

STEAM SUBJECT: Geology/Paleontology

Lab: Make Your Own Fossil

Grades: 2-5

Learning Objective:

Students will be able to

- make a model of a fossil
- identify the characteristics of a fossil and how they are formed
- analyze and interpret data about fossils to describe their habitats

ENGAGE:

Ask students the following questions:

- What do you think a fossil is? Students can make a drawing and share what they know!
- How do you think a fossil is formed? Share your ideas!
- What can we learn from fossils?
 - Have students take a look at the following pictures and see if they can determine the animal's diet based on its teeth.
 - The T-rex was a carnivore and had sharp teeth perfect for tearing through meat. The sauropod was an herbivore and had rounded, flat teeth perfect for grabbing and grinding leaves.



Tyrannosaurus rex Skull



Sauropod Skull

EXPLORE:

Make your own fossil activity

Materials needed per student:

- Modeling clay
- Shells, branches, leaves, toy animals, or anything to make a fossil imprint with

Directions:

1. Roll a lime sized clay into a ball and lightly flatten it into ~half an inch thickness.
2. Press the object (branch, leaves, shell, etc.) into the clay to make the print. This will create an imprint of the object onto the clay and form a clay fossil. If the students have any plastic dinosaur/animal toys, they can also use those to create more interesting fossil molds.
3. Students can create narratives and stories with their fossil by creating footprints and other imprints onto another clay fossil. Follow directions on the modeling clay packaging to allow fossils to dry/harden completely.



Optional Activity:

When clay is dried, have students paint their fossils. The paint can end up highlighting parts of the fossil that are less visible in the clay. Once the paint and clay are dry, have an adult use a hot glue gun or super glue to attach a magnet to the fossil. Parents can proudly display their children's work on the refrigerator or gift the fossils to family and friends.

EXPLAIN:

- What are fossils?
 - ✓ any preserved remains or traces/evidence of remains of any organisms that lived in the past, such as dinosaur bones or seashells.
 - ✓ preserved remains become fossils if they reach an age of about 10,000 years.
 - ✓ the remains usually need to be covered by sediment soon after death to avoid decomposition.

- What can we learn from fossils?

We can learn many things from observing fossils. Fossils provide evidence about the types of organisms that lived long ago, what type of food it ate, how it moved, where it may have lived, and how the Earth's habitat and environment has changed (marine animal fossils being found in deserts, similar fossils being found in different parts of the world, etc.).

- How a fossil is formed?
 - There are generally five types of fossils that can be formed: petrified fossils, molds and casts, carbon films, trace fossils, and preserved remains. Within these five types, paleontologists may divide fossils into more categories.

Types of Fossils:

- Petrified Fossils: These fossils are formed when an animal is buried in sediment and over time, the water dissolves the parts and the minerals in the water replaces the dissolved parts, turning into stone. It creates an exact copy of the organism in stone form. This is also known as mineral replacement.
- Mold and Cast Fossils: These fossils are formed when an organism's body leaves a mold/impression in sand, silt, or clay. As the mold is filled with sediment, it leaves a cast that looks like the organism.
- Carbon Films: When an organism dies and is buried in sand, dirt, silt, or clay, the materials that make up the organism begin to break down, leaving behind only carbon remnants. A thin layer of carbon usually shows the organism's delicate parts, like leaves from a plant.
- Trace Fossils: These fossils show the activities of an animal, such as footprints left in the mud or a nest that was built on the ground. Over time, the footprints or nests become buried by layers of dirt, eventually becoming solid rock,
- Preserved Remains: These fossils are formed when an organism is trapped in a specific environment and stays relatively intact. Ex: mammoths found frozen in ice, insects and plants trapped in amber, animals found in tar pits.

ELABORATE:

Investigating Fossils:

- Read the information about fossils at <https://www.nationalgeographic.org/encyclopedia/fossil/> and answer the guiding questions. *Answers are providing in case you don't have access to this resource.*

Guiding Questions:

- What marine fossil was discovered in the Himalayas? What kind of habitat was there millions the years ago?

Fossils of ancient marine animals called **ammonites** have been unearthed in the highest mountain range in the world, the Himalayas in Nepal. This tells scientists that millions of years ago, the rocks that became the Himalayas were at the bottom of the ocean.

- What is an index fossil? What does it tell us? Find an example in the image gallery.

Index fossils are fossils used to reliably identify geologic time periods.

Ammonites Photograph by Brian Piltz, Myshot National Geographic



- Where in the western United States did paleontologists find a megalodon fossil?

Fossils of an ancient giant shark, a **megalodon**, have been found in Utah. Check out a United States map to locate Utah. Is it a coastal state? *No!* This discovery tells scientists that millions of years ago, the middle of North America was probably entirely underwater.

- Read more about fossils and observe examples of fossils at <https://www.nationalgeographic.org/encyclopedia/fossil/>
- Watch the following videos about fossils:
 - Fossils 101: https://www.youtube.com/watch?v=bRuSmxJo_iA
 - How Do Dinosaur Fossils Form? <https://www.youtube.com/watch?v=87E8bQrX4Wg>
 - Dig into Paleontology: <https://www.youtube.com/watch?v=1FjyKmpmQzc>
- Check out places in Southern California to learn more about fossils.
 - San Diego Natural History Museum (highlighted exhibit *Fossil Mysteries*): <https://www.sdnhm.org/exhibitions/fossil-mysteries/>
 - La Brea Tar Pits and Museum: <https://tarpits.org/>
 - Natural History Museum of Los Angeles County: <https://nhm.org/>
 - Alf Museum of Paleontology: <https://www.alfmuseum.org/>
 - Western Science Center: <https://www.westernsciencecenter.org/>

- Discovery Cube (highlighted exhibit *Dino Quest*):
<https://oc.discoverycube.org/exhibits/dinoquest/>

EVALUATE:

Students will make a list of the characteristics of a fossil.

What scientists study fossils and what can fossils tell us?

Students will use their “fossils” to make a story about their creature, describe their habitat from millions of years ago and their diet.

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