

## 2<sup>nd</sup> Grade Earth Science

### Rocks & Soils

#### Teacher Background Information – for teacher content knowledge only, NOT student learning goals

- The earth is mostly rock.
- Minerals are made, dissolved, and remade on the earth's surface, in the ocean and earth's crust.
- Some rocks are made of single substance; most are made of several substances.
- Earth materials are solid rock, soil, water, and gases of the atmosphere and living organisms.

#### Instructional Implications

- Young children are naturally interested in soil and rocks and they should be encouraged to observe closely, describing properties and features that distinguish one from another.
- Students can be guided to observe and describe changes.
- Understanding rocks and minerals should not be extended to the study of the source of rocks (sedimentary, igneous, metamorphic) because the origin of rocks has little meaning in small children.
- Playgrounds, beaches and parks are convenient study sites to observe a variety of earth materials.
- If students revisit study sites regularly, children will develop an understanding that the earth's surface is constantly changing.
- As students collect rocks and observe vegetation they will become aware that soil varies from place to place in color, texture, and reaction to water.
- Children should use hand lenses to closely observe soil and sort parts that are alike.

#### Big Idea

Some changes to rocks and dirt can be seen and some take too long to see happen.

#### Essential Questions

How can rocks change?  
What's in the soil?

#### AAAS Benchmarks/National and Science Education Standards

##### Processes that Shape the Earth

- Change is something that happens to many things. 4C/P2\*
- Some changes are so slow or so fast that they are hard to see. 11C/P4\*
- Chunks of rocks come in many sizes and shapes, from boulders to grains of sand and even smaller. 4C/P1\*
- Soils have properties of color and texture, capacity to hold water, and ability to support growth of plants.

### Local Connections

- Observations and interactions within the natural world of the child, including the natural environment around the school and backyards
- Local Geologist – see below

### Materials/Resources

FOSS: Pebbles, Sand, and Silt

AMEREF: Minerals & Rocks materials

“If You Find A Rock” Ch. 16 from Picture Perfect Science K-4

### Assessments

Understanding Student Ideas in Science – Formative Assessment Probe:

Vol. 2, Is It a Rock? (Version 1) page 151

Science Notebooks

### Related Scientist or Career Path

#### *Geology*

Local Geologist: Dr. Cathy Connor  
UAS Professor and Researcher

#### *Mining*

Local Resource: Greens Creek Mine

#### Soil science

Local Soil Scientist: Dr. Dave D’Amore  
Forest Service Lab

#### Glaciologist

Local glaciologist: Roman Motyka  
UAS Professor and Researcher

### Alaska GLE’s

There are no grade level expectations for K-2. The concepts in this unit provide students with the necessary experiences to develop scientific literacy and an understanding of the concepts in the grade 3-11 grade level expectations.

#### **Building towards understanding of the following 3<sup>rd</sup> grade GLE:**

[3] **SD1.1** recognizing that most rocks are composed of combinations of different substances.

#### **Process Skills Addressed in 3rd Grade GLE’s**

#### **The student demonstrates an understanding of the process of science by**

[3] **SA1.1** asking questions, predicting, observing, describing, measuring, classifying, making generalizations, inferring and communicating

[3] **SA1.2** observing and describing the student’s own world to answer simple questions

#### **The student demonstrates an understanding of the attitudes and approaches to scientific inquiry by**

[3] **SA2.1** answering “how do you know” questions with reasonable answers

### **Student Difficulties and Misconceptions**

- Children have difficulty distinguishing between rocks and minerals. To children: Rocks must be large, heavy, and jagged. Smaller pieces are not called rocks, but rather stones.
- Some students suggest that minerals are small, precious stones.
- Some student’s think of soil as the precursor to rock and that it changes to rock in the sequence: soil-clay-rock.