

Investigating Fossils in the Classroom



Sedgwick Museum
of Earth Sciences

Some ideas for hands-on activities for KS1-3

Children are captivated by deadly dinosaurs and underwater creatures. Be creative and try using them in your teaching across the curriculum as a way to embed scientific enquiry into other tasks.

Here are a few suggestions of simple ways of working with fossils in the classroom, as well as some useful background information to support your subject knowledge.

What are fossils?

Fossils are the remains of organisms and evidence of past life preserved in rock.

The word fossil comes from the Latin *fossilis*, meaning “dug up from the ground”. Fossils are the evidence for the existence of once-living animals and plants and may be either the preserved remains of an organism or evidence of its activity.



A fossil is any evidence of ancient life naturally preserved within the materials that make up the Earth - usually sediments / sedimentary rocks, but also tar, natural resins and ice.

Different types of fossil

Body fossils preserve the hard or much more rarely soft body parts of an animal or plant, or internal casts of these parts. Common examples are bones, shells, teeth, leaves and spines.



Trace fossil foot print

Trace fossils are evidence of animal or plant activity that do not preserve part of the animal or plant. These can be footprints, burrows, gnaw marks in bones, and even poo.

Chemical fossils are subtle molecular evidence of life that can be found in some rocks eg the presence of organic carbon. This is carbon that has a special chemical signature that indicates that it was once part of a living thing.



Why do we study fossils?

Fossils provide evidence that helps us to learn about life on Earth in the very distant past. The oldest known fossil is approximately 3.6 billion years old.

Studying the evolution and extinction of different animals and plants by looking at fossils can provide clues about what might happen in the future to plants and animals alive today.

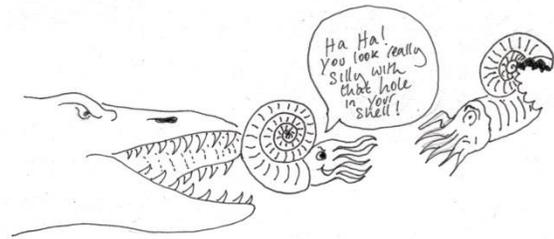
Along with rocks, fossils help us to learn about the environment and how it has changed through time.

As we learn more about the animals and plants that are alive today, our ideas about fossils and how we interpret them as living things can change a lot.

Fossils and the stories they tell

Palaeontologists are scientists who investigate fossils with the aim of bringing the past back to life. It's not at all like Jurassic Park where we can bring extinct animals and plants back to life, and as DNA does not keep well even in amber, palaeontologists must look for more subtle bits of evidence. These can include similarities and differences between fossils, and similarities and differences between fossils and living things.

Individual fossils can provide us with some evidence and a range of clues about life in the past. A bite mark in a shell or a bone is a clue that some animals were being predated, or that animals fought, so they can even help us to learn about behaviour.



Looking at fossils that were found in the same rock in the same place together can provide evidence about habitats and food chains.

What other things can you think of that we can learn about life in the past from looking at fossils?

- We know how big animals were from the size of their bones and shells
- We know how tall plants were from their stems or trunks
- We know whether animals had an endoskeleton or an exoskeleton
- Fossilised poo can give clues about what animals ate, like owl pellets
- Teeth are also a useful clue about what an animal ate
- Sometimes we can see what animals' bodies were covered in egg scales or bony plates

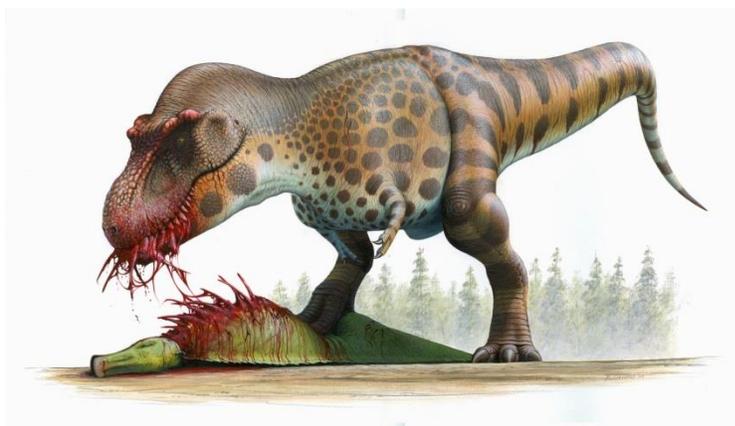


Can you think of any bits of important evidence that are completely missing from the fossils?

Think of a dinosaur. Can we answer any of these questions just by looking at a skeleton in a museum?

- What colour were dinosaurs?
- Were dinosaurs all the same colour?
- Did dinosaurs go grey when they got old?
- How big were their hearts?
- Male or female?
- Did dinosaurs have good hearing?
- Did dinosaurs have excellent eye sight?
- How long was a dinosaur's tongue?
- How long did a dinosaur live for?
- How did the dinosaur die?
- How fast could a dinosaur run?
- Was the dinosaur furry?
- Was the dinosaur overweight?
- Did a dinosaur have ears?
- How big were *T. Rex's* biceps?

Museums have pictures and models of dinosaurs on display alongside the fossil skeletons. Film and TV includes CGI animations of dinosaurs. *Jurassic Park*, *The Lost World* and *Walking with Dinosaurs* are some of the best known examples. The animals move, make noises, care for their young, hunt and hide. They are often brightly coloured, with patterns on their skin which can help them to blend into their environment, or make a statement. The film makers work with palaeontologists to bring the 150 million year old rocky skeletons back to life.



Where does all this extra stuff come from?

How do the scientists work out what colour a pterosaur's belly might have been? Did *Stegosaurus* blush?

Palaeontologists look around them at living things to fill in the missing information that fossils cannot provide.

For example, people studying *Tyrannosaurus rex* have studied:

- Big cats, birds of prey and hyenas to get ideas about how it may have hunted or scavenged
- Birds to understand its skeleton, musculature and movement
- Reptiles to get clues about how it's skin may have looked

But remember that until we can build a time machine and travel back to see them for ourselves we will never be 100% certain of how dinosaurs or any other fossil animal or plant looked or behaved!

