

## How Do Scientists Interpret Fossils?

### Background

Scientists learn about organisms that live in the past by studying fossils. 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.

### Vocabulary

**Mold:** a fossil that is an imprint of an organism or its trace.

**Cast:** a fossil formed when a fossil mold becomes filled.

In order to study the details of mold fossils, casts are produced. In this activity, you will produce and analyze molds of common objects.

### Materials (per student)

Small seashell or another distinctively shaped object  
Petroleum jelly, such as Vaseline  
Paper pint milk container  
Plastic spoon  
Plaster of Paris  
Tap water

### Procedure

1. Grease the inside of a milk container with petroleum jelly.
2. Mix plaster of paris as needed (2parts plaster/1 part water)
3. Pour the mixture into the container until it is half full.
4. Coat the seashells or other objects with petroleum jelly.
5. Press them into the plaster.
6. After the plaster has hardened (about 20 minutes) carefully remove the objects from the plaster.
7. Observe the imprint of the objects. Compare the imprint in the clay with the shape and texture of the outside of the shell/objects.
8. Grease the "fossil" **mold** you have made.
9. Mix and pour another layer of plaster over the hardened mold.



**Note:** *Throw the cup and spoon away and do not wash any plaster down the sink as it can clog the drain.*

10. Allow the plaster to harden once again. This will take about 20 minutes. Tear away the container and separate the two layers. You now have casts and molds of the objects.
11. Compare the shape and texture of the original outside shell with the shape and texture of the outside of the plaster cast that was created.

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### Analysis

1. How do the molds and casts compare? \_\_\_\_\_
2. Which was easier to interpret, a mold or a cast? Explain. \_\_\_\_\_  
\_\_\_\_\_
3. What are the imprints in the plaster and the plaster casts examples of? \_\_\_\_\_
4. What did the pressing of the shell/object into the plaster represent? \_\_\_\_\_
5. What does removing the shell/object from the plaster represent? \_\_\_\_\_
6. The mold produced is a \_\_\_\_\_ of the shell's/object's outside surface.
7. Compare the way you predicted what the unknown objects were with the way a scientist predicts which organism left a fossil mold or cast.  
\_\_\_\_\_

8. Label the type of fossils below.



a. \_\_\_\_\_



b. \_\_\_\_\_



c. \_\_\_\_\_



d. \_\_\_\_\_

9. How do fossils relate to evolution? (use the following terms in complete sentences for your answer: geologic time, stratus layer, evolutionary tree, fossil record )

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