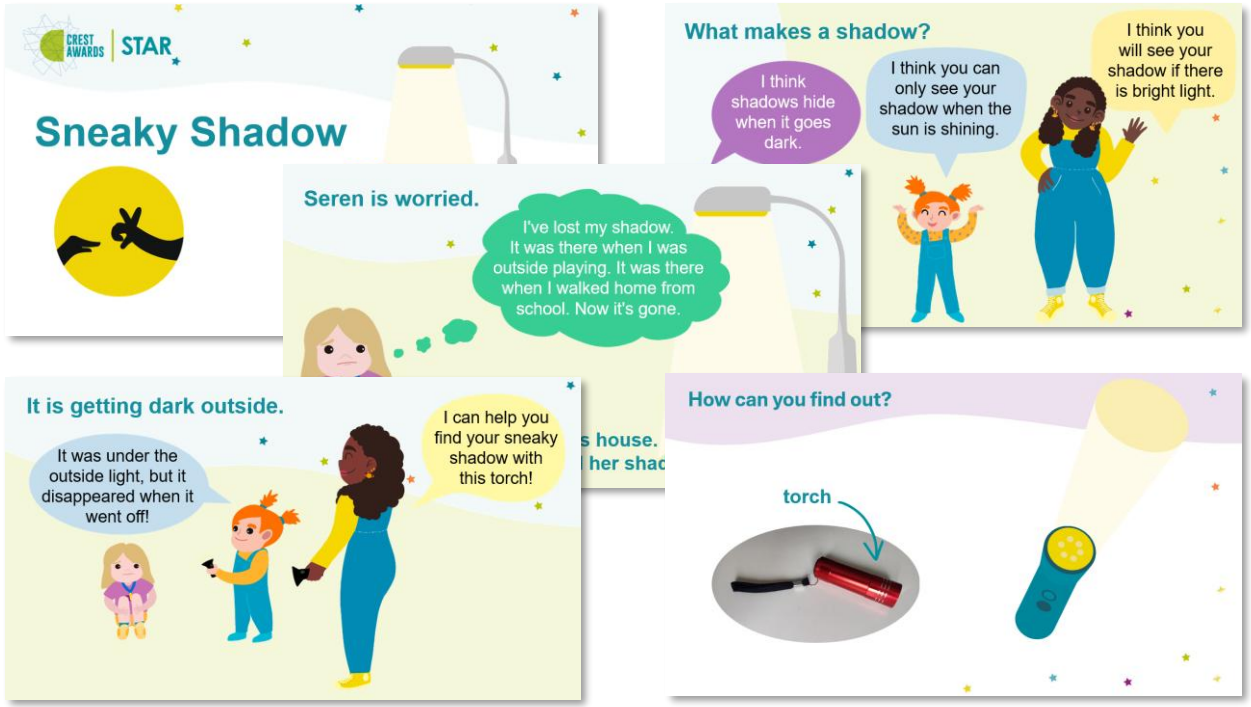
Story scenarios and relatable characters help to capture children's interest, whilst the use of simple, readily-available equipment makes CREST easy to run

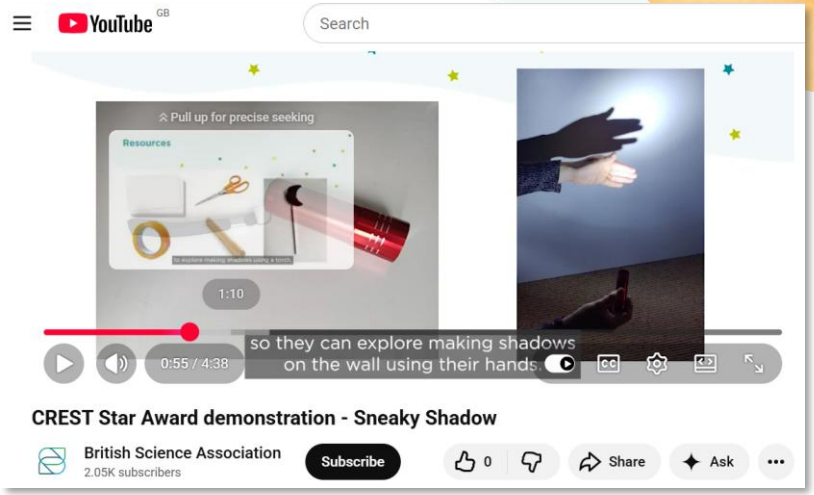
Plenty of opportunities to **take the learning outside**, plus suggestions and prompts for **cross-curricular follow-on activities**

CREST AWARDS | STAR

Supporting classroom slides

Many Star level challenges come with classroom slides, to support understanding and engagement





Short demonstration videos

Brief demo videos are also available for many activities, so you can quickly get up to speed with how to run the challenges

CREST AWARDS | STAR

Find out more and get started by visiting the CREST website!

How to run

Plan

Explore our free activities in the Resource Library and pick the ones you want to do with your children.

You can also choose your own activities. Pre-order your Star certificates to have them ready for your event!

Browse Resource Library

1

Explore

Select and run at least six Star activities.

This is the fun part! Children take on the role of investigators, while you use the organiser card for the activity.

2

Apply

Create a free account on our application platform to order your certificates.

Complete the application, pay for the Star certificates and they will be delivered to your delivery address.

Apply now

3

Achieve!

Celebrate the incredible achievement of the children as they earn their Star CREST Awards!

Share your experience with us or tag us in your posts. Let's spread the joy and inspire others with the children's success!

Share your experience

4

Engage

Science Museum Group

Peter Jeffrey-Bourne
Academy and Resources Developer

Marissa Rauth
Academy Programme Leader

www.sciencemuseumgroup.org.uk/

RESEARCH

The Primary Science Capital Teaching Approach

University College London

See, move, wonder: supporting young children with low science capital to learn from science museum objects

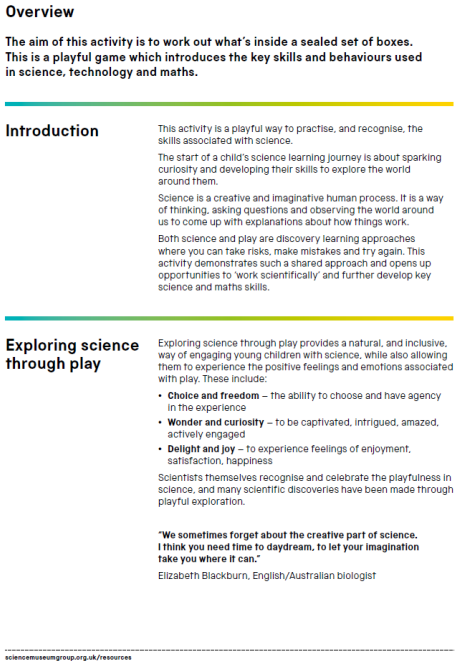
Science Museum Group Journal, 2025

Supporting young children's learning from science objects: the importance of play on gallery

Science Museum Group Journal, 2023

CURIOSITY GAME

Highlights and develops skills



Overview

The aim of this activity is to work out what's inside a sealed set of boxes. This is a playful game which introduces the key skills and behaviours used in science, technology and maths.

Introduction

This activity is a playful way to practise, and recognise, the skills associated with science.

The start of a child's science learning journey is about sparking curiosity and developing their skills to explore the world around them.

Science is a creative and imaginative human process. It is a way of thinking, asking questions and observing the world around us to come up with explanations about how things work.

Both science and play are discovery learning approaches where you can take risks, make mistakes and try again. This activity demonstrates such a shared approach and opens up opportunities to 'work scientifically' and further develop key science and maths skills.

Exploring science through play

Exploring science through play provides a natural, and inclusive, way of engaging young children with science, while also allowing them to experience the positive feelings and emotions associated with play. These include:

- **Choice and freedom** – the ability to choose and have agency in the experience
- **Wonder and curiosity** – to be captivated, intrigued, amazed, actively engaged
- **Delight and joy** – to experience feelings of enjoyment, satisfaction, happiness

Scientists themselves recognise and celebrate the playfulness in science, and many scientific discoveries have been made through playful exploration.

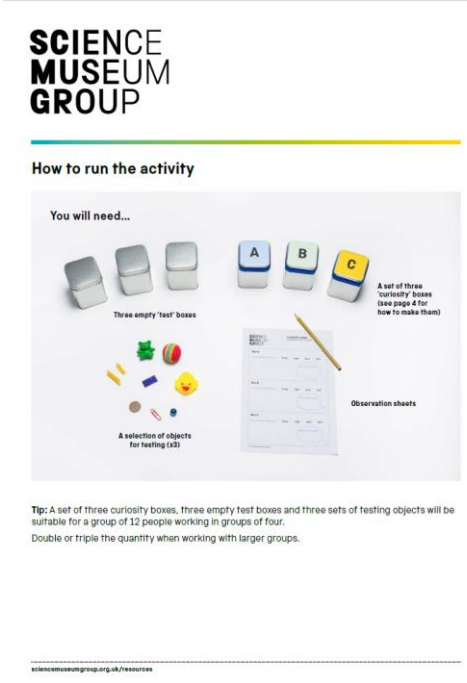
"We sometimes forget about the creative part of science. I think you need time to daydream, to let your imagination take you where it can."

Elizabeth Blackburn, English/Australian biologist

sciencemuseumgroup.org.uk/resources

Builds confidence in adults

Explores STEM through play



SCIENCE MUSEUM GROUP

How to run the activity

You will need...

Three empty 'test' boxes

A set of three 'curiosity' boxes (see page 4 for how to make them)

A selection of objects for testing (x3)

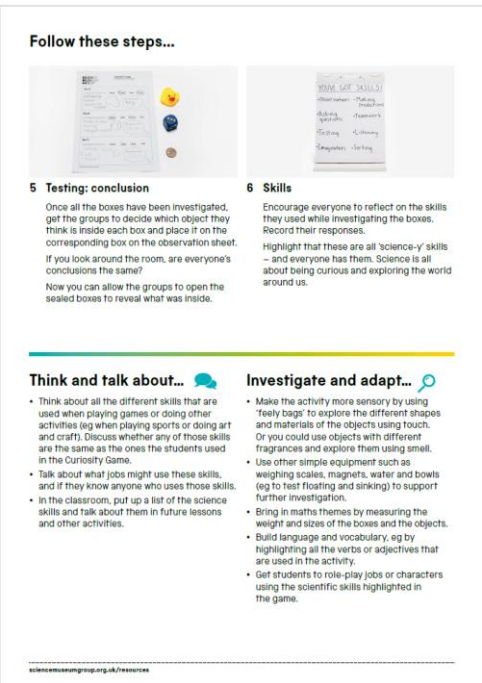
Observation sheets

Tip: A set of three curiosity boxes, three empty test boxes and three sets of testing objects will be suitable for a group of 12 people working in groups of four.

Double or triple the quantity when working with larger groups.

sciencemuseumgroup.org.uk/resources

Promotes science talk



Follow these steps...

5 Testing: conclusion

Once all the boxes have been investigated, get the groups to decide which object they think is inside each box and place it on the corresponding box on the observation sheet.

If you look around the room, are everyone's conclusions the same?

Now you can allow the groups to open the sealed boxes to reveal what was inside.

6 Skills

Encourage everyone to reflect on the skills they used while investigating the boxes. Record their responses.

Highlight that these are all 'science-y' skills – and everyone has them. Science is all about being curious and exploring the world around us.

Think and talk about...

- Think about all the different skills that are used when playing games or doing other activities (eg when playing sports or doing art and craft). Discuss whether any of those skills are the same as the ones the students used in the Curiosity Game.
- Talk about what jobs might use these skills, and if they know anyone who uses those skills.
- In the classroom, put up a list of the science skills and talk about them in future lessons and other activities.

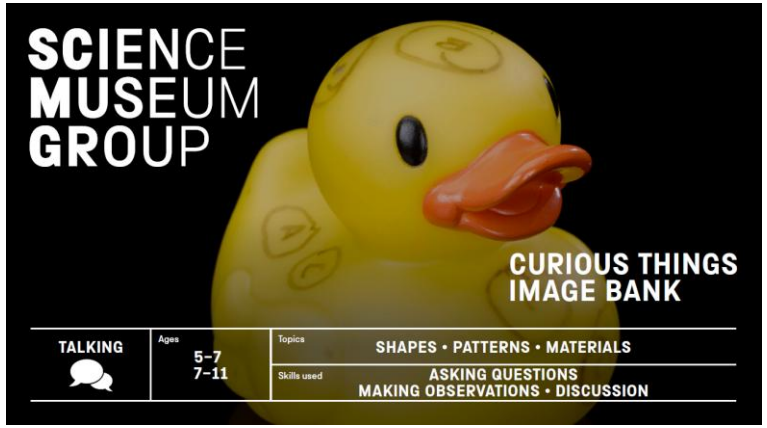
Investigate and adapt...

- Make the activity more sensory by using 'feely bags' to explore the different shapes and materials of the objects using touch. Or you could use objects with different fragrances and explore them using smell.
- Use other simple equipment such as weighing scales, magnets, water and bowls (eg to test floating and sinking) to support further investigation.
- Bring in maths themes by measuring the weight and sizes of the boxes and the objects.
- Build language and vocabulary, eg by highlighting all the verbs or adjectives that are used in the activity.
- Get students to role-play jobs or characters using the scientific skills highlighted in the game.

sciencemuseumgroup.org.uk/resources

Builds confidence and ownership

CURIOUS THINGS IMAGE BANK: OVERVIEW



COVER PAGE

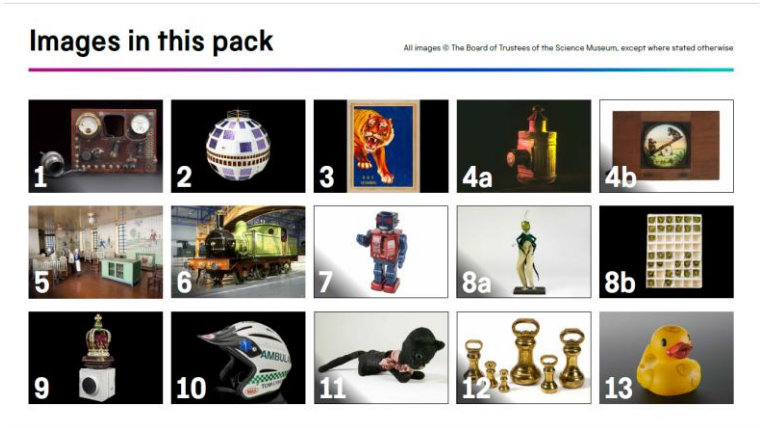
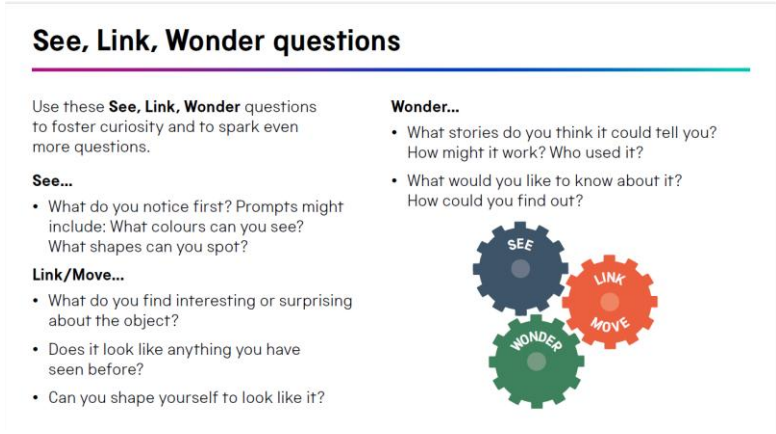


IMAGE BANK CONTENT OVERVIEW



INTRODUCTION & HOW TO USE

IMAGES

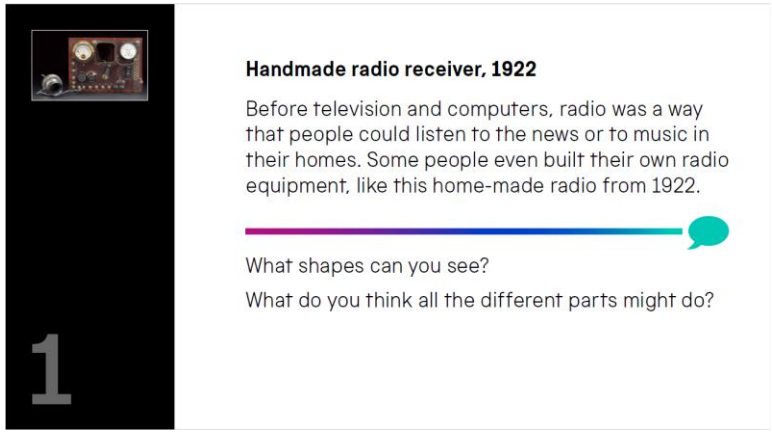
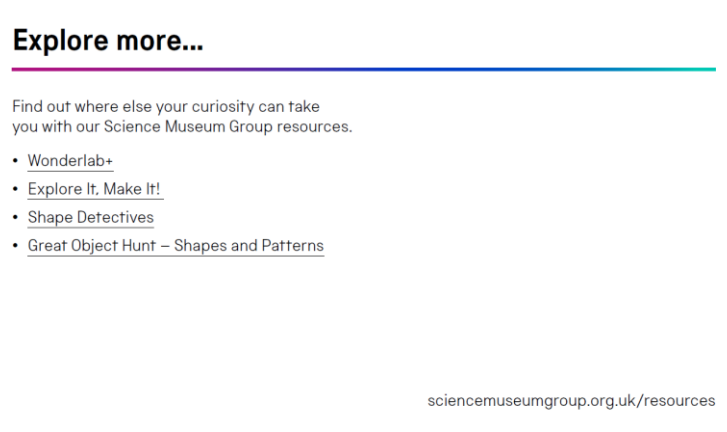


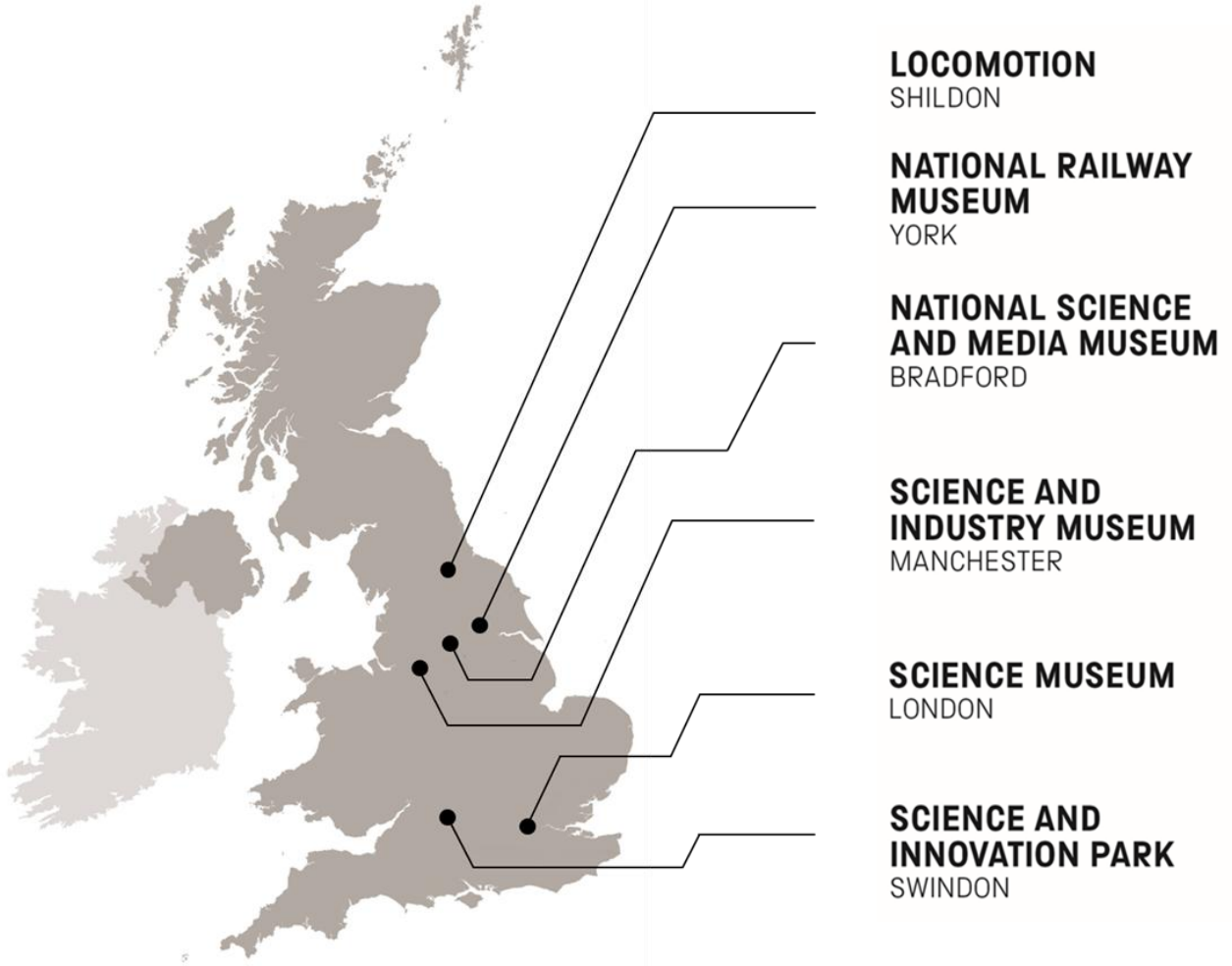
IMAGE INFORMATION & ACTIVITY



LINKS TO FURTHER INFORMATION

USEFUL LINKS

- Get the most from your museum visit: www.sciencemuseum.org.uk/get-most-your-museum-visit
- Science Museum Group Resources: www.sciencemuseum.org.uk/learning/resources
- Science Museum Group Academy: www.sciencemuseum.org.uk/learning/academy-training



Engage

NUSTEM

nustem

Northumbria University NEWCASTLE

Professor Carol Davenport
Director, NUSTEM

www.nustem.uk

Northumbria University NEWCASTLE

Play, Be, C

Supporting teachers and other adults in EYFS to provide high-quality STEM education.
Linked to literacy development through a story book.
Flexible and adaptable to your setting.
Attribute focused

nustem

Structure of each unit

Based around a career with three attributes highlighted

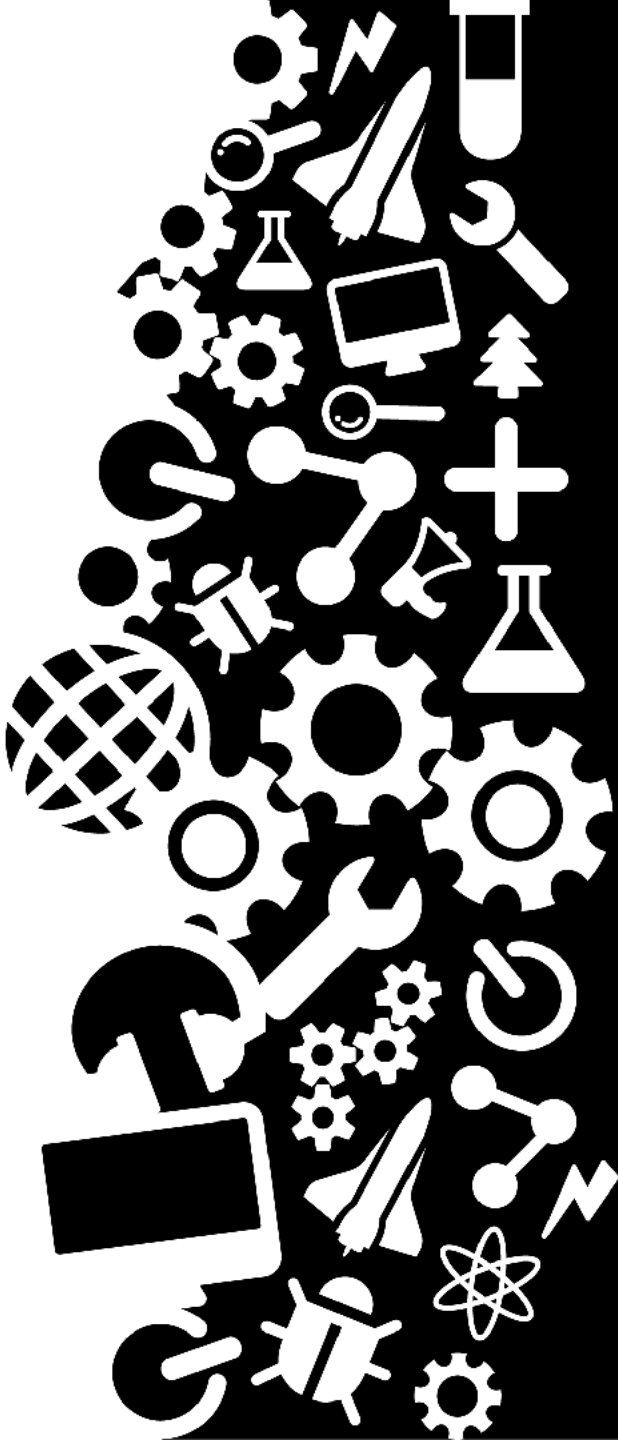
Story book with STEM focussed questions

Six activities

- Three adult led
- Three provocations

Suggested family activities: in-school and at-home

Career poster



Arborist

Arborists look after trees and make sure they are healthy. Arborists are sometimes called Tree Surgeons.

Observe and find out about the trees in your setting with activities for each season.

Civil Engineer

Civil engineers plan, build and manage big structures such as buildings, railways and bridges.

Develop and extend construction play with a focus on planning and problem solving.

Fluid Scientist

Fluid scientists are interested in what liquids and gases are like and how they move and behave.

Investigate bubbles by making them in different quantities and sizes.

Glaciologist

Glaciologists study glaciers – huge areas of ice found on mountains or near the North and South poles.

Investigate freezing and melting in a variety of ways.

Lighting Technician

Lighting technicians design the way lights are used in films, concerts and theatre, or to light up buildings, statues and bridges.

Make, use and explore resources to create light and shadow.

Magnet Engineer

Magnet engineers design magnets or machines that use magnets.

Discover more about magnetism and how magnets can be used to push and pull.

Marine Engineer

Marine engineers make and fix boats and ships, submarines, oil rigs and drilling equipment.

Explore floating, sinking and water displacement.

Meteorologist

Meteorologists use measuring equipment and make forecasts of what the weather is going to be like.

Make and use equipment to observe, measure and record the weather.

Pharmacist

Pharmacists prepare and give medicines to people who have a prescription.

Count, measure, sort and create patterns while making pills and medicines to dispense to customers.

Robotics Engineer

Robotics engineers design, build and program machines to do jobs more easily than a human could.

Program simple robots and learn about giving and following directions.

Northumbria University NEWCASTLE

Attributes

Curious
Collaborative
Creative
Observant
Resilient

nustem

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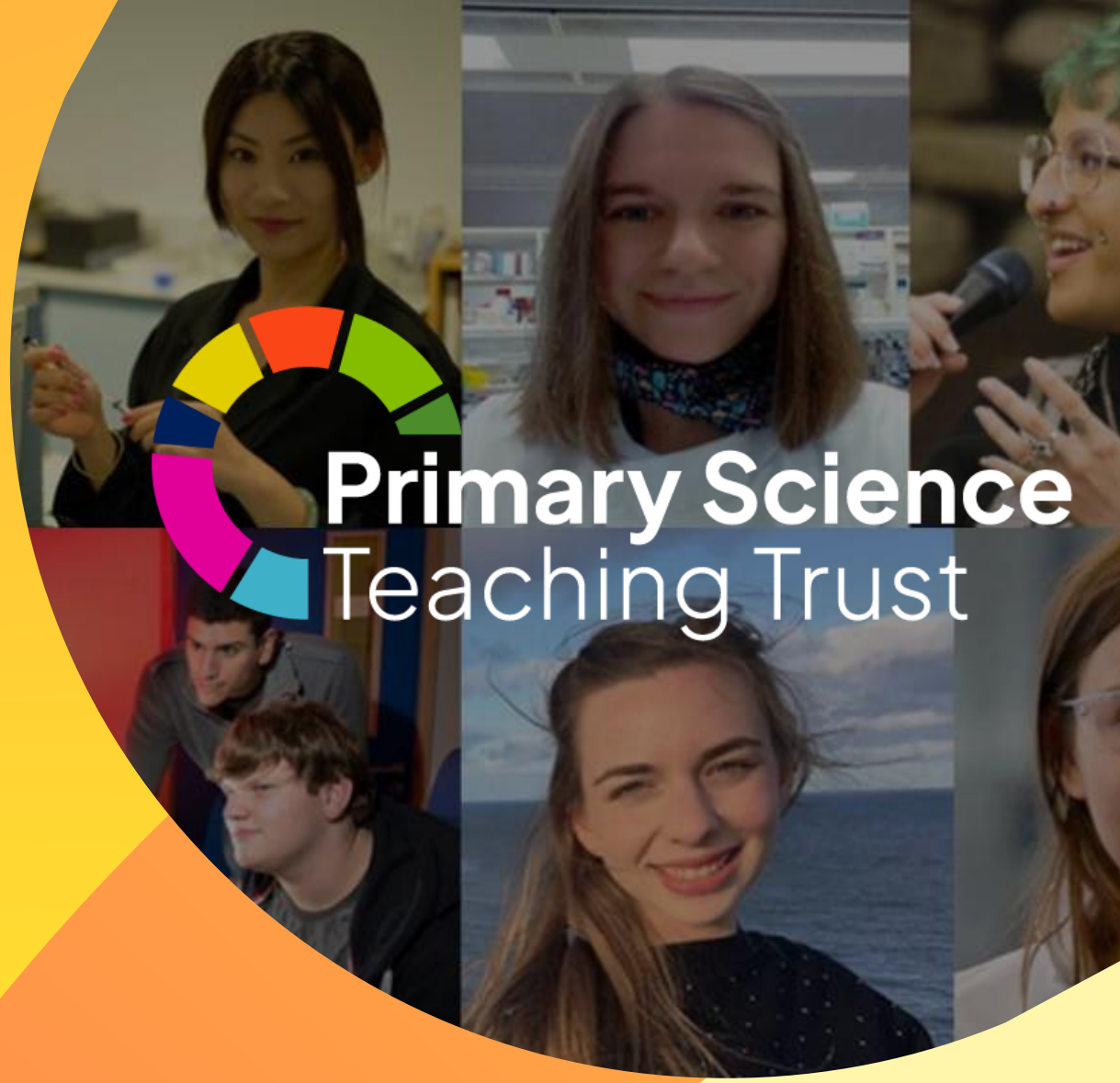
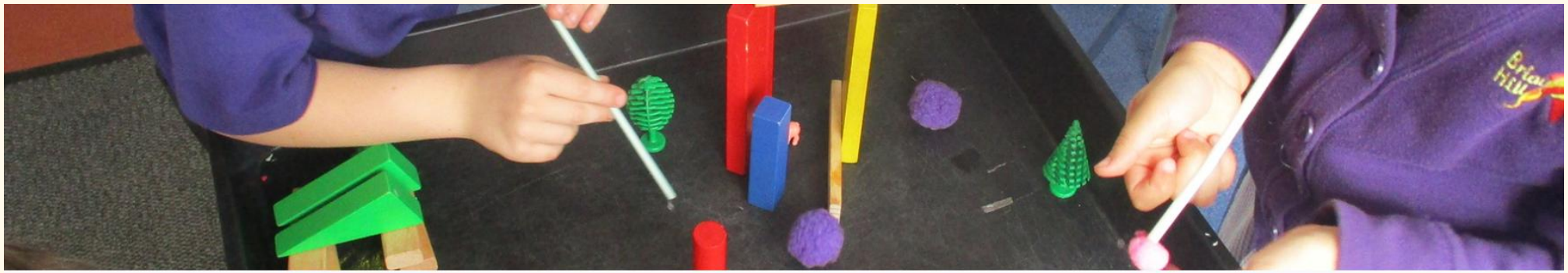
Primary Science Teaching Trust



Chris Lawson
Primary Science Mentor and
Area Mentor (North East)

www.pstt.org.uk

PLAY, OBSERVE AND ASK (in EYFS)



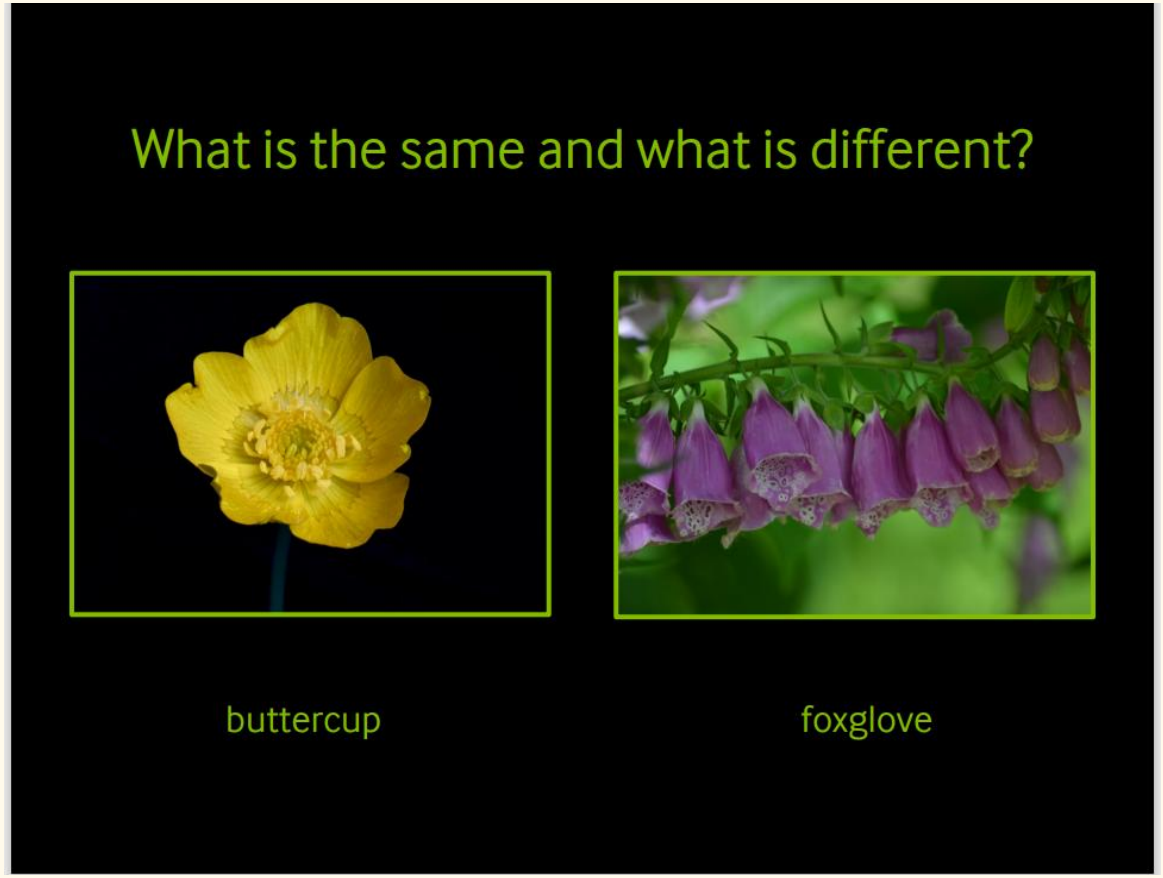
www.pstt.org.uk/resources/play-observe-ask

SCAN ME

- High quality pictures of British wildlife
- Free to download
- Dominoes

- Wildlife faces

- Who am I?
- Paired pictures
- Odd one out



Promotes skills:

- Observation
- Science talk

EARLY YEARS SCIENCE PROVISION MAP

Play, Observe & Ask

Sensory Play

Learn: how biscuits change in different liquids
You need: bowls, mini gingerbread man biscuits, milk, vinegar, oil, juice, timers
Play, observe & ask

- What does the (solid) biscuit feel /look/smell like?
- What might happen if the gingerbread man falls into puddles of different liquids? Can you make predictions and test out your ideas? How long shall we leave them?
- Was your prediction about the [liquid] correct? Can you describe how they look, feel, smell now? Are you surprised? Why?

Malleable Play

Learn: that some materials are stretchy
You need: gingerbread dough, pastry, Curly Wurly®, marshmallows, spaghetti
Play observe & ask:

- Can we stretch all these foods?
- Which can be stretched the longest?
- Can they go back to their original shape? Why / why not?

Outdoors

Learn: that some materials absorb liquids.
You need: trays containing cornflour, rice, rice crispies/corn flakes, pasta, oats, grapes, raisins, lentils, jugs of water, spoons to stir, cloths to wipe messy hands
Invite children to use their hands to explore the different trays of dry food before adding water.
Play, observe & ask:

- How do they feel/look/smell?
- What do you predict will happen to each tray if we pour on water? Which might change? Will any stay the same? Why?
- What would you like to find out next? E.g. what happens when changing the temperature of water, leaving raisins overnight. Encourage the children to test out their ideas and use their senses and lots of descriptive language to explain what happens.

Construction

Learn: some objects float and some sink.
You need: junk modelling resources, tape, glue, scissors, gingerbread men biscuits, pebbles, cubes
Play, observe & ask:

- Can you make a floating boat for the gingerbread man? Which materials will you use? Why?
- Does it matter what shape or size your boat is?
- How many gingerbread men/pebbles/cubes can it hold before it sinks?

Small World

Learn: how to build strong bridges
You need: lolly sticks, variety of clothes pegs, toy animals from the story, gingerbread man
Play, observe & ask:

- Can you use the different lolly sticks and pegs to make a bridge for the gingerbread man to cross the river?
- Which types of clothes pegs work best?
- Can you improve your design to make it stronger? How many toy animals can it hold?

Role Play

Learn: common features of different animals
You need: pictures/masks/costumes of different animals from the story
Play, observe & ask:

- How are the animals the same/different?
- Do they all have four legs/a tail/fur/teeth?
- Can you show me how they move?

Water/Sand Play

Learn: waterproof materials
You need: gingerbread man biscuits, a selection of materials e.g. kitchen roll, foil, cling film, tissue paper, bin bag, fabric, plastic containers, tape, watering cans
Encourage children to put the gingerbread man in a container and use different materials to make a 'roof'.
Play, observe & ask:

- Which material will keep him dry from the (watering can) rain?
- Which material would make the worst roof? Why?

Key Science Vocabulary

material, solid, liquid, absorb
properties of materials - dry, wet, soggy, waterproof, float, sink, strong, stretchy
animal body parts - legs, body, head, ears, tail, mane, fur, udder, etc.

Further Science

Exploring how heat/cooking changes materials, e.g. malleable gingerbread dough to hard biscuit, jelly dissolving, eggs becoming opaque, chocolate melting, popcorn exploding!
Tasting experiments, e.g. sweet gingerbread, sour lemon slices, salty crisps. Can children guess which flavour (even if they hold their nose)?
Comparing types of animal teeth, e.g. fox, cow, mouse. What do they eat?

Any questions?

Engage

Or get in touch with todays speakers:

Explorify
enquiries@stem.org.uk

CREST Awards
crest@britishscienceassociation.org

Science Museum Group
info@sciencemuseumgroup.ac.uk

NUSTEM
nustem@northumbria.ac.uk

Primary Science Teaching Trust
chris.lawson@pstt.org.uk

Engage Teacher Conference

Thank you

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