



## Grade 6 Science

## Unit # 2 – Earth and Space Science

## Topic 7 Minerals and Rocks in the Geosphere – 19 Days

**Unit Overview:** Students make sense of phenomena as they explore the disciplinary core ideas through the lens of crosscutting concepts, such as Systems and System Models, Cause and Effect, and Matter and Energy. Students begin their discovery of the physical world with models and observable phenomena and move to explore Earth's systems and their interactions, weather in the atmosphere, rocks and minerals, plate tectonics, and Earth's surface systems – erosion and deposition.

**Topic Essential Question:** What events form Earth's rocks?

### Lessons

- Topic Launch/Quest Kickoff
- Lesson 1 Earth's Interior
- Lesson 2 Minerals
- Lesson 3 Rocks
- Lesson 4 Cycling of Rocks
- Topic Close –Assessment, Quest Findings

### NYSSLS Performance Expectations

**MS-ESS2-1. Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process. [Clarification Statement: Emphasis is on the processes of melting, crystallization, weathering, deformation, and sedimentation, which act together to form minerals and rocks through the cycling of Earth's materials.] [Assessment Boundary: Assessment does not include the specific identification and naming of minerals and rocks but could include the general classification of rocks as igneous, metamorphic, or sedimentary.]**

**MS-ESS3-1 Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geologic processes. [Clarification Statement: Emphasis is on how these resources are limited and typically non-renewable, and how their distributions are significantly changing as a result of removal by humans. Examples of uneven distributions of resources as a result of past processes could include petroleum (locations of the burial of organic marine sediments and subsequent geologic traps), metal ores (locations of past volcanic and hydrothermal activity associated with subduction zones), and soil (locations of active weathering and/or deposition of rock).]**

**MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.**

**MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.**

### Topic Opener

**PE:** MS-ESS2-1

**SEP:** Constructing Explanations and Designing Solutions

### Savvas

**Highlighted labs are important to the understanding of the instructional concepts in this lesson and must be completed during Science instructional time.**

- Topic Readiness Test
- **uConnect Lab – Build a Model of Earth**
- Quest Kickoff Video
- Quest Kickoff: Science in the Movies

**Lesson 1 – Earth’s Interior**

**PE:** MS-ESS2-1

**SEP:** Developing and Using Models

**DCI:**

**ESS2.A:** Earth’s Materials and Systems

- All Earth processes are the result of energy flowing and matter cycling within and among the planet’s systems. This energy is derived from the sun and Earth’s hot interior. The energy that flows and matter that cycles produce chemical and physical changes in Earth’s materials and living organisms. (MS-ESS2-1)

**CCC:** Stability and Change

**Savvas**

**Guiding Objectives:**

- Students will examine evidence to determine how geologists learn what Earth’s interior is like.
- Students will identify and describe evidence that Earth is made up of a lithosphere, a mantle, and an outer and inner core.
- Students will use what they have learned to explain how convection occurs in Earth’s mantle.

**Literacy Connection**

- Translate Information

**Vocabulary**

- seismic wave
- crust
- mantle
- outer core
- inner core

**Academic Vocabulary**

- evidence
- elements

**Connect** - TE/SB p. 280

- Connect It!
- Class Discussion: A Wrapped-Up Mystery
- Quest Connection

**Investigate** - TE/SB pp. 281-288

- **Investigate Lab – Heat and Motion in a Liquid**

- Video – Earth’s Interior
- Interactivity – Hot on the Inside
- Interactivity – Earth’s Layers
- Reading Checks (pp. 287)
- Math Toolbox (p.285)
- Model It! (p.286)

**Synthesize** - TE/SB pp. 289-290

- Interactivity – Comparing Earth and the Moon
- Quest Check-In Interactivity – The Deep Drill
- Quest Check -In
- Literacy Connection (p.289)

**Demonstrate** – TE/SB pp. 290

- Lesson 1 Check
- Lesson Quiz 1

**Lesson 2 – Minerals**

**PE:** MS-ESS2-1; MS-ESS3-1

**SEP:** Developing and Using Models

**DCI:**

**ESS2.A:** Earth's Materials and Systems

- All Earth processes are the result of energy flowing and matter cycling within and among the planet's systems. This energy is derived from the sun and Earth's hot interior. The energy that flows and matter that cycles produce chemical and physical changes in Earth's materials and living organisms. (MS-ESS2-1)

**ESS3.A** Natural Resources

- Humans depend on Earth's land, ocean, atmosphere, and biosphere for many different resources. Minerals, fresh water, and biosphere resources are limited, and many are not renewable or replaceable over human lifetimes. These resources are distributed unevenly around the planet as a result of past geologic processes. (MS-ESS3- 1)

**CCC:** Stability and Change

**Savvas**

**Guiding Objectives:**

- Students will use visuals and models to identify characteristics of minerals and explore their properties.
- Students will use textual evidence to: Identify the processes that result in the formation of minerals; explain the distribution of mineral resources on Earth.
- Students will apply mathematical formulas to determine the density of minerals.

**Literacy Connection**

- Integrate with Visuals

**Vocabulary**

- mineral
- crystal
- crystallization

**Academic Vocabulary**

- organic

**Connect** - TE/SB p. 292

- Connect It!
- Poll: A Curious Word
- Quest Connection

**Investigate** - TE/SB pp. 293-298

- Video – Minerals
- ***u*Investigate Lab – Mineral Mash-Up**
- Interactivity – So Many, Many Minerals
- Reading Check (pp. 297)
- Literacy Connection (p.297)
- Math Toolbox (p.295)
- Model It! (p.298)

**Synthesize** - TE/SB pp. 299-300

- Interactivity – Mineral Management
- Lab: Growing a Crystal Garden
- Reading Check (p.299)
- Quest Check In – Lab – Making Your Own Stalactites and Stalagmites
- Quest Check-In

**Demonstrate** – TE/SB p. 300

- Lesson 2 Check
- Lesson 2 Quiz

**Lesson 3 – Rocks**

**PE:** MS-ESS2-1

**SEP:** Developing and Using Models

**DCI:**

**ESS2.A** – Earth’s Materials and Systems

- All Earth processes are the result of energy flowing and matter cycling within and among the planet’s systems. This energy is derived from the sun and Earth’s hot interior. The energy that flows and matter that cycles produce chemical and physical changes in Earth’s materials and living organisms. (MS-ESS2-1)

**CCC:** Stability and Change

**Savvas**

**Guiding Objectives:**

- Students will use visuals and models to: Identify the three major types of rocks; explain how the formation of rocks is the result of the flow of energy and cycling of matter within Earth; observe rocks and classify them according to the three major types.
- Students will use textual evidence to explain how each of the three major types of rocks form.

**Literacy Connection**

- Summarize Text

**Vocabulary**

- igneous rock
- sedimentary rock
- sediment
- metamorphic rock

**Academic Vocabulary**

- apply

**Connect** - TE/SB p. 302

- Connect It!
- Inquiry Warm-Up Lab – Rock Versus Rock
- Quest Connection

**Investigate** - TE/SB pp. 303-306

- **Investigate Lab – A Sequined Rock**
- Interactivity – Don’t Take it for Granite
- Video – Minerals and Rocks
- Plan It! (p.304)
- Literacy Connection (p.306)

**Synthesize** - TE/SB pp. 307-309

- Interactivity – Is There a Geologist in the House?
- Lab – Name that Rock
- Reading Check (pp.307, 308)
- Math Toolbox (p.308)
- Quest Check-In Interactivity – Rocky Business
- Quest Check-In

**Demonstrate** – TE/SB p.309

- Lesson 3 Check
- Lesson 3 Quiz

<p><b>Lesson 4 – Cycling of Rocks</b>  <b>PE:</b> MS-ESS2-1  <b>SEP:</b> Developing and Using Models  <b>DCI:</b>  <b>ESS2.A</b> – Earth’s Materials and Systems</p> <ul style="list-style-type: none"> <li>All Earth processes are the result of energy flowing and matter cycling within and among the planet’s systems. This energy is derived from the sun and Earth’s hot interior. The energy that flows and matter that cycles produce chemical and physical changes in Earth’s materials and living organisms. (MS-ESS2-1)</li> </ul> <p><b>CCC:</b> Stability and Change</p>	<p><b>Savvas</b>  <b>Guiding Objectives:</b></p> <ul style="list-style-type: none"> <li>Students will develop and use models to demonstrate: How processes that occur on Earth’s surface and in the crust and mantle slowly change rocks from one kind to another; that materials are not lost or gained.</li> <li>Students will analyze cause-and-effect relationships in order to predict how: Energy from deep inside Earth drives the forces that build and change the rocks of Earth’s crust; patterns of repeating events in the rock cycle constantly change rocks from one type into another type; the flow of energy within Earth cause the plate movements that help drive the rock cycle.</li> </ul> <p><b>Literacy Connection</b></p> <ul style="list-style-type: none"> <li>Translate Information</li> </ul> <p><b>Vocabulary</b></p> <ul style="list-style-type: none"> <li>rock cycle</li> </ul> <p><b>Academic Vocabulary</b></p> <ul style="list-style-type: none"> <li>process</li> <li>source</li> </ul> <p><b>Connect</b> - TE/SB p. 310</p> <ul style="list-style-type: none"> <li>Connect It!</li> <li>Inquiry Warm-Up Lab: Paper or Plastic...or Rock?</li> <li>Quest Connection</li> </ul> <p><b>Investigate</b> - TE/SB pp. 311-313</p> <ul style="list-style-type: none"> <li><b>Investigate Lab – Ages of Rocks</b></li> <li>Interactivity – Rocky Changes</li> <li>Interactivity – Earth’s Rock Cycle</li> <li>Video – Cycling of Rocks</li> <li>Virtual Lab – Rocks and Minerals: The Story of Earth</li> <li>Literacy Check (p.312)</li> </ul> <p><b>Synthesize</b> - TE/SB pp. 314-315</p> <ul style="list-style-type: none"> <li>Interactivity – Rocks on the Move</li> <li>Reading Check (p.314)</li> <li>Model It! (p.314)</li> <li>Quest Check-In Interactivity – The Rock Cyclers</li> <li>Quest Check-In</li> </ul> <p><b>Demonstrate</b> – TE/SB p.315</p> <ul style="list-style-type: none"> <li>Lesson 4 Check</li> <li>Lesson 4 Quiz</li> </ul>
<p><b>Topic Close</b></p> <ul style="list-style-type: none"> <li>Topic 6 Assessment and Remediation TE/SB pp. 318-321</li> <li>Quest Finding and Reflection TE/SB p. 321</li> </ul>	<p><b>Topic 7 Enrichment</b></p> <p><b>Topic 7 - Lesson 1 Enrichment</b></p> <ul style="list-style-type: none"> <li>Enrichment – How Deep Can We Go?</li> <li>uEngineer It! – Examining Earth’s Interior from Space</li> <li>Engineering Design Notebook – Looking Inside</li> </ul> <p><b>Topic 7 - Lesson 2 Enrichment</b></p> <ul style="list-style-type: none"> <li>Enrichment – Properties of Minerals</li> <li>Global to Local – The Cost of Technology</li> </ul> <p><b>Topic 7 - Lesson 3 Enrichment</b></p> <ul style="list-style-type: none"> <li>Enrichment – Geology of the Appalachians</li> </ul> <p><b>Topic 7 – Lesson 4 Enrichment</b></p> <ul style="list-style-type: none"> <li>Enrichment – Rock Cycles of the Hawaiian Islands</li> <li>Case Study – Mighty Mauna Loa</li> </ul> <p><b>Topic 7 – Topic Close</b></p> <ul style="list-style-type: none"> <li>uDemonstrate Lab – The Rock Cycle in Action</li> </ul>

<b>English Language Learners (ELL) Enhancements</b> To access <a href="#">hyperlinked</a> material, you must be logged into your BPS Google Drive	<p><b><u>Listening</u></b></p> <ul style="list-style-type: none"> <li>● <b><u>Cross- Linguistic Practices</u></b>: Gives students opportunities to make connections between what they hear and their home language (For example, allow students to listen to a passage and identify cognates).</li> <li>● <b><u>Activating Prior Knowledge</u></b> Activating prior knowledge means both eliciting from students what they already know and building initial knowledge that they need in order to access upcoming content.</li> <li>● <b><u>Visuals</u></b> - GIFs, pictures- will assist students in understanding what they are listening to. Use <b><u>visual thinking strategies</u></b> to set the lens for learning.</li> <li>● Video to review or introduce a topic – use <b><u>closed captioning</u></b> to help students see the words and pronunciations while they listen to the content.</li> <li>● <b><u>Word stretching / Vowel stretching</u></b> when instructing allows student to listen closely to the pronunciation of the word.</li> <li>● <b><u>Performance Level Descriptors</u></b> this document provides teachers with a description of what output they can expect from students based on earned NYSESLAT levels in the modality of listening. Scroll for grade 6.</li> </ul>
	<p><b><u>Speaking</u></b></p> <ul style="list-style-type: none"> <li>● <b><u>Sentence Stems/Frames</u></b> - to begin a sentence - such as <i>Evolution is...</i> or <i>I think that evolution is...</i></li> <li>● <b><u>Academic Conversation Starters</u></b>: Have a visual of a list of academic sentence starters that students can refer to in a discussion.</li> <li>● <b><u>Choral Reading</u></b> - To build fluency, self-confidence and motivation with <a href="#">reading/speaking</a>.</li> <li>● Create <b><u>movement</u></b> to go with the word. Movement can be a motivating factor, as well as a kinesthetic tool for conceptualizing the rhythm and flow of fluent reading while triggering brain function for optimal learning.</li> <li>● <b><u>Performance Level Descriptors</u></b> This document provides teachers with a description of what output they can expect from students based on earned NYSESLAT levels in the modality of speaking. Scroll for grade 6.</li> </ul>
	<p><b><u>Reading</u></b></p> <ul style="list-style-type: none"> <li>● Supplementary Text to help reinforce concepts.</li> <li>● <b><u>Visual Aids</u></b> - Pictures or models to support vocabulary words and concepts</li> <li>● Video to review or introduce a topic - use <b><u>closed captioning</u></b> to help students read along while they listen to the content.</li> <li>● <b><u>4 Square / Frayer models</u></b> to help students gain a deeper understanding of vocabulary.</li> <li>● <b><u>Highlighting</u></b> important text to assist students in answering questions after the reading.</li> <li>● <b><u>Chunking</u></b>-Break reading of text into chunks or paragraphs</li> <li>● <b><u>Vocabulary Morphology</u></b>- Morphology relates to the segmenting of words into affixes (prefixes and suffixes) and roots or base words, and the origins of words. Understanding that words connected by meaning can be connected by spelling can be critical to expanding a student’s vocabulary.</li> <li>● <b><u>Performance Level Descriptors</u></b> this document provides teachers with a description of what output they can expect from students based on earned NYSESLAT levels in the modality of reading. Scroll for grade 6.</li> </ul>
	<p><b><u>Instructional Accommodations (depending on the student’s needs)</u></b></p> <ul style="list-style-type: none"> <li>● <b><u>Extended time</u></b> for tests in class, projects and assignments</li> <li>● <b><u>Directions read</u></b>. Broken down as necessary</li> <li>● <b><u>Model</u></b> how to complete the activity in the lesson</li> <li>● <b><u>Oral simplification</u></b> of directions or questions</li> <li>● <b><u>Translated version</u></b> of test when available. Student may have both version English and native language version</li> <li>● Use of <b><u>approved bilingual glossaries</u></b> from NYS in each subject</li> </ul>

<p><b>Special Education Modifications</b></p> <p>Special Education students must have accommodations as per Individual Educational Plan (IEP)</p>	<p><b><u>Instructional</u></b></p> <ul style="list-style-type: none"> <li>● <b>Pre-teach</b> vocabulary</li> <li>● Use <b>picture vocabulary</b></li> <li>● Scaffold <b>Depth of Knowledge</b> questions</li> <li>● Provide copy of notes/<b>notes in “cloze”</b> form</li> <li>● Use of <b>Think, Pair, and Share</b> strategy to help process information</li> <li>● <b>Scaffold</b> written assignments with the use of <b>graphic organizers</b></li> <li>● Allow for <b>multiple ways to respond</b> (verbal, written, response board)</li> <li>● Provide <b>model of performance task</b></li> <li>● <b>Modify informational text</b> to fit the needs of the students</li> <li>● Provide a digital or paper <b>interactive notebook</b></li> <li>● Present complex <b>tasks in multiple ways</b></li> <li>● Provide <b>mnemonic strategies</b> for scientific concepts</li> </ul> <hr/> <p><b><u>Technology:</u></b></p> <ul style="list-style-type: none"> <li>● <b>Audio</b> reading of text</li> <li>● <b>Text to type</b> functions</li> <li>● <b>Videos</b> to clarify/visualize science concepts</li> <li>● <b>Record class lecture/discussions</b> and make accessible to student</li> <li>● <b>Nearpod-</b> interactive presentations of notes</li> </ul> <hr/> <p><b><u>In Class Assessments</u></b></p> <ul style="list-style-type: none"> <li>● Provide <b>multiple options</b> for projects</li> <li>● <b>Use of timer</b> in class</li> <li>● Break all complex tasks into chunks</li> </ul>
<p><b>Step Up to Writing</b></p> <p>Step Up to Writing Materials can be found in BPS Science K-12 Schoology Folder Grade 6 Resources Grade 6 SUTW materials</p>	<ul style="list-style-type: none"> <li>● Easy Two-Column Notes</li> <li>● Breaking Down Definitions</li> <li>● Paragraph Frame- What I Learned</li> <li>● <b>Performance Level Descriptors</b> this document provides teachers with a description of what output they can expect from students based on earned NYSESLAT levels in the modality of writing. Scroll for grade 6.</li> </ul>
<p><b>Culturally and Linguistically Responsive Teaching (CLRT) in the Science Classroom</b></p>	<ul style="list-style-type: none"> <li>● Materials, resources, and/or discussions address diverse cultural backgrounds and real-world applications</li> <li>● Artifacts (posters, charts, etc.) in the science classroom are representative of the cultures of the student population</li> <li>● All students are given an opportunity to engage in science discourse</li> <li>● Teacher demonstrates high expectations for all students</li> </ul>