

Sedimentary Rock Activity

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Revised from a lesson by The Society for Mining, Metallurgy, and Exploration, Inc
<http://www.coaleducation.org/lessons/sme/elem/6.pdf>

Purpose: Facilitate students' understanding of sedimentary rocks and understand that they are usually formed underwater over long periods of time.

A. South Carolina State standards covered:

8-3.4 Explain how igneous, metamorphic, and sedimentary rocks are interrelated in the rock cycle

8-1.3 Construct explanations and conclusions from interpretations of data obtained during a controlled scientific investigation.

B. Performance Objectives:

- Students should be able to *explain* how sedimentary rocks are formed
- Students should be able to *compare* how rocks can be changed by particular processes
- Students should be able to *identify* a rock type by the method with which it was formed
- Students should be able to *interpret* and *analyze* data collected in an investigation

C. Lesson Plan:

Hook:

Show students a picture of the Grand Canyon. Have them make observations of what they see. Then ask students why they think there are so many layers and how they think the layers were formed. Also ask students to recall how sedimentary rocks are formed, and if they do not know, they will find out today.

Concept exploration:

Students will be creating their own sedimentary rocks in a jar. They will learn the process that forms sedimentary rocks and understand that it occurs under water. Students will also have the opportunity to strengthen their math and analytical skills by measuring and graphing. They should learn that it takes a long period of time to form sedimentary rocks.

Materials: Glass jars with lids
Water
Rocks *note:* the amount and type of rocks can be adjusted
Pebbles depending on what is preferred/available
Sand
Soil
Rulers
Graph paper



1. Instruct students to fill their jar about 1/3 full with the rocks, pebbles, sand, and soil (or other rock sizes depending on availability).
2. Above the rock layers, have the students add water so all the layers are submerged.
3. Students should now write a hypothesis in their journal, predicting what they think will happen if they shake up the jar.
4. Have students put the lid back on the jar and carefully shake the jar until all layers are mixed.
5. Students will now watch the sediment layers slowly settle. They should notice the larger rocks settling to the bottom and smaller layers at the top.
6. Have students measure the layer of one size of sediment every 10 seconds and record it in their data table. (note: more advanced classes could be instructed to make their own data table)
7. Once all layers have settled, have students measure the layer of each size group.
8. Have students repeat the shaking and measuring steps two more times, recording thickness in their data table. Then have them calculate the averages. *Note: time permitting; the repetitions could easily be omitted.*
9. Students should now create 2 graphs, one graph showing the thickness of a layer changing with time and one graph showing the different layer thicknesses for size groups.

Concept introduction/application:

Once students have finished graphing, have them write down a short explanation for each graph. Students could now share their graphs with the class, discussing what their graph shows.

Explain to students that the water in the jar helps represent a larger body of water. Be sure they understand that sedimentary rocks are usually formed in water and near running water.

Now help students understand what their graphs show, if they did not explain it completely. As time (on the x axis) increased, the layer thickness (y axis) should have gotten thicker. This represents the amount of time it takes to form sedimentary rock layers like they saw in the Grand Canyon picture. On the other graph, the larger rock sizes should have a thicker layer while the smaller sizes will have thinner layers. With both graphs, the results could vary depending on several factors including the time they shook the jar, materials used, water, time they waited, measuring, etc. Explain that in nature, the results could also vary depending on erosion, weather, etc.