Grade 5

Unit 4: Energy and Matter in Ecosystems

New Jersey Student Learning Standards
2024 - 2025

Established 2016-2017
Revised 2018-2019
Revised 2019-2020
Revised 2020-2021
Revised 2022-2023
Revised 2023-2024
Revised 2024-2025

Trimester	Unit Title	Recommended Instructional Days
2	Energy and Matter in Ecosystems	29

NJSLS - Science: *TItle*	NJSLS - Science: *Performance Expectations*	Recommended Activities, Investigations, Interdisciplinary Connections, and/or Student Experiences to Explore NJSLS-S within Unit
5-LS2- Ecosystems: Interactions, Energy, and Dynamics	**5-LS2-1** Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.	
FOUNDATION Disciplinary: *Core Idea*	**FOUNDATION Disciplinary: *Statement***	
LS2.A: Interdependent Relationships in Ecosystems **LS2.B: Cycles of Matter and Energy Transfer in Ecosystems** **ESS2.A: Earth Materials and Systems** **ETS1.B: Developing Possible Solutions**	• The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plant parts and animals) and therefore operate as "decomposers." Decomposition eventually restores (recycles) some materials back to the soil. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs	**Essential Question/s:** • How Do Organisms Interact in an Ecosystem? • How Do Organisms Change Their Ecosystems? **Enduring Understanding:** • Use models to explore how organisms interact in ecosystems and how these interactions can change environments. • Develop and use models to explore how organisms interact and survive in ecosystems consisting of environments where their needs are met. • Use models to describe how organisms, including newly introduced species, affect ecosystems. **Activity Description**: **Lab Activities** • *Unit Project - Self-Contained Ecosystem* - Students research and develop a self contained ecosystem model that shows how organisms interact through matter and energy in the environment. (SCI, TECH, MA, ELA, ART) • *Hands-On Activity 1 - What's Out There?*: Living and nonliving things make up ecosystems. (SCI, TECH)

	in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem. (5-LS2-1) ● Matter cycles between that air and soil and among plants, animals, and microbes as these organisms live and die. Organisms obtain gasses, and water, from the environment, and release waste matter (gas, liquid, or solid) back into the environment. (5-LS2-1) ● Earth's major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans). These systems interact in multiple ways to affect Earth's surface materials and processes. The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate. Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather. (5-ESS2-1)	● *Hands-On Activity 2 - Environment Matters*: Organisms survive in environments where their needs are met. (SCI, MA) ● *Hands-On Activity 1 - Invasion!*: Native organisms are often at a disadvantage when interacting with invasive species. (SCI, MA, ART, TECH) ● *Hands-On Activity 2 - Balance Restored:* Humans develop solutions to protect the environment from invasive species. (SCI, ART, TECH) ● *You Solve It - Build an Ecosystem* - Students design a model to observe and describe the movement of matter in an ecosystem. (SCI, TECH, MA) **Performance Task** ● *Design an Ecosystem* - Students obtain information and use it to design a self-contained system as a habitat for an animal. (SCI, TECH, ART) **Research Task** ● *Fantastic Field Guides* - Students research science careers that specialize in designing technology to guide scientific studies in the field (in the environment or wilderness). (SCI, ELA, TECH) **Career Education** ● Entomologist - Students read about USDA scientist Richard Mankin and Other entomologist study. ● U.S. Army Corps of Engineers - Students will learn about the U.S. Army Corps of Engineers, a part of the U.S. Army that is dedicated to protecting ecosystems, among other things. People in Science & Engineering: Alejandro E. Almario - Students learn about the work of Alejandro E. Almario, who researches how human behavior and products affect marine ecosystems in the Gulf of Mexico. As an employee of the U.S. government, it is Mr. Almario's job is to help solve the problems that can kill off wildlife in the Gulf. **(Diversity & Inclusion)** Research Dr. Jane Goodal who is one of the world's most well-known and

	● Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions. (3-5-ETS1-2) ● At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs. (3-5-ETS1-2) ● Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved. (3-5-ETS1-3)	well-loved zoologists and primatologists.. Dr. Goodall has prosopagnosia, or "face blindness." Prosopagnosia may not pose the same degree of challenge that a disability like deafness does, but it does affect how one interacts with others. These kinds of social interactions can be very important in the workplace and in STEM careers. **(Diversity & Inclusion)** **Interdisciplinary Connections: Content: ;NJSLS#:** ***ELA/Literacy*** **RI.5.7** Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. (5-LS2-1) **SL.5.5** Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes. (5-LS2-1) ***Mathematics*** **MP.2** Reason abstractly and quantitatively. (5-LS2-1) **MP.4** Model with mathematics. (5-LS2-1)
FOUNDATION **Science and Engineering Practices:** ***Core Idea***	**FOUNDATION** **Science and Engineering Practices:** ***Statement***	
Developing and Using Models **Science Models, Laws, Mechanisms, and Theories**	● Modeling in 3-5 builds on K-2 models and progresses to building and revising simple models and using models to represent events and design solutions. ○ Develop a model to describe phenomena (5-LS2-1)	

	• Science explanations describe the mechanisms for natural events. (5-LS2-1)	
FOUNDATION **Crosscutting Concepts:** ***Core Idea***	**FOUNDATION** **Crosscutting Concepts:** ***Statement***	
Systems and System Models	• A system can be described in terms of its components and their interactions. (5-LS2-1)	
Social and Emotional Learning: ***Competencies***	**Social and Emotional Learning:** ***Sub-Competencies***	
Self-Awareness **Self-Management** **Social Awareness** **Responsible Decision-Making** **Relationship Skills**	• Recognize one's feelings and thoughts • Recognize the impact of one's feelings and thoughts on one's own behavior • Recognize one's personal traits, strengths, and limitations • Recognize the importance of self-confidence in handling daily tasks and challenges • Understand and practice strategies for managing one's own emotions, thoughts, and behaviors • Recognize the skills needed to establish and achieve personal and educational goals • Identify and apply ways to persevere or overcome barriers through alternative	

	methods to achieve one's goals ● Recognize and identify the thoughts, feelings, and perspectives of others ● Demonstrate an awareness of the differences among individuals, groups, and others' cultural backgrounds ● Demonstrate an understanding of the need for mutual respect when viewpoints differ ● Demonstrate an awareness of the expectations for social interactions in a variety of settings ● Develop, implement, and model effective problem-solving and critical thinking skills ● Identify the consequences associated with one's actions in order to make constructive choices ● Evaluate personal, ethical, safety, and civic impacts of decisions ● Establish and maintain healthy relationships ● Utilize positive communication and social skills to interact effectively with others ● Identify ways to resist inappropriate social pressure ● Demonstrate the ability to prevent and resolve	

	interpersonal conflicts in constructive ways ● Identify who, when, where, or how to seek help for oneself or others when needed	

Assessments (Formative) ***To show evidence of meeting the standard/s, students will successfully engage within:***	**Assessments (Summative)** ***To show evidence of meeting the standard/s, students will successfully complete:***
Formative Assessments: ● Diagnostic tests used to modify teaching and learning activities to improve student attainment (Unit Readiness Check, Lesson Quiz, Unit Test, Performance-Based Assessment)	**Benchmarks:** ● District Assessments **Summative Assessments:** ● End of Unit/Chapter Test

Differentiated Student Access to Content:
Teaching and Learning *Resources/Materials*

Core Resources	**Alternate Core Resources** ***IEP/504/At-Risk/ESL***	**ML Core Resources**	**Gifted & Talented Core Resources**
● Evidence Notebook ● Equipment Kit ● FUNomental Readers ● Idea Organizer ● Language Development Worksheet ● Online Simulations ● Into Science TE ● Into Science SE ● District Approved Resources	● FUNomental Readers ● Multilingual Glossary	● FUNomental Readers ● Multilingual Glossary ● Multilingual Home Letters	● FUNomental Readers

Supplemental Resources

Technology:
● Chromebook

- SMARTBoard / Promethean Board
- District-Approved Resources

Ed Science Platforms:

- Digital Assessments
- Digital Performance Tasks
- You Solve It Simulation
- Student eBook
- Video-Based Projects
- Science Tools
- Online Glossary

Differentiated Student Access to Content:
Recommended *Strategies & Techniques*

Core Resources	**Alternate Core Resources** ***IEP/504/At-Risk/ESL***	**ML Core Resources**	**Gifted & Talented Core**
• Model how to identify vocabulary terms within text. Discuss how to locate definition within the text, noting that some definitions will need to be inferred based on images as well as text.	• Utilize a multi-sensory (VAKT) approach during instruction, provide alternate presentations of skills by varying the method (repetition, simple explanations, additional examples, modeling, etc.), modify test content and/or format, allow students to retake tests for additional credit, provide additional times and preferential seating as needed, review, restate and repeat directions, provide study guides, and/or break assignments into segments of shorter tasks.	• Extend time requirements, preferred seating, positive reinforcement, check often for understanding/ review, oral/ visual directions/ prompts when necessary, supplemental materials including use of an online bilingual dictionary, and modified assessment and/ or rubric.	• Create an enhanced set of introductory activities, integrate active teaching/ learning opportunities, incorporate authentic components, propose interest-based extension activities, and connect students to related talent development opportunities.

NJSLS CAREER READINESS, LIFE LITERACIES & KEY SKILLS	**Disciplinary Concept:** Creativity and Innovation	
	Core Ideas:	Collaboration with individuals with diverse perspectives can result in new ways of thinking and/or innovative solutions. Curiosity and a willingness to try new ideas (intellectual risk-taking) contributes to the development of creativity and innovation skills.
	Performance Expectation/s:	• 9.4.5.CI.1: Use appropriate communication technologies to collaborate with individuals with diverse perspectives about a local and/or global climate change issue and deliberate about possible solutions (e.g., W.4.6,3.MD.B.3,7.1.NM.IPERS.6). • 9.4.5.CI.2: Investigate a persistent local or global issue, such as climate change, and collaborate with individuals with diverse perspectives to improve upon current actions designed to address the issue (e.g., 6.3.5.CivicsPD.3, W.5.7). • 9.4.5.CI.3: Participate in a brainstorming session with individuals with diverse perspectives to expand one's thinking about a topic of curiosity (e.g., 8.2.5.ED.2, 1.5.5.CR1a). • 9.4.5.CI.4: Research the development process of a product and identify the role of failure as a part of the creative process (e.g., W.4.7, 8.2.5.ED.6).
	Career Readiness, Life Literacies, & Key Skills Practices	
	Students work in cooperative groups and will use research strategies to complete labs	

New Jersey Legislative Statutes and Administrative Code (place an "X" before each law/statute if/when present within the curriculum map)									
	Amistad Law: *N.J.S.A. 18A 52:16A-88*		Holocaust Law: *N.J.S.A. 18A:35-28*		LGBT and Disabilities Law: *N.J.S.A. 18A:35-4.35*	X	Diversity & Inclusion: *N.J.S.A. 18A:35-4.36a*		Standards in Action: *Climate Change*