



CAVE OF THE MOUNDS®

National Natural Landmark

Educational Programs

RocksROCK

Rock Mini-Course

Grade 9-12

Objectives:

At the end of this program, the student should be able to:

- Apply rock related vocabulary
- Name & identify the three main rock types
- Describe how sedimentary, igneous, and metamorphic rocks form
- Describe the way rocks & minerals differ
- Investigate rock and mineral specimens and determine what they are
- Understand the how the different rock types are related
- Identify at least five different rocks and five different minerals

Wisconsin DPI Standards:

Science:

*D.12.4, D.12.5, D.12.6, D.12.11,
D.12.12, E.12.2*

Activities:

Times are approximate and specific reinforcing activities will vary based on the needs of each individual group.

- 30 minutes The interactive audio visual presentation provides the definition of a rock, a mineral & a gem, rock types & how each forms, and how scientists identify rocks, gems & minerals.
- 30 minutes Sluicing give participants a hands-on experience to uncover their own collection like a true geologist. Guided identification shows examples of both local/non-local rocks & minerals.
- 60 minutes The Cave Tour fosters a connection between previously discussed rock, mineral, and gem concepts with the experience of observing large scale rocks & minerals inside the cave.

Pre-teach Vocabulary:

A glossary of terms is provided for your convenience

Rock	Metamorphic	Gneiss	Rock cycle	Intrusive Igneous
Mineral	Sedimentary	Calcite	Erosion	Extrusive Igneous
Geologist	Igneous	Granite	Weathering	Chemical Weathering
Geology	Limestone	Gemstone	Crystal	

Learning Extension:

Try this after your visit to reinforce important concepts.

You will need:

- Mineral specimens - milky quartz, feldspar, mica
- Crushed granite rock - use granite or granite pegmatite (One film canister will be enough for a class of up to 45 students.)
- 1 hand lens for each student
- 2 toothpicks for each student
- 1 "A Rock Apart" worksheet for each student (attached) (Download from educator pages at www.caveofthemounds.com)

Activity:

1. Students are to sort the crushed rock into categories using the worksheet, hand lens & toothpicks.
2. The piles should contain similar looking material as students have sorted by the characteristic of color. Students use the hands lens to observe & describe each mineral pile. Students record color, luster (dull, shiny, metallic, etc.), and cleavage (round, flat, 90° angle, etc.) of the pieces in each pile.

Discuss: Rocks are made up of two or more minerals. Minerals have physical characteristics that help identify them; color, crystal structure, cleavage, and luster are just a few. Rocks & minerals are important materials and have many practical and commercial uses. As a class, generate a list of uses and discuss why protection might be important.

Glossary of Terms

Rock – A solid, cohesive aggregate of one or more minerals or mineral materials.

Mineral – A naturally occurring, solid element or compound, with a definite composition and a regular internal crystal structure.

Geologist – A scientist who studies the earth and the materials that form it.

Geology – Scientific study of the earth and the materials that form it.

Metamorphic – A type of rock changed from its original form (sedimentary or igneous) and/or composition by heat, pressure, or chemically active fluids, or some combination of them.

Sedimentary – A type of rock formed from the accumulation of sediment, which may consist of fragments and mineral grains of varying sizes from pre-existing rocks, remains or products of animals and plants, or the products of chemical action.

Igneous – A type of rock formed from molten or partially molten material cooling and hardening either above or below the surface of the earth.

Limestone – A carbonate-rich sedimentary rock which usually forms from layers of the remains of marine life and other marine sediments.

Gneiss – Metamorphic rock characterized by strong two colored banding that appears folded, as a result of metamorphic processes.

Calcite – A mineral composed of calcium carbonate. Most cave formations are made of calcite.

Granite – A light-colored, coarse-grained igneous rock formed by cooling of silica-rich magma below the surface of the earth.

Gemstone – A mineral that is valued for its beauty, durability, and rarity.

Rock Cycle – All rock at or near Earth's surface is being continuously modified by the processes of metamorphism, melting, crystallization, sedimentation and weathering.

Erosion – The set of processes by which materials are removed or transported by wind, water, ice or gravity.

Weathering – The breakdown of earth materials by natural processes such as wind, water, & ice.

Crystal – A solid whose atoms are arranged in an orderly, repeating, three-dimensional pattern. All minerals, such as calcite, are composed of crystals.

Intrusive igneous – Igneous rocks that form as magma cools and hardens into rock beneath the earth's surface, with or without crystallization.

Extrusive igneous – Igneous rocks that form as lava cools and hardens at the earth's surface, with or without crystallization.

Chemical weathering – The breakdown of earth materials by natural chemical reactions that act to change materials by altering their mineral components.