

4TH GRADE FOSSILS

Summary: Student paleontologists observe specimens from the Natural History Museum and the Utah Geological Survey. They predict which specimens are fossils and what type of fossil they are. Students hold real fossils as well as casts of real fossils as they predict their source.

Intended Learning Outcomes for 4th Grade:

- 1a. Observe simple objects and patterns and report their observations.
- 1c. Make simple predictions and inferences based upon observations.
- 1d. Compare things and events.
- 3a. Know science information specified for their grade level.
- 3b. Distinguish between examples and non-examples of science concepts taught.
- 4a. Record data accurately when given the appropriate form and format.

Utah State Core Curriculum Tie:

Standard 4 Objective 1:

- a. Identify features of fossils that can be used to compare them to living organisms that are familiar.
- b. Describe three ways fossils are formed in sedimentary rock (i.e., preserved organisms, mineral replacement of organisms, impressions or tracks).

Standard 4 Objective 2:

- a. Explain why fossils are usually found in sedimentary rock.

Preparation time: 30 min to set up the lab, extra time to pick up and return the two fossil kits from the Utah Geological Survey and the Museum of Natural History

Lesson time: 1 hour

Small group size: works best with one adult for every 5 students

Materials: Two toolbox kits are needed for this lab. There is high demand for these kits at different times of the year. Decide on a two-week interval you think you will fit the lesson in over the year and book the kits for those weeks early in the fall. If you don't have access to these kits the same type of lab can be run with any fossils and non-fossils available to you.

1. **Ancient Ecosystems** from the Natural History Museum of Utah. Order online at <http://nhmu.utah.edu/>. District offices may also carry the kits so check if your school is not located near the museum.
2. **Dinosaurs** from the Utah Geological Survey at geology.utah.gov/. Call to order the kit. A deposit is required but it is returned when the box is checked in complete upon its return.

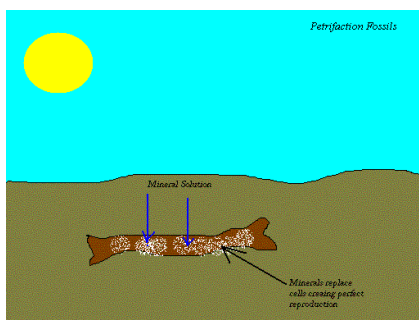
Preparation: Using the fossil/not a fossil answer key, find the specimens from between the two kits that are used in the lab. Using a small piece of paper and tape, place a number on the specimen that corresponds to the number on the answer key. Both kits should have a list of all the fossils contained within the kits so you can identify which fossils are to be used. If you have 6 groups of students then place 5-6 specimens on each table and have the students move from table to table for each station.

Note: At times the specimens in the kits change, you may need to add or delete specimens to the lab based on what is available in the kits.

Background information:

Fossils are evidence of past life; remains of plants and animals that once lived. Fossils generally formed from living organisms 10,000 to 500,000,000 years ago. Fossils are found in sedimentary rocks. Igneous rocks form from hot molten rock and metamorphic rocks are exposed to high temperatures and pressures, either of these forces would destroy any fossil remains. From studying fossils, scientists can infer the shape, size, cellular structure, and skeletal structure about the animals and plants that lived long ago.

Mineral replacement fossils form from the hard parts of animals, such as bone, teeth, or shells. When the original animal is buried in sediment, groundwater washes over the animal. Minerals in the remains are dissolved and replaced with a new mineral that is found in the soil and water where the organism died. These fossils become rocks. Mineral replacement fossils form over a very long time. Trilobites, fossilized bone, and petrified wood are examples.



Preserved organisms occur when a whole organism or large part of an organism is preserved with some of its original soft tissue and bones still intact. The most common examples are when insects were preserved in tree sap or amber, mummification of animals in ice, or mummification of animals in tar pits. These types of fossils are very rare.



Trace fossils are tracks, impressions, trails, burrows, footprints, gastroliths (gizzard stones), and animal excrement or scat. These weren't actual living organisms but signs that an animal or plant once lived.



Pre-lab discussion: Hold up the piece of wood from a tree and the petrified wood. Ask students to predict what the specimens are and list how they are similar and different. Use this example to explain the three types of fossils and how they are formed.

Instructional procedure: Many of these specimens are casts of real fossils. For this lab, tell students to treat the casts as the actual fossils when they decide their source. Explain to students that the real fossils would be very heavy if they were mineral replacement and very expensive.

1. Give each student the fossil or not a fossil prediction sheet.
2. Students should observe the specimens at each station. Students can decide individually if they think each specimen is a fossil or not. Place a mark in the column marked not a fossil if they predict that the specimen is not a fossil. If they predict that the item is a fossil, they also need to decide if they predict it is

a preserved, trace, or mineral replacement fossil. They then place a mark in the appropriate column.

3. After students place their marks at each station, go over the answers with them for that group of fossils. They do not need to change their answers. The sheet is just for them to keep track of their ideas before the teacher or adult goes over the answers. Tell them the name of the specimen and show them a picture of the dinosaur the fossil came from using the dinosaurs picture document.

4. Students will go from fossils group to fossil group until they have identified all the specimens.