



**Grade 5 Science**  
**Unit # 2 – Earth and Space Science**  
**Topic 3 Earth’s Systems – 18 Days**

**Unit Overview:** In **Topic 3** students will learn how patterns in the natural world contribute to the interactions of Earth’s four spheres – Geosphere, hydrosphere, atmosphere, and biosphere. Water is the primary emphasis in Topic 4. Students will explore the water cycle and the interactions among water and land. Topic 5 focuses on renewable and non-renewable resources on Earth and how humans use the resources. Topic 6 and Topic 7 both investigate the Solar System. Students will develop models to observe brightness, orbits, and object sizes. Students should be able to recognize the position of the Earth, and key characteristics of the sun, planets, and other space objects. Students will then study patterns of the moon phases, star movement, rotation and revolution of Earth.

**Topic Essential Question:** How can you model interactions among Earth’s systems?

**Lessons**

- Topic Launch/Quest Kickoff
- Lesson 1 Geosphere and Biosphere
- Lesson 2 Hydrosphere and Atmosphere
- Lesson 3 Interactions Among Earth’s Systems
- Topic Close –Assessment, Quest Findings

**NYSSLS Performance Expectations**

**5-ESS2-1. Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.** [Clarification Statement: Examples could include the influence of the ocean on ecosystems, landform shape, and climate; the influence of the atmosphere on landforms and ecosystems through weather and climate; and the influence of mountain ranges on winds and clouds in the atmosphere. The geosphere, hydrosphere, atmosphere, and biosphere are each a system.] [Assessment Boundary: Assessment is limited to the interactions of two systems at a time.]

**3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.**

**Topic Opener**

**PE:** 5-ESS2-1

**SEP:** Developing and Using Models

**DCI:**

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

- Earth’s major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans). These systems interact in multiple ways to affect Earth’s surface materials and processes. The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate. Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather. (5-ESS2-1)

**CCC – Systems and System Models**

**Savvas**

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

- **uConnect Lab – How Can You Model Earth?**
- Quest Kickoff – Connect the Spheres
- Leveled Readers
- STEM Engineering Reader
- Reading Check – Cause and Effect

**Lesson 1 – Geosphere and Biosphere**

**PE:** 5-ESS2-1

**SEP:** Developing and Using Models

**DCI:**

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

- Earth’s major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans). These systems interact in multiple ways to affect Earth’s surface materials and processes. The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate. Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather. (5-ESS2-1)

**CCC:** Systems and System Models

**Savvas**

**Guiding Objective**

- Students will describe what makes up the geosphere.
- Students will describe what makes up the biosphere.

**Literacy Skill**

- Cause and Effect

**Vocabulary**

- biosphere
- geosphere
- lithosphere

**Academic Vocabulary**

- system

**Connect** - TE/SB p. 102

- Curriculum Connection

**Investigate** - TE/SB pp. 103-107

- ***Investigate Lab – How does water move through soil?***

- Video – Geosphere and Biosphere
- Literacy Toolbox – Cause and Effect
- Math Toolbox – Graphing
- Quest Connection
- Visual Literacy Connection – What are parts of Earth’s geosphere and Biosphere?

**Synthesize** - TE/SB pp. 105, 107-109

- Interactivity – The Organic Geosphere
- Quest Check-In- Raining Acid
- Science Practice Toolbox – Designing Solutions
- *Be a Scientist*

**Demonstrate** – TE/SB p. 108

- Lesson 1 Check
- Lesson Quiz 1

<p><b><u>Lesson 2 – Hydrosphere and Atmosphere</u></b>  <b>PE:</b> 5-ESS2-1  <b>SEP:</b> Developing and Using Models  <b>DCI:</b>  <b>ESS2.A – Earth Materials and Systems</b></p> <ul style="list-style-type: none"> <li>Earth’s major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans). These systems interact in multiple ways to affect Earth’s surface materials and processes. The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate. Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather. (5-ESS2-1)</li> </ul> <p><b>ETS1.A - Defining and Delimiting Engineering Problems</b></p> <ul style="list-style-type: none"> <li>Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account. (3-5-ETS1-1)</li> </ul> <p><b>CCC:</b> Systems and System Models</p>	<p><b>Savvas</b>  <b>Guiding Objective:</b></p> <ul style="list-style-type: none"> <li>Students will describe what makes up the atmosphere.</li> <li>Students will describe what makes up the hydrosphere.</li> </ul> <p><b>Vocabulary</b></p> <ul style="list-style-type: none"> <li>atmosphere</li> <li>hydrosphere</li> </ul> <p><b>Academic Vocabulary</b></p> <ul style="list-style-type: none"> <li>distinguish</li> </ul> <p><b>Connect - TE/SB p. 110</b></p> <ul style="list-style-type: none"> <li>Engineering Connection</li> </ul> <p><b>Investigate - TE/SB pp. 111-113</b></p> <ul style="list-style-type: none"> <li>Video – Hydrosphere and Atmosphere</li> <li><b><i>uInvestigate Lab – How does a greenhouse work?</i></b></li> <li>Visual Literacy Connection – What are parts of Earth’s hydrosphere?</li> <li>Interactivity – Is There Enough Water?</li> </ul> <p><b>Synthesize - TE/SB pp. 114-115</b></p> <ul style="list-style-type: none"> <li>Interactivity – Earth’s Four Spheres</li> <li>Quest Connection</li> <li>Science Practice Toolbox – Analyze and Interpret Data</li> </ul> <p><b>Demonstrate – TE/SB pp. 115-117</b></p> <ul style="list-style-type: none"> <li>Lesson 2 Check</li> <li>Lesson 2 Quiz</li> <li><b><i>Quest Check in Lab – Where are Earth’s spheres?</i></b></li> </ul>
<p><b><u>Lesson 3 – Interactions Among Earth’s Systems</u></b>  <b>PE:</b> 5-ESS2-1  <b>SEP:</b> Developing and Using Models; Constructing Explanations and Designing Solutions  <b>DCI:</b>  <b>ESS2.A – Earth Materials and Systems</b></p> <ul style="list-style-type: none"> <li>Earth’s major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans). These systems interact in multiple ways to affect Earth’s surface materials and processes. The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate. Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather. (5-ESS2-1)</li> </ul> <p><b>CCC – Systems and System Models</b></p>	<p><b>Savvas</b>  <b>Guiding Objective:</b></p> <ul style="list-style-type: none"> <li>Students will describe how Earth’s systems interact with each other.</li> </ul> <p><b>Vocabulary</b></p> <ul style="list-style-type: none"> <li>greenhouse effect</li> </ul> <p><b>Academic Vocabulary</b></p> <ul style="list-style-type: none"> <li>interdependent</li> </ul> <p><b>Connect - TE/SB p. 120</b></p> <ul style="list-style-type: none"> <li>Sports Connection</li> </ul> <p><b>Investigate - TE/SB pp. 121-125</b></p> <ul style="list-style-type: none"> <li><b><i>uInvestigate – How does the geosphere affect the hydrosphere?</i></b></li> <li>Video – Interactions Among Earth’s Systems</li> <li>Crosscutting Concepts Toolbox – Systems and System Models</li> <li>Reading Check – Cause and Effect</li> <li>Visual Literacy Connection – How does the ocean affect other systems on Earth?</li> <li>Virtual Lab – Build Your Dream Park</li> </ul> <p><b>Synthesize - TE/SB pp. 126, 128</b></p> <ul style="list-style-type: none"> <li>Interactivity – Interactions Among Earth’s Spheres</li> <li>Quest Connection</li> <li>Quest Check-In – Earth’s Interactions</li> </ul> <p><b>Demonstrate – TE/SB p. 127</b></p> <ul style="list-style-type: none"> <li>Lesson 3 Check</li> <li>Lesson 3 Quiz</li> </ul>

<p><b>Topic Close</b></p> <ul style="list-style-type: none"> <li>● Topic Assessment and Remediation TE/SB pp. 132-137</li> <li>● Quest Finding and Reflection TE/SB p. 130</li> </ul>	<p><b>Topic 3 Enrichment</b></p> <p><b>Topic 3 - Lesson 1 Enrichment</b></p> <ul style="list-style-type: none"> <li>● Enrichment Activity TE p. 107</li> </ul> <p><b>Topic 3 - Lesson 2 Enrichment</b></p> <ul style="list-style-type: none"> <li>● Enrichment Activity TE p. 114</li> </ul> <p><b>Topic 3 - Lesson 3 Enrichment</b></p> <ul style="list-style-type: none"> <li>● Enrichment Activity TE p. 126</li> </ul>
<p><b>English Language Learners (ELL) Enhancements</b> To access <a href="#">hyperlinked</a> material, you must be logged into your BPS Google Drive</p>	<p><b>Listening</b></p> <ul style="list-style-type: none"> <li>● <b>Cross- Linguistic Practices:</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>Activating Prior Knowledge</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>Visuals</b> - GIFs, pictures- will assist students in understanding what they are listening to. Use <a href="#">visual thinking strategies</a> to set the lens for learning.</li> <li>● Video to review or introduce a topic – use <a href="#">closed captioning</a> to help students see the words and pronunciations while they listen to the content.</li> <li>● <b>Word stretching / Vowel stretching</b> when instructing allows student to listen closely to the pronunciation of the word.</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 listening. Scroll for grade 5.</li> </ul> <p><b>Speaking</b></p> <ul style="list-style-type: none"> <li>● <b>Sentence Stems/Frames</b> - to begin a sentence - such as <i>Evolution is...</i> or <i>I think that evolution is...</i></li> <li>● <b>Academic Conversation Starters:</b> Have a visual of a list of academic sentence starters that students can refer to in a discussion.</li> <li>● <b>Choral Reading</b> - To build fluency, self-confidence and motivation with <a href="#">reading/speaking</a>.</li> <li>● Create <b>movement</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>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 speaking. Scroll for grade 5.</li> </ul> <p><b>Reading</b></p> <ul style="list-style-type: none"> <li>● Supplementary Text to help reinforce concepts.</li> <li>● <b>Visual Aids</b> - Pictures or models to support vocabulary words and concepts</li> <li>● Video to review or introduce a topic - use <a href="#">closed captioning</a> to help students read along while they listen to the content.</li> <li>● <b>4 Square / Frayer models</b> to help students gain a deeper understanding of vocabulary.</li> <li>● <b>Highlighting</b> important text to assist students in answering questions after the reading.</li> <li>● <b>Chunking</b>-Break reading of text into chunks or paragraphs</li> <li>● <b>Vocabulary Morphology</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>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 reading. Scroll for grade 5.</li> </ul>

	<p><b><u>Instructional Accommodations (depending on the student’s needs)</u></b></p> <ul style="list-style-type: none"> <li>● <b>Extended time</b> for tests in class, projects and assignments</li> <li>● <b>Directions read.</b> Broken down as necessary</li> <li>● <b>Model</b> how to complete the activity in the lesson</li> <li>● <b>Oral simplification</b> of directions or questions</li> <li>● <b>Translated version</b> of test when available. Student may have both version English and native language version</li> <li>● Use of <b>approved bilingual glossaries</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> <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> <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 5 Resources Grade 5 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 5.</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>