

HILLSBOROUGH TOWNSHIP SCHOOL DISTRICT

SCIENCE CURRICULUM

KINDERGARTEN

AUGUST 2021

Kindergarten Science Course Overview

Kindergarten students are naturally curious scientists of their world. The kindergarten science curriculum of Hillsborough Township Public Schools aims to educate students in the areas of Physical Sciences, Life Sciences, as well as Earth and Space Sciences. The performance expectations in kindergarten help students formulate answers to questions such as: How do our senses help us explore, investigate, and understand the world around us? What is the weather like today and how is it different from yesterday? Where do animals live and why do they live there? How are animals different from plants? How is light, sound and heat observed in our everyday lives? What happens if you push or pull an object harder?

Students are expected to develop an understanding of patterns and changes in local weather and the purpose of weather forecasting to prepare for, and react to, and adapt to severe weather. Students are able to apply an understanding of the effects of different strengths or different directions of pushes and pulls on the motion of an object to analyze a design solution. Students are also expected to develop understanding of what plants and animals (including humans) need to survive and the relationship between their needs and where they live.

The crosscutting concepts of patterns, cause and effect, systems and system models, interdependence of science, engineering, and technology, and influence of engineering, technology, and science on society and the natural world are embedded as organizing concepts for the above mentioned disciplinary core ideas.

In the kindergarten performance expectations, students are expected to demonstrate grade-appropriate proficiency in the practices of science and engineering by asking questions, developing and using models, planning and carrying out investigations, analyzing and interpreting data, designing solutions, engaging in argument from evidence, and obtaining, evaluating, and communicating information. Students are expected to use these practices to demonstrate understanding of the core ideas.

The kindergarten science curriculum meets the requirements of the New Jersey Student Learning Standards for Science. It also helps to prepare students to meet and exceed the standards assessed by the New Jersey State administered assessments through higher order application of various skills required for complete understanding and sensemaking of science phenomena at the kindergarten level.

**Hillsborough Township Public Schools
Grade K Science Curriculum**

Unit Title	Time Frame/Pacing
Sensational Senses	7 weeks
Phenomena/Anchoring Activity/Anchoring Question/Essential Questions	
<p><u>Phenomena:</u></p> <ul style="list-style-type: none"> ● Introduction to Unit: Go outside and complete an experiment. First, have students close their eyes and discuss what they are doing with their five senses. Then, have students open their eyes and repeat questions. <p><u>Anchoring Activity:</u></p> <ul style="list-style-type: none"> ● Sense of Touch: Create a Feely Box with several different items. Have students reach in the feely box and guess what the items are. ● Sense of Smell: Can you guess the secret smell? ● Sense of Hearing: Watch video with no sound at first, then rewatch with sound and compare the differences. <ul style="list-style-type: none"> ○ What is sound? (SciShow Kids) ○ What is sound? (Kids Academy) ● Sense of Sight: Use blindfold and have students discuss what it would be like to not be able to see. <p><u>Essential Question(s):</u></p> <ul style="list-style-type: none"> ● How do our senses help us explore, investigate and understand the world around us? 	
Enduring Understandings	
<ul style="list-style-type: none"> ● The students will be able to associate each sense with its corresponding physical structure, or body part, and to process and classify information gathered with one or more senses. ● There are five senses. They are smell, taste, touch, sight and hearing. ● Our senses help us understand our bodies, learn what they need and keep us safe. ● Our senses help us learn about the people, places, objects and environment around us. 	
NJ Standards/NGSS Performance Expectations Taught and Assessed Students who demonstrate understanding can:	
<ul style="list-style-type: none"> ● 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.] 	

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3-Dimensional Learning Components		
Science and Engineering Practices	Disciplinary Core Ideas (DCI)	Crosscutting Concepts
<p>Analyzing and Interpreting Data</p> <ul style="list-style-type: none"> Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. 	<p>LS1.C: Organization for Matter and Energy Flow in Organisms</p> <ul style="list-style-type: none"> 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) <p>ESS2.E: Biogeology</p> <ul style="list-style-type: none"> Plants and animals can change their environment. (K-ESS2-2) <p>ESS3.A: Natural Resources</p> <ul style="list-style-type: none"> Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do. (K-ESS3-1) <p>ESS3.C: Human Impacts on Earth Systems</p> <ul style="list-style-type: none"> 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) <p>ETS1.B: Developing Possible Solutions</p> <ul style="list-style-type: none"> 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 K-ESS3-3) 	<p>Patterns</p> <ul style="list-style-type: none"> Patterns in the natural and human designed world can be observed and used as evidence. (K-LS1-1)

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Interdisciplinary Connections: Math, ELA, and Computer Science and Design Thinking

Math

- 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-LS1-1)

ELA

- 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-LS1-1)

Computer Science and Design Thinking

- 8.2.2.B.3 Identify products or systems that are designed to meet human needs.

Career Readiness, Life Literacies, and Key Skills

- 9.3.ST-ET.2 Display and communicate STEM information.
- 9.3.ST-ET.5 Apply the knowledge learned in STEM to solve problems.

Social-Emotional Learning Competencies

- Recognize and identify the thoughts, feelings, and perspectives of others
- Demonstrate an awareness of the differences among individuals, groups, and others’ cultural backgrounds
- Demonstrate an understanding of the need for mutual respect when viewpoints differ
- Demonstrate an awareness of the expectations for social interactions in a variety of settings
- Develop, implement, and model effective problem-solving and critical thinking skills

Learning Targets	Investigations/Resources	Formative Assessment
<p>Ask and answer questions about how we use our five senses to gather information about the world around us.</p> <p>Ask and answer questions about body parts and how the body part relates to each sense.</p>	<p>Section 1.1 - Our Sensational Senses</p> <ul style="list-style-type: none"> ● Investigation 1: Mystery Sounds ● Investigation 2: Smellies ● Investigation 3: Paste The Taste ● Investigation 4: Senses Assessment (Formative) ● My Five Sensational Senses Book - Assessment 	<p>Formative Assessment:</p> <p>Investigation 4: Senses Assessment</p> <ul style="list-style-type: none"> ● Teacher and students will discuss and explain answers to meet learning targets. (Answers may vary)

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<p>Use senses to communicate properties of objects.</p> <p>Compare and classify objects using one or more senses.</p>	<p style="text-align: center;">Books:</p> <ul style="list-style-type: none"> ● <u>Brown Bear, Brown Bear</u> by Bill Martin Jr. ● <u>My Five Senses</u> by Alikei ● <u>The Five Senses: Touching</u> by Rebecca Rissman ● <u>The Five Senses: Hearing</u> by Rebecca Rissman ● <u>The Five Senses: Smelling</u> by Rebecca Rissman ● <u>The Five Senses: Tasting</u> by Rebecca Rissman <p style="text-align: center;">Resources On Youtube:</p> <ul style="list-style-type: none"> ● What is Sound? (SciShow Kids) ● What is Sound? (Kids Academy) ● Brainpop Jr.: Senses ● The Five Senses (The Dr. Binocs Show) ● The Five Senses (ABCya Game) ● What Do You Hear? (Super Simple Songs) ● The Sense Of Taste: How Does It Work? (Senses For Kids) ● Five Senses: Taste, Smell, Sight, Hearing, Touch - Quiz For Kids (KidsEduc.com) ● Sid the Science Kid: All My Senses 	
<p>Instructional Modifications and/or Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) When Appropriate</p>		
<ul style="list-style-type: none"> ● Read articles and/or directions to students to help with comprehension ● Teacher provided scaffolding for designing investigations, one-on-one or in small groups ● Provide access to anchor charts and classroom labels relevant to science concepts ● Scribe for students or allow students to use talk-to-text feature on Chromebooks when responding to questions ● Provide access to articles and books further exploring the topic of study ● Any other modification as per student IEP or 504 plan 		
<p>Common Assessment(s)</p>	<p>Assessment Modifications and/or Accommodations</p>	

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	(ELL, Special Education, Gifted, At-Risk of Failure, 504) When Appropriate
My Five Sensational Senses Journal ~ Students will illustrate a picture of what they see, touch, hear, smell, and taste.	<ul style="list-style-type: none">• Provide modifications per IEPs

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Unit Title	Time Frame/Pacing
Weather	8 weeks
Phenomena/Anchoring Activity/Anchoring Question/Essential Questions	
<p><u>Phenomena:</u></p> <ul style="list-style-type: none"> ● What changes do you notice throughout the year? (Weather, temperature, activities, clothing) <p><u>Anchoring Activities:</u></p> <ul style="list-style-type: none"> ● Watch: Wonder About Weather (Nat Geo Kids) ● Record weather each day ● Observe how a tree changes throughout the year. ● Discuss how to stay safe in severe weather. <p><u>Essential Question(s):</u></p> <ul style="list-style-type: none"> ● How does weather affect our daily activities? ● How do weather patterns change throughout the year? ● What's the wildest weather you've ever seen? (Hail, Fog, Thunder and Lightning, Snow, Tornado) 	
Enduring Understandings	
<ul style="list-style-type: none"> ● Weather is affected by many factors. ● Weather is predictable. ● Some climates have four seasons. ● Humans must conserve and preserve natural resources for future generations. 	
NJ Standards/NGSS Performance Expectations Taught and Assessed Students who demonstrate understanding can:	
<ul style="list-style-type: none"> ● K-ESS2-1 Use and share observations of local weather conditions to describe patterns over time. [Clarification Statement: Examples of qualitative observations could include descriptions of the weather (such as sunny, cloudy, rainy, and warm); examples of quantitative observations could include numbers of sunny, windy, and rainy days in a month. Examples of patterns could include that it is usually cooler in the morning than in the afternoon and the number of sunny days versus cloudy days in different months.] [Assessment Boundary: Assessment of quantitative observations limited to whole numbers and relative measures such as warmer/cooler.] ● K-ESS3-2 Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather. [Clarification 	

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Statement: Emphasis is on local forms of severe weather.]

3-Dimensional Learning Components

Science and Engineering Practices	Disciplinary Core Ideas (DCI)	Crosscutting Concepts
<p>Analyzing and Interpreting Data</p> <ul style="list-style-type: none"> Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations. Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. <p>Asking Questions and Defining Problems</p> <ul style="list-style-type: none"> Asking questions and defining problems in grades K–2 builds on prior experiences and progresses to simple descriptive questions that can be tested. Ask questions based on observations to find more information about the designed world. <p>Obtaining, Evaluating, and Communicating Information</p> <ul style="list-style-type: none"> Obtaining, evaluating, and communicating information in K–2 builds on prior experiences and uses observations and texts to communicate new information. Read grade-appropriate texts and/or use media to obtain scientific information to describe patterns in the natural world. 	<p>ESS2.D: Weather and Climate</p> <ul style="list-style-type: none"> Weather is the combination of sunlight, wind, snow or rain, and temperature in a particular region at a particular time. People measure these conditions to describe and record the weather and to notice patterns over time. (K-ESS2-1) <p>ESS3.B: Natural Hazards</p> <ul style="list-style-type: none"> 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) <p>ETS1.A: Defining and Delimiting an Engineering Problem</p> <ul style="list-style-type: none"> Asking questions, making observations, and gathering information are helpful in thinking about problems. (secondary to K-ESS3-2) 	<p>Systems and System Models</p> <ul style="list-style-type: none"> Systems in the natural and designed world have parts that work together. (K-ESS2-1) <p>Cause and Effect</p> <ul style="list-style-type: none"> Events have causes that generate observable patterns. (K-ESS3-2) <p>Interdependence of Science, Engineering, and Technology</p> <ul style="list-style-type: none"> People encounter questions about the natural world every day. (K-ESS3-2) <p>Influence of Engineering, Technology, and Science on Society and the Natural World</p> <ul style="list-style-type: none"> People depend on various technologies in their lives; human life would be very different without technology. (K-ESS3-2)

Interdisciplinary Connections: Math, ELA, and Computer Science and Design Thinking

Math

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- MP.2 Reason abstractly and quantitatively. (K-ESS2-1)
- MP.4 Model with mathematics. (K-ESS2-1), (K-ESS3-2)
- K.CC Counting and Cardinality (K-ESS3-2)
- K.CC.A Know number names and the count sequence. (K-ESS2-1)
- K.MD.A.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. (K-ESS2-1)

ELA

- RI.K.1 With prompting and support, ask and answer questions about key details in a text. (K-ESS2-3)
- SL.K.3 Ask and answer questions in order to seek help, get information, or clarify something that is not understood. (K-ESS3-2)
- 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-ESS2-1)

Computer Science and Design Thinking

- 8.2.2.A.1 Define products produced as a result of technology or of nature.
- 8.2.2.A.2 Describe how designed products and systems are useful at school, home and work.
- 8.2.2.A.3 Identify a system and the components that work together to accomplish its purpose.
- 8.2.2.B.1 Identify how technology impacts or improves life.
- 8.2.2.B.2 Demonstrate how reusing a product affects the local and global environment.
- 8.2.2.B.3 Identify products or systems that are designed to meet human needs.
- 8.2.2.B.4 Identify how the ways people live and work has changed because of technology.

Career Readiness, Life Literacies, and Key Skills

- 9.3.ST.2 Use technology to acquire, manipulate, analyze and report data.

Social-Emotional Learning Competencies

- Recognize and identify the thoughts, feelings, and perspectives of others
- Demonstrate an awareness of the differences among individuals, groups, and others' cultural backgrounds
- Demonstrate an understanding of the need for mutual respect when viewpoints differ
- Demonstrate an awareness of the expectations for social interactions in a variety of settings
- Develop, implement, and model effective problem-solving and critical thinking skills

Learning Targets	Investigations/Resources	Formative Assessment
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<p>Investigate ways that weather influences human behavior.</p> <p>Observe, analyze, and explain weather conditions including temperature, wind speed, precipitation, and sky conditions.</p> <p>Record daily observations of general weather conditions.</p> <p>Create a bar graph of daily weather observations over time (weekly and monthly).</p> <p>Analyze weather data over time to identify patterns.</p> <p>Report what a weather forecaster does.</p> <p>Illustrate and name one kind of severe weather. Construct an explanation for the factors that identify the severe weather event.</p> <p>Explain what steps families should take to stay safe in severe weather.</p>	<p>Section 1.1 - Weather Watches</p> <ul style="list-style-type: none"> ● My Weather Journal ● Investigation 1: Weather Observations ● Investigation 2: What Will I Wear? Assessment ● Investigation 3: Rain in a Bag ● Investigation 4: Clouds <p>Section 1.2 - Stormy Weather Ahead!</p> <ul style="list-style-type: none"> ● Investigation 1: Predicting Weather ● Investigation 2: Safety Flap Book ● Investigation 3: Power Outage Safety ● Investigation 4: My Ready Kit ● Investigation 5: Family Ready Kit <p style="text-align: center;">Books:</p> <ul style="list-style-type: none"> ● <u>True or False? Weather</u> by Daniel Nunn ● <u>Maisy's Wonderful Weather Book</u> by Lucy Cousins ● <u>What is Weather?</u> By Robin Johnson ● <u>Blizzard</u> by John Rocco ● <u>Blackout</u> by John Rocco <p style="text-align: center;">Resources On Youtube:</p> <ul style="list-style-type: none"> ● Brain Pop Jr.: <ul style="list-style-type: none"> ○ Summer ○ Spring ○ Fall ○ Winter ○ Seasons ● Websites: <ul style="list-style-type: none"> ○ Weather WizKids ○ Scholastic News: My Wild Weather Day ● Sesame Street: Grover Reports The Weather 	<p>Observe the weather each day for a month. For week 1 through week 4, circle the symbol that shows the weather for that day. Then circle hot or cold to show the temperature. (You can do this individually or as a whole class).</p> <p>Activity Sheet 1: Weather Observations at the end of the month complete a graph of weather observations which indicates the number of days different weather occurred during that month.</p> <p>Activity Sheet 3: Power Outage Safety Match each picture and safety rule.</p> <p>Activity Sheet 4: My Ready Kit Cut and paste pictures of items that would be packed into a ready kit in case of an emergency.</p>
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	<ul style="list-style-type: none"> ● Be A Weather Watcher (Science For Kids) ● What's The Weather Like Today? (The Kiboomers) ● What Exactly Is A Blizzard? ● What To Do During And After A Power Outage. ● Be Prepared For Anything! Emergency Kits For Kids (SciShow Kids) ● Where Do Snowflakes Come From? (SciShow Kids) 	
<p>Instructional Modifications and/or Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) When Appropriate</p>		
<ul style="list-style-type: none"> ● Read articles and/or directions to students to help with comprehension ● Teacher provided scaffolding for designing investigations, one-on-one or in small groups ● Provide access to anchor charts and classroom labels relevant to science concepts ● Scribe for students or allow students to use talk-to-text feature on Chromebooks when responding to questions ● Provide access to articles and books further exploring the topic of study ● Any other modification as per student IEP or 504 plan 		
<p>Common Assessment(s)</p>	<p>Assessment Modifications and/or Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) When Appropriate</p>	
<p>Investigation 2 ~ What Will I Wear? Students should match pictures of clothes to appropriate weather.</p>	<ul style="list-style-type: none"> ● Provide modifications per IEPs 	

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Unit Title	Time Frame/Pacing
Motion and Forces	7 weeks
Phenomena/Anchoring Activity/Anchoring Question/Essential Questions	
<p><u>Phenomena:</u></p> <ul style="list-style-type: none"> ● Pushing and pulling objects in the classroom. <p><u>Anchoring Activities:</u></p> <ul style="list-style-type: none"> ● Visit to the playground to observe the motion of the playground equipment ● Bean Bag Toss ● Tug of War Game <p><u>Essential Questions:</u></p> <ul style="list-style-type: none"> ● What is motion? ● How do objects move? ● How can you make an object move? ● How can you change an object's direction? ● What causes moving objects to stop? 	
Enduring Understandings	
<ul style="list-style-type: none"> ● Motion of an object can be described by the distance it has moved from its initial position to its final position. ● A force is a push or pull that gets something moving or stops something that is already in motion. An object that is at rest will stay at rest until a push or pull moves it. 	
NJ Standards/NGSS Performance Expectations Taught and Assessed Students who demonstrate understanding can:	
<ul style="list-style-type: none"> ● 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. 	

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[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.]

3-Dimensional Learning Components

Science and Engineering Practices	Disciplinary Core Ideas (DCI)	Crosscutting Concepts
<p>Planning and Carrying Out Investigations</p> <ul style="list-style-type: none"> With guidance, plan and conduct an investigation in collaboration with peers. (K-PS2-1) <p>Analyzing and Interpreting Data</p> <ul style="list-style-type: none"> Analyze data from tests of an object or tool to determine if it works as intended. (K-PS2-2) 	<p>PS2.A: Forces and Motion</p> <ul style="list-style-type: none"> 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. (K-PS2-1), (K-PS2-2) <p>PS2.B: Types of Interactions</p> <ul style="list-style-type: none"> When objects touch or collide, they push on one another and can change motion. (K-PS2-1) <p>PS3.C: Relationship Between Energy and Forces</p> <ul style="list-style-type: none"> A bigger push or pull makes things speed up or slow down more quickly. (secondary to K-PS2-1) <p>ETS1.A: Defining Engineering Problems</p> <ul style="list-style-type: none"> A situation that people want to change or create can be approached as a problem to be solved through engineering. Such problems may have many acceptable solutions. (secondary to K-PS2-2) 	<p>Cause and Effect</p> <ul style="list-style-type: none"> Simple tests can be designed to gather evidence to support or refute student ideas about causes. (K-PS2-1), (K-PS2-2)

Interdisciplinary Connections: Math, ELA, and Computer Science and Design Thinking

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Math

- MP.2 Reason abstractly and quantitatively. (K-PS2-1)
- K.MD.A.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. (K-PS2-1)
- 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-PS2-1)

ELA

- RI.K.1 With prompting and support, ask and answer questions about key details in a text. (K-PS2-2)
- 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-PS2-1)
- SL.K.3 Ask and answer questions in order to seek help, get information, or clarify something that is not understood. (K-PS2-2)

Computer Science and Design Thinking

- 8.2.2.C.1 Brainstorm ideas on how to solve a problem or build a product.
- 8.2.2.C.2 Create a drawing of a product or device that communicates its function to peers and discuss.
- 8.2.2.C.3 Explain why we need to make new products.
- 8.2.2.C.5 Describe how the parts of a common toy or tool interact and work as part of a system.
- 8.2.2.E.1 List and demonstrate the steps to an everyday task.

Career Readiness, Life Literacies, and Key Skills

- 9.3.ST-SM.2 Apply science and mathematics concepts to the development of plans, processes and projects that address real world problems.
- 9.3.ST-SM.3 Analyze the impact that science and mathematics has on society.

Social-Emotional Learning Competencies

- Recognize and identify the thoughts, feelings, and perspectives of others
- Demonstrate an awareness of the differences among individuals, groups, and others’ cultural backgrounds
- Demonstrate an understanding of the need for mutual respect when viewpoints differ
- Demonstrate an awareness of the expectations for social interactions in a variety of settings
- Develop, implement, and model effective problem-solving and critical thinking skills

Learning Targets	Investigations/Resources	Formative Assessment
Measure the distance that an object has traveled.	Section 2.1 - Distance and Motion <ul style="list-style-type: none"> ● Investigation 1 - Distance 	Formative Assessment: Bean Bag Toss Investigation: Teacher will model

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Compare speeds of two objects using a stopwatch.

Analyze a bar graph to interpret the information being communicated.

- Investigation 2 - Race Times Bar Graph
- Section 2.2 - Forces and Motion
- Investigation 1 - Bean Bag Bar Graph (Formative Assessment)
 - Investigation: How does the mass of an object affect its motion?
 - Investigation: How does the direction of a force affect an object's motion?
 - Investigation: Putting it all together: Can we make a tennis ball repeatedly knock over a block?
 - Push and Pull Worksheet - Assessment

Books:

- Inch By Inch by Leo Lionni
- The Fastest Animals by Catherine Ipcizade
- Oscar and the Cricket by Geoff Waring
- Push and Pull by Patricia J. Murphy

Resources On Youtube:

- BrainPop Jr.: Pushes and Pulls
- BrainPop Jr.: Forces and Magnets
- BrainPop Jr. : Gravity
- What is Force?
- Push and Pull for Kids
- Motion: Push and Pull, Fast and Slow
- Push and Pull Forces
- Push and Pull for Kids
- The Motion Song
- Learn About Force And Motion With Milo The Monster

throwing the bean bag with increasing force (soft throw, medium throw, and hard throw). The students will be invited to toss the bean bag using different forces as modeled by the teacher. They will conclude that the stronger the force the farther distance the bean bag will travel.

Act out examples of pushing and pulling (Example: Opening and closing a door; Pushing buttons on a calculator; Push ups; Tug of War).

Illustrate a picture of a push or a pull.

Investigation 1: Distance

Pushes and Pulls Worksheet: Sort examples of things we move by pushing and pulling.

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	<ul style="list-style-type: none"> ● Forces and Motions For Kids: Ramps (Kids Academy) ● Force and Motion: Studyjams.scholastic.com <p>*The World Around Us - Investigating Forces (What Makes Things Move?, What Makes Things Stop?, Speed and Strength, Gravity).</p>	
<p>Instructional Modifications and/or Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) When Appropriate</p>		
<ul style="list-style-type: none"> ● Read articles and/or directions to students to help with comprehension ● Teacher provided scaffolding for designing investigations, one-on-one or in small groups ● Provide access to anchor charts and classroom labels relevant to science concepts ● Scribe for students or allow students to use talk-to-text feature on Chromebooks when responding to questions ● Provide access to articles and books further exploring the topic of study ● Any other modification as per student IEP or 504 plan 		
<p>Common Assessment(s)</p>	<p>Assessment Modifications and/or Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) When Appropriate</p>	
<p>Push or Pull Worksheet ~ Students write the word "push" or "pull" to show which force is being used.</p>	<ul style="list-style-type: none"> ● Provide modifications per IEPs 	

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Grade K Science Curriculum**

Unit Title	Time Frame/Pacing
Living Things	10 weeks
Phenomena/Anchoring Activity/Anchoring Question/Essential Questions	
<p><u>Phenomena:</u></p> <ul style="list-style-type: none"> ● Ask which is a picture of a living thing. How can you tell it is living/alive? <p><u>Anchoring Activities:</u></p> <ul style="list-style-type: none"> ● Sort living and nonliving things. Explain why they are living or nonliving. ● Chick Journal ● Planting Seeds <p><u>Essential Questions:</u></p> <ul style="list-style-type: none"> ● How can you tell if something is living or nonliving? ● How are animals different from plants? ● How are animals different from humans? How are they the same? ● What do living things need to survive? ● How do plants and animals change during their life cycle? 	
Enduring Understandings	
<ul style="list-style-type: none"> ● Living things make up life on earth and depend on each other for survival. ● An animal is a living system made up of parts that work together to supply its needs. ● Humans and animals can meet their basic needs for food, water, shelter, and air in their natural habitats. ● Animals go through various stages of growth and development. ● Offspring are similar to their parents and other offspring. 	
NJ Standards/NGSS Performance Expectations Taught and Assessed Students who demonstrate understanding can:	
<ul style="list-style-type: none"> ● 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.] ● K-ESS2-2 Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their 	

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needs. [Clarification Statement: Examples of plants and animals changing their environment could include a squirrel digs in the ground to hide its food and tree roots can break concrete.]

- 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
- 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.]

3-Dimensional Learning Components

Science and Engineering Practices	Disciplinary Core Ideas (DCI)	Crosscutting Concepts
<p>Developing and Using Models</p> <ul style="list-style-type: none"> ● Use a model to represent relationships in the natural world. (K-ESS3-1) <p>Asking Questions and Defining Problems</p> <ul style="list-style-type: none"> ● Ask questions based on observations to find more information about the designed world. (K-ESS3-2) <p>Obtaining, Evaluating, and Communicating Information</p> <ul style="list-style-type: none"> ● Read grade-appropriate texts and/or use media to obtain scientific information to describe patterns in the natural world. (K-ESS3-2) ● Communicate solutions with others in oral and/or written forms using models and/or drawings that provide detail about scientific ideas. (K-ESS3-3) 	<p>ESS3.A: Natural Resources</p> <ul style="list-style-type: none"> ● Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do. <p>ESS3.B: Natural Hazards</p> <ul style="list-style-type: none"> ● 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) <p>ESS3.C: Human Impacts on Earth Systems</p> <ul style="list-style-type: none"> ● 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) <p>ETS1.A: Defining and Delimiting an Engineering Problem</p>	<p>Systems and System Models</p> <ul style="list-style-type: none"> ● Systems in the natural and designed world have parts that work together. <p>Cause and Effect</p> <ul style="list-style-type: none"> ● Events have causes that generate observable patterns. (K-ESS3-2), (K-ESS3-3)

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- Asking questions, making observations, and gathering information are helpful in thinking about problems. (secondary to K-ESS3-2)

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 K-ESS3-3)

Interdisciplinary Connections: Math, ELA, and Computer Science and Design Thinking

Math

- MP.2 Reason abstractly and quantitatively. (K-ESS3-1)
- MP.4 Model with mathematics. (K-ESS3-1), (K-ESS3-2)
- K.CC Counting and Cardinality (K-ESS3-1), (K-ESS3-2)

ELA

- RI.K.1 With prompting and support, ask and answer questions about key details in a text. (K-ESS3-2)
- 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. (K-ESS3-3)
- SL.K.3 Ask and answer questions in order to seek help, get information, or clarify something that is not understood. (K-ESS3-2)
- SL.K.5 Add drawings or other visual displays to descriptions as desired to provide additional detail. (K-ESS3-1)

Computer Science and Design Thinking

- 8.2.2.A.3 Identify a system and the components that work together to accomplish its purpose.
- 8.2.2.B.1 Identify how technology impacts or improves life.
- 8.2.2.B.2 Demonstrate how reusing a product affects the local and global environment.
- 8.2.2.B.3 Identify products or systems that are designed to meet human needs.
- 8.2.2.B.4 Identify how the ways people live and work has changed because of technology.

Career Readiness, Life Literacies, and Key Skills

- 9.3.ST.2 Use technology to acquire, manipulate, analyze and report data.

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Social-Emotional Learning Competencies		
<ul style="list-style-type: none"> ● Recognize and identify the thoughts, feelings, and perspectives of others ● Demonstrate an awareness of the differences among individuals, groups, and others' cultural backgrounds ● Demonstrate an understanding of the need for mutual respect when viewpoints differ ● Demonstrate an awareness of the expectations for social interactions in a variety of settings ● Develop, implement, and model effective problem-solving and critical thinking skills 		
Learning Targets	Investigations/Resources	Formative Assessment
<p>Explore and explain seeds and their role in plant survival.</p> <p>Communicate and model requirements for plant growth.</p> <p>Plan and carry out an investigation for how seeds grow.</p> <p>Recognize observable physical structures of plants and their functions.</p> <p>Compare plants that live in different habitats.</p> <p>Investigate how plants can change their habitats.</p> <p>Explore the relationship between humans and plants.</p> <p>Communicate the basic needs of all animals.</p> <p>Recognize that some animals care for the basic needs of their offspring and some do not.</p> <p>Explain how an animal's external physical structures contribute to its survival.</p>	<p>Section 2.1 - Is it Alive?</p> <ul style="list-style-type: none"> ● Investigation 1: Living and Nonliving Pictures ● Investigation 2: Living and Nonliving Sorting ● Investigation 3: Basic Needs <p>Section 2.2 - Plants and Their Basic Needs</p> <ul style="list-style-type: none"> ● Investigation 1: A Seed or Not a Seed? ● Investigation 2: Seed Hunt Homework ● Investigation 3: Popcorn Garden ● Investigation 4: Plant Parts Diagram ● Investigation 5: Plant Parts Puzzle ● Investigation 6: Plant Photos ● Investigation 7: Plants Grow Everywhere ● Investigation 8: Plants and Habitats <p>Section 2.4 - Humans and Their Habitats</p> <ul style="list-style-type: none"> ● Investigation 2: My Shelter ● Investigation 3: Natural Resources ● Investigation 5: Changes ● Investigation 7: Recycle It! ● Plant Observation Journal <p style="text-align: center;">Books:</p>	<p>Formative Assessments:</p> <p>Investigation 2: Living and Nonliving Sorting Sort pictures according to living and nonliving.</p> <p>Investigation 3: Basic Needs Sort pictures according to plants needs and animals needs.</p> <p>Investigation 1: A Seed or Not a Seed? Sort objects into seeds and not seeds.</p> <p>Investigation 5: Plant Parts Puzzle Color, cut, and glue the plant part pieces together on construction paper to make the flower. Discuss what each part is and the role that each part plays for the plant.</p> <p>Investigation 7: Plants Grow Everywhere Draw a sketch for each caption.</p> <p>My Greenhouse Journal (Engineering project) Students record observations in a plant journal</p>

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<p>Compare animals that live in different habitats.</p> <p>Explore the relationship between humans and animals.</p> <p>Communicate and model natural resources that all living things need to live and grow.</p> <p>Communicate ideas of how people can conserve natural resources.</p> <p>Compare observable properties of metal and plastic containers.</p> <p>Sort waste into two categories: recyclable and not recyclable.</p> <p>Sort recyclables into categories for plastic, paper, and metal.</p>	<ul style="list-style-type: none"> ● <u>Are you Living?</u> A song About Living and Nonliving Things by Laura Purdie Salas ● <u>Living and Nonliving</u> by Carol Lindeen ● <u>What's Alive?</u> by Kathleen Weidner Zoehfeld ● <u>Seeds</u> by Vijaya Khisty Bodach ● <u>Learning about Plants</u> by Catherine Veitch ● <u>Dessert, Ocean, Grasslands, and Rain Forest</u> by Rebecca Rissman ● <u>Bird Babies</u> by Catherine Veitch ● <u>Many Creatures</u> by Laura Purdie Salas ● <u>Do Frogs Have Fur?</u> by Michael Dahl ● <u>Bugs Senses</u> by Charlotte Guillain ● <u>Do Ducks Live in the Desert?</u> by Michael Dahl ● <u>Homes</u> by Daniel Nunn ● <u>Do Dogs Make Dessert?</u> by Michael Dahl ● <u>You're Aboard Spaceship Earth</u> by Patricia Lauber ● <u>Where Does the Garbage Go?</u> By Paul Showers ● Learning Resources Life Cycle Chick Exploration Set-You should have this in your classroom already. <li style="text-align: center;">Resources on Youtube: ● BrainPop Jr.:Plant Life Cycle - ● BrainPop Jr.: Parts of a Plant ● BrainPop Jr.: Earth ● BrainPop Jr.: Reduce, Reuse, Recycle 	
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- Needs Of Living Things: A Fun Video For Preschoolers
 - Living Things (Jack Hartman)
 - It's Alive: Biology For Kids (SciShow Kids)
 - Living Things And Nonliving Things (Kids Science)
 - Living Or Nonliving?: A Science Song for Kids
 - Living And Nonliving Things For Kids (Freeschool)
 - Living Things and Nonliving Things
 - How To Draw Living And Nonliving Things For Kids
 - Living Things
 - Living And Nonliving Things
 - How Does A Seed Become A Plant? (SciShow Kids)
 - Parts Of A Plant For Kids
 - Look Inside A Flower (SciShow Kids)
 - Life Cycle Of A Chicken (NG Science)
 - Life Cycle Of A Chicken (Ripons School)
 - Needs of Living Things (Make Me Genius)
- Websites:
- Scholastic News: What Is Living On The Farm?
 - Scholastic News: Go, Seeds, Go!
 - Scholastic News: 1 Egg, 2 Eggs, I See Blue Eggs!
 - Plant Adaptations (Study Jams)
 - Animal Life Cycles (Study Jams)
 - Sesame street: Who's Alive?

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	<ul style="list-style-type: none"> ● Animals and Science <p>*Living Things- Amazing Plants (Plants, What Do Plants Need? Plants Life Cycle, Plant Uses). *Parts of a Plant Diagram</p>	
<p>Instructional Modifications and/or Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) When Appropriate</p>		
<ul style="list-style-type: none"> ● Read articles and/or directions to students to help with comprehension ● Teacher provided scaffolding for designing investigations, one-on-one or in small groups ● Provide access to anchor charts and classroom labels relevant to science concepts ● Scribe for students or allow students to use talk-to-text feature on Chromebooks when responding to questions ● Provide access to articles and books further exploring the topic of study ● Any other modification as per student IEP or 504 plan 		
<p>Common Assessment(s)</p>	<p>Assessment Modifications and/or Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) When Appropriate</p>	
<p>Chick Journal ~ Observe and record what happens as the chicks begin hatching. What does the chick look like when it first hatches? How does it look as the days go on? What does the chick need to survive?</p> <p>Plant Observation Journal ~ Observe and record what you see as the plant grows.</p>	<ul style="list-style-type: none"> ● Provide modifications per IEPs 	

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Unit Title		Time Frame/Pacing
Sunlight and Energy		4 weeks
Phenomena/Anchoring Activity/Anchoring Question/Essential Questions		
<ul style="list-style-type: none"> Describe the difference between a material that has been in the sun and a material that has not been in the sun. 		
Enduring Understandings		
<ul style="list-style-type: none"> Earth is made up of both living and nonliving components. Living things include plants, animals, fungi, and bacteria. Nonliving components include sunlight/temperature, water, air, and Earth materials such as rocks, soil, and sand. Sunlight heats Earth's surface. It affects both living and nonliving components. Sunlight drives the water cycle and heats Earth's surface, which makes life possible. Not all surfaces heat up or retain heat in the same way. 		
NJ Standards/NGSS Performance Expectations Taught and Assessed		
Students who demonstrate understanding can:		
<ul style="list-style-type: none"> 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.] 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. 		
3-Dimensional Learning Components		
Science and Engineering Practices	Disciplinary Core Ideas (DCI)	Crosscutting Concepts
Planning and Carrying Out Investigations <ul style="list-style-type: none"> Planning and carrying out investigations to answer questions or test solutions to 	PS3.B: Conservation of Energy and Energy Transfer <ul style="list-style-type: none"> Sunlight warms Earth's surface. (K-PS3-1), 	Cause and Effect <ul style="list-style-type: none"> Events have causes that generate observable patterns. (K-PS3-1), (K-PS3-2)

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<p>problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions. Make observations (firsthand or from media) to collect data that can be used to make comparisons. (KPS3-1)</p> <p>Constructing Explanations and Designing Solutions</p> <ul style="list-style-type: none"> Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions. Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem. (K-PS3-2) 	<p>(K-PS3-2)</p>	<p>Connections to Nature of Science Scientific Investigations</p> <ul style="list-style-type: none"> Use a Variety of Methods Scientists use different ways to study the world. (K-PS3-1)
<p>Interdisciplinary Connections: Math, ELA, and Computer Science and Design Thinking</p>		
<p>Mathematics</p> <ul style="list-style-type: none"> 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) <p>ELA</p> <ul style="list-style-type: none"> 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) <p>Computer Science and Design Thinking</p> <ul style="list-style-type: none"> 8.2.2.C.1 Brainstorm ideas on how to solve a problem or build a product. 8.2.2.D.1 Collaborate and apply a design process to solve a simple problem from everyday experiences. 		
<p>Career Readiness, Life Literacies, and Key Skills</p>		

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- 9.3.ST-ET.1 Use STEM concepts and processes to solve problems involving design and/or production.
- 9.3.ST.1 Apply engineering skills in a project that requires project management, process control and quality assurance.

Social-Emotional Learning Competencies

- Recognize and identify the thoughts, feelings, and perspectives of others
- Demonstrate an awareness of the differences among individuals, groups, and others' cultural backgrounds
- Demonstrate an understanding of the need for mutual respect when viewpoints differ
- Demonstrate an awareness of the expectations for social interactions in a variety of settings
- Develop, implement, and model effective problem-solving and critical thinking skills

Learning Targets	Investigations/Resources	Formative Assessment
<p>Explain how sunlight heats the Earth's surface.</p> <p>Observe and compare heating properties of various materials.</p> <p>Design and build a structure that will reduce the warming effects of sunlight on an area.</p>	<p>Knowing Science Teacher's Edition, Grade K Section 2.1 Sunlight And Energy</p> <ul style="list-style-type: none"> ● Investigation 1: Our Umbrella ● We Love Sunlight Book (Assessment) <p style="text-align: center;">Books:</p> <ul style="list-style-type: none"> ● <u>Sunlight</u> by Erin Edison <p style="text-align: center;">Resources On Youtube:</p> <ul style="list-style-type: none"> ● What Is The Sun? (SciShow Kids) ● Our Sun (Kids Academy) ● What If The Sun Disappeared? (Peekaboo Kids) ● Energy From The Sun (Read Aloud) ● How The Sun Affects The Earth (Kids Academy) ● Mr. Sun (Raffi) ● The Sun (Scratch Garden) ● The Sun For Kids (Homeschool Pop) ● Here Comes The Sun: Crash Course Kids #5.1 ● BrainPop Jr.: The Sun 	<p>Formative Assessment:</p> <p>Investigation 1: Our Umbrella ~ Students will make an "umbrella" using different materials (aluminum, paper, or foam). Record the starting temperature on the sheet. Take the umbrellas outside or place them by a sunny window. As students wait for the outdoor shade temperature to register, they may draw the umbrella that they made. Record the ending temperature. Discuss what was learned about the materials that were used for the shade umbrella. What material worked best? What other ways can these materials be used to build shade structures?</p>

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	<p style="text-align: center;">Websites:</p> <ul style="list-style-type: none"> ● NGSS: The Wonder of Science ● NGSS: The Wonder of Science ~ Snowman Melt Timelapse 	
<p>Instructional Modifications and/or Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) When Appropriate</p>		
<ul style="list-style-type: none"> ● Read articles and/or directions to students to help with comprehension ● Teacher provided scaffolding for designing investigations, one-on-one or in small groups ● Provide access to anchor charts and classroom labels relevant to science concepts ● Scribe for students or allow students to use talk-to-text feature on Chromebooks when responding to questions ● Provide access to articles and books further exploring the topic of study ● Any other modification as per student IEP or 504 plan 		
<p>Common Assessment(s)</p>	<p>Assessment Modifications and/or Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) When Appropriate</p>	
<p>We Love Sunlight! Journal ~ The students will draw a simple illustration to match the text on the page.</p>	<ul style="list-style-type: none"> ● Provide modifications per IEPs 	