

Research Space

Online educational resource

The Power of Light Zine 2 - Why does life exist? - an epistemically insightful way to explore the nature of science and research at Diamond Light Source, UK

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Exploring ways we can investigate Big Questions about ourselves and the world around us

Why does life exist?

Let's investigate by thinking about the ways we try to understand how the world around us 'works'.

If we were to place inside this jar all the ingredients needed for life to exist on planet Earth, what would we add?

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When we observe living things around us, we can learn about the relationships between different biological systems. We may wonder what happens to living things when there are changes in the environment.

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One of the key relationships we can observe in the world around us is based on 'cause' and 'effect'. Look at the example of these dominoes... each one appears to be having an effect on the next one.

Think about what may be a 'cause' and an 'effect' for each of **C** the following events: **rain sunburn flowering falling** Sometimes we might find there are questions that are hard to answer... for example "which came first – the chicken or the egg?"

Imagine you are walking near the sea and you observe, in the sandy soil, fossilised remains of an animal that lived a long time ago. What kinds of questions might you ask about this animal?

Tina is a scientist at Diamond Light Source who uses the synchrotron to research questions about the structures and relationships of materials inside living things. Tina has helped to find out more about what happened to dinosaurs long ago by observing the structures inside fossils. What challenges might you face when trying to find answers to some of these questions?

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...be exploring the work of scientists who observe and seek to understand what is needed for life on Earth to exist and thrive

In this zine we will ...

...find out how and why scientists at Diamond can work with paleontologists and geographers to explore events from a long time ago ...wonder about the ways we can investigate questions that help us build our knowledge about the world around us.





Why might observing what plants need help us understand events from millions of years ago?

Find out more about:

- Research at Diamond Light Source through their website page 'Dinosaur CSI'
- Mary Anning through books and films (add to your search 'a fossil hunter's story', and 'sea dragon')
- David Attenborough's BBC documentaries about 'Sea Dragon' and 'Dinosaurs: the Final Day'



How do you <u>know</u> if this statement is true?

Thinking like a scientist would involve observing how and where plants grow and thrive. Imagine you are putting on your 'scientist hat'... look outside and observe the places where most plants seem to grow well. What is the soil like – wet? dry? Is the season cold or warm? Compare the same kinds of plants that are growing in light places

to ones that are in darker places.

What could you do to test how important sunlight is for plants to thrive? Hint – you may need to have an experiment that takes more than a few days.. it may take some time to observe changes.

- 1) Take three containers (make sure each has a hole in the bottom), fill each with seedlings or a small leafy houseplant (like a spider plant)
- Place each container on a small plate or saucer and move them to 2) different places: one container in full sunlight (on a window sill), one in a place that is light but does not get full sunlight, and the last container somewhere very dark (maybe behind a cupboard or in a closed box).
- 1) Check that each container gets some water regularly (not too wet and not too dry).

At the end of the first week, put the containers side by side to compare what is happening to the plants. You could put the containers back and compare them at the end of the second week of your experiment.

At the end of the experiment, what can you say that you now know?

