Grade 7
Trimester 1
Unit 3 The Structure of Matter
Unit 4 Chemical Processes and Equations

New Jersey Student Learning Standards

Established	2016-2017
Revised	2017-2018
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Revised	2024-2025

Marking Period	Unit Title	Recommended Instructional Days
Trimester 1	**Unit 3 The Structure of Matter** **Unit 4 Chemical Processes and Equations**	**60 days (including Science Inquiry, Lab Skills, and Science Safety)**

NJSLS - Science: *Title*	NJSLS - Science: *Performance Expectations*	Recommended Activities, Investigations, Interdisciplinary Connections, and/or Student Experiences to Explore NJSLS-S within Unit
Matter and Its Interactions	**MS-PS1-1.** Develop models to describe the atomic composition of simple molecules and extended structures. **MS-PS1-4**. Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed. **MS-PS1-2.** Analyze and interpret	**Essential Question/s:** **Unit 3: The Structure of Matter** 1. What are the building blocks of matter? 2. How do chemical and physical properties help us identify matter? 3. How does energy or pressure influence a change of state? 4. How are an element's properties related to its placement on the Periodic Table? **Unit 4: Chemical Processes and Equations** 1. How is matter conserved through a chemical

	data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred. **MS-PS1-5.** Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved. **MS-PS1-6.** Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.	reaction? 2. How do the reactants and products in a chemical reaction differ? 3. How can you use properties to determine the identity of an unknown substance? 4. How can a chemical process relate to the energy in a system (endothermic/ exothermic)? **<u>Activity Description:</u>** ❖ Lesson Phenomenon ❖ Unit Opener: Can you Explain it? ❖ "Take it Further" activities **<u>Unit 3: The Structure of Matter</u>** ❖ Hands on Lab: Investigating Mass, Volume, and Density ❖ Hands on Lab: Observe States of Matter ❖ Hands on Lab: Investigate a Change in State ❖ Hands on Lab: Compare Densities ❖ Hands on Lab: Observe, Grow and Model Crystals ❖ Virtual Lab: How Are Atoms Structured ❖ Virtual Lab: Determining Density ❖ Virtual Lab: What Trends Can You See in the Periodic Table ❖ Virtual Lab: How Are Atoms Structured
Engineering Design	**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.	**Unit 4: Chemical Processes and Equations** ❖ Hands on Lab: Mix It Up! ❖ Hands on Lab: When Chemicals React! ❖ Hands on Lab: Reaction to the Rescue ❖ Virtual Lab: What Factors Affect the Rate of Chemical Reaction? **Lab and engineering activities will incorporate these skills:** ● Planning and Organization ● Critical Thinking ● Communication in a group ● Decision Making ● Reflection on activity and participation **Spotlight on scientists and their accomplishments** Example: Joseph Proust- Chemist Angela Clayton - Nuclear Physicist Percy Julian- Chemist Talia Martin - Chemist and Tribal Liaison **Human Impacts on Earth** Introduce the Greenhouse Gases and their role in our atmosphere. "Meet The Greenhouse Gases" - Refer to NASA Climate Kids website
FOUNDATION **Disciplinary:** ***Core Idea***	**FOUNDATION** **Disciplinary:** ***Statement***	
PS1.A Structure and Properties of Matter	Substances are made from different types of atoms, which combine with one another in various ways. Atoms form molecules that range in size from two to thousands of atoms. (MS-PS1-1) Each pure substance has characteristic physical and chemical properties (for any bulk quantity under given conditions) that can be used to identify it. (MS-PS1-2), (MS-PS1-3) Gases and liquids are made of molecules or inert atoms that are moving about relative to each other. (MS-PS1-4)	

PS1.B Chemical Reactions	In a liquid, the molecules are constantly in contact with others; in a gas, they are widely spaced except when they happen to collide. In a solid, atoms are closely spaced and may vibrate in position but do not change relative locations. (MS-PS1-4) Solids may be formed from molecules, or they may be extended structures with repeating subunits (e.g., crystals). (MS-PS1-1) The changes of state that occur with variations in temperature or pressure can be described and predicted using these models of matter. (MS-PS1-4) Substances react chemically in characteristic ways. In a chemical process, the atoms that make up the original substances are regrouped into different molecules, and these new	**Interdisciplinary Connection: Content: (NJSLS#)** **Connections to Mathematics:** ● Reason abstractly and quantitatively. **(MP.2)** ● Model with mathematics. **(MP.4)** ● Use ratio and rate reasoning to solve real-world and mathematical problems. **(6.RP.A.3)** ● Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. **(6.NS.C.5)** ● Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. **(8.EE.A.3)** ● Write, read, and evaluate expressions in which letters stand for numbers. (**6.EE.A.2)** ● Understand ratio concepts and use ratio reasoning to solve problems. (**6.RP.A)** ● Analyze proportional relationships and use them to solve real-world and mathematical problems.**(7.RP.A)**

ETS1.A Defining and Delimiting Engineering Problems	substances have different properties from those of the reactants. (MS-PS1-2), (MS-PS1-3), (MS-PS1-5) The total number of each type of atom is conserved, and thus the mass does not change. (MS-PS1-5) Some chemical reactions release energy, others store energy. (MS-PS1-6) The more precisely a design task's criteria and constraints can be defined, the more likely it is that the designed solution will be successful. Specification of constraints includes consideration of scientific principles and other relevant knowledge that are likely to limit possible solutions. (MS-ETS1-1)	**<u>Connections to Language Arts:</u>** ● Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table). **(RST.6-8.7)** ● Write arguments focused on content. **(WHST.6-8.1)** ● Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration. **(WHST.6-8.7)**

ETS1.B Developing Possible Solutions	A solution needs to be tested, and then modified on the basis of the test results, in order to improve it. (secondary to MS-PS1-6)	
ETS1.C Optimizing the Design Solution	Although one design may not perform the best across all tests, identifying the characteristics of the design that performed the best in each test can provide useful information for the redesign process—that is, some of the characteristics may be incorporated into the new design. (secondary to MS-PS1-6) The iterative process of testing the most promising solutions and modifying what is proposed on the basis of the test results leads to greater refinement and ultimately to an optimal solution. (secondary to MS-PS1-6)	

FOUNDATION Science and Engineering Practices: *Core Idea*	FOUNDATION Science and Engineering Practices: *Statement*	
Planning and Carrying Out Investigations	Planning and carrying out investigations to answer questions or test solutions to problems in 6–8 builds on K–5 experiences and progresses to include investigations that use multiple variables and provide evidence to support explanations or design solutions.	
Developing and Using Models	Modeling in 6–8 builds on K–5 and progresses to developing, using and revising models to describe, test, and predict more abstract phenomena design systems.	
Analyzing and Interpreting Data	Analyzing data in 6–8 builds on K–5 and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis.	

Constructing Explanations and Designing Solutions **Engaging in Argument from Evidence**	Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories. Engaging in argument from evidence in 6–8 builds on K–5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed worlds.	
FOUNDATION **Crosscutting Concepts:** ***Core Idea***	**FOUNDATION** **Crosscutting Concepts:** ***Statement***	
Patterns	Macroscopic patterns are related to the nature of microscopic and atomic-level structure. (MS-PS1-2)	

Energy and Matter	Matter is conserved because atoms are conserved in physical and chemical processes. (MS-PS1-5) The transfer of energy can be tracked as energy flows through a designed or natural system. (MS-PS1-6)	
Scale, Proportion, and Quantity	Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small. (MS-PS1-1)	
Structure and Function	Structures can be designed to serve particular functions by taking into account properties of different materials, and how materials can be shaped and used. (MS-PS1-3)	
Cause and Effect	Cause and effect relationships may be used to predict phenomena in natural or designed systems. (MS-PS1-4)	

Social and Emotional Learning: ***Competencies***	**Social and Emotional Learning:** ***Sub-Competencies***	
Responsible Decision-Making Relationship Skills Self-Management Social Awareness Social Awareness	• Develop, implement, and model effective problem-solving and critical thinking skills • Utilize positive communication and social skills to interact effectively with others • Recognize the skills needed to establish and and achieve personal and educational goals • 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 ways. • Recognize the importance of self-confidence in handling daily tasks and challenges	
Assessments (Formative)		**Assessments (Summative)**

To show evidence of meeting the standard/s, students will successfully engage within:	*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	**Benchmarks:** ● District Assessment **Summative Assessments:** ● End of unit/chapter tests/lesson quizzes

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

Core Resources	**Alternate Core Resources** *IEP/504/At-Risk/ESL*	**ELL Core Resources**	**Gifted & Talented Core Resources**
● **Interactive Worktext** ● **Equipment Kits** ● **Online Simulations** ● **Lab Safety Handbook**	● Multilingual Glossary ● Online Science Tools (Scientific Calculator, Graphing)	● Multilingual Glossary ● Online Science Tools (Scientific Calculator, Graphing)	● Online Simulations ● Virtual Labs ● Webquests ● Video-Based Projects ● Take It Further ● You Solve It! ● Unit Performance Tasks ● Unit Projects ● Online Science Tools (Scientific Calculator, Graphing)

Supplemental Resources
Technology: 8.1.8.A.1, 8.1.8.A. 2, 8.1.8.A.3, 8.1.8.A. 4, 8.1.8.A. 5 **Other: Career Education** ● CRP4 Communicate clearly and effectively and with reason. ● CRP6 Demonstrate creativity and innovation ● CRP7 Employ valid and reliable research strategies ● CRP11 Use technology to enhance productivity

Differentiated Student Access to Content: *Recommended Strategies & Techniques*			
Core Resources	**Alternate Core Resources** *IEP/504/At-Risk/ESL*	**ELL Core Resources**	**Gifted & Talented Core Resources**
● **Large group instruction** ● **Small group instruction** ● **Think Pair Share** ● **Peer editing** ● **Cooperative group work** ● **Multimedia presentations** ● **Choice Boards/Learning Menus** ● **Manipulatives**	● 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 test for additional credit, provide additional	● Extend time requirements, preferred seating, positive reinforcement, check often for understanding/review, oral/visual directions/prompts when necessary, supplemental materials including	● Create an enhanced set of introductory activities, integrate active teaching/learning opportunities, incorporate authentic components, propose interest-based extension activities,

	times and preferential seating as needed, review, restate and repeat directions, provide study guides, and/or break assignments into segments of shorter tasks.	use of an online bilingual dictionary, and modified assessment and/or rubric.	and connect student to related talent development opportunities.

NJSLS CAREER READINESS, LIFE LITERACIES & KEY SKILLS	**Disciplinary Concept: 1.Career Awareness and Planning, 2.Creativity and Innovation, 3.Critical Thinking and Problem Solving, 4.Global and Cultural Awareness 5. Digital Citizenship 6. Information and Media Literacy 7. Technology Literacy**	
	Core Ideas:	**1. There are a variety of resources available to help navigate the career planning process.** **2. Gathering and evaluating knowledge and information from a variety of sources, including global perspectives, fosters creativity and innovative thinking.** **3. Multiple solutions often exist to solve a problem.** **4. Awareness of and appreciation for cultural differences is critical to avoid barriers to productive and positive interaction.** **5. Detailed examples exist to illustrate crediting others when incorporating their digital artifacts in one's own work.** **6. Digital tools make it possible to analyze and interpret data, including text, images, and sound. These tools allow for broad concepts and data to be more effectively communicated.** **7. Some digital tools are appropriate for gathering, organizing, analyzing, and presenting information, while other types of digital tools are appropriate for creating text, visualizations, models, and**

		communicating with others
	Performance Expectation/s:	**1. 9.2.8.CAP.12: Assess personal strengths, talents, values, and interests to appropriate jobs and careers to maximize career potential.** **2. 9.4.8.CI.1: Assess data gathered on varying perspectives on causes of climate change (e.g., cross cultural, gender-specific, generational), and determine how the data can best be used to design multiple potential solutions (e.g., RI.7.9, 6.SP.B.5, 7.1.NH.IPERS.6, 8.2.8.ETW.4).** **3. 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).** **4. 9.4.8.GCA.2: Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal.** **5. 9.4.8.DC.1: Analyze the resource citations in online materials for proper use.** **5. 9.4.8.DC.2: Provide appropriate citation and attribution elements when creating media products (e.g., W.6.8).** **6. 9.4.8.IML.4: Ask insightful questions to organize different types of data and create meaningful visualizations.** **7. 9.4.8.TL.2: Gather data and digitally represent information to communicate a real-world problem (e.g., MS-ESS3-4, 6.1.8.EconET.1, 6.1.8.CivicsPR.4).** **7. 9.4.8.TL.2: Gather data and digitally represent information to communicate a real-world problem (e.g., MS-ESS3-4, 6.1.8.EconET.1, 6.1.8.CivicsPR.4).**
	Career Readiness, Life Literacies, & Key Skills Practices	
	• **Act as a responsible and contributing community member and employee.** • **Demonstrate creativity and innovation.** • **Utilize critical thinking to make sense of problems and persevere in solving them.**	

	• **Consider the environmental, social and economic impacts of decisions.** • **Use technology to enhance productivity, increase collaboration and communicate effectively.** • **Work productively in teams while using cultural/global competence.**

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