

7 Science Unit 3 Ecology

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

Unit Overview

Resources in Ecosystems

The living things on our planet interact with each other and with the nonliving parts of the environment in dynamic ecosystems. Apply what you learn about resources, interactions, and changes in ecosystems to solve a problem in the fish exhibit at a zoo.

Energy and Matter in Ecosystems

You will take on the role of science animator to represent the invisible pathway that a single atom of carbon and one unit of energy take as they travel through the world.

Humans and Changing Ecosystems

As investigative TV reporters, students will explore the interaction between people and their environment. Learn how scientists use biodiversity to study ecosystem health, how people depend on ecosystems, and how people design solutions when ecosystems are unhealthy. Finally, they'll report on a local story about human and ecosystem interactions.

Standards

Science and Engineering Practices

- Analyzing and Interpreting Data
- Asking Questions and Defining Problems
- Constructing Explanations and Designing Solutions
- Developing and Using Models
- Engaging in Argument from Evidence
- Obtaining, Evaluating, and Communicating Information
- Planning and Carrying Out Investigations
- Using Mathematics and Computational Thinking

Crosscutting Concepts

- Cause and Effect
- Patterns
- Scale, Proportion, and Quantity
- Stability and Change
- Structure and Function

- Stems and System Models

SCI.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.
SCI.MS-ETS1-2	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
SCI.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.
SCI.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.
SCI.MS-LS2-2	Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.
SCI.MS-LS2-4	Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
SCI.MS-LS2-3	Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.
SCI.MS-LS2-5	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.
SCI.MS-LS1-6	Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.
SCI.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.
SCI.MS-LS1-7	Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.

Materials

Core Materials:

- TCI Ecology Text and Online Resources
 - Resources in Ecosystems
 - Energy & Matter in Ecosystems
 - Humans & Changing Ecosystems
- Teacher Created Labs

Supplemental Materials:

- [Gizmos](#)
- [BrainPop resources](#)
- [GRC Lessons](#)
- [Nearpod Activities](#)

Technology

CS.6-8.8.1.8.DA.1	Organize and transform data collected using computational tools to make it usable for a specific purpose.
CS.6-8.8.2.8.ED.2	Identify the steps in the design process that could be used to solve a problem.
CS.6-8.8.2.8.ED.3	Develop a proposal for a solution to a real-world problem that includes a model (e.g., physical prototype, graphical/technical sketch).
TECH.9.4.8.CT.1	Evaluate diverse solutions proposed by a variety of individuals, organizations, and/or agencies to a local or global problem, such as climate change, and use critical thinking skills to predict which one(s) are likely to be effective (e.g., MS-ETS1-2).
TECH.9.4.8.IML.1	Critically curate multiple resources to assess the credibility of sources when searching for information.

Evidence of Learning/Assessment

Formative Assessment

- Teacher Observation
- Quizzes
- Exit Tickets
- Labs

Summative Assessment

- Unit Tests
- 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

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
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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

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
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Gifted & Talented

- Independent projects
- STEM Projects

Interdisciplinary Connections

Connections to NJSLS - English Language Arts

Reading

RI.7.1. Cite several pieces of textual evidence and make relevant connections to support analysis of what the text says explicitly as well as inferences drawn from the text.

RI.7.2. Determine two or more central ideas in a text and analyze their development over the course of the text; provide an objective summary of the text.

RI.7.7. Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue. RI.6.8. Trace and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not.

RI.7.9. Compare, contrast and reflect on (e.g. practical knowledge, historical/cultural context, and background knowledge) one author's presentation of events with that of another (e.g., a memoir written by and a biography on the same person).

Writing

W.7.1. Write arguments to support claims with clear reasons and relevant evidence.

W.7.2. Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

Connections to NJSLS - Mathematics

Math Practices

Make sense of problems and persevere in solving them.

Construct viable arguments and critique the reasoning of others.

Use appropriate tools strategically.

Career Readiness, Life Literacies, and Key Skills

TECH.9.4.8.DC.1	Analyze the resource citations in online materials for proper use.
TECH.9.4.8.TL.1	Construct a spreadsheet in order to analyze multiple data sets, identify relationships, and facilitate data-based decision-making.
TECH.9.4.8.TL.3	Select appropriate tools to organize and present information digitally.
TECH.9.4.8.IML.12	Use relevant tools to produce, publish, and deliver information supported with evidence for an authentic audience.

Career Ready Practices

- CRP2. Apply appropriate academic and technical skills.
- CRP4. Communicate clearly and effectively and with reason.
- CRP6. Demonstrate creativity and innovation.
- CRP7. Employ valid and reliable research strategies.
- CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
- CRP11. Use technology to enhance productivity.
- CRP12. Work productively in teams while using cultural global competence