Science

Unit	Motion and Stability: Forces and Interactions
Unit Duration	8 weeks
Unit Goals	
NJSLS	● 3-PS2-1. Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object. ● 3-PS2-2. Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion. ● 3-PS2-3. Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other. ● 3-PS2-4. Define a simple design problem that can be solved by applying scientific ideas about magnets.
Science & Engineering Practices	● Ask questions that can be investigated based on patterns such as cause and effect relationships. (3-PS2-3) ● Define a simple problem that can be solved through the development of a new or improved object or tool. (3-PS2-4) ● 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. (3-PS2-1) ● Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution. (3-PS2-2)
Disciplinary Core Ideas	**PS2.A: Forces and Motion** ● Each force acts on one particular object and has both strength and a direction. An object at rest typically has multiple forces acting on it, but they add to give zero net force on the object. Forces that do not sum to zero can cause changes in the object's speed or direction of motion. (Boundary: Qualitative and conceptual, but not quantitative addition of forces are used at this level.) (3-PS2-1) ● The patterns of an object's motion in various situations can be observed and measured; when that past motion exhibits a regular pattern, future motion can be predicted from it. (Boundary: Technical terms, such as magnitude, velocity, momentum, and vector quantity, are not introduced at this level, but the concept that some quantities need both size and direction to be described is developed.) (3-PS2-2) **PS2.B: Types of Interactions** ● Objects in contact exert forces on each other. (3-PS2-1)

	● Electric and magnetic forces between a pair of objects do not require that the objects be in contact. The sizes of the forces in each situation depend on the properties of the objects and their distances apart and, for forces between two magnets, on their orientation relative to each other. (3-PS2-3),(3-PS2-4)
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.3.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. (3-PS2-1),(3-PS2-3) • RI.3.3 Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect. (3-PS2-3) • RI.3.8 Describe the logical connection between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence). (3-PS2-3) • W.3.7 Conduct short research projects that build knowledge about a topic. (3-PS2-1),(3-PS2-2) • W.3.8 Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories. (3-PS2- 1),(3-PS2-2) • SL.3.3 Ask and answer questions about information from a speaker, offering appropriate elaboration and detail. (3-PS2-3)
Connections to NJSLS - Mathematics	● MP.2 Reason abstractly and quantitatively. (3-PS2-1) ● MP.5 Use appropriate tools strategically. (3-PS2-1) ● 3.MD.A.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem. (3-PS2-1)
21st Century and Career Integration	● Patterns of change can be used to make predictions. (3-PS2-2) ● Cause and effect relationships are routinely identified. (3-PS2-1) Cause and effect relationships are routinely identified, tested, and used to explain change. (3-PS2-3)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 – Forces, Motion & Magnets ● 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	From Molecules to Organisms: Structures and Processes
Unit Duration	8 weeks
Unit Goals	
NJSLS	● **3-LS1-1.** Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death. *[Clarification Statement: Changes organisms go through during their life form a pattern.] [Assessment Boundary: Assessment of plant life cycles is limited to those of flowering plants. Assessment does not include details of human reproduction.]*
Science & Engineering Practices	● Develop models to describe phenomena. (3-LS1-1)

Disciplinary Core Ideas	**LS1.B: Growth and Development of Organisms** ● Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles. (3-LS1-1)
Cross Cutting Concepts	**Patterns** ● Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.(1-LS1-2) **Scientific Knowledge is Based on Empirical Evidence** ● Science findings are based on recognizing patterns. (3-LS1-1)
Connections to NJSLS – English Language Arts	● RI.3.7 Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur). (3-LS1-1) ● SL.3.5 Create engaging audio recordings of stories or poems that demonstrate fluid reading at an understandable pace; add visual displays when appropriate to emphasize or enhance certain facts or details. (3-LS1-1)
Connections to NJSLS - Mathematics	● MP.4 Model with mathematics. (3-LS1-1) ● 3.NBT Number and Operations in Base Ten (3-LS1-1) ● 3.NF Number and Operations—Fractions (3-LS1-1)
21st Century and Career Integration	● Patterns of change can be used to make predictions. (3-LS1-1)

Resources and Technology Integration
● Mystery Science – Life Cycles ● 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	Heredity: Inheritance and Variation of Traits
Unit Duration	6 weeks
Unit Goals	
NJSLS	● **3-LS2-1**. Construct an argument that some animals form groups that help members survive. ● **3-LS3-1**. Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms. *[Clarification Statement: Patterns are the similarities and differences in traits shared between offspring and their parents, or among siblings. Emphasis is on organisms other than humans.] [Assessment Boundary: Assessment does not include genetic mechanisms of inheritance and prediction of traits. Assessment is limited to non-human examples.]* ● **3-LS3-2.** Use evidence to support the explanation that traits can be influenced by the environment. *[Clarification Statement: Examples of the environment affecting a trait could include normally tall plants grown with insufficient water are stunted; and, a pet dog that is given too much food and little exercise may become overweight.]*
Science & Engineering Practices	● 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). Construct an argument with evidence, data, and/or a model. (3-LS2-1) ● Analyze and interpret data to make sense of phenomena using logical reasoning. (3-LS3-1) ● Use evidence (e.g., observations, patterns) to support an explanation. (3-LS3-2)

Disciplinary Core Ideas	**LS2.D: Social Interactions and Group Behavior** ● Being part of a group helps animals obtain food, defend themselves, and cope with changes. Groups may serve different functions and vary dramatically in size (3-LS2-1) **LS3.A: Inheritance of Traits** ● Many characteristics of organisms are inherited from their parents. (3-LS3-1) ● Other characteristics result from individuals' interactions with the environment, which can range from diet to learning. Many characteristics involve both inheritance and environment. (3- LS3-2) **LS3.B: Variation of Traits** ● Different organisms vary in how they look and function because they have different inherited information. (3-LS3-1) ● The environment also affects the traits that an organism develops. (3-LS3-2)
Cross Cutting Concepts	**Cause and Effect** ● Cause and effect relationships are routinely identified and used to explain change. (3-LS2-1) **Patterns** ● Similarities and differences in patterns can be used to sort and classify natural phenomena. (3- LS3-1) **Cause and Effect** ● Cause and effect relationships are routinely identified and used to explain change. (3-LS3-2)
Connections to NJSLS – English Language Arts	● RI.3.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. (3-LS3-1), (3-LS3-2) ● RI.3.2 Determine the main idea of a text; recount the key details and explain how they support the main idea. (3-LS3-1), (3-LS3-2) ● RI.3.3 Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect. (3-LS3-1), (3-LS3-2) ● W.3.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. (3-LS3-1), (3-LS3-2) ● SL.3.4 Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace. (3- LS3-1), (3-LS3-2) ● W.3.1 Write opinion pieces on topics or texts, supporting a point of view with reasons. (3-LS2-1)
Connections to NJSLS - Mathematics	● MP.4 Model with mathematics. (3-LS2-1) ● 3.NBT Number and Operations in Base Ten (3-LS2-1) ● MP.2 Reason abstractly and quantitatively. (3-LS3-1), (3-LS3-2)

	● 3.MD.B.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters. (3-LS3-1), (3-LS3-2)
21st Century and Career Integration	● MP.4 Model with mathematics. (3-LS2-1) ● 3.NBT Number and Operations in Base Ten (3-LS2-1) ● Similarities and differences in patterns can be used to sort and classify natural phenomena. (3-LS3-1) ● Cause and effect relationships are routinely identified and used to explain change. (3-LS3-2)

Resources and Technology Integration

- Mystery Science – Heredity, Survival & Selection
- Brain Pop Jr.
- https://www.openscied.org/curriculum/elementary-school/explore-the-curriculum/

Assessments

- Ask questions
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- Analyze and interpret data
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- Teacher observation
- Class discussion
- Venn diagram

Unit	Earth & Human Activity / Earth's Systems
Unit Duration	8 weeks

Unit Goals	
NJSLS	● **3-ESS2-1** Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season. *[Clarification Statement: Examples of data could include average temperature, precipitation, and wind direction.] [Assessment Boundary: Assessment of graphical displays is limited to pictographs and bar graphs. Assessment does not include climate change.]* ● **3-ESS2-2** Obtain and combine information to describe climates in different regions of the world. ● **3-ESS3-1** Make a claim about the merit of a design solution that reduces the impacts of climate change and/or a ● weather-related hazard. *[Clarification Statement: Examples of design solutions to weather-related hazards could include barriers to prevent flooding, wind resistant roofs, and lightning rods.]*
Science & Engineering Practices	● Represent data in tables and various graphical displays (bar graphs and pictographs) to reveal patterns that indicate relationships. (3-ESS2-1) ● 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). Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem. (3-ESS3-1)
Disciplinary Core Ideas	**ESS3.B: Natural Hazards** ● A variety of natural hazards result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce their impacts. (3-ESS3-1) (Note: This Disciplinary Core Idea is also addressed by 4-ESS3-2.) **ESS2.D: Weather and Climate** ● Scientists record patterns of the weather across different times and areas so that they can make predictions about what kind of weather might happen next. (3- ESS2-1) ● Climate describes a range of an area's typical weather conditions and the extent to which those conditions vary over years. (3-ESS2-2)
Cross Cutting Concepts	**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** ● Engineers improve existing technologies or develop new ones to increase their benefits (e.g., better artificial limbs), decrease known risks (e.g., seatbelts in cars), and meet societal demands (e.g., cell phones). (3-ESS3-1) **Science is a Human Endeavor**

	● Science affects everyday life. (3-ESS3-1)
Connections to NJSLS – English Language Arts	● RI.3.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. (3-ESS2-2) ● RI.3.9 Compare and contrast the most important points and key details presented in two texts on the same topic. (3-ESS2-2) ● W.3.8 Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories. (3- ESS2-2) ● W.3.1 Write opinion pieces on topics or texts, supporting a point of view with reasons. (3-ESS3-1) ● W.3.7 Conduct short research projects that build knowledge about a topic. (3-ESS3-1)
Connections to NJSLS - Mathematics	● MP.2 Reason abstractly and quantitatively. (3-ESS2-1), (3-ESS2-2) ● MP.4 Model with mathematics. (3-ESS2-1),(3-ESS2-2) ● MP.5 Use appropriate tools strategically. (3-ESS2-1) 3.MD.A.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem. (3-ESS2-1) ● 3.MD.B.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in bar graphs. (3-ESS2-1)
21st Century and Career Integration	● Patterns of change can be used to make predictions. (3-ESS2-1),(3-ESS2-2) ● Cause and effect relationships are routinely identified, tested, and used to explain change. (3-ESS3-1)

Resources and Technology Integration

- Mystery Science – Weather & Climate
- Brain Pop Jr.
- 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
- https://thestemlaboratory.com/stem-activities-for-kids/
- https://www.education.com/activity/second-grade/science/
- http://detectiveosterhoff.weebly.com/stem-activities-by-grade-level.html

Assessments

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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