

SCIENCE
Third Grade
Unit 1
Rocks and Minerals Objectives

GRADE-LEVEL CONCEPT: ♦ Rocks and minerals have properties that may be identified through observation and testing; these properties determine how earth materials are used.

Describe the physical properties of rocks and relate them to their potential uses.

Relate the properties of rocks to the possible environmental conditions during their formation.

GRADE-LEVEL EXPECTATIONS:

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.
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/msese/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