S3E1: Rocks and Soil

Dates: 1/20 - 3/4

Key Terms

Rock[1]
Mineral[3]
Texture[1]
Scratch Test[3]
Hardness[2]
Hardness Scale[3]
Characteristics[1]
Attributes[2]
Streak[2]
Grain[1]
Grain Sizes[2]
Color Absorption[2]
Soil[1]
Loam[3]
Potting Soil[2]
Clay[1]
Silt[2]
Humus[3]
Igneous Rock[3]
Sedimentary Rock[3]
Metamorphic Rock[3]
Weathering[2]
Erosion[2]
Scale[2]
Absorption of Water[2]
Shape[1]
Color[1]
Sand[1]
Topsoil[2]
Subsoil[3]
Bedrock[3]
Physical[2]
Compare[2]
Particle[2]
Research[2]

Framework for Teaching:

Students Will Be Able To:

1. Define rock and mineral based on originations and characteristics.

2. Compare and contrast rocks and minerals.
3. Identify rocks and minerals using shape, color, texture, measurement, and simple tests (hardness).
4. Use The Mohs Scale (hardness) to identify common minerals.
5. Use a streaking test to identify different minerals.
6. Classify rocks as igneous, sedimentary, and metamorphic and explain how each type of rock was formed.
7. Describe the process of rock formation and the rock cycle.
8. Identify the effects of wind, water, and heat on rocks and the rock cycle.
9. Describe the components of soil
10. Identify and classify types of soil based on composition and location.
11. Compare and contrast humus, sand, silt, and clay
12. Relate loam to humus, clay, silt, and clay.
13. List uses for each type of soil in everyday life.
14. Identify and model the process by which rocks are broken down and move (weathering and erosion).

For the teacher to know for their own understanding and to avoid misconceptions:

1. Minerals are solid material that is formed in nature and has never been living.
2. Minerals have a multitude of properties so be careful when using blanket statements regarding characteristics.
3. Minerals can be classified using visual observation and tests (hardness, streaking).
4. Minerals can be found in the food we eat.
5. Diamonds are the hardest substance known to man. (Mohs Scale = 10)
6. Rocks are made of one or more minerals.
7. Rocks are composed of grains that sometimes can be seen and can affect the texture of the rock.
8. 75% of the rocks on Earth are sedimentary.
9. The rock cycle is dictated by temperature, wind, water, and pressure. These factors dictate the type of rock (sedimentary, igneous, metamorphic)
10. Earthworms move nutrients around in the layers of the soil.
11. Humus is composed of organic materials (dead plants and animals). Organic materials have carbon in them. Humus is more common in soil that is close to the surface.
12. Sand, slit, and clay are composed of grains of rock. The size and texture of the grain dictates how each is classified.

Activities (Suggestions)

- ✓ If You Find a Rock (Picture Perfect)
- ✓ Grand Canyon (Picture Perfect)
- ✓ Observing minerals, rocks, and soil (Summative lab or separate activities)
- ✓ Testing Minerals (Page 56)
- ✓ Make A Model Rock (Page 70)
- ✓ Observing Soil (Page 82)
- ✓ Water at Work Lab (Page 94)

Notes:

Classifying minerals, rocks, and soils using simple tests and observations are key to meeting the standards. Students should keep data for each (minerals, rocks, soil) in order compare how they are classified. This

will help them make connections to their origination. Using characteristics to understand process is instrumental in science. Mineral and rock testing supports inquiry. Allow students to construct their own write up format for these activities. Provide a rubric with required components but do not include a logistical format. This will further assist students with constructing their own understanding.