

Fun with Fossils!

Teacher Background

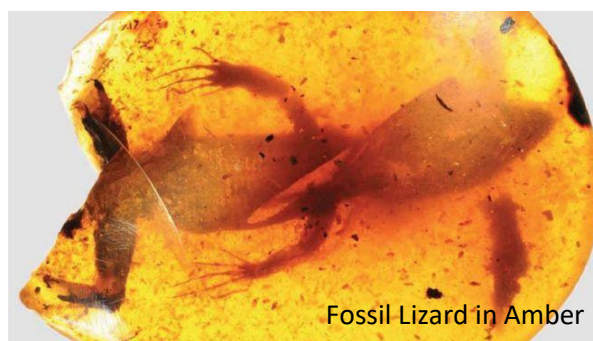
Fossils are the remains or evidence of prehistoric animals. Fossils provide a record of animals that lived millions of years ago. Very few plants and animals actually become fossils. In order for a plant or animal to turn into a fossil, specific conditions must all happen in a relatively short period of time. In most cases, a plant or animal dies in a watery environment and its remains lay on top of soft sediments (clay, silt, or sand). The animal then becomes buried relatively quickly after dying. This happens during catastrophic events, such as floods, landslides, earthquakes, etc. After an animal has died, its body will decay away due to bacteria and other bugs or animals. But when the animal's remains become buried beneath sediment after death this decaying process slows down dramatically. The soft parts of the animal eventually decay away and leave behind the hard parts like bones and shells. Over millions of years, the sediment and animal's remains continues to get buried beneath more and more layers of sediment. The animal remains can then become mineralized where minerals fill in the spaces in the cellular structure of the animal (turning the animal into stone) or the animal's remains can completely decay away leaving a mold of the animal in the stone. If the mold is filled in with minerals an exact replica, called a cast, is created.

There are other ways a plant or animal forms a fossil. The different types of fossils and how they form are described below:

Mineralized: Animals become mineralized when, the hard parts of animal's remains are hardened into rock through minerals precipitating (filling) in the tiny spaces in the animal's cellular structure.



Amber: Insects and small animals can become trapped inside a tree's sap. This sap will harden into the mineral amber and preserve the remains inside.



Carbonization: Carbonization is when all the parts of an animal disappear except the carbon. This leave a residue that outlines the plant or animal.



Cast and Mold: A mold is formed when buried remains decays away and leaves behind a hollow space. This would leave an imprint of the animal in the rock called a mold. If that hollow space or imprint is later filled in with minerals a cast is created. A cast would be a 3-dimensional solid recreation of the animal.

Ammonite cast and mold



Freezing: Some animals can be found preserved in ice. If the ice remains frozen the animal can remain preserved for thousands of years.



Trace Fossil: These are not the physical remains of an animal but evidence that a plant or animal lived nearby. For example, footprints left behind by an animal walking over soft sediment. Other examples include, burrows, trails, nests, teeth marks, and, gastroliths (gizzard stones), and coprolites (fossilized poop!).



Instructions

Pre-Lesson Preparation:

Make copies of the Fossil or Not ID sheet for each student.

Place the fossil and non-fossil specimens around the room with their sample numbers.

Class Lesson:

1. Begin by having a discussion with the students to see if they can recall any animals that used to live a long time ago but are no longer around. Many will name dinosaurs and maybe a few others.
2. Ask them how do we know these animals existed? They should come up with the idea that scientists have found fossils.
3. Ask the students what is a fossils? They may say animal bones that are turned to rock.
4. Read with the class the book "Fossils Tell of Long Ago"
5. Discuss the book with them and what a fossil is and how they form.
6. You can then expand on the book and discuss the different types of fossils showing them the different pictures provided.
7. You may want to show short videos on fossilization here are a few from PBS: Becoming a Fossil: <https://mass.pbslearningmedia.org/resource/tdc02.sci.life.evo.becfossil/becoming-a-fossil/#.Xpcu-shKg2w>
8. You can then give each student their ID tables and a magnifying glass
9. Tell the students they are going to go around the room and look at the different objects and write the sample number in either the 'Fossil' or the 'Not Fossil' column.

10. You may want to break them up into small groups (2 – 3 students) and divide them among the stations, giving them a certain amount of time at each station before moving them on to another one.
11. After the students have looked through each specimen. Discuss each specimen and decide whether they are a fossil or not.
12. Sort the specimens into two piles as you do this. One pile for fossils and a second pile for specimens that are not fossils.
13. Discuss with the students what the fossils look like and what types of fossils they are. Ask them if they look like any animals, they know of that are around today. Have them compare these specimens to organisms that they know of. Are they the same shapes and patterns?

Extension Activity

You could have the students pick one fossil and imagine what type of environment it may have lived in. Students can do this by how they compared the fossils to organisms that they know of. You may need to help them make the connection. Some examples could be a fossil shell is most likely from an animal that lived in the ocean. Or a fossil leaf could be from a forest. The students can then write a short sentence describing their fossil and where it lived.

Assessment

To assess students understanding of the topic, show them some unknown fossil samples (pictures or real) and ask them to identify them as fossils or not a fossil.

Fossil	Not A Fossil