



Grade 8 Science – Course 3
Unit 3 – Earth and Space Science
Topic 6 History of Earth – 14 Days

Unit Overview – The Earth and Space Science unit consists of five topics. In Topic 6 students investigate the history of Earth, Earth’s geologic features, and Earth’s living organisms. Topic 7 focuses on energy flow through Earth’s atmosphere and oceans. Students focus on the impact of natural and human factors on Earth’s climate in Topic 8. Topic 9 explores the effect of the sun and moon on Earth. The formation of celestial bodies, discovery of other planetary systems, and the understanding of the universe is the context of Topic 10.

Topic Essential Question How can events in Earth’s past be organized?

Lessons

- Topic Launch/Quest Kickoff
- Lesson 1 Determining the Age of Rocks
- Lesson 2 Geologic Time Scale
- Lesson 3 Major Events in Earth’s History
- Topic Close – Assessment, Quest Findings

MS-ESS1-4. Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth’s 4.6-billion-year-old history. [Clarification Statement: Emphasis is on how analyses of rock formations and the fossils they contain are used to establish relative ages of major events in Earth’s history. Examples of Earth’s major events or evidence could include very recent events or evidence (such as the last Ice Age or the earliest fossils of Homo sapiens) to very old events or evidence (such as the formation of Earth or the earliest evidence of life). Examples of evidence could include the formation of mountain chains and ocean basins, the evolution or extinction of particular living organisms, or significant volcanic eruptions.] [Assessment Boundary: Assessment does not include recalling the names of specific periods or epochs and events within them, radiometric dating using half-lives, and defining index fossils.]

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

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.

Topic Opener

PE: MS-ESS1-4

SEP: Analyzing and Interpreting Data; Engaging in Argument from Evidence

CCC – Patterns

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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 – Dividing History**
- Quest Kickoff Video – How do paleontologists know where to look for fossils?

Lesson 1 – Determining Ages of Rocks

PE:MS-ESS1-4

SEP: Constructing Explanations and Designing Solutions

DCI:

ESS1.C – The History of Planet Earth

- The geologic time scale interpreted from rock strata provides a way to organize Earth’s history. Analyses of rock strata and the fossil record provide only relative dates, not an absolute scale. (MS-ESS1-4)

CCC: Scale, Proportion, and Quantity

zSpace Activities (code)

Learning History from Rock Layers (A108)

[Learning History from Rock Layers - Teacher Activity Plan](#)

In this activity, students will dive deep into the ocean to explore how the spreading seafloor is creating oceanic structures, including ridges, fraction zones, and trenches. They will then use this data about seafloor structures to provide evidence of past plate motion.

[Learning History from Rock Layers - Student Worksheet GoogleDoc](#)

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Guiding Objectives:

- Students will identify current methods that geologists use to determine the ages of rocks.
- Students will identify current methods that geologists use to determine the relative ages of rocks.
- Students will explain and give examples of ways that geologists: Determine the absolute ages of rocks; provide physical evidence to show that Earth has changed over time due to natural processes.

Literacy Connection

- Write Explanatory Texts

Vocabulary

- relative age
- absolute age
- Law of Supposition
- fossil
- unconformity
- radioactive decay
- radioactive dating

Academic Vocabulary

- relative
- infer

Connect - TE/SB p.302

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

Investigate - TE/SB pp.303-304; 306-308

- **Investigate Lab – The Story of Rocks***
- Video – Determining Ages of Rocks
- Interactivity – Oldest to Youngest
- Interactivity – Radiometric Dating
- Literacy Connection (p.306)
- Reading Checks (pp.303; 306; 308)
- Math Toolbox (p.308)

Synthesize - TE/SB pp. 305; 308-309

- Interactivity – Know Your Index Fossils
- Quest Check-In Interactivity – Clues in the Rock Layers
- Quest check-In Interactivity – Fossils Around the World
- Quest Check-In
- Model It! (p.305)

Demonstrate – TE/SB p.309

- Lesson 1 Check
- Lesson Quiz 1

***Denotes accompanying lab video**

Lesson 2 – Geologic Time Scale

PE: MS-ESS1-4

SEP: Constructing Explanations and Designing Solutions

DCI:

ESS1.C – The History of Planet Earth

- The geologic time scale interpreted from rock strata provides a way to organize Earth’s history. Analyses of rock strata and the fossil record provide only relative dates, not an absolute scale. (MS-ESS1-4)

CCC: Scale, Proportion, and Quantity

Savvas

Guiding Objectives:

- Students will construct an explanation using reasoning to identify the purpose of the geologic time scale.
- Students will identify and analyze evidence that: Helps define and divide geologic time; Earth evolved due to natural processes.

Literacy Connection

- Write Informative Texts

Vocabulary

- geologic time scale
- era
- period

Academic Vocabulary

- organize
- refine

Connect - TE/SB p. 312

- Connect It!
- Quest Connection
- Class Discussion – Clues to the Past

Investigate - TE/SB pp. 313-316

- Video – Geologic Time Scale
- ***u*Investigate Lab – Going Back in Time***
- Interactivity – On the Clock
- Interactivity – A Very Grand Canyon
- Reading Check (pp.313; 316)

Synthesize - TE/SB p.317-318

- Interactivity – Going Away
- Quest Check-In Lab – A Matter of Time
- Literacy Connection (p.317)
- Question It! (p.317)
- Quest Check-In

Demonstrate – TE/SB p.318

- Lesson 2 Check
- Lesson 2 Quiz

***Denotes accompanying lab video**

<p><u>Lesson 3 – Major Events in Earth’s History</u> PE: MS-ESS1-4 SEP: Constructing Explanations and Designing Solutions DCI: ESS1.C – The History of Planet Earth</p> <ul style="list-style-type: none"> The geologic time scale interpreted from rock strata provides a way to organize Earth’s history. Analyses of rock strata and the fossil record provide only relative dates, not an absolute scale. (MS-ESS1-4) <p>CCC: Scale, Proportion, and Scale</p>	<p>Savvas Guiding Objectives:</p> <ul style="list-style-type: none"> Students will identify and analyze data to support that Earth’s geologic history can be organized by major events. Students construct explanations using evidence to demonstrate how: Earth changed in the Paleozoic era; Earth changed in the Mesozoic era; Earth changed in the Cenozoic era. <p>Literacy Connection</p> <ul style="list-style-type: none"> Cite Textual Evidence <p>Vocabulary</p> <ul style="list-style-type: none"> invertebrate vertebrate amphibian reptile mass extinction mammal <p>Academic Vocabulary</p> <ul style="list-style-type: none"> factors hypothesize <p>Connect - TE/SB p.320</p> <ul style="list-style-type: none"> Connect It! Quest Connection Write: Identify Evidence <p>Investigate - TE/SB pp. 321-324; 326</p> <ul style="list-style-type: none"> Investigate Lab – Changes in the Water Video – Major Events in Earth’s History Interactivity – Observation and Deduction Virtual Lab – The Story in the Strata Literacy Connection (p.322) Reading Check (p. 323) Math Toolbox (p.326) <p>Synthesize - TE/SB pp. 325; 327</p> <ul style="list-style-type: none"> Interactivity – Big Changes Quest Check-In Interactivity – Time to Choose the Dig Site Quest Check-In Reading Check (p.325) Model It! (p.325) <p>Demonstrate – TE/SB p.328</p> <ul style="list-style-type: none"> Lesson 3 Check Lesson 3 Quiz
<p><u>Topic Close</u></p> <ul style="list-style-type: none"> Topic 6 Assessment and Remediation TE/SB pp. 330-333 Quest Finding and Reflection TE/SB p. 333 	<p><u>Topic 6 Enrichment</u></p> <p>Topic 6 - Lesson 1 Enrichment</p> <ul style="list-style-type: none"> Enrichment – Rocks of the Grand Canyon Case Study – Rewriting the History of Your Food (pp.310-311) <p>Topic 6 - Lesson 2 Enrichment</p> <ul style="list-style-type: none"> Enrichment – How Old are Grand Canyon Rocks? uEngineer It! – Tiny Fossil, Big Accuracy (p. 319) <p>Topic 6 - Lesson 3 Enrichment</p> <ul style="list-style-type: none"> Enrichment – Earth’s Early Atmosphere Global to Local – A New Mass Extinction (p.329) <p>Topic 6 Close</p> <ul style="list-style-type: none"> uDemonstrate Lab – Core Sampling Through Time (pp.334-337)

<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 8.
	<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 8.
	<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 8.
	<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
	<p><u>Instructional</u></p>

<p>Special Education Modifications</p> <p>Special Education students must have accommodations as per Individual Educational Plan (IEP)</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 <p>Technology:</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 <p>In Class Assessments</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 8 Resources □ Grade 8 SUTW materials</p>	<ul style="list-style-type: none"> ● Easy Two-Column Notes ● Breaking Down Definitions ● Paragraph Frame- What I Learned ● Performance Level Descriptors 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 8.
<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