Sandia Mountain Natural History Center

Ecology Field Program

Geology Rocks! Lesson plan

Your Name:	
Grade Level: 5th	**Subject Area:** Earth Science (Geology)
Lesson Title: *Geology Rocks*	**Lesson Length:** 20-30 minutes

The Teaching Process

Lesson Overview

Focusing on an abiotic part of the ecosystem, students first use their observational skills to closely examine a rock of their choice and then write about some specifics such as texture, grain size and color. Further, students make connections between the rock and the ecosystem it was found in. Students will also observe and record evidence of the environment it formed in and the possible ecosystems it may have been part of.

Unit Objectives:

1. Students will recognize five attributes of a rock that aid in identification/differentiation.
2. Students will understand how rock, an abiotic element of an ecosystem, is an active component of that ecosystem.
3. Using their rock, students will make connections between the current ecosystem and the distant past, interpreting the evidence of geologic and biologic changes.

Standards addressed

NMSS: NM I- Scientific Thinking & Practice, BM I- Scientific Method 2; NM III- Earth & Space Science, BM II- Geology & Weather 1
NGSS disciplinary core ideas: ESS 2.A, ESS 2.C
NGSS crosscutting concepts: Systems & System Models; Scale, Proportion & Quantity
NGSS science & engineering practices: Engaging in argument from evidence
CCSS: RI 5.10, RF 5.3, W 5.8, L 5.1, L 5.2, SL 5.4, MP2, MP3

List of Materials

Geology Rocks! card, magnifying glass, spiral journal, pencil and a fairly open and rocky site

Instructional Sequence

Phase One: Engage the Learner

The instructor focuses the students on the abiotic parts of an ecosystem, leading them specifically to rock. This connects directly to the introduction earlier in the day.

What's the teacher doing?	What are the students doing?
• Through questioning, directs students to the abiotic ecosystem component of rock. • Leads brief discussion/Q and A about the rock families (igneous, metamorphic, sedimentary) to ascertain current level of student knowledge while using available specimens and prior knowledge of the Albuquerque area.	• Actively participate in discussion • Observe/handle displayed rocks.

Phase Two: Explore the Concept

Students will spend about 10 minutes observing a chosen rock using 5 criteria (texture, grain size, color, hardness, and mineralogy) and then recording their results. The intent is to expand students' understanding of rock identification while leading them into the more complex portion of the activity later. That said, students will also, in general, practice observational skills and employ descriptive terminology.

What's the teacher doing?	What are the students doing?
• Explains activity instructions and describes boundaries. • Actively monitors students, clarifies and questions.	• Individually or with a partner, students explore the area and select a rock to closely observe. • Closely observe rock with and without magnifying glass. • Following the activity card, students write down their observations, answers and explanations.

Phase Three: Explain the concept and define terms

After students have explored the rocky area and made their observations, the group convenes to share the results. In order to facilitate and expand student understanding, the instructor ensures the group has a grasp on the geologic processes involved (sedimentary deposition leading to the formation of sandstone and limestone). It is also important for students to grasp the processes of weathering and erosion.

What's the teacher doing?	What are the students doing?
• Elicits student observations. • Uses their observations to prompt student ideas and conclusions about the formation process of their rocks.	• Successfully uses relevant terminology while describing observations. • Uses their observations to develop theories/conclusions about their rock's formation.

Phase Four: Elaborate the Concept	
The students are able to extend their understanding of the abiotic and biotic connections within the ecosystem and through geologic time by using what they have learned about their rock while responding to six brief questions on the reverse of the card. These questions require students to combine the structure and nature of the rock with weather, producers and consumers.	
What's the teacher doing? • Regroups the students • Explains second half of activity	**What are the students doing?** • Work with one or more partners • Apply their observations, knowledge of the rock's formation and understanding of the local ecosystem to respond to a second set of questions.

Phase Five: Evaluate students' Understanding of Concept	
Students are given the opportunity to share and discuss what they have concluded while the instructor assesses the level of understanding about the rock's direct connection to the ecosystem.	
What's the teacher doing? • Regroups students • Leads students in wrap-up discussion, eliciting their thoughts, theories, ideas	**What are the students doing?** • Discuss/share their conclusions, while considering those of others

Revised by S. Henley, Jan, 2014
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