

Grade 5

Unit 2: Matter

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
1	Matter	37
NJSL - Science: <i>Title</i>	NJSL - Science: <i>Performance Expectations</i>	<p style="text-align: center;">Recommended Activities, Investigations, Interdisciplinary Connections, and/or Student Experiences to Explore NJSL-S within Unit</p>
5-PS1 Matter and Its Interactions	<p>5-PS1-1 Develop a model to describe that matter is made of particles too small to be seen.</p> <p>5-PS1-2 Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.</p> <p>5-PS1-3 Make observations and measurements to identify materials based on their properties.</p> <p>5-PS1-4 Conduct an investigation to determine whether the mixing of two or more substances results in new substances.</p> <p>3-5-ETS1-1 Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.</p> <p>3-5-ETS1-2 Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.</p>	

	<p>3-5-ETS1-3 Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.</p>	
<p>FOUNDATION Disciplinary: <i>Core Idea</i></p>	<p>FOUNDATION Disciplinary: <i>Statement</i></p>	
<p>PS1.A: Structure and Properties of Matter</p> <p>PS1.B: Chemical Reactions</p> <p>ETS1.A: Defining and Delimiting Engineering Problems</p> <p>ETS1.B: Developing Possible Solutions</p> <p>ETS1.C: Optimizing the Design Solution</p>	<ul style="list-style-type: none"> ● Matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists and can be detected by other means. A model showing that gasses are made from matter particles that are too small to see and are moving freely around in space can explain many observations, including the inflation and shape of a balloon and the effects of air on larger particles or objects. (5-PS1-1) ● The amount (weight) of matter is conserved when it changes form, even in transitions in which it seems to vanish. (5-PS1-2) ● Measurements of a variety of properties can be used to identify materials. (Boundary: At this grade level, mass and weight are not distinguished, and no 	<p><u>Essential Questions:</u></p> <ul style="list-style-type: none"> ● Does Matter Have Mass and Volume? ● What are the Properties of Matter? ● How Does Matter Change? <p><u>Enduring Understanding:</u></p> <ul style="list-style-type: none"> ● Explore matter, its properties and its different forms. ● Use models and conduct investigations to identify properties of matter. ● Demonstrate that matter is made of particles too small to be seen from the very small to the immensely large, but whose effects can be observed. ● Explore properties of matter. ● Compare substances based on their physical properties. ● Recognize factors affecting properties of matter. ● Identify mixtures with the properties of starting materials. ● Gather data to use as evidence to demonstrate that properties of matter can be used to identify a substance. <p><u>Activity Description:</u></p> <p>Lab Activities</p> <ul style="list-style-type: none"> ● <i>Unit Project - Conservation of Matter</i> - Groups will design an experiment to prove that matter is conserved during physical or chemical changes. (SCI, TECH, MA, ART) ● <i>Hands-On Activity 1 - Measuring Mass and Volume</i>: Matter takes up space and has mass (SCI, MA)

	<p>attempt is made to define the unseen particles or explain the atomic-scale mechanism of evaporation and condensations.) (5-PS1-3)</p> <ul style="list-style-type: none"> • When two or more different substances are mixed, a new substance with different properties may be formed. (5-PS1-4) • No matter what reaction or change in properties occurs, the total weight of the substances does not change. (Boundary: Mass and weight are not distinguished at this grade level.) (5-PS1-2) • Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account. (3-5- ETS1-1) • • Research on a problem should be carried out before 	<ul style="list-style-type: none"> • <i>Hands-On Activity 2 - Evidence of Matter</i>: Gases are made of matter, can be compressed, and affect objects in ways we can observe. (SCI, MA) • <i>Hands-On Activity 1 - So Many Properties</i>: Materials have distinct properties that can be observed. (SCI, MA) • <i>Hands-On Activity 2 - Beat the Heat</i>: People use distinct properties of materials to design solutions. (SCI, ELA, TECH) • <i>Hands-On Activity 1 - Changes in Matter</i>: Substances can undergo changes in which they retain or change their identities. (SCI) • <i>Hands-On Activity 2 - Which Will React?</i>: Substances can be identified based on their properties. (SCI) • <i>You Solve It - Maze Matters</i> - Students will apply understanding of the properties of matter to solve problems and identify substances. (SCI, TECH) <p>Performance Task</p> <ul style="list-style-type: none"> • <i>Physical or Chemical?</i>- Students plan and carry out investigations to exhibit cause and effect of certain types of matter. (SCI) <p>Research Task</p> <ul style="list-style-type: none"> • <i>Healthy Mixtures</i> - Students will explore the mixtures of vitamins and minerals found in foods and the impact of these substances on the body and overall health. Then, students will research one specific vitamin or mineral nutrient. (SCI, ELA, TECH) • <i>Slow Down the Spoil</i> - Students investigate how refrigeration slows down the oxidation rate and spoilage of food. (SCI, ELA, TECH) <p>Career Education</p> <ul style="list-style-type: none"> • <u>Materials Scientist and Engineer</u> - Students explore how many of the materials we use in everyday life were developed by material scientists. • <u>Flavor Chemist</u> - Students learn about the job of a flavor chemist. <p><u>People in Science & Engineering: Shirley Ann Jackson & Anthony Atala</u> - Students will learn about a physicist who specializes in particle movement and semiconductors and a physician who is pioneering the use of 3D printers in regenerative machines. (Amistad Law / Diversity & Inclusion)</p>
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	<p>beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions. (3-5-ETS1-2)</p> <ul style="list-style-type: none"> • 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) • Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. (3-5-ETS1-3) 	<p><u>People in Science & Engineering: Dr. Jani Ingram and Ciarra Greene</u> - Students will learn about Dr. Jani Ingram’s and Ciarra Greene’s research into the link between environments contaminates and cancer among Native American peoples.. (Diversity & Inclusion)</p> <p>Interdisciplinary Connections: Content: ;NJSL#: 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-PS1-1) W.5.7 Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic. (5-PS1-2), (5-PS1-3), (5-PS1-4) W.5.8 Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources. (5-PS1-2), (5-PS1-3), (5-PS1-4) W.5.9 Draw evidence from literary or informational texts to support analysis, reflection, and research. (5-PS1-2), (5-PS1-3), (5-PS1-4)</p> <p>Mathematics MP.2 Reason abstractly and quantitatively (5-PS1-1), (5-PS1-2), (5-PS1-3) MP.4 Model with mathematics. (5-PS1-1), (5-PS1-2), (5-PS1-3) MP.5 Use appropriate tools strategically. (5-PS1-2), (5-PS1-3) 5.NBT.A.1 Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10. (5-PS1-1) 5.NF.B.7 Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. (5-PS1-1) 5.MD.A.1 Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real-world problems. (5-PS1-2) 5.MD.C.3 Recognize volume as an attribute of solid figures and understand concepts of volume measurement. (5-PS1-1)</p>
<p>FOUNDATION Science and Engineering Practices: <i>Core Idea</i></p>	<p>FOUNDATION Science and Engineering Practices: <i>Statement</i></p>	
<p>Planning and Carrying Out Investigation Developing and Using Models</p>	<ul style="list-style-type: none"> • Planning and carrying out investigations to answer questions or test solutions to problems in 3-5 builds on 	

<p>Using Mathematics and Computational Thinking</p> <p>Engaging in Argument from Evidence</p>	<p>K-2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions.</p> <ul style="list-style-type: none">○ Conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered. (5-PS1-4)○ Make observations and measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon (5-PS1-3) <ul style="list-style-type: none">● 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<ul style="list-style-type: none">○ Develop a model to describe phenomena (5-PS1-1)	<p>5.MD.C.4 Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units. (5-PS1-1)</p>
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	<ul style="list-style-type: none"> ● 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. <ul style="list-style-type: none"> ○ Measure and graph quantities such as weight to address scientific data ● 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). <ul style="list-style-type: none"> ○ Support an argument within evidence, data, or a model. (5-LS1-1) 	
<p>FOUNDATION Crosscutting Concepts: <i>Core Idea</i></p>	<p>FOUNDATION Crosscutting Concepts: <i>Statement</i></p>	
<p>Cause and Effect</p> <p>Scale, Proportions, and Quantity</p> <p>Science Is a Human Endeavor</p>	<ul style="list-style-type: none"> ● Cause and effect relations are routinely identified, tested, and used to explain change. (5-PS2-1) 	

<p>Scientific Knowledge Assumes and Order and Consistency in Natural Systems</p> <p>Systems and System Models</p>	<ul style="list-style-type: none"> • Standard units are used to measure and describe physical quantities such as weight, time, temperature, and volume. (5-PS1-2), (5-PS1-3) • Science affects everyday life. • Science assumes consistent patterns in natural systems. (5-PS1-2) • Systems can be described by its components and their interactions. (5-LS2-1) 	
<p>Social and Emotional Learning: <i>Competencies</i></p>	<p>Social and Emotional Learning: <i>Sub-Competencies</i></p>	
<p>Self-Awareness</p> <p>Self-Management</p> <p>Social Awareness</p> <p>Responsible Decision- Making</p> <p>Relationship Skills</p>	<ul style="list-style-type: none"> • Recognize one’s feelings and thoughts • Recognize the impact of one’s feelings and thought 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 	

	<ul style="list-style-type: none">● 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 appropriate social pressure	
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	<ul style="list-style-type: none"> • 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 		
<p align="center">Assessments (Formative) <i>To show evidence of meeting the standard/s, students will successfully engage within:</i></p>		<p align="center">Assessments (Summative) <i>To show evidence of meeting the standard/s, students will successfully complete:</i></p>	
<p>Formative Assessments:</p> <ul style="list-style-type: none"> • Diagnostic tests used to modify teaching and learning activities to improve student attainment (Unit Readiness Check, Lesson Quiz, Unit Test, Performance-Based Assessment) 		<p>Benchmarks:</p> <ul style="list-style-type: none"> • District Assessments <p>Summative Assessments:</p> <ul style="list-style-type: none"> • End of Unit/Chapter Test 	
<p align="center">Differentiated Student Access to Content: Teaching and Learning Resources/Materials</p>			
<p align="center">Core Resources</p>	<p align="center">Alternate Core Resources <i>IEP/504/At-Risk/ESL</i></p>	<p align="center">ML Core Resources</p>	<p align="center">Gifted & Talented Core Resources</p>
<ul style="list-style-type: none"> • Evidence Notebook • Equipment Kit • FUNomental Readers • Idea Organizer • Language Development Worksheet • Online Simulations • Into Science TE • Into Science SE • District Approved Resources 	<ul style="list-style-type: none"> • FUNomental Readers • Multilingual Glossary 	<ul style="list-style-type: none"> • FUNomental Readers • Multilingual Glossary • Multilingual Home Letters 	<ul style="list-style-type: none"> • FUNomental Readers
<p align="center">Supplemental Resources</p>			

<p>Technology:</p> <ul style="list-style-type: none"> ● Chromebook ● SMARTBoard / Promethean Board ● District-Approved Resources <p>Ed Science Platforms:</p> <ul style="list-style-type: none"> ● Digital Assessments ● Digital Performance Tasks ● You Solve It Simulation ● Student eBook ● Video-Based Projects ● Science Tools ● Online Glossary 			
<p>Differentiated Student Access to Content: Recommended <i>Strategies & Techniques</i></p>			
Core Resources	Alternate Core Resources <i>IEP/504/At-Risk/ESL</i>	ML Core Resources	Gifted & Talented Core
<ul style="list-style-type: none"> ● 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. 	<ul style="list-style-type: none"> ● 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 	<ul style="list-style-type: none"> ● 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. 	<ul style="list-style-type: none"> ● 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.

	assignments into segments of shorter tasks.		
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NJSLS CAREER READINESS, LIFE LITERACIES & KEY SKILLS	Disciplinary Concept: Creativity and Innovation		
	Core Ideas:	<p>Collaboration with individuals with diverse perspectives can result in new ways of thinking and/or innovative solutions.</p> <p>Curiosity and a willingness to try new ideas (intellectual risk-taking) contributes to the development of creativity and innovation skills.</p>	
	Performance Expectation/s:	<ul style="list-style-type: none"> ● 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		

X	Amistad Law: <i>N.J.S.A. 18A 52:16A-88</i>		Holocaust Law: <i>N.J.S.A. 18A:35-28</i>		LGBT and Disabilities Law: <i>N.J.S.A. 18A:35-4.35</i>	X	Diversity & Inclusion: <i>N.J.S.A. 18A:35-4.36a</i>		Standards in Action: <i>Climate Change</i>
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