



Grade 7 Science – Course 2
Unit # 2 – Earth and Space Science
Topic 6 Distribution of Natural Resources – 18 Days

Unit Overview - Course 2 Unit 2 Earth and Space Science consists of two topics: Distribution of Natural Resources (Topic 6) and Human Impacts on the Environment (Topic 7). In Topic 6 students will explore the diversity of nonrenewable energy sources and investigate the differences between renewable and non-renewable resources, benefits of energy sources, and methods to reduce fossil fuel use. In Topic 7 students will learn about human population growth and the impact it has on the Earth's systems along with the causes of air pollution, long-term impacts air pollution has on Earth's systems, and efforts to reduce air pollution around the world.

Topic Essential Question: How is the distribution of natural resources the result of geological processes?

Lessons

- Topic Launch/Quest Kickoff
- Lesson 1 Nonrenewable Energy Resources
- Lesson 2 Renewable Energy Resources
- Lesson 3 Mineral Resources
- Lesson 4 Water Resources
- Topic Close – Assessment, Quest Findings

NYSSLS Performance Expectations

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-ESS3-3. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.* [Clarification Statement: Examples of the design process could include examining human environmental impacts, assessing the kinds of solutions that are feasible, and designing and evaluating solutions that could reduce that impact. Examples of human impacts could include water usage (such as the withdrawal of water from streams and aquifers or the construction of dams and levees), land usage (such as urban development, agriculture, or the removal of wetlands), and pollution (such as of the air, water, or land).]

MS-ESS3-4. Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems. [Clarification Statement: Examples of evidence could include grade-appropriate databases on human populations and the rates of consumption of food and natural resources (such as freshwater, mineral, and energy). Examples of impacts could include changes to the appearance, composition, and structure of Earth's systems as well as the rates at which they change. The consequences of increases in human populations and consumption of natural resources are described by science, but science does not make the decisions for the actions society takes.]

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-ETS1-4. 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-ESS3-1; MS-ETS1-1 SEP: Engaging in Argument from Evidence DCI: ESS3.A – Natural Resources</p> <ul style="list-style-type: none"> 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) <p>CCC: Cause and Effect</p>	<p>Savvas 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 – What’s in a Piece of Coal? Quest Kickoff Video – How could natural resources have saved a ghost town? 				
<p>Lesson 1 – Nonrenewable Energy Resources PE: MS-ESS3-1; MS-ESS3-4 SEP: Constructing Explanations and Designing Solutions DCI: ESS3.A – Natural Resources</p> <ul style="list-style-type: none"> 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) <p>CCC: Cause and Effect</p> <p>zSpace Activities (code) How Does Living = Destruction? (A060) How Does Living = Destruction? - Teacher Activity Plan Have you heard of the Great Pacific Garbage Patch? 80% of the debris found in the Great Pacific Garbage Patch comes from land activities in Asia and North America. By living as we do today, we are slowly destroying Earth as we know it. In this activity, students will learn how we are impacting Earth through pollution, debris, and invasive species. How Does Living = Destruction - Student Worksheet How does Living = Destruction? - Student Worksheet GoogleDoc</p>	<p>Savvas Guiding Objectives:</p> <ul style="list-style-type: none"> Students will identify and describe: The differences between renewable and nonrenewable resources; examples of use of nonrenewable energy resources in daily life. Students will construct an explanation for: The distribution patterns of nonrenewable resources throughout the globe; how past and current geoscience processes affect the distribution of natural resources. Students will use an evidence-based argument to show that increases in human population and resource consumption impact Earth’s systems. <p>Literacy Connection</p> <ul style="list-style-type: none"> Cite Textual Evidence <p>Vocabulary</p> <table border="0"> <tr> <td>● natural resource</td> <td>fossil fuels</td> </tr> <tr> <td>● nonrenewable resource</td> <td>nuclear fission</td> </tr> </table> <p>Academic Vocabulary</p> <ul style="list-style-type: none"> renew <p>Connect - TE/SB p.290</p> <ul style="list-style-type: none"> Connect It! Quest Connection Inquiry Warm-Up Lab – Using Resources <p>Investigate - TE/SB pp.291-297</p> <ul style="list-style-type: none"> uInvestigate Lab – Fossil Fuels* Video – Fossil Fuels Interactivity – Distribution of Fossil Fuels Literacy Connection (p.297) Reading Checks (pp.291; 292) <p>Synthesize - TE/SB pp. 298-299</p> <ul style="list-style-type: none"> Interactivity – Fossil Fuel Sources Quest Check-In Interactivity – Surviving Fossil Fuels Quest Check-In <p>Demonstrate – TE/SB p.299</p> <ul style="list-style-type: none"> Lesson 1 Check Lesson Quiz 1 <p>*Denotes accompanying lab video</p>	● natural resource	fossil fuels	● nonrenewable resource	nuclear fission
● natural resource	fossil fuels				
● nonrenewable resource	nuclear fission				

	<p>CLRI Connections:</p> <ul style="list-style-type: none"> Article: "How does climate change affect poor people in Africa?" <p>Our planet is warming up! Floods, droughts, and heatwaves are more powerful and are happening more often. People who are very poor do not have enough resources to handle the effects of extreme weather events. Data from thousands of families living all across the continent showed that floods had a worse impact than heatwaves and droughts. In addition, it was predicted that, because of climate change, the number of people living in poverty there could increase in 10 years.</p>
<p><u>Lesson 2 – Renewable Energy Resources</u> PE: MS-ESS3-1; MS-ESS3-3 SEP: Constructing Explanations and Designing Solutions DCI: ESS3.A – Natural Resources</p> <ul style="list-style-type: none"> 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) <p>CCC: Cause and Effect</p>	<p>Savvas Guiding Objectives:</p> <ul style="list-style-type: none"> Students will use models and images to: Describe how solar panels, hydroelectric plants, and geothermal plants generate energy; demonstrate how a wind turbine generates electricity. Students will use quantitative relationships to describe the projected growth in the use of wind power over time. Students will construct an explanation for the circumstances that favor the use of each type of renewable resource. <p>Literacy Connection</p> <ul style="list-style-type: none"> Draw Evidence <p>Vocabulary</p> <ul style="list-style-type: none"> renewable resource <p>Academic Vocabulary</p> <ul style="list-style-type: none"> cost <p>Connect - TE/SB p. 300</p> <ul style="list-style-type: none"> Connect It! Quest Connection Write: Renewable Resources in Your Community <p>Investigate - TE/SB pp. 301-304</p> <ul style="list-style-type: none"> Video – Renewable Energy Resources Investigate Lab – The Power of Wind Interactivity – Using Renewable Resources Interactivity – Biogas Farming Reading Check (pp.301; 302; 305) Model It! (p.302) Math Toolbox (p.304) Literacy Connection (p.305) <p>Synthesize - TE/SB pp. 305 - 306</p> <ul style="list-style-type: none"> Interactivity – Renewable Resource Ranges Quest Check-In Interactivity – Renewable Energy Quest Check-In <p>Demonstrate – TE/SB p.306</p> <ul style="list-style-type: none"> Lesson 2 Check Lesson 2 Quiz

Lesson 3 – Mineral Resources

PE: MS-ESS3-1; MS-ESS3-4

SEP: Constructing Explanations and Designing Solutions

DCI:

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: Cause and Effect

zSpace Activities (code)

How Does Living = Destruction? (A060)

[How Does Living = Destruction? - Teacher Activity Plan](#)

Have you heard of the Great Pacific Garbage Patch? 80% of the debris found in the Great Pacific Garbage Patch comes from land activities in Asia and North America. By living as we do today, we are slowly destroying Earth as we know it. In this activity, students will learn how we are impacting Earth through pollution, debris, and invasive species.

[How Does Living = Destruction - Student Worksheet](#)

[How does Living = Destruction? - Student Worksheet](#)

[GoogleDoc](#)

Savvas

Guiding Objectives:

- Students will cite textual evidence to identify mineral resources.
- Students will use visuals and models to determine factors that affect the distribution of minerals on Earth.

Literacy Connection

- Determine Meaning

Vocabulary

- ore
- crystallize

Academic Vocabulary

- distribution

Connect - TE/SB p.308

- Connect It!
- Quest Connection
- Class Discussion: Using Minerals

Investigate - TE/SB pp. 308-314

- **Investigate Lab – Cool Crystals**
- Video – Mineral Resources
- Interactivity – Distribution of Minerals
- Virtual Lab – Go With the Flow
- Question It! (p.312)
- Reading Check (pp.311; 312; 314)
- Literacy Connection (p.310)

Synthesize - TE/SB pp. 314-315

- Interactivity – Resources in Use
- Quest Check-In Interactivity – Surviving on Minerals
- Quest Check-In

Demonstrate – TE/SB p.315

- Lesson 3 Check
- Lesson 3 Quiz

<p><u>Lesson 4 – Water Resources</u> PE: MS-ESS3-1; MS-ESS3-4 SEP: Constructing Explanations and Designing Solutions DCI: ESS3.A – Natural Resources</p> <ul style="list-style-type: none"> 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) <p>CCC: Cause and Effect</p> <p>zSpace Activities (code) Global Water Distribution (E450) Global Water Distribution - Teacher Activity Plan Students will understand how water is distributed on the globe by exploring the amounts of fresh water and salt water on Earth as well as where each are found. Global Water Distribution - Student Worksheet Global Water Distribution - Student Worksheet GoogleDoc</p> <p>Water Cycle (E451) Water Cycle - Teacher Activity Plan Students will explore the phases of the water cycle as well as the driving forces behind them (gravity and the Sun). Water Cycle - Student Worksheet Water Cycle - Student Worksheet GoogleDoc</p>	<p>Savvas Guiding Objectives:</p> <ul style="list-style-type: none"> Students will describe and give examples of: The types of water resources available on Earth; ways that geological processes affect the distribution of water resources. Students will analyze and interpret data to determine how people rely on and use water resources. <p>Literacy Connection</p> <ul style="list-style-type: none"> Support Authors Claim <p>Vocabulary</p> <ul style="list-style-type: none"> desalination <p>Academic Vocabulary</p> <ul style="list-style-type: none"> component obtain <p>Connect - TE/SB p.318</p> <ul style="list-style-type: none"> Connect It! Quest Connection Poll: Drinkable Water <p>Investigate - TE/SB pp. 319-323</p> <ul style="list-style-type: none"> Investigate Lab – An Artesian Well* Video – Water Resources Interactivity – Distribution of Water Resources Interactivity – Designing a Rainwater Capture System Interactivity – Wetland Restoration Reading Check (pp.321; 323) Math Toolbox (p.320) Literacy Connection (p.322) Design It! (p.323) <p>Synthesize - TE/SB pp. 323-324</p> <ul style="list-style-type: none"> Interactivity – Water Worth Quest Check-In Interactivity – Surviving on Water Quest Check-In <p>Demonstrate – TE/SB p.324</p> <ul style="list-style-type: none"> Lesson 4 Check Lesson 4 Quiz <p>*Denotes accompanying lab video</p>
<p>Topic Close</p> <ul style="list-style-type: none"> Topic 6 Assessment and Remediation TE/SB pp. 326-329 Quest Finding and Reflection TE/SB p. 329 	<p><u>Topic 6 Enrichment</u> Topic 6 - Lesson 1 Enrichment</p> <ul style="list-style-type: none"> Enrichment – Fossil Fuels <p>Topic 6 - Lesson 2 Enrichment</p> <ul style="list-style-type: none"> Enrichment – Biofuels from Crops uEngineer It – Micro-Hydro Power (p.307) <p>Topic 6 - Lesson 3 Enrichment</p> <ul style="list-style-type: none"> Enrichment – Minerals in the Body Case Study – Phosphorous Fiasco (pp.316-317) <p>Topic 6 - Lesson 4 Enrichment</p> <ul style="list-style-type: none"> Enrichment – Keeping Water Clean It’s All Connected – The Pseudoscience of Water Dowsing (p. 325)

<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 student 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 7. <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 7. <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 7. <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>
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<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 5 Resources □ Grade 5 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 7.
<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