

Division of Outdoor Experiences

Minerals and Rocks

Grade Level: 6

Length of Program: 3, ten-minute sessions

Setting: Asynchronous Remote Learning

State Standards:

6: ESS.1: Minerals have specific, quantifiable properties.

6: ESS.2 Igneous, metamorphic and sedimentary rocks have unique characteristics that can be used for identification and/or classification.

6: ESS.3: Igneous, metamorphic and sedimentary rocks form in different ways.

6: ESS.5: Rocks, minerals and soils have common and practical uses.

Themes:

Session 1: Minerals are the building blocks of rocks.

Session 2: Families of rocks are unique in their formation and features.

Session 3: Minerals and rocks are a big part of our daily lives.

Objectives

At the end of the program, student will be able to:

- name four criteria that qualify a mineral as a mineral.
- name several specific quantifiable properties that identify one mineral (rock) from the other by conducting tests.
- Understand that a combination of minerals provide the recipe for rocks of the world.
- name the layers of the earth and the processes that have contributed to its formation.
- identify the three families of rocks, and how each are formed.
- identify each family of rock by its unique characteristics.
- explain the rock cycle.
- recognize that minerals are essential for human survival.
- name three minerals and rocks that provide infrastructure for homes, cities and roads.
- identify minerals in their everyday lives.
- identify jobs related to mineral extraction and usage.
- understand that minerals are nonrenewable resources.

Vocabulary (key concept words only)

- Element - a pure substance that cannot be broken down into different substances.
- Erosion – the movement of rock particles by water, wind, ice and gravity.
- Extrusive – igneous rock that cools quickly above the ground.
- Igneous - the family of rock formed from hardened magma and lava.

- Intrusive – igneous rock that cools slowly below the ground.
- Lithosphere – the solid, outer part of the earth made up of the crust and the upper mantle.
- Magma – molten rock found below the earth’s surface.
- Metamorphic – the family of rock that is formed from existing rock that changes with heat and pressure.
- Mineral - solid substances that occur naturally, are inorganic, and have a specific chemical formula.
- Non-renewable - natural resources that cannot be replaced or that can be replaced only over thousands or millions of years.
- Rock – a solid object made up of one or more minerals.
- Sedimentary – the family of rock that is formed when particles of rock are cemented together.
- Weathering – the breakdown of rock and minerals on the earth’s surface.

Program Outline:

Session 1: Minerals are the Building Blocks of Rocks

- A. Four criteria that constitute a mineral (solid, naturally occurring, inorganic, fixed chemical formula).
- B. Minerals have properties that help us ID specific minerals, i.e.... hardness, specific gravity, cleavage, transparency, luster, and streak test.
- C. A combination of minerals provide the recipe for rocks.

Session 2: Families of Rocks are Unique in Their Formation and Features

- A. Igneous rock - definition, explain intrusive and extrusive, glacial erratic.
- B. Sedimentary rocks - sedimentary definition, inorganic and organic, creek examples, river sedimentation layering and profile.
- C. Metamorphic rocks - metamorphic definition, butterfly metamorphosis analogy, (examples).
- D. Families of Rocks revisited and rock cycle explained.

Session 3: Minerals and Rocks are a Big Part of Our Daily Lives

- A. Minerals used the Human Body and in our Food.
Minerals (not easy to see) – statistics, five major minerals in the body, function, minerals gained through daily food intake.
- B. Minerals (easy to see) as infrastructure and jobs.
Sandstone beds to building blocks, clay (shale) to bricks, and limestone to cement bridges.
Jobs – mining, quarrying, oil drilling, bricklaying ...
- C. Minerals used around the house, daily routine, and transportation.
- D. Minerals and rocks are nonrenewable Resources.
Reduce, Reuse, Recycle – definitions and examples.

Enrichment:

- “Properties of Minerals Worksheet”
- “Families of Rocks Worksheet”
- “Rocks and Minerals in our Daily Lives Worksheet”