Earthlearningidea

What was it like to be there? – bringing a fossil to life

A series of questions to bring fossils, and the environments in which they lived, to life

Try to bring fossils to life in the imaginations of your pupils by asking a series of key questions. Encourage them to use the evidence from the fossils themselves to answer the questions, rather than by guessing. Ask them to suggest what other evidence might help them to give even better answers. The '**What was it like to be there?**' questions are as follows.

When it was alive:

- *What sort of place was this animal living in?*
- *What did it breathe?*
- *What did it eat?*
- *Was it a hunter? – or hunted? – or both?*
- *What could it have seen?*
- *What could it have sensed?*
- *How did it die? – can we tell?*
- *What happened after it died?*

A fossil trilobite of the species *Dalmanites limulurus*, 7 cm long, found in mudstone of Silurian age (443 – 416 million years old) in New York state (USA). Photo taken by DanielCD. *Permission is granted to copy, distribute and/or modify this document under the terms of the GNU Free Documentation License.*

Possible answers, for the trilobite shown in the photograph, are:

- *What sort of place was this animal living in?* The flat shape suggests that it crawled around on the sea bed or swam near the sea floor.
- *What did it breathe?* It took oxygen from the water around, it 'breathed' from sea water.
- *What did it eat?* Smaller sea bed creepy crawlies or bits of dead animals.
- *Was it a hunter? – or hunted? – or both?* Depending on the age of the rock, both – it hunted little things, but was hunted in later geological periods by bigger things, like large nautiloids (squids). Its "armoured" exterior was for protection from these bigger things.
- *What could it have seen?* It had eyes, so it could have looked around and seen the sea bed with plants and other sea bed animals and, depending on the age of the rock, maybe fish in the water above.
- *What could it have sensed?* It could sense light with its eyes and vibrations in the water with its body.
- *How did it die? – can we tell?* This near perfect specimen might have been suddenly buried by muddy sediment and died.
- *What happened after it died?* The soft parts rotted and disappeared and the surrounding sediment hardened into rock.

The questions should help pupils to understand that the fossil was once a living, breathing, animal before it died and became preserved in the rock.

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The back up

Title: What was it like to be there? – bringing a fossil to life

Subtitle: A series of questions to bring fossils, and the environments in which they lived, to life

Topic: Using a series of questions to bring fossils (real specimens, plaster casts, photos or drawings) to life in the ancient environments in which they lived and died.

Age range of pupils: 8 – 18 years

Time needed to complete activity: 10 minutes for each fossil

Pupil learning outcomes: Pupils can:

- describe an animal fossil as the ancient remains of a living, breathing entity preserved in rock;
- interpret evidence from the fossil itself and the surrounding sediment to suggest the lifestyle and environment of the original animal.

Context:
The **'What was it like to be there?'** questions can be used to bring other fossils to life, such as those shown in the photographs.

Possible answers, for the *Gorgosaurus* skeleton in the photograph, are:

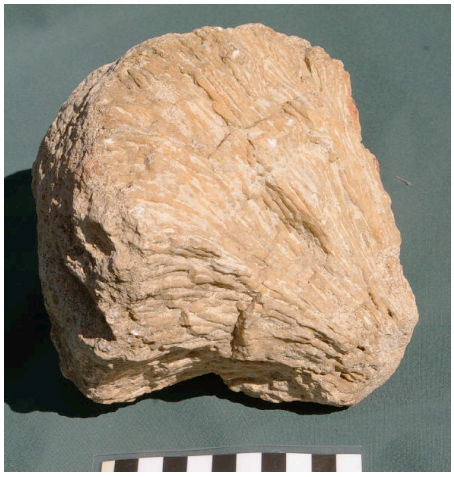
- *What sort of place was this animal living in?* It had feet, so must have lived on land and there must have been other animals around for it to eat – and they must have eaten plants.

- *What did it breathe?* It lived on land, breathing the oxygen in the air as we do.
- *What did it eat?* Its sharp teeth show it was a meat-eater.

Gorgosaurus skeleton in its burial position in a mudstone. Skeleton about 4m across. From the American Geological Institute, Earth science World Image Bank (http://www.earthscienceworld.org/images/index.html). Photo ID: hpdzvh, copyright Abi Howe, AGI.

- *Was it a hunter? – or hunted? – or both?* The teeth are those of a hunter.
- *What could it have seen?* It could have seen its prey – especially plant-eating dinosaurs, and the plants that they lived on.
- *What could it have sensed?* It would have all the senses that we do.
- *How did it die? – can we tell?* This well-preserved skeleton must have died suddenly and been buried by muddy sediment. The tightening of the neck muscles after death caused its head to bend backwards.
- *What happened after it died?* The soft parts rotted and disappeared and the surrounding sediment hardened into rock, preserving the bones.

What was it like to be there? – when this coral was fossilised in limestone.



Colonial fossil coral *Cladophyllia* from Jurassic (200 - 145 million year old) rocks in Wiltshire, UK, Photo: Elizabeth Devon. Specimen about 15 cm across.

- *What sort of place was this animal living in?* Colonial corals today live in shallow warm sea reefs – this one probably did too. ('Colonial' - lots of tiny soft jelly-like coral polyps living together in a colony.)
- *What did it breathe?* It took oxygen from the water around, it 'breathed' from sea water.
- *What did it eat?* Modern coral polyps have soft parts with tentacles to catch small organisms in the sea water. The fossil probably did too.
- *Was it a hunter? – or hunted? – or both?* It caught tiny live animals, so it was a "hunter" even though it was fixed in position.
- *What could it have seen?* It had no eyes.
- *What could it have sensed?* It could sense vibrations and 'smells' in the water.
- *How did it die? – can we tell?* This specimen might have been broken off a reef in a storm and buried with other coral debris – you can see the broken base.
- *What happened after it died?* The soft polyps rotted and disappeared and the surrounding sediment hardened into rock.

Following up the activity: Many other fossil examples can be dealt with in this way, including plant fossils.

Underlying principles:
The evidence on how fossils lived and died comes from:

- the principle of Uniformitarianism that the 'present is the key to the past' – we use our understanding of the lifestyles of organisms today to interpret how similar organisms lived in the past;
- the evidence preserved in the fossil, such as presence of eyes, limbs, etc. and the unusual preservation of soft parts;
- the traces left by the organism – tracks, trails, burrows, etc. can be very revealing;
- the sediments, with their sedimentary structures, in which the organisms were buried.

Thinking skill development:
Pupils have to use their creativity and imagination to bring the animals and their environments to life, whilst 'bridging' between life today and in the past.

Resource list:
Fossils, as real specimens, plaster casts, photos or drawings, and a vivid imagination.

Useful links: Many examples of fossil photographs can be found on the internet, by searching images using an internet search engine like Google (http://www.google.co.uk/).

Source: This activity was developed by Chris King of the Earthlearningidea team.