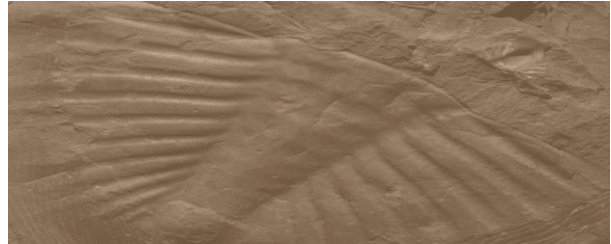


FOSSILS

Essential Questions and Answers:



What is a fossil?

Teacher: A fossil is the remains or evidence of an animal or plant that lived many years ago. Most fossils are found in sedimentary rocks when an animal or plant was quickly covered by sand or mud, which later turned to rock. Plant and animal remains become fossils only in certain rare conditions. Most fossils are formed from the hard parts of animals and plants, such as shells, bones, teeth, or wood.

What can you learn from studying fossils?

Teacher: Fossils can tell us a lot about plants and animals that lived in the past. Studying fossils show how living things have changed, or evolved, over millions of years. Fossils also show how land masses have slowly moved over time and how weather and climate have changed.

Why might you find a fossil of an aquatic organism in a desert?

Teacher: Remains of sea dwelling organisms in the earth indicate that the land was once covered in water. The deeper the layer of fossils, the older those fossils are. Using this knowledge, scientists can determine how long ago water may have covered the land. For example, much of the Coastal Plain in Georgia, very near the Piedmont, is covered in fossils of sharks, fish, marine reptiles, and marine mammals. This tells us that the coast of Georgia was once much further inland than it is now.

How are different fossil types formed? (molds, casts, imprints, and amber)

Teacher: Most plant and animals remains DO NOT become fossils. Fossils are rare and form only in certain conditions. Some of the more common fossil types include molds, cast, imprints, and amber.

Molds: Mold fossils are hollow impressions of plants, bones, and shells in rocks. Molds form when the hard parts of a plant and animal decay over thousands of years, leaving a hollow print.

Casts: Cast fossils are materials that have hardened after filling a mold. Water will cause minerals to fill a mold fossil. Over time the minerals harden into rock leaving a cast fossil. A cast fossil looks just like the original bone or shell the minerals replaced.

Imprints: Some common fossil imprints are dinosaur tracks which are formed when the large animals left their tracks on the bottom of shallow seas or rivers. The tracks are covered with sediment and harden. (Think of a footprint made in wet cement that has dried over time.)
Imprint fossils are known as impression fossils.

Amber: Amber is hardened tree sap. Amber often contains animals that were trapped in sticky resin as it dripped down trunks and stems.

Where are fossils most likely to be found?

Teacher: Most fossils are found in sedimentary rocks when tiny particles of sediment are cemented together. Sedimentary rocks generally formed in layers. The deeper a fossil is discovered underground, generally the older the fossil.

What is a paleontologist?

Teacher: Paleontologists are scientists that specialize in studying fossils in order to learn about plants and animals of the past. Paleontologists travel to sites where fossils are found to carefully dig fossils out of the ground.

How do paleontologists find fossils?

Teacher: Paleontologists carefully search and dig for fossils around the world. Studying geologic maps is important, as searches are generally focused on sedimentary rocks such as sandstone and limestone. Some tools paleontologists use include chisels, maps, trowels, hammers, brushes, and magnifying glasses.

How is an authentic fossil different from a model/replica?

Teacher: Some fossils are very rare and therefore there are not many of them. Yet those fossils play an important role in the timeline of life on Earth. Therefore, many museums have replicas or casts of the rare fossil in their displays of Earth's timeline. A model or replica is a perfect copy of a fossil that scientists make by filling a cast with a substance like plaster.

What are extinct organisms, and how do scientists study them?

Teacher: Extinct organisms are those organisms that no longer exist on earth. They were wiped out by extreme weather conditions, predators, or climate change among other reasons. Scientists can study these animals by studying their remains. Animals that have gone extinct more recently can be studied using scientists' records. Some examples include: Tyrannosaurus, Velociraptor, Pterodactyl, Woolly Mammoth, Triceratops, Stegosaurus, Procompsognathus, Pachycephalosaurus, Apatosaurus, Edmontosaurus, Dodo Bird, Saber Tooth Tiger, Giant Ground Sloth, Archelon, Quagga, and the Cave Lion.

Essential Questions and Answers (for students):

What is a fossil?

Student: The evidence or remains of a living thing from long ago.

What can you learn from studying fossils?

Student: Fossils can tell us a lot about plants and animals that lived in the past.

Why might you find a fossil of an aquatic organism in a desert?

Student: The types of fossils scientists find in a particular area tells them whether there used to be water there or not. How deep the fossils are buried can tell scientists how long ago water was there.

How are different fossil types formed? (molds, casts, imprints, and amber)

Student: Most plant and animals remains DO NOT become fossils.

Molds: Mold fossils are hollow impressions of plants, bones, and shells in rocks.

Casts: Cast fossils are materials that have hardened after filling a mold. A cast fossil looks just like the original bone or shell they replaced.

Imprints: Imprints are generally formed when dinosaurs walked over muddy areas and left behind their footprints. (Think of a footprint made in wet cement that has dried over time.)

Amber: Amber is hardened tree sap. Amber often contains animals that were trapped in sticky resin as it dripped down trunks and stems.

Where are fossils most likely to be found?

Student: Most fossils are found in sedimentary rocks.

What is a paleontologist?

Student: Paleontologists study fossils to learn about Earth's past.

How do paleontologists find fossils?

Student: Paleontologists find fossils all over world by searching and digging in sedimentary rocks.

How is an authentic fossil different from a model/replica?

Student: A model or replica is a copy of a fossil that scientists make by filling a cast with something like plaster.

What are extinct organisms, and how do scientists study them?

Student: Extinct organisms are organisms that have completely died off, so no more can be found on Earth. Scientists study them by looking at fossils and the notes of other scientists.

What is a fossil?

Teacher:

A fossil is the remains or evidence of an animal or plant that lived many years ago. Fossils are found in sedimentary rocks. Not all plants and animals become fossils. Only some parts of an animal become a fossil, mainly teeth and bones.

Student:

The evidence or remains of a living thing from long ago.

What makes a fossil?

Teacher:

Some fossils are made from teeth, bones, the exoskeletons of ancient invertebrates, and leaves. The key is that they are formed from the hard parts of living things being pressed into or between soft soils. You would not find the remains of a jellyfish or the eye of a tyrannosaurus because those parts decompose and do not leave a solid imprint in the earth. Nor would you find a fossil of a dinosaur tooth if that tooth had fallen onto a solid rock instead of mud or tar. Other evidence of ancient animals includes footprints, burrows, and coprolite (animal scat/solid waste).

Student:

The hard parts of animals are left behind in mud which hardens over time to create the fossil.

How is a fossil made?

Teacher:

When a plant or animal dies, its remains leave a cast in the earth. Over many years, the bone or other remains are slowly replaced by minerals from water and soil. Eventually those minerals completely replace the original remains, leaving behind the fossil that paleontologists dig up. Other fossils are formed when animals like insects get caught in tree sap. Over time the tree sap hardens, preserving the animal inside. This hardened tree sap is called amber.

Student:

When a plant or animal dies, it may press into soft soil. As that soil hardens, the organism is either preserved by the hard rock and minerals or it eventually decomposes, leaving an empty space in the shape of that organism. Some small animals, like insects, may get caught in tree sap that hardens into amber.

How is an authentic fossil different from a model/replica?

Teacher:

Some fossils are very rare and therefore there are not many of them. Yet those fossils play an important role in the timeline of life on Earth. Therefore, many museums have replicas or casts of the rare fossil in their displays of Earth's timeline. A model or replica is a perfect copy of a fossil that scientists make by filling a cast with a substance like plaster.

Student:

A model or replica is a copy of a fossil that scientists make by filling a cast with something like plaster.

How can scientists learn about the earth by looking at fossils?

Teacher:

Remains of sea dwelling organisms in the earth indicate that the land was once covered in water. The deeper the layer of fossils, the older those fossils are. Using this knowledge, scientists can determine

how long ago water may have covered the land. For example, much of the Coastal Plain in Georgia, very near the Piedmont, is covered in Fossils of sharks, fish, marine reptiles, and marine mammals. This tells us that the coast of Georgia was once much further inland than it is now.

Student:

The types of fossils scientists find in a particular area tells them whether there used to be water there or not. How deep the fossils are buried can tell scientists how long ago water was there.

What are extinct organisms, and how do scientists study them?

Teacher:

Extinct organisms are those organisms that no longer exist on earth. They were wiped out by extreme weather conditions, predators, or climate change among other reasons. Scientists can study these animals by studying their remains. Animals that have gone extinct more recently can be studied using other scientists' records. Some examples include: Tyrannosaurus, Velociraptor, Pterodactyl, Woolly Mammoth, Triceratops, Stegosaurus, Procompsognathus, Pachycephalosaurus, Apatosaurus, Edmontosaurus, Dodo Bird, Saber Tooth Tiger, Giant Ground Sloth, Archelon, Quagga, Cave Lion

Student:

Extinct organisms are organisms that have completely died off, so that no more can be found on Earth. Scientists study them by looking at fossils and the notes of other scientists.

Essential Vocabulary:

fossil
organism
evidence
fossil formation
*fossils are found in sedimentary rocks

paleontologist
mold
cast
replica
imprint
amber
extinct