Science

Unit	Matter and It's Interactions
Unit Duration	8 weeks
Unit Goals	
NJSLS	● **5-PS1-1** Develop a model to describe that matter is made of particles too small to be seen. *[Clarification Statement: Examples of evidence supporting a model could include adding air to expand a basketball, compressing air in a syringe, dissolving sugar in water, and evaporating salt water.] [Assessment Boundary: Assessment does not include the atomic-scale mechanism of evaporation and condensation or defining the unseen particles.]* ● **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. *[Clarification Statement: Examples of reactions or changes could include phase changes, dissolving, and mixing that form new substances.] [Assessment Boundary Assessment does not include distinguishing mass and weight.]* ● **5-PS1-3** Make observations and measurements to identify materials based on their properties. *[Clarification Statement: Examples of materials to be identified could include baking soda and other powders, metals, minerals, and liquids. Examples of properties could include color, hardness, reflectivity, electrical conductivity, thermal conductivity, response to magnetic forces, and solubility; density is not intended as an identifiable property.] [Assessment Boundary: Assessment does not include density or distinguishing mass and weight.]* ● **5-PS1-4** Conduct an investigation to determine whether the mixing of two or more substances results in new substances.
Science & Engineering Practices	● Develop a model to describe phenomena. (5-PS1-1) ● 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) ● Measure and graph quantities such as weight to address scientific and engineering questions and problems. (5-PS1-2)
Disciplinary Core Ideas	**PS1.A: Structure and Properties of Matter** ● 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 gases 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 attempt is made to define the unseen particles or explain the atomic-scale mechanism of evaporation and condensation.) (5-PS1-3) **PS1.B: Chemical Reactions** ● 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)
Cross Cutting Concepts	**Cause and Effect** ● Cause and effect relationships are routinely identified, tested, and used to explain change. (5-PS1-4) **Scale, Proportion, and Quantity** ● Natural objects exist from the very small to the immensely large. (5-PS1-1) ● Standard units are used to measure and describe physical quantities such as weight, time, temperature, and volume. (5-PS1-2), (5-PS1-3) **Scientific Knowledge Assumes an Order and Consistency in Natural Systems** ● Science assumes consistent patterns in natural systems. (5- PS1-2)
Connections to NJSLS – English Language Arts	● 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)
Connections to NJSLS - 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) ● 5.MD.C.4 Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units. (5-PS1-1)
21st Century and Career Integration	● Cause and effect relationships are routinely identified, tested, and used to explain change. (5-PS1-4) ● Natural objects exist from the very small to the immensely large. (5-PS1-1) Standard units are used to measure and describe physical quantities such as weight, time, temperature, and volume. (5-PS1- 2),(5-PS1-3)

Resources and Technology Integration

- Mystery Science – Chemical Reactions & Properties of Matter
- Brain Pop
- https://www.openscied.org/curriculum/elementary-school/explore-the-curriculum/

Assessments

- Ask questions
- Define problems
- Develop and use models
- Plan and carry out investigations
- Analyze and interpret data
- Formative assessment
- Teacher observation
- Class discussion
- Venn diagram

Unit	Ecosystems: Interactions, Energy, and Dynamics

Unit Duration	8 weeks
Unit Goals	
NJSLS	● **5-LS2-1**Develop a model to describe the movement of matter among plants, animals, decomposers, and the ● environment. [Clarification Statement: Emphasis is on the idea that matter that is not food (air, water, decomposed materials in soil) is changed by plants into matter that is food. Examples of systems could include organisms, ecosystems, and the Earth.] [Assessment Boundary: Assessment does not include molecular explanations.] ● 5-LS1-1. Support an argument that plants get the materials they need for growth chiefly from air and water. *[Clarification Statement: Emphasis is on the idea that plant matter comes mostly from air and water, not from the soil.]*
Science & Engineering Practices	● Develop a model to describe phenomena. (5-LS2-1)
Disciplinary Core Ideas	**LS2.A: Interdependent Relationships in Ecosystems** ● 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) **LS2.B: Cycles of Matter and Energy Transfer in Ecosystems** ● Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. Organisms obtain gases, and water, from the environment, and release waste matter (gas, liquid, or solid) back into the environment. (5-LS2-1)
Cross Cutting Concepts	**Systems and System Models** ● A system can be described in terms of its components and their interactions. (5-LS2-1) ● Science explanations describe the mechanisms for natural events. (5-LS2-1)
Connections to NJSLS – English Language Arts	● 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)
Connections to NJSLS - Mathematics	● MP.2 Reason abstractly and quantitatively. (5-LS2-1) ● MP.4 Model with mathematics. (5-LS2-1)
21st Century and Career Integration	● A system can be described in terms of its components and their interactions. (5-LS2- 1)

Resources and Technology Integration

- Mystery Science – Ecosystems & the Food Web
- Brain Pop
- https://www.openscied.org/curriculum/elementary-school/explore-the-curriculum/

Assessments

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Unit	Earth's Place in the Universe

Unit Duration	4 weeks
Unit Goals	
NJSLS	● **5-ESS1-1.** Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth. *[Assessment Boundary: Assessment is limited to relative distances, not sizes, of stars. Assessment does not include other factors that affect apparent brightness (such as stellar masses, age, stage).]* ● **5-ESS1-2.** Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky. *[Clarification Statement: Examples of patterns could include the position and motion of Earth with respect to the sun and selected stars that are visible only in particular months.] [Assessment Boundary: Assessment does not include causes of seasons.]*
Science & Engineering Practices	● Represent data in graphical displays (bar graphs, pictographs and/or pie charts) to reveal patterns that indicate relationships. (5-ESS1-2) ● Support an argument with evidence, data, or a model. (5- ESS1-1)
Disciplinary Core Ideas	**ESS1.A: The Universe and its Stars** ● The sun is a star that appears larger and brighter than other stars because it is closer. Stars range greatly in their distance from Earth. (5-ESS1-1) **ESS1.B: Earth and the Solar System** ● The orbits of Earth around the sun and of the moon around Earth, together with the rotation of Earth about an axis between its North and South poles, cause observable patterns. These include day and night; daily changes in the length and direction of shadows; and different positions of the sun, moon, and stars at different times of the day, month, and year. (5- ESS1-2)
Cross Cutting Concepts	**Patterns** ● Similarities and differences in patterns can be used to sort, classify, communicate and analyze simple rates of change for natural phenomena. (5-ESS1-2) **Scale, Proportion, and Quantity** ● Natural objects exist from the very small to the immensely large. (5-ESS1-1)
Connections to NJSLS – English Language Arts	● RI.5.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text. (5-ESS1-1)

	● 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-ESS1-1) ● RI.5.8 Explain how an author uses reasons and evidence to support particular points in a text, identifying which reasons and evidence support which point(s). (5-ESS1-1) ● RI.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably. (5-ESS1-1) ● W.5.1 Write opinion pieces on topics or texts, supporting a point of view with reasons and information. (5-ESS1-1) ● 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- ESS1-2)
Connections to NJSLS - Mathematics	● MP.2 Reason abstractly and quantitatively. (5-ESS1-1), (5-ESS1-2) ● MP.4 Model with mathematics. (5-ESS1-1), (5-ESS1-2) ● 5.NBT.A.2 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-ESS1-1) ● 5.G.A.2 Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation. (5-ESS1-2)
21st Century and Career Integration	● Similarities and differences in patterns can be used to sort, classify, communicate and analyze simple rates of change for natural phenomena. (5- ESS1-2) ● Natural objects exist from the very small to the immensely large. (5-ESS1- 1)

Resources and Technology Integration

- Mystery Science – Earth & Space Patterns and Stars & Planets
- Brain Pop
- https://www.openscied.org/curriculum/elementary-school/explore-the-curriculum/

Assessments

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Unit	Earth's Systems
Unit Duration	8 weeks
Unit Goals	
NJSLS	● **5-ESS2-1.** Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact. *[Clarification Statement: Examples could include the influence of the ocean on ecosystems, landform shape, and climate; the influence of the atmosphere on landforms and ecosystems through weather and climate; and the influence of mountain ranges on winds and clouds in the atmosphere. The geosphere, hydrosphere, atmosphere, and biosphere are each a system.] [Assessment Boundary: Assessment is limited to the interactions of two systems at a time.]* ● **5-ESS2-2.** Describe and graph the amounts of saltwater and fresh water in various reservoirs to provide evidence about the distribution of water on Earth. [*Assessment Boundary: Assessment is limited to oceans, lakes, rivers, glaciers, ground water, and polar ice caps, and does not include the atmosphere.]*.
Science & Engineering Practices	● Develop a model using an example to describe a scientific principle. (5-ESS2-1) ● Describe and graph quantities such as area and volume to address scientific questions. (5-ESS2-2)
Disciplinary Core Ideas	**ESS2.A: Earth Materials and Systems** ● 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)

	ESS2.C: The Roles of Water in Earth's Surface Processes ● Nearly all of Earth's available water is in the ocean. Most fresh water is in glaciers or underground; only a tiny fraction is in streams, lakes, wetlands, and the atmosphere. (5-ESS2-2)
Cross Cutting Concepts	**Scale, Proportion, and Quantity** ● Standard units are used to measure and describe physical quantities such as weight and volume. (5- ESS2-2) **Systems and System Models** ● A system can be described in terms of its components and their interactions. (5-ESS2-1)
Connections to NJSLS – English Language Arts	● 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-ESS2- 1),(5-ESS2-2) ● 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-ESS2-2) ● 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- ESS2-1),(5-ESS2-2)
Connections to NJSLS - Mathematics	● MP.2 Reason abstractly and quantitatively. (5-ESS2-1),(5-ESS2-2) ● MP.4 Model with mathematics. (5-ESS2-1),(5-ESS2-2) ● 5.G.A.2 Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation. (5-ESS2-1)
21st Century and Career Integration	● Standard units are used to measure and describe physical quantities such as weight and volume. (5-ESS2-2) ● SA system can be described in terms of its components and their interactions. (5-ESS2-1)

Resources and Technology Integration

- Mystery Science – Water Cycle & Earth's Systems
- Brain Pop
- https://www.openscied.org/curriculum/elementary-school/explore-the-curriculum/

Assessments

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Unit	Engineering Design
Unit Duration	6 weeks
Unit Goals	
NJSLS	● **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. ● **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. ● **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.
Science & Engineering Practices	● Define a simple design problem that can be solved through the development of an object, tool, process, or system and includes several criteria for success and constraints on materials, time, or cost. ● Plan and 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. ● Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design problem.
Disciplinary Core Ideas	**ETS1.A: Defining and Delimiting Engineering Problems** • A situation that people want to change or create can be approached as a problem to be solved through engineering. (K-2-ETS1-1)

	• Ask questions, make observations, and gather information about a situation people want to change (e.g., climate change) to define a simple problem that can be solved through the development of a new or improved object or tool. (K-2- ETS1-1) • Before beginning to design a solution, it is important to clearly understand the problem. (K-2- ETS1-1) **ETS1.B: Developing Possible Solutions** • Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions, such as climate change, to other people. (K-2-ETS1-2) **ETS1.C: Optimizing the Design Solution** • Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (K-2-ETS1-3)
Cross Cutting Concepts	**Influence of Engineering, Technology, and Science on Society and the Natural World** ● People's needs and wants change over time, as do their demands for new and improved technologies. (3-5-ETS1-1) ● Engineers improve existing technologies or develop new ones to increase their benefits, decrease known risks, and meet societal demands. (3-5-ETS1-2)
Connections to NJSLS – English Language Arts	● RI.5.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text. 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. ● RI.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably. W.5.7 Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic. ● 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. ● W.5.9 Draw evidence from literary or informational texts to support analysis, reflection, and research.
Connections to NJSLS - Mathematics	● MP.2 Reason abstractly and quantitatively. ● MP.4 Model with mathematics. ● MP.5 Use appropriate tools strategically. 3-5.OA Operations and Algebraic Thinking
21st Century and Career Integration	● 9.1.4.A.1 Explain the difference between a career and a job, and identify various jobs in the community and the related earnings.
Resources and Technology Integration	

- WT Maker Space Curriculum
- Brain Pop
- https://www.state.nj.us/education/modelcurriculum/sci/videos/
- https://www.state.nj.us/education/aps/cccs/science/resources/QR35.pdf
- https://www.state.nj.us/education/assessment/sla/science/

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Curriculum Modifications

Special Education and 504 Students	**General Modifications** ● Allow outlining, instead of writing for an essay or major project ● Computerized spell-check support ● Word bank of choices for answers to test questions ● Provision of calculator and/or number line for math tests ● Film or video supplements in place of reading text ● Reworded questions in simpler language ● Projects instead of written reports ● Highlighting important words or phrases in reading assignments ● Modified workload or length of assignments/tests ● Modified time demands ● Pass/no pass option ● Modified grades based on IEP **Behavioral Modifications** ● Breaks between tasks ● Cue expected behavior

	● Daily feedback to student ● Use de-escalating strategies ● Use positive reinforcement ● Use proximity/touch control ● Use peer supports and mentoring ● Model expected behavior by adults ● Have parent sign homework/behavior chart ● Set and post class rules ● Chart progress and maintain data
Students At Risk of School Failure - Students or groups of students who are considered to have a higher probability of failing academically or dropping out of school.	● Maximize use of community resources ● Connect family to school and school activities ● Support through transition ● Help develop compensating strategies ● Increase opportunity for positive peer group influences ● Supplemental courses ● Placement in small and interactive groups
English Language Learner Students (ELL)	● Alternate Responses ● Notes in Advance ● Extended Time ● Simplified Instruction (written and verbal) ● Online Dictionary ● Use lots of visuals ● Use physical activity; model, role-play ● Repeat/Rephrase often ● Use lower level materials when appropriate
Gifted & Talented Students (G&T)	**Inclusion, infusion and differentiated instruction across the curriculum meets the individual needs of gifted and talented students. Gifted and talented services include:** ● Differentiated curriculum for the gifted learner. ● Regular classroom curricula and instruction that is adapted, modified, or replaced. ● Educational opportunities consist of a continuum of differentiated curricular options, instructional approaches and materials. ● Integrated G&T programming into the general education school day. ● Flexible groupings of students to facilitate differentiated instruction and curriculum. **Learning Environments:** ● Extensive outside reading ● Active classroom discussion ● Innovative oral and written presentations

	● Deductive and inductive reasoning ● Independent writing and research ● Divergent thinking ● Challenging problem solving situations ● Interactive, independent and interdisciplinary activities