

Classroom Activity

Rock Analysis

Description

Rock Analysis Lesson

Geology Unit

Heidi Pierce, Beth Albery, and Becky Wessling

Activity Overview: Students will compare characteristics and properties of sample rocks from the Carr Brother's Gravel Pit and the Kalamazoo River.

Source: Heidi, Beth, and Becky

Process Skills: Observation, measurement, prediction, evaluation

Materials: Rocks, masking tape, tape measure, scale, ruler, water tubs, eye dropper, vinegar, penny, nails, poster board, graph paper, rock classification chart, and rock classification guide (hand out and chart included with lesson plan)

Time Required: Approximately 45 minutes

Procedures: Students participated in a rock scavenger hunt both at the gravel pit and river side. We chose twelve rocks from each location to examine. The students perform a variety of tests to determine specific characteristics of each rock. The tests include measuring length, weight, and hardness. Students will also test the acidity by dropping vinegar on the rocks to see if calcium carbonate is present. Other tests include determining whether or not the rocks float and if they mark on a black or white piece of paper. Before the tests are done, students will make predictions based on their own observations and prior knowledge. We ask that the students write their own rock descriptions using a variety of adjectives (shiny, flat, etc).

Cautions: When collecting the rocks from at the Gravel Pit students were instructed to stay at a lower level, avoiding sliding rocks.

Specific Outcomes:

Students will be able to recognize and describe different characteristic

of types of earth materials.(MEGOSE)

Students will be able to explain how rocks and minerals are formed.

(MEGOSE)

Students will use skills related to math including measurement, graphing, and problem solving.

Students will be able to come to conclusions regarding the differences between river rocks and inland rocks. (If any?)

Students will be able to work together in cooperating groups to complete their data charts and to come to these conclusions.

Evaluation:

Students will not receive a grade, but will be expected to participate in testing and complete their specific duties. They will be encouraged and praised.

Room Activity

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Watersheds: Large Group Lesson Geology Unit Heidi, Beth, & Becky

Activity Overview: Students will participate in hands- on activities to learn about, understand, and produce their own watersheds. They will create their own watershed models to demonstrate the basic geography of a watershed, how water flows through this system, and the impact people can have on the quality of the water.

Source: Rueben Rubio, Internet, Heidi , Beth & Becky

Materials: White papers, 3 different colors of water- soluble markers, spray bottles of water, white garbage bags, food coloring, and a variety of different shaped containers

Time Required: 45 minutes?

Procedures:

Part 1: As a large group, we will ask the students what they already know about watersheds. We will use hypothetical situations and illustrations to present the group with an overview of what a watershed is.

Part 2: To understand what happens in a watershed, students will create their own miniature watershed model. Each camper will crumple up a piece of white paper and then partially uncrumple the paper so that the crinkles are at different elevations. The students use water soluble markers to color the highest points (the mountain tops) with one color, places where they think there would be rivers or lakes with another color, and places where they think there would be human settlements (houses, factories, schools, etc.) with a third color. The teachers will spray each student's watershed with water to represent the rain falling into the watershed. We will discuss observations about how water travels through the system, the path the water follows, and the effect that human activity has on a watershed.

Part 3: In small groups students will cover different shaped objects with a white garbage bag. We will pour yellow water over the miniature watersheds to again demonstrate how a watershed works. We will also add a few drops of red or blue food coloring to show how the presence of pollution in one area can affect an entire watershed.

Cautions: Food coloring can stain clothing!

Specific Outcomes:

Students will understand the basic geography of a watershed.

Students will understand exactly how water flows through a watershed.

Students will understand how human activity can affect a watershed.

Students will understand that watersheds include all the plants, animals, and people who live in it, as well as the non-living components like rocks and soil.

Students will use process skills such as observation, experimentation, analysis, and problem solving.

MEGOSE: Students can trace one of the paths that rain water follows after it falls.

MEGOSE: Students will be able to describe one of the origins of pollution of the hydrosphere.

MEGOSE: Students can describe how human activities can affect the quality of water in the hydrosphere.

Evaluation: During part three, teachers will ask the students to explain what is taking place. They should understand the concept by now and be able to understand the garbage bag model of a watershed that is created.

Room Activity

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River Boxes: A Lesson in Water Erosion Heidi, Beth, and Becky

Activity Overview: Students will come to realize that some of the clay, sand, and sediment that makes the river muddy comes from the riverbed itself, and a result of the river eroding or cutting the riverbed. Students will also understand the actual erosion process and its part in the formation of rivers and streams.

Source: "Water, Stones, and Fossil Bones"

Materials: 1.9 liter milk carton, 2 liter bottle, outdoor source of soil, a graduated cylinder, a metric ruler, scissors, a water supply, a lightly colored container/bowl, and a garden trowel.

Time Required: 25 minutes

Procedures: Students will engage in a discussion about rivers and streams. The group will use an empty half-gallon milk carton that has one of the side panels cut out, leaving the spout intact to build their model of a riverbed. Outdoors, we will lay the milk carton on its side with the cut out panel facing up. We will then dig enough soil to fill the container half way full. To simulate a flowing river we will set one end of the milk carton about 1 cm higher than the other end, using a small rock, keeping the spout at the lower end. We will then pour a slow stream of water (no more than 2 liters) into the higher end of the milk carton. We will observe the change in the soil formation, including the path cut by the water formation.

We will repeat the process with a fresh soil sample in two different cartons, one elevated at 3 cm, and one at 5 cm. We will observe the differences in the flow of the water and the resulting rivers.

Cautions: If the soil is too dry, too much of the water will be absorbed. The run off of the water will not begin until the soil is soaked with water.

Specific Outcomes:

Students will understand how water moves sediment and soil.

Students will understand how water shapes and cuts riverbeds.

Students will realize that water is the most important tool of nature in wearing down the surface of the earth.

MEGOSE-Students will be able to describe erosion, one of the natural changes in the earth's surface.

Evaluation: Students will be expected to actively participate in both the activity and follow-up discussion.

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gy of the Kalamazoo River

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Elaboration: Students learn about geology and how it relates to the Kalamazoo River.

Relationship to Students' Lives: Students learn how their actions effect the geology of the river and the earth's environment.

Major Content Areas:

Earth Science: rocks and minerals, groundwater, watershed, pollution, erosion, and layers of the earth.

Mathmatics: graphing, measuring, weighing.

Language Arts: journal writing

Concept

What is a watershed?

Description**Elaboration:**

A watershed is the land and everything on the land that

Explanation to the kids:

See Watershed activity.

Concept

What is the composition of the earth and its layers?

Description**Elaboration:**

See Rock Analysis, Layers of the Earth, and Erosion concepts.

Assessment

Graphs of rock conclusions.

Description

Overview: Students will display results of rock tests on large poster boards.

Source: Heidi and Beth

Procedures: After testing rocks buoyancy and hardness, students color

in data information for the corresponding rock.

Criteria: Data is based on test results.

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Are rocks from separate locations different?

ription

Elaboration:

Igneous rocks are formed from volcanoes, while sedimentary rocks form in layers due to the pressure of materials compressing against each other. These rocks may be found in different places.

Explanation to students: See Rock Analysis

Concept

What are the layers of the earth?

Description

Elaboration:

The earth is composed of four layers; the crust, mantle, inner core, and outer core. The thickest layer is the core, followed by the mantle, and then the crust.

Explanation to the students:

We discussed an illustrated model of the layers as we compared the layers of the earth to the layers of a peanut M&M. We followed up by using different colored tree tape to proportionally measure out the layers of the earth.

Assessment

River Boxes

Description

Overview: Students learn about the process of erosion by using boxes filled with dirt to create their own mini rivers.

Source: Ms. Newton's Book

Procedures: See Erosion Activity

Criteria: Students should be able to understand and explain the differences between the river boxes at different heights. They should be able to notice and describe the different way in which the dirt was eroded; depth, width, and formation.

Assessment

Students Night Production

Description

Overview: The students gave a short presentation to their parents.

Source:

Procedures: Students shared something that they had learned during the camp. Students also wrote and performed a song describing their adventures at camp.

Criteria:

Procedures: Students wrote in journals describing the days events and things that they learned. Those who did not want were to write drew pictures.

Criteria:

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Board

ription

Overview: Students create a poster board of Scientific Words they have heard, learned, and used.

Source: Heidi and Beth

Procedures: Students write at least one new word a day on a poster board. It is a word that they have either learned the meaning too or learned about during the day.

Criteria: