

SCIENCE

Third Grade Unit 1

Rocks and Minerals Objectives

SCIENCE CONTENT STANDARD 3.3

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| <p>CONCEPTUAL THEME:</p> <p><i>The Changing Earth - How do materials cycle through the Earth's systems?</i></p> <p>CONTENT STANDARD:</p> <p>3.3 – Earth materials have different physical and chemical properties.</p> | <p>GRADE-LEVEL CONCEPT: ♦ Rocks and minerals have properties that may be identified through observation and testing; these properties determine how earth materials are used.</p> <p>GRADE-LEVEL EXPECTATIONS:</p> <ol style="list-style-type: none"> 1. Earth is mainly made of rock. Rocks on the earth's surface are constantly being broken down into smaller and smaller pieces, from mountains to boulders, stones, pebbles and small particles that make up soil. 2. Rocks can be sorted based on properties, such as shape, size, color, weight or texture. 3. Properties of rocks can be used to identify the conditions under which they were formed. 4. Igneous rocks are formed when melted rock cools, hardens and forms crystals. Melted rock that cools slowly inside a volcano forms large crystals as it cools. Melted rock that cools rapidly on the earth's surface forms small crystals (or none at all). 5. Sedimentary rocks are formed underwater when small particles of sand, mud, silt or ancient shells/skeletons settle to the bottom in layers that are buried and cemented together over a long period of time. They often have visible layers or fossils. 6. Metamorphic rocks are formed when igneous or sedimentary rocks are reheated and cooled or pressed into new forms. They often have bands, streaks or clumps of materials. 7. Rock properties make them useful for different purposes. Rocks that can be cut into regular shapes are useful for buildings and statues; rocks that crumble easily are useful for making mixtures such as concrete and sheetrock. | <p align="center">CMT EXPECTED PERFORMANCES</p> <p>B5 Describe the physical properties of rocks and relate them to their potential uses.</p> <p>B6 Relate the properties of rocks to the possible environmental conditions during their formation.</p> |
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8. All rocks are made of materials called minerals that have properties that may be identified by testing. Mineral properties include color, odor, streak, luster, hardness and magnetism.
9. Minerals are used in many ways, depending on their properties. For example, gold is a mineral that is easily shaped to make jewelry; talc is a mineral that breaks into tiny grains useful for making powders.

KEY SCIENCE VOCABULARY: property, classify, texture, igneous, sedimentary, metamorphic, fossil, crystal, mineral

Lesson1: Sharing What We Know about Rocks- Pre-Assessment

- Students set up science notebooks in which they will record their observations, ideas, and question.
- Students share their ideas about rocks and discuss what they would like to learn about them.
- Students observe three rocks and record their descriptions of them.
- Students connect their descriptions of rocks with the properties of rocks.

Lesson 2: Observing Rocks: How Are They the Same and Different?

- Students observe and describe the properties of 12 rocks.
- Students sort rocks according to similarities and differences they observe.
- Students describe and discuss the properties that were the basis of each sort.
- Students sort rocks according to properties suggested by their classmates.

Lesson 3: Learning More about Rocks

- Students use a Venn diagram to identify and discuss similarities and differences among rocks.
- Students read about and discuss how rocks are formed.
- Students identify observable properties that are related to how rocks are formed.
- Students use properties related to how rocks are formed to sort rocks by classes: sedimentary, igneous, or metamorphic.

Lesson 4: Discovering Minerals

- Students review and summarize the properties of the rocks they have observed.
- Students compare rocks and minerals and discuss the similarities and differences between them.
- Students observe and describe three minerals.
- Students record and discuss their observations of three minerals.

Lesson 5: Sharing What We Know about Minerals

- Students share their ideas and questions about minerals.
- Students observe and describe 12 minerals.
- Students compare and discuss their observations of the 12 minerals.
- Students compare and describe similarities between samples of the same mineral.

Lesson 6: Observing Minerals: How Are They the Same and Different?

- Students observe, describe, and draw each mineral in their set.
- Students observe, describe, and record the texture and smell of each mineral.
- Students discuss the similarities and differences among minerals.
- Students discuss the different terms they used to describe the same property.
- Students set up their mineral profile sheets.

Lesson 7: Describing the Color of Minerals

- Students describe and record the observable color of the 12 minerals.
- Students sort their minerals on the basis of observable color.
- Students apply the streak test to their minerals.
- Students describe and record the results of the streak test.
- Students compare and discuss the differences between each mineral's observable color and its identifying (streak) color.

Lesson 8: Shining a Light on the Minerals

- Students test how much light shines through each of their minerals.

- Students compare and discuss each mineral's ability to transmit.
- Students sort the minerals according to their ability to transmit light.
- Students record the results of the light test.

Lesson 9: Exploring the Luster of Minerals

- Students observe, discuss, and describe the luster of minerals when they are placed under bright light.
- Students sort their minerals according to similarities and differences in luster.
- Students record the results of the luster test on their mineral profile sheets.
- Students summarize the information they have recorded on each mineral and begin to identify its distinguishing properties.

Lesson 10: Exploring the Hardness of Minerals

- Students test, compare, and discuss the hardness of 12 minerals.
- Students sort minerals according to their relative hardness.
- Students record the results of hardness test.

Lesson 11: Testing the Minerals with a Magnet

- Students test minerals with a magnet and observe and describe the results.
- Students record and compare results of their test.
- Students read to learn more about magnetite.

Lesson 12: Describing the Shape of Minerals

- Students observe and describe the shapes of four new mineral samples.
- Students compare the shapes of the 12 minerals in their set and the new samples.
- Students sort the 12 minerals on the basis of shape.
- Students discuss and record the shapes of their 12 minerals.

Lesson 13: Comparing Samples of the Same Mineral

- Students review and summarize what they have learned about the 12 minerals.
- Students identify distinctive properties of each mineral and use them to describe the mineral.
- Students compare and contrast several samples of the same mineral.
- Students reflect on their new observations of minerals and share ideas and questions about them.

Lesson 14: Identifying the Minerals

- Students analyze a mineral identification card and select the properties that will allow them to identify a sample of that mineral from among the 12 minerals in their set.
- Students apply problem-solving skills to identify each of the 12 minerals by name.
- Students make field guides with their set of mineral profile sheets.

Lesson 15: Exploring New Minerals

- Students apply tests to describe new minerals.
- Students record and discuss the results of their tests.
- Students identify and discuss similarities and differences between known and unknown mineral.
- Students communicate in writing how they have recorded to identify three new minerals by name.
- Students communicate in writing how they identified the new minerals.

Lesson 16: How are Rocks and Minerals Used?

- Students suggest possible uses for rocks and minerals.
- Students read to learn more about how rocks and minerals were used.
- Students prepare and share reports on specific rocks and minerals.

- Students complete a Venn diagram showing the similarities and differences between the rocks and minerals they have studied.

Rocks and Minerals Resources:

Videos:

United streaming: search Rocks and Minerals (material changes)

The Magic School Bus Rocks and Rolls.-about boulders and rocks

The Magic School Bus Blows Its Top.- island creation

Literature and Reference Guides

References/Guides:

Peterson First Guide to Rocks and Minerals. Fredrick H. Pough

Smithsonian Handbooks: Rocks & Minerals. Chris Pellant

Simon & Schuster's Guide to Rocks and Minerals (Rocks, Minerals and Gemstones. Simon & Schuster

The Practical Geologist: The Introductory Guide to the Basics of Geology and to Collecting and Identifying Rocks. Dougal Dixon

Let's Go Rock Collecting (Let's-Read-And-Find-Out Science. Stage 2). Roma Gans

Rocks and Minerals (Eye Wonder). DK Publishing

Geology RocksQ: 50 Hands-On Activities to Explore the Earth (Kaleidoscope Kids). Cindy Blobaum. (+)

The Practical Encyclopedia of Rocks & Minerals: How to Find, Identify, Collect and Maintain the World's best Specimens, with over 1000 photographs and Artworks. John Farndon

Stories:

Anasi and the Moss-Covered Rock. Erick Kimmel

Girls Who Looked Under Rocks: The Lives of Six Pioneering Naturalists. Jeannie Atkins

The Pebble in my Pocket: A History of Our Earth. Meredith Hooper

How to Dig a Hole to the Other Side of the World. Faith McNulty

Rocks in His Head. Carol Otis Hurst

The Big Rock (Aladdin Picture Books). Bruce Hiscock

Websites:

**Please check sites to ensure material has not been altered since publication!*

www.msha.gov/KIDS/MINING.HTM What is mined in each state.

www.fi.edu/fellows/fellow1/oct98/index2.html- lesson plans, literature collection, activities, quizzes, puzzles and more.

www.cotf.edu/ete/modules/mse/earthsysflr/rock.html- rock cycle information

www.fi.edu/fellows/fellow4/nov98/indexhtml- create site created by 5th graders! –connections, games, labs and more. **Why not use technology teacher to help create your own website, let us know!

www.geocities.com/missneill/- about different jobs dealing with rocks!!

<http://volcano.und.nodak.edu/vwdocs/vwlessons/lessons/slideshow/slideindex.html>- excellent slideshow of rocks and minerals, lessons, and video

Connections/extensions:

Music:

Rock Cycle Song

(Sing to the tune of “Row, Row, Row Your Boat”)

SEDIMENTARY rock

Has been formed in layers

Often found near water sources

With fossils from decayers

Then there’s **IGNEOUS** rock

Here since Earth was born

Molten Lava, cooled and hardened

That’s how it is formed

These two types of rocks

Can also be transformed

With pressure, heat and chemicals
METAMORPHIC they'll become.

Don't forget to sing this as a "Round" after all; it is the Rock "Cycle"!)
j.carlson-pickering 2001

ART:

Create a rock pet, or artwork on a river rock or other found rocks.
Explore zen rock gardening.
Explore rock gardening.

Gym:

Explore rock climbing.

Post Assessment

The post-unit assessment is matched to the pre-unit assessment in Lesson 1 and to the assessment questions about minerals in Lesson 5. By comparing individual responses from this activity with those from Lessons 1 and 5, you will be able to document each student's learning over the course of this unit. When students respond again to these questions and review the class lists, they may realize how much they have learned about rocks and minerals and about identifying and describing their properties.

Materials:

- 1 science notebook for each student
- 1 blank KWL chart for each student

For class:

- 3 sheets of newsprint
- Colored markers
- Masking tape
- Class lists: “What We Know about Rocks” (from Lesson 1) and “what We Know about Minerals: (from Lesson 5)

Preparation:

1. Label one sheet of newsprint with the words “What we Know about Rocks,” one with “What We Know about Minerals,” and a third with “Questions We Still Have.” Date the sheets and post them in a prominent position in the classroom. You may need extra sheets of newsprint. *(You can receive **FREE** news print from the New Haven Register, by driving to the loading dock and asking for an end roll and telling them you work for a New Haven public school. If you return the completely empty roll, you will receive another one. This helps save the district and you money plus you help save the environment by recycling. Please give it a try!! And pass the word around)*
2. Have the class lists from Lessons 1 and 5 ready to display.

Procedure:

1. Ask students to think about what they have learned in this unit. Have them write down what they now know about rocks and minerals. When you compare these entries with those from Lessons 1 and 5, look for new ideas as well as for indications that students’ existing ideas have been refined.
2. Display the original class lists. Ask students to point out ideas they now know to be true. What experiences did they have during the unit that confirmed these statements?
3. Ask students to look at the lists again and to point to statements they would like to correct, improve, or delete. Again, ask them to support their suggestions with experiences from the unit.
4. Finally, ask students to share new information they gained from the unit. What else have they learned? What new questions do they have? Record their answers on the newly prepared newsprint. Point out that science involves asking questions and conducting investigations to find out the answers, and that the answers usually lead to more questions and additional investigations.

Significant Task:

Students will prepare a museum like exhibit for others to visit/observe. The exhibit can be exhibited in the library, cafeteria, school entry, bulletin board, and showcase. The exhibit should include both rocks and minerals. The materials should be labeled with not only name but a student written description including vocabulary used during unit. The descriptions could include possible uses and history/origin.

Literature/Books:

Websites:

Additional resources:

Yale Peabody (either visit or have them visit you)