



Grade 7 Science – Course 2
Unit # 1- Life Science
Topic 4 Ecosystems – 15 Days

Unit Overview Students will understand and apply scientific concepts, principles, and theories pertaining to the living environment setting and recognize the historical development/multicultural involvement of the ideas in science. Main ideas include: living things are alike yet different, structures in living things are related to their function and living things interact with their environment. Students consider systems and how they interact as they investigate cell function and cellular processes as well as exploring the human body as a system model, driven by the flow of energy and the cycling of matter. This leads to the study of reproduction and the plant and animal structures that support it. Students consider stability and change as a core concept in the biosphere.

Topic Essential Question: How are matter and energy cycled in an ecosystem?

Lessons

- Topic Launch/Quest Kickoff
- Lesson 1 Living Things in the Environment
- Lesson 2 Energy Flow in Ecosystems
- Lesson 3 Cycles of Matter
- Topic Close –Assessment, Quest Findings

NYSSLS Performance Expectations

MS-LS2-1. Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem. [Clarification Statement: Emphasis is on cause and effect relationships between resources and growth of individual organisms and the numbers of organisms in ecosystems during periods of abundant and scarce resources.]

MS-LS2-3. Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. [Clarification Statement: Emphasis is on describing the conservation of matter and flow of energy associated with the ecosystem, and on defining the boundaries of the ecosystem.] [Assessment Boundary: Assessment does not include the use of chemical reactions to describe the processes.]

Topic Opener

PE: MS-LS2-1

SEP: Analyzing and Interpreting Data

DCI:

LS2.A – Interdependent Relationships in Ecosystems

- Organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with nonliving factors. (MS-LS2-1)
- In any ecosystem, organisms and populations with similar requirements for food, water, oxygen, or other resources may compete with each other for limited resources, access to which consequently constrains their growth and reproduction. (MS-LS2- 1)
- Growth of organisms and population increases are limited by access to resources. (MS-LS2-1)

CCC: Cause and Effect

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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 – Every Breath You Take**
- Quest Kickoff Video – What do you think is causing Pleasant Pond to turn green?

Lesson 1 – Living Things and the Environment

PE: MS-LS2-1

SEP: Analyzing and Interpreting Data

DCI:

LS2.A – Interdependent Relationships in Ecosystems

- Organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with nonliving factors. (MS-LS2-1)
- In any ecosystem, organisms and populations with similar requirements for food, water, oxygen, or other resources may compete with each other for limited resources, access to which consequently constrains their growth and reproduction. (MS-LS2-1)
- Growth of organisms and population increases are limited by access to resources. (MS-LS2-1)

CCC: Cause and Effect

zSpace Activities (code)

Levels of Organization (A306)

[Levels of Organization - Teacher Activity Plan](#)

In this activity, students will investigate what makes up a cell and how these building blocks of life are organized within and among living things on Earth. Biological levels of organization will be explored from the atom to the biosphere.

[Levels of Organization - Student Worksheet](#)

[Levels of Organization - Student Worksheet GoogleDoc](#)

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Guiding Objectives:

- Students will analyze and interpret data to provide evidence that changes in the amount and availability of resources affect populations within an ecosystem.
- Students will analyze cause-and-effect relationships in order to predict how the size of a population directly affects the availability of resources.

Literacy Connection

- Cite Textual Evidence

Vocabulary

- organism
- habitat
- biotic factor
- abiotic factor
- population
- community
- ecosystem
- limiting factor

Academic Vocabulary

- resources
- density

Connect - TE/SB p.194

- Connect It!
- Quest Connection
- Inquiry Warm-Up Lab – Lining Up the Neighborhood

Investigate - TE/SB pp.195 - 200

● **Investigate Lab – Elbow Room**

- Video – Living Things and the Environment
- Interactivity – There’s No Place Like Home
- Interactivity – An Ecological Mystery
- Interactivity – Factors Affecting Growth
- Design It! (p.196)
- Literacy Connection (p.197)
- Reading Checks (pp.196;197; 199; 200)
- Math Toolbox (p.198)

Synthesize - TE/SB pp. 200-201

- Quest Check-In Interactivity – Suspicious Activities
- Quest Check-In
- Lab – Modeling a Dam

Demonstrate – TE/SB p.201

- Lesson 1 Check
- Lesson Quiz 1

Lesson 2 – Energy Flow in Ecosystems**PE:** MS-LS2-2**SEP:** Developing and Using Models**DCI:****LS2.B** – Cycle of Matter and Energy Transfer in Ecosystems

- Food webs are models that demonstrate how matter and energy is transferred between producers, consumers, and decomposers as the three groups interact within an ecosystem. Transfers of matter into and out of the physical environment occur at every level. Decomposers recycle nutrients from dead plant or animal matter back to the soil in terrestrial environments or to the water in aquatic environments. The atoms that make up the organisms in an ecosystem are cycled repeatedly between the living and nonliving parts of the ecosystem. (MS-LS2-3)

CCC: Energy and Matter**zSpace Activities (code)****Levels of Organization (A306)**[Levels of Organization - Teacher Activity Plan](#)

In this activity, students will investigate what makes up a cell and how these building blocks of life are organized within and among living things on Earth. Biological levels of organization will be explored from the atom to the biosphere.

[Levels of Organization - Student Worksheet](#)[Levels of Organization - Student Worksheet GoogleDoc](#)**Lesson 3 – Cycles of Matter****Savvas****Guiding Objectives:**

- Students will make models to identify and describe: How energy enters an ecosystem; the roles of producers, consumers, and decomposers in cycling of energy through an ecosystem.
- Students will develop a model that illustrates the flow of energy between living and nonliving things in a food web.
- Students will explain and illustrate how energy is conserved within an ecosystem.

Literacy Connection

- Integrate with Visuals

Vocabulary

- producer
- consumer
- decomposer
- food chain
- food web
- energy pyramid

Academic Vocabulary

- role

Connect - TE/SB p. 204

- Connect It!
- Quest Connection
- Write: Food Sources

Investigate - TE/SB pp. 205-210

- Video – Energy Flow in Ecosystems
- **uInvestigate Lab – Observing Decomposition***
- Interactivity – Energy Roles and Flows
- Interactivity - Living Systems: Living Things in Ecosystems
- Virtual Lab – Chesapeake Bay Ecosystem Crisis
- Reading Check (p.207)
- Model It! (p.209)

Synthesize - TE/SB pp. 210-212

- Interactivity – A Changing Ecosystem
- Quest Check-In Interactivity – Nutrients and Aquatic Organisms
- Literacy Connection (p.210)
- Math Toolbox (p.211)
- Reading Check (p.211)
- Quest Check-In

Demonstrate – TE/SB p.212

- Lesson 2 Check
- Lesson 2 Quiz

*Denotes accompanying lab video

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<p>PE: MS-LS2-1; MS-LS2-3 SEP: Developing and Using Models DCI: LS2.B – Cycle of Matter and Energy Transfer in Ecosystems</p> <ul style="list-style-type: none"> Food webs are models that demonstrate how matter and energy is transferred between producers, consumers, and decomposers as the three groups interact within an ecosystem. Transfers of matter into and out of the physical environment occur at every level. Decomposers recycle nutrients from dead plant or animal matter back to the soil in terrestrial environments or to the water in aquatic environments. The atoms that make up the organisms in an ecosystem are cycled repeatedly between the living and nonliving parts of the ecosystem. (MS-LS2-3) <p>CCC: Energy and Matter</p> <p>zSpace Activities (code) Water’s Journey (A151) Water's Journey - Teacher Activity Plan In this activity, students will examine how water circulates among the ocean, sky, and land. Students will track water as it travels through the water cycle and learn how the water cycle is slowly changing the salinity, or saltiness, of the ocean. Water's Journey - Student Worksheet Water's Journey - Student Worksheet GoogleDoc</p>	<p>Guiding Objectives:</p> <ul style="list-style-type: none"> Students will construct an explanation for how matter is transferred between the living and nonliving parts of an ecosystem. Students will explain how matter is conserved in an ecosystem. <p>Literacy Connection</p> <ul style="list-style-type: none"> Determine Central Ideas <p>Vocabulary</p> <ul style="list-style-type: none"> Law of Conservation of Mass Law of Conservation of Energy evaporation condensation precipitation <p>Academic Vocabulary</p> <ul style="list-style-type: none"> system components <p>Connect - TE/SB p.214</p> <ul style="list-style-type: none"> Connect It! Quest Connection Write: Recycling Your Energy <p>Investigate - TE/SB pp. 215-220</p> <ul style="list-style-type: none"> uInvestigate Lab – Following Water* Video – Cycles of Matter Interactivity – Cycles of Matter Model It! (p.216) Reading Check (pp.215; 217; 219) Literacy Connection (p.218) <p>Synthesize - TE/SB pp. 220-222</p> <ul style="list-style-type: none"> Interactivity – Earth’s Recyclables Quest Check-In Interactivity – Matter and Energy in a Pond Quest Check-In <p>Demonstrate – TE/SB p.222</p> <ul style="list-style-type: none"> Lesson 3 Check Lesson 3 Quiz <p>* Denotes accompanying lab video</p>
<p>Topic Close</p> <ul style="list-style-type: none"> Topic 4 Assessment and Remediation TE/SB pp. 224-227 Quest Finding and Reflection TE/SB p. 227 	<p>Topic 4 Enrichment</p> <p>Topic 4 - Lesson 1 Enrichment</p> <ul style="list-style-type: none"> Enrichment – Modeling Population Growth Case Study – The Case of the Disappearing Cerulean Warbler (p.202-203) <p>Topic 4 - Lesson 2 Enrichment</p> <ul style="list-style-type: none"> Enrichment – Building an Ocean Food Web uEngineer It – Eating Oil (p.213) uEngineer It – Engineering Design Notebook – Put Decomposers to Work at Home (p.213) <p>Topic 4 - Lesson 3 Enrichment</p> <ul style="list-style-type: none"> Enrichment – Carbon and the Ocean Extraordinary Science – An Appetite for Plastic (p.223) <p>Topic 4 Close</p> <ul style="list-style-type: none"> uDemonstrate Lab – Last Remains pp.228-231
<p>Listening</p>	

<p>English Language Learners (ELL) Enhancements To access hyperlinked material, you must be logged into your BPS Google Drive</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 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 <u>reading/speaking</u>. ● 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> <ul style="list-style-type: none"> ● Pre-teach vocabulary ● Use picture vocabulary

<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"> ● 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 ● <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 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