Grade 5

Unit 3: Energy and Matter in Organisms

New Jersey Student Learning Standards
2024 - 2025

Established 2016-2017
Revised 2018-2019
Revised 2019-2020
Revised 2020-2021
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Revised 2023-2024
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Trimester	Unit Title	Recommended Instructional Days
2	Energy and Matter In Organisms	35

NJSLS - Science: *TItle*	NJSLS - Science: *Performance Expectations*	Recommended Activities, Investigations, Interdisciplinary Connections, and/or Student Experiences to Explore NJSLS-S within Unit
5-LS1 From Molecules to Organisms: Structures and Processes	**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 **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.	
FOUNDATION Disciplinary: *Core Idea*	**FOUNDATION Disciplinary: *Statement***	
5-LS1.C: Organization for Matter and Energy flow in Organisms **PS3.D: Energy in Chemical Processes and Everyday Life** **LS2.A: Interdependent Relationships in Ecosystems** **LS2.B: Cycles of Matter and Energy Transfer in Ecosystems**	• Food provides animals with the materials they need for body repair and growth and the energy they need to maintain body warmth and for motion. (secondary to 5-PS3-1) • The energy released [from] food was once energy from the sun that was captured by plants in the chemical	**Essential Question/s:** • How Does Energy Get Transformed By Plants? • How Do Organisms Use Matter And Energy? • How Does Energy and Matter Move Between Organisms? **Enduring Understanding:** • Explore how plants and other organisms use and transform matter and energy to live and grow. • Identify energy sources and trace flows of energy within living systems. • Use evidence to support a claim that plants get energy from sunlight and materials they need for growth from air and water.

	process that forms plant matter (from air and water). (5- PS3-1) ● 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 plants 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 in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem. (5-LS2- 1) ● Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. Organisms obtain gases, and water,	● Investigate how living organisms get energy. ● Explore how living organisms use energy and how they interact in this environment. ● Explain that plants get the materials they need to grow mostly from air and water. ● Explain how organisms use matter and energy obtained from their environments. ● Describe how animals exchange matter with their environment and use matter and energy stored in food for warmth, motion, body growth and body repair. ● Develop models to show the flow of energy derived from the sun is transferred as matter through a food chain and food web to consumers and decomposers. **<u>Activity Description</u>**: **Lab Activities** ● *Unit Project - The Best Light* - Students will conduct an investigation to see under which conditions the plants grow the best. (SCI, TECH, MA, ELA) ● *Hands-On Activity 1 - A Tree in a Forest*: Plants need the right amount of light to live and grow. (SCI, MA) ● *Hands-On Activity 2 - Needs for Growth*: Plants gain weight and grow when able to make food. (SCI, MA) ● *Hands-On Activity 1 - A Filling Morsel*: Some foods provide more energy than others. (SCI, MA, TECH) ● *Hands-On Activity 2 - Where's the Heat?:* The energy in food is used by many organisms to maintain body temperature. (SCI, ELA, TECH) ● *Hands-On Activity 1 - Modeling Matter Moving Within an Ecosystem*: Matter moving through an ecosystem can be modeled.. (SCI, TECH ART) ● *Hands-On Activity 2 - Break It Down*: Decomposers break down plant material and recycle that matter back into the soil. (SCI) ● *You Solve It - What Do Plants Need?* - Students will determine which color light allows plants to grow the tallest and will conduct an investigation to find out what plants need to grow. (SCI, TECH, MA)

	from the environment, and release waste matter (gas, liquid, or solid) back into the environment. (5-LS2-1)	**Performance Task** ● *Business Has Bean Bad*- Students design a water solution to help bean plants grow quickly. (SCI, ART) **Research Task** ● *In the Water* - Students explore how dolphins, tuna, squid, and shrimp meet their needs for matter and energy.(SCI, ELA, TECH) ● *Exploring a Desert Ecosystem* - Students explore the feeding relationships in a complex desert ecosystem. (SCI, ELA, TECH) **Career Education** ● Mycologist - Students learn about mycologists, scientists who study fungi. Because of their work, scientists now know that fungi are not plants but take in food in ways similar to animals. ● Animal Nutritionist - Students read about the work of an animal nutritionist - a scientist who studies and develops diets for specific types of animals. Then they will select an animal and complete research about characteristics and appropriate diet of that animal. Then they must select an animal and complete research about that animal. ● Zoologist - Students script their own questions for a specific type of zoologist. People in Science & Engineering: Ynes Mexia - Students read about Ynes Mexia, a Mexican-American plant collector, explorer and botanist who lived during the early 20th century and made many contributions to the collection and study of different plants including the discovery of new species. **(Diversity & Inclusion)** People in Science & Engineering: Jafet Velez-Valentin - Students meet a conservationist who has worked to save animals from extinction.. **(Diversity & Inclusion)** **Interdisciplinary Connections: Content: ;NJSLS#:** ***ELA/Literacy*** **RI.5.1** Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text. (5-LS1-1)
FOUNDATION **Science and Engineering Practices:** ***Core Idea***	**FOUNDATION** **Science and Engineering Practices:** ***Statement***	
Developing and Using Models **Engaging in Argument from Evidence** **Obtaining, Evaluating and Communication Information** **Using Mathematics and Computational Thinking** **Science Models, Laws, Mechanisms and Theories**	● Modeling in 3-5 builds on K-2 experiences and progresses to building and revising simple models and using models to represent events and design solutions ○ Develop a model to describe phenomena (5-PS1-1) ● Engaging in argument from evidence in 3-5 builds on K-2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s). ○ Support an argument within evidence, data, or a model. (5-LS1-1) ● Mathematical and computational thinking in 3-5 builds on K-2 experiences and progresses to extending quantitative measurements to a variety of	

	physical properties and using computation and mathematics to analyze data and compare alternative design solutions. ○ Measure and graph quantities such as weight to address scientific data ● Science explanations describe the mechanisms for natural events. (5-LS2-1)	**RI.5.9** Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably. (5-LS1-1) **W.5.1** Write opinion pieces on topics or texts, supporting a point of view with reasons and information. (5-LS1-1) ***Mathematics*** **MP.2** Reason abstractly and quantitatively. (5-LS1-1) **MP.4** Model with mathematics. (5-LS1-1) **MP.5** Use appropriate tools strategically. (5-LS1-1) **5.MD.A.1** Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5cm to 0.05m), and use these conversions in solving multi-step, real world problems. (5-LS1-1)
FOUNDATION **Crosscutting Concepts:** ***Core Idea***	**FOUNDATION** **Crosscutting Concepts:** ***Statement***	
Energy and Matter **Systems and System Models**	● Matter is transported into, out of, and within systems (5-LS1-1) ● Systems can be described by 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 impact 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	• FUNomental Readers • Multilingual Glossary	• FUNomental Readers • Multilingual Glossary • Multilingual Home Letters	• FUNomental Readers

• Idea Organizer • Language Development Worksheet • Online Simulations • Into Science TE • Into Science SE • District Approved Resources			

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 definitions with 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,	• 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,	• Create an enhanced set of introductory activities, integrate active teaching/ learning opportunities, incorporate authentic components, propose interest-based extension activities, and connect

	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.	and modified assessment and/or rubric.	students to related talent development opportunities.

NJSLS CAREER READINESS, LIFE LITERACIES & KEY SKILLS	**Disciplinary Concept:** Critical Thinking & Problem-Solving	
	Core Ideas:	The ability to solve problems effectively begins with gathering data, seeking resources, and applying critical thinking skills.
	Performance Expectation/s:	• 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 (e.g., 6.1.5.CivicsCM.3).
	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*