Hand-making Fossils (with Clay)

Grade 8

Subject: earth science

Time: 1-2 class periods

Description

In this lesson, students will compare and contrast the process of fossilization with the process of making and casting molds. More specifically, students will participate in a hands-on, visual experience in which they go through the process of making a fossilized specimen. Plus, students will get to keep a fun little fossil trinket or pendant for themselves!



State Standards

8-ESS1-4: Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6 billion year old history.

Learning Objectives

Students will be able to create a partial replica or impression of an object by carefully adhering to instructions and a standardized procedure.

Students will be able to describe the process of fossilization in detail.

Students will be able to assess how the fossil record contributes to the larger geologic time scale.

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Materials

Required:

- Crayola air dry clay
- Leaves or shells
- Cup of water
- Straws
- Toothpicks
- Parchment Paper
- Painters tape

Additional:

- String/cords
- Keychain clasps/keyrings
- Acrylic paint *(for further decoration)*
- Paint brushes *(for further decoration)*
- Modge Podge *(for further decoration)*



(Your set up might look something like this)

Assessment Questions

If a fossil is found in a deeper layer of the Earth than another fossil, what does that tell us about the age of the fossils?

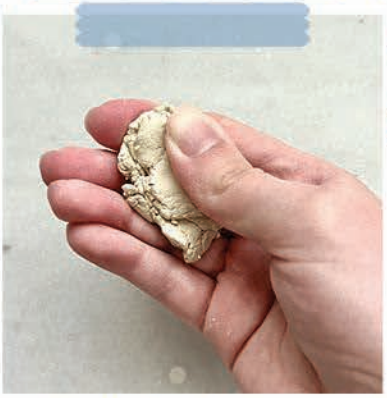
What happens to the organic material (flesh, bones, etc.) of a dead organism when it becomes fossilized, and how is it replaced with rock?

What environments are best suited for the fossilization process?

Instructions



1 Before class, set up work areas with the needed supplies. The air dry clay will stick to surfaces, so make sure to cut a square of parchment paper for each work area, and tape it down.



2 Have your students grab a chunk of clay from the tub, and knead it like bread dough for a little bit. To knead, press the chunk of clay flat and keep on folding it over on itself. Students can split the chunk of clay into smaller parts to make it easier to knead.



3 Roll the clay on the palm of your hand to make a sphere.



4 Then, press the clay flat so that it makes a disk. If your clay is a little dry, your disk might have some cracks along the edges.

Instructions



5 To get rid of any cracks on the edges of your disk, simply dip your finger in your cup of water, and run it along the edges. This should smooth out and close up any cracks, but it can be a tedious process.



6 Next, take your leaf or shell that you scavenged and press it firmly into the clay, making sure to apply even pressure all around. *(Tip: If you are pressing a leaf, press it vein side down to get a better impression)*



7 Carefully peel off your leaf/shell. You should be left with a faint impression of it, or a 'cavity' from which the original organic material would have decomposed in a real fossil.



8 Use a plastic straw or a toothpick to poke a hole near the top of your clay fossil. I would recommend using the plastic straw if you have any intention of making a keychain out of this.

Instructions



9 Let the clay dry overnight or until it turns white like the fossil charm shown in the picture. Technically, this is the last step, but if you plan to paint your fossil, there are some things you should know.



10 For painting air dry clay, it is best to use acrylic paints. Additionally, since the clay impressions can be pretty faint (especially if you pressed leaves), you should consider dry-brushing the area around your impression, as a normal coat of paint could cover it up. Dry-brushing is a technique where you use only the very tip of a dry paintbrush to slowly build up faint layers of paint, as shown in the picture.

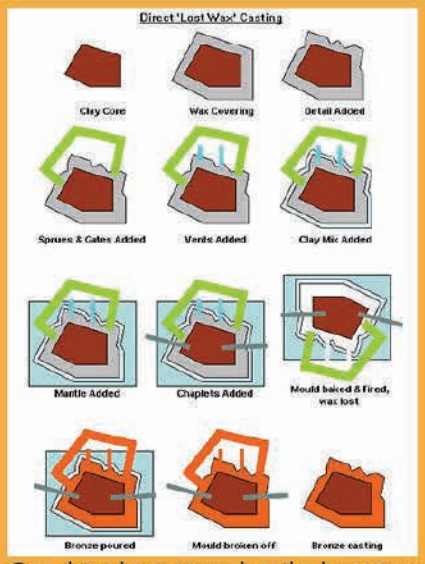


11 Lastly, if you want to seal your fossil charm, cover it with a thin coat of modge podge and let it dry. Grab some string or keyrings, and your students can take home their little clay fossils, which they can use as a charm, keychain, ornament, etc!

Art History

The fossilization process can essentially be described as nature's way of making and casting molds. In fact, the lost wax casting method, which has been used for more than 4,000 years, is eerily similar to how fossils are made. The lost wax casting method has been historically used to create metal sculptures, jewelry, and even gold crowns. First, an orig - inal sculpture (made out of wax, clay, plaster, etc.) is used to create a two part mold. Then, molten wax is poured into this mold, creating a wax copy of the original sculpture. From there, wax tubes called sprues are attached to the wax copy. The wax copy is then dipped into a ceramic slurry over and over until it has a nice, thick coating. This new ceramic mold is heated, and all the wax melts and exits the mold through the sprues, leaving a cavity. This is comparable to how groundwater dissolves buried organic material. Finally, heated bronze or copper is poured into the ceramic mold, which mimics how sediments replace dissolved bone.

Once cooled, the ceramic mold is brok- en off the bronze sculpture, and all the sprues are removed, leaving a metal replica of the original piece. Now, while the lost casting method might be too complicated to perform in the classroom, the fossilization process can be demonstrated with some more simplified mold making methods. In this way, students can actually observe a 'fossil' being created, which can help them understand and retain information more easily.



Graphic depicting detailed version of the last wax casting process, from Wikipedia


Dancing Girl of Mohenjo - daro, 2300 -1750 BCE, bronze cast