

Making Sedimentary Rocks

<http://www.coaleducation.org/lessons/sme/elem/7.htm>

Focus on Inquiry

The student will model the formation of sedimentary rocks.

Lesson Overview



Students will simulate the formation of sedimentary rocks. In this activity they will create sandstone, coal, and limestone.

Duration Two 45 minute class periods	Setting Classroom	Grouping Cooperative groups of four	PTI Inquiry Subskills 3.4, 5.8, 7.3
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Lesson Components	Estimated Time	Inquiry Subskills Used	Technology Used	Level of Student Engagement	Brief Description
<i>Engage (Day 1)</i>	15 min	3.4	None	2	Students classify rock samples brought from home.
<i>Explore (Day 1)</i>	30 min	5.8	None	3	Students create sandstone, coal, limestone samples.
<i>Explain (Day 2)</i>	20 min	7.3	None	3	Student examine their homemade rocks and create Venn diagrams of the three types of rocks and describe how each was made.
<i>Expand (Day 2)</i>	25 min	3.4	None	2	Students sort and classify rock kit sedimentary rock samples into the three types of sedimentary and add these rock types to their Venn diagram
<i>Evaluate</i>	varies	None	Internet (video)	n/a	Teacher developed rubric for Venn diagram and formation explanation.

Level of Student Engagement

1	Low	Listen to lecture, observe the teacher, individual reading, teacher demonstration, teacher-centered instruction
2	Moderate	Raise questions, lecture with discussion, record data, make predictions, technology interaction with assistance
3	High	Hands-on activity or inquiry; critique others, draw conclusions, make connections, problem-solve, student-centered

<p>National Science Education Standards – Inquiry</p> <p>Use appropriate tools and techniques to gather, analyze, and interpret data. Develop descriptions, explanations, predictions, and models using evidence. Communicate scientific procedures and explanations.</p> 
<p>National Science Education Standards – Earth Science</p> <p>Some changes in the solid earth can be described as the "rock cycle." Old rocks at the earth's surface weather, forming sediments that are buried, then compacted, heated, and often recrystallized into new rock. Eventually, those new rocks may be brought to the surface by the forces that drive plate motions, and the rock cycle continues.</p>
<p>Louisiana Grade Level Expectations – Inquiry</p> <p>Gr. 8, Inquiry GLE#14 - Develop models to illustrate or explain conclusions reached through investigation (SI-M-A5)</p> <p>Gr. 8, Inquiry GLE#19 - Communicate ideas in a variety of ways (e.g., symbols, illustrations, graphs, charts, spreadsheets, concept maps, oral and written reports, equations) (SI-M-A7)</p> 
<p>Louisiana Grade Level Expectations Earth Science</p> <p>Gr. 8, GLE#16 – identifying the characteristics and uses of minerals and rocks and recognizing that rocks are mixtures of minerals. (ESS-M-A5)</p> <p>Gr. 8, GLE#18 – explaining the processes involved in the rock cycle. (ESS-M-A6)</p>

Materials List

- plaster
- cement
- milk cartons (pint)
- sand
- soil
- water
- mixing spoon
- Computer
- Internet access

Advance Preparation

1. Obtain materials listed in materials list above for students to complete the activity.
2. Copy the printable version of the activity located on the website.
3. Teacher can also obtain samples of coal, sandstone, and limestone to display for students. If samples are not available, teacher can obtain pictures of the rocks for students to view.
4. Sign up with UnitedStreaming (<http://www.unitedstreaming.com>; there is a free 30-day trial if you are not a member) and preview the video clip of Sedimentary Rock Formation. Another option for excellent free video is to register (for free) with Annenberg Media and preview the Earth Revealed, Sedimentary Rocks (Program 17, <http://www.learner.org/resources/series78.html>, click on Individual Program Descriptions).

Other Information

Learning Objective

The learner will...

- simulate the formation of sedimentary rocks.

Prior Knowledge Needed by the Students

None

Procedure

Engage

1. Have each student bring three to five rock samples to class. You can also go on a rock hunt around the school.
2. Ask each group of students to classify their rocks according to similarities.
3. Have each group explain how they classified their rocks. Explain that rocks are classified according to the way they are formed. Tell students that today they will simulate the formation of sedimentary rocks.

Explore

1. Students create sandstone, coal, and limestone following the procedures from the following the online lesson found at <http://www.coaleducation.org/lessons/sme/elem/7.htm>. Have groups label their rocks with the type of rock and their group name(s).
2. Allow the rocks to dry overnight.

Explain

1. Have students remove their rocks from the cartons and examine each one. As a group, have students create a Venn-diagram on a sheet of paper comparing and contrasting the three different sedimentary rocks.
2. Below their diagram (or on another sheet of paper), have each group write an explanation of how each sedimentary rock was formed.
3. Show video clip entitled *Sedimentary Rock Formation* (<http://www.unitedstreaming.com>) or a portion of the Earth Revealed, Sedimentary Rocks (Program 17, <http://www.learner.org/resources/series78.html>, click on Individual Program Descriptions).

Expand

1. Using sample of sedimentary rock from a rock sample kit, have your students examine these specimens and compare them with the three types that they created (sandstone, coal, limestone).
2. Have your students sort through the rock kit samples and divide them up into the three classes of sedimentary rock (clastic, organic, chemical). Have them add these rock names to their Venn diagrams they created during the Explain section.

Evaluate

1. Teacher-made rubrics for assessing the Venn-diagrams and explanation of how each rock was formed.

Blackline Master

none

Supplementary Resources**UnitedStreaming video clip, *Sedimentary Rock Formation***

<http://www.unitedstreaming.com/>

This website contains a video clip on the formation of sedimentary rocks. You must sign up for the free 30-day trial membership in order to view the video. You can find the video by typing the name of the video in the search and searching under video clips.

Sedimentary Rocks

http://www.geocities.com/RainForest/Canopy/1080/sedimentary_profiles.htm

This website contains information on the formation, properties and uses for sedimentary rocks.