



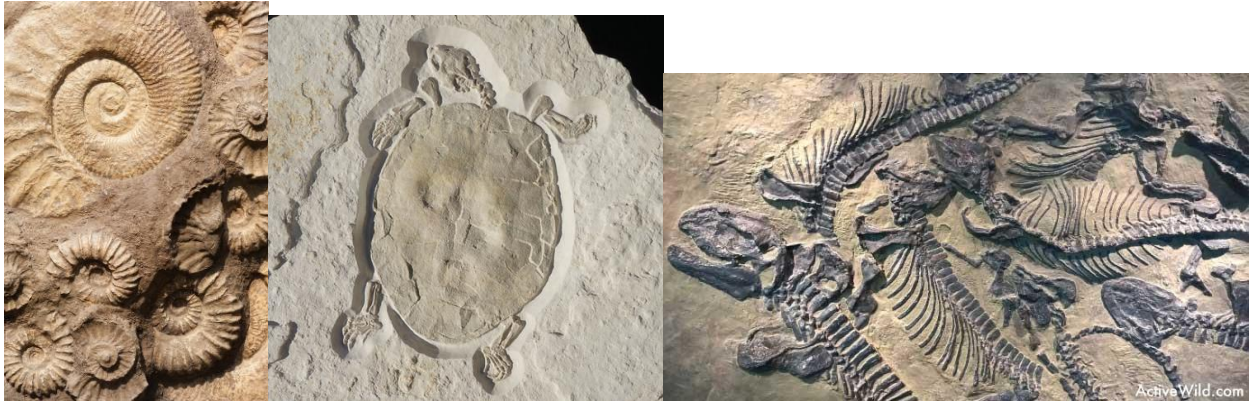
Year 3

Remote Learning

Wider Curriculum Week 14

Science

Continuing our learning about **rocks**, we are moving on to **fossils!** Have you ever seen a picture of a fossil or one in real life? There are some examples of fossils below.



Fossils

What are fossils? How are they formed? You can watch this video to begin finding out, or you can skip this if you are not using a device:

<https://www.bbc.co.uk/bitesize/topics/z9bbkqt/articles/z2ym2p3>

Think about this question: are dinosaurs real?

Explain your answer - why do you think that? What evidence do you have that they are real or not real? Where does the evidence come from?

We know that dinosaurs are real from the study of fossils! We call this **palaeontology**.

Palaeontology

It is believed that dinosaur fossils have been found for centuries (many hundreds of years - even millions of years!) and that fossils led the people of the past (in ancient cultures) to create and believe in mythical creatures because they thought that this is what they were looking at when they saw a fossil. However, we don't have the right evidence to know this for sure. What we do know is that our current knowledge of dinosaurs and palaeontology started in the 1800s (the Victorians). So we really have only known about them for the last 200 years! We know about dinosaurs due to the discovery of fossils and fossilised skeletons.

You can watch this short video to help understand what we learn from fossils - how they tell us about the history of the Earth. If you are not using a device, just skip this - it doesn't matter! <https://www.bbc.co.uk/bitesize/topics/z9bbkqt/articles/z22g7p3>

First of all, it is important to know the difference between fossil and bone.

What is the difference between fossils and bones?

Bones are any piece of the hard whitish tissue that makes up **the skeleton** in animals, including humans. **Fossils** are more than just ancient bones, which is what many people think. **There are three types of fossils – body fossils, trace fossils and chemical fossils.**

- **Chemical fossils** contain carbon, which is proof that they must be formed from once living things. Examples of chemical fossils include coal, petroleum oil and natural gas.
- **Body fossils** are the remains of an animal or plant such as bones, shells or leaves. There are different types of body fossils:

Mold and Cast Fossils



Mold fossils form when over millions of years, the plant or animal is pressed in between layers of rock, but all the parts (including the bones) have *decayed* and all that is left is the empty mold of the animal. Think of molds you may have used with playdough, or if you press an object into playdough - the imprint (the print and shape of the object) that is left in the dough when you remove the object, is like a mold fossil, except instead of being removed, the living thing in this case, completely decays and leaves nothing behind but the mold of its shape in rock - a mold fossil!

Cast fossils form from mold fossils. The mold fossil gets filled up with *sediment* – so it is not made up of the original matter of the animal or plant anymore. In other words, you start with a mold fossil - which is the original living thing but completely decayed and so just the imprint is left (no original part of the living thing). Then over time this fills with sediment - the way you might fill a sand mold with wet sand, so that when you remove the sand mold, you are left with the 3D shape of your mold. A cast fossil is made from the mold fossil of whatever the living animal or plant was originally.

Replacement Fossils

Replacement fossils form when water dissolves (breaks down) the original hard matter of the bones and replaces them with mineral matter – this is what we think

of when we discuss dinosaur fossils. They still look like the original bones but are not made up of the same matter (not the actual bones anymore).



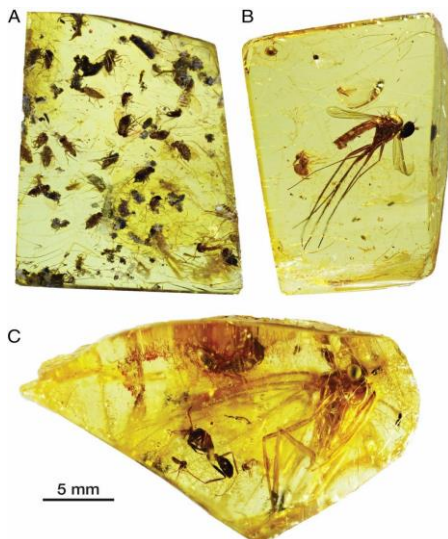
This is a dinosaur fossil - **a replacement fossil**, but you would be forgiven for thinking it was the original dinosaur bones!

Whole Body Fossils

Whole body fossils form when the original body has been preserved – for example a woolly mammoth in ice or a mosquito in amber. The actual body has not decayed.



This is **a whole body fossil** of a baby woolly mammoth. The body didn't decay because it was in ice, which preserves things - stops them from decaying.



These are examples of **whole body fossils** too. Insects in amber - the orangey, almost transparent, resin that comes from trees and hardens, (it is where we get the name for the 'amber' traffic light).

- **Trace fossils** are fossils that show the activity of an animal, for example its movement. These include *footprints*, *trackways* and even *coprolites* (which is fossil faeces - in other words, poo that has become a fossil!). Let's think of this type of

fossils as being 'traces' of the creature, rather than showing the actual creature itself. We don't get trace fossils for plants!

Trace fossil of a dinosaur footprint



Trace fossil of trackways



Coprolite (fossilised poo!)



The Fossilisation Process

There are many different ways that fossilisation occurs. We will focus on how fossils form in rocks (both **body** and **trace fossils**). **Fossilisation only takes place in sedimentary rocks** as the heat from the lava that creates *igneous rocks* and also changes the structure of *metamorphic rocks* would be too high for fossils to survive.

Now watch the BBC video again (if you can, otherwise, you can see the process in the pictures below):

Fossilisation Process; Step 1

An animal or creature dies on land or in the sea and it gets covered by a layer of sediments (e.g. plant material and tiny parts of rock or soil etc). Over time, through compaction and cementation (solidifying), these eventually form a layer of rock.



Fossilisation Process; Step 2

Over time more layers of rock are formed which cover it and by this time the only thing to remain of the organism would be the hard parts such as bones, shells and teeth.



Fossilisation Process; Step 3

Over thousands of years the mould fossil might become a cast fossil with sediment entering the mould. In the case of replacement fossils, the original bone matter changes to mineral matter but this does not affect the shape of the bones.



<https://www.bbc.co.uk/bitesize/topics/z9bbkqt/articles/z2ym2p3>

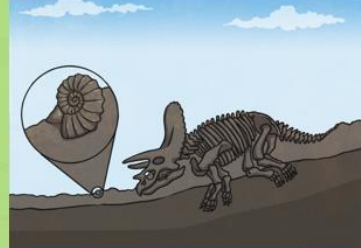
Fossilisation Process; Step 4

Over a long period of time the sea will recede in certain places. The sea level could also be changed quickly through earthquakes and volcanic eruptions.



Fossilisation Process; Step 5

As erosion and weathering takes place, eventually the fossils become exposed.



Fun Fact!

What do you think a **'living fossil'** might be?

Definition of living fossil: an organism (a living thing) that has remained essentially unchanged from earlier geologic times, and whose close relatives are usually extinct.

There is an animal that we can all think of, that is considered by some scientists and palaeontologists to be a living fossil (although there is some argument about whether it is or it isn't!) Can you think what the animal might be? Here are some clues...

- It can be deadly!
- It is large with bony scales and a long, strong tail
- It is a reptile but spends a lot of time in water
- You won't see this animal in the wild in the UK! You will find it in Australia and parts of North or South America
- It has sharp teeth!

Have you guessed what it is?

A crocodile

Activity ideas

- Sorting Activity - The Fossilisation Process. Print the pictures/ draw your own and put them in the correct order to show the fossilisation process. Match the description to each picture or challenge yourself to write your own short explanation of each stage.
- Think like a palaeontologist and see if you can match the fossil to the dinosaur! You will need to print the document - Match the Fossil to the Dinosaur.
- Create a poster or PowerPoint presentation about fossils! Explain the different fossil types and the fossilisation process.
- Use dough, playdough, modelling clay (whatever you can think of or have access to) to make an example of a mold fossil or a cast fossil! Of course, you won't actually be using a living thing, or waiting for it to decay for years as it is compressed between rocks in order to leave nothing but the mold of its original form! But you get the idea!

If you are able to login to Twinkl at home, you might enjoy doing this **Fossil Quiz** to test out your knowledge and learning (Miss Akyildiz enjoyed doing it!)

<https://www.twinkl.co.uk/resource/fossils-multiple-choice-quiz-tg-337-newlink>