Description

This lesson plan is an exciting activity that will help students foster awareness and appreciation of the Earth’s history through fossils. When complete students should be able to explain how fossils are formed and to reproduce replicas of fossils of their own just like professional paleontologists do.

Modern paleontology sets ancient life in context by studying how long-term physical changes of global geography paleo-geography and paleo-climate have affected the evolution of life. It does so through the study of the change in ancient life forms as evidenced by fossils.

A fossil is any trace of a once-living organism preserved in rock from the Earth’s past. Much of what we know of earth’s history comes from fossilized remains of plants and animals. Some of these remains can be traced back many millions of years. That is because when living things die though their bodies disintegrate, some become buried and thus protected from the ravages of weather and oxygen which supports decay. What remains after decay are bones and teeth.

Layers of sediment build on them creating pressure and heat which compress the sediments into rock thus preserving evidence of life form remains. The process of fossilization involves the dissolving and replacement of the original minerals in the object with other minerals. This process results in a heavy, rock-like copy of the original object - a fossil. The fossil has the same shape as the original object, but is chemically more like a rock. Some of the original hydroxyapatite (a major bone constituent) remains, although it is saturated with silica (rock). Paleontologists estimate that only a small percentage of the dinosaur genera that ever lived have been or will be found as fossils. This lesson shows the student how paleontologists create and preserve copies of fossils.

Objectives

- Students will be able to explain how fossils are created
- Students will be able to identify different fossils
- The students will be able to reproduce fossils of their own just as paleontologist do in the field.
LESSON PLAN — Science Meets Art in Paleontology

Materials

- Plasticine Clay       8-Lb (Part Number)
- MoldGel SILFREE Regular Set  4-Lb. (Part Number)
- CastRite    20-Lb. (Part Number)
- Foam Core Board      (Part Number)
- Paper Cups, 8-Oz.   50-Ea.    (Part Number)
- Quart Containers,    2 ea.    (Part Number)
- Craft Sticks,    25 ea.    (Part Number)
- Combination Rasp, 8"      (Part Number)
- Sandpaper, 25-Sheet Assortment    (Part Number)
- Masking Tape       (Part Number)
- Assorted Paint Brushes      (Part Number)
- Paper towels

Suggested Resources

- Barrett  (2001) National Geographic Dinosaurs: National Geographic
- David Ward , (2002) Fossils (Smithsonian Handbooks) : Turtleback

Directions

Research fossils with the suggested resources above and the Internet. For this lesson, several particularly good resources are available. The first, can be found at the Fossil Museum website:

http://www.fossilmuseum.net/

Two other excellent sites show how an Ammonite and Trilobite fossils are created. They can be found below:

http://www.discoveringfossils.co.uk/Whatsafossil.htm
http://www.trilobites.info/trilobite.htm

Students can review the website of the Fossil Museum to see the complete details of how fossils are created and types of fossils found throughout the world. Combine this project with science and art lessons to gain a full appreciation for art of casting and mold making and its relation to advancement of human knowledge. Have the students make drawings of fossils just as paleontologist have to do in their field work. Artistic evidence can be seen in the existence of fossils in the repetition of structures, spiral design elements as well as an almost contemporary sculptural element in how bones, teeth and shells are found in nature. Such findings can inspire a student of art to create interesting works of there own suggesting fossil finds.

In preparation for the class have students bring in several dried chicken bones. As an alternative you may collect chicken bones and prepare them making stripping all meat and drying them for several days. These

1. Set up required for each student.
bones then can be handed out in class

Divide your class into groups. Each student will get four 8-Oz. cups. One is used for the molding powder, another is for the water. The other two are for Part A and B of the resin used for casting. Also, each student will receive two craft sticks for mixing and a plastic pen.

Help the students to measure out the molding powder into one cup. You’ll need about 2-Oz. of powder. Measure out 6 Oz. of warm water into the second cup. Allow the student to pour the powder from the powder cup into the water cup and mix for about 30-seconds until fairly smooth. Have the student place his/her finger in the center of the cup. Make certain the finger is not against the bottom or side or distortion will result in the final casting. The molding powder should gel in about 2-3 minutes. Leave the finger in for one minute longer after the surface has set. Remove the finger and place the cup upside down to remove any excess water and any bits of molding material. The student has now created a mold and negative space into which you will cast.

Open the KastEZ Resin and pour about ½ inch of part A in the third cup and equal amounts of Part B in the fourth cup. These amounts must be equal so supervise this part carefully or the material may not set. Before combining Part A with Part B remind students that the material sets within 3-4 minutes so they must mix quickly. Now pour A into B and using a mixing stick to mix until the material is clear (it is cloudy when first poured together).

Carefully pour into the mold. You can spill a little over the top as this spill will be used latter as a ‘tell tale’ to tell if the material is thoroughly set. Have each student suspend there pen into the center of the mold being careful not to touch the sides. Hold the pen still until the casting material sets. Once set they can let the pen go. Watch the spilled area – when this turns as white as the center of the cast you can demold.

You may trim off any flashing with a file. Paint the finger black. This will seem counter intuitive, but this black base provides the deep shadows needed to give your art the look of bronze. Squeeze out a little ‘Antique Gold’ Rub ’n Buff. Apply it to the tip of your brush and then brush on a paper towel to wipe off excess. Now being careful, just lightly brush across the finger to so that the gold appears only on the high points. The finger will transform into a bronze casting ‘look’ in front of the students eyes.

- The surface decoration is as important as the form. Here are a few ideas:
- Use the metallic acrylics for the look of bronze or brass. Age them with a faux patina by dry brushing on metallic color with a light blue-green paint mixture.
6. Suspend pen, point up into the center of the liquid resin. Hold it steady until resin sets.

7. After de-molding file off the flashing. Now you are ready to finish it.

8. Spray or paint the finger black as an under coat. Wait until dry. Lightly brush over the high spots of the finger with a dry brush dipped in antique gold Rub N’ Buff. The finger transforms into a faux bronze just like our Liberty Bell.

National Standards

Content Standard #1: Understanding and applying media, techniques and processes.

**Grades K-4:** Students will use different media techniques and processes to communicate ideas, experiences and stories.

**Grade 5-8:** Students will select media, techniques and processes; analyze what makes them effective or not effective in communicating ideas; and reflect upon the effectiveness of their choices.

**Grades 9-12:** Students conceive and create works of visual art that demonstrate an understanding of how the communication of their ideas relates to the media, techniques and processes they use.

Content Standard #4: Understanding the importance of mold making and casting in relation to history and cultures.

**Grades K-4:** Students know that the visual arts have both a history and specific relationships to various cultures.

**Grades 5-8:** Students know and compare the characteristics of types of castings in various eras and cultures.

**Grades 9-12:** Students differentiate among a variety of historical and cultural contexts in terms of characteristics and purposes of works of art.