

Engage

Teacher Conference

Breaking barriers, not budgets: high-impact, no-cost primary STEM resources

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

Rebecca Olajide and Peter Jeffrey-Bourne. Science Museum Group

Andrew Charlton-Perez OBE, Climate Ambassadors

Anika Abedin, The British Science Association

Elizabeth Pugh, Oak National Academy

Kulvinder Kaur Johal, Primary Science Teaching Trust

Nicola Fletcher, SEERIH The University of Manchester

Dr Martin Archer, Imperial College London

Dr Patricia Smith, The Rosalind Franklin Institute

Rose Want, British Geological Survey

Welcome, please be aware:

- Talks are recorded
- You can ask questions in the chat throughout
- There will be time for questions at the end



Engage

Science Museum Group

Peter Jeffrey-Bourne

Academy and Resources Developer

Rebecca Olajide

Learning Resources Producer

www.sciencemuseumgroup.org.uk

SCIENCE MUSEUM GROUP

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

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GROUP



CURIOSITY
GAME

TALKING 	Age	5-7	Topic	WORKING SCIENTIFICALLY	⌚ 40 MIN
	Skills used	CURIOSITY AND ASKING QUESTIONS • MAKING OBSERVATIONS TESTING • COMMUNICATION • TEAMWORK			

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](https://www.sciencemuseumgroup.org.uk/resources)

Highlights and develops skills

Builds confidence in adults

Explores STEM through play

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How to run the activity

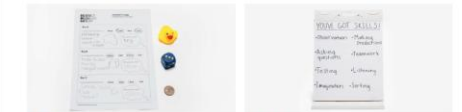


Tip: A set of three curiosity boxes, three empty test boxes and three sets of testing objects will be suitable for a group of 12 people working in groups of four. Double or triple the quantity when working with larger groups.

[sciencemuseumgroup.org.uk/resources](https://www.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](https://www.sciencemuseumgroup.org.uk/resources)

Builds confidence and ownership

HANDS-ON ACTIVITIES

SCIENCE MUSEUM GROUP

ROCKET MICE

MAKING	Age: 5-7	Topic: FORCES	30 MIN
DIY IDEAS	MAKING OBSERVATIONS • CURIOSITY		

Highlights and develops skills

Overview for adults

There's an old saying: what goes up must come down. This activity is a perfect chance to challenge that idea, shooting a rocket high into the air by rapidly squashing a plastic bottle launcher. You'll never get this rocket into space – but some real rockets do go fast enough to prove the saying wrong.

What's the science?

The bottle used as the rocket launcher is not really empty; there is air in it. Air is elastic (compressible), and when you compress it, it pushes back and the pressure inside increases. In this activity, the sudden increase in air pressure inside the bottle pushes hard on the bottom of the rocket, sending it flying high into the air. There are also two other forces acting on the rocket: air resistance and gravity. Air resistance always pushes in the opposite direction to the rocket's movement, and its strength depends on the rocket's shape and its speed. Gravity always pulls downwards, slowing the rocket's climb but speeding up its descent.

Science in your world

Just as increasing the air pressure in the bottle sends the rocket flying, you use air pressure when you squeeze shampoo or ketchup from a plastic bottle. It's not usually as exciting as watching the rocket shoot into the air in this activity... unless you're having a food fight!

Did you know...?

In order to keep going straight upwards and never fall down again, a rocket must reach a speed called escape velocity, which is 11.2 kilometres per second.

learning-resources.sciencemuseum.org.uk

Builds confidence in adults

Links to everyday examples of STEM

SCIENCE MUSEUM GROUP

Make your very own rocket mouse and launcher – see how high your mouse can fly!

You will need...

Think and talk about...

- What makes your rocket fly?
- What makes it come down again?
- How do you think a real rocket works?

Investigate...

- How could you make your rocket travel higher?
- How could you make your rocket go more slowly?
- Can you make your rocket spin as it falls?

learning-resources.sciencemuseum.org.uk

Promotes science talk

Follow these steps...

- 1 Cut out a template along the dotted lines.
- 2 Roll it into a cone shape and secure it with tape – this is your rocket.
- 3 Decorate your rocket any way you like...
- 4 Now pop it on top of the bottle.
- 5 Hit the sides and launch your rocket into the air!

Science in your world

Just as increasing the air pressure in the bottle sends the rocket flying, you use air pressure when you squeeze shampoo or ketchup from a plastic bottle.

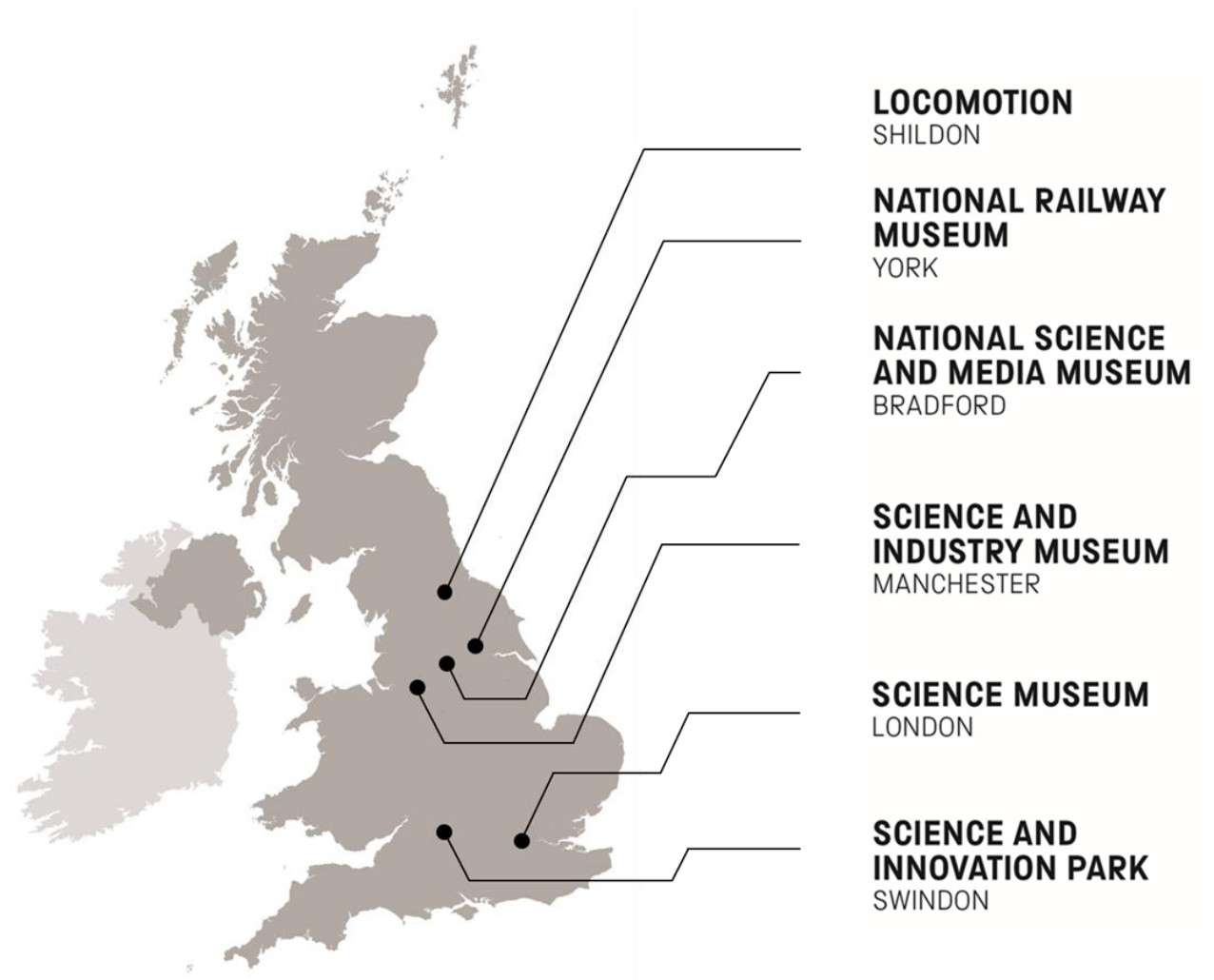
learning-resources.sciencemuseum.org.uk

Builds confidence and ownership

Links to everyday examples of STEM

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
- Wonderlab+
www.wonderlabplus.sciencemuseumgroup.org.uk



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Climate Ambassadors

Andrew Charlton –Perez OBE
Co-Lead of Climate Ambassadors
Professor of Meteorology at the
University of Reading

www.climateambassadors.org.uk



CLIMATE AMBASSADORS

In association with EAUC, STEM Learning and the University of Reading



Funded by
UK Government

What is a climate action plan (CAP)?

Covers:

- Adaptation and resilience
- Biodiversity
- Climate education and green skills
- Decarbonisation



Much Wenlock Primary School climate action plan cover



Funded by
UK Government

Climate Ambassadors can help you with:

1) Auditing your climate action



2) Developing your CAP and suggesting targets



3) Implementing your CAP and supporting leadership and governance



4) Engaging your learners



5) Careers and green skills





Funded by
UK Government

Request a Climate Ambassador today

Your local Regional Hub Manager will be in touch to help you get started.

You can also request support by posting an activity request on the STEM Learning platform.

[Hello@climateambassadors.org.uk](mailto>Hello@climateambassadors.org.uk)

Register education setting interest
in support from Climate
Ambassadors



Engage

The British Science Association

Anika Abedin
Education Project Officer

www.crestawards.org





Engage

Teacher Network

CREST Star and SuperStar projects are typically completed by children aged 3-11, or those working at this level.

Hands-on

Fun



Engaging

Inspiring



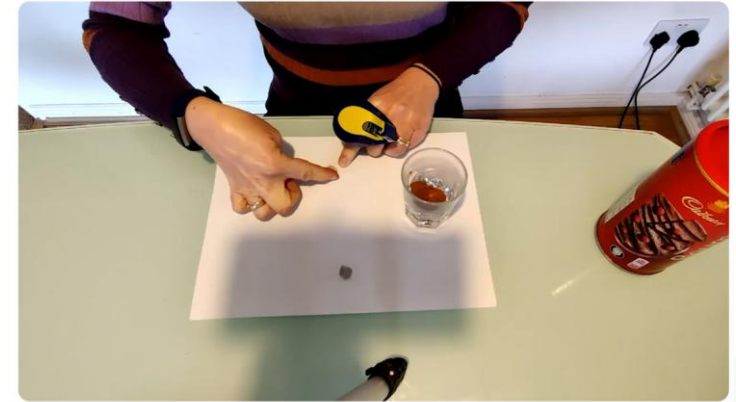
Student-led



Relatable

Why run CREST challenges with your pupils?

- Activities are designed to be low-cost and easy to run
- Free to use and download from our Resource Library
- Can be completed in 45 minutes - 1 hour
- Demo videos and supporting slides available for some activities
- No need for specialist knowledge or equipment
- Relatable contexts allow children to make links with their own lives



CREST SuperStar Awards demonstration - Fantastic Fingerprints



Activity card: Peggy Problem

CREST STAR Peggy Problem

Aunt Stella is doing some washing.

Warm and windy! It's a perfect day for washing clothes.

Can we help hang the washing out to dry?

Which pegs do you think have the best grip?

I think a peg with a spring will have the most grip.

I think plastic pegs will have a tight grip.

I think wooden pegs will have the best grip as wood is stronger.



CREST Star Awards demonstration - Peggy Problem

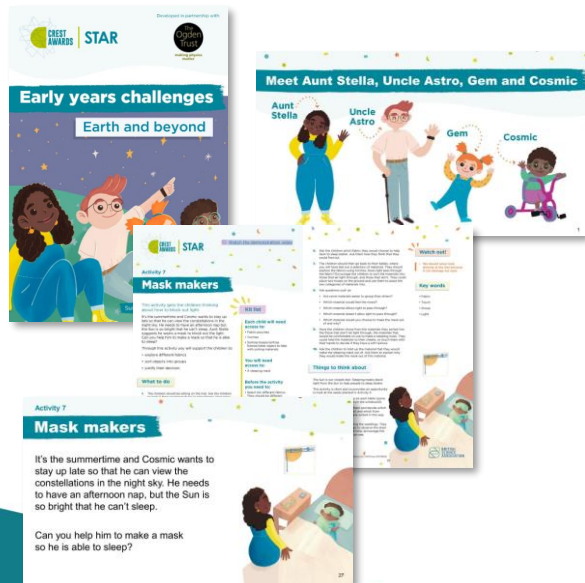
British Science Ass... 1.91K subscribers



Engage Teacher Network

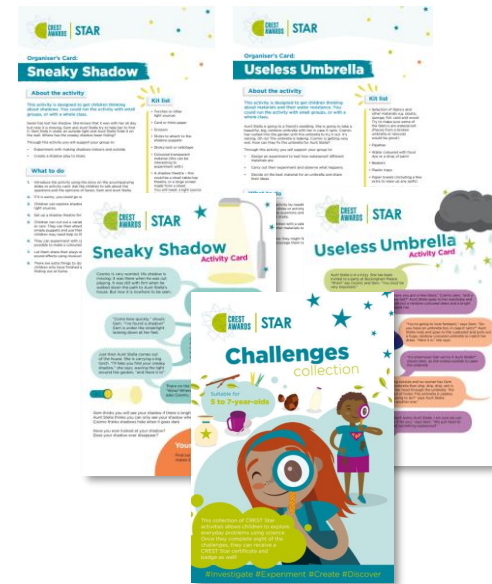
Resources are free to use and download from our Resource library <https://primarylibrary.crestawards.org>

Early years challenges with a physics focus



New early years and primary accessible Star collection for ages 3-7, or those working at this level

Star collection – aimed at children aged 5-7



SuperStar collection – aimed at children aged 7-11

Other collections, supporting classroom slides, demo videos and Welsh language translations are also available!



Engage Teacher Network

Your pupils can track their progress using a CREST Star or SuperStar passport...



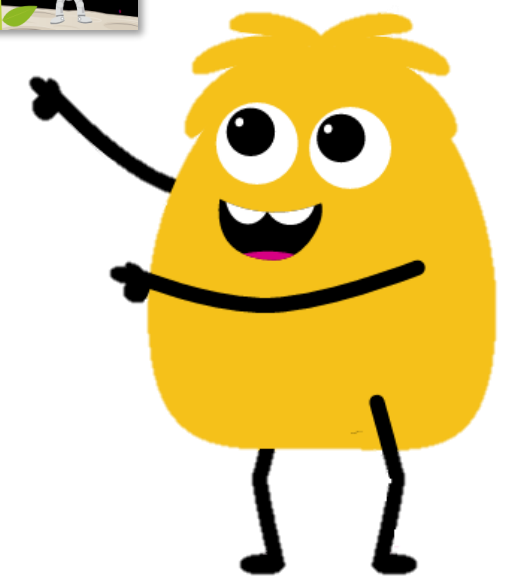
...when they have completed at least 6 projects, they can earn a CREST Award!

Apply for an Engage Grant in September and receive funding and free CREST Awards for your class!



BRITISH SCIENCE WEEK

2026 Activity Packs



- Free to download
- Packed with fun, hands-on science activities
- Cross-curricular learning opportunities
- Ideas to extend the learning at home
- Links with skills and careers

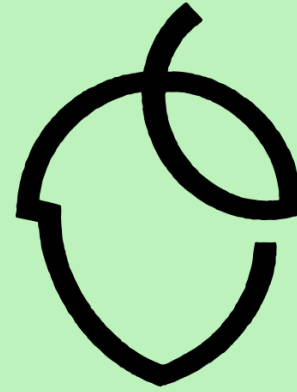
www.britishscienceweek.org/

Engage

Oak National Academy

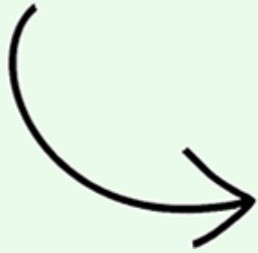
Elisabeth Pugh
Science Lead

www.thenational.academy



**Oak
National
Academy**

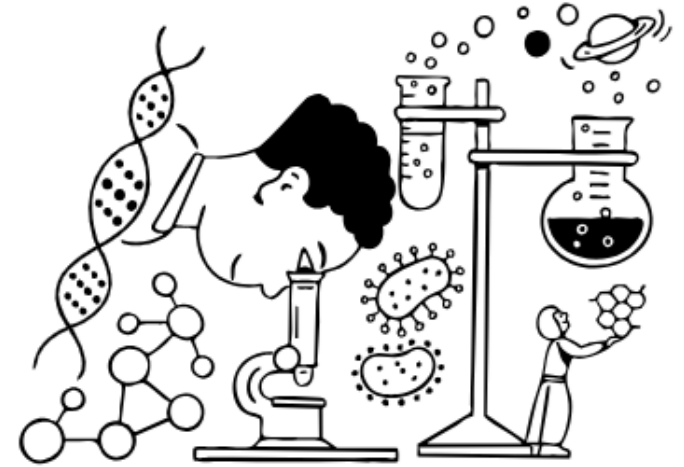
Curriculum sequences



Science KS2

Our research-informed science curriculum helps pupils build secure scientific knowledge and enquiry skills, deepening understanding through big questions and hands-on learning.

- ✓ National curriculum aligned
- ✓ Sequenced, flexible, adaptable
- ✓ Addresses misconceptions
- ✓ Embedded practical activities



Unit sequence

Explainer

Download

Year group

All

Year 3

Year 4

Year 5

Year 6

Category (KS2)



All



Biology



Chemistry



Physics

Year 3 units

1

Rocks and soils

Chemistry

Physics

16 lessons

Save

2

Introduction to the human skeleton and muscles

Biology

10 lessons

Save

3

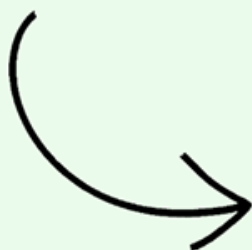
Simple forces including magnets

Physics


12 lessons

Save


Unit information



Rocks and soils

 [View all units](#)

[Next unit →](#)

[Download complete unit](#) 

Why this why now

This unit builds on pupils' prior learning from Uses of everyday materials, where they explored the properties and uses of various materials. In Rocks and soils, pupils will investigate different types of rocks and soils, understanding their properties and how they are formed. This prepares them for the future unit, Evolution and inheritance, where they will explore how living things have changed over time, including how fossils provide evidence of past environments and the organisms that once lived in them.

Prior knowledge requirements


- Identify and name a variety of everyday materials, including rock
- Describe the simple physical properties of a variety of everyday materials
- Compare and group together different materials on the basis of their simple physical properties
- Compare the suitability of different materials, including rock, for particular uses

Unit 1 of 6

[Chemistry](#) [Physics](#)

Rocks and soils

This unit covers comparing and grouping rocks based on appearance and physical properties, understanding fossil formation, and recognising that soils are made from rocks and organic matter. It involves setting up practical enquiries, making observations, and using evidence to answer questions.

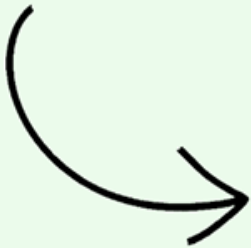
Save 

16 lessons in unit

1 Introduction to rocks

I can explain that rock occurs naturally and can be used for different purposes.

Lesson information



1. The appearance of rocks can be observed more closely using a hand lens or microscope.
2. Rocks can be compared and grouped by appearance, by looking for similarities and differences.
3. Different rocks have different names.
4. Rocks can be identified and named using simple secondary sources of information.

Keywords

Rock - Rock is a solid material that occurs naturally in Earth.

Appearance - The appearance of an object is the way something looks.

Compare - We compare things by looking at what is the same and what is different.

Identify - To identify something is to be able to name it correctly.

Secondary sources - Information gathered using secondary sources is information that has been collected by someone else.

Common misconception

Children may think that rocks are all just called 'rock' and they don't have different appearances and different names.

Make sure the rock samples you give them are not actual objects, e.g. an ornament, so they are not able to use usage as a way to classify. Use a wide range of rocks that are very different so the children can identify them correctly.

Lesson resources

Lesson slides

Lesson details

Lesson video

Worksheet

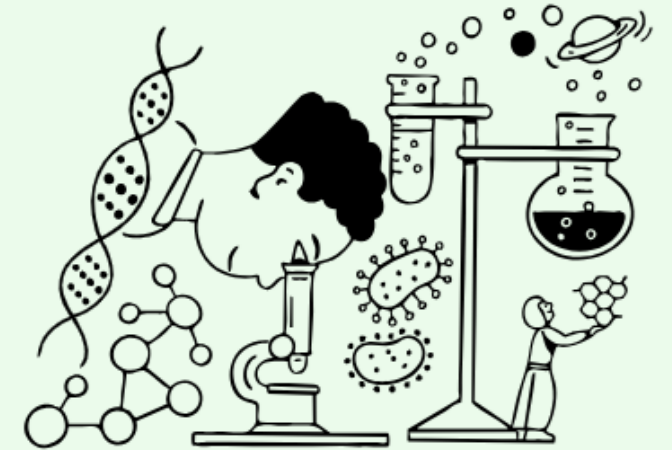
Quizzes

Prior knowledge starter quiz
Assessment exit quiz

Additional material

Download all ↓

The appearance of rocks



☰ View unit

← Previous lesson

Next lesson →

Download all resources ↓

Share lesson with pupils 🔗

New Create more with AI ▾

Lesson slides

Download lesson slides (PPTX) ↓

The appearance of

Lesson slides

Lesson details

Lesson video

Worksheet

The appearance of rocks



Science

Unit: Rocks and soils



Outcome

I can compare, group and identify different rocks by observing their appearance.



Lesson outline

The appearance of rocks



The appearance of rocks



Rock identification



Keywords

Rock is a solid material that occurs naturally in Earth.

The **appearance** of an object is the way something looks.

To **compare** is to look for similarities and differences.

To **identify** is to be able to name something correctly.

Information gathered using **secondary sources** is information that has been collected by someone else.



The appearance of rocks



These objects have been made from **rock**.



chalk sticks



roof



kitchen worktop

Rock can look very different depending on what type of rock it is.
What do you observe about the **appearance** of these rocks?



The appearance of rocks



Which of these pieces of equipment help you to look more closely at things that are near to you?



hand lens

a



binoculars

b



microscope

c



Task A The appearance of rocks



Use a hand lens or microscope to observe your rocks closely. Discuss with a partner what you observed.



Compare the rocks.

What is the same and what is different about them?

Sort the rocks into groups depending on their similarities and differences.

Add some labels to your groups to show how you have sorted them by their appearance.

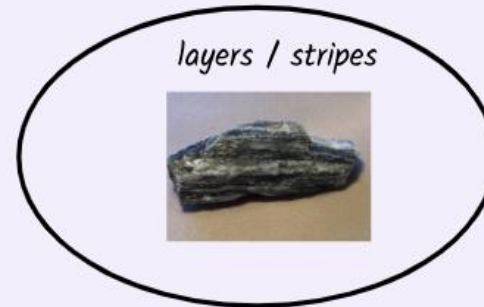


Task A The appearance of rocks



Observe closely, compare and group your rocks by appearance.

There are lots of ways to sort rocks by their appearance, you may have sorted your rocks like this:



Name: _____



The appearance of rocks

Task A: The appearance of rocks

Use a hand lens or microscope to observe your rocks closely. Discuss with a partner what you observed.



Compare the rocks.
What is the same and what is different about them?

Sort the rocks into groups depending on their similarities and differences.

Add some labels to your groups to show how you have sorted them by their appearance.

Observe closely, compare and group your rocks by appearance.

6 Questions

Q1. A _____ is what we use to make things. It is a substance from which something is made.

✓ material, Material

Q2. A rock is a type of ...

plant.
animal.

✓ material.

fabric.

Q3. Which of these materials is man-made?



wool



wood



6 Questions

Q1. Scientists observe the appearance of rocks more closely using a _____ or a microscope.

✓ hand lens

telescope

binoculars

Q2. If we want to compare and group things by their appearance, what would we do?

decide which ones we like and we don't like

divide them into equal groups

✓ compare their similarities and differences

Q3. Which property could help you to identify and name this rock just by its appearance?

✓ the colour of the rock

how many pieces of rock there are

how waterproof the rock is

Q4. Different rocks have different names. Which of these are types of rock?

✓ chalk

rubber

✓ granite

sponge

✓ pumice

Q5. Which of these are secondary sources of information that you could use to help identify a rock you didn't know the name of?

a website about animals

✓ a visit to a rock museum

The appearance of rocks



Additional material

Purpose of activity

In this lesson, children will develop substantive knowledge as they learn about the appearance of rocks and some names of common rocks. Children will develop disciplinary knowledge as they use scientific equipment, including a hand lens or microscope, to observe rocks more closely. They will also develop their grouping, classifying and sorting skills as they compare, sort and identify their rocks by their appearance. They will use a variety of secondary sources to help them with this process.

The purpose of the activity in Task A supports the development of disciplinary knowledge by observing the similarities and differences in their rocks using a hand lens. They will need to sort and group their rocks using their own criteria based on what they have observed.

The purpose of the activity in Task B supports the development of disciplinary knowledge to identify the rocks they grouped in Task A using a rock identification sheet provided as a secondary source. Children may also choose to use books, internet, visits and asking an expert.

Note: it is important that children have access to real rock specimens rather than photos of rocks throughout this unit. Class rock packs can be purchased from educational internet sites, or rocks can be collected across the year when visiting the local and wider environment.

Task A

Materials

- access to a selection of real rock specimens for children to observe and handle
- hand lens/ magnifying glass/ digital microscope - enough per pair or small group
- hoops, mini white boards, string for sorting and grouping
- paper and pencil to create labels

Note: common rocks might include: sandstone, limestone, chalk, granite, basalt, slate, garnet-gneiss, marble, gabbro and pumice.

Method

Children will need to have access to real rock specimens to look at and handle. If working in small groups, each group will need at least six rocks to be able to look at with the hand lens or digital microscope. You may need to demonstrate how to use a hand lens as children often struggle to use it correctly. Make sure the children first look at each rock and discuss

The appearance of rocks

Additional material

Common rocks identification chart

		
sandstone	granite	gneiss
		
limestone	gabbro	marble
		
chalk	slate	pumice

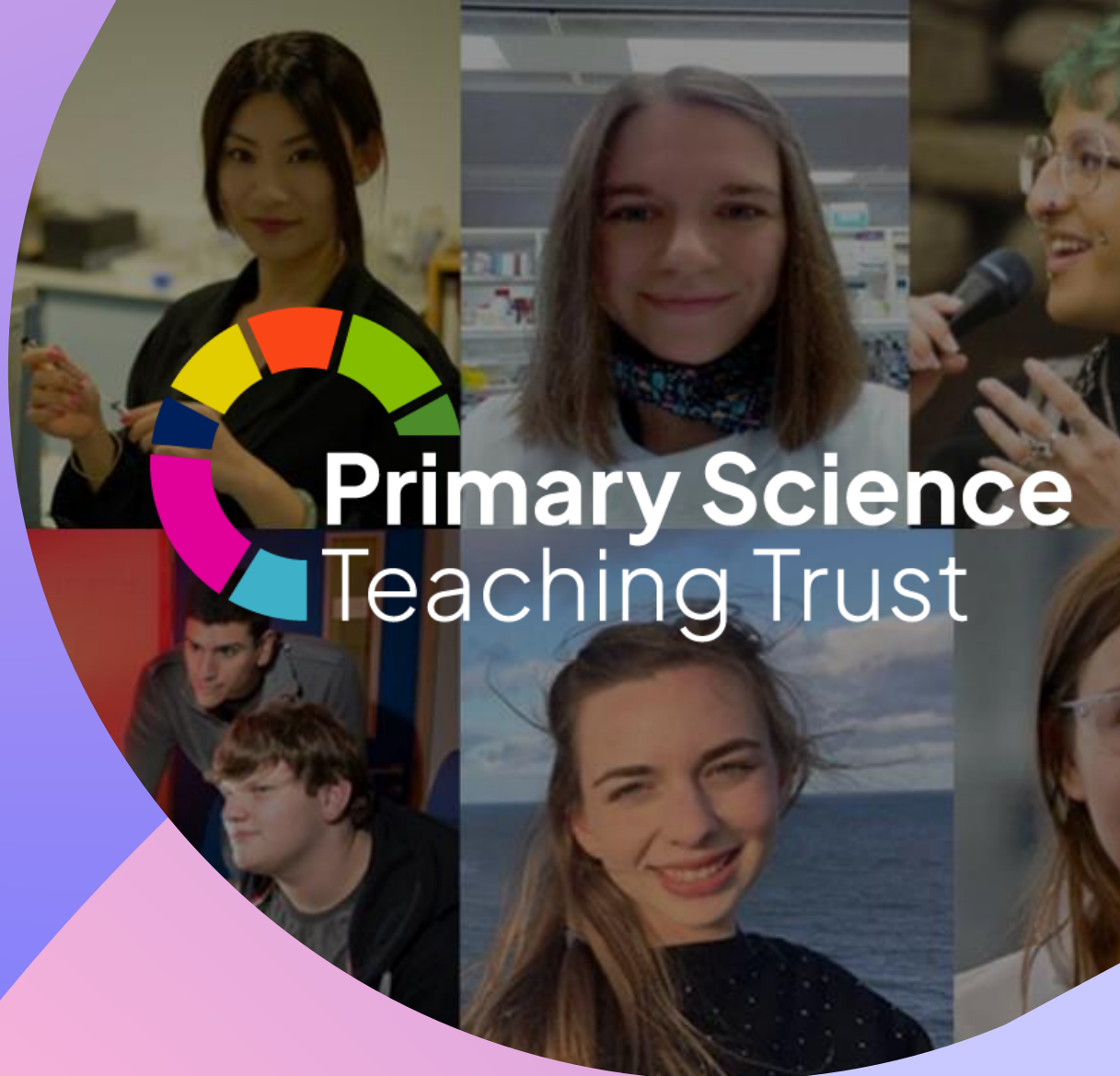
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Primary Science Teaching Trust

Kulvinder Kaur Johal
Primary Science Mentor

www.pstt.org.uk



A scientist just like me



Use your classroom to promote diversity in science

Slideshows and some videos ‘telling the story’ of scientist:

- stand-alone, fifteen-minute discussion activities to challenge stereotypes about science jobs
- part of a science topic that relates to the work of the scientist



SCAN ME

A scientist just like me

Hi there! I am Dr Kelsey Byers – an evolutionary biologist



Where do I work?

I work at the John Innes Centre in Norwich where I study how the smells of flowers (both nice and not so nice!) affect plant evolution and pollination.

What did I like doing when I was at school?

I have wanted to do something with nature my whole life. I originally wanted to be a vet, but realized I liked biology a lot and now I study it.

What do I like doing in my spare time?

I love birdwatching, looking at insects, trees, and flowers, cooking and baking, and reading books. Anything where I can explore the outdoors is fun for me!

Relatable to children

Simple explanations:

What do I do as an evolutionary biologist?

How does what I do make the world a better place?

<https://pstt.org.uk/unique-resources/a-scientist-just-like-me/>

A scientist just like me

What I like about my job

I love that I can come up with a cool idea and test it! I also get to be in a variety of places - my lab, the glasshouse, and outdoors in the field. I am a very curious and passionate person and I get to use these which is great.



Challenges I have faced

I am disabled (I use a wheelchair) and sometimes my co-workers think I can do less than I really can, for example they might think I can't do work outdoors. This isn't true - everyone's abilities are different, and I can do a lot more than people sometimes think.

Challenges:

Physical disabilities

Dyslexia

Dyscalculia

Family background

Gender issues

Finance

Geographic location

A scientist just like me

If you want to be an evolutionary biologist, you need:

- ✱ **to be a very curious person** - someone who is constantly asking themselves questions about how things came to be like they are in nature and why.
- ✱ **to enjoy looking at plants and animals** and to think about how they fit into their environment.
- ✱ **to be interested in nature** and the natural world.
- ✱ to enjoy **coming up with new ideas**.



DISCUSSION TIME

What skills and interests do you already have that would help you become an evolutionary biologist?

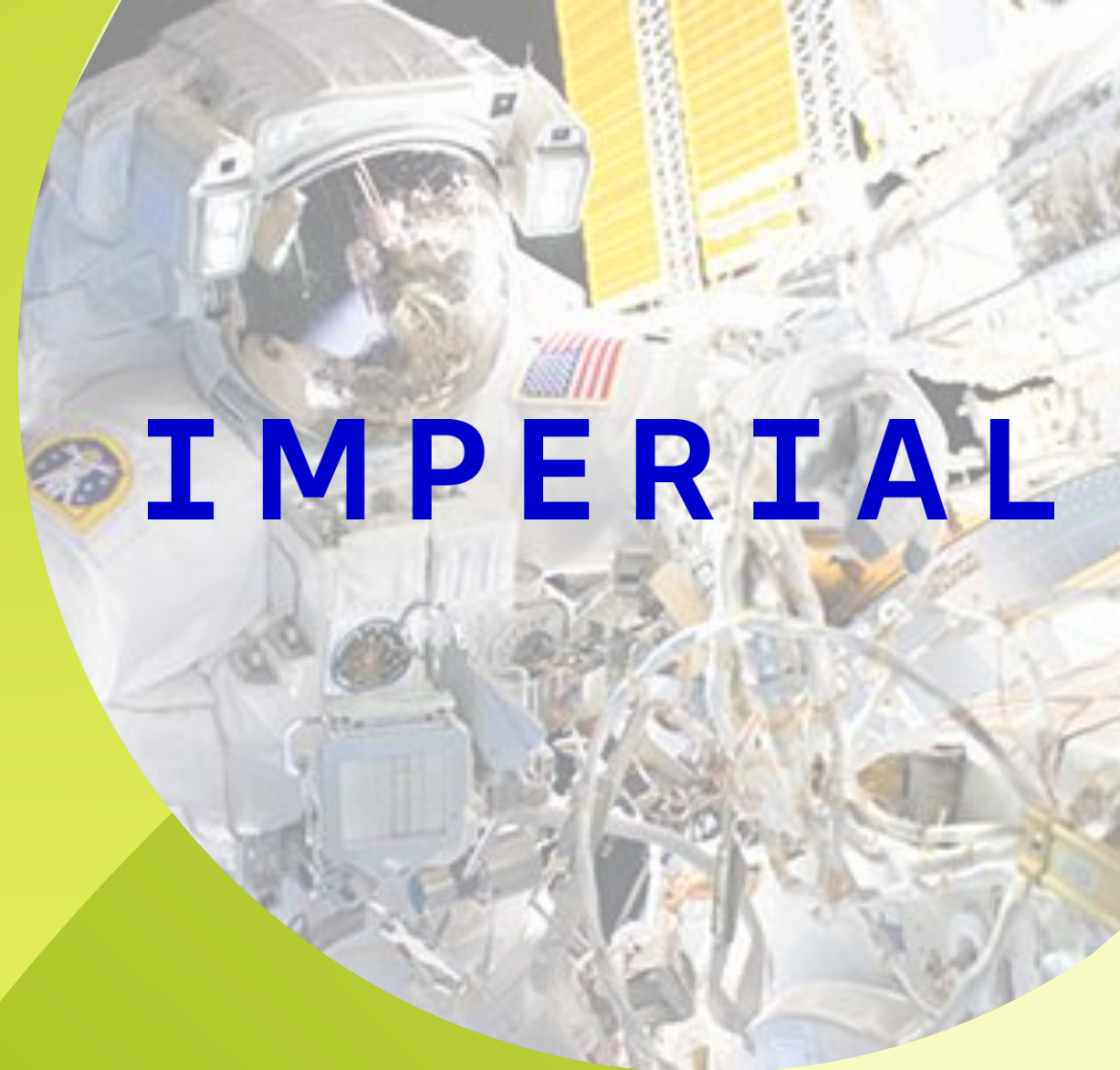
What new skills and knowledge would you need to develop?

Engage

Imperial College London

Dr Martin Archer
UKRI Future Leaders &
Stephen Hawking Fellow in
Space Physics

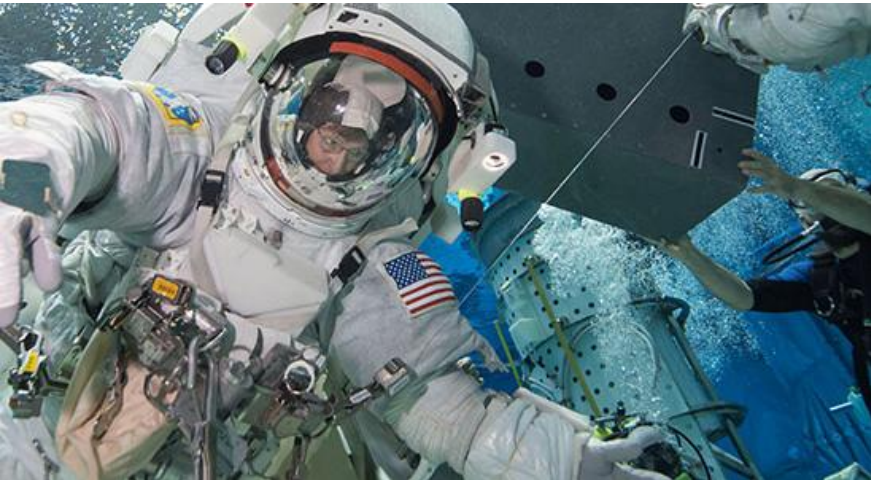
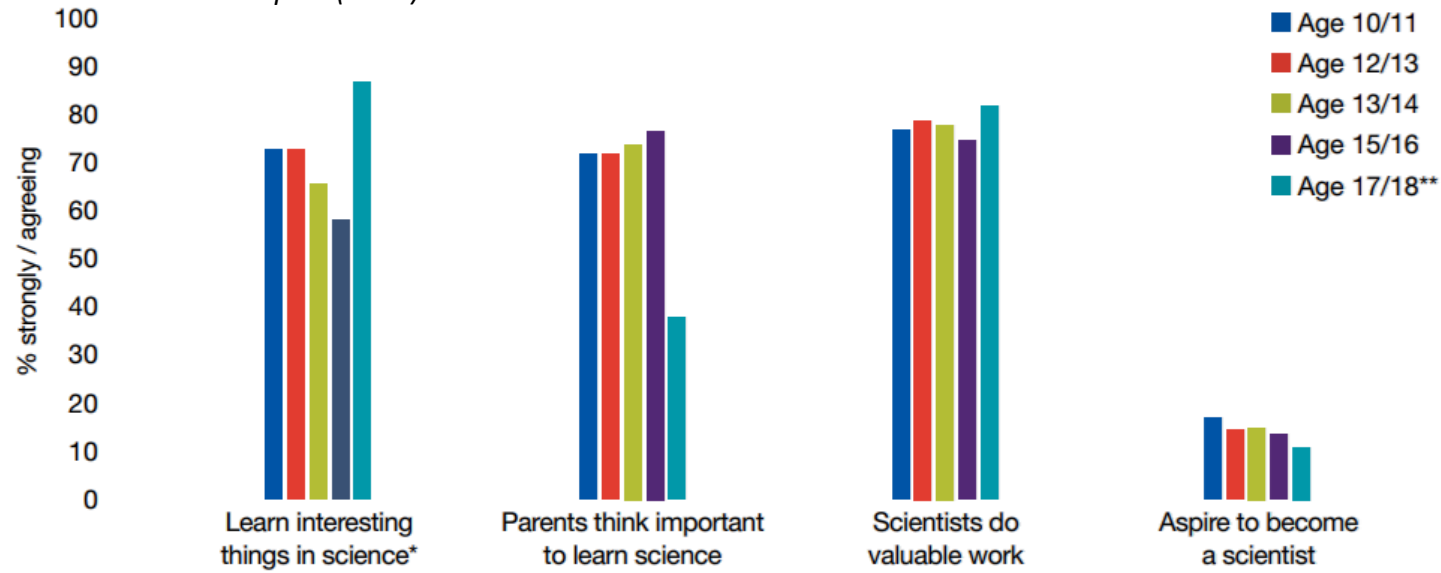
www.spaceperson.co.uk



Research says young people from early on need to personally relate to potential careers

So what careers are there in the space sector?

ASPIRES report (2020)



and established careers resources

- Don't reflect the diversity of jobs
- Target sixth formers / university students



A set of 36 postcards around space careers aimed at upper primary / lower secondary age

3 STEM Attributes



Illustration based on job category

Job category

Short description of the job

QR code link to the job on our website

I COULD BE AN...
Environmental Engineer

Engineering

Environmental engineers make sure that the spacecraft can survive in the environments that it will travel to or through. This includes launch, orbit, interplanetary travel, other planets, and re-entry to the Earth. They must consider protection systems such as radiation and heat shields.

Routes
 A degree in science or engineering and sometimes a postgraduate qualification. There are also apprenticeships instead of degrees.

Example UK employers
 Thales Alenia Space

Learn more
www.spaceperson.co.uk

Imperial College London **Share on social media using #spaceperson**

Example UK-based employer for this job

Typical routes into this career including qualifications needed

www.spaceperson.co.uk

Young people can explore more space careers sorted by interests or personal qualities along with their parents/carers

Chosen career:

Astrophysicist

Interests: **Scientific**

Skills: **Imaginative** **Open-minded** **Passionate**



Description

Astrophysicists study objects in the universe including galaxies and stars. They want to understand the history of them, what they are made of, how they formed and their main features to identify other similar objects. They may use telescopes on Earth or satellites in space to analyse these objects.

Routes

A degree in physics specialising in astrophysics, going on to achieve a doctorate.

Example UK Employers

Imperial College London.

Key Stage 2 Curriculum Links

Maths

Statistics: Astrophysicists will deal with data from lots of objects observed by telescopes or satellites and will calculate the statistics of datasets.

Science

Earth and space: Astrophysicists know about planets, moons and stars.

Light: Astrophysicists analyse data from telescopes, including spectra of light that has come from far away objects.

Other

Computing: Astrophysicists use computers to analyse data.

Key Stage 3 Curriculum Links

Maths

Statistics: Astrophysicists deal with data from lots of objects observed by telescopes or satellites and will calculate the statistics of datasets.

Chemistry

Atoms, elements and compounds: Astrophysicists know about different elements and what features they cause in their observations.



Home Rocket Tour Careers Resources Contact

Careers in space

Search the wide range of space careers out there to find one that just might suit you.

[Find a career](#)



Find a career

Dream of working in the space sector? Or maybe you're not sure it's for you? Before you decide, find out about the wide range of space careers that might suit you.

What **interests** you?

Choose one...

What **qualities** do you have?

Choose one...



Artist

Other

Creative Passionate Self-motivated



Astrobiologist

Scientific

Communicative Patient Resilient



Astrophysicist

Scientific

Imaginative Open-minded Passionate

Free space resources For teachers & parents/carers

Wealth of **space resources** from Imperial & UK Space Agency about this project & more!

Includes **exercises, guides & simple evaluation materials**

If you use any of our resources in any way, please tell us!

spaceperson.co.uk



Space Careers Postcards
The 'I'm a Space Person' careers resources showcase the incredibly diverse range of jobs available in the space sector, linking each to personal qualities young people can relate to.
Based on the latest educational research recommendations, use these postcards, sheets, and guides at home, school, or in your community to support young people to be a space person.
[View](#)

Jobs in Space You Didn't Know Existed
Space isn't just for astronauts or rocket scientists. There's a lot more to it.
In this activity you'll learn about some of the jobs in space you didn't even know existed, and what it takes to create your own place in space.
[Download](#)

The Future of Planet Earth is a Job for... Outer Space?
Not everyone wants to travel into space, or build a rocket... But that's what space is all about, right?
Not quite! That's just a small part of the space industry. And the good news is, you don't have to be interested in that side of things to get involved. In this activity you'll learn about some of the awesome jobs in space that you can do with your feet planted firmly on the ground.
[Download](#)

Satellites and Marine Conservation
It's time to meet Ali and Alexis, a pair of whale sharks who spend most of their time down under, in Australia.
In this activity you'll learn all about satellites and how we can use them to protect the people and animals (like our lovely whale sharks) around us.
[Download](#)

Who builds satellites?
In this activity you'll dive into the world of small satellites (also known as CubeSats) – what they're used for, what they're made of, how they're built and who builds them. CubeSats may be small but it takes a mighty effort to build them and get them into space.
Let's learn about all jobs involved in building and launching CubeSats here in the UK.
[Download](#)

Food in Space: (Brussels) space sprouts
Can you grow plants on the Moon?
In this activity you'll learn what plants need to survive and thrive on planet Earth, and how the conditions vary on the Moon. Your mission, should you choose to accept it, is to design a greenhouse suitable for growing plants on the Moon. Good luck!
[Download](#)

8

Engage

The Rosalind Franklin Institute

Dr Patricia Smith
Community Manager

www.rfi.ac.uk/discover-learn



Virus Factory – in Schools!

Learn about viruses, microscopes, microbiology and computer algorithms while contributing to **real science research** in the classroom.

- Built around the online citizen science project **Science Scribbler: Virus Factory**
- Up to four hours of workshops
- Built using the **science capital teaching approach**
- Curriculum mapped to KS2 (& KS3)
- Incorporates a live Q&A with scientists from the Franklin

Resources are free to use:

- Download print-and-play resources online
- Or receive a free **physical resource pack**



Workshop structure

Workshop 1 – Background Science

- Inside a cell
- DNA extraction practical
- Scale and imaging
- Scientists, microscopes, discoveries

Workshop 2 – Citizen Science

- Virus Picker and Classifier activities
- How we can see inside a cell in 3D
- How the students' contributions are used (zoo notes)

Workshop 3 – Computer Science and Q&A

- Developing algorithms - CATegories
- Meet the researchers

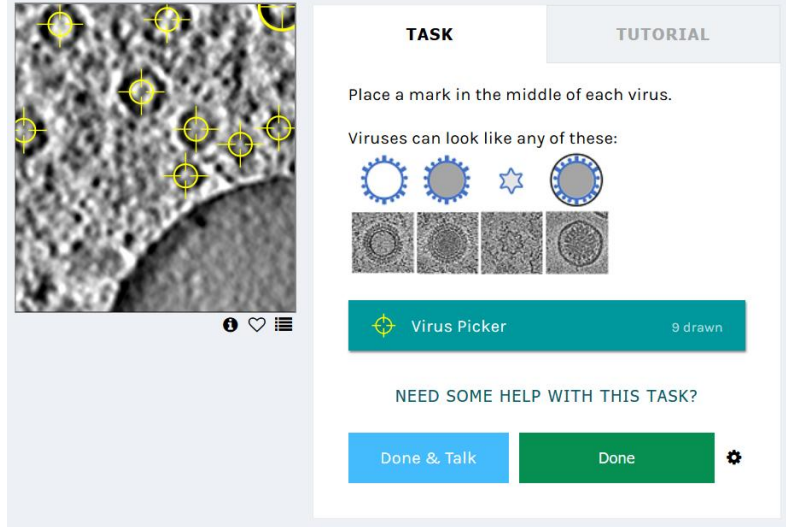
Extension Workshop – Maths & ICT

- Averages
- Virus multiplication activity
- Bar graphs
- Pie charts

*** Also covered in Standalone Workshop**

Online citizen science with Virus Factory

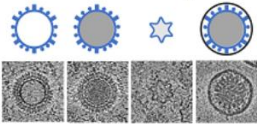
Vote on the lifecycle stage of the virus



TASK | TUTORIAL

Place a mark in the middle of each virus.

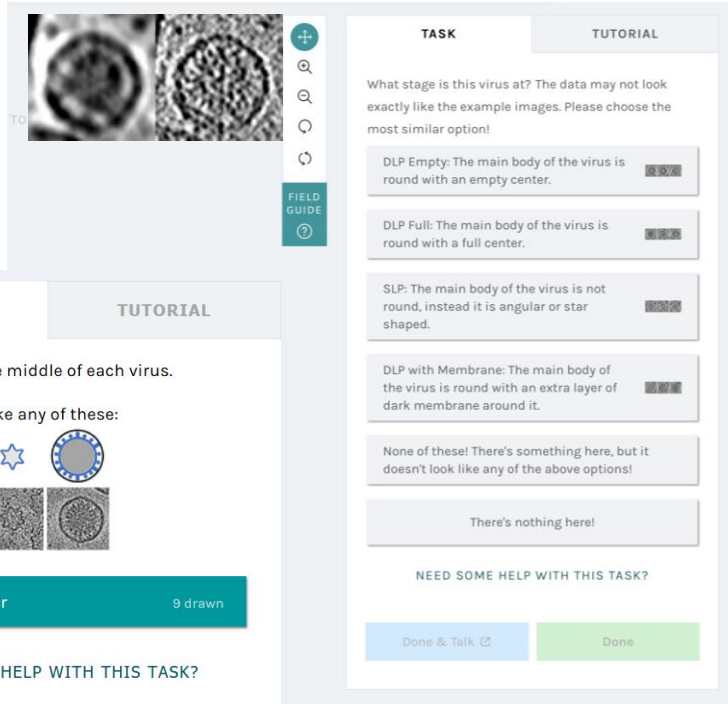
Viruses can look like any of these:



Virus Picker 9 drawn

NEED SOME HELP WITH THIS TASK?

Done & Talk Done



TASK | TUTORIAL

What stage is this virus at? The data may not look exactly like the example images. Please choose the most similar option!

DLP Empty: The main body of the virus is round with an empty center. 100%

DLP Full: The main body of the virus is round with a full center. 100%

SLP: The main body of the virus is not round, instead it is angular or star shaped. 100%

DLP with Membrane: The main body of the virus is round with an extra layer of dark membrane around it. 100%

None of these! There's something here, but it doesn't look like any of the above options!

There's nothing here!

NEED SOME HELP WITH THIS TASK?

Done & Talk Done



Zooniverse - Zoo Notes

Viewing Subject

Subject: 50157418 (READY) | Workflow: 16156 (READY) Virus Picker

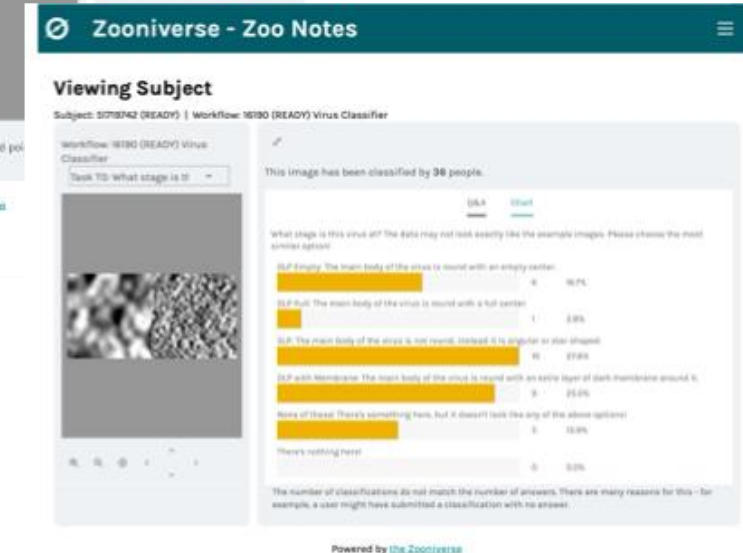
Workflow: 16156 (READY) Virus Picker | Task TO: Place a mark in

This image has been classified by 107 people who have made 800 markings. These raw markings have been combined to make 6 averaged points.

Powered by [the Zooniverse](#)

Explore your students' contributions with zoo notes

Understand how computers process the data



Zooniverse - Zoo Notes

Viewing Subject

Subject: 5078742 (READY) | Workflow: 16180 (READY) Virus Classifier

Workflow: 16180 (READY) Virus Classifier | Task TO: what stage is it

This image has been classified by 96 people.

Option	Count	Percentage
DLP Empty: The main body of the virus is round with an empty center.	4	4.1%
DLP Full: The main body of the virus is round with a full center.	1	1.0%
DLP: The main body of the virus is not round, instead it is angular or star shaped.	10	10.4%
DLP with Membrane: The main body of the virus is round with an extra layer of dark membrane around it.	9	9.4%
None of these! There's something here, but it doesn't look like any of the above options!	3	3.1%
There's nothing here!	0	0.0%

NEED SOME HELP WITH THIS TASK?

Powered by [the Zooniverse](#)

Place markers on virus particles

How to contact us

Sign up to receive a free teacher pack:



Email the Science Scribbler team:

science.scribbler@rfi.ac.uk

Visit the landing page

www.rfi.ac.uk/discover-learn/virus-factory-in-schools

General public engagement inquiries:

public.engagement@rfi.ac.uk

Engage

Great Science Share for Schools

Nicola Fletcher

Science and Engineering Education
Research and Innovation Hub
(SEERIH) Specialist Officer

www.greatscienceshare.org

**Great
Science
Share**
for SCHOOLS

What is it?



Core Values

- child-focused enquiry
- inclusive and non-competitive
- encourages collaboration



unesco

United Kingdom
National Commission
for UNESCO

Great Guided Enquiries

ROCK REPORTERS

The Geological Society

15

Great Skills Improver

GCHQ

4 10 16

Animal Action

Royal Society of Biology

13 14 15

RACETRACK TO ROAD

aramco

9

ROCK REPORTERS
What would a world without rocks be like?
AGE RANGE: 5-7 years
OVERVIEW: Pupils explore how important rocks are in our world by observing and describing them in their school or local area. They use knowledge of rocks to sort in different ways based on their characteristics and then analyse findings to write a report.

Animal Action
Which animal group is the most important?
AGE RANGE: 5-7 years
OVERVIEW: Pupils explore different animals, inspired by The Most Important Animal of All by Penny Worms. They compare and contrast the diversity of living things by identifying the simple features of five vertebrate groups. Pupils record their findings using simple tables, developing their skills in data recording.

Great Skills Improver
Can machines think?
AGE RANGE: 7-11 years
OVERVIEW: Pupils actively develop key skills in teamwork, creativity, and problem-solving. They explore the understanding of effective teamwork and provide appropriate feedback.

RACETRACK TO ROAD
How can we reduce the amount of air resistance acting on a car?
AGE RANGE: 7-11 years
OVERVIEW: Pupils consider the forces acting on a car and investigate air resistance. They explore the effect of the shape of the nose cone of a car. Working scientifically, they develop skills in recording and interpreting data.

Animal Action
Which animal group is the most important?
AGE RANGE: 5-7 years
OVERVIEW: Pupils explore different animals, inspired by The Most Important Animal of All by Penny Worms. They compare and contrast the diversity of living things by identifying the simple features of five vertebrate groups. Pupils record their findings using simple tables, developing their skills in data recording.

RACETRACK TO ROAD
How can we reduce the amount of air resistance acting on a car?
AGE RANGE: 7-11 years
OVERVIEW: Pupils consider the forces acting on a car and investigate air resistance. They explore the effect of the shape of the nose cone of a car. Working scientifically, they develop skills in recording and interpreting data.

Learning Objectives:

- Identify and name a variety of common animals, including fish, amphibians, reptiles, birds and mammals.
- Use simple features to compare animals
- Use observations and ideas to suggest answers to questions
- Gather and record data to help answer questions.

Working Scientifically:

- Record data and results using bar graphs
- Ask questions and develop a line of enquiry based on observations of the real world
- Use appropriate techniques, apparatus and materials during laboratory work, paying attention to health and safety.

Prior Learning:

Pupils will have explored the five vertebrate animal groups and their features.

Resources:

- Data Collection Table
- Concept Maps
- New Animal Frame
- A range of resources to create a new animal - pencil crayon, paper, scissors, glue

Key Vocabulary:

- classify
- identify
- sort
- mammal
- bird
- fish
- group
- amphibian
- reptile
- force
- friction
- air resistance
- thrust
- downforce
- aerodynamics

Extend the Learning:

The Royal Society of Biology's A to Z of the Biosphere profiles a science career that supports understanding of the world around us.

Teacher Support:

Explore how to tackle pupil misconceptions and review samples of pupil work within the slide deck.

greatscienceshare.org

#GSSfS



Great Science Toolkit

Enquiry Planning Tool	Question Makers	Prediction Prompts
Conclusion Creators	Reliability Checkers	Observe And Draw Prompt
Share Prompts	Talk Prompts	Progression Tool for teachers
Sorting Selector	Group Roles	Model It Prompt

The collage features several educational tools:

- Question Teller:** A green sheet with a circular spinner divided into 12 segments, each labeled with a question word: Who, What, Where, How, Why, When, Which, How often, How long, How many, How much, and How big.
- Share Spinner:** A blue sheet with a circular spinner and instructions: "What you need? A pair of scissors, pencil and a paperclip. How does it work? 1. Print and cut out of the spinner. 2. Place the paperclip over the centre of the circle. 3. Place the tip of the pencil on the paperclip and flick it." It also lists various media types: Poster, Newspaper story, Magazine article, Letter, Website, Video, and Podcast.
- Great Science Prediction Prompts:** A blue sheet with orange cloud-shaped prompts: "I have...", "I think that...", and "I think that...". It includes the text "Age 5 - 7 years" and "#GreatSciShare".
- Great Science Conclusion Creator:** A blue sheet with a "Focus Frames" section and a "Sentence 1" section. The "Focus Frames" section includes a "Question Focus Frame" (Place over the scientific questions to encourage children to talk about what they've found out.) and an "Evidence Focus Frame" (Place over the evidence e.g. chart, table etc. to encourage children to talk about how it helps to answer their question.). The "Sentence 1" section has three prompts: "Sentence 1 Reason: What is your answer to your scientific question? I have found out that... I have discovered that...", "Sentence 2 Reason: Why does your evidence make you think this? I think this because I observed... My measurements show this because... My Venn diagram shows this because... My tally chart shows this because... My Carroll diagram shows this because... My pictogram shows this because...", and "Sentence 3 Reason: What other reason does your evidence make you think this? I think this because I observed... My measurements show this because... My diagram shows this because...". It also includes the text "Encourage children to form their conclusions using the Conclusion Creator." and "Age 5 - 7 years".



Why take part?

Advantages:

- Save teachers' time
- Inclusive resources
- Fosters pupil-led learning and curiosity
- Raise the profile of science
- Teacher professional development to build teacher confidence

Benefits:

- Improves working scientifically skills and builds science capital
- Empowers pupils to lead their learning and ask meaningful questions
- Builds a supportive culture for science across school and community

Great
Science
Share
for SCHOOLS

GSSfS resources are inclusive for all pupils and provide real-world links which enabled pupils to understand the importance of science.

Headteacher, Lancashire

8

Engage

British Geological Survey

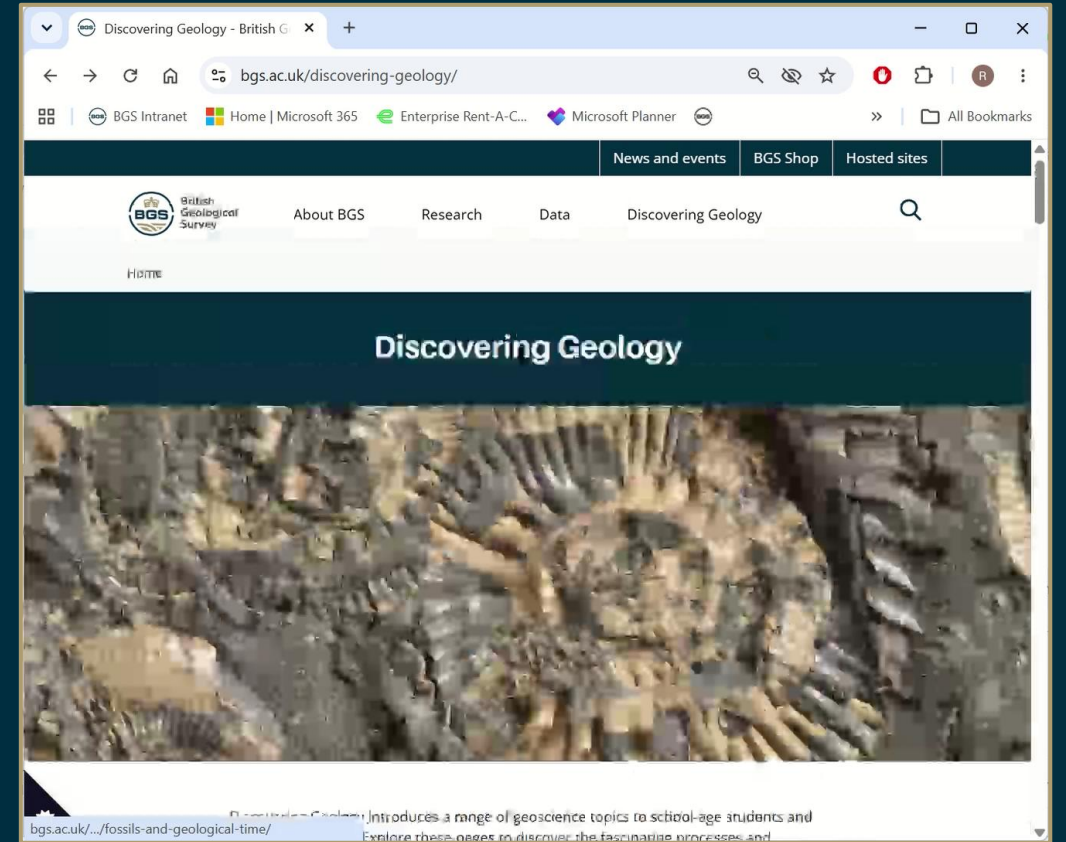
Rose Want
Public Engagement Manager

www.bgs.ac.uk



Discovering Geology

- Our hub for resources, activities and information related to geoscience
- Resources from KS1-5 / P1-S6
- Activities and lesson plans to download, resources to loan, background reading for topics



Rock loan kits!

- We have a range of rock and fossil kits to loan out to schools
- Include 12 rock and fossil specimens, magnifying glasses or hand lenses, and info sheets
- Loans available for 2 week period, free of charge
- Email bgsengage@bgs.ac.uk to enquire





Fossil kits



Rock kits

CheMudstry

- Teacher resource and info pack for exploring soils in the classroom
- Includes worksheets, lesson plan and teacher notes
- Aimed for KS2, or children aged 7-11


 ROYAL SOCIETY OF CHEMISTRY  British Geological Survey

Quick activity

This photo is taken from Rainbow mountain in Peru. All the different colours in the rocks are caused by the geology; the red is from iron.

Can you see and circle on this picture shades of:

1. brown
2. yellow
3. orange
4. green
5. purple



The diagram (overleaf) shows how soil colour is affected by the influencing factors and conditions described above.



Teacher CPD sessions

- Full-day or half-day sessions exploring rocks, fossils, soils, volcanoes and earthquakes for primary teachers
- Free sessions are run from our offices in London and Keyworth, Nottinghamshire
- All attendees receive a pack afterwards of demos they can do in the classroom



Sign up to hear about
upcoming sessions



Any questions?

Engage

Or get in touch with today's speakers:

Oak National Academy
help@thenational.academy

Imperial College London
spaceperson@imperial.ac.uk

CREST Awards
crest@britishscienceassociation.org

The Rosalind Franklin Institute
science.scribbler@rfi.ac.uk

Primary Science Teaching Trust
Kulvinder.johal@pstt.org.uk

Climate Ambassadors
hello@climateambassadors.org.uk

British Geological Survey
bgsengage@bgs.ac.uk

Great Science Share for Schools
greatscishare@manchester.ac.uk

Science Museum Group
info@sciencemuseumgroup.ac.uk

Engage Teacher Conference

Thank you

Complete the **5-minute feedback form** for the chance to win one of ten **£10 Amazon vouchers!**
<https://www.tfaforms.com/5181926>



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ASSOCIATION

