Bloomfield Public Schools
Bloomfield, New Jersey 07003

Curriculum Guide

Science
Kindergarten

Prepared by:
Jennifer Lehansky

Salvatore Goncalves, Superintendent of Schools
Sandra Searing, Assistant Superintendent of Curriculum and Instruction
Lou Cappello, Supervisor of Science K-12

Conforms to the Next Generation Science Standards and the NJSLS Standards

Board Approved: September 12, 2017

Science
Kindergarten

Introduction: The purpose of this curriculum is to provide students with fundamental understandings in life, earth and space, and physical sciences, while also developing critical thinking skills. Students will be encouraged to develop the qualities inherent in the practice of science, such as curiosity, skepticism, open-mindedness, and honesty. Particular attention will be paid to collecting of data and interpreting findings.

In kindergarten, students will demonstrate an understanding of the effect of pushes and pulls on the motion of an object, the effect of the sun on the Earth's surface, of patterns and variations in local weather (including forecasting), of what plants and animals need to survive, and what humans need to survive and the relationship between their needs and where they live.

This curriculum is aligned with the *Next Generation Science Standards*, the New Jersey State Standards for English Language Arts, Math and Technology and Career Ready Practices

This document is a tool that will provide an overview as to what to teach, when to teach it, and how to assess student progress. With considerations made for altered pacing, modifications, and accommodations; this document is to be utilized for all students enrolled in this course, regardless of ability level, native language, or classification. It is meant to be a dynamic tool that we, as educators, will revise and modify as it is used during the course of the school year.

Pacing:
Unit 1: Plants and Animals (25 days)
Unit 2: Pushes and Pulls (15 days)
Unit 3: Weather (20 days)

Resources: Electronic and text resources are listed in each unit. Teachers will be able to access the curriculum document on the district website.

Textbook: Bring Science Alive! Exploring Science Practices Grade K
Established Goals: New Jersey Student Learning Standards
Science: **http://www.nextgenscience.org/next-generation-science-standards**
ELA: **http://www.state.nj.us/education/cccs/2016/ela/**
Math: **http://www.state.nj.us/education/aps/cccs/math/**
Technology: **http://www.state.nj.us/education/cccs/2014/tech/**

Modifications:
● Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community. ● Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling). ● 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). ● 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). ● Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings. ● Use project-based science learning to connect science with observable phenomena. ● Structure the learning around explaining or solving a social or community-based issue. ● Provide ELL students with multiple literacy strategies. ● Collaborate with after-school programs or clubs to extend learning opportunities. ● Restructure lesson using UDL principles (http://www.cast.org/our-work/about-udl.html#.VXmoXcfD_UA).

Unit #: 1	Unit Name: Plants and Animals	Unit Length: 25 Days

DESIRED RESULTS

ENDURING UNDERSTANDINGS:

Students will understand:

- Plants need water, sunlight and soil to grow and live.
- People and animals need food, water, air and space to grow and live
- Plants and animals are found all around the Earth.
- Plants, animals and people can change the Earth.

ESSENTIAL QUESTIONS:

What do plants, animals, and people need in order to survive?
Where are plants and animals found?
How do living things change the Earth?

All Students Will Know and Be Able To:

#	STUDENT LEARNING OBJECTIVES (SLO)	Corresponding DCIs and PEs
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-LS1-1)**
2	**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)**

3	**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.]*	**(K-ESS2-2)**
4	**Communicate solutions that will reduce the impact of 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.]*	**(K-ESS3-3)**
5	**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.**	**(K-2 ETS1-1)**

Established Goals:

The performance expectations above were developed using the following elements from the NRC document A Framework for K-12 Science Education:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Planning and Carrying Out Investigations • Make observations (firsthand or from media) to collect data that can be used to make comparisons. (K-PS3-1) **Analyzing and Interpreting Data** • Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (K-LS1-1) **Developing and Using Models**	**LS1.C: Organization for Matter and Energy Flow in Organisms** • All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow. (K-LS1-1) **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. (K-ESS3-1)	**Patterns** • Patterns in the natural and human designed world can be observed and used as evidence. (K-LS1-1) **Systems and System Models** • Systems in the natural and designed world have parts that work together. (K-ESS3-1), (K-ESS2-2) **Cause and Effect** • Events have causes that generate observable patterns. (K-ESS3-3)

• Use a model to represent relationships in the natural world. (K-ESS3-1) **Engaging in Argument from Evidence** Construct an argument with evidence to support a claim. (K-ESS2-2) **Obtaining, Evaluating, and Communicating Information** • Communicate solutions with others in oral and/or written forms using models and/or drawings that provide detail about scientific ideas. (K-ESS3-3) **Asking Questions and Defining Problems** • Ask questions based on observations to find more information about the natural and/or designed world(s). (K-2-ETS1-1) • Define a simple problem that can be solved through the development of a new or improved object or tool. (K-2-ETS1-1)	**ESS2.E: Biogeology** • Plants and animals can change their environment. (K-ESS2-2) **ESS3.C: Human Impacts on Earth Systems** • Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. (K-ESS3-3) **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)* (K-ESS3-3) **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) • Asking questions, making observations, and gathering information are helpful in thinking about problems. (K-2-ETS1-1)	**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 Nature of Science*** **Scientific Knowledge is Based on Empirical Evidence** • Scientists look for patterns and order when making observations about the world. (K-LS1-1)

	• Before beginning to design a solution, it is important to clearly understand the problem. (K-2-ETS1-1)	

New Jersey State Standards Connections:

ELA:

Use a combination of drawing, dictating, and writing to compose opinion pieces in which they tell a reader the topic or the name of the book they are writing about and state an opinion or preference about the topic or book. (K-ESS2-2) **W.K.1**

Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic. (K-ESS2-2) **W.K.2**

With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. (K-2-ETS1-1) **W.2.6**

Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them). (K-LS1-1) **W.K.7**

Recall information from experiences or gather information from provided sources to answer a question. (K-2-ETS1-1) **W.2.8**

Add drawings or other visual displays to descriptions as desired to provide additional detail. (K-ESS3-1) **SL.K.5**

With prompting and support, ask and answer questions about key details in a text. (e.g., who, what, when, where, why, how) (K-ESS2-2) **R.K.1**

MATH:

Directly compare two objects with a measurable attribute in common, to see which object has "more of"/ "less of" the attribute, and describe the difference. (K-LS1-1) **K.MD.A.2**

Reason abstractly and quantitatively. (K-ESS3-1) **MP.2**

Model with mathematics. (K-ESS3-1) **MP.4**

Counting and Cardinality (K-ESS3-1) **K.CC**

Use appropriate tools strategically. (K-2-ETS1-1) **MP.5**

Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (K-2-ETS1-1) **2.MD.D.10**

Technology & Career Standards:

8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

Career Ready Practices:

CRP1. Act as a responsible and contributing citizen and employee.

CRP2. Apply appropriate academic and technical skills.

CRP3. Attend to personal health and financial well-being.

CRP4. Communicate clearly and effectively and with reason.

CRP5. Consider the environmental, social and economic impacts of decisions.

CRP6. Demonstrate creativity and innovation.

CRP7. Employ valid and reliable research strategies.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP9. Model integrity, ethical leadership and effective management.

CRP10. Plan education and career paths aligned to personal goals.

CRP11. Use technology to enhance productivity.

CRP12. Work productively in teams while using cultural global competence.

Unit Plan			
Content Vocabulary	**Academic Vocabulary**	**Required Resources**	**Suggested Resources**
system change environment relationship between the needs of different plants and animals places plants and animals can be found human(s) solutions living things	observations plants animals survive questions impact reduce land water air environment	Bring Science Alive! Grade K	**Plants (website)** http://mrscateskindergarten.blogspot.com/2011/04/plants.html **What Do Plant Need to Survive? (video)** http://mrscateskindergarten.blogspot.com/2011/04/plants.html **Growing Plants (simulation)** http://www.bbc.co.uk/schools/scienceclips/ages/5_6/growing_plants.shtml **What Do Animals Eat? (video)** http://www.pbslearningmedia.org/resource/tdc02.sci.life.colt.eat/what-do-animals-eat/ **What Do Animals Need to Survive? (website)** http://edsitement.neh.gov/lesson-plan/under-deep-blue-sea#section-20133 **Pocket Zoo Webcams (simulation)**

			http://tinyhearts.com/pocketzoo/ **Staying Healthy (video)** http://www.dailymotion.com/video/xx0rqd_sid-the-science-kid-sid-s-healthy-day-pt-2_shortfilms **How Do Humans Get Nutrients from Food? (website)** http://kidshealth.org/kid/htbw/digestive_system.html **Keeping Water Clean (simulation)** http://www.h2ouniversity.org/html/K2_sci_clean_water.html **Where Do Polar Bears Live? (video)** http://www.watchknowlearn.org/Video.aspx?CategoryID=10512&VideoID=36333 **The Needs of Living Things (website)** http://www.pbslearningmedia.org/resource/tdc02.sci.life.colt.lp_stayalive/the-needs-of-living-things/

			Understanding Habitats (simulation) http://pbskids.org/fetch/games/habitats/ **Animals That Dig (video)** http://www.youtube.com/watch?v=2dZGCY8z3Uk **Plant and Animal Ecosystems (website)** http://www.learnnc.org/lp/pages/4214 **Decomposers (simulation)** http://citadel.sjfc.edu/students/naa07113/e-port/decomposers.html **Ocean Garbage Patch (video)** http://news.discovery.com/earth/videos/earth-whats-an-ocean-garbage-patch.htm **Ocean Garbage Patch (simulation)** http://oceanmotion.org/html/impact/garbagepatch.htm **Recycling with Sid the Science Kid (video)** http://pbskids.org/video/?category=Science&pid=TUmOlfBGfk

			zTqaVD_U0nEZf_XnkKyjkV **Air Pollution and Human Activity (website)** http://www.dec.ny.gov/education/52185.html **Harnessing Energy (simulation)** http://www.planetseed.com/laboratory/energy-playground **Read Alouds:** *From Seed to Plant* by Gail Gibbons *How a Seed Grows* by Helene J. Jordan *The Magic School Bus Plants Seeds: A Book About How Living Things Grow* by Patricia Relf and Johanna Cole. *One Bean* by Anne Rockewell *The Tiny Seed* by Eric Carle *Are You Living?: A Song About Living and Nonliving Things* by Laura Purdie Salas *What Do Living Things Need?* by Elizabeth Austen *What Is a Living Thing?* by Bobbie Kalman *From Peanut to Peanut Butter (Start to Finish, Second Series: Food)* by Robin Nelson

			How Did That Get In My Lunchbox? by Christine Butterworth *Where Does Food Come From?* by Shelley Rotner and Gary Goss *I See a Kookaburra!* by Steve Jenkins and Robin Page *I Took A Walk* by Henry Cole *National Geographic Little Kids First Big Book of Animals* by Catherine D. Hughes *Where Do Plants Grow?* by Louise and Richard Spilsbury *Animal Architects* by Vicky Franchino *Animals That Dig* by Angela Royston *Kudzu Chaos* by Jennifer Lambe *All the Way to the Ocean* by Joel Harper *The Lorax* by Dr. Seuss *Just a Dream* by Chris Van Allsburg *One Plastic Bag: Isatou Ceesay and the Recycling Women of the Gambia* by Miranda Paul *The Adventures of a Plastic Bottle: A Story About Recycling* by Allison Inches *I Can Save the Earth!: One Little Monster Learns to Reduce,*

			Reuse, and Recycle by Allison Inches *Michael Recycle* by Ellie Bethel *The Summer Sands* by Sherry Garland

EVIDENCE OF STUDENT LEARNING	
Formative Performance Task:	**Recycling Old Newspapers** We can use less paper. We can use paper to make new things. We can also recycle paper. Let's make paper with old newspapers. We will start by making pulp. ● Measure how long the newspaper is. Then, you can tear up newspaper into little pieces and place the pieces in the bowl. ● I will stir in hot water. Then we will wait about 3 hours. ● You can add 1 spoonful of cornstarch. I will stir in more hot water. How has the newspaper changed? Now you will make paper with the pulp. Come to the papermaking table when your name is called. You will: ● Place a piece of foil on a section of newspaper. ● Use a strainer to scoop up some pulp from the bowl. Press out extra water into the bowl. ● Put the pulp on the foil. Spread it out to make a flat sheet. Press down to get rid of any extra water. ● Let the layer of pulp dry. Then peel away the paper from the foil.

	You've made paper! Measure how long it is again. Did the length change? ● How can people take care of Earth? ● How can you use less paper, use paper again, and recycle paper? Why is it important? ● How can you show other people your ideas for taking care of Earth?
Summative Performance Task:	TCI Assessment: What Do Plants Need? TCI Assessment: What Do Animals Need? TCI Assessment: What Do People Need? TCI Assessment: Where are Plants and Animals found? TCI Assessment: How Do Plants and Animals Change the Earth? TCI Assessment: How Do People Change Earth? TCI Assessment: How Can People Take Care of the Earth?
Formal Evidence of Learning & Progress:	Rubrics Exit Cards Written Responses Quizzes Tests Interactive Student Notebooks Checklists Examinations of Student Work
Informal Evidence of Learning & Progress:	Rubrics Exit Cards Presentations Pre-Assessments Portfolios Journals

	Checklists Informal Observations/Dialogues Think Alouds Examinations of Student Work Self-Assessment /Reflection Lesson Games Interactive Tutorials Interactive Student Notebooks Vocabulary Cards Class Participation

LEARNING PLAN	
Required Activities:	**TCI Unit 1** **What Do Plants Need?** Analyze a picture of a garden being watered. Read about plants, their needs and how to take care of them. Science Skill Builder Activity: visit a "garden center" to look for a plant for the classroom. Learn to read symbols and use them to compare plant needs. Choose a plant and explain your choice. Fill in blanks with symbols or words to show what all plants need. **What Do Animals Need?** Analyze a picture of a dog drinking water. Response Group Activity: visit a "pet store" to find out what different pets need. Analyze the

	information and look for patterns. Choose a pet and explain your choice. Read about what animals need to leave and grow. Listen to information about pet hermit crabs. Identify one thing they need to live and grow. **What Do People Need?** Analyze a picture of a family eating dinner. Visual Discovery Investigation: take a tour of 4 farms to find out where foods that people eat come from. Create a tour book for each place and decide which foods come from plants and which come from animals. Read about what people need. Write a thank you email to a tour guide. **Where Are Plants and Animals Found?** Analyze a picture of a bird in the wetlands. Find out why plants and animals live where they do. Experiential Exercise: take the part of a living thing. Search for food to eat. Create diagrams that show how living things are connected to the places they live. Create a diagram that shows the plants and animals that live in a pond. **How Do Plants and Animals Change Earth?** Analyze a picture of a tree near a broken sidewalk. Visual Discovery Investigation: go on a virtual nature expedition to look for evidence. of how beavers change Earth. Create a book with information about beavers. Read about ways plants and animals change Earth. Find pictures that provide evidence to support statements about how plants and animals change Earth. **How Do People Change Earth?** Analyze a picture of a forest being cut down. Read about ways people change Earth.

	Response Group Activity: learn about a proposal to build a playground. Listen to a scientist explain how cutting down a tree to build the playground would affect other living things. Work with a group to make a sign either for or against the playground. Present arguments to the class. Create a picture showing how you want the air, water, land and living things to be on Earth. **How Can People Take Care of the Earth?** Analyze a picture of recyclable objects. Read about how people take care of Earth by using less, using things again, and recycling. Whole Class Investigation: explore different ways to use less paper. Design and make a paper mache object, and make recycled paper. Make drawing of different ways to reuse trash.

Suggested Activities:		
THE 5 "E"s	**Examples of Learning Activities for the specified "E"**	**SLO's and Engineering Practices**
ENGAGE	**Examples of Engaging Activities:**	
	The Needs of Animals and The Needs of Plants- two videos showing what animals and plants need to survive	#1 and Obtaining, Evaluating, and Communicating Information
	Habitats- slideshow representing different types of habitats and animals which can be found there	#2 and Obtaining, Evaluating, and Communicating Information
	Plant VS Animal- sorting animals and plants	#1 and Obtaining, Evaluating, and Communicating Information
	Animals in Winter- discuss animals who migrate, hibernate, adapt, why they do so (chart)	#2 and Asking Questions and Defining Problems
	Sorting trash vs recycling- students cut and paste pictures into t-chart	#1 Developing and Using Models
	Ways to help the earth- coloring worksheet	#1 and Analyzing and Interpreting Data
EXPLORE	**Examples of Exploring Activities:**	
	Plants and Animals Sort students practice sorting pictures of plants and animals	#2 and Developing and Using Models/ Planning and Carrying Out Investigations

	Sorting Animals into Habitats - students use pictures of different habitats to sort animals into where they live	#2 and Developing and Using Models/ Engaging in Argument from Evidence
	BrainPOP Jr. - search plants, view various information on plant adaptations, slow land changes, natural resources, etc.	#1 and Asking Questions and Defining Problems/ Constructing Explanations and Designing Solutions/ Obtaining, Evaluating, and Communicating Information
	We Can Help Our Planet Earth- mini book discussing ways humans can help the earth	#1 and #2 and Asking Questions and Defining Problems/ Obtaining, Evaluating, and Communicating Information
EXPLAIN	**Examples of Explaining Activities:**	
	What do plants & animals need to survive? t-chart	#1 Engaging in Argument from Evidence
	Parts of a Plant- chart with food as examples	#2 Developing and Using Models
	Habitats- anchor chart of different habitats & what animals & plants live there (pictures) (example)	#2 Engaging in Argument from evidence
	Plants and Animals Need Each Other- slideshow shows different ways plants and animals need each other, class discussion	#2 and #3 and Asking Questions and Defining Problems/ Constructing Explanations and Designing Solutions/ Obtaining, Evaluating, and Communicating Information
	Water Pollution- students experiment with different variables to determine what is happening to the "fish" throughout the experiment	#1 and #2 and Asking Questions and Defining Problems/ Developing and Using Models/ Analyzing and Interpreting Data/ Using Mathematics and Computational Thinking/ Constructing Explanations and Designing Solutions/ Engaging in Argument from Evidence
ELABORATE	**Examples of Elaborating Activities:**	

	Flipbook- students create 4-page flipbook with drawings	#2 and Engaging in Argument from evidence
	Blubber Experiment- students can participate in discovering how some animals stay warm longer than others	#2 and Developing and Using Models/ Planning and Carrying Out Investigations/ Analyzing and Interpreting Data/ Engaging in Argument from Evidence
	Where Do Animals Live In Winter?- students create a model of where different animals can live during the winter	#2 and Developing and Using Models/Analyzing and Interpreting Data/Engaging in Argument from Evidence/ Obtaining, Evaluating, and Communicating Information
	Packet of activities to review concepts	#1 Asking Questions and Defining Problems/ Obtaining, Evaluating, and Communicating Information
	Recycling Center- students can sort through various trash and put into proper bins	#1 and #2 and Planning and Carrying Out Investigations
EVALUATE	**Examples of Evaluating Activities:**	
	Animal NF booklet- Students create a book about an animal	#1 and Planning and Carrying Out Investigations
	Basic Needs- on t-chart students identify needs of plants vs animals Plant and animal needs	#2 and Obtaining, Evaluating, and Communicating Information
	Protecting the Earth- Students must complete writing and sorting activities	#1 & 2 Constructing Explanations and Designing Solutions

Unit #: 2	Unit Name: Pushes and Pulls	Unit Length: 15 days

DESIRED RESULTS

ENDURING UNDERSTANDINGS:

Students will understand:

- How things move
- What pushes and pulls do
- How pushes and pulls move things
- What happens when objects bump
- How people design things that move

ESSENTIAL QUESTIONS:

How do pushes and pulls move things?

How do people design things that move?

All Students Will Know and Be Able To:

#	STUDENT LEARNING OBJECTIVES (SLO)	Corresponding DCIs and PEs
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-PS2-1)**
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*	**(K-PS2-2)**

	marble or ball to turn.] [Assessment Boundary: Assessment does not include friction as a mechanism for change in speed.]	
3	**Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.**	**(K-2-ETS1-3)**

Established Goals:

The performance expectations above were developed using the following elements from the NRC document A Framework for K-12 Science Education:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Planning and Carrying Out Investigations • With guidance, plan and conduct an investigation in collaboration with peers. (K-PS2-1) **Analyzing and Interpreting Data** • Analyze data from tests of an object or tool to determine if it works as intended. (K-PS2-2) **Asking Questions and Defining Problems** • Ask questions based on observations to find more information about the natural and/or designed world(s). (K-2-ETS1-1) • Define a simple problem that can be solved through the development of a new or improved object or tool. (K-2-ETS1-1) **Developing and Using Models**	**PS2.A: Forces and Motion** • Pushes and pulls can have different strengths and directions. (K-PS2-1), (K-PS2-2) • Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. (K-PS2-1), (K-PS2-2) **PS2.B: Types of Interactions** • When objects touch or collide, they push on one another and can change motion. (K-PS2-1) **PS3.C: Relationship Between Energy and Forces** • A bigger push or pull makes things speed up or slow down more quickly. *(secondary to K-PS2-1)*	**Cause and Effect** • Simple tests can be designed to gather evidence to support or refute student ideas about causes. (K-PS2-1), (K-PS2-2) **Structure and Function** • The shape and stability of structures of natural and designed objects are related to their function(s). (K-2-ETS1-1) - ***Connections to the Nature of Science*** **Scientific Investigations Use a Variety of Methods** • Scientists use different ways to study the world. (K-PS2-1)

• Develop a simple model based on evidence to represent a proposed object or tool. (K-2-ETS1-2)	**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 to K-PS2-2)* **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) • Asking questions, making observations, and gathering information are helpful in thinking about problems. (K-2-ETS1-1) Before beginning to design a solution, it is important to clearly understand the problem. (K-2-ETS1-1)	

New Jersey State Standards Connections:

ELA:

With prompting and support, ask and answer questions about key details in a text. (eg. who, what, when, where, why and how) (K-PS2-2) **RI.K.1**

Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them). (K-PS2-1) **W.K.7**

Ask and answer questions in order to seek help, get information, or clarify something that is not understood. (K-PS2-2) **SL.K.3**

MATH:

Reason abstractly and quantitatively. (K-PS2-1), (K-2-ETS1-1),(K-2-ETS1-3) **MP.2**

Model with mathematics. (K-2-ETS1-1), (K-2-ETS1-3) **MP.4**
Use appropriate tools strategically. (K-2-ETS1-1), (K-2-ETS1-3) **MP.5**
Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. (K-PS2-1) **K.MD.A.1**
Directly compare two objects with a measurable attribute in common, to see which object has "more of"/ "less of" the attribute, and describe the difference. (K-PS2-1) **K.MD.A.2**

Technology & Career Standards:

8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

Career Ready Practices:

CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.
CRP5. Consider the environmental, social and economic impacts of decisions.
CRP6. Demonstrate creativity and innovation.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP10. Plan education and career paths aligned to personal goals.
CRP11. Use technology to enhance productivity.
CRP12. Work productively in teams while using cultural global competence.

Unit Plan			
Content Vocabulary	**Academic Vocabulary**	**Required Resources**	**Suggested Resources**
pushes and pulls motion solution ramp forces	direction(s) analyze data change speed	Bring Science Alive! Grade K	Discovery Education Science A to Z NEWSELA NGSS Classroom Library

backward and forward bump	problems distance tools strengths and weaknesses		**Right, Left Kind of Day (video)** http://www.youtube.com/watch?v=uY421EKYMjQ **Push and Pull Simulation** http://www.bbc.co.uk/schools/scienceclips/ages/5_6/pushes_pulls.shtml **Forces and Movement Simulation** http://www.bbc.co.uk/schools/scienceclips/ages/6_7/forces_movement.shtml **Robot Factory Simulation** **http://www.wonderville.ca/asset/robot-factory** **WHOAHler Coaster Simulation** **http://pbskids.org/fetch/games/coaster/game.html** **Read Alouds:** *Full Speed Ahead!* by Cruschiform *How Fast Can You Go?* by Kate Riggs *Motion: Push and Pull, Fast and Slow* by Darlene R. Stille *And Everyone Shouted, "Pull!": A First Look at Forces and Motion* by Claire Llewellyn.

			Push and Pull by Patricia J. Murphy *Sheep in a Jeep* by Nancy E. Shaw. *Making Things Move* by Sian Smith. *Newton and Me* by Lynne Mayer. *Oscar and the Cricket: A Book About Moving and Rolling* by Geoff Waring *Forces Make Things Move* by Kimberly Brubaker Bradley *Move It! Motion, Forces and You* by Adrienne Mason. *Roll, Slope, and Slide: A Book About Ramps* by Michael Dahl. *What Do You Do with an Idea?* by Kobi Yamada *The Wondrous Whirligig: The Wright Brothers First Flying Machine* by Andrew Glass.

EVIDENCE OF STUDENT LEARNING	
Formative Performance Task:	Students design a ramp in order to get a chip from one corner of a slide to another. Today you and your partner will use what you've learned about ramps and bumps to design a safe, but fun, slide. Your slide will be a cardboard square leaning against a wall. Mark where the slider should start and stop. Draw a green circle in one corner. Draw a red circle in the opposite corner. Use a student book to hold the bottom of the ramp in place. Place a chip at the green circle. Let go. What happens? Where does the chip end up? Your job will be to design a slide so that the slider ends up at the red circle. Use the materials to make bumpers. The bumpers will help you control where the slider goes. Make your slide as steep as possible. But be careful! If the ramp is too steep, the ride may not be safe. Sliders may fall off the slide. You may begin work on your slide. Remember: The goal is to make the slide fun and safe. Draw a picture of your design in your notebook.

	You've all made different slides! Make a sign with your names so we know who made each slide. Think about how you built your slide. ● What happened when you made the slide steeper? When was that a problem? ● How did you use bumpers to control the slider? What problems did the bumpers solve? ● Were some materials better to use than others? ● What problems did you have making a slide and how did you solve them? Now you will go around the classroom testing the slides students in our class have made. You will find out which slides are safe What makes a slide safe? How can we test the slides? After you test a slide, record what you find out in your notebook. ● Write the first letters of the designers' names. ● Answer the question. Circle yes or no. Talk to the designers. ● Tell the designers what you like about the slide. ● Ask about any problems the designers had and how they solved the problems. Which slide was the safest? Which slide did you like best? ● Draw your favorite slide in your notebook. Show how the slider goes down the slide. ● Write the designers' names.

	Let's talk. ● How do people design things that move? ● How do designers use ramps and bumpers to change the way things move? ● How can people know if the designs are safe?
Summative Performance Task:	TCI Assessment: How Do Things Move? TCI Assessment: What Do Pushes and Pulls Do? TCI Assessment: How Do Pushes and Pulls Move Things? TCI Assessment: What Happens When Objects Bump? TCI Assessment: How Do People Design Thing That Move?
Formal Evidence of Learning & Progress:	Rubrics Exit Cards Written Responses Quizzes Tests Interactive Student Notebooks Checklists Examinations of Student Work
Informal Evidence of Learning & Progress:	Rubrics Exit Cards Presentations Pre-Assessments Portfolios Journals Checklists Informal Observations/Dialogues

	Think Alouds Examinations of Student Work Self-Assessment /Reflection Lesson Games Interactive Tutorials Interactive Student Notebooks Vocabulary Cards Class Participation

LEARNING PLAN	
Required Activities:	TCI Unit 2 **How Do Things Move?** Analyze a picture of a running dog. Read and describe how things move. Experiential Exercise- Move to the words of a rap song, then create and perform your own rap song. Move a spider in different directions and speeds. **What Do Pushes and Pulls Do?** Analyze picture of a boy pushing a girl on a bike. Small Group Investigation- push and pull box wagons, one empty and one full of rocks, determine

	which is more difficult to pull. Read about what pushes and pulls do. Learn about tools that help people push or pull. Act out a scene in which you push or pull something, students guess what they are doing. Sort pictures that show pushes and pulls. **How Do Pushes and Pulls Move Things?** Analyze a picture of a girl throwing a ball. Read about the way pushes and pulls move things. Experiential exercise - push a ball in different directions, start and stop the ball from moving. Use arrows to show how the ball moves. Predict and test how the ball will move when pushed in different directions. Write about how a toy train might move. **What Happens When Objects Bump?** Analyze a picture of a girl bowling. Read about what happens when objects bump into each other. Small Group Investigation- find out what happens when you push a chip so it bumps into a wall, another chip and a tower. Conduct your own investigation. Make up and play a game that involves objects bumping into each other. **How Do People Design Things That Move?** Analyze a picture of kids on a roller coaster. Read about how people design things that move. Small Group Investigation- Explore how ramps make things move. Design slides and test them to see if they are safe. Predict how a chip will go down a slide.

Suggested Activities:		
THE 5 "E"s	**Examples of Learning Activities for the specified "E"**	**SLO's and Engineering Practices**
ENGAGE	**Examples of Engaging Activities:**	
	Push and Pull Sort (free download) https://www.teacherspayteachers.com/Product/Science-Push-Pull-Sort-2253794 As a class, identify things that can be pushed and pulled or both	#1 Asking Questions and Defining Problems/ Obtaining, Evaluating, and Communicating Information
	Push and Pull Sorting Cards (free download) https://www.teacherspayteachers.com/FreeDownload/Force-Motion-Push-Pull-Sorting-Cards-421544	#1 Asking Questions and Defining Problems/ Obtaining, Evaluating, and Communicating Information
	Right, Left Kind of Day (Video) http://www.youtube.com/watch?v=uY421EKYMjQ This fun video has a song and dance to help students familiarize themselves with the directions of left, right, up, and down. It also discusses patterns such as circles.	#1 Asking Questions and Defining Problems/ Obtaining, Evaluating, and Communicating Information
	"And Everyone Shouted Pull!" by Claire Llewellyn- Join the farmer and his animals as they journey to the market with their wagon full of goods. The animals must push, pull, and stop the wagon along the way. This story is a fun and colorful way to talk about forces with students.	#1 Asking Questions and Defining Problems/ Obtaining, Evaluating, and Communicating Information
EXPLORE	**Examples of Exploring Activities:**	
	How Fast will it Go?- students will blow a marble through a straw on 4 different surfaces	#1, 3 Developing and Using Models, Planning and Carrying out Investigations, Constructing Explanations and Designing Solutions
	Throwing & Rolling- students will analyze how easy/difficult it is to throw or roll different types of balls	#1, 2, & 3 Developing and Using Models/ Planning and Carrying out

		Investigations/ Constructing Explanations and Designing Solutions
	"What's your favorite way to move?"- class created bar graph of different ways to move and each students' favorite	#2 Analyzing and Interpreting Data
	Experimenting with Friction-Make different kinds of ramps, see if things roll or slide, use different flat surfaces	#1, 2, &3 Developing and Using Models/ Analyzing and Interpreting Data/ Constructing Explanations and Designing Solutions
EXPLAIN	**Examples of Explaining Activities:**	
	How Does It Move? - students will determine if pictures are a push motion or a pull motion.	#1 Analyzing and Interpreting Data
	Heavy Work Activities- gives several examples of activities students can participate in to determine force.	#1 Planning and Carrying Out Investigations
	Push or Pull- Class will play a game on smartboard identifying if each picture is a push or pull	#1 Asking Questions and Defining Problems
ELABORATE	**Examples of Elaborating Activities:**	
	Bridge Map- Whole Group activity creating map of objects and how they move	#1 Analyzing and Interpreting Data/ Obtaining, Evaluating, and Communicating Information
	Forces and Interactions (Pull and Push)-push and pull experiments which are achievable for students.	#1, #2, and #3 and Developing and Using Models/ Analyzing and Interpreting Data/Engaging in Argument from Evidence/Obtaining, Evaluating, and Communicating Information
	Forces & Motions- Students will investigate how they can change the speed and direction of objects by exerting more or less strength.	#2, 3 Developing and Using Models, Planning and Carrying out Investigations, Constructing Explanations and Designing Solutions

EVALUATE	Examples of Evaluating Activities:	
	Force and Motion Experiment- experiment using two ramps, students will tests ramps, and draw conclusions.	#1,2

Unit #: 3	Unit Name: Weather	Unit Length: 20 Days

DESIRED RESULTS

ENDURING UNDERSTANDINGS:

Students Will Understand:

- What weather is
- When weather changes
- The sun keeps the Earth warm
- How to stay cool in hot weather
- What makes storms on Earth
- How to prepare for storms

ESSENTIAL QUESTIONS:

What is weather?

What keeps the Earth warm?

All Students Will Know and Be Able To:

#	STUDENT LEARNING OBJECTIVES (SLO)	Corresponding DCIs and PEs
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-ESS2-1)**
2	**Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.*** *[Clarification Statement: Emphasis is on local forms of severe weather.]*	**(K-ESS3-2)**

3	**Make observations to determine the effect of sunlight on Earth's surface.** *[Clarification Statement: Examples of Earth's surface could include sand, soil, rocks, and water.]* [Assessment Boundary: Assessment of temperature is limited to relative measures such as warmer/cooler.*]*	**(K-PS3-1)**
4	**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.]*	**(K-PS3-2)**
5	**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.**	**(K-2-ETS1-1)**
6	**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-ETS1-2)**
7	**Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.**	**(K-2-ETS1-3)**

Established Goals:

The performance expectations above were developed using the following elements from the NRC document A Framework for K-12 Science Education:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Analyzing and Interpreting Data ● Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (K-ESS2-1) **Asking Questions and Defining Problems** ● Ask questions based on observations to find more information about the designed world. (K-ESS3-2) ● 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. (K-2-ETS1-1) **Obtaining, Evaluating, and Communicating Information** ● Read grade-appropriate texts and/or use media to obtain scientific information to describe patterns in the natural world. (K-ESS3-2)	**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. (K-ESS2-1) **ESS3.B: Natural Hazards** ● Some kinds of severe weather are more likely than others in a given region. Weather scientists forecast severe weather so that the communities can prepare for and respond to these events. (K-ESS3-2) **PS3.B: Conservation of Energy and Energy Transfer** ● Sunlight warms Earth's surface. (K-PS3-1),(K-PS3-2) **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)	**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) **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 Nature of Science*** **Science Knowledge is Based on Empirical Evidence** ● Scientists look for patterns and order when making observations about the world. (K-ESS2-1) **Scientific Investigations Use a Variety of Methods** ● Scientists use different ways to study the world. (K-PS3-1)

Planning and Carrying Out Investigations • Make observations (firsthand or from media) to collect data that can be used to make comparisons. (K-PS3-1) **Constructing Explanations and Designing Solutions** • Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem. (K-PS3-2) **Developing and Using Models** • Develop a simple model based on evidence to represent a proposed object or tool. (K-2-ETS1-2)	• Asking questions, making observations, and gathering information are helpful in thinking about problems. (K-2-ETS1-1) • Before beginning to design a solution, it is important to clearly understand the problem. (K-2-ETS1-1) **ETS1.B: Developing Possible Solutions** • Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. (K-2-ETS1-2) **ETS1.C: Optimizing the Design Solution** • Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (K-2-ETS1-3)	- ***Connections to Engineering, Technology, and Applications of Science*** **Interdependence of Science, Engineering, and Technology** • People encounter questions about the natural world every day. (K-ESS3-2) **Influence of Engineering, Technology, and Science on Society and the Natural World** • People depend on various technologies in their lives; human life would be very different without technology. (K-2-ETS1-1)

New Jersey State Standards Connections:

ELA:

Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them). (K-PS3-1),(K-PS3-2) (K-ESS2-1) **W.K.7**

With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. (K-2-ETS1-1),(K-2-ETS1-3) **W.K.6**

Recall information from experiences or gather information from provided sources to answer a question. (K-2-ETS1-1),(K-2-ETS1-3) **W.K.8**

Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (K-2-ETS1-2) **SL.K.5**

With prompting and support, ask and answer questions about key details in a text (e.g., who, what, when, where, why, how). (K-ESS3-2) **RI.K.1**

Ask and answer questions in order to seek help, get information, or clarify something that is not understood. (K-ESS3-2) **SL.K.3**

MATH:

Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. (K-ESS2-1) **K.MD.A.1**

Directly compare two objects with a measurable attribute in common, to see which object has “more of”/ “less of” the attribute, and describe the difference. (K-PS3-2) **K.MD.A.2**

Classify objects into given categories; count the number of objects in each category and sort the categories by count. (K-ESS2-1) **K.MD.B.3**

Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (K-2-ETS1-1),(K-2-ETS1-3) **2.MD.D.10**

Reason abstractly and quantitatively. (K-2-ETS1-1),(K-2-ETS1-3) **MP.2**

Model with mathematics. (K-2-ETS1-1),(K-2-ETS1-3) **MP.4**

Use appropriate tools strategically. (K-2-ETS1-1),(K-2-ETS1-3) **MP.5**

Counting and Cardinality (K-ESS3-2) **K.CC**

Know number names and the count sequence. (K-ESS2-1) **K.CC.A**

Technology & Career Standards:

8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

Career Ready Practices:

CRP1. Act as a responsible and contributing citizen and employee.

CRP2. Apply appropriate academic and technical skills.

CRP3. Attend to personal health and financial well-being.

CRP4. Communicate clearly and effectively and with reason.

CRP5. Consider the environmental, social and economic impacts of decisions.

CRP6. Demonstrate creativity and innovation.

CRP7. Employ valid and reliable research strategies.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP9. Model integrity, ethical leadership and effective management.

CRP10. Plan education and career paths aligned to personal goals.

CRP11. Use technology to enhance productivity.

CRP12. Work productively in teams while using cultural global competence.

Unit Plan			
Content Vocabulary	**Academic Vocabulary**	**Required Resources**	**Suggested Resources**
observation effect Earth's surface structure qualitative observations quantitative observations weather forecasting	analyze data tools strengths and weaknesses materials sun sand soil rocks water	Bring Science Alive! Grade K	Discovery Education Science A to Z NEWSELA NGSS Classroom Library **Sid the Science Kid: what is Wind Made Of? (Video)** http://pbskids.org/video/

	temperature measure observations questions weather patterns measures such as warmer/ cooler		**Martha Speaks: Windy McCloud Talks About The Weather (video)** http://pbskids.org/video/ **Snowflake Match (simulation)** http://www.pbslearningmedia.org/ **What Season Is It? (simulation)** http://www.pbslearningmedia.org/ **A Ross School Kindergarten Production: Seasonal Changes and Migration (video)** http://vimeo.com/ **Super Sun (video)** http://pbskids.org/sid/ **Plum Landing: Evaporation Station (video)** http://pbskids.org/video/ **Observe Sunrise and Sunset (video)** http://www.pbslearningmedia.org/ **Gerald's Weather Wheel (simulation)** http://pbskids.org/sid/

			Elmer Visits the Desert (video) http://www.pbslearningmedia.org/ **Shadow Smile! (video)** http://www.pbslearningmedia.org/ **Hurricane at Pteranodon Terrace (video)** http://www.pbslearningmedia.org/ **Wild Kratts: Tornado! (video)** http://pbskids.org/video/ **Observe Precipitation (video)** http://www.pbslearningmedia.org/ **Dads' Day Rained Out (video)** http://www.pbslearningmedia.org/ **Weather Station Field Trip (video)** http://www.pbslearningmedia.org/

			Read Alouds: *The Cloud Book* by Tomie dePaola *Oh Say Can You Say What's the Weather Today?* by Trish Rabe *Weather Words and What They Mean* by Gail Gibbons *The Wind Blew* by Pat Hutchins *Four Seasons Make a Year* by Anne Rockwell *Green Eyes* by Abe Birnbaum *On the Same Day in March: A Tour of the World's Weather* by Marilyn Singer *Hello Sun!* by Hans Wilhelm. *The Sun Is My Favorite Star* by Frank Asch *The Sun Our Nearest Star* by Franklin M. Branley *Sun Up, Sun Down* by Gail Gibbons *A Cool Summer Tail* by Carrie A. Pearson *Hotter Than a Hot Dog* by Stephanie Calmenson *One Hot Summer Day* by Nina Crews *Summer: Hot Days Out in the Sun!* by Lisa Bell *Flash, Crash, Rumble, and Roll* by Franklyn M. Branley

			Hurricane by David Wiesner. *Twister* by Darleen Bailey Beard *Wild Weather* by Katharine Kenah *Freddy the Frogcaster* by Janice Dean. *Groundhog Weather School* by Joan Holub *Ready, Set, …Wait! What Animals Do Before a Hurricane* by Patti R. Zelch. *Thunder Cake* by Patricia Polacco.

EVIDENCE OF STUDENT LEARNING	
Formative Performance Task:	Investigation: Shade Makers Look at the picture of the playground. The playground has a sandbox. Sometimes it gets very hot. The children do not like to play in the hot sand. What can be done to make the sandbox cooler? Think about the problem: ● Why is the sand hot in the sandbox? ● What could help make the sand cooler? Today you will be engineers. You will build a structure to keep the sand cool in hot weather. Engineers start by making models. A model is smaller than the structure will be. You and your partner will use one dish as the model of the sandbox. ● How is the model different from a real ● sandbox? Think of ways to make shade. ● What are some ways to make shade? ● What shape could your shade maker be? ● What are some ways to hold up your shade maker? **Step 1: Building Your Shade Maker** Look at the materials. Talk with your partner. ● What materials will you use for shade?

	● What materials will you use to hold up your shade maker? ● How will you build your shade maker? ● How will you make sure your shade maker is big enough to shade the sand? Decide who will go to the Materials Center to get the materials. Work with your partner. Try different ideas and materials for a shade maker. Build a shade maker for your sand dish. **Step 2: Testing the Shade Maker** Now you and your partner will test your design. Put your two sand dishes in the sun. Use your design to make shade for one of the dishes. Wait one hour. Compare the sand in the two dishes. Find out which dish has cooler sand. Go to your notebook. ● Draw your shade maker. ● Circle the tools and materials you used. ● Circle the sand that was cooler. **Step 3: Touring the Designs** Takes turns with your partner. First, one of you will go around and look at each design. Then the other will take a turn. ● Ask the engineers any questions you may have. ● Find out what problems the engineers had and how they solved the problems.

	• Find out if the shade maker worked to make the sand cooler. Think back on the investigation. • You designed a shade maker. Why? What was the problem you were trying to solve? • What different kinds of materials did we use in our shade makers? What different shapes were they? • How did you make sure your shade maker was big enough? • How could you tell if your design worked? Let's talk. • How can people stay cool in hot weather? • How does shade help things stay cool in hot weather? • Why do engineers make models?
Summative Performance Task:	TCI Assessment:What is Weather? TCI Assessment:When Does Weather Change? TCI Assessment: What Keeps Earth Warm? TCI Assessment: How Can People Stay Cool in Hot Weather? TCI Assessment: What Makes Storms on Earth? TCI Assessment: How Can People Prepare for Storms?
Formal Evidence of Learning & Progress:	Rubrics Exit Cards Written Responses Quizzes Tests Interactive Student Notebooks Checklists Examinations of Student Work

Informal Evidence of Learning & Progress:	Rubrics Exit Cards Presentations Pre-Assessments Portfolios Journals Checklists Informal Observations/Dialogues Think Alouds Examinations of Student Work Self-Assessment /Reflection Lesson Games Interactive Tutorials Interactive Student Notebooks Vocabulary Cards Class Participation

LEARNING PLAN	
Required Activities:	**TCI Unit 3** **What is Weather?** Analyze a picture of a girl catching snow. Read about different kinds of weather and describe it. Visual Discovery Investigation- watch videos of the weather in different places. Students work in groups to prepare and deliver a weather report from one of the places. Draw a picture of the weather and use weather words to describe it. **When Does Weather Change?** Analyze a picture of a boy running through a field. Science Skill Builder- keep track of the weather each day on a calendar. Study the calendar and tell what it shows. Read about how the weather changes in a day, in a week, in a year. Explore weather patterns. Show how the weather changes. **What Keeps Earth Warm?** Analyze a picture of a sunset. Read about the sun. Learn how scientists ask questions and compare. Small Group Investigation- test sand, rock, soil and water in the sun and in the shade to see if the sunlight makes them warmer. Write a story about what happens to a snowman when sun shines on it. **How Can People Stay Cool in Hot Weather?** Analyze a picture of a boy on a swing. Read about ways people make shade from the sun. Small Group Investigation- work with a partner to design a structure to keep a sandbox cool.

	Make a model of the structure and test to see if it keeps the sand cool. Design a shade maker to keep puppies cool in hot weather. **What Makes Storms on Earth?** Analyze a picture that shows a storm is coming. Read about different kinds of storms. Science Skill Builder- write a story about a storm you've experienced. Ask your family questions about the storm. Share with the class. Put the events of a storm story in order. **How Can People Prepare For Storms?** Analyze a picture of a tree branch on a house. Read about how people prepare for storms. Learn about weather forecasts and what happens in storms. Experiential Exercise- prepare for a storm by creating a supply kit. Watch a storm forecast. Check supply kit to see if you are ready for the storm. Cut and paste pictures to make a storm kit.

Suggested Activities:		
THE 5 "E"s	**Examples of Learning Activities for the specified "E"**	**SLO's and Engineering Practices**
ENGAGE	**Examples of Engaging Activities:**	
	Here Comes the Sun Video- introduction to the sun	#1 and #3 and Asking Questions and Defining Problems
	Understanding the Sun- discuss and brainstorm with students what the sun is, how it works, what it does, etc. (examples)	#1 and #3 and Asking Questions and Defining Problems/Obtaining, Evaluating, and Communicating Information
	Learning About the Sun- detailed lesson plan on facts about the sun	#1 Asking Questions and Defining Problems
	Weather Song, Types of Weather Chart, Weather Bar Graph Weather Resources	#1 and #3 and Asking Questions and Defining Problems/Obtaining,

		Evaluating, and Communicating Information
EXPLORE	**Examples of Exploring Activities:**	
	"What Melts in the Sun?" Students use a cupcake pan to observe what objects melt in the sun	#1, 2, & 3 Developing and Using Materials/ Planning and Carrying out Investigations, Constructing Explanations and Designing Solutions
	Sun Activities for Kindergarten- provides 12 different activities for students to engage in	#1, #2, #3, #4, and #5 and Asking Questions and Defining Problems, Developing and Using Models, Planning and Carrying Out Investigations, Analyzing and Interpreting Data, Obtaining, Evaluating, and Communicating Information
	Why do plants need sunlight? - detailed lesson plan on shade vs sunlight on plants	#1-5 Developing and using Models/ Obtaining, Evaluating, and Communicating Information
	Weather Write the Room	#1 and #3 and Asking Questions and Defining Problems/Obtaining, Evaluating, and Communicating Information
EXPLAIN	**Examples of Explaining Activities:**	
	Will It Melt?- students determine/discuss if certain types of candy will melt or not	#1, #3, and #5 and Planning and Carrying Out Investigations/ Analyzing and Interpreting Data/Engaging in Argument from Evidence/ and Obtaining, Evaluating, and Communicating Information

	Some Sun! Evaporation Station- students will discover how the sun affect plant's water	#1, #3, #4, and #5 and Developing and Using Models, Planning and Carrying Out Investigations, Analyzing and Interpreting Data, Using Mathematical and Computational Thinking
ELABORATE	**Examples of Elaborating Activities:**	
	"Why do we Need Sunscreen?"- Whole class experiment showing the effects of sunscreen	#1, 2, 3, &4 Asking Questions and Defining Problems/ Developing and Using Models/ Planning and Carrying Out Investigations/ Analyzing and Interpreting Data
	Black or White?- students will investigate which color does a better job of keeping an ice cube from melting?	#5 and Engaging in Argument from Evidence/ Obtaining, Evaluating, and Communicating Information
	Exploration of Day & Night- lesson helps them expand their understanding of differences between day and night by completing a sort	#1, 2, 4 Planning and Carrying out Investigations/ Constructing Explanations and Designing Solutions
EVALUATE	**Examples of Evaluating Activities:**	
	The Sun and The Shade- students explain what they noticed happen to an ice cube in the sun and in the shade	#1, 2, 3, 4 Developing and Using Models/ Planning and Carrying out Investigations/ Analyzing and Interpreting Data/ Constructing Explanations and Designing Solutions
	What is the Sun?- students explain what they have learned about the sun	#1, 2, 3, 4 Developing and Using Models/ Planning and Carrying out Investigations/ Analyzing and Interpreting Data/ Constructing

		Explanations and Designing Solutions