

See Through Science

Using photographic images to engage and inspire children to ask scientific questions about the world around them

FREE SAMPLE PAGES

To support teachers and families during school closures, **PSTT Fellows Dr. Paul Tyler and Alex Farrer** have written a second issue of their highly successful book, **See Through Science**. They have selected eight images designed to encourage children to think, to question and to discuss. The images cover a range of scientific phenomena and different applications of science. Each image comes with one or more key questions/clues, a small amount of background knowledge and suggestions for further activities.

Using the images

- Children will get the most out of using the images if they can discuss in a group, or have a discussion partner— this could be a teacher, parent or carer.
- You need to be able to show the children the images without them being able to see the information about each. **For a downloadable version containing only the images and key questions please click here.**

- Show the children one of the images with the key question, either on a screen or printed onto paper
- Read the key question together
- Encourage the children to share all the ideas they have, however unlikely they may seem
- Ask the children to discuss all the ideas and think about what sort of questions it would be helpful to ask
- If needed, give the children some clues or answer their questions
- Once the children have discovered what the image is, follow the suggested links to find out more

For more information about the original See Through Science resource please **click here**. The book includes fifteen high resolution digital images (included with the book as a digital download) and is packed with practical advice for teachers about using the image pack to develop children's observation, questioning and discussion skills.

Dr. Paul Tyler teaches at Kirkhill Primary School and has been a Fellow of the PSTT since 2013. He specialises in primary science and is especially interested in developing children's curiosity and scientific questioning skills. He has written several articles on aspects of primary science and speaks at conferences nationally.



Having had an advisory role for science in Richmond and Kingston for many years, **Alex Farrer** is now Head of STEAM at Wimbledon High School. She is delighted to be one of the PSTA winners for 2019. Alex is an experienced PSQM hub leader and led her own school to gain a PSQM Outreach Award last year.





With permission Brian Prout

Where have you seen this writing? Can you find out what the whole sentence says? Can you find out who said it?

CLUES

This writing is around the edge of something...

You'll need to look very closely as the letters are small...

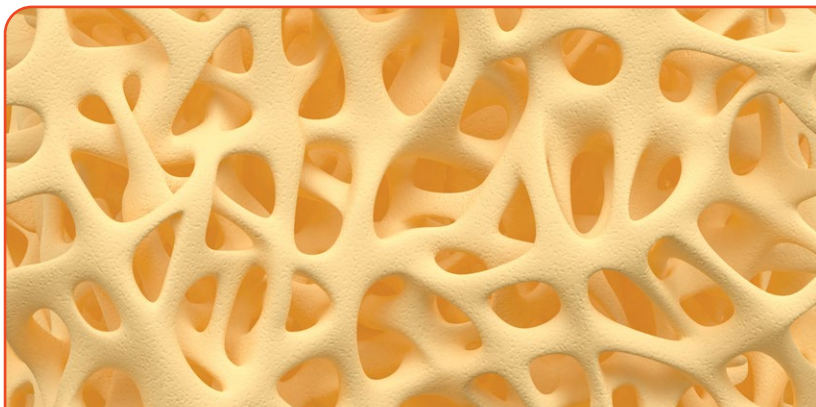
The object you are looking for would fit in your pocket or a purse...

FURTHER INFORMATION

Sir Isaac Newton famously once said "If I have seen further it is by standing on the shoulders of giants" meaning that he made his discoveries by building on the work of other scientists. He was a very influential mathematician, physicist and astronomer whose work on the laws of motion and gravity shaped all our lives. His words are now around the edge of £2 coins.

You could try using a fridge magnet to find out which coins are magnetic. How will you record your results? How will you explain your results? Some information that might help can be found by clicking below.

[Magnetic coins >](#)



There is a large amount of this material in your house. What is it? Can you work out what properties the material might have?

CLUES

Look at the connections – this is a very strong, but flexible material!

This material is as strong as stainless steel but three times more lightweight.

This material is very durable but starts to wear out after 60 – 80 years.

This very amazing material is inside all of us!

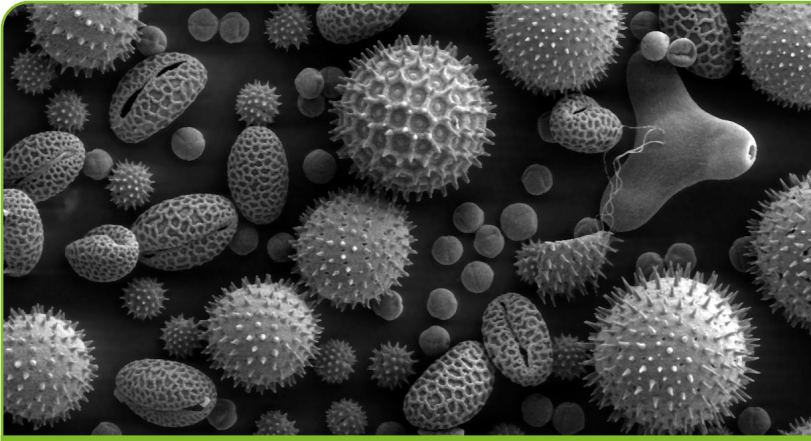
FURTHER INFORMATION

It's human bone!

Human bone is an amazing material. It has unique characteristics that make it superb at withstanding the rigours of life such as jumping, standing and running. It is flexible yet strong, lightweight but durable, and it can repair itself.

Astronauts have to do exercises to make sure that the lower gravity in space doesn't cause their bone density to decline. Why not try out some crew strength training with NASA astronauts so that you can improve your bone density too? Join in with the NASA squats and pushups by clicking the link above.

[NASA training >](#)



**What do you think has been magnified in this photograph?
Look very carefully at the shapes you can see and the
similarities and differences between them.**

CLUES

There is lots of this outside at the moment..

This comes in many different colours...

You can sometimes find this stuck onto the legs of bees.

This causes lots of people to have hayfever.

FURTHER INFORMATION

It's pollen! You can find out more about pollen by clicking the link below.

You could use a hand lens or a microscope to look at some other things very closely, but don't worry if you can't as you can use this great website instead.

[Pollen >](#)

[Microscope website >](#)



**Look very carefully. Can you think of 5 words that this
photograph makes you think of?**

MY WORDS ARE

bird

camouflage

tree

patterns

predator

Can you think of 5 more words?

FURTHER INFORMATION

This owl has feathers that are dull in colour and look very similar to the environment it hunts in. If the owl keeps very still it will be very hard for its prey to spot it. Having feather patterns that look like tree bark and tufts that break up its outline are very useful adaptations that help make owls very successful predators. What other adaptations do you think an owl has that make it such a successful predator? Find out more about camouflage with this activity on page 21 of the British Science Week pack.

[British Science Week pack >](#)



Spider webs are amazing. What do you think has happened here? What will happen next? Where is the spider? What clues can you find in this photo?

MORE QUESTIONS

See if you can find a spider's web. Maybe you can draw a very careful diagram of it. Maybe you can also draw and label a detailed diagram of the spider that made the web. Can you work out the species of the spider from the shape of the web? More help is available for identifying the spider in the link below.

[Identifying spiders >](#)

FURTHER INFORMATION

Spider web silk can be 5 times stronger than steel but 1000 times thinner a human hair! There are 660 different species of spider in the UK and the shape and structure of their webs can help identify the spider that lives there. Find out more by clicking below.

[Spider webs >](#)



Image: NASA, ESA

What five questions would you like to ask about this photo?

MORE QUESTIONS

What do you think this photo shows?

How do you think it was taken?

Why is it such an important image for astronomers?

[Read more about this amazing image >](#)

FURTHER INFORMATION

At first glance the photo looks like it is a collection of stars, but on closer inspection it becomes clear that they are not stars but a variety of differently shaped, and coloured objects. You can explore it in more detail by clicking the link below.

The image is the Hubble Ultra Deep Field image and only contains 5 stars, can you spot them, and what makes them different? The image contains nearly 10000 galaxies and is a snapshot through the history of the universe. There are galaxies in the photo that are nearly 13 billion years old, and others that are new – about 1 billion years old.

[Explore the image further >](#)

[Explore the scale of the universe >](#)



Image: NASA/JPL-Caltech

**Where do you think this photo was taken?
How was the photo taken?**

CLUES

It wasn't taken on Earth.

This robot rover is exploring the most visited planet in our Solar System.

The colour of the surface is a big clue as to what planet this is.

FURTHER INFORMATION

This is the Curiosity rover exploring the surface of Mars. Curiosity was launched in 2011 and following a traumatic landing on the Martian surface, it became the fourth rover successfully landed on Mars.

Why don't you explore the Solar System with the amazing interactive animation in the link below.

[Curiosity Mars Landing >](#)

[Explore the Solar System >](#)

[More about the Mars Rovers >](#)



What is this? Think of 5 questions to ask to try to find out the answer. All of your questions have to be able to be answered YES or NO.

HELPFUL QUESTIONS

Good questions to help find out the answer might be:

Is it made of metal?

Have we got one in our house?

Is it an animal?

FURTHER INFORMATION

It's a propeller on a boat!

A propeller is just one way of making a boat zoom across the water. Click below for a more unusual way that you might want to have a go at.

[Soap powered boats >](#)