



Grade 6 Science
Unit # 2 – Earth and Space Science
Topic 9 Earth’s Surface Systems – 20 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 processes change Earth’s Surface?

Lessons

- Topic Launch/Quest Kickoff
- Lesson 1 Weathering and Soil
- Lesson 2 Erosion and Deposition
- Lesson 3 Water Erosion
- Lesson 4 Glacial and Wave Erosion
- Topic Close –Assessment, Quest Findings

NYSSLS Performance Expectations

MS-ESS2-2. Construct an explanation based on evidence for how geoscience processes have changed Earth’s surface at varying temporal and spatial scales. [Clarification Statement: Emphasis is on how processes change Earth’s surface at temporal and spatial scales that can be large (such as slow plate motions or the uplift of large mountain ranges) or small (such as rapid landslides or microscopic geochemical reactions), and how many geoscience processes (such as earthquakes, volcanoes, and meteor impacts) usually behave gradually but are punctuated by catastrophic events. Examples of geoscience processes could include surface weathering and deposition by the movements of water, ice, and wind. Emphasis is on geoscience processes that shape local geographic features, where appropriate.]

MS-ESS3-2. Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects. [Clarification Statement: Emphasis is on how some natural hazards, such as volcanic eruptions and severe weather, are preceded by phenomena that allow for reliable predictions, but others, such as earthquakes, occur suddenly and with no notice, and thus are not yet predictable. Examples of natural hazards could include those resulting from interior processes (such as earthquakes and volcanic eruptions) and surface processes (such as mass wasting and tsunamis), or from severe weather events (such as blizzards, hurricanes, tornadoes, floods, and droughts). Examples of data could include the locations, magnitudes, and frequencies of the natural hazards. Examples of technologies could include global technologies (such as satellite images to monitor hurricanes or forest fires) or local technologies (such as building basements in tornado-prone regions or reservoirs to mitigate droughts).]

MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

<p>Topic Opener PE: MS-ESS2-2; MS-ESS3-2 SEP: Constructing Explanations and Designing Solutions DCI: ESS2.A: Earth’s Materials and Systems</p> <ul style="list-style-type: none"> The planet’s systems interact over scales that range from microscopic to global in size, and they operate over fractions of a second to billions of years. These interactions have shaped Earth’s history and will determine its future. (MS-ESS2-2) <p>ESS3.B – Natural Hazards</p> <ul style="list-style-type: none"> Mapping the history of natural hazards in a region, combined with an understanding of related geologic forces can help forecast the locations and likelihoods of future events. (MS-ESS3-2) <p>CCC: Scale, Proportion, and Quantity</p>	<p>Savvas</p> <p>Highlighted labs are important to the understanding of the instructional concepts in this lesson and must be completed during Science instructional time.</p> <ul style="list-style-type: none"> Topic Readiness Test uConnect Lab – How Does Gravity Affect Materials on a Slope? Quest Kickoff Video Quest Kickoff – How can I design and build an artificial island?
<p>Lesson 1 – Weathering and Soil PE: MS-ESS2-2 DCI: Constructing Explanations and Designing Solutions ESS2.A: Earth’s Materials and Systems</p> <ul style="list-style-type: none"> The planet’s systems interact over scales that range from microscopic to global in size, and they operate over fractions of a second to billions of years. These interactions have shaped Earth’s history and will determine its future. (MS-ESS2-2) <p>CCC: Scale, Proportion, and Quantity</p> <p>zSpace Activities (code) Exploring Beach and River Erosion: Shaping the Shore (E412) Exploring beach and river erosion shaping the shore - Teacher Activity Plan Students will explore how the process of erosion impacts beaches and rivers. They will make observations that provide evidence of erosion by water at varying time and spatial scales. Exploring Beach and River Erosion Shaping the Shore - Student Worksheet Pdf Exploring Beach and River Erosion Shaping the Shore - Student Worksheet GoogleDoc</p>	<p>Savvas</p> <p>Guiding Objectives:</p> <ul style="list-style-type: none"> Students will describe and give examples of ways in which Earth’s surface is torn down by mechanical and chemical weathering. Students will describe and give examples of ways in which Earth’s surface is built up by the formation of soil. Students will describe and give examples of ways in which Earth’s surface is torn down by processes of erosion. <p>Literacy Connection</p> <ul style="list-style-type: none"> Write Explanatory Texts <p>Vocabulary</p> <ul style="list-style-type: none"> uniformitarianism mechanical weathering chemical weathering erosion soil humus <p>Academic Vocabulary</p> <ul style="list-style-type: none"> principle component <p>Connect - TE/SB p. 386</p> <ul style="list-style-type: none"> Connect It! Inquiry Warm-Up Lab: Breaking Up is Hard to do Quest Connection <p>Investigate - TE/SB pp. 387- 393</p> <ul style="list-style-type: none"> uInvestigate Lab – Freezing and Thawing Video – Rock Weathering Interactivity – Colors of the Sand Interactivity – Dating Using Weathering Rates Literacy Connection (p.389) Reading Checks (pp. 389; 391; 393) Math Toolbox (p.390) <p>Synthesize - TE/SB pp. 392-394</p> <ul style="list-style-type: none"> Interactivity – Classify the Force of Weathering Quest Check-In Lab – Breaking it Down Quest Check -In Model It! (p.393) <p>Demonstrate – TE/SB p.394</p> <ul style="list-style-type: none"> Lesson 1 Check Lesson Quiz 1

Lesson 2 – Erosion and Deposition

PE: MS-ESS2-2; MS-ESS3-2

SEP: Constructing Explanations and Designing Solutions;
Analyzing and Interpreting Data

DCI:

ESS2.A: Earth’s Materials and Systems

- The planet’s systems interact over scales that range from microscopic to global in size, and they operate over fractions of a second to billions of years. These interactions have shaped Earth’s history and will determine its future. (MS-ESS2-2)

ESS3.B: Natural Hazards

- Mapping the history of natural hazards in a region, combined with an understanding of related geologic forces can help forecast the locations and likelihoods of future events. (MS-ESS3-2)

CCC: Patterns; Scale, Proportion, and Quantity

Savvas

Guiding Objectives:

- Students will describe and give examples of processes that change Earth’s surface, such as erosion and deposition.
- Students will describe how mass movement of rocks and soil on Earth’s surface changes that surface.
- Students will describe how wind contributes to erosion and deposition and causes changes to Earth’s surface.

Literacy Connection

- Integrate with Visuals

Vocabulary

- sediment
- deposition
- mass movement
- deflation
- sand dune
- loess

Academic Vocabulary

- similar
- significant

Connect - TE/SB p. 396

- Connect It!
- Class Discussion: Models of Erosion and Deposition
- Quest Connection

Investigate - TE/SB pp. 397-400

• **Investigate Lab – Small, Medium, and Large**

- Video – Erosion and Deposition
- Interactivity – Predicting Disasters
- Interactivity – Material Slope Angle
- Virtual Lab – Save the Town
- Reading Check (p. 398)
- Literacy Connection (p. 397)
- Math Toolbox (p.399)

Synthesize - TE/SB pp. 401-402

- Reading Check (p.401)
- Question It! (p.401)
- Quest Check In – Interactivity – Changing Landscapes
- Quest Check-In Lab – Ingenious Island Part 1
- Quest Check-In

Demonstrate – TE/SB p. 402

- Lesson 2 Check
- Lesson 2 Quiz

Lesson 3 – Water Erosion

PE: MS-ESS2-2

SEP: Constructing Explanations and Designing Solutions

DCI:

ESS2.A – Earth’s Materials and Systems

- The planet’s systems interact over scales that range from microscopic to global in size, and they operate over fractions of a second to billions of years. These interactions have shaped Earth’s history and will determine its future. (MS-ESS2-2)

CCC: Scale, Proportion, and Quantity

Savvas

Guiding Objectives:

- Students will describe and give examples of ways in which Earth’s surface is built up and torn down by water erosion.
- Students will describe and give examples of landforms that form from water erosion and deposition.
- Students will describe and give examples of ways in which groundwater affects and changes Earth’s surface.

Literacy Connection

- Cite textual evidence

Vocabulary

- runoff
- stream
- tributary
- flood plain
- delta
- alluvial fan
- ground water

Academic Vocabulary

- develop
- suggest

Connect - TE/SB p. 404

- Connect It!
- Poll – Learning from Rocks
- Quest Connection

Investigate - TE/SB pp. 405 - 411

● **Investigate Lab – Raindrops Falling**

- Interactivity – Carving a Canyon
- Interactivity – Karst Topography
- Video – Water Erosion
- Reading Check (pp.406; 408; 410)
- Model It! (p.408)
- Literacy Connection (p.405)

Synthesize - TE/SB pp. 412-413

- Interactivity – Mammoth Caves
- Reading Check (p.412)
- Quest Check-In Lab – Ingenious Island Part II
- Quest Check-In

Demonstrate – TE/SB p.413

- Lesson 3 Check
- Lesson 3 Quiz

<p><u>Lesson 4 – Glacial and Wave Erosion</u> PE: MS-ESS2-2 SEP: Constructing Explanations and Designing Solutions DCI: ESS2.A – Earth’s Materials and Systems</p> <ul style="list-style-type: none"> • The planet’s systems interact over scales that range from microscopic to global in size, and they operate over fractions of a second to billions of years. These interactions have shaped Earth’s history and will determine its future. (MS-ESS2-2) <p>CCC: Scale, Proportion, and Quantity</p>	<p>Savvas Guiding Objectives:</p> <ul style="list-style-type: none"> • Students will describe and give examples of ways in which Earth’s surface is changed by glaciers. • Students will describe and give examples of ways in which Earth’s surface is changed by wave erosion. <p>Literacy Connection</p> <ul style="list-style-type: none"> • Write Informative Text <p>Vocabulary</p> <ul style="list-style-type: none"> • glacier • continental glacier • ice age • valley glacier • plucking • till • longshore drift <p>Academic Vocabulary</p> <ul style="list-style-type: none"> • interaction • impact <p>Connect - TE/SB p. 416</p> <ul style="list-style-type: none"> • Connect It! • Inquiry Warm-Up Lab: Glaciers in a Cup • Quest Connection <p>Investigate - TE/SB pp. 417- 423</p> <ul style="list-style-type: none"> • uInvestigate Lab – Changing Coastlines • Interactivity – Effects of Glaciers • Interactivity – Glacial Ice • Video – Glacial Wave Erosion • Model It! (p.421) • Reading Check (pp.421; 423) • Literacy Connection (p.423) • Math Toolbox (p.418) <p>Synthesize - TE/SB pp. 424-425</p> <ul style="list-style-type: none"> • Interactivity – Coastline Management • Reading Check (p.424) • Quest Check-In Interactivity – Breaking Waves • Quest Check-In <p>Demonstrate – TE/SB p.425</p> <ul style="list-style-type: none"> • Lesson 4 Check • Lesson 4 Quiz
<p>Topic Close</p> <ul style="list-style-type: none"> • Topic 6 Assessment and Remediation TE/SB pp. 426-429 • Quest Finding and Reflection TE/SB p. 429 <p><u>CLRI Literacy Connections:</u> Enrichment: Independent Reading “Grand Canyon” by Jason Chin</p> <p>Synopsis: “Go on a journey to the Grand Canyon and explore the flora, fauna, and rock layers. Discover the history of how the Grand Canyon came to be and wonder at the expanse of this natural wonder.”</p>	<p><u>Topic 9 Enrichment</u></p> <p>Topic 9 - Lesson 1 Enrichment</p> <ul style="list-style-type: none"> • Enrichment – Soil Formation • uEngineer It! – Defining the Problem- Ground Sifting Advances: Maps Help Predict • Engineering Design Notebook – Stop a Landslide <p>Topic 9 - Lesson 2 Enrichment</p> <ul style="list-style-type: none"> • Enrichment – Slow and Steady Creep • Career – Civil Engineer <p>Topic 9 - Lesson 3 Enrichment</p> <ul style="list-style-type: none"> • Enrichment – River Erosion • Case Study – Buyer Beware <p>Topic 9 – Lesson 4 Enrichment</p> <ul style="list-style-type: none"> • Enrichment – Wave Erosion

<p>English Language Learners (ELL) Enhancements To access hyperlinked material, you must be logged into your BPS Google Drive</p>	<p><u>Listening</u></p> <ul style="list-style-type: none"> ● <u>Cross- Linguistic Practices</u>: 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). ● <u>Activating Prior Knowledge</u> 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. ● <u>Visuals</u> - GIFs, pictures- will assist students in understanding what they are listening to. Use <u>visual thinking strategies</u> to set the lens for learning. ● Video to review or introduce a topic – use <u>closed captioning</u> to help students see the words and pronunciations while they listen to the content. ● <u>Word stretching / Vowel stretching</u> when instructing allows students to listen closely to the pronunciation of the word. ● <u>Performance Level Descriptors</u> 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.
	<p><u>Speaking</u></p> <ul style="list-style-type: none"> ● <u>Sentence Stems/Frames</u> - to begin a sentence - such as <i>Evolution is...</i> or <i>I think that evolution is...</i> ● <u>Academic Conversation Starters</u>: Have a visual of a list of academic sentence starters that students can refer to in a discussion. ● <u>Choral Reading</u> - To build fluency, self-confidence and motivation with reading/speaking. ● Create <u>movement</u> 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. ● <u>Performance Level Descriptors</u> 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.
	<p><u>Reading</u></p> <ul style="list-style-type: none"> ● Supplementary Text to help reinforce concepts. ● <u>Visual Aids</u> - Pictures or models to support vocabulary words and concepts ● Video to review or introduce a topic - use <u>closed captioning</u> to help students read along while they listen to the content. ● <u>4 Square / Frayer models</u> to help students gain a deeper understanding of vocabulary. ● <u>Highlighting</u> important text to assist students in answering questions after the reading. ● <u>Chunking</u>-Break reading of text into chunks or paragraphs ● <u>Vocabulary Morphology</u>- 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. ● <u>Performance Level Descriptors</u> 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.
	<p><u>Instructional Accommodations (depending on the student’s needs)</u></p> <ul style="list-style-type: none"> ● Extended time for tests in class, projects and assignments ● Directions read. Broken down as necessary ● Model how to complete the activity in the lesson ● Oral simplification of directions or questions ● Translated version of test when available. Student may have both version English and native language version ● Use of <u>approved bilingual glossaries</u> from NYS in each subject

Grade 6 Unit 2 Earth and Space Science

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