Science

Unit	Motion and Stability: Forces and Interactions
Unit Duration	6 weeks
Unit Goals	
NJSLS	● **K-PS2-1** Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object. *[Clarification Statement: Examples of pushes or pulls could include a string attached to an object being pulled, a person pushing an object, a person stopping a rolling ball, and two objects colliding and pushing on each other.] [Assessment Boundary: Assessment is limited to different relative strengths or different directions, but not both at the same time. Assessment does not include non-contact pushes or pulls such as those produced by magnets.]* ● **K-PS2-2** Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull. *[Clarification Statement: Examples of problems requiring a solution could include having a marble or other object move a certain distance, follow a particular path, and knock down other objects. Examples of solutions could include tools such as a ramp to increase the speed of the object and a structure that would cause an object such as a marble or ball to turn.] [Assessment Boundary: Assessment does not include friction as a mechanism for change in speed.]*
Science & Engineering Practices	● With guidance, plan and conduct an investigation in collaboration with peers. ● Analyze data from tests of an object or tool to determine if it works as intended.
Disciplinary Core Ideas	**PS2.A: Forces and Motion** • Pushes and pulls can have different strengths and directions. (K-PS2- 1), (K-PS2-2) • Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. (KPS2-1), (K-PS2-2) **PS2.B: Types of Interactions** • When objects touch or collide, they push on one another and can change motion. (K-PS2-1) **PS3.C: Relationship Between Energy and Forces** • A bigger push or pull makes things speed up or slow down more quickly. (secondary to K-PS2-1)
Cross Cutting Concepts	**Cause and Effect** • Simple tests can be designed to gather evidence to support or refute student ideas about causes. (K-PS2-1), (K-PS2-2)

	Connections to Nature of Science **Scientific Investigations Use a Variety of Methods** • Scientists use different ways to study the world. (K-PS2-1)
Connections to NJSLS – English Language Arts	● RI.K.1 With prompting and support, ask and answer questions about key details in a text. ● W.K.7 Participate in shared research and writing projects ● SL.K.3 Ask and answer questions in order to seek help, get information, or clarify something that is not understood.
Connections to NJSLS - Mathematics	● MP.2 Reason abstractly and quantitatively ● K.MD.A.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. ● K.MD.A.2 Directly compare two objects with a measurable attribute in common, to see which object has “more of” or “less of” the attribute, and describe the difference.
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 – Pushes and Pulls ● 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	Energy
Unit Duration	6 weeks
Unit Goals	
NJSLS	● **K-PS3-1.** Make observations to determine the effect of sunlight on Earth's surface. *[Clarification Statement: Examples of Earth's surface could include sand, soil, rocks, and water] [Assessment Boundary: Assessment of temperature is limited to relative measures such as warmer/cooler.]* ● **K-PS3-2** Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area. *[Clarification Statement: Examples of structures could include umbrellas, canopies, and tents that minimize the warming effect of the sun.]*
Science & Engineering Practices	● Make observations (firsthand or from media) to collect data that can be used to make comparisons. ● Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem.
Disciplinary Core Ideas	**PS3.B: Conservation of Energy and Energy Transfer** • Sunlight warms Earth's surface. (K-PS3-1), (K-PS3-2)
Cross Cutting Concepts	**Cause and Effect** • Events have causes that generate observable patterns. (K-PS3-1), (K-PS3-2) **Connections to Nature of Science**

	Scientific Investigations Use a Variety of Methods • Scientists use different ways to study the world. (K-PS2-1)
Connections to NJSLS – English Language Arts	● W.K.7 Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them). (K-PS3-1),(K-PS3-2)
Connections to NJSLS - Mathematics	● K.MD.A.2 Directly compare two objects with a measurable attribute in common, to see which object has “more of”/”less of” the attribute, and describe the difference. (K-PS3-1),(KPS3-2)
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 – Sunlight and Warmth
- 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	6 weeks
Unit Goals	
NJSLS	● **K-LS1-1** Use observations to describe patterns of what plants and animals (including humans) need to survive. *[Clarification Statement: Examples of patterns could include that animals need to take in food but plants do not; the different kinds of food needed by different types of animals; the requirement of plants to have light; and, that all living things need water.]*
Science & Engineering Practices	● Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions.
Disciplinary Core Ideas	**LS1.C: Organization for Matter and Energy Flow in Organisms** • All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow. (K-LS1-1)
Cross Cutting Concepts	**Patterns** • Patterns in the natural and human designed world can be observed and used as evidence. (K-LS1-1) **Connections to Nature of Science** **Scientific Knowledge is Based on Empirical Evidence** • Scientists look for patterns and order when making observations about the world. (K-LS1-1)
Connections to NJSLS – English Language Arts	● W.K.7 Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them).
Connections to NJSLS - Mathematics	● K.MD.A.2 Directly compare two objects with a measurable attribute in common, to see which object has “more of”/”less of” the attribute, and describe the difference.
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 Needs, Plant Needs ● 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 Systems
Unit Duration	6 weeks
Unit Goals	
NJSLS	● **K-ESS3-1** Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live. *[Clarification Statement: Examples of relationships could include that deer eat buds and leaves, therefore, they usually live in forested areas; and, grasses need sunlight, so they often grow in meadows. Plants, animals, and their surroundings make up a system.]* ● **K-ESS3-2** Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to severe weather. *[Clarification Statement: Emphasis is on local forms of severe weather.]*

	● **K-ESS3-3** Communicate solutions that will reduce the impact of climate change and humans on the land, water, air, and/or other living things in the local environment. *[Clarification Statement: Examples of human impact on the land could include cutting trees to produce paper and using resources to produce bottles. Examples of solutions could include reusing paper and recycling cans and bottles.]*
Science & Engineering Practices	● Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. ● Construct an argument with evidence to support a claim.
Disciplinary Core Ideas	**ESS3.A: Natural Resources** • Living things need water, air, and resources from the land, and they live in places that have the thingsthey need. Humans use natural resources for everything they do. (K-ESS3-1) **ESS3.B: Natural Hazards** • Some kinds of severe weather are more likely than others in a given region. Weather scientists forecast severe weather so that the communities can prepare for and respond to these events. (K-ESS3-2) **ESS3.C: Human Impacts on Earth Systems** • Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. (K-ESS3-3)
Cross Cutting Concepts	**Cause and Effect** • **Events have causes that generate observable patterns. (K-ESS3-2), (K-ESS3-3)** **Systems and System Models** • **Systems in the natural and designed world have parts that work together. (K-ESS3-1)** **Connections to Engineering, Technology, and Applications of Science** **Interdependence of Science, Engineering, and Technology** • **People encounter questions about the natural world every day. (KESS3-2)** **Influence of Engineering, Technology, and Science on Society and the Natural World** • **People depend on various technologies in their lives; human life would be very different without technology. (K-ESS3-2)**
Connections to NJSLS – English Language Arts	● RI.K.1 With prompting and support, ask and answer questions about key details in a text. ● W.K.1 Use a combination of drawing, dictating, and writing to compose opinion pieces in which they tell a reader the topic or the name of the book they are writing about and state an opinion or preference about the topic or book.

	● W.K.2 Use a combination of drawing, dictating, and writing to compose informative/ explanatory texts in which they name what they are writing about and supply some information about the topic. ● W.K.7 Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them)
Connections to NJSLS - Mathematics	● MP.2 Reason abstractly and quantitatively. ● MP.4 Model with mathematics. K.CC.A Know number names and the count sequence. ● K.MD.A.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. ● K.MD.B.3 Classify objects into given categories; count the number of objects in each category and sort the categories by count.
21st Century and Career Integration	● 9.2.4.A.2 Identify various life roles and civic and work-related activities in the school, home, and community.

Resources and Technology Integration

- Mystery Science – Weather Patterns, Severe Weather
- 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 and Human Activity
Unit Duration	6 weeks
Unit Goals	
NJSLS	● **K-ESS3-1** Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live. *[Clarification Statement: Examples of relationships could include that deer eat buds and leaves, therefore, they usually live in forested areas; and, grasses need sunlight, so they often grow in meadows. Plants, animals, and their surroundings make up a system.]* ● **K-ESS3-2** Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to severe weather. *[Clarification Statement: Emphasis is on local forms of severe weather.]* ● **K-ESS3-3** Communicate solutions that will reduce the impact of climate change and humans on the land, water, air, and/or other living things in the local environment. *[Clarification Statement: Examples of human impact on the land could include cutting trees to produce paper and using resources to produce bottles. Examples of solutions could include reusing paper and recycling cans and bottles.]*
Science & Engineering Practices	● Ask questions based on observations to find more information about the designed world. ● Use a model to represent relationships in the natural world. ● Read grade-appropriate texts and/or use media to obtain scientific information to describe patterns in the natural world.
Disciplinary Core Ideas	**ESS3.A: Natural Resources** • Living things need water, air, and resources from the land, and they live in places that have the thingsthey need. Humans use natural resources for everything they do. (K-ESS3-1) **ESS3.B: Natural Hazards** • Some kinds of severe weather are more likely than others in a given region. Weather scientists forecast severe weather so that the communities can prepare for and respond to these events. (K-ESS3-2) **ESS3.C: Human Impacts on Earth Systems** • Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. (K-ESS3-3)
Cross Cutting Concepts	**Cause and Effect**

	• Events have causes that generate observable patterns. (K-ESS3-2), (K-ESS3-3) **Systems and System Models** • Systems in the natural and designed world have parts that work together. (K-ESS3-1) **Connections to Engineering, Technology, and Applications of Science** **Interdependence of Science, Engineering, and Technology** • People encounter questions about the natural world every day. (KESS3-2) **Influence of Engineering, Technology, and Science on Society and the Natural World** • People depend on various technologies in their lives; human life would be very different without technology. (K-ESS3-2)
Connections to NJSLS – English Language Arts	● RI.K.1 With prompting and support, ask and answer questions about key details in a text. ● W.K.2 Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic. SL.K.3 Ask and answer questions in order to seek help, get information, or clarify something that is not understood. SL.K.5 Add drawings or other visual displays to descriptions as desired to provide additional detail.
Connections to NJSLS - Mathematics	● MP.2 Reason abstractly and quantitatively. ● MP.4 Model with mathematics. ● K.CC Counting and Cardinality
21st Century and Career Integration	● 9.2.4.A.2 Identify various life roles and civic and work-related activities in the school, home, and community.

Resources and Technology Integration
● Mystery Science – Weather Patterns, Severe Weather ● 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	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/ ● https://thestemlaboratory.com/kindergarten-stem-activities/

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

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