

Earth Materials Unit Design - Grade 4

The **Earth Materials Module** consists of four sequential investigations dealing with observable characteristics of solid materials from the earth—rocks and minerals. The focus is on taking materials apart to find what they are made of and putting materials together to better understand their properties. The module introduces fundamental concepts in earth science

RI Statements of Enduring Knowledge - (Established Goals):

ESS 1 - The Earth and earth materials as we know them today have developed over long periods of time, through continual change processes.

PS1 - All living and nonliving things are composed of matter having characteristic properties that distinguish one substance from another (independent of size or amount of substance)

Related Rhode Island GSE's (Understandings)	RI Assessment Targets Assessment Evidence ***High Emphasis Targets
<p>ESS1 (3 – 4) -1 Students demonstrate an understanding of earth materials by...</p> <p>1a describing, comparing, and sorting rocks, soils, <i>and minerals</i> by similar or different physical properties (e.g., size, shape, color, texture, smell, weight, <i>temperature, hardness, composition</i>).</p> <p>1b recording <i>and analyzing</i> observations/data about physical properties (e.g., <i>within a grouping</i>, some characteristics are the same and other are different.</p> <p>1c <i>citing evidence</i> (e.g., <i>prior knowledge, data</i>) to support why rocks, soils, or minerals are <i>classified/not classified</i> together.</p>	<p>***ESS1 (K-4) INQ-1</p> <p><i>Given certain earth materials (soils, rocks or minerals) use physical properties to sort, classify, and describe them.</i></p> <p>Investigation 1, Parts 1-3, pp. 8-29 Investigation 2, Parts 1-2, pp. 8-21 Investigation 4, Part 1, pp. 8-13 FOSS Web, Activity: Rock Database</p> <p>Investigations 1-4 Science Stories, pp. 12-15, 30-37</p>
<p>PS1 (3-4)-1 Students demonstrate an understanding of characteristic properties of matter by ...</p> <p>1a identifying, comparing, and sorting objects by similar or different physical properties (e.g., size, shape, color, texture, smell, weight, <u>temperature, flexibility</u>).</p> <p>1b recording and <u>analyzing</u> observations/data about physical properties (e.g., within a grouping, some characteristics are the same and others are different.</p> <p>1c <u>citing evidence</u> (e.g., <u>prior knowledge, data</u>) to support <u>conclusions about</u> why objects are grouped/<u>not grouped</u> together.</p>	<p>PS1 (K-4) INQ -1</p> <p><i>Collect and organize data about physical properties in order to classify objects or draw conclusions about objects and their characteristic properties (e.g., temperature, color, size, shape, weight, texture, flexibility)</i></p> <p>Investigation 1, Parts 1-2, pp. 8-23 Investigation 2, Parts 1-2, pp. 8-21</p>

Words in **bold** are important for science vocabulary development, and should be used for word walls.

Investigation-Time (45min.periods)	Investigation	Focus Questions (Essential Questions)	Big Ideas (Understandings)
1.1-(2)	Investigating Mock Rocks	<ul style="list-style-type: none"> What are some of the properties we can use to describe individual rocks? 	<ul style="list-style-type: none"> Rocks have many properties, including shape, size, color, and texture. Geologists use rock properties to help identify different rocks. Some dimensions of rocks can be measured and compared.
1.2-(2)	Taking Rocks Apart	<ul style="list-style-type: none"> How can we determine the ingredients of a rock? How can we separate the ingredients of a rock? 	<ul style="list-style-type: none"> Rocks are made of ingredients called minerals; minerals are made of only one ingredient. Some ingredients can be identified by breaking rocks apart. Water can be used to separate ingredients: some break into smaller pieces, and some dissolve.
1.3-(2)	Observing Crystals	<ul style="list-style-type: none"> What are the ingredients in mock rocks? What evidence do you have to support your conclusions? 	<ul style="list-style-type: none"> Rocks are made of minerals. Evaporation is a way to separate liquid and solid ingredients. Mineral crystals have identifiable shapes.
2.1-(2)	Observing Minerals	<ul style="list-style-type: none"> What properties can we use to identify minerals? 	<ul style="list-style-type: none"> A mineral is a basic earth material that cannot be physically broken down any further. Minerals are the ingredients that make up rocks. It is usually necessary to know several properties of a mineral in order to identify it.
2.2-(1)	Testing for Hardness	<ul style="list-style-type: none"> What properties can we use to identify minerals? How can your fingernail, a penny, and a paper clip help to determine hardness? 	<ul style="list-style-type: none"> Hardness, a mineral property, is the resistance of a mineral to being scratched. Minerals can be seriated by hardness. When comparing the hardness of any two objects, the harder one will scratch the softer one.
3.1-(1)	Detecting Calcite	<ul style="list-style-type: none"> How can we tell if one of the ingredients in a rock is the mineral calcite? 	<ul style="list-style-type: none"> Rocks are made of minerals. Calcite is one of the most common minerals on Earth. Putting acid on a rock is a tool geologists use to identify calcite.
3.2-(1)	Looking for More Evidence	<ul style="list-style-type: none"> Is there another test that we can do to know for sure which rocks contain calcite? 	<ul style="list-style-type: none"> Sometimes more than one test is needed to provide conclusive evidence. Evaporation is a technique used to separate liquid from solid parts of a mixture or solution. Crystal patterns can help us identify certain minerals. Limestone and marble are two rocks that contain calcite.

Investigation- Time (45min.periods)	Investigation	Focus Questions (Essential Questions)	Big Ideas (Understandings)
4.1-(2)	Identifying Minerals in Granite	<ul style="list-style-type: none"> • What are the mineral ingredients in granite? 	<ul style="list-style-type: none"> • Rocks are made of ingredients called minerals. • Rocks and minerals have identifiable characteristics. • The minerals that make up a rock can be identified by observing certain characteristics.
4.2-(ongoing)	Choose investigation	(Dependent on investigation)	