NHMU: Our Ancient Earth - The Stratigraphy Cup

Summary

In this activity, students will make a stratigraphy cup by layering specimens in sand and plaster.

Time Frame

2 class periods of 45 minutes each

Group Size

Large Groups

Materials

For the whole class:

- 10-15 lbs. of plaster of paris
- Plastic scoop
- 2 liter bottle filled with water
- 4 liter container of sand
- Assorted fossils

For each groups of students:

- Specimens to bury such as leaves, sticks, snails, dead bugs.
- Popsicle stick for stirring
- Two clear plastic cups
- Masking tape
- Permanent marker

Background for Teachers

The order in which the Earth's layers of sediment were laid down is an important clue to the Earth's past. In most sedimentary rock, a given layer will be older than the layer above it. By using this principle, and by knowing the type of fossils in the sedimentary rock layers, geologists can determine the relative ages of the layers. Rock layers containing the same type of fossils are presumed to be the same age.

Instructional Procedures

Exhibit any fossils (or even pictures of fossils) that you have and discuss the different fossil types. Have your students talk about what they think fossils are and where they think they are found.

Go outdoors and collect 2 small specimens to bury within the layers of sand and plaster to represent fossils. The specimens will need to be small enough to fit into the cups. (Leaves, sticks, dead bugs work well.) If you do not want to collect specimens you may use items such as shells, beans or macaroni.

Have each group put their initials on the bottom of one the cups using masking tape and permanent marker. Put a 1 cm layer of sand in the bottom of the cup and place some of the specimens on top of the sand. By doing this the students will develop a chronology based on the fossil evidence in the stratigraphy.

To make the plaster, take 2 scoops of plaster and put them in the 2nd cup. Add 1 scoop of water and stir. Be sure the plaster is well mixed. Pour half of the plaster into the cup over the layer of "fossils". Make sure students do not mix the sand and plaster together as this will cause the layers to disappear.

Carefully add another 1 cm of sand to the cup.
Add a second layer of specimens and pour the remaining plaster over them. Set the cup aside to harden. It is best if it hardens overnight and the activity is continued the next day.
Examine the plaster and sand layers and describe any differences between them.
Compare the stratigraphy cup with pictures of layered sedimentary rocks. Encourage the students to view formations firsthand with their parents in nearby road cuts or rock outcrops.
To examine the specimens in the cup more closely remove the student-made fossils from the cup by laying the stratigraphy cup on its side and cracking it open by carefully pushing down on the open end. Determine if the specimens have changed. (For example, the beans may sprout, leaves may dry out and shrivel, and insects my fall apart.) The specimens may have changed but not "fossilized". The fossil formed is a mold or imprint --type fossil. If the same type of specimens appear in the same layer (like if all the twigs are in the first layer and all the insects are in the second layer) ask "When did the twigs disappear?" or "Were insects more common in the most recent plaster period?"

If You Are Feeling Ambitious…

As a take-home activity, have students examine a pile of laundry in their home. From looking at the layers of laundry, students should be able to reconstruct what they wore each day. You may ask "What was the last thing that you wore?" or "Can you tell what you wore 3 days ago?" Explain that geologists do this with layers of rocks.

Questions to Think About:

Which layers were formed first?
Which layers are the oldest?
How can you tell these

Bibliography

Lowen, Amy and Weaver, Lisa; *Water, Stones, & Fossil Bones*. NSTA, 1991.

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Authors

Utah LessonPlans