Activity 8
Print and Cast

Students make a mold of a "fossil print" and then create a cast from it. This activity has been adapted from Badlands National Park's Making a Fossil Cast.

Guiding Questions: What are casts and molds? How do you create a cast?
Critical Content: Fossils are imbedded in rocks. What are the techniques for excavating a fossil from rock?
Grades: 3-6
Duration: 60 minutes
Group size: individuals
Setting: classroom

Background: Fossils are not always the actual remains of the living organisms. Many fossils are just copies called imprints, molds or casts. Imprints are impressions made by organisms in soft mud that were preserved when the mud solidified. Imprints can be traces of an animal's activity, rather than its actual remains. The hardened tracks of animals or the burrows of prehistoric worms in solidified mud are examples of fossil imprints.

Molds are made when organisms are totally or partially buried in mud that hardens into rock. Over time ground water may dissolve the organisms, leaving cavities shaped like their bodies. Both imprints and molds are mirror images of the organisms.

If a mold was later filled with mud or mineral material, the hardened filling is called a cast. It is a reproduction that has the same outer shape as the organism. A cast looks like the organism itself, not like its imprint. Paleontologists make casts of fossil molds by filling them with liquids, such as plaster, that harden.

Materials:

Object to cast, a distinctly shaped object representing a plant or animal presence such as a small seashell, a pinecone, a student's finger, hand, or toe.

Modeling clay, enough so that students can create a form about twice the size of the seashell, finger or other object to be cast

Paper plate for each

Petroleum jelly

Paper cup, 7oz size

Plastic spoon

Plaster of Paris (available from craft or hardware store)

Tap water

Vocabulary:

Fossil
Mold
Cast

Procedures:

1. Give each student one of each type of cookie, two paper towels, and six toothpicks.
2. Start the students excavating in the hard cookies to extract the chocolate chips or raisins using only the toothpicks. If they break a toothpick so that it is no longer sharp, they can no longer use it. It must be discarded.
3. After 3 to 5 minutes, stop and find out if anyone was successful in extracting anything. As a class, review the Discussion Questions, below.
4. Have them excavate with the soft cookies using the same constraints and rules.
5. After 3 to 5 minutes, stop and find out if the students were more or less successful in extracting chips or raisins. Review the Discussion Questions again. How did the results differ between the hard and the soft cookies?

Discussion Questions:

The imprint in the clay and the plaster cast are both examples of how fossils form. Pressing the shell into the clay represents burying the shell in mud. In nature, the mud would have hardened into rock around the shell. Removing the shell from the clay represents how the shell dissolves over long periods of time, leaving a cavity called a mold in the rock. The mold produced is a mirror-image imprint of the shell's outside surface. In nature, this mold would have been filled with sediment, or small particles or rock and minerals that are deposited by water, wind, or ice that hardened into rock. The Plaster of Paris hardened, like the sediment, but in a much shorter period of time. The plaster is a replacement of the shell and is called a cast.

1. Might a paleontologist find a fossil mold or a fossil cast?
2. Which is created by the original plant or animal?
3. Which looks most like the original plant or animal?