Science

Unit	Matter and Its Interactions
Unit Duration	9 weeks
Unit Goals	
NJSLS	● **2-PS1-1** Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. *[Clarification Statement: Observations could include color, texture, hardness, and flexibility. Patterns could include the similar properties that different materials share.]* ● **2-PS1-2** Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose. *[Clarification Statement: Examples of properties could include, strength, flexibility, hardness, texture, and absorbency.] [Assessment Boundary: Assessment of quantitative measurements is limited to length.]* ● **2-PS1-3** Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object. *[Clarification Statement: Examples of pieces could include blocks, building bricks, or other assorted small objects.]* ● **2-PS1-4** Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot. *[Clarification Statement: Examples of reversible changes could include materials such as water and butter at different temperatures. Examples of irreversible changes could include cooking an egg, freezing a plant leaf, and heating paper.]*
Science & Engineering Practices	● Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question. ● Analyze data from tests of an object or tool to determine if it works as intended. ● Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. ● Construct an argument with evidence to support a claim.
Disciplinary Core Ideas	**PS1.A: Structure and Properties of Matter** • Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties. (2-PS1-1) • Different properties are suited to different purposes. (2-PS1-2), (2-PS1-3) • A great variety of objects can be built up from a small set of pieces. (2-PS1-3) **PS1.B: Chemical Reactions**

	• Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible, and sometimes they are not. (2-PS1-4)
Cross Cutting Concepts	**Patterns** • Patterns in the natural and human designed world can be observed. (2-PS1-1) **Cause and Effect** • Events have causes that generate observable patterns. (2-PS1-4) • Simple tests can be designed to gather evidence to support or refute student ideas about causes. (2-PS1-2) **Energy and Matter** • Objects may break into smaller pieces and be put together into larger pieces or change shapes. (2- PS1-3)
Connections to NJSLS – English Language Arts	● RI.2.1 Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text. ● RI.2.3 Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. ● RI.2.8 Describe how reasons support specific points the author makes in a text. ● W.2.1 Write opinion pieces in which they introduce the topic or book they are writing about, state an opinion, supply reasons that support the opinion, use linking words (e.g., because, and, also) to connect opinion and reasons, and provide a concluding statement or section. W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). ● W.2.8 Recall information from experiences or gather information from provided sources to answer a question.
Connections to NJSLS - Mathematics	● MP.2 Reason abstractly and quantitatively. ● MP.4 Model with mathematics. ● MP.5 Use appropriate tools strategically. ● 2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.
21st Century and Career Integration	● 9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.
Resources and Technology Integration	

- Mystery Science – Material Properties
- Brain Pop Jr.
- 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	6 weeks
Unit Goals	
NJSLS	● **2-LS2-1.** Plan and conduct an investigation to determine if plants need sunlight and water to grow. *[Assessment Boundary: Assessment is limited to testing one variable at a time.]* ● **2-LS2-2**. Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.
Science & Engineering Practices	● Develop a simple model based on evidence to represent a proposed object or tool. ● Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question.
Disciplinary Core Ideas	**LS2.A: Interdependent Relationships in Ecosystems** • Plants depend on water and light to grow. (2-LS2-1) • Plants depend on animals for pollination or to move their seeds around. (2-LS2-2)

	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 to other people. (secondary to 2-LS2-2)
Cross Cutting Concepts	**Patterns** • Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.(1-LS1-2) **Structure and Function** • The shape and stability of structures of natural and designed objects are related to their function(s). (1-LS1-1) **Influence of Engineering, Technology, and Science on Society and the Natural World** • Every human-made product is designed by applying some knowledge of the natural world and is built using materials derived from the natural world. (1-LS1-1)
Connections to NJSLS – English Language Arts	● W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). ● W.2.8 Recall information from experiences or gather information from provided sources to answer a question. ● SL.2.5 Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings
Connections to NJSLS - Mathematics	● MP.2 Reason abstractly and quantitatively. ● MP.4 Model with mathematics. ● MP.5 Use appropriate tools strategically. ● 2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems.
21st Century and Career Integration	● 9.2.4.A.1 Identify reasons why people work, different types of work, and how work can help a person achieve personal and professional goals.
Resources and Technology Integration	

- Mystery Science – Plant Adaptations
- Brain Pop Jr.
- 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	Biological Evolution: Unity and Diversity
Unit Duration	6 weeks
Unit Goals	
NJSLS	● **2-LS4-1** Make observations of plants and animals to compare the diversity of life in different habitats. *[Clarification Statement: Emphasis is on the diversity of living things in each of a variety of different habitats.] [Assessment Boundary: Assessment does not include specific animal and plant names in specific habitats.]*
Science & Engineering Practices	● Make observations (firsthand or from media) to collect data that can be used to make comparisons. (1-ESS1- 2) ● Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (1-ESS1-1)

Disciplinary Core Ideas	**LS4.D: Biodiversity and Humans** • There are many different kinds of living things in any area, and they exist in different places on land and in water. (2-LS4-1)
Cross Cutting Concepts	**Connections to Nature of Science** **Scientific Knowledge is Based on Empirical Evidence** • Scientists look for patterns and order when making observations about the world. (2-LS4-1)
Connections to NJSLS – English Language Arts	● W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). ● W.2.8 Recall information from experiences or gather information from provided sources to answer a question.
Connections to NJSLS - Mathematics	● MP.2 Reason abstractly and quantitatively. ● MP.4 Model with mathematics. ● 2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems
21st Century and Career Integration	● 9.2.4.A.3 Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.

Resources and Technology Integration

- Mystery Science – Animal Biodiversity
- Brain Pop Jr.
- 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	Earth's Place in the Universe / Earth's Systems
Unit Duration	12 weeks
Unit Goals	
NJSLS	● **2-ESS1-1**. Use information from several sources to provide evidence that Earth events can occur quickly or slowly. *[Clarification Statement: Examples of events and timescales could include volcanic explosions and earthquakes, which happen quickly and erosion of rocks, which occurs slowly.] [Assessment Boundary: Assessment does not include quantitative measurements of timescales.]* ● **2-ESS2-1.** Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land. *[Clarification Statement: Examples of solutions could include different designs of dikes and windbreaks to hold back wind and water, and different designs for using shrubs, grass, and trees to hold back the land.]* ● **2-ESS2-2**. Develop a model to represent the shapes and kinds of land and bodies of water in an area. *[Assessment Boundary: Assessment does not include quantitative scaling in models.]* ● **2-ESS2-3**. Obtain information to identify where water is found on Earth and that it can be solid or liquid
Science & Engineering Practices	● Make observations from several sources to construct an evidence-based account for natural phenomena. ● Develop a model to represent patterns in the natural world. ● Compare multiple solutions to a problem. ● Obtain information using various texts, text features (e.g., headings, tables of contents, glossaries, electronic menus, icons), and other media that will be useful in answering a scientific question.
Disciplinary Core Ideas	**ESS1.C: The History of Planet Earth** • Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe. (2-ESS1-1)

	ESS2.A: Earth Materials and Systems • Wind and water can change the shape of the land. (2-ESS2-1) **ESS2.B: Plate Tectonics and Large Scale System Interactions** • Maps show where things are located. One can map the shapes and kinds of land and water in any area. (2-ESS2-2) **ESS2.C: The Roles of Water in Earth's Surface Processes** • Water is found in the ocean, rivers, lakes, and ponds. Water exists as solid ice and in liquid form. (2- ESS2-3) 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. (secondary to 2-ESS)
Cross Cutting Concepts	**Stability and Change** • Things may change slowly or rapidly. (2-ESS1-1) **Patterns** • Patterns in the natural and human designed world can be observed and used as evidence. (K-LS1-1) (1-ESS1-2) **Influence of Engineering, Technology, and Science on Society and the Natural World** • Developing and using technology has impacts on the natural world. (2-ESS2-1) **Science Addresses Questions About the Natural and Material World** • Scientists study the natural and material world. (2-ESS2-1)
Connections to NJSLS – English Language Arts	● W.1.7 Participate in shared research and writing projects (e.g., explore a number of "how-to" books on a given topic and use them to write a sequence of instructions). (1-ESS1-1), (1-ESS1-2) ● W.1.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question. (1- ESS1-1), (1-ESS1-2)
Connections to NJSLS - Mathematics	● MP.2 Reason abstractly and quantitatively. (1-ESS1-2) ● MP.4 Model with mathematics. (1-ESS1-2) ● MP.5 Use appropriate tools strategically. (1-ESS1-2) ● 1.OA.A.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations to represent the problem. (1-ESS1-2)

	● 1.MD.C.4 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another. (1-ESS1-2) Patterns ● Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (1-ESS1-1), (1- ESS1-2)
21st Century and Career Integration	● Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (1-ESS1-1), (1- ESS1-2)

Resources and Technology Integration

- Mystery Science – Day Patterns, Night Patterns
- Brain Pop Jr.
- https://www.openscied.org/curriculum/elementary-school/explore-the-curriculum/

Assessments

- Ask questions
- Define problems
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- Analyze and interpret data
- Formative assessment
- Teacher observation
- Class discussion
- Venn diagram

Unit	Engineering Design
Unit Duration	6 weeks

Unit Goals	
NJSLS	● **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-ETS1-2** Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem. ● **K-2-ETS1-3** Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.
Science & Engineering Practices	● Ask questions based on observations to find more information about the natural and/or designed world(s). ● Define a simple problem that can be solved through the development of a new or improved object or tool. ● Develop a simple model based on evidence to represent a proposed object or tool. ● Analyze data from tests of an object or tool to determine if it works as intended.
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	**Structure and Function** • The shape and stability of structures of natural and designed objects are related to their function(s). (K-2-ETS1-2)
Connections to NJSLS – English Language Arts	● RI.2.1 Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text. ● W.2.6 With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers.

	● W.2.8 Recall information from experiences or gather information from provided sources to answer a question. SL.2.5 Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings.
Connections to NJSLS - Mathematics	● MP.2 Reason abstractly and quantitatively. (K-2-ETS1-1),(K-2-ETS1-3) ● MP.4 Model with mathematics. (K-2-ETS1-1),(K-2-ETS1-3) ● MP.5 Use appropriate tools strategically. (K-2-ETS1-1),(K-2-ETS1-3) 2. ● MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set
21st Century and Career Integration	● 9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.

Resources and Technology Integration

- WT Maker Space Curriculum
- https://fun-a-day.com/14-fun-engineering-activities-for-kids/
- https://thekindergartenconnection.com/awesome-engineering-activities-kids/

Assessments

- Ask questions
- Define problems
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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 **<u>Behavioral Modifications</u>** ● 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