Moonachie School District
Science Curriculum:
Grade K

New Jersey Student Learning Standards for Science

Born On: August 23, 2022
Re-Adopted: August 26, 2025

Unit 1 Overview
Unit 1: Pushes and Pulls
Grade: Kindergarten
Content Area: Physical Science
Pacing: 25 days
Essential Question
What does science have to do with playing sports?
Student Learning Objectives (Performance Expectations)
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.
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.
Unit Summary
During this unit of study, students 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. The crosscutting concept of cause and effect is called out as the organizing concept for this disciplinary core idea. Students are expected to demonstrate grade-appropriate proficiency in planning and carrying out investigations and analyzing and interpreting data. Students are also expected to use these practices to demonstrate understanding of the core ideas.
Technical Terms
Position, Force, Push, Pull, Friction, Strength, Direction, Movement, Motion
Formative Assessment Measures
Part A: Why do scientists like to play soccer?
Students who understand the concepts are able to: • With guidance, design simple tests to gather evidence to support or refute ideas about cause-and-effect relationships. • With guidance, plan and conduct an investigation in collaboration with peers. • With guidance, collaboratively 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. (Assessment is limited to different relative strengths or different directions, but not both at the same time. Assessment does not include noncontact pushes or pulls such as those produced by magnets.) Some examples of pushes and pulls on the motion of an object could include: A string attached to an object being pulled. A person pushing an object, A person stopping a rolling ball, Two objects colliding and pushing on each other.
Part B: How can you design a simple way to change the speed or direction of an object using a push or pull from another object?
Students who understand the concepts are able to: • With guidance, design simple tests to gather evidence to support or refute ideas about cause-and-effect relationships. • Analyze data from tests of an object or tool to determine if it works as intended. • Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs. • Analyze data to determine whether a design solution works as intended to change the speed or direction of an object with a push or a pull. • 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 does not include friction as a mechanism for change in speed.)
Interdisciplinary Connections

NJSLS- ELA	NJSLS- Mathematics
RI.CI.K.2. With prompting and support, identify the main topic and key details of an informational text (e.g., who, what, where, when, why, how) RI.CR.K.1 With prompting and support, ask and answer questions about key details in an informational text (e.g., who, what, where, when, why, how). W.WR.K.5. With prompting and support, generate questions through shared research in response to a topic, text, or stimulus (e.g., event, photograph, video, book). SL.ES.K.3. Ask and answer questions in order to seek help, get information, or clarify something that is not understood.	MP.2: Reason abstractly and quantitatively. MP.4: Model with mathematics. MP.5: Use appropriate tools strategically. K.M.A.1: Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. K.M.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.

Core Instructional Materials	Textbooks Series, Lab Materials, etc.
Career Readiness, Life Literacies and Key Skills	9.4 Life Literacies and Key Skills - 9.4.2.TL.3: Enter information into a spreadsheet and sort the information. - 9.4.2.IML.2: Represent data in a visual format to tell a story about the data (e.g., 2.MD.D.10). - 9.4.2.TL.3: Enter information into a spreadsheet and sort the information.
Computer Science and Design Thinking	8.1 Computer Science - 8.1.2.DA.1: Collect and present data, including climate change data, in various visual formats. - 8.1.2.DA.3: Identify and describe patterns in data visualizations. - 8.1.2.DA.4: Make predictions based on data using charts or graphs.

Modifications

Multilingual Learners	Special Education	At Risk of School Failure	Gifted and Talented	504
Scaffolding	Word walls	Teacher tutoring	Curriculum compacting	Word walls
Word walls	Visual aides	Peer tutoring	Challenge assignments	Visual aides
Sentence/paragraph frames	Graphic organizers	Study guides	Enrichment activities	Graphic organizers
Bilingual dictionaries/translation	Multimedia	Graphic organizers	Tiered activities	Multimedia
Think alouds	Leveled readers	Extended time	Independent research/inquiry	Leveled readers
Read alouds	Assistive technology	Parent communication	Collaborative teamwork	Assistive technology
Highlight key vocabulary	Notes/summaries	Modified assignments	Higher level questioning	Notes/summaries
Annotation guides	Extended time	Counseling	Critical/Analytical thinking tasks	Extended time
Think-pair- share	Answer masking		Self-directed activities	Answer masking
Visual aides	Answer eliminator			Answer eliminator
Modeling	Highlighter			Highlighter
	Color contrast			Color contrast

Cognates				Parent communication Modified assignments Counseling

Kindergarten Unit 1: Pushes and Pulls		
K-PS Motion and Stability: Forces and Interactions		
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.		
Science & Engineering Practices	**Disciplinary Core Ideas**	**Cross-Cutting Concepts**
Planning and Carrying out Investigations Planning and carrying out investigations to answer questions or and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions. With guidance, plan and conduct an investigation in collaboration with peers. **Connections to the Nature of Science** **Scientific Investigations Use a Variety of Methods** Scientists use different ways to study the world.	**PS2.A: Forces and Motion** Pushes and pulls can have different strengths and directions. Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. **PS2.B: Types of Interactions** When objects touch or collide, they push on one another and can change motion. **PS3.C: Relationship Between Energy and Forces** A bigger push or pull makes things speed up or slow down more quickly. (secondary)	**Cause and Effect** Simple tests can be designed to gather evidence to support or refute student ideas about causes.
Connections to other DCIs in this grade-band: N/A		
Articulation of DCIs across grade-bands: 3.PS2.A ; 3.PS2.B		

5E Model	
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.	
Engage **Anticipatory Set**	BrainPOP: Pushes and Pulls https://jr.brainpop.com/search/?keyword=pushes+and+pulls Pushes and Pulls Using this interactive website, students can explore hard and soft pushes and pulls. http://www.bbc.co.uk/schools/scienceclips/ages/5_6/pushes_pulls.shtml Pushes and Pulls

	Use the following lesson to activate students' previous knowledge of pushes and pulls with sorting activities. Picture cards included. http://www.harmonydc.org/Curriculum/pdf/kindersample.pdf The Push and Pull Song http://www.cape.k12.mo.us/blanchard/hicks/news%20pages/scienceforcepoems.htm Suggested Read Alouds *Motion by Darlene R. Stille* *How Things Move by Don L. Curry* *Give it a Push! Give it a Pull! by Jennifer Boothroyd* *Everyone Shouted, "PULL!" by Claire Llewellyn*
Exploration **Student Inquiry**	Introduction to Force and Motion In this introductory lesson, students will learn that force and motion are all around them! http://betterlesson.com/lesson/638992/introduction-to-force-and-motion Forces and Interaction: Push and Pull The following experiments will introduce students to the topics of pushes and pulls. 1. Soda Bottle Bowling 2. Simple Chair Pulley 3. Ramps and Matchbox Cars https://www.weareteachers.com/simple-physics-experiments-for-kids-pushing-and-pulling/
Explanation **Concepts and Practices**	In these lessons: Teachers should: Introduce formal labels, definitions, and explanations for concepts, practices, skills or abilities. Students should: Verbalize conceptual understandings and demonstrate scientific and engineering practices. Topics to Be Discussed in Teacher Directed Lessons (Disciplinary Core Ideas): PS2.A: Forces and Motion Pushes and pulls can have different strengths and directions. Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. PS2.B: Types of Interactions When objects touch or collide, they push on one another and can change motion. PS3.C: Relationship Between Energy and Forces A bigger push or pull makes things speed up or slow down more quickly. (secondary)
Elaboration **Extension Activity**	SMART Board Activities: Pushes and Pulls http://exchange.smarttech.com/search.html?q=pushes+and+pulls&subject=Science&grade=Kindergarten&region=en_US Push or Pull Game http://www.learningliftoff.com/kindergarten-science-learning-game-push-pull/#.WD2miNUrLIV Additional Related Activities http://ngss.nsta.org/DisplayStandard.aspx?view=pe&id=23
Evaluation **Assessment Tasks**	With guidance, plan and conduct an investigation in collaboration with peers. Assessment Task A

	Forces and Interaction: Push and Pull- Performance Rubric

Kindergarten Unit 1: Pushes and Pulls		
K-PS2 Motion and Stability: Forces and Interactions		
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	**Disciplinary Core Ideas**	**Cross-Cutting Concepts**
Analyzing and Interpreting Data Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations. Analyze data from tests of an object or tool to determine if it works as intended.	**PS2.A: Forces and Motion** Pushes and pulls can have different strengths and directions. Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. **ETS1.A: Defining Engineering Problems** 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)	**Cause and Effect** Simple tests can be designed to gather evidence to support or refute student ideas about causes.
Connections to other DCIs in this grade-band: K.ETS1.A ; K.ETS1.B		
Articulation of DCIs across grade-bands: 2.ETS1.B; 3.PS2.A ; 4.PS3.A ; 4.EST1.A		

5E Model	
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.	
Engage **Anticipatory Set**	Force and Motion https://www.youtube.com/watch?v=rfeVlNL7d9U Sid the Science Kid: Inclined Planes https://www.youtube.com/watch?v=eOX5X6KLpL8&list=PL609_mdE9rpuMGO5ZvR-UlrPaiN_8OlQC Ramps: A Super, Simple Machine! https://www.youtube.com/watch?v=3COvm0TtxWg
Exploration **Student Inquiry**	Stop It! Exploring Forces on Moving Objects In this lesson, students will be able to explain what is needed to stop an object by completing a simple investigation. http://betterlesson.com/lesson/635423/stop-it-exploring-forces-on-moving-objects Changing Direction: A Change of Direction-Exploring the Impact of Forces

	In this lesson, students will be able to determine a way to change the direction of a moving object by conducting a simple experiment. http://betterlesson.com/lesson/635429/a-change-of-direction-exploring-the-impact-of-forces Ramps: Let It Roll In this lesson, students will explore and measure the rate of spherical objects rolling down a ramp. http://sciencenetlinks.com/lessons/ramps-1-let-it-roll/
Explanation **Concepts and Practices**	In these lessons: Teachers should: Introduce formal labels, definitions, and explanations for concepts, practices, skills or abilities. Students should: Verbalize conceptual understandings and demonstrate scientific and engineering practices. Topics to Be Discussed in Teacher Directed Lessons (Disciplinary Core Ideas): PS2.A: Forces and Motion Pushes and pulls can have different strengths and directions. Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. ETS1.A: Defining Engineering Problems 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)
Elaboration **Extension Activity**	19 Fun Ideas and Resources for Force and Motion http://www.teachjunkie.com/sciences/19-fun-ideas-resources-force-and-motion/ Push-Me, Pull-Me Toys The following lesson is about creating push or pull toys. You can modify the lesson to make it easier for your classroom. http://www.learnnc.org/lp/editions/designtech/6805 Three Simple Science Experiments with Momentum http://frugalfun4boys.com/2012/12/06/easy-science-experiments-with-momentum/ Ramps, Angle and Measuring http://www.weareteachers.com/exploring-potential-and-kinetic-energy/ Ramp Builder In this lesson, students will plan, build, and test a ramp that allows objects to roll far. http://sciencenetlinks.com/lessons/ramps-2-ramp-builder/
Evaluation **Assessment Tasks**	Analyze data from tests of an object or tool to determine if it works as intended. Assessment Task A Will It Stop the Car Investigation Recording Sheet & Discussion Questions Assessment Task B A Change of Direction: Prediction Recording Sheet & Discussion Questions Assessment Task C Ramps: Let It Roll- Assessment Activities

Kindergarten Unit 1: Pushes and Pulls		
K-2-ETS1-3 Engineering Design		
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.		
Clarification Statement: N/A		
Assessment Boundary: N/A		
Science & Engineering Practices	**Disciplinary Core Ideas**	**Cross-Cutting Concepts**
Analyzing and Interpreting Data Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations Analyze data from tests of an object or tool to determine if it works as intended.	**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.	
Connections to other DCIs in this grade-band: Second Grade: 2-ESS2-1		
Articulation of DCIs across grade-bands: 3-5.ETS1.A ; 3-5.ETS1.C		

Unit 2 Overview
Effects of the Sun
Grade: K
Content Area: Physical Science
Pacing: 25 days
Essential Question
How can we use science to keep a playground cool in the summertime?
Student Learning Objectives (Performance Expectations)
K-PS3-1 Make observations to determine the effect of sunlight on Earth's surface.
K-PS3-2 Use tools and materials provided to design and build a structure that will reduce the warming effect of sunlight on an area.
Unit Summary
During this unit of study, students apply an understanding of the effects of the sun on the Earth's surface. The crosscutting concepts of cause and effect and structure and function are called out as organizing concepts for this disciplinary core idea. Students are expected to demonstrate grade-appropriate proficiency in developing and using models; planning and carrying out investigations; analyzing and interpreting data; and designing solutions. Students are also expected to use these practices to demonstrate understanding of the core ideas.
Technical Terms
Sun, Energy, Absorption, Solar Energy, Shade, Heat, Shadows, Daytime, Night time, Solar System, Planets
Formative Assessment Measures
Part A: How does sunlight affect the playground?

Students who understand the concepts are able to:
• Observe patterns in events generated by cause-and-effect relationships.
• Make observations (firsthand or from media) to collect data that can be used to make comparisons.
• Make observations to determine the effect of sunlight on Earth's surface. (Assessment of temperature is limited to relative measures such as warmer/cooler.)
• Examples of Earth's surface could include: Sand, Soil, Rocks, Water

Part B: Imagine that we have been asked to design a new playground. How would we keep the sand, soil, rocks, and water found on the playground cool during the summer?

Students who understand the concepts are able to:
• Observe patterns in events generated by cause-and-effect relationships.
• Describe how the shape and stability of structures are related to their function.
• Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem.
• Use tools and materials to design and build a structure (e.g., umbrellas, canopies, tents) that will reduce the warming effect of sunlight on an area.
• Develop a simple model based on evidence to represent a proposed object or tool.
• 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.
• Analyze data from tests of an object or tool to determine if it works as intended.
• Analyze data from tests of two objects designed to solve the same problem to compare the strengths

Interdisciplinary Connections

NJSLS- ELA	NJSLS- Mathematics
W.WR.K.5. With prompting and support, generate questions through shared research in response to a topic, text, or stimulus (e.g., event, photograph, video, book). RI.CI.K.2. With prompting and support, identify the main topic and key details of an informational text (e.g., who, what, where, when, why, how). W.RW.K.7. With prompting and support, engage in brief but regular writing and drawing tasks W.SE.K.6. With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question SL.AS.K.6. Speak audibly and express thoughts, feelings, and ideas clearly	MP.2: Reason abstractly and quantitatively. MP.4: Model with mathematics. MP.5: Use appropriate tools strategically. K.M.A.1: Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. K.M.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.

Core Instructional Materials	Textbooks Series, Lab Materials, etc.
Career Readiness, Life Literacies and Key Skills	Life Literacies and Key Skills - 9.4.2.CT.1: Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the

	problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2). - 9.4.2.CT.3: Use a variety of types of thinking to solve problems (e.g., inductive, deductive).
Computer Science and Design Thinking	Computer Science - 8.1.2.DA.1: Collect and present data, including climate change data, in various visual formats. - 8.1.2.DA.3: Identify and describe patterns in data visualizations. - 8.2.2.ED.2: Collaborate to solve a simple problem, or to illustrate how to build a product using the design process. - 8.1.2.DA.4: Make predictions based on data using charts or graphs.

Modifications				
Multilingual Learners	**Special Education**	**At Risk for School Failure**	**Gifted and Talented**	**504**
Scaffolding Word walls Sentence/paragraph frames Bilingual dictionaries/translation Think alouds Read alouds Highlight key vocabulary Annotation guides Think-pair- share Visual aides Modeling Cognates	Word walls Visual aides Graphic organizers Multimedia Leveled readers Assistive technology Notes/summaries Extended time Answer masking Answer eliminator Highlighter Color contrast	Teacher tutoring Peer tutoring Study guides Graphic organizers Extended time Parent communication Modified assignments Counseling	Curriculum compacting Challenge assignments Enrichment activities Tiered activities Independent research/inquiry Collaborative teamwork Higher level questioning Critical/Analytical thinking tasks Self-directed activities	Word walls Visual aides Graphic organizers Multimedia Leveled readers Assistive technology Notes/summaries Extended time Answer masking Answer eliminator Highlighter Color contrast Parent communication Modified assignments Counseling

Kindergarten Unit 2: Effects of the Sun		
K-PS3 Energy		
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**.**		
Science & Engineering Practices	**Disciplinary Core Ideas**	**Cross-Cutting Concepts**
Planning and Carrying Out Investigations Planning and carrying out investigations to answer questions or test solutions to 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.	**PS3.B: Conservation of Energy and Energy Transfer** Sunlight warms Earth's surface.	**Cause and Effect** Events have causes that generate observable patterns.

Make observations (firsthand or from media) to collect data that can be used to make comparisons. **Connections to Nature of Science** **Scientific Investigations Use a Variety of Methods** Scientists use different ways to study the world.		

Connections to other DCIs in this grade-band: N/A
Articulation of DCIs across grade-bands: 1.PS4.B ; 3.ESS2.D

5E Model	
K-PS3-1 Make observations to determine the effect of sunlight on Earth's surface.	
Engage **Anticipatory Set**	BrainPOP Jr: The Sun https://jr.brainpop.com/science/space/sun/ Mr. Sun: Song for Kids https://www.youtube.com/watch?v=lFIv7s8Xceo&list=PL1wrsEJEvZjbRQhwU-r--6LDo8tMLWYSL
Exploration **Student Inquiry**	Learning About the Sun Students see the sun almost every day, but do they really understand what the sun is and its important role in our lives? This lesson will help them build a basic understanding about the sun. http://betterlesson.com/lesson/642295/learning-about-the-sun Feel the Heat! In the following lesson, students will demonstrate and observe the effects of sunlight on the Earth's surface. Students will learn about how the surfaces of the Earth absorb energy in the form of sunlight at different rates. https://www.boreal.com/www.boreal.com/images/kindergarten_temp_probe-_final.pdf Exploring Day and Night In this activity, students will be able to explain the phenomena of day and night by participating in an inquiry investigation. http://betterlesson.com/lesson/643721/exploring-day-and-night
Explanation **Concepts and Practices**	In these lessons: Teachers should: Introduce formal labels, definitions, and explanations for concepts, practices, skills or abilities. Students should: Verbalize conceptual understandings and demonstrate scientific and engineering practices. Topics to Be Discussed in Teacher Directed Lessons (Disciplinary Core Ideas): PS3.B: Conservation of Energy and Energy Transfer Sunlight warms Earth's surface
Elaboration **Extension Activity**	Sunlight Warms Earth's Surface In this unit, students explore the effect of sunlight on Earth's natural surfaces of sand, soil, rock and water. Students learn that

	surfaces in sunlight are warmer than those surfaces in the shade. In addition, students explore how the color and material of a surface affects how warm it gets after being in sunlight. Students use tools and materials to build a prototype that reduces the warming effect of sunlight. http://millriverschools.org/documents/drivesync/Curriculum%20Website/Science/GL%20K/mcu-SCIgK-SunlightWarms.pdf Sun's Effect On Earth's Surface Experiment http://camsp.kcusd.com/files/Documents/The_Sun_Classwork__Homework-2013-07-26.pdf
Evaluation Assessment Tasks	Make observations (firsthand or from media) to collect data that can be used to make comparisons. Assessment Task A Learning About the Sun: The Sun Book Assessment Task B Feel the Heat: Data Table and Temperature Bar Graph pg. 8-9 Assessment Task C Exploring Day and Night- Discussion Questions

Kindergarten Unit 2: Effects of the Sun		
K-PS3 Energy		
K-PS3-2 Use tools and materials provided 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.		
Assessment Boundary: N/A		
Science & Engineering Practices	**Disciplinary Core Ideas**	**Cross-Cutting Concepts**
Constructing Explanations and Designing Solutions 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.	**PS3.B: Conservation of Energy and Energy Transfer** Sunlight warms Earth's surface.	**Cause and Effect** Events have causes that generate observable patterns.
Connections to other DCIs in this grade-band: K.ETS1.A ; K.ETS1.B		
Articulation of DCIs across grade-bands: 1.PS4.B ; 2.ETS1.B ; 4.ETS1.A		
5E Model		
K-PS3-2 Use tools and materials provided to design and build a structure that will reduce the warming effect of sunlight on Earth's surface.		

Engage **Anticipatory Set**	Crash Course Kids: Here Comes the Sun https://www.youtube.com/watch?v=6FB0rDsR_rc I'm So Hot: The Sun Song https://www.youtube.com/watch?v=t-kzdR93bqw
Exploration **Student Inquiry**	Sunlight Warms Earth's Surface In this unit, students explore the effect of sunlight on Earth's natural surfaces of sand, soil, rock and water. Students learn that surfaces in sunlight are warmer than those surfaces in the shade. In addition, students explore how the color and material of a surface affects how warm it gets after being in sunlight. Students use tools and materials to build a prototype that reduces the warming effect of sunlight. Lesson 6: Using Tools to Build a Model Lesson 7: Beach Shelter Prototype http://millriverschools.org/documents/drivesync/Curriculum%20Website/Science/GL%20K/mcu-SCIgK-SunlightWarms.pdf A Place in the Shade: An Engineering Challenge In this lesson, students will demonstrate knowledge of the engineering and design process by creating a structure that provides shade. http://betterlesson.com/lesson/644795/a-place-in-the-shade-an-engineering-challenge Still Looking For Shade- A Design and Engineering Challenge Continues The students have previously participated in a design and engineering challenge. Now it is time for the student to see if they can improve their structures! http://betterlesson.com/lesson/645370/still-looking-for-shade-a-design-and-engineering-challenge-continues
Explanation **Concepts and Practices**	In these lessons: Teachers should: Introduce formal labels, definitions, and explanations for concepts, practices, skills or abilities. Students should: Verbalize conceptual understandings and demonstrate scientific and engineering practices Topics to Be Discussed in Teacher Directed Lessons (Disciplinary Core Ideas): PS3.B: Conservation of Energy and Energy Transfer Sunlight warms Earth's surface.
Elaboration **Extension Activity**	Black or White: An Inquiry Activity about Energy Absorption and Reflection Students will be able to describe which color absorbs more light and heat by participating in an investigation. http://betterlesson.com/lesson/644807/black-or-white-an-inquiry-activity-about-energy-absorption-and-reflection Additional Related Activities http://ngss.nsta.org/DisplayStandard.aspx?view=topic&id=3
Evaluation **Assessment Tasks**	Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem. Assessment Task A Beach Shelter Prototype: Model Rubric pg. 30-31

	Assessment Task B A Place in the Shade: Model Testing and Discussion Questions

Kindergarten Unit 2: Effects of the Sun		
K-2-ETS1-1: Engineering Design		
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.		
Clarification Statement: N/A		
Assessment Boundary: N/A		
Science & Engineering Practices	**Disciplinary Core Ideas**	**Cross-Cutting Concepts**
Asking Questions and Defining Problems Asking questions and defining problems in K–2 builds on prior experiences and progresses to simple descriptive questions. 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.	**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)	
Connections to other DCIs in this grade-band: Kindergarten- K-PS2-2, K-ESS3-2		
Articulation of DCIs across grade-bands: 3-5.ETS1.A ; 3-5.ETS1.C		

Kindergarten Unit 2: Effects of the Sun		
K-2-ETS1-2 Engineering Design		
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.		
Clarification Statement: Examples of devices could include a light source to send signals, paper cup and string “telephones,” and a pattern of drum beats.		
Assessment Boundary: Assessment does not include technological details for how communication devices work.		
Science & Engineering Practices	**Disciplinary Core Ideas**	**Cross-Cutting Concepts**

Developing and Using Models Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions. Develop a simple model based on evidence to represent a proposed object or tool. (K-2-ETS1-2)	**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, such as climate change, to other people. (K-2-ETS1-2)	**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 K-2-ETS1.B: Kindergarten K-ESS3-3; First Grade 1-PS4-4; Second Grade 2-LS2-2		
Articulation of DCIs across grade-bands: 3-5.ETS1.A; 3-5.ETS1.B; 3-5.ETS1.C		

Kindergarten Unit 2: Effects of the Sun		
K-2-ETS1-3 Engineering Design		
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.		
Clarification Statement: N/A		
Assessment Boundary: N/A		
Science & Engineering Practices	**Disciplinary Core Ideas**	**Cross-Cutting Concepts**
Analyzing and Interpreting Data Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations Analyze data from tests of an object or tool to determine if it works as intended.	**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.	
Connections to other DCIs in this grade-band: Second Grade: 2-ESS2-1		
Articulation of DCIs across grade-bands: 3-5.ETS1.A ; 3-5.ETS1.C		

Unit 3 Overview
Unit 3: Weather
Grade: K
Content Area: Earth and Space Science
Pacing: 15 days
Essential Question
How does weather forecasting help to keep people safe?
Student Learning Objectives (Performance Expectations)

K-ESS2-1 Use and share observations of local weather conditions to describe patterns over time.

K-ESS3-2 Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.

Unit Summary

In this unit of study, students develop an understanding of patterns and variations in local weather and the use of weather forecasting to prepare for and respond to severe weather. The crosscutting concepts of patterns; cause and effect; interdependence of science, engineering, and technology; and the influence of engineering, technology, and science on society and the natural world are called out as organizing concepts for the disciplinary core ideas. Students are expected to demonstrate grade-appropriate proficiency in asking questions, analyzing and interpreting data, and obtaining, evaluating, and communicating information. Students are also expected to use these practices to demonstrate understanding of the core ideas.

Technical Terms

Weather, Forecast, Meteorologist, Temperature, Winter, Spring, Summer, Fall, Thunderstorm, Hurricane, Tornado, Blizzard

Formative Assessment Measures

Part A: What types of patterns can be observed in local weather conditions?

Students who understand the concepts are able to:

• Observe and use patterns in the natural world as evidence and to describe phenomena.
• Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions.
• Use and share observations of local weather conditions to describe patterns over time. (Assessment of quantitative observations limited to whole numbers and relative measures such as warmer/cooler.)
• 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.

Part B: How does weather forecasting help us to prepare for and respond to severe weather?

Students who understand the concepts are able to:

• Observe patterns in events generated by cause-and-effect relationships.
• Read grade-appropriate texts and/or use media to obtain scientific information to describe patterns in the natural world.
• Ask questions based on observations to find more information about the designed world.
• Ask questions to obtain information about the purpose of weather forecasting to prepare for and respond to severe weather. (Emphasis is on local forms of severe weather.)
• Define a simple problem that can be solved through the development of a new or improved object or tool.
• Ask questions, make observations, and gather information about a situation people want to change in order to define a simple problem that can be solved through the development of a new or improved object or tool.

Interdisciplinary Connections

NJSLS- ELA	NJSLS- Mathematics
W.WR.K.5. With prompting and support, generate questions through shared research in response to a topic, text, or stimulus (e.g., event, photograph, video, book). RL.CR.K.1 With prompting and support, ask and answer questions	MP.2 : Reason abstractly and quantitatively. MP.4 : Model with mathematics. MP.5 : Use appropriate tools strategically.

about key details in a literary text (e.g., who, what, where, when, why, how). SL.ES.K.3. Ask and answer questions in order to seek help, get information, or clarify something that is not understood. SL.PI.K.4. Describe familiar people, places, things, and events and, with prompting and support, provide additional detail. W.SE.K.6. With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question W.RW.K.7. With prompting and support, engage in brief but regular writing and drawing tasks.	K.M.A.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. K.DL.A.1 Classify objects into given categories; count the number of objects in each category and sort the categories by count.

Core Instructional Materials	Textbooks Series, Lab Materials, etc.
Career Readiness, Life Literacies and Key Skills	9.4 Life Literacies and Key Skills - 9.4.2.IML.2: Represent data in a visual format to tell a story about the data (e.g., 2.MD.D.10). - 9.4.2.CT.3: Use a variety of types of thinking to solve problems (e.g., inductive, deductive).
Computer Science and Design Thinking	8.1 Computer Science - 8.1.2.DA.1: Collect and present data, including climate change data, in various visual formats. - 8.1.2.DA.3: Identify and describe patterns in data visualizations. - 8.2.2.ED.2: Collaborate to solve a simple problem, or to illustrate how to build a product using the design process.

Modifications				
Multilingual Learners	**Special Education**	**At Risk for School Failure**	**Gifted and Talented**	**504**
Scaffolding	Word walls	Teacher tutoring	Curriculum compacting	Word walls
Word walls	Visual aides	Peer tutoring	Challenge assignments	Visual aides
Sentence/paragraph frames	Graphic organizers	Study guides	Enrichment activities	Graphic organizers
Bilingual dictionaries/translation	Multimedia	Graphic organizers	Tiered activities	Multimedia
Think alouds	Leveled readers	Extended time	Independent research/inquiry	Leveled readers
Read alouds	Assistive technology	Parent communication	Collaborative teamwork	Assistive technology
Highlight key vocabulary	Notes/summaries	Modified assignments	Higher level questioning	Notes/summaries
Annotation guides	Extended time	Counseling	Critical/Analytical thinking tasks	Extended time
Think-pair- share	Answer masking		Self-directed activities	Answer masking
Visual aides	Answer eliminator			Answer eliminator
Modeling	Highlighter			Highlighter

Cognates	Color contrast			Color contrast Parent communication Modified assignments Counseling

Kindergarten Unit 3: Weather		
K-ESS2 Earth's Systems		
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.		
Science & Engineering Practices	**Disciplinary Core Ideas**	**Cross-Cutting Concepts**
Analyzing and Interpreting Data 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. **Connections to Nature of Science** **Science Knowledge is Based on Empirical Evidence** Scientists look for patterns and order when making observations about the world.	**ESS2.D: Weather and Climate** 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.	**Patterns** Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.
Connections to other DCIs in this grade-band: N/A		
Articulation of DCIs across grade-bands: 2.ESS2.A ; 3.ESS2.D ; 4.ESS2.A		
5E Model		
K-ESS2-1 Use and share observations of local weather conditions to describe patterns over time.		
Engage **Anticipatory Set**	BrainPOP Jr: Seasons, Temperature, Fall, Spring, Winter and Summer https://jr.brainpop.com/science/weather/seasons/ https://jr.brainpop.com/science/weather/temperature/ https://jr.brainpop.com/science/weather/fall/ https://jr.brainpop.com/science/weather/spring/ https://jr.brainpop.com/science/weather/winter/ https://jr.brainpop.com/science/weather/summer/ What Do I Wear?- An Introduction to Weather In this lesson, students will identify with different types of weather by understanding the different physical needs for each type of weather.	

	http://betterlesson.com/lesson/639903/what-do-i-wear-an-introduction-to-weather Suggested Read Alouds http://www.lindaglaserauthor.com/celebrate-the-seasons-1/
Exploration **Student Inquiry**	What is Weather? In this lesson, students will be able to describe weather by listening to a non fiction text by Gail Gibbons. http://betterlesson.com/lesson/640553/what-is-weather Read Aloud Text: https://www.youtube.com/watch?v=UeJohy6cHl4 Exploring Weather - One, Two, Three Forecast! In this lesson, students will use weather data they collect to make a prediction and will then compare weather data to an actual forecast to compare results. http://betterlesson.com/lesson/636219/exploring-weather-one-two-three-forecast Wacky Weather - Olympic Track Start - Tracking Weather In this lesson, students will create a graph to describe and track weather to observe its effects. http://betterlesson.com/lesson/635569/wacky-weather-olympic-track-star-tracking-weather What Weather? In this lesson, students will create a diagram that forecasts using appropriate elements of weather and science vocabulary. http://betterlesson.com/lesson/636325/what-weather-assessment
Explanation **Concepts and Practices**	In these lessons: Teachers should: Introduce formal labels, definitions, and explanations for concepts, practices, skills or abilities. Students should: Verbalize conceptual understandings and demonstrate scientific and engineering practices. Topics to Be Discussed in Teacher Directed Lessons (Disciplinary Core Ideas): ESS2.D: Weather and Climate 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.
Elaboration **Extension Activity**	Ever Changing Seasons In this lesson, students will be able to observe a native tree, describe what they see and accurately record their observations. http://betterlesson.com/lesson/628569/the-ever-changing-seasons Describing Weather- Season Reasons In this lesson, students will create a model to show the Earth's seasonal cycle. http://betterlesson.com/lesson/636177/describing-weather-season-reasons Additional Related Activities http://ngss.nsta.org/DisplayStandard.aspx?view=pe&id=31
Evaluation **Assessment Tasks**	Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. Assessment Task A

	What Is Weather: Student Response Chart Assessment Task B My Weather Forecast Chart Assessment Task C My Weather Chart Assessment Task D What's the Forecast Worksheet

Kindergarten Unit 3: Weather		
K-ESS3 Earth and Human Activity		
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.		
Assessment Boundary: N/A		
Science & Engineering Practices	**Disciplinary Core Ideas**	**Cross-Cutting Concepts**
Asking Questions and Defining Problems 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. **Obtaining, Evaluating, and Communicating Information** 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.	**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. **ETS1.A: Defining and Delimiting an Engineering Problem** 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)	**Cause and Effect** Events have causes that generate observable patterns. **Connections to Engineering,Technology, and Application of Science** Interdependence of Science, Engineering, and Technology People encounter questions about the natural world every day. **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.
Connections to other DCIs in this grade-band: K.ETS1.A		
Articulation of DCIs across grade-bands: 2.ESS1.C ; 3.ESS3.B ; 4.ESS3.B		

5E Model	
K-ESS3-2 Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather	
Engage **Anticipatory Set**	Crash Course Kids: What Is Severe Weather? https://www.youtube.com/watch?v=QVZExLO0MWA

	Nat Geo Kids- Wonder About Weather: Wacky Weather, Hurricanes, Tornadoes & Thunderstorms Wacky Weather: https://www.youtube.com/watch?v=QZVtgOK8uTw&list=PLQlnTldJs0ZQ67D3cB0HVlAf3H_y8u54T&index=1 Hurricanes: https://www.youtube.com/watch?v=2ThJiqgUY2c&list=PLQlnTldJs0ZQ67D3cB0HVlAf3H_y8u54T&index=3 Tornadoes: https://www.youtube.com/watch?v=HmONWtpzRq4&index=5&list=PLQlnTldJs0ZQ67D3cB0HVlAf3H_y8u54T Thunderstorms: https://www.youtube.com/watch?v=CU0enuGnSjY&list=PLQlnTldJs0ZQ67D3cB0HVlAf3H_y8u54T&index=8
Exploration **Student Inquiry**	Severe Weather: Storm Alert! In this lesson, students will learn and demonstrate safety measures to follow in a storm. http://betterlesson.com/lesson/636641/severe-weather-storm-alert Severe Weather - Tornadoes - Dorothy was Right! In this lesson, students will create a model to better understand and observe the structure of a tornado. http://betterlesson.com/lesson/636193/severe-weather-tornados-dorothy-was-right Severe Weather: Hurricanes- Tropical Storms Run Amok! In this lesson, students will be able to explain the structure of a hurricane by building a model. http://betterlesson.com/lesson/636813/severe-weather-hurricanes-tropical-storms-run-amok Severe Weather - Blizzard - Let it Snow! In this lesson, students will explain how snowflakes are formed to cause blizzards by sketching different crystals. http://betterlesson.com/lesson/636967/severe-weather-blizzards-let-it-snow
Explanation **Concepts and Practices**	In these lessons: Teachers should: Introduce formal labels, definitions, and explanations for concepts, practices, skills or abilities. Students should: Verbalize conceptual understandings and demonstrate scientific and engineering practices. Topics to Be Discussed in Teacher Directed Lessons (Disciplinary Core Ideas): 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. ETS1.A: Defining and Delimiting an Engineering Problem 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)
Elaboration **Extension Activity**	Make Your Own Snow http://www.savvysassymoms.com/blog/diy-play-snow/ Make a Hurricane http://www.giftofcuriosity.com/make-a-hurricane-extreme-weather-science/ Tornado In a Bottle http://worldforlearning.com/make-tornado-in-a-bottle/

Evaluation Assessment Tasks	Ask questions based on observations to find more information about the designed world. Assessment Task A When completing the Exploration Activities above, teacher should record student questions related to severe weather and lead a class discussion following each activity to address these questions.

Kindergarten Unit 3: Weather		
K-2-ETS1-1: Engineering Design		
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.		
Clarification Statement: N/A		
Assessment Boundary: N/A		
Science & Engineering Practices	**Disciplinary Core Ideas**	**Cross-Cutting Concepts**
Asking Questions and Defining Problems Asking questions and defining problems in K–2 builds on prior experiences and progresses to simple descriptive questions. 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.	**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)	
Connections to other DCIs in this grade-band: Kindergarten- K-PS2-2, K-ESS3-2		
Articulation of DCIs across grade-bands: 3-5.ETS1.A ; 3-5.ETS1.C		

Unit 4 Overview
Unit 4: Basic Needs of Living Things
Grade: Kindergarten
Content Area: Life & Earth Science
Pacing: 30 Instructional Days
Essential Question
How do plants get the things that they need to live and grow?

Student Learning Objectives (Performance Expectations)
K-LS1-1 Use observations to describe patterns of what plants and animals (including humans) need to survive.
K-ESS3-1 Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live.
K-ESS2-2: Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.
Unit Summary
In this unit of study, students develop an understanding of what plants and animals need to survive and the relationship between their needs and where they live. Students compare and contrast what plants and animals need to survive and the relationship between the needs of living things and where they live. The crosscutting concepts of patterns and systems and system models are called out as organizing concepts for these disciplinary core ideas. Students are expected to demonstrate grade-appropriate proficiency in developing and using models, analyzing and interpreting data, and engaging in argument from evidence. Students are also expected to use these practices to demonstrate understanding of the core ideas.
Technical Terms
Nonliving, Living, Object, Plant, Animal, Need, Air, Water, Food, Light, Space, Shelter, Habitat, Grow, Change, Leaf, Flowers, Seed, Tree, Land, Field, Pond, Ocean, Desert, Cactus, Cold, Snow, Mountain, Grassland
Formative Assessment Measures
Part A: What do plants need to live and grow?
Students who understand the concepts are able to: • Observe and use patterns in the natural world as evidence. • Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. • Use observations to describe patterns in what plants need to survive. Examples of patterns could include: Plants do not need to take in food. All plants require light. All living things need water. • Use observations to describe patterns in what animals need to survive. Examples of patterns could include: Animals need to take in food, but plants do not. Different kinds of food are needed by different types of animals. All living things need water.
Part B: What is the relationship between what plants need and where they live?
Students who understand the concepts are able to: • Observe that systems in the natural and designed world have parts that work together. • Use a model to represent relationships between the needs of different plants and the places they live in the natural world. (Plants, animals, and their surroundings make up a system.) Examples of relationships could include that grasses need sunlight, so they often grow in meadows. Examples of models include diagrams, drawings, physical replicas, dioramas, dramatizations, or storyboards." • Use a model to represent the relationships between the needs of different animals and the places they live in the natural world. (Plants, animals, and their surroundings make up a system.) Examples of relationships could include that deer eat buds and leaves and therefore usually live in forested areas. Examples of models include diagrams, drawings, physical replica, dioramas, dramatizations, and storyboards.
Part C: How can plants change their habitat?
Students who understand the concepts are able to: • Observe that systems in the natural and designed world have parts that work together. • Use a model to represent relationships between the needs of different plants and the places they live in the natural world. (Plants, animals, and their surroundings make up a system.) Examples of relationships could include that grasses need sunlight, so they often grow in meadows. Examples of models include diagrams, drawings, physical replicas, dioramas, dramatizations, or storyboards.
Interdisciplinary Connections

NJSLS- ELA	NJSLS- Mathematics
W.AW.K.1. Use a combination of drawing, dictating, and writing to compose opinion pieces on topics or texts (e.g., My favorite book is...). W.IW.K.2. Use a combination of drawing, dictating, and writing to compose informative/explanatory texts to convey ideas W.SE.K.6. With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question SL.UM.K.5. Add drawings or other visual displays to descriptions as desired to provide additional detail RL.CR.K.1 With prompting and support, ask and answer questions about key details in a literary text (e.g., who, what, where, when, why, how).	MP.2 : Reason abstractly and quantitatively. MP.4 : Model with mathematics. MP.5 : Use appropriate tools strategically. K.M.A.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. K.DL.A.1 Classify objects into given categories; count the number of objects in each category and sort the categories by count. K.M.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.

Core Instructional Materials	Textbooks Series, Lab Materials, etc.
Career Readiness, Life Literacies and Key Skills	9.4 Life Literacies and Key Skills - 9.4.2.TL.6: Illustrate and communicate ideas and stories using multiple digital tools (e.g., SL.2.5.). - 9.4.2.IML.2: Represent data in a visual format to tell a story about the data (e.g., 2.MD.D.10).
Computer Science and Design Thinking	8.1 Computer Science - 8.1.2.DA.1: Collect and present data, including climate change data, in various visual formats. - 8.2.2.ED.2: Collaborate to solve a simple problem, or to illustrate how to build a product using the design process. - 8.1.2.DA.3: Identify and describe patterns in data visualizations.

Modifications				
Multilingual Learners	**Special Education**	**At Risk for School Failure**	**Gifted and Talented**	**504**
Scaffolding	Word walls	Teacher tutoring	Curriculum compacting	Word walls
Word walls	Visual aides	Peer tutoring	Challenge assignments	Visual aides
Sentence/paragraph frames	Graphic organizers	Study guides	Enrichment activities	Graphic organizers
Bilingual dictionaries/translation	Multimedia	Graphic organizers	Tiered activities	Multimedia
Think alouds	Leveled readers	Extended time	Independent research/inquiry	Leveled readers
Read alouds	Assistive technology	Parent communication	Collaborative teamwork	Assistive technology
Highlight key vocabulary	Notes/summaries	Modified assignments	Higher level questioning	Notes/summaries
Annotation guides	Extended time	Counseling	Critical/Analytical thinking tasks	Extended time
	Answer masking		Self-directed activities	Answer masking

Think-pair- share Visual aides Modeling Cognates	Answer eliminator Highlighter Color contrast			Answer eliminator Highlighter Color contrast Parent communication Modified assignments Counseling

Kindergarten Unit 4: Basic Needs of Living Things		
K-LS1 From Molecules to Organisms: Structures and Processes		
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.		
Assessment Boundary: N/A		
Science & Engineering Practices	**Disciplinary Core Ideas**	**Cross-Cutting Concepts**
Analyzing and Interpreting Data 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. **Connections to Nature of Science** **Scientific Knowledge is Based on Empirical Evidence** Scientists look for patterns and order when making observations about the world.	**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.	**Patterns** Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.
Connections to other DCIs in this grade-band: N/A		
Articulation of DCIs across grade-bands: 1.LS1.A ; 2.LS2.A ; 3.LS2.C ; 3.LS4.B ; 5.LS1.C ; 5.LS2.A		
5E Model		
K-LS1-1 Use observations to describe patterns of what plants and animals (including humans) need to survive.		
Engage **Anticipatory Set**	The Needs of An Animal: Song https://www.youtube.com/watch?v=k4UDf3tF_O4 The Needs of a Plant: Song https://www.youtube.com/watch?v=dUBIQ1fTRzI The Needs of Living Things https://www.youtube.com/watch?v=7oYTNFNvqO0&list=PL27j5a_HUHcUgMgMXRot2ZSBnJuhyHaRS&index=10&t=27s	

	The Needs of Living Things In this introductory lesson, students will learn what animals and plants need to survive, how their habitats support these needs, and how organisms can change their environment. http://nj.pbslearningmedia.org/resource/tdc02.sci.life.colt.lp_stayalive/the-needs-of-living-things/
Exploration **Student Inquiry**	What Do We Need? In this lesson, students will be able to identify basic survival needs by completing a sort. http://betterlesson.com/lesson/631009/what-do-we-need What Do Plants Need? In this two part lesson, students will describe what plants need to survive by completing a simple investigation. http://betterlesson.com/lesson/640647/what-do-plants-need-part-i http://betterlesson.com/lesson/641195/what-do-plants-need-part-ii Comparing Needs of Plants and Humans In this lesson, students will compare the needs of plants and humans by completing a Venn diagram. http://betterlesson.com/lesson/641203/comparing-needs-of-plants-and-humans
Explanation **Concepts and Practices**	In these lessons: Teachers should: Introduce formal labels, definitions, and explanations for concepts, practices, skills or abilities. Students should: Verbalize conceptual understandings and demonstrate scientific and engineering practices. Topics to Be Discussed in Teacher Directed Lessons (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.
Elaboration **Extension Activity**	How Do Interactions Happen with Living Things http://www.georgetowncollege.edu/ccrp/files/2014/04/How-do-interactions-happen-with-living-things-K-Science-Unit.pdf Who Needs What? In this lesson, students will identify the physical needs of animals and then speculate on the needs of plants. https://www.teachengineering.org/lessons/view/duk_sunflower_mary_less
Evaluation **Assessment Tasks**	Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. Assessment Task A What Do Animal Needs: Needs and Wants Sort Assessment Task B What Do Plants Need: Prediction Worksheet Assessment Task C Comparing Human and Plant Need Venn-Diagram

Kindergarten Unit 4: Basic Needs of Living Things		
K-ESS3 Earth and Human Activity		
K-ESS3-1 Use a model to represent the relationship between the needs of different plants and 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.		
Assessment Boundary: N/A		
Science & Engineering Practices	**Disciplinary Core Ideas**	**Cross-Cutting Concepts**
Developing and Using Models Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, storyboard) that represent concrete events or design solutions. Use a model to represent relationships in the natural world.	**ESS3.A: Natural Resources** 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.	**Systems and System Models** Systems in the natural and designed world have parts that work together.
Connections to other DCIs in this grade-band: N/A		
Articulation of DCIs across grade-bands: 1.LS1.A ; 5.LS2.A ; 5.ESS2.A		

5E Model	
K-ESS3-1 Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live.	
Engage **Anticipatory Set**	BrainPOP Jr: Habitats Arctic Habitats: https://jr.brainpop.com/science/habitats/arctichabitats/ Deserts: https://jr.brainpop.com/science/habitats/desert/ Forests: https://jr.brainpop.com/science/habitats/forests/ Freshwater Habitats: https://jr.brainpop.com/science/habitats/freshwaterhabitats/ Ocean Habitats: https://jr.brainpop.com/science/habitats/oceanhabitats/ Rainforests: https://jr.brainpop.com/science/habitats/rainforests/ Plant and Animal Habitats: Informational Text http://www.bbc.co.uk/bitesize/ks2/science/living_things/plant_animal_habitats/read/1/
Exploration **Student Inquiry**	What's A Habitat Anyway? In this lesson, students will explore the idea that different animals live in different habitats due to their unique attributes. http://betterlesson.com/lesson/637733/what-s-a-habitat-anyway Survival of the Fittest: Exploring Basic Needs In this lesson, students will identify and match key elements that different living things need to survive. http://betterlesson.com/lesson/599355/survival-of-the-fittest-exploring-basic-needs Toad's Abode- Interior Design For Our Toad Why do habitats need to be unique for different animals? In this lesson, students will create a diagram to identify elements of a Fire Bellied Toad habitat. http://betterlesson.com/lesson/635015/toad-s-abode-interior-design-for-our-toad

	Hermie's House- Create a Crabitat for Hermie Why do habitats need to be unique for different animals? In this lesson, students will use a diagram to identify elements of a hermit crab habitat. http://betterlesson.com/lesson/635017/hermie-s-house-create-a-crabitat-for-hermie Awesome Animals Assessment - Follow Me Duuude! In this lesson, students will complete a diagram that connects an animal with it's appropriate habitat and essential need. http://betterlesson.com/lesson/635240/awesome-animals-assessment-follow-me-duuude
Explanation Concepts and Practices	In these lessons: Teachers should: Introduce formal labels, definitions, and explanations for concepts, practices, skills or abilities. Students should: Verbalize conceptual understandings and demonstrate scientific and engineering practices. Topics to Be Discussed in Teacher Directed Lessons (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 things they need. Humans use natural resources for everything they do.
Elaboration Extension Activity	Additional Related Activities & Resources http://www.earthsciweek.org/ngss-performance-expectations/k-ess3-1 https://www.opened.com/search?standard=K.ESS3.1
Evaluation Assessment Tasks	Use a model to represent relationships in the natural world. Assessment Task A Habitat Animal Sort Assessment Task B Where Should We Live- Matching Activity and Reflection Paper Assessment Task C Make a Home for a Fire Bellied Toad Worksheet Assessment Task D Make a Home for a Hermit Crab Worksheet Assessment Task E Where Should I Live- Matching Activity, Student Checklist & Awesome Animal Rubric

Kindergarten Unit 4: Basic Needs of Living Things
K-ESS2 Earth's Systems
K-ESS2-2: Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their 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.

Assessment Boundary: N/A

Science & Engineering Practices	Disciplinary Core Ideas	Cross-Cutting Concepts
Engaging in Argument from Evidence Engaging in argument from evidence in K–2 builds on prior experiences and progresses to comparing ideas and representations about the natural and designed world(s). Construct an argument with evidence to support a claim.	**ESS2.E: Biogeology** Plants and animals can change their environment. **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. (secondary)	**Systems and System Models** Systems in the natural and designed world have parts that work together.

Connections to other DCIs in this grade-band: N/A

Articulation of DCIs across grade-bands: 4.ESS2.E ; 5.ESS2.A

5E Model

K-ESS2-2: Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.

Engage **Anticipatory Set**	Crash Course Kids: Big Changes in the Big Apple Did you know that all living things change their environments? It's true. Beavers, deer, worms, and humans all change their environments. It just so happens that humans change our environments in big, obvious ways. In this episode, Sabrina chats about how humans have been changing our environments for a long time! https://www.youtube.com/watch?v=CyE4_D6Fb_w Crash Course Kids: Big Changes in the Big Forest What do beavers, termites, and prairie dogs have in common? They all change their environments! https://www.youtube.com/watch?v=1fkGqO0Xk94
Exploration **Student Inquiry**	How Do Interactions Happen with Living Things Lesson 6: How do animals change their environment? Why do animals need to change their environment? http://www.georgetowncollege.edu/ccrp/files/2014/04/How-do-interactions-happen-with-living-things-K-Science-Unit.pdf Plants, Animals, and Environmental Changes https://sbs.wsu.edu/eucaps/gradelevels/resources/PlantsAnimalsandEnvironmentalChanges_Kindergarten.pdf
Explanation **Concepts and Practices**	In these lessons: Teachers should: Introduce formal labels, definitions, and explanations for concepts, practices, skills or abilities. Students should: Verbalize conceptual understandings and demonstrate scientific and engineering practices. Topics to Be Discussed in Teacher Directed Lessons (Disciplinary Core Ideas): ESS2.E: Biogeology Plants and animals can change their environment. 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. (secondary)

Elaboration **Extension Activity**	Plants, Animals and Environmental Changes https://sbs.wsu.edu/eucaps/gradelevels/resources/PlantsAnimalsandEnvironmentalChanges_Kindergarten.pdf
Evaluation **Assessment Tasks**	Construct an argument with evidence to support a claim. Assessment Task A After viewing the pictures in the Plants, Animals, and Environmental Changes lesson, students will complete the table by answering the guiding questions.

Unit 5 Overview
Unit 5: Basic Needs of Humans
Grade: Kindergarten
Content Area: Earth Science
Pacing: 15 Instructional Days
Essential Question
How can humans reduce their impact on the land, water, air, and other living things in the local environment?
Student Learning Objectives (Performance Expectations)
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.
Unit Summary
In this unit of study, students develop an understanding of what humans need to survive and the relationship between their needs and where they live. The crosscutting concept of cause and effect is called out as the organizing concept for the disciplinary core ideas. Students demonstrate grade-appropriate proficiency in asking questions and defining problems, and in obtaining, evaluating, and communicating information. Students are also expected to use these practices to demonstrate understanding of the core ideas.
Technical Terms
Recycle, Reduce, Reuse, Natural Resources, Extinction, Endangered, Waste, Landfill, Conserve, Disposable, Fossil Fuel, Minerals, Pollution, Wetlands, Rainforest, Reserves, Decompose
Formative Assessment Measures
Part A: How can humans reduce their impact on the land, water, air, and other living things in the local environment?
Students who understand the concepts are able to: • Observe patterns in events generated due to cause-and-effect relationships. • Communicate solutions with others in oral and/or written forms using models and/or drawings that provide detail about scientific ideas. • Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment. • Ask questions based on observations to find more information about the natural and/or designed world. • Define a simple problem that can be solved through the development of a new or improved object or tool. • Ask questions, make observations, and gather information about a situation that people want to change in order to define a simple problem that can be solved through the development of a new or improved object or tool.

Interdisciplinary Connections	
NJSLS- ELA	**NJSLS- Mathematics**
W.AW.K.1. Use a combination of drawing, dictating, and writing to compose opinion pieces on topics or texts (e.g., My favorite book is...). W.IW.K.2. Use a combination of drawing, dictating, and writing to compose informative/explanatory texts to convey ideas W.SE.K.6. With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question SL.UM.K.5. Add drawings or other visual displays to descriptions as desired to provide additional detail RL.CR.K.1 With prompting and support, ask and answer questions about key details in a literary text (e.g., who, what, where, when, why, how).	MP.2 : Reason abstractly and quantitatively. MP.4 : Model with mathematics. MP.5 : Use appropriate tools strategically. K.M.A.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. K.DL.A.1 Classify objects into given categories; count the number of objects in each category and sort the categories by count. K.M.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.

Core Instructional Materials	Textbooks Series, Lab Materials, etc.
Career Readiness, Life Literacies and Key Skills	9.4 Life Literacies and Key Skills - 9.4.2.CT.1: Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2). - 9.4.2.CT.2: Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3). - 9.4.2.CT.3: Use a variety of types of thinking to solve problems (e.g., inductive, deductive). - 9.4.2.IML.2: Represent data in a visual format to tell a story about the data (e.g., 2.MD.D.10).
Computer Science and Design Thinking	8.1 Computer Science - 8.1.2.DA.3: Identify and describe patterns in data visualizations. - 8.2.2.ED.2: Collaborate to solve a simple problem, or to illustrate how to build a product using the design process. - 8.2.2.ED.3: Select and use appropriate tools and materials to build a product using the design process.

Modifications				
Multilingual Learners	**Special Education**	**At Risk for School Failure**	**Gifted and Talented**	**504**
Scaffolding	Word walls	Teacher tutoring	Curriculum compacting	Word walls
Word walls	Visual aides	Peer tutoring	Challenge assignments	Visual aides
Sentence/paragraph frames	Graphic organizers	Study guides	Enrichment activities	Graphic organizers
Bilingual dictionaries/translation	Multimedia	Graphic organizers	Tiered activities	Multimedia
	Leveled readers	Extended time	Independent research/inquiry	Leveled readers
Think alouds	Assistive technology	Parent communication	Collaborative teamwork	Assistive technology

Read alouds Highlight key vocabulary Annotation guides Think-pair- share Visual aides Modeling Cognates	Notes/summaries Extended time Answer masking Answer eliminator Highlighter Color contrast	Modified assignments Counseling	Higher level questioning Critical/Analytical thinking tasks Self-directed activities	Notes/summaries Extended time Answer masking Answer eliminator Highlighter Color contrast Parent communication Modified assignments Counseling

Kindergarten Unit 5: Basic Needs of Humans		
K-ESS3 Earth and Human Activity		
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.		
Assessment Boundary: N/A		
Science & Engineering Practices	**Disciplinary Core Ideas**	**Cross-Cutting Concepts**
Obtaining, Evaluating, and Communicating Information Obtaining, evaluating, and communicating information in K–2 builds on prior experiences and uses observations and texts to communicate new information. Communicate solutions with others in oral and/or written forms using models and/or drawings that provide detail about scientific ideas.	**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. **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)	**Cause and Effect** Events have causes that generate observable patterns.
Connections to other DCIs in this grade-band: K.ETS1.A		
Articulation of DCIs across grade-bands: 2.ETS1.B ; 4.ESS3.A ; 5.ESS3.C		
5E Model		
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.		
Engage **Anticipatory Set**	BrainPOP Videos: Conservation Reduce, Reuse & Recycle: https://jr.brainpop.com/science/conservation/reducereuserecycle/	

	How Recycling Works! Humans make a lot of garbage every day, and a lot of it ends up in big, smelly dumps. Luckily, there are things we can do to reuse a lot of our garbage and keep the Earth healthy and clean! Join Jessi and find out how! https://www.youtube.com/watch?v=VlRVPum9cp4 Reduce, Reuse, Recycle: Song https://www.youtube.com/watch?v=AOvcW8l3RzE
Exploration **Student Inquiry**	PBS Kids: Reduce, Reuse, Recycle In this lesson students will be introduced to the concepts of reducing, reusing and recycling. They will learn new vocabulary, read labels, and connect environmental concepts to their everyday experiences. Students will perform a skit highlighting what they have learned about taking action to conserve the earth's resources. http://pbskids.org/eekoworld//parentsteachers/lessonsk_1.html Give and Get: Reduce, Reuse, Recycle and Remind Why is it important to keep things out of the landfill? In this lesson, students will collect materials and find alternatives to trash to practice recycling. http://betterlesson.com/lesson/637871/give-and-get-reduce-reuse-recycle-remind Productive Paper How can changing paper help people? In this lesson, students will discover a different way to reuse paper. http://betterlesson.com/lesson/640508/productive-paper-prosperous-paper
Explanation **Concepts and Practices**	In these lessons: Teachers should: Introduce formal labels, definitions, and explanations for concepts, practices, skills or abilities. Students should: Verbalize conceptual understandings and demonstrate scientific and engineering practices. Topics to Be Discussed in Teacher Directed Lessons (Disciplinary Core Ideas): 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. 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)
Elaboration **Extension Activity**	Human Impact on Earth Systems https://sbs.wsu.edu/eucaps/gradelevels/resources/NGSS%20Human%20Impact%20Unit_Kindergarten.pdf Everyday in Earth Day: Interactive Game http://www.starfall.com/n/holiday/earthday/play.htm?f Recycle Roundup: Interactive Game http://images.nationalgeographic.com/wpf/media-content/richmedia/1/1143/project/dist/desktop.html

Evaluation Assessment Tasks	Communicate solutions with others in oral and/or written forms using models and/or drawings that provide detail about scientific ideas. Assessment Task A When completing the Exploration Activities above, teacher should record student communications about solutions to human impacts on land, water and air in oral and/or written form. Give and Get-Reduce, Reuse, Recycle & Remind: Reflection Paper

Kindergarten Unit 5: Basic Needs of Humans		
K-2-ETS1-1: Engineering Design		
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.		
Clarification Statement: N/A		
Assessment Boundary: N/A		
Science & Engineering Practices	**Disciplinary Core Ideas**	**Cross-Cutting Concepts**
Asking Questions and Defining Problems Asking questions and defining problems in K–2 builds on prior experiences and progresses to simple descriptive questions. 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.	**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)	
Connections to other DCIs in this grade-band: Kindergarten- K-PS2-2, K-ESS3-2		
Articulation of DCIs across grade-bands: 3-5.ETS1.A ; 3-5.ETS1.C		