Unit 2 - Matter and Energy in Organism and Ecosystems

Content Area: **Template**
Course(s):
Time Period: **Full Year**
Length: **Full Year**
Status: **Published**

Unit Overview

Throughout this unit, students are introduced to the inner workings of their environment. Students develop an understanding of the idea that plants get the materials they need for growth chiefly from air and water. Using models, students can describe the movement of matter among plants, animals, decomposers, and the environment and that energy in animals' food was once energy from the sun. Through studies of the Galapagos Islands, students will understand that each piece of our environment is connected. Changing one piece of an environment can damage other organisms.

Enduring Understandings

Plants need carbon dioxide, sunlight, and water to grow and thrive.
Energy enters the ecosystem through producers. As producers are eaten, energy moves from consumer to consumer through the environment.
When one piece of an ecosystem is changed, the entire ecosystem can be thrown off balance.
Energy and nutrients cycle through ecosystems through decomposers, as well as interactions between plants and animals.
If an organism's needs are not being met in an ecosystem, the organism will either move, adapt, or die out.
Human activities are impacting the climate system.
Life on Earth depends on, is shaped by, and affects climate.

Essential Questions

What does a plant need to grow?
How does energy enter and move through an ecosystem?
What happens if one piece of the ecosystem is changed?
How do energy and nutrients cycle through an ecosystem?
What happens if an organisms needs are not being met in an ecosystem?

Learning Objectives

List the three main things that plants need to live and grow.
Use models to describe that energy in animals' food was once energy from the sun.
Support an argument that plants get the materials they need for growth chiefly from air and water.
Identify the source of the energy that plants use to make the food they need to survive.

Explain that the energy that plants use to live and grow was once energy from the sun.
Describe the process of photosynthesis.
Explain that plants get the materials they need for growth chiefly from air and water.
Identify some of the conditions that make it difficult to grow enough food for all the people on Earth.
Describe hydroponics and explain how its use can help increase the supply of food for humans.
Conduct an investigation to determine if plants can grow without soil.
Use evidence to support the argument that plants get the material they need for growth chiefly from air and water.
Identify how changes in the environment can affect populations around the world.
Explain that food provides animals with the materials they need for growth and body repair, and the energy they need for motion and to maintain body warmth.
Use a food chain to describe the flow of energy from the sun through the plants and animals in an ecosystem.
What is global warming and its effects on ecosystems? What are ways to prevent global warming from happening?
Use food chains to compare the pathway of energy from the sun through the organisms in two different environments.
Use a model to describe that energy in animals' food was once energy from the sun.
Describe the flow of energy from the sun through the organism in a food web.
Describe the role of decomposers in food webs and in cycles of matter.
Describe how matter cycles through an ecosystem and among the plants, animals, and microbes that live and die in the environment.
Explain that organisms can survive only in environments in which their particular needs are met.
Describe the levels of organism that make up an ecosystem.
Observe the way organisms live and survive in their ecosystem by interacting with other organisms and nonliving elements.
Describe the flow of energy derived from the sun through an ecosystem.
Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.
Describe how newly introduced species can damage the balance of an ecosystem.
Describe how a newly introduced species is damaging the balance of an ecosystem.
Explain how scientists are using another species to control the population of an invasive species.
Describe how a conservationist studies the natural world and works with other people to save natural resources.
Career Exploration - Explore careers related to environmental science.

Standards: Content

SCI.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.
SCI.5-LS1-1	Support an argument that plants get the materials they need for growth chiefly from air and water.
SCI.5-LS2-1	Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

Standards: Interdisciplinary

Assessment Evidence

Formative	Teacher observations, Class discussions, Lab Activities, Key concepts and vocabulary quizzes, Science Starter's/Do Nows, Open Ended Responses, Modeling, Simulations, Innovators Monthly Research, Lab Activities, Vocabulary Responses, Exit Questions, Interactive Digital Assessments embedded in Exploring Science Digital Book
Summative	Projects, Tests, Quizzes, lab skills demonstrations, projects, and vocabulary quizzes.
Alternative & Benchmark	Alternative - Read to the student and chart oral responses. Word banks, sentence frames, oral responses, graphic organizers, observations, portfolios of student work, orally administered assessments, and anecdotal notes. Benchmark – LinkIt Benchmark Assessment, Teacher Generated Assessments
Assessment Evidence Resource	

Instructional Resources

Smartboard, Computers, Websites and digital interactives/models, Multi-media presentations, Video Streaming, Brain Pop, Middle School Science, Generation Genius Digital Curriculum, Mystery Science Digital Curriculum, Amplify Digital Curriculum, Microsoft 365, Primary and Secondary Source, tape, ruler, scissors, colored pencils, crayons, markers, construction paper, graph paper Documents, Assorted lab materials. 5th Grade Science Course,

Instructional Resource List

Curricular Mandates

Below are the curricular requirements as defined in NJ Administrative Code and Statute

	Amistad		Diversity, Equity, and Inclusion
	Holocaust		LGBT and Disabilities (Grades 6-12)
	Climate Change		Asian American & Pacific Islander

Social Emotional Learning (SEL) Competencies

NJ Social and Emotional Learning Competencies & Sub-Competencies

	Self-Awareness		Relationship Skills
X	Responsible Decision-Making		Social Awareness
	Self-Management		

21st Century Skills & Themes

X	Global and Cultural Awareness		Technology Literacy		Planning and Budgeting
X	Creativity and Innovation		Financial Institutions		Risk Management and Insurance
X	Information and Media Literacy		Digital Citizenship		Economic and Government Influences
X	Critical Thinking and Problem Solving		Credit Profile		Career Awareness and Planning
	Civic Financial Responsibility		Financial Psychology		