

Hudson Valley Rock Identification

Time: 2 class periods

National Benchmarks: Benchmarks 5A: Diversity of Life; 5D Interdependence of Life; 5E: Flow of Matter and Energy; 9B: Symbolic Relationships; 9D: Uncertainty; 12B: Computation and Estimation; 12D: Communication Skills; 12E: Critical-Response Skills.

National Science Content Standards: *Earth and Space Science:* D: Energy in the Earth System; Geochemical Cycles; *Science in Personal and Social Perspectives:* F: Natural Resources

New York State Standards: 1,4,6

Objective:

Students will identify each of the rocks provided, locate where in the valley they are found and be able to explain why the rocks came to be as they are in each place.

Lesson Outline:

1. Students will brainstorm origin of rocks in their backyards
2. Students identify rocks in lab pairs, completing lab packet

Materials:

- Class sets of Hudson Valley rocks. Each set should include one the following: gneiss, dolostone, shale, slate, schist (mica schist if possible), conglomerate, sandstone, basalt, and glacial till. *Note – Rocks do not necessarily have to come from the Hudson Valley, however students should be made aware of substitutions.
- Class set of Earth Science Reference Tables
- Class set of the article “Rocks Serve as Snapshot of Valley’s Timeline” by Jill S. Schneiderman, Poughkeepsie Journal, 2006
- Geologic Map of New York State Southeastern sheet and Legend sheet (optional)
- Class set of Geologic Map of New York State Southeastern sheet and Legend sheet reproducible

Preparation:

Prepare trays with each of the nine rock samples. Each sample should be assigned a number. Students will use these numbers when identifying the rocks. Each group of students will receive a tray when doing the lab. The day before the lab, students should read the article “Rocks Serve as Snapshot of Valley’s Timeline” by Jill S. Schneiderman for homework. When reading the article, they should underline or highlight any rock name they encounter.

Engagement: To get students thinking about where rocks come from you could ask the question “How did your backyard get its rocks?” Ask the students what kind of rocks they have in their backyard, specifically focusing on the rock’s physical characteristics, and whether any of the students have outcrops or unusual specimens. With the class, brainstorm a potential “history” of how a rock, chosen from the examples given by the students, may have gotten into his/her backyard. At the conclusion, relate the exercise to

how the Hudson Valley's geologic past has shaped and influence the rocks that can be found across the local landscape today.

Explore: Students will break up into pairs for this exercise, however each person will complete and hand in their own lab packet. The teacher should provide each group with a tray containing the nine unidentified rock samples. Explain that each of the samples was found somewhere in the Hudson Valley and it is up to the students to explain why the rocks are the way they are and locate where they came from. Stress the importance of using the reference materials provided, their Earth Science Reference Tables, and the article they read for homework when doing the activity. Once students answer all lab questions and identify each sample they should check their results with the teacher. If a student misidentifies a rock sample they should be made aware which ones are incorrect and have a chance to correct their error.

Explain: Often times we don't think about the rocks we see around us everyday as we walk around our property, drive down roads, or hike up hills and mountains. Why are there different rocks in different places? How did the rocks come to be as they are? Very little attention is paid to the geologic tapestry of an area aside from the most basic physical characteristics of the rocks we encounter. Geologists have learned to see rocks as more than just something colored and clunky. They have learned to interpret the past from the stones they see under their feet in the present. They ask the question, "What happened to make this rock the way it is?" By noting simple physical features, along with considering a rock's mineral make-up, a geologist can decipher the geologic events and processes that occurred to form and mold the rock that she may hold in her hand. In the Hudson Valley a scientist can hold rocks spanning the three major types, metamorphic, igneous, and sedimentary, and from a range of geologic time periods all in a single day trip up or down the valley. Each different kind of rock tells a tale of molten magma, being squeezed by continents, thrust up as part of a mountain, or buried beneath a shallow inland sea swarming with exotic creatures. From these simple rocks we can learn about our natural history; not only how the rocks came to be, but how the Hudson Valley came to be as well.

Extend: Students could pick a region of New York State and do a research project that includes information about the different rocks and rock types found there, why those specific rocks are found in that region, and what the commercial uses of some of the named rocks are. Students would then present their results to the class either as a poster presentation or a PowerPoint.

Evaluate: Students should be able to complete the activity and answer the questions appropriately.

Comments:

References: This lesson was written by Kirk Dorton, high school teacher at Arlington High School, Arlington, NY.