



Rocks and Minerals with Scope-On-A-Rope

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“Rocking Out”

OBJECTIVES

- To use Scope-On-A-Rope to heighten students’ senses, hone their observation skills, and strengthen concepts such as magnification and scale.
- For students to gain an understanding of earth science concepts: the physical properties of rocks and minerals, composition and formation.

BACKGROUND

Rocks and minerals are all around us! The Earth is made of rock, and people use these resources in a wide variety of ways. From highways to toothpaste, you would have trouble coming up with items in our everyday lives that *don’t* contain rocks or minerals.

Quartz crystals are used in computers and watches; metals such as gold and silver are used in wiring, jewelry and currency. Halite (salt) is a mineral that many of us would have a hard time living without, and the graphite found in pencils is also a mineral. The examples are endless! (See websites list on page three for more examples.)



A **rock** is an aggregate of one or more minerals and can contain organic components such as shell fragments. **Geologists**, scientists who study rocks and minerals, classify rocks into three classes based on how they were formed:

- **igneous rocks** are volcanic rocks that form when magma cools and hardens; they can look very different depending on whether the magma cooled fast or slow (ex: obsidian, basalt, granite, pumice).
- **sedimentary rocks** are formed at the Earth’s surface, either in water or on land; they are layered accumulation of sediments (such as sand and gravel) that compact and cement together under pressure (ex: sandstone, shale, limestone).
- **metamorphic rocks** are formed through the transformation of another rock; they used to be igneous or sedimentary rocks whose mineral composition and grain size have changed due to intense heat and pressure acting on them deep within the Earth’s surface (ex: slate, which is transformed shale; marble, which used to be limestone).

A **mineral** is a naturally occurring, solid, nonliving element or compound that has a definite chemical composition and unique physical characteristics. Rocks and minerals mined in Louisiana include lignite (coal), halite (salt), agate (a gemstone), clay, and sulfur.

MATERIALS NEEDED

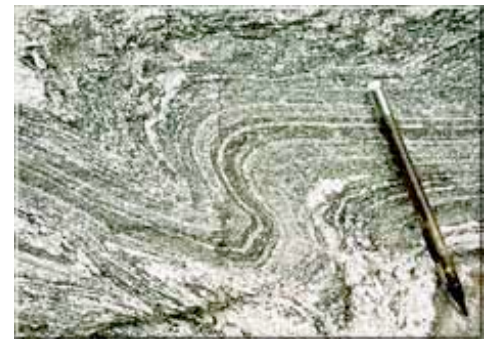
Scope-On-A-Rope*
Miscellaneous rock and mineral samples*
Tape measures or rulers
(or paper clips for young students)
Scale or other weighing device, if desired
Copies of “Properties Worksheet” (attached)

*The Scope-On-A-Rope and miscellaneous rocks and minerals can be borrowed from LSU.

ACTIVITY

1. After reviewing some background information with your students, pass out rock and mineral samples. You can ask students to bring samples from home as well; many students collect rocks. Encourage your students to look at each rock and mineral very carefully. They are to pretend to be geologists and must come up with characteristics to tell each specimen apart. Use the 1x lens of SOAR to show all samples at once.
2. Give each student a copy of the “properties worksheet”. This will give them categories to record their observations. Try to encourage the use of their senses – sight, smell, and touch. You may have to go over vocabulary with younger students or give them possible answers for each category. For example, **texture** is how the rock feels; is it smooth or rough? The **luster** of a rock indicates how it reflects light – it can be metallic or nonmetallic (dull). There are no wrong answers here, but students should be encouraged to think carefully about the best way to describe their specimens.
3. Use the 30x lens of Scope-On-A-Rope to view the samples up close. Do you see more colors now? Does it look like your sample is made of more than one substance? Can you see any crystals?
4. Have students measure the length and width of their rock or mineral using a tape measure or ruler. For younger students, use paper clips to measure size (if your samples are big enough to do so). Older students can be encouraged to estimate the volume of the rock – take three dimensions as best you can, or use the water displacement method.
5. If you have a scale, balance, or other weighing device, you can obtain the weight of each sample. Compute the density of each sample by dividing mass by volume. If not, have students estimate mass in relation to each sample – is it heavy or light?
6. Once all the data are collected, have students sort the rocks and minerals according to certain properties. For instance, separate into rough and smooth or into different colors and luster; let the students decide how they’d like to group them. Encourage vocabulary use of superlatives such as biggest, smallest, heaviest.

Sedimentary Rock
(this sample is full of biological objects, shells and fossils are embedded in the sediments)



Igneous Rock
(this sample of basalt is very porous, indicating its slow cooling time)



Metamorphic Rock
(this sample of gneiss has been folded by heat and high pressure deep within the Earth)

LOUISIANA GRADE LEVEL EXPECTATIONS

	K	1 st	2 nd	3 rd	4 th	5 th	8 th
Science As Inquiry	1-7, 10	1-3, 5, 11	1-3, 6, 12	1-3, 6, 8, 15	1-3, 7, 9, 17	1, 4, 6, 7, 29	1, 4, 6, 7, 29
Physical Science	11, 13	13-15	16, 17	18, 19	23	1	
Earth Science			36, 42	45, 50	55, 62	31	16-18
Math	14, 15	20, 22	14, 17, 19	19, 21, 22, 25, 28	20-22, 25	18-20	19-21

ACTIVITY EXTENSIONS

SCIENCE: Grow crystals with your students. Examine how different they look when cooled fast or slow, like igneous rock. Make your own sedimentary rocks:

http://www.windows.ucar.edu/tour/link=/teacher_resources/teach_makerock.html

Earth Science GLE's = Gr. 2: 39; Gr. 3: 45; Gr. 4: 55; Gr. 5: 31, Gr. 8: 16, 18

ELA: Read a book to your class about the rock cycle. Have your students write a story of the life of a grain of sand that first becomes part of a sedimentary rock, then a metamorphic rock, then back to a grain of sand again through weathering.

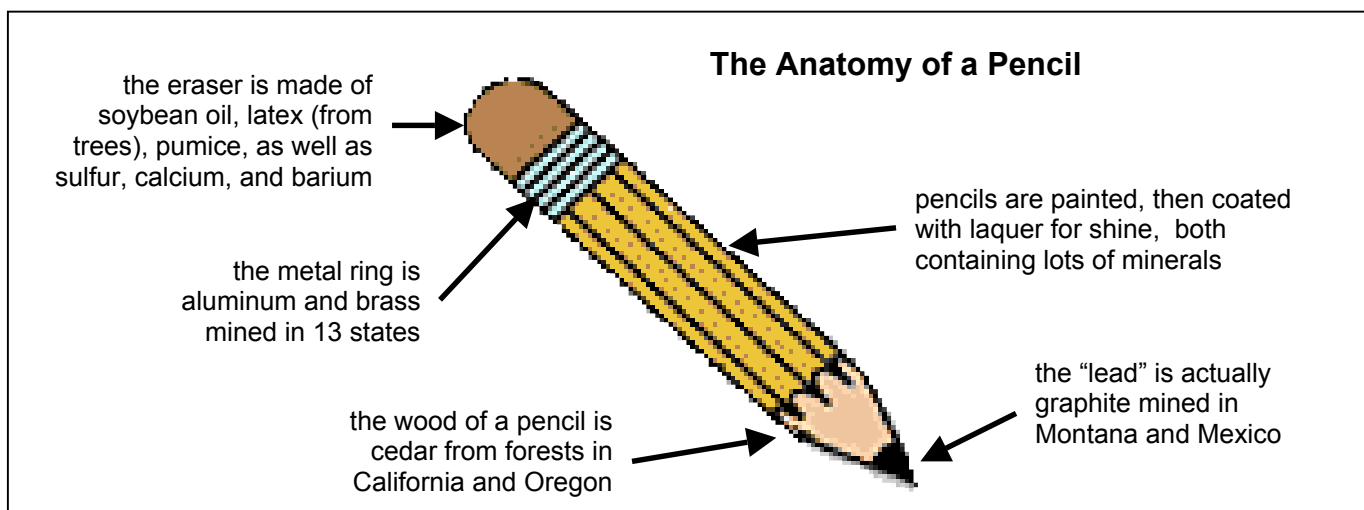
Writing GLE's = K: 20, 24-25; Gr. 1: 26, 29; Gr. 2: 21, 24; Gr. 3: 22, 24; Gr. 4: 20, 23; Gr. 5: 18, 21

🔗 Websites for additional information:

<http://education.usgs.gov/common/primary.htm#rocks> (US Geological Survey – great resource for information on all earth science topics!)

<http://www.minsocam.org/MSA/K12/uses/uses.html> (mineralogy for kids - info and games)

<http://www.mii.org/> (free earth science teaching materials)



Name _____

Date _____

Rock and Mineral Properties

Assign each rock a number, and record the properties of each rock using the characteristics in the chart below.

#	Color	Shape	Texture	Luster	Size (L x W)	Weight
1						
2						
3						
4						
5						
6						

Put the rocks in order from biggest to smallest: _____

Which is the heaviest? _____