

Study Guide

Rocks, Minerals, Soils and Fossils

Standards:

S3E1. Students will investigate the physical attributes of rocks and soils.

S3E2. Students will investigate fossils as evidence of organisms that lived long ago.

By the end of this unit you will be able to:

- Explain the difference between a rock and a mineral.
- Describe how various rocks are formed.
- Observe and describe samples of soils, rocks, minerals for shape, color texture, measurement and hardness.
- Identify various soils, rocks and minerals based on your observations.
- Understand erosion.
- Describe how fossils are formed.

Vocabulary -

humus - a type of soil that has bits of dead plants and animals in it. Usually found in the top layer of soil.

sand - a type of soil that is made up of tiny bits of rock that you can see with your eyes and feel with your fingers.

silt - a type of soil that it made up of small bits of rock that is too small to see with your eyes or feel with your finger. This type of soil is usually found in or around water.

clay - a type of soil that has very tiny bits of rock in it that you cannot feel. Clay feels sticky when it is wet and can range in color from gray to brownish red.

loam - is a mixture of soils (humus, clay, silt, and sand). This soil is excellent for growing plants.

weathering - the process of wind and water erosion that causes rocks to change.

erosion - the process of carrying away of tiny bits of soil or rocks caused by the movement of water or wind.

mineral - a solid, non-living thing/substance that is formed in the ground.

rock - a solid, non-living substance made up of one or more minerals.

igneous rock - rock that was formed by being melted, then cooled.

sedimentary rock - rock that was formed by bits of soil, rock and mud being squeezed together into layers over time.

metamorphic rock - rock formed by heat and pressure deep within the Earth.

streak - color left behind by a mineral when it is rubbed against a black/white tile.

hardness - a mineral property identified by the Mohs scale.

fossil - what is left of a plant or animal that lived long ago.

extinct - when a plant or animal that once lived on Earth no longer exists.

Soil

Soil is formed by rocks that break up through the weathering process and become mixed with organic material such as bits of decaying plants and animals. Some soils are better for growing plants than others. Humus or loam is best because it absorbs water well, is loosely packed so that air can enter it, and contains nutrients plants need. Clay has small particles that pack together so tightly that water and air have a hard time getting into it. So do the roots of plants. Sand lacks organic material needed as nutrients for plants. Soil is important because plants could not survive without it, and people and animals depend on plants to live.

Erosion

Wind erosion causes soils to move from one location to another. Most wind erosion occurs in areas of high prevailing wind speeds and with light soils that are easily moved by the wind. Soil from a large open field, where winds can get a good sweep, is more likely to blow than soil from a field protected by trees, grass strips and residue or from a smaller field.

Studies by the U.S.D.A Natural Resources Conservation Service show that from 1 to 100 tons of soil per acre may be splashed into the air during one rain. Small clods and granules of soil are broken down by the impact of the falling drops of water. This splashed up soil consists of single particles that have been dislodged from the soil mass. They are easily transported by any water movement on the surface, no matter how slight, regardless of slope. It is very easy to see signs of erosion along the banks of streams and rivers.

Rocks and Minerals

Rocks are identified and named by their characteristics. The hardness, color, luster (*dull or shiny*), and texture (*how it feels*) are four of the characteristics used to classify a rock.

Two different tests that geologists perform to determine what kind of rock they are studying and what minerals make it up are scratch test and streak test.

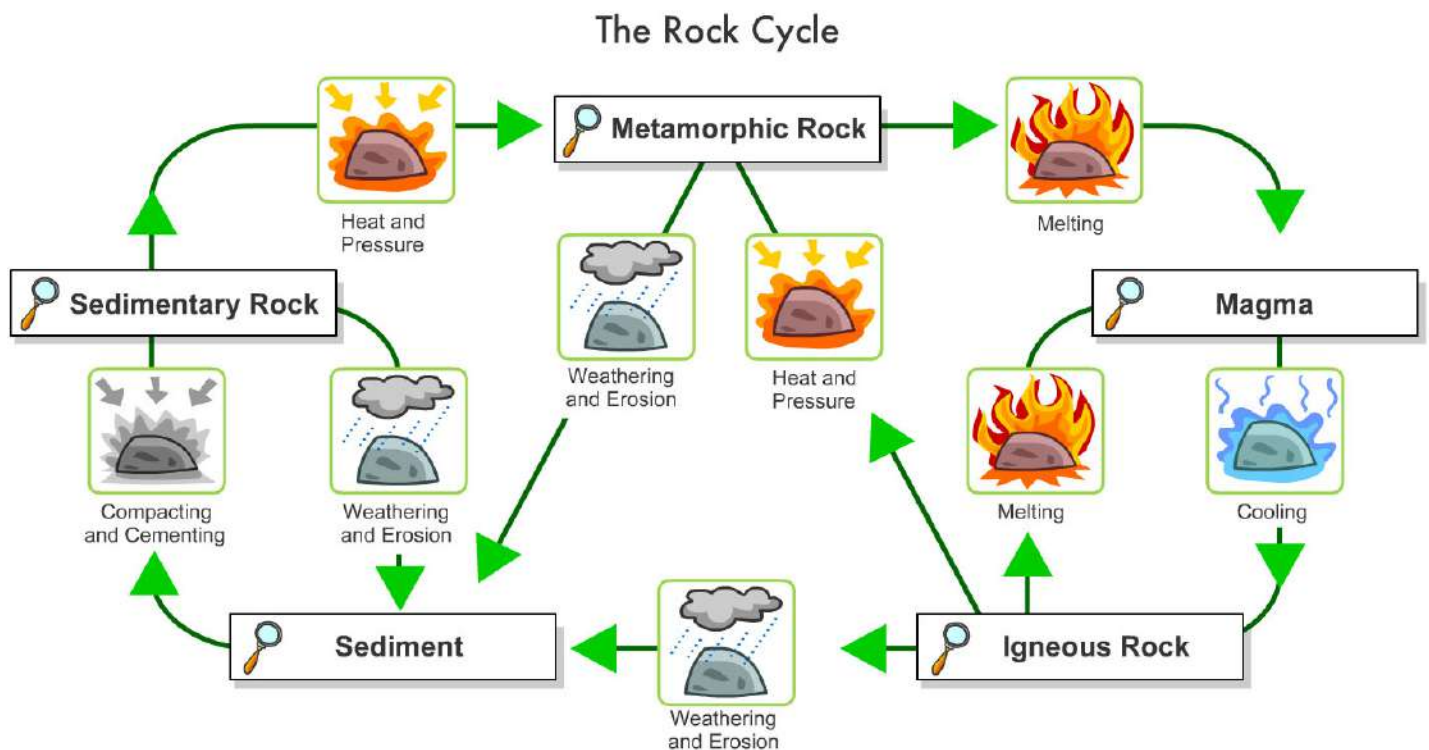
1. A *scratch test* is when different items (fingernail, nail, penny, etc) are used to scratch the rock. It tells the hardness of the minerals and rocks. It also aids the geologist in determine which minerals make up the rocks.

Mohs' Scale of Hardness - scale designed by Friedrich Mohs to test the hardness of minerals (How easily they can be scratched). It is used with a scratch test to identify minerals. The diamond is the hardest at 10, and talc is the softest at 1.

2. A *streak test* is when a rock is rubbed or dragged across a tile. The colored mark it leaves on the tile helps to determine what minerals are in the rock.

The Rock Cycle

Rocks and change over time. The diagram below shows the process of change known as the rock cycle.



Suggested Websites:

<http://studyjams.scholastic.com/studyjams/jams/science/rocks-minerals-landforms/igneous-rocks.htm>

<http://studyjams.scholastic.com/studyjams/jams/science/rocks-minerals-landforms/minerals.htm>

<http://studyjams.scholastic.com/studyjams/jams/science/rocks-minerals-landforms/sedimentary-rocks.htm>

<http://studyjams.scholastic.com/studyjams/jams/science/rocks-minerals-landforms/metamorphic-rocks.htm>

<http://studyjams.scholastic.com/studyjams/jams/science/rocks-minerals-landforms/rock-cycle.htm>

<http://studyjams.scholastic.com/studyjams/jams/science/rocks-minerals-landforms/fossils.htm>