White-glue fossils: Casts, molds, and impressions

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Introduction

You don't want to mess with plaster to make fossil molds? Here's a simple solution. Students make impressions and molds in clay and then make casts with glue. After the glue dries, students pull back their "fossils." You can see examples of fossil impressions on-line at the Kentucky Geological Survey's **pictures of different fossil types.**

Grade Level : K-8

Time : 15-20 minutes preparation in class, and then glue has to dry overnight

Materials :

- White glue
- Objects to make impressions. You can substitute objects, but there should be a mix of hard and soft objects. Small, low-relief to flat objects work the best
- Cotton ball
- Coin
- Blade of grass
- Leaf
- Shell or other hard natural object like a paper clip or nail
- Modeling clay to make impressions
- Copy of worksheet

Background

Fossils are any evidence of ancient life preserved (usually) in stone. There are many types of fossils and many different ways that fossils form. Most fossils are not the actual body parts of the original organisms. Rather they are altered remains, impressions, molds and casts of parts of the organisms. A mold is the impression and void (space, hole) that an organism or organism's body or body part leaves in the sediment. An impression of the outside of the object can leave an *external mold* in the sediment. If the object is filled with the same sediment that surrounds the object, an *internal mold* can be left on the sediment inside the object. If the buried object dissolves and leaves a space or void and the void is filled with minerals carried in groundwater through the sediment, then a *cast* is formed. A *cast* is the material that fills the void. A cast is made of different material than a mold. Both casts and molds are types of fossils. Sometimes the mold and cast are found together, although molds are more than casts.

Activity:

- Students can work in groups or individually. Students should shape their clay into a pancake shape.
- Students should take an object and place it on a desk or in their hand. On the worksheet, write the name of the object.
- Would you consider the object hard or soft? On the worksheet, fill in hard or soft on the line next to the object's name.
- Press the clay into the object on the desk.

- The impressions should not be too deep (the deeper the impression, the longer it will take for the glue to dry). When organisms are buried, they may leave an impression of their body outline or surface structure in the sediment (in this case, the clay).
- Slowly and carefully pull the object out of the clay. Try not to have the clay stretch or smear when you remove the object. In nature, objects may rot (which means they are eaten by bacteria). By removing the object you are the bacteria.
- The impression of the object in the clay forms a "mold" of the object even if the object is gone. Look at the impression. On the worksheet, describe the mold impression as none, poor, good, or excellent by placing an "x" in the appropriate column.
- Now take white glue and fill the mold. When animals rot beneath the soil, the space they filled can be filled with minerals from groundwater. The glue is like those minerals.
- Let the glue dry. The time it takes to dry depends on the depth of the impression (which is why we try to use relatively flat objects for this exercise).
- When the glue has dried, peel back the glue shape from the clay. The glue shape is a "cast" of the object. Many fossils are preserved as casts and molds.
- Write the name of the object on the "cast" chart.
- Was the original object hard or soft? Fill in the "cast" chart with the same description you used for the "mold" chart.
- Look at the quality of the glue cast. Is the quality poor, good, or excellent compared to the mold quality.
- Sometimes there is excess glue around the "fossil." Cut away the excess glue with your fingers or scissors. Many fossils have excess material around them and have to be cleaned to see the original fossil.

Repeat this process at least five times. If working in a group, have each member of the group fill out one line of the chart on the worksheet below. Compare different objects to see which objects make the best impressions (hard vs. soft). Answer the questions on the worksheet.

Fossil Cast and Mold Worksheet

Name_____

In the table, write the name of the object you are using. Then put an x under the column for the quality of the mold and cast that object made.

Mold Quality

Object name or description	Soft or hard	None	Poor	Good	Excellent
1._____	_____	_____	_____	_____	_____
2._____	_____	_____	_____	_____	_____
3._____	_____	_____	_____	_____	_____
4._____	_____	_____	_____	_____	_____
5._____	_____	_____	_____	_____	_____

Cast Quality

Object name or description	Soft or hard	None	Poor	Good	Excellent
1._____	_____	_____	_____	_____	_____
2._____	_____	_____	_____	_____	_____
3._____	_____	_____	_____	_____	_____
4._____	_____	_____	_____	_____	_____
5._____	_____	_____	_____	_____	_____

• What is a cast in your own words?

• What is a mold in your own words?

• Which of the objects (name or description) you tested make the best mold fossils?

• Which of the objects (name or description) you tested make the best cast fossils?

• Do hard or soft objects make the best casts or mold fossils?

6. Imagine a dead animal or plant that was buried in the mud. What parts of that animal or plant might make good impressions based on your experiment?