5 Science Unit 1: Ecosystems & The Food Web (Web of Life)

Content Area: **Science**
Course(s):
Time Period: **Marking Period 4**
Length: **9 Weeks**
Status: **Published**

Unit Overview

In this unit, students explore how organisms depend on one another and form an interconnected ecosystem. Students investigate food chains, food webs, and the importance of producers, consumers, and decomposers.

Standards

Scientific & Engineering Practices

- Students construct models of different food chains by linking cards representing different organisms. The chains are used to explain the relationship between predators and prey. Students argue using evidence and reasoning about which organisms can be linked together and in what order.
- Students plan an investigation to determine whether or not air has weight. As a whole class, students conduct an investigation to compare the weights of balloons with and without air. Students analyze and interpret data from the investigation to explain what happened and how the evidence may explain how plants gain weight.
- Students ask questions about what conditions they think will induce and prevent the growth of mold. Students plan and conduct an investigation to test different conditions. Students analyze and interpret data that they record from their experiments to explain how different conditions impact mold growth.
- Students observe worm behavior to help them determine a worm's role in a garden. Then, they conduct an investigation to test if worms prefer damp or dry places. They create an argument using the investigations results as evidence to support a claim about the worm's preferences. Lastly, students plan and carry out an investigation to answer a question they have about worms.
- Students develop a model to show the flow of energy and matter within an ecosystem. Then, students develop a model of a pond ecosystem. They add different living things to the pond, considering what each organism needs to eat and how much carbon dioxide each organism adds or removes from the ecosystem.
- Students develop a model of a dinosaur food web to show how all animals get their energy. They use the model to help construct an explanation about how an asteroid killed all of the dinosaurs.

Crosscutting Concepts

- This lesson begins to lay the foundation for thinking about systems and energy/matter flow. By constructing chains of relationships between organisms, students are exposed to an example of a system. Food chains set students up for considering energy & matter flow in

future Mysteries in this unit.

- Students observe that deflating a balloon causes the balloon to weigh less, leading to the conclusion that air has weight. This lesson also lays the foundation for an understanding of conservation of matter by considering how plants gain weight as they grow due to the air they absorb.
- Students observe patterns in the rates of change in the mold terrariums. They note similarities and differences to analyze how mold grows on different foods under different conditions.
- Students recognize that earthworms are part of a system, a food chain, with other organisms. Earthworms help matter flow back into the food chain.
- Students recognize the living organisms in a habitat as a system, an ecosystem. If one organism were to disappear, the whole ecosystem would break down.
- Students identify the sun as the ultimate source of energy in an ecosystem. The sun's energy is used by plants to grow and transferred through an ecosystem in the form of food.

5-PS3-1	Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.
5-LS1-1	Support an argument that plants get the materials they need for growth chiefly from air and water.
5-LS2-1	Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

Materials

Core Materials:

- Mystery Science
  - Why would a hawk move to New York City?
  - What do plants eat?
  - Where do fallen leaves go?
  - Do worms really eat dirt?
  - Why do you have to clean a fish tank but not a pond?
  - Why did the dinosaurs go extinct?
- Teacher Created Labs

Supplemental Materials:

- BrainPop resources
- NewsELA
- GRC Lessons
- TBSAID
- Nearpod Activities

Technology

Technology Literacy

• 9.4.5.TL.1: Compare the common uses of at least two different digital tools and identify the advantages and

disadvantages of using each.

• 9.4.5.TL.2: Sort and filter data in a spreadsheet to analyze findings.

• 9.4.5.TL.3: Format a document using a word processing application to enhance text, change page formatting, and include appropriate images graphics, or symbols.

Technology - Engineering Design

• 8.2.5.ED.1: Explain the functions of a system and its subsystems.

• 8.2.5.ED.2: Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.

• 8.2.5.ED.3: Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task.

Technology - Data & Analysis

• 8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim.

• 8.1.5.DA.2: Compare the amount of storage space required for different types of data.

• 8.1.5.DA.3: Organize and present collected data visually to communicate insights gained from different views of the data.

• 8.1.5.DA.4: Organize and present climate change data visually to highlight relationships or support a claim.

• 8.1.5.DA.5: Propose cause and effect relationships, predict outcomes, or communicate ideas using data.

Technology - Effects on the Natural World

• 8.2.5.ETW.2: Describe ways that various technologies are used to reduce improper use of resources.

• 8.2.5.ETW.3: Explain why human-designed systems, products, and environments need to be constantly monitored, maintained, and improved.

• 8.2.5.ETW.4: Explain the impact that resources, such as energy and materials used to develop technology, have on the environment.

• 8.2.5.ETW.5: Identify the impact of a specific technology on the environment and determine what can be done to increase positive effects and to reduce any negative effects, such as climate change.

Evidence of Learning/Assessment

Formative Assessment

- Teacher Observation
- Quizzes
- Exit Tickets
- Labs

Summative Assessment

- Benchmark Tests
- Alternative Assessments: Performance Tasks & Projects

Accommodations & Modifications

Special Education

Follow IEP Plan which may contain some of the following examples…

- In class/pull out support with special ed teacher
- Additional time during intervention time
- Preferred seating
- Questions read aloud
- Extended time for completing tasks
- Graphic organizers
- Vocabulary support
- Mnemonic devices
- Songs/videos to reinforce concepts
- Study Guides
- Limit number of questions
- Scribe
- Newsela leveled reading passages

504

Follow 504 Plan which may contain some of the following examples…

- In class/pull out support with special ed teacher
- Additional time during intervention time
- Preferred seating
- Questions read aloud
- Extended time for completing tasks
- Graphic organizers
- Vocabulary support
- Mnemonic devices
- Songs/videos to reinforce concepts
- Study Guides
- Limit number of questions
- Scribe
- Newsela leveled reading passages

ELL

- Translation device/dictionary
- In class/pull out support with ESL teacher

- In class/pull out support with special ed teacher
- Additional time during intervention time
- Preferred seating
- Questions read aloud
- Extended time for completing tasks
- Graphic organizers
- Vocabulary support
- Mnemonic devices
- Songs/videos to reinforce concepts
- Study Guides
- Limit number of questions
- Scribe
- Newsela leveled reading passages

At-risk of Failure

- Extra time during intervention
- In class/pull out support with special ed teacher
- Additional time during intervention time
- Preferred seating
- Questions read aloud
- Extended time for completing tasks
- Graphic organizers
- Vocabulary support
- Mnemonic devices
- Songs/videos to reinforce concepts
- Study Guides
- Limit number of questions
- Scribe
- Newsela leveled reading passage

Gifted & Talented

- Independent projects
- STEM Projects
- Leveled Reading with Newsela

Interdisciplinary Connections

Connections to NJSLS - English Language Arts

• RI.3.2 Determine the main idea of a text; recount the key details and explain how they support the main idea. (3-LS3-1), (3-LS3-2)

• RI.3.3 Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect. (3-LS3- 1), (3-LS3-2)

• W.3.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. (3-LS3-1), (3-LS3-2) • SL.3.4 Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant,

descriptive details, speaking clearly at an understandable pace. (3-LS3-1), (3-LS3-2)

• RI.3.7 Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur). (3-LS1-1)

• SL.3.5 Create engaging audio recordings of stories or poems that demonstrate fluid reading at an understandable pace; add visual displays when appropriate to emphasize or enhance certain facts or details. (3-LS1-1)

Connections to NJSLS - Mathematics

• MP.2 Reason abstractly and quantitatively. (3-LS3-1), (3-LS3-2)

• MP.4 Model with mathematics. (3-LS3-1), (3-LS3-2)

• 3.MD.B.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters. (3-LS3-1), (3-LS3-2)

• 3.NBT Number and Operations in Base Ten (3-LS1-1)

• 3.NF Number and Operations—Fractions (3-LS1-1)

Career Readiness, Life Literacies, and Key Skills

Critical Thinking and Problem Solving:

• 9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process (e.g., 2.1.5.EH.4, 4-ESS3-1, 6.3.5.CivicsPD.2).

• 9.4.5.CT.2: Identify a problem and list the types of individuals and resources (e.g., school, community agencies, governmental, online) that can aid in solving the problem (e.g., 2.1.5.CHSS.1, 4-ESS3-1).

• 9.4.5.CT.3: Describe how digital tools and technology may be used to solve problems. • 9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global

Career Ready Practices

- CRP6. Demonstrate creativity and innovation.
- CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.