Beach Haven School District

Science Curriculum

Grade K

Original Adoption: September 12, 2016
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Revised on: June 22, 2022
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Recommended Pacing Guide	
Unit 1: **Engineering and Technology**	**30 days- ongoing**
Unit 2: **Forces and Motion**	**30 days- ongoing**
Unit 3: **Plant & Animal Structures**	**30 days- ongoing**
Unit 4: **Sun Warms Earth**	**30 days- ongoing**
Unit 5: **Weather**	**30 days- ongoing**
Unit 6: **Earth's Resources**	**30 days- ongoing**

Unit 1: Engineering and Technology	Duration: 30 days- ongoing

Standards/Learning Targets

New Jersey Student Learning Standards:

- 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.

Correlation Chart

EDI

Performance Expectation

K-2- ETS1-1- Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

Science and Engineering Practices	Disciplinary Core Ideas
Asking Questions and Defining Problems- ● 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. ● Asking questions, making observations, and gathering information are helpful in thinking about problems. ● Before beginning to design a solution, it is important to clearly understand the problem.
Crosscutting Concepts	**Learning Objectives**
Patterns • Patterns in the natural world can be observed, used to describe	● Students ask questions and make observations to gather information about a situation that people want to change. Students' questions, observations, and information gathering are focused on: ○ A given situation that people wish to change.

phenomena, and used as evidence. (K-ESS2-1) Cause and Effect • Events have causes that generate observable patterns. (K-ESS3-2)	○ Why people want the situation to change. ○ The desired outcome of changing the situation. ● Students' questions are based on observations and information gathered about scientific phenomena that are important to the situation. ● Students use the information they have gathered, including the answers to their questions, observations they have made, and scientific information, to describe the situation people want to change in terms of a simple problem that can be solved with the development of a new or improved object or tool. ● With guidance, students describe the desired features of the tool or object that would solve the problem, based on scientific information, materials available, and potential related benefits to people and other living things.

Performance Expectation	
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.	
Science and Engineering Practices	**Disciplinary Core Ideas**
Developing and Using Models- ● Develop a simple model based on evidence to represent a proposed object or tool.	**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
Crosscutting Concepts	**Learning Objectives**
Structure and Function- ● The shape and stability of structures of natural and designed objects are related to their function(s).	● Students develop a representation of an object and the problem it is intended to solve. In their representation, students include the following components: ○ The object ○ The relevant shape(s) of the object. ○ The function of the object. ● Students use sketches, drawings, or physical models to convey their representations. ● Students identify relationships between the components in their representation, including: ○ The shape(s) of the object and the object's function. ○ The object and the problem is it designed to solve. ● Students use their representation (simple sketch, drawing, or physical model) to communicate the connections between the shape(s) of an object, and how the object could solve the problem.

Performance Expectation	
K-2- ETS1-3. Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.	
Science and Engineering Practices	**Disciplinary Core Ideas**
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.
Crosscutting Concepts	**Learning Objectives**
Patterns • Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (K-ESS2-1) Cause and Effect • Events have causes that generate observable patterns. (K-ESS3-2)	● With guidance, students use graphical displays (e.g., tables, pictographs, line plots) to organize given data from tests of two objects, including data about the features and relative performance of each solution. ● Students use their organization of the data to find patterns in the data, including: ○ How each of the objects performed, relative to: ■ The other object. ■ The intended performance ○ How various features of the objects relate to their performance ● Students use the patterns they found in object performance to describe: ○ The way each object will solve the problem ○ The strengths and weaknesses of each design. ○ Which object is better suited to the desired function, if both solve the problem.

Primary Interdisciplinary Connections:

- **ELA:** SL.K.3. Ask and answer questions in order to seek help, get information, or clarify something that is not understood.
- Engineering Units are embedding throughout Units

Technology Standards:

- 8.1.2.A.1 Identify the basic features of a digital device and explain its purpose.
- 8.1.2.A.4 Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
- 8.2.2.C.1 Brainstorm ideas on how to solve a problem or build a product
- 8.1.2.E.1 Use digital tools and online resources to explore a problem or issue.

- 8.2.2.E.1 List and demonstrate the steps to an everyday task

21st Century Themes/Career Readiness

- CRP4. Communicate clearly and effectively and with reason.
- CRP7. Employ valid and reliable research strategies.
- CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

Suggested Accommodations

English Language Learners:

- Labeled pictures/videos
- Using tactile objects to relate to key ideas.
- Chunk/limit information
- Speak slowly
- Limit number of questions
- Partner with a strong English speaking partner
- Extended time
- Modified assignments
- Review vocabulary before the lesson

Special Education/Students with Disabilities:

- Follow specific IEP accommodations and modifications
- Extended time
- Modified assignments
- Labeled pictures of weather phenomenon
- Pre-teach concepts
- Differentiate assignments

504 Plans:

- Follow specific 504 accommodations and modifications
- Extended time
- Modified assignments
- Labeled pictures of weather phenomenon
- Pre-teach concepts
- Differentiate assignments

Gifted and Talented:

- Differentiate assignments
- Higher level texts
- Homework questions should be open ended to increase higher level thinking
- Differentiate test questions
- Create alternate projects or assignments that challenge thinking
- Reference and possibly apply assessment boundary skills

Students at Risk of Failure:

- Small group instruction
- Frequent breaks
- Model how assignments should look
- Incorporate social/emotional discussions
- Encourage and monitor positive peer collaboration
- Provide academic resources for both school and home use

Economically Disadvantaged:

- Structure the learning around explaining or solving a social or community-based issue.
- Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tools such as Zoom, experts from the community helping with a project, journal articles, and biographies).

Culturally Diverse:

- Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences).
- Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.
- Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tools such as Zoom, experts from the community helping with a project, journal articles, and biographies).

Evidence of Student Learning

Formative Tasks:

- Cooperative group learning
- Exit slips
- Analysis of student work
- Teacher observations
- Self-reflection
- Science journals

Alternative Assessments:

- 3-D Performance Tasks
- Student created models
- draw/verbal explanations
- Self-assessment
- Critical Juncture Assessments

Summative Assessments:

- End of the unit assessment

Benchmark Assessments:

- Pre-Unit Assessments
- On-the-fly Assessments

Knowledge & Skills

Enduring Understandings:

- A situation that people want to change or create can be approached as a problem to be solved through engineering.
- Asking questions, making observations, and gathering information are helpful in thinking about problems.
- The shape and stability of structures of natural and designed objects are related to their function(s)

Essential Questions:

- How are asking questions, gathering information, and making observation helpful when thinking about problems?
- How does sketching or creating a model to illustrate its shape help solve a given problem?
- How does testing a model determine its strengths and weaknesses in solving a given problem?

Core Instructional & Supplemental Materials

Suggested Activities/Resources:

- *Houghton Mifflin Harcourt Science Dimensions*
- Embedded hands on investigations and readers
- https://betterlesson.com/lesson/637784/simple-machines-inventions?from=cc_lesson
- https://betterlesson.com/lesson/644795/a-place-in-the-shade-an-engineering-challenge
- Mystery Science

Varied Levels of Text:

- Revisit texts
- *Rosie Revere Engineer* by Andrea Beaty
- *Iggy Peck Architect* by Andrea Beaty
- *Incredible Inventions* by Lee Bennett Hopkins
- *Jabari Tries* by Gaia Cornwall
- *If I Built A School* by Chris Van Dusen

Unit 2: Forces and Motion	Duration: 30 days- ongoing

Standards/Learning Targets

New Jersey Student Learning Standards:

- **K-PS2-1-** Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object. [Clarification Statement: Examples of pushes or pulls could include a string attached to an object being pulled, a person pushing an object, a person stopping a rolling ball, and two objects colliding and pushing on each other.] [Assessment Boundary: Assessment is limited to different relative strengths or different directions, but not both at the same time. Assessment does not include non-contact pushes or pulls such as those produced by magnets.]
- **K-PS2-2-** Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull. [Clarification Statement: Examples of problems requiring a solution could include having a marble or other object move a certain distance, follow a particular path, and knock down other objects. Examples of solutions would 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.]

Performance Expectation

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 would 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 and Engineering Practices	Disciplinary Core Ideas
Analyzing and Interpreting- ● 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
Crosscutting Concepts	**Learning Objectives**
Cause and Effect- ● Simple tests can be designed to gather evidence to support or refute student ideas about causes	**Organizing data-** ● With guidance, students organize given information using graphical or visual displays (e.g., pictures, pictographs, drawings, written observations, tables, charts). The given information students organize includes: ○ The relative speed or direction of the object before a push or pull is applied (i.e., qualitative measures and expressions of speed and

	direction; e.g., faster, slower, descriptions* of “which way”). ○ The relative speed or direction of the object after a push or pull is applied. ○ How the relative strength of a push or pull affects the speed or direction of an object (i.e., qualitative measures or expressions of strength; e.g., harder, softer). **Identifying relationships-** ● Using their organization of the given information, students describe relative changes in the speed or direction of the object caused by pushes or pulls from the design solution. **Interpreting data-** ● Students describe the goal of the design solution. ● Students describe their ideas about how the push or pull from the design solution causes the change in the object’s motion. ● Based on the relationships they observed in the data, students describe whether the push or pull from the design solution causes the intended change in speed or direction of motion of the object.

Performance Expectation	
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 and Engineering Practices	**Disciplinary Core Ideas**
Planning and Carrying Out Investigations- ● With guidance, plan and conduct an investigation in collaboration with peers.	**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)
Crosscutting Concepts	**Learning Objectives**

Cause and Effect- ● Simple tests can be designed to gather evidence to support or refute student ideas about causes.	**Identifying the phenomenon to be investigated-** ● With guidance, students collaboratively identify the phenomenon under investigation, which includes the following idea: the effect caused by different strengths and directions of pushes and pulls on the motion of an object. ● With guidance, students collaboratively identify the purpose of the investigation, which includes gathering evidence to support or refute student ideas about causes of the phenomenon by comparing the effects of different strengths of pushes and pulls on the motion of an object. **Identifying the evidence to address this purpose of the investigation-** ● With guidance, students collaboratively develop an investigation plan to investigate the relationship between the strength and direction of pushes and pulls and the motion of an object (i.e., qualitative measures or expressions of strength and direction; e.g., harder, softer, descriptions* of "which way"). ● Students describe* how the observations they make connect to the purpose of the investigation, including how the observations of the effects on object motion allow causal relationships between pushes and pulls and object motion to be determined ● Students predict the effect of the push of pull on the motion of the object, based on prior experiences. **Planning the investigation-** ● In the collaboratively developed investigation plan, students describe ○ The object whose motion will be investigated. ○ What will be in contact with the object to cause the push or pull. ○ The relative strengths of the push or pull that will be applied to the object to start or stop its motion or change its speed. ○ The relative directions of the push or pull that will be applied to the object ○ How the motion of the object will be observed and recorded ○ How the push or pull will be applied **t**o vary strength or direction **Collecting the data-** ● According to the investigation plan they developed, and with guidance, students collaboratively make observations that would allow them to compare the effect on the motion of the object caused by changes in the strength or direction of the pushes and pulls and record their data.

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Technology Standards:

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- 8.2.2.C.1 Brainstorm ideas on how to solve a problem or build a product
- 8.1.2.E.1 Use digital tools and online resources to explore a problem or issue.
- 8.2.2.E.1 List and demonstrate the steps to an everyday task

21st Century Themes/Career Readiness

- CRP1. Act as a responsible and contributing citizen and employee.
- CRP4. Communicate clearly and effectively and with reason.
- CRP6. Demonstrate creativity and innovation
- CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

Suggested Accommodations

English Language Learners:

- Labeled pictures/videos
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- Chunk/limit information
- Speak slowly
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Evidence of Student Learning	
Formative Tasks: ● Cooperative group learning ● Exit slips ● Analysis of student work ● Teacher observations ● Self-reflection ● Science journals	**Alternative Assessments:** ● 3-D Performance Tasks ● Student created models ● draw/verbal explanations ● Self-assessment ● Critical Juncture Assessments
Summative Assessments: ● End of the unit assessment ● Portfolio Assessment ● Benchmark	**Benchmark Assessments:** ● Pre-Unit Assessments ● On-the-fly Assessments
Knowledge & Skills	
Enduring Understandings: ● An object starts to move when another object exerts a force on it. ● Forces happen between two objects. ● An object moves a long distance when a strong force is exerted on it. ● An object moves a short distance when a gentle force is exerted on it. ● An object starts to move in the same direction as the force that starts the motion. ● Every force has a strength—gentle or strong—and a direction. ● Every force has a strength—gentle or strong—and a direction, which makes the object move a certain distance and direction. ● A moving object changes direction when another moving object exerts a force on it.	**Essential Questions:** ● What makes and object start to move? ● What makes an object move shorter or longer distances? ● What makes an object start moving in a certain direction? ● What makes an object move to a certain place? ● What can make a moving object change direction? ● How do engineers make their solutions do all the things they want them to do? ● How do engineers make their solutions do all the things they want them to do?

• A moving object changes direction when a still object in its way exerts a force on it.	

Core Instructional & Supplemental Materials

Suggested Activities/Resources:

- *Houghton Mifflin Harcourt Science Dimensions*
- Hands on embedded investigations
- https://www.sciencea-z.com/marketing-content/science-a-z-and-ngss-grade-k.pdf
- http://www.education.com/activity/kindergarten/science/
- https://www.youtube.com/watch?v=FOcY37oGhj8
- https://www.youtube.com/watch?v=AKUgWLCNb68
- http://www.sciencebuddies.org/science-activities?gclid=CjwKEAjwiZitBRCy0pb3rIbG9XwSJACmuvvziKHHQaFENLZpQDpWc9hEI0M1iXg3QHGKilQ2G8W0FhoCRbTw_wcB
- http://www.goorulearning.org/?gclid=CjwKEAjwiZitBRCy0pb3rIbG9XwSJACmuvvzqgodQ5WRpB9ve2OFICWiwZY72fRgEI_1j4TEIfqPChoCeuHw_wcB#home
- http://thehappyscientist.com/next-generation-science-standards-grade-k
- http://www.bbc.co.uk/bitesize/ks3/science/energy_electricity_forces/forces/activity/ (forces)
- http://www.hookedonscience.org/nextgenerationsciencestandards.html
- http://www.ssec.si.edu/games/students
- http://www.resa.net/curriculum/curriculum/science/professionaldevelopment/ngss-pd/lesson-plans-exploring-ngss/
- http://moodle.tbaisd.org/course/view.php?id=1021
- https://www.sciencea-z.com/marketing-content/science-a-z-and-ngss-grade-k.pdf
- http://www.mccracken.kyschools.us/Downloads/PUSHES%20and%20PULLS%20-K.pdf
- http://www.schoolofdragons.com/hiccups-science-workshop/ngss/kindergarten
- http://www.calacademy.org/educators/science-lesson-plans-for-kindergarten-and-1st-grade
- http://climatekids.nasa.gov/menu/big-questions/

Varied Levels of Text:

- *Talking About Forces*
- *Building with Forces*
- *Room 4 Solves a Problem*
- *A Busy Day in Pushville*
- *Forces in Ball Games*

Unit 3: Plant and Animal Structures	Duration: 30 days- ongoing

Standards/Learning Targets

New Jersey Student Learning Standards:

- **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-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.]
- **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.]
- **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.]

Performance Expectation

K-LS1-1- Use observations to describe patterns of what plants and animals (including humans) need to survive. *[Clarification Statement: Examples of patterns could include that animals need to take in food but plants do not; the different kinds of food needed by different types of animals; the requirement of plants to have light; and, that all living things need water.]*

Science and Engineering Practices	Disciplinary Core Ideas
Analyzing and Interpreting Data- ● Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. **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.
Crosscutting Concepts	**Learning Objectives**
Patterns- ● Patterns in the natural and human designed world can be observed and used as evidence.	● With guidance, students organize the given data from observations (firsthand or from media) using graphical displays (e.g., pictures, charts), including: ○ Different types of animals

	○ Data about the foods different animals eat and drink ○ Data about plants' need for water ○ Data about plants' need for light ● Students identify patterns in the organized data, including that**:** ○ All animals eat food. ○ All animals drink water. ○ Plants cannot live or grow if there is no water. ○ Plants cannot live or grow if there is no light. ● Students describe that the patterns they identified in the data provide evidence that: ○ Plants need light and water to live and grow. ○ Animals need food and water to live and grow. ○ Animals get their food from plants, other animals, or both.

Performance Expectation	
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.]	
Science and Engineering Practices	**Disciplinary Core Ideas**
Developing and Using Models- ● 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.
Crosscutting Concepts	**Learning Objectives**
Systems and System Models- ● Systems in the natural and designed world have parts that work together.	● From the given model (e.g., representation, diagram, drawing, physical replica, diorama, dramatization, storyboard) of a phenomenon involving the needs of living things and their environments, students identify and describe the components that are relevant to their representations, including: ○ Different plants and animals ○ The places where the different plants and animals live. ○ The things that plants and animals need ● Students use the given model to represent and describe relationships between the components, including:

	○ The relationships between the different plants and animals and the materials they need to survive ○ The relationships between places where different plants and animals live and the resources those places provide. ○ The relationships between specific plants and animals and where they live (e.g., fish live in water environments, deer live in forests where there are buds and leaves, rabbits live in fields and woods where there is grass to eat and space for burrows for homes, plants live in sunny and moist areas, humans get resources from nature [e.g., building materials from trees to help them live where they want to live]). ● Students use the given model to represent and describe, including: ○ Students use the given model to describe the pattern of how the needs of different plants and animals are met by the various places in which they live ○ Students use the given model to describe that plants and animals, the places in which they live, and the resources found in those places are each part of a system, and that these parts of systems work together and allow living things to meet their needs.

Performance Expectation	
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.]	
Science and Engineering Practices	**Disciplinary Core Ideas**
Engaging in Argument from Evidence- ● 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)
Crosscutting Concepts	**Learning Objectives**
Systems and System Models- ● Systems in the natural and designed world have parts that work together.	● Students make a claim to be supported about a phenomenon. In their claim, students include the idea that plants and animals (including humans) can change the environment to meet their needs. ● Students identify and describe the given evidence to support the claim, including ○ Examples of plants changing their environments (e.g., plant roots lifting sidewalks). ○ Examples of animals (including humans) changing their environments (e.g., ants building an ant hill, humans clearing land to build houses, birds building a nest, squirrels digging

	holes to hide food). ○ Examples of plant and animal needs (e.g., shelter, food, room to grow). ● Students describe how the examples do or do not support the claim ● Students support the claim and present an argument by logically connecting various needs of plants and animals to evidence about how plants/animals change their environments to meet their needs. Students include: ○ Examples of how plants affect other parts of their systems by changing their environments to meet their needs (e.g., roots push soil aside as they grow to better absorb water). ○ Examples of how animals affect other parts of their systems by changing their environments to meet their needs (e.g., ants, birds, rabbits, and humans use natural materials to build shelter; some animals store food for winter).

Primary Interdisciplinary Connections:

- **ELA:** SL.K.3. Ask and answer questions in order to seek help, get information, or clarify something that is not understood.
- Engineering Units are embedding throughout Units

Technology Standards:

- 8.1.2.A.1 Identify the basic features of a digital device and explain its purpose.
- 8.1.2.A.4 Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
- 8.2.2.C.1 Brainstorm ideas on how to solve a problem or build a product
- 8.1.2.E.1 Use digital tools and online resources to explore a problem or issue.
- 8.2.2.E.1 List and demonstrate the steps to an everyday task

Career Ready Practices:

- CRP1. Act as a responsible and contributing citizen and employee.
- CRP4. Communicate clearly and effectively and with reason.
- CRP12. Work productively in teams while using cultural global competence.

21st Century Life and Career Standards:

- 9.1.4.A.1- Explain the difference between a career and a job, and identify various jobs in the community and the related earnings.

Suggested Accommodations

English Language Learners:

- Labeled pictures/videos
- Using tactile objects to relate to key ideas.
- Chunk/limit information
- Speak slowly
- Limit number of questions
- Partner with a strong English speaking partner
- Extended time
- Modified assignments
- Review vocabulary before the lesson

Special Education/Students with Disabilities:

- Follow specific IEP accommodations and modifications
- Extended time
- Modified assignments
- Labeled pictures of weather phenomenon
- Pre-teach concepts
- Differentiate assignments

504 Plans:
- Follow specific 504 accommodations and modifications
- Extended time
- Modified assignments
- Labeled pictures of weather phenomenon
- Pre-teach concepts
- Differentiate assignments

Gifted and Talented:
- Differentiate assignments
- Higher level texts
- Homework questions should be open ended to increase higher level thinking
- Differentiate test questions
- Create alternate projects or assignments that challenge thinking
- Reference and possibly apply assessment boundary skills

Students at Risk of Failure:
- Small group instruction
- Frequent breaks
- Model how assignments should look
- Incorporate social/emotional discussions
- Encourage and monitor positive peer collaboration
- Provide academic resources for both school and home use

Economically Disadvantaged:
- Structure the learning around explaining or solving a social or community-based issue.
- Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies).

Culturally Diverse:
- Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences).
- Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.
- Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies).

Evidence of Student Learning	
Formative Tasks: ● Cooperative group learning ● Exit slips ● Analysis of student work ● Teacher observations	**Alternative Assessments:** ● 3-D Performance Tasks ● Student created models ● draw/verbal explanations ● Self-assessment

• Self-reflection • Science journals	• Critical Juncture Assessments
Summative Assessments: • End of the unit assessment • Portfolio Assessment • Benchmark	**Benchmark Assessments:** • Pre-Unit Assessments • On-the-fly Assessments
Knowledge & Skills	
Enduring Understandings: • Different kinds of plants and animals live in a place • An animal needs to eat food to live. • Animals can only live in a place that has the food they need. • When plants grow, they get bigger and have new parts that were not there before. • Plants need water from the place where they are in order to live and grow. • Animals need water from the place where they are in order to live and grow. • Plants get water they need with their roots from the soil around them. Plants need light to live and grow • Plants get light they need with their leaves. • What scientists learn about living things can help people make choices about what to do.	**Essential Questions:** • Why can an animal live where it does? • What does it look like when plants grow? • Do plants need water to grow? • How do plants get the water they need? • Do plants need light to live and grow? • How do plants get light? • How can humans make sure that other living things can live and grow?
Core Instructional & Supplemental Materials	
Suggested Activities/Resources: • *Houghton Mifflin Harcourt Science Dimensions* • Unit investigations and readers • http://spaceplace.nasa.gov/science-fair/en/ (science method fair ideas) • http://www.hookedonscience.org/nextgenerationsciencestandards.html • http://www.ssec.si.edu/games/students • http://www.resa.net/curriculum/curriculum/science/professionaldevelopment/ngss-pd/lesson-plans-exploring-ngss/ • http://moodle.tbaisd.org/course/view.php?id=1021 • https://www.sciencea-z.com/marketing-content/science-a-z-and-ngss-grade-k.pdf • http://www.schoolofdragons.com/hiccups-science-workshop/ngss/kindergarten • http://www.calacademy.org/educators/science-lesson-plans-for-kindergarten-and-1st-grade • http://climatekids.nasa.gov/menu/big-questions/	**Varied Levels of Text:** • *Science Walk* • *A Plant In the Desert* • *Above and Below* • *Investigating Monarchs* • *Handbook of Plants*

Unit 4: Sun Warms Earth	Duration: 30 days- ongoing

Standards/Learning Targets

New Jersey Student Learning Standards:

- **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-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. [Clarification Statement: Examples of structures could include umbrellas, canopies, and tents that minimize the warming effect of the sun.]

Performance Expectation

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 and Engineering Practices	Disciplinary Core Ideas
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. **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.
Crosscutting Concepts	**Learning Objectives**
Patterns Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.	**Organizing data** With guidance, students organize data from given observations (firsthand or from media) about local weather conditions using graphical displays (e.g., pictures, charts). The weather condition data include: ● The number of sunny, cloudy, rainy,

	windy, cool, or warm days. ● The relative temperature at various times of the day (e.g., cooler in the morning, warmer during the day, cooler at night). **Identifying relationships** Students identify and describe* patterns in the organized data, including: ● The relative number of days of different types of weather conditions in a month. ● The change in the relative temperature over the course of a day. **Interpreting data** Students describe and share that: ● Certain months have more days of some kinds of weather than do other months (e.g., some months have more hot days, some have more rainy days). ● The differences in relative temperature over the course of a day (e.g., between early morning and the afternoon, between one day and another) are directly related to the time of day

Performance Expectation	
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. [Clarification Statement: Examples of structures could include umbrellas, canopies, and tents that minimize the warming effect of the sun.]	
Science and Engineering Practices	**Disciplinary Core Ideas**
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.

Crosscutting Concepts	Learning Objectives
Cause and Effect Events have causes that generate observable patterns.	**Using scientific knowledge to generate design solutions** ● Students use given scientific information about sunlight's warming effect on the Earth's surface to collaboratively design and build a structure that reduces warming caused by the sun. ● With support, students individually describe the problem, the design solution, and in what way the design solution uses the given scientific information. **Describing* specific features of the design solution, including quantification when appropriate** ● Students describe* that the structure is expected to reduce warming for a designated area by providing shade ● Students use only the given materials and tools when building the structure. **Evaluating potential solutions** ● Students describe* whether the structure meets the expectations in terms of cause (structure blocks sunlight) and effect (less warming of the surface).

Performance Expectation	
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 and Engineering Practices	**Disciplinary Core Ideas**
Planning and Carrying Out Investigations- ● Make observations (firsthand or from media) to collect data that can be used to make comparisons. **Scientific Investigations Use a Variety of Methods-** ● Scientists use different ways to study the world.	**PS3.B: Conservation of Energy and Energy Transfer-** ● Sunlight warms Earth's surface.
Crosscutting Concepts	**Learning Objectives**
Cause and Effect-	**Identifying the phenomenon to be investigated-**

• Events have causes that generate observable patterns.	• From the given investigation plan, students describe (with guidance) the phenomenon under investigation, which includes the following idea: sunlight warms the Earth's surface • Students describe (with guidance) the purpose of the investigation, which includes determining the effect of sunlight on Earth materials by identifying patterns of relative warmth of materials in sunlight and shade (e.g., sand, soil, rocks, water) **Identifying the evidence to address the purpose of the investigation-** • Based on the given investigation plan, students describe (with guidance) the evidence that will result from the investigation, including observations of the relative warmth of materials in the presence and absence of sunlight (i.e., qualitative measures of temperature; e.g., hotter, warmer, colder). • Students describe how the observations they make connect to the purpose of the investigation. **Planning the investigation-** • Based on the given investigation plan, students describe (with guidance) the materials on the Earth's surface to be investigated and how the relative warmth of the materials will be observed and recorded.

Performance Expectation	
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.]	
Science and Engineering Practices	**Disciplinary Core Ideas**
Asking Questions and Defining Problems- • Ask questions based on observations to find more information about the designed world. **Obtaining, Evaluating, and Communicating 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-** • Asking questions, making observations, and gathering information are helpful in thinking about problems. (secondary)
Crosscutting Concepts	**Learning Objectives**

Cause and Effect- ● Events have causes that generate observable patterns. **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.	● Students formulate questions about local severe weather, the answers to which would clarify how weather forecasting can help people avoid the most serious impacts of severe weather events. ● Identifying the scientific nature of the question a Students' questions are based on their observations.. ● Obtaining information a Students collect information (e.g., from questions, grade appropriate texts, media) about local severe weather warnings (e.g., tornado alerts, hurricane warnings, major thunderstorm warnings, winter storm warnings, severe drought alerts, heatwave alerts), including that: ○ There are patterns related to local severe weather that can be observed (e.g., certain types of severe weather happen more in certain places). ○ Weather patterns (e.g., some events are more likely in certain regions) help scientists predict severe weather before it happens. ○ Severe weather warnings are used to communicate predictions about severe weather. ○ Weather forecasting can help people plan for, and respond to, specific types of local weather (e.g., responses: stay indoors during severe weather, go to cooling centers during heat waves; preparations: evacuate coastal areas before a hurricane, cover windows before storms).

Primary Interdisciplinary Connections:

- **ELA:** SL.K.3. Ask and answer questions in order to seek help, get information, or clarify something that is not understood.
- Engineering Units are embedding throughout Units

Technology Standards:

- 8.1.2.A.1 Identify the basic features of a digital device and explain its purpose.
- 8.1.2.A.4 Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
- 8.2.2.C.1 Brainstorm ideas on how to solve a problem or build a product
- 8.1.2.E.1 Use digital tools and online resources to explore a problem or issue.
- 8.2.2.E.1 List and demonstrate the steps to an everyday task

Career Ready Practices:

- CRP1. Act as a responsible and contributing citizen and employee.
- CRP4. Communicate clearly and effectively and with reason.
- CRP12. Work productively in teams while using cultural global competence.

21st Century Life and Career Standards:

- 9.1.4.A.1- Explain the difference between a career and a job, and identify various jobs in the community and the related earnings.

Suggested Accommodations

English Language Learners:

- Labeled pictures/videos
- Using tactile objects to relate to key ideas.
- Chunk/limit information
- Speak slowly
- Limit number of questions
- Partner with a strong English speaking partner
- Extended time
- Modified assignments
- Review vocabulary before the lesson

Special Education/Students with Disabilities:

- Follow specific IEP accommodations and modifications
- Extended time
- Modified assignments
- Labeled pictures of weather phenomenon
- Pre-teach concepts
- Differentiate assignments

504 Plans:

- Follow specific 504 accommodations and modifications
- Extended time
- Modified assignments
- Labeled pictures of weather phenomenon
- Pre-teach concepts
- Differentiate assignments

Gifted and Talented:

- Differentiate assignments
- Higher level texts
- Homework questions should be open ended to increase higher level thinking
- Differentiate test questions
- Create alternate projects or assignments that challenge thinking
- Reference and possibly apply assessment boundary skills

Students at Risk of Failure:

- Small group instruction
- Frequent breaks
- Model how assignments should look
- Incorporate social/emotional discussions
- Encourage and monitor positive peer collaboration
- Provide academic resources for both school and home use

Economically Disadvantaged:

- Structure the learning around explaining or solving a social or community-based issue.
- Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies).

Culturally Diverse:

- Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences).
- Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.

- Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies).

Evidence of Student Learning

Formative Tasks:
- Cooperative group learning
- Exit slips
- Analysis of student work
- Teacher observations
- Self-reflection
- Science journals

Alternative Assessments:
- 3-D Performance Tasks
- Student created models
- Draw/Verbal explanations
- Self-assessment
- Critical Juncture Assessments

Summative Assessments:
- End of the unit assessment

Benchmark Assessments:
- Pre-Unit Assessments
- On-the-fly Assessments

Knowledge & Skills

Enduring Understandings:
- Weather can be sunny, cloudy, windy, rainy, or snowy
- Weather can be sunny, cloudy, windy, rainy, snowy and different temperatures
- When light shows on a surface, the surface gets warmer.
- The longer light shines on a surface, the warmer the surface gets
- Dark surfaces get warmer than pale surfaces when light shines on them.
- Weather affects people most when it is severe
- Weather can be predicted
- Predicting weather helps people prepare for it.

Essential Questions:
- How do we describe weather?
- Why does Earth's surface get warm?
- Why are the playgrounds warmer in the afternoon?
- Why does one surface on the Earth get warmer than another when sunlight shines on them for the same amount of time.
- When does weather affect people most?
- Why does severe rain flood some places but not others?
- How do we stay safe from severe weather?

Core Instructional & Supplemental Materials

Suggested Activities/Resources:
- *Houghton Mifflin Harcourt Science Dimensions*
- Hands on embedded investigations
- http://thehappyscientist.com/next-generation-science-standards-grade-k
- http://www.sciencecourseware.org/eec/GlobalWarming/Tutorials/Seasons/ (seasons)
- http://spaceplace.nasa.gov/science-fair/en/ (science method fair ideas)
- http://pbs.panda-prod.cdn.s3.amazonaws.com/media/assets/wgbh/ess05/ess05_int_seasonsgame/index.html (seasons)

Varied Levels of Text:
- *What Is the Weather Like Today?*
- *Getting Warm in the Sunlight*
- *Cool People in Hot Places*
- *Tornado! Predicting Severe Weather*
- *Handbook of Models*

• http://www.hookedonscience.org/nextgenerationsciencestandards.html • http://www.ssec.si.edu/games/students • http://www.resa.net/curriculum/curriculum/science/professionaldevelopment/ngss-pd/lesson-plans-exploring-ngss/ • http://moodle.tbaisd.org/course/view.php?id=1021 • https://www.sciencea-z.com/marketing-content/science-a-z-and-ngss-grade-k.pdf • http://www.exploringnature.org/db/detail.php?dbID=93&detID=3738 • http://www.schoolofdragons.com/hiccups-science-workshop/ngss/kindergarten • http://www.calacademy.org/educators/science-lesson-plans-for-kindergarten-and-1st-grade • http://climatekids.nasa.gov/menu/big-questions/	

Unit 5: Weather	Duration: 30 days- ongoing

Standards/Learning Targets

New Jersey Student Learning Standards:

- **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-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. [Clarification Statement: Examples of structures could include umbrellas, canopies, and tents that minimize the warming effect of the sun.]

Performance Expectation

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 and Engineering Practices	Disciplinary Core Ideas
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. **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.
Crosscutting Concepts	**Learning Objectives**
Patterns Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.	**Organizing data** With guidance, students organize data from given observations (firsthand or from media) about local weather conditions using graphical displays (e.g., pictures, charts). The weather condition data include: ● The number of sunny, cloudy, rainy,

	windy, cool, or warm days. ● The relative temperature at various times of the day (e.g., cooler in the morning, warmer during the day, cooler at night). **Identifying relationships** Students identify and describe* patterns in the organized data, including: ● The relative number of days of different types of weather conditions in a month. ● The change in the relative temperature over the course of a day. **Interpreting data** Students describe and share that: ● Certain months have more days of some kinds of weather than do other months (e.g., some months have more hot days, some have more rainy days). ● The differences in relative temperature over the course of a day (e.g., between early morning and the afternoon, between one day and another) are directly related to the time of day

Performance Expectation	
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. [Clarification Statement: Examples of structures could include umbrellas, canopies, and tents that minimize the warming effect of the sun.]	
Science and Engineering Practices	**Disciplinary Core Ideas**
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.

Crosscutting Concepts	Learning Objectives
Cause and Effect Events have causes that generate observable patterns.	**Using scientific knowledge to generate design solutions** ● Students use given scientific information about sunlight's warming effect on the Earth's surface to collaboratively design and build a structure that reduces warming caused by the sun. ● With support, students individually describe the problem, the design solution, and in what way the design solution uses the given scientific information. **Describing* specific features of the design solution, including quantification when appropriate** ● Students describe* that the structure is expected to reduce warming for a designated area by providing shade ● Students use only the given materials and tools when building the structure. **Evaluating potential solutions** ● Students describe* whether the structure meets the expectations in terms of cause (structure blocks sunlight) and effect (less warming of the surface).

Performance Expectation	
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 and Engineering Practices	**Disciplinary Core Ideas**
Planning and Carrying Out Investigations- ● Make observations (firsthand or from media) to collect data that can be used to make comparisons. **Scientific Investigations Use a Variety of Methods-** ● Scientists use different ways to study the world.	**PS3.B: Conservation of Energy and Energy Transfer-** ● Sunlight warms Earth's surface.
Crosscutting Concepts	**Learning Objectives**
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Evidence of Student Learning	
Formative Tasks: ● Cooperative group learning ● Exit slips ● Analysis of student work ● Teacher observations ● Self-reflection ● Science journals	**Alternative Assessments:** ● 3-D Performance Tasks ● Student created models ● Draw/Verbal explanations ● Self-assessment ● Critical Juncture Assessments
Summative Assessments: ● End of the unit assessment	**Benchmark Assessments:** ● Pre-Unit Assessments ● On-the-fly Assessments
Knowledge & Skills	
Enduring Understandings: ● Weather can be sunny, cloudy, windy, rainy, or snowy ● Weather can be sunny, cloudy, windy, rainy, snowy and different temperatures ● When light shows on a surface, the surface gets warmer. ● The longer light shines on a surface, the warmer the surface gets ● Dark surfaces get warmer than pale surfaces when light shines on them. ● Weather affects people most when it is severe ● Weather can be predicted ● Predicting weather helps people prepare for it.	**Essential Questions:** ● How do we describe weather? ● Why does Earth's surface get warm? ● Why are the playgrounds warmer in the afternoon? ● Why does one surface on the Earth get warmer than another when sunlight shines on them for the same amount of time. ● When does weather affect people most? ● Why does severe rain flood some places but not others? ● How do we stay safe from severe weather?
Core Instructional & Supplemental Materials	
Suggested Activities/Resources: ● *Houghton Mifflin Harcourt Science Dimensions* ● Hands on embedded investigations ● http://thehappyscientist.com/next-generation-science-standards-grade-k ● http://www.sciencecourseware.org/eec/GlobalWarming/Tutorials/Seasons/ (seasons) ● http://spaceplace.nasa.gov/science-fair/en/ (science method fair ideas)	**Varied Levels of Text:** ● *What Is the Weather Like Today?* ● *Getting Warm in the Sunlight* ● *Cool People in Hot Places* ● *Tornado! Predicting Severe Weather* ● *Handbook of Models*

• http://pbs.panda-prod.cdn.s3.amazonaws.com/media/assets/wgbh/ess05/ess05_int_seasonsgame/index.html (seasons) • http://www.hookedonscience.org/nextgenerationsciencestandards.html • http://www.ssec.si.edu/games/students • http://www.resa.net/curriculum/curriculum/science/professionaldevelopment/ngss-pd/lesson-plans-exploring-ngss/ • http://moodle.tbaisd.org/course/view.php?id=1021 • https://www.sciencea-z.com/marketing-content/science-a-z-and-ngss-grade-k.pdf • http://www.exploringnature.org/db/detail.php?dbID=93&detID=3738 • http://www.schoolofdragons.com/hiccups-science-workshop/ngss/kindergarten • http://www.calacademy.org/educators/science-lesson-plans-for-kindergarten-and-1st-grade • http://climatekids.nasa.gov/menu/big-questions/	

Unit 6: Earth's Resources	Duration: 30 days- ongoing

Standards/Learning Targets

New Jersey Student Learning Standards:

- **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-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. [Clarification Statement: Examples of structures could include umbrellas, canopies, and tents that minimize the warming effect of the sun.]

Performance Expectation

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 and Engineering Practices

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.

Science Knowledge is Based on Empirical Evidence

Scientists look for patterns and order when making observations about the world.

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.

Crosscutting Concepts

Patterns

Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.

Learning Objectives

Organizing data

With guidance, students organize data from given observations (firsthand or from media) about local weather conditions using graphical displays (e.g., pictures, charts). The weather condition data include:

- The number of sunny, cloudy, rainy, windy, cool, or warm days.

	● The relative temperature at various times of the day (e.g., cooler in the morning, warmer during the day, cooler at night). **Identifying relationships** Students identify and describe* patterns in the organized data, including: ● The relative number of days of different types of weather conditions in a month. ● The change in the relative temperature over the course of a day. **Interpreting data** Students describe and share that: ● Certain months have more days of some kinds of weather than do other months (e.g., some months have more hot days, some have more rainy days). ● The differences in relative temperature over the course of a day (e.g., between early morning and the afternoon, between one day and another) are directly related to the time of day

Performance Expectation	
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. [Clarification Statement: Examples of structures could include umbrellas, canopies, and tents that minimize the warming effect of the sun.]	
Science and Engineering Practices	**Disciplinary Core Ideas**
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.

Crosscutting Concepts	Learning Objectives
Cause and Effect Events have causes that generate observable patterns.	**Using scientific knowledge to generate design solutions** ● Students use given scientific information about sunlight's warming effect on the Earth's surface to collaboratively design and build a structure that reduces warming caused by the sun. ● With support, students individually describe the problem, the design solution, and in what way the design solution uses the given scientific information. **Describing* specific features of the design solution, including quantification when appropriate** ● Students describe* that the structure is expected to reduce warming for a designated area by providing shade ● Students use only the given materials and tools when building the structure. **Evaluating potential solutions** ● Students describe* whether the structure meets the expectations in terms of cause (structure blocks sunlight) and effect (less warming of the surface).

Performance Expectation	
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 and Engineering Practices	**Disciplinary Core Ideas**
Planning and Carrying Out Investigations- ● Make observations (firsthand or from media) to collect data that can be used to make comparisons. **Scientific Investigations Use a Variety of Methods-** ● Scientists use different ways to study the world.	**PS3.B: Conservation of Energy and Energy Transfer-** ● Sunlight warms Earth's surface.
Crosscutting Concepts	**Learning Objectives**
Cause and Effect-	**Identifying the phenomenon to be investigated-**

• Events have causes that generate observable patterns.	• From the given investigation plan, students describe (with guidance) the phenomenon under investigation, which includes the following idea: sunlight warms the Earth's surface • Students describe (with guidance) the purpose of the investigation, which includes determining the effect of sunlight on Earth materials by identifying patterns of relative warmth of materials in sunlight and shade (e.g., sand, soil, rocks, water) **Identifying the evidence to address the purpose of the investigation-** • Based on the given investigation plan, students describe (with guidance) the evidence that will result from the investigation, including observations of the relative warmth of materials in the presence and absence of sunlight (i.e., qualitative measures of temperature; e.g., hotter, warmer, colder). • Students describe how the observations they make connect to the purpose of the investigation. **Planning the investigation-** • Based on the given investigation plan, students describe (with guidance) the materials on the Earth's surface to be investigated and how the relative warmth of the materials will be observed and recorded.

Performance Expectation	
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.]	
Science and Engineering Practices	**Disciplinary Core Ideas**
Asking Questions and Defining Problems- • Ask questions based on observations to find more information about the designed world. **Obtaining, Evaluating, and Communicating 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-** • Asking questions, making observations, and gathering information are helpful in thinking about problems. (secondary)
Crosscutting Concepts	**Learning Objectives**

Cause and Effect- ● Events have causes that generate observable patterns. **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.	● Students formulate questions about local severe weather, the answers to which would clarify how weather forecasting can help people avoid the most serious impacts of severe weather events. ● Identifying the scientific nature of the question a Students' questions are based on their observations.. ● Obtaining information a Students collect information (e.g., from questions, grade appropriate texts, media) about local severe weather warnings (e.g., tornado alerts, hurricane warnings, major thunderstorm warnings, winter storm warnings, severe drought alerts, heatwave alerts), including that: ○ There are patterns related to local severe weather that can be observed (e.g., certain types of severe weather happen more in certain places). ○ Weather patterns (e.g., some events are more likely in certain regions) help scientists predict severe weather before it happens. ○ Severe weather warnings are used to communicate predictions about severe weather. ○ Weather forecasting can help people plan for, and respond to, specific types of local weather (e.g., responses: stay indoors during severe weather, go to cooling centers during heat waves; preparations: evacuate coastal areas before a hurricane, cover windows before storms).

Primary Interdisciplinary Connections:

- **ELA:** SL.K.3. Ask and answer questions in order to seek help, get information, or clarify something that is not understood.
- Engineering Units are embedding throughout Units

Technology Standards:

- 8.1.2.A.1 Identify the basic features of a digital device and explain its purpose.
- 8.1.2.A.4 Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
- 8.2.2.C.1 Brainstorm ideas on how to solve a problem or build a product
- 8.1.2.E.1 Use digital tools and online resources to explore a problem or issue.
- 8.2.2.E.1 List and demonstrate the steps to an everyday task

Career Ready Practices:

- CRP1. Act as a responsible and contributing citizen and employee.
- CRP4. Communicate clearly and effectively and with reason.
- CRP12. Work productively in teams while using cultural global competence.

21st Century Life and Career Standards:

- 9.1.4.A.1- Explain the difference between a career and a job, and identify various jobs in the community and the related earnings.

Suggested Accommodations

English Language Learners:

- Labeled pictures/videos
- Using tactile objects to relate to key ideas.
- Chunk/limit information
- Speak slowly
- Limit number of questions
- Partner with a strong English speaking partner
- Extended time
- Modified assignments
- Review vocabulary before the lesson

Special Education/Students with Disabilities:

- Follow specific IEP accommodations and modifications
- Extended time
- Modified assignments
- Labeled pictures of weather phenomenon
- Pre-teach concepts
- Differentiate assignments

504 Plans:

- Follow specific 504 accommodations and modifications
- Extended time
- Modified assignments
- Labeled pictures of weather phenomenon
- Pre-teach concepts
- Differentiate assignments

Gifted and Talented:

- Differentiate assignments
- Higher level texts
- Homework questions should be open ended to increase higher level thinking
- Differentiate test questions
- Create alternate projects or assignments that challenge thinking
- Reference and possibly apply assessment boundary skills

Students at Risk of Failure:

- Small group instruction
- Frequent breaks
- Model how assignments should look
- Incorporate social/emotional discussions
- Encourage and monitor positive peer collaboration
- Provide academic resources for both school and home use

Economically Disadvantaged:

- Structure the learning around explaining or solving a social or community-based issue.
- Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies).

Culturally Diverse:

- Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences).
- Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.

- Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies).

Evidence of Student Learning

Formative Tasks:
- Cooperative group learning
- Exit slips
- Analysis of student work
- Teacher observations
- Self-reflection
- Science journals

Alternative Assessments:
- 3-D Performance Tasks
- Student created models
- Draw/Verbal explanations
- Self-assessment
- Critical Juncture Assessments

Summative Assessments:
- End of the unit assessment

Benchmark Assessments:
- Pre-Unit Assessments
- On-the-fly Assessments

Knowledge & Skills

Enduring Understandings:
- Weather can be sunny, cloudy, windy, rainy, or snowy
- Weather can be sunny, cloudy, windy, rainy, snowy and different temperatures
- When light shows on a surface, the surface gets warmer.
- The longer light shines on a surface, the warmer the surface gets
- Dark surfaces get warmer than pale surfaces when light shines on them.
- Weather affects people most when it is severe
- Weather can be predicted
- Predicting weather helps people prepare for it.

Essential Questions:
- How do we describe weather?
- Why does Earth's surface get warm?
- Why are the playgrounds warmer in the afternoon?
- Why does one surface on the Earth get warmer than another when sunlight shines on them for the same amount of time.
- When does weather affect people most?
- Why does severe rain flood some places but not others?
- How do we stay safe from severe weather?

Core Instructional & Supplemental Materials

Suggested Activities/Resources:
- *Houghton Mifflin Harcourt Science Dimensions*
- Hands on embedded investigations
- http://thehappyscientist.com/next-generation-science-standards-grade-k
- http://www.sciencecourseware.org/eec/GlobalWarming/Tutorials/Seasons/ (seasons)
- http://spaceplace.nasa.gov/science-fair/en/ (science method fair ideas)
- http://pbs.panda-prod.cdn.s3.amazonaws.com/media/assets/wgbh/ess05/ess05_int_seasonsgame/index.html (seasons)

Varied Levels of Text:
- *What Is the Weather Like Today?*
- *Getting Warm in the Sunlight*
- *Cool People in Hot Places*
- *Tornado! Predicting Severe Weather*
- *Handbook of Models*

• http://www.hookedonscience.org/nextgenerationsciencestandards.html • http://www.ssec.si.edu/games/students • http://www.resa.net/curriculum/curriculum/science/professionaldevelopment/ngss-pd/lesson-plans-exploring-ngss/ • http://moodle.tbaisd.org/course/view.php?id=1021 • https://www.sciencea-z.com/marketing-content/science-a-z-and-ngss-grade-k.pdf • http://www.exploringnature.org/db/detail.php?dbID=93&detID=3738 • http://www.schoolofdragons.com/hiccups-science-workshop/ngss/kindergarten • http://www.calacademy.org/educators/science-lesson-plans-for-kindergarten-and-1st-grade • http://climatekids.nasa.gov/menu/big-questions/	

Unit 6: Earth's Resources	**Duration: 30 days - ongoing**

Standards/Learning Targets

New Jersey Student Learning Standards:

- **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-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. [Clarification Statement: Examples of structures could include umbrellas, canopies, and tents that minimize the warming effect of the sun.]

Performance Expectation

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 and Engineering Practices	Disciplinary Core Ideas
Analyzing and Interpreting Data	**ESS2.D: Weather and Climate**

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.

Science Knowledge is Based on Empirical Evidence

Scientists look for patterns and order when making observations about the world.

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.

Crosscutting Concepts	Learning Objectives
Patterns Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.	**Organizing data** With guidance, students organize data from given observations (firsthand or from media) about local weather conditions using graphical displays (e.g., pictures, charts). The weather condition data include: ● The number of sunny, cloudy, rainy, windy, cool, or warm days. ● The relative temperature at various times of the day (e.g., cooler in the morning, warmer during the day, cooler at night). **Identifying relationships** Students identify and describe* patterns in the organized data, including: ● The relative number of days of different types of weather conditions in a month. ● The change in the relative temperature over the course of a day. **Interpreting data** Students describe and share that: ● Certain months have more days of some kinds of weather than do other months (e.g., some months have more hot days, some have more rainy days). ● The differences in relative temperature over the course of a day (e.g., between early morning and the afternoon, between one day and another) are directly related to the time of day

Performance Expectation

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. [Clarification Statement: Examples of structures could include umbrellas, canopies, and tents that minimize the warming effect of the sun.]

Science and Engineering Practices	Disciplinary Core Ideas
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.
Crosscutting Concepts	**Learning Objectives**
Cause and Effect Events have causes that generate observable patterns.	**Using scientific knowledge to generate design solutions** ● Students use given scientific information about sunlight's warming effect on the Earth's surface to collaboratively design and build a structure that reduces warming caused by the sun. ● With support, students individually describe the problem, the design solution, and in what way the design solution uses the given scientific information. **Describing* specific features of the design solution, including quantification when appropriate** ● Students describe* that the structure is expected to reduce warming for a designated area by providing shade ● Students use only the given materials and tools when building the structure. **Evaluating potential solutions** ● Students describe* whether the structure meets the expectations in terms of cause (structure blocks sunlight) and effect (less warming of the surface).

Performance Expectation
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 and Engineering Practices	Disciplinary Core Ideas
Planning and Carrying Out Investigations- ● Make observations (firsthand or from media) to collect data that can be used to make comparisons. **Scientific Investigations Use a Variety of Methods-** ● Scientists use different ways to study the world.	**PS3.B: Conservation of Energy and Energy Transfer-** ● Sunlight warms Earth's surface.
Crosscutting Concepts	**Learning Objectives**
Cause and Effect- ● Events have causes that generate observable patterns.	**Identifying the phenomenon to be investigated-** ● From the given investigation plan, students describe (with guidance) the phenomenon under investigation, which includes the following idea: sunlight warms the Earth's surface ● Students describe (with guidance) the purpose of the investigation, which includes determining the effect of sunlight on Earth materials by identifying patterns of relative warmth of materials in sunlight and shade (e.g., sand, soil, rocks, water) **Identifying the evidence to address the purpose of the investigation-** ● Based on the given investigation plan, students describe (with guidance) the evidence that will result from the investigation, including observations of the relative warmth of materials in the presence and absence of sunlight (i.e., qualitative measures of temperature; e.g., hotter, warmer, colder). ● Students describe how the observations they make connect to the purpose of the investigation. **Planning the investigation-** ● Based on the given investigation plan, students describe (with guidance) the materials on the Earth's surface to be investigated and how the relative warmth of the materials will be observed and recorded.

Performance Expectation	
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.]	
Science and Engineering Practices	**Disciplinary Core Ideas**

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Summative Assessments: ● End of the unit assessment	**Benchmark Assessments:** ● Pre-Unit Assessments ● On-the-fly Assessments
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- http://spaceplace.nasa.gov/science-fair/en/ (science method fair ideas)
- http://pbs.panda-prod.cdn.s3.amazonaws.com/media/assets/wgbh/ess05/ess05_int_seasonsgame/index.html (seasons)
- http://www.hookedonscience.org/nextgenerationsciencestandards.html
- http://www.ssec.si.edu/games/students
- http://www.resa.net/curriculum/curriculum/science/professionaldevelopment/ngss-pd/lesson-plans-exploring-ngss/
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- http://www.calacademy.org/educators/science-lesson-plans-for-kindergarten-and-1st-grade
- http://climatekids.nasa.gov/menu/big-questions/

Varied Levels of Text:

- *What Is the Weather Like Today?*
- *Getting Warm in the Sunlight*
- *Cool People in Hot Places*
- *Tornado! Predicting Severe Weather*
- *Handbook of Models*