Science Department

Kindergarten

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Scope and Sequence

Kindergarten

Throughout the unit, Mystery Science will direct that some units are "optional" or for "extension purposes". For our curriculum programming and pacing, all activities, even those indicated as "optional" are mandated parts of the curriculum for coverage. In the event of an emergency situation, where a long period of curricular time is lost due to unforeseen circumstances, the activities noted by Mystery Science as "optional" would be the first activities to eliminate from coverage.

	Plant & Animal Secrets (6-9 weeks)	Force Olympics (6-9 weeks)	Weather Watching (6-9 weeks)
Week 1	Mystery 1: Why do woodpeckers peck wood? ***(K-LS1-1)***	Mystery 1: What's the biggest excavator? (***Foundational for K-PS2-1, K-PS2-2)***	Mystery 1: Have you ever watched a storm? ***(K-ESS2-1)***
Week 2	Mystery 2 Read Along: Where do animals live? ***(K-ESS3-1)***	Mystery 2 Read Along: Why do builders need so many big machines? (***Foundational for K-PS2-1, K-PS2-2)***	Mystery 2 Read Along: How can you get ready for a big storm? ***(K-ESS3-2)***

Week 3	Mystery 3: How can you find animals in the woods? ***(K-LS1-1)***	Mystery 3: How can you knock down a wall made of concrete? ***(K-PS2-1 and K-PS2-2)***	Mystery 3: What will the weather be like on your birthday? ***(K-ESS2-1)***
Week 4	Mystery 4 Read Along: How do animals make their home in the forest? ***(K-ESS2-2)***	Mystery 4 Read Along: How can you knock down the most bowling pins? ***(K-PS2-1)***	Mystery 4 Read Along: How do you know what to wear for the weather? ***(K-ESS2-1)***
Week 5	Mystery 5: How do plants and trees grow? ***(K-LS1-1)***	Mystery 5: How can we protect a mountain town from falling rocks? ***(K-PS2-2, K-2-ETS1-2, K-2-ETS1-3)***	Mystery 5: How could you warm up a frozen playground? (***K-PS3-1, K-PS3-2, K-2-ETS1-2, K-2-ETS1-3)***
Week 6	Mystery 5 - **Part 2**: How do plants and trees grow? ***(K-LS1-1)***	Mystery 6 Read Along: How could you invent a trap? ***(K-PS2-2, K-2-ETS1-2)***	Mystery 6 Read Along: How could you walk barefoot across hot pavement without burning your feet? ***(K-PS3-1, K-PS3-2)***
Week 7	Mystery 6 Read Along: Why would you want an old log in your backyard? ***(K-ESS3-3)***		

<u>Plant & Animal Secrets</u> (6-9 weeks)

Plant and Animal Needs

Profound Perspective: Animals and plants need things in order to survive, and their lives are *all* about meeting those needs. It's the secret to why they do the many strange and wonderful things they do! Knowing how they meet their needs can even help you find plants and animals near where you live.

Kindergarten Life Science	Performance Expectations	Topics	Disciplinary Core Ideas (DCIs) (Mystery Conceptual Flow)	Scientific & Engineering Practices (SEPs)	Crosscutting Concepts (CCC)
Mystery 1 Why do woodpeckers peck wood?	K-LS1-1	Animal Needs: Food	All animals need to find food in order to survive. They go about finding food in different ways, but all animals have this need in common. Knowing that animals have this need can help you find animals where you live, as well as help you make sense of their behaviors. **DCIs: LS1.C**	Students **obtain information through observations** of different animal behaviors. They use evidence from their observations to **argue** for their **explanation** of why animals are acting in these ways. Students act out the behaviors of different animals.	Students study animal behaviors to identify the **pattern** that all animals have behaviors that include seeking out food to survive.
Mystery 2 Read Along Where do animals live?	K-ESS3-1	Animal Homes	Living things need food, water, shelter, and many other resources to survive! All living things live in places that provide the needs they have to survive. Not all living things live in a house, like humans do. Animals live in many different types of homes close to their resources. **DCIs: ESS3.A**	Students **obtain information** through media about how different animal homes are built. They **communicate this information** in order to identify patterns in the natural world.	Students identify the **pattern** that all living things live where their needs are met. They recognize that plants, animals, and their surroundings make up a **system** as parts that work together.
Mystery 3 How can you find animals in the woods?	K-LS1-1	Animal Needs: Safety	All animals need to find safety (protection) in order to survive. They go about finding safety in different ways, but all animals have this need in common. Knowing that animals have this need can help you find animals where you live, as well as help you make sense of their behaviors. **DCIs: *Extends* LS1.C**	Students **obtain information through observations** of different animal behaviors. They use evidence from their observations to **argue** for why animals are acting in these ways. Students act out the behaviors of different animals.	Students study animal behaviors to identify the **pattern** that all animals have the behavior seeking out safety to survive.

Plant & Animal Secrets (6-9 weeks)

Plant and Animal Needs

(continued)

Kindergarten Life Science	Performance Expectations	Topics	Disciplinary Core Ideas (DCIs) (Mystery Conceptual Flow)	Scientific & Engineering Practices (SEPs)	Crosscutting Concepts (CCC)
Mystery 4 Read Along How do animals make their home in the forest?	K-ESS2-2	Changing the Environment	All living things need food and safety to survive. Animals can't always find shelter or something to eat lying around, so they have to change their environment to meet their needs. Animals change the environment in many ways - they dig for food, build homes, create hiding spots, and much more! **DCIs: ESS2.E**	Students take a nature walk to **carry out an investigation** exploring which types of animals live around them and what their homes are like. They **analyze and interpret data** by using their observations to describe the patterns they see.	Students begin to recognize that plants, animals, and their surroundings make up a **system** as parts that work together.
Mystery 5 How do plants and trees grow?	K-LS1-1	Plant Needs: Sunlight	Plants are alive, just like animals. They grow over time, and have similar needs (like water). However, there are some big differences between plants and animals. Plants don't have legs… so you won't see them walking around. They also don't have mouths or eat food the way we do. They need water *and* sunlight. **DCIs: LS1.C**	Students **plan and carry out an investigation** to determine how light affects plant growth. They grow radish plants in light and dark conditions for four days and then **analyze their data**. Using this data, students **engage in an argument from evidence** about which plant is healthier and why.	Students study plant growth under different conditions to identify the **pattern** that all plants have survival needs.
Mystery 6 Read Along Why would you want an old log in your backyard?	K-ESS3-3	Animal Needs & Changing the Environment	People make changes to their environment so that they can live comfortably. They cut down trees, use energy to produce materials and products, and much more. When people make changes to their environment they use resources needed by other living things. It is important to make choices that reduce our impact on the habitat we share. **DCIs: ESS3.C**	Students **obtain and evaluate information** by virtually keeping watch on a log and reporting about the living things that visit it. They **communicate information** by drawing a log and the animals that would use it as their habitat.	Students consider the **cause and effect** relationship between the changes people make to their environment and the impact it has on other living things that share their habitat.

<u>Force Olympics</u> (6-9 weeks)

Forces, Machines, & Engineering

Profound Perspective: This unit will help students develop their first concept of "force," and the idea that by playing with forces and thinking about them, we can accomplish surprisingly big things.

Kindergarten Physical Science	Performance Expectations	Topics	Disciplinary Core Ideas (DCIs) (Mystery Conceptual Flow)	Scientific & Engineering Practices (SEPs)	Crosscutting Concepts (CCC)
Mystery 1 What's the biggest excavator?	Foundational for K-PS2-1 K-PS2-2	Pushes, Pulls & "Work Words"	Machines multiply the work a human can do - making the work easier! A machine's force is stronger than a human's force. For example, digging a hole takes less work with a shovel than it does with your hands. It takes even less work if you use a bigger machine, like a bulldozer! **DCIs: *Foundational* for PS2.A, PS2.B, PS2.C**	Students **obtain information** through observations of different machines. They use evidence from their observations to **argue** for their **explanation** of why machines make work easier. Students act out the "work words" of different machines.	Students consider the **effects** that machines can have when completing a task.
Mystery 2 Read Along Why do builders need so many big machines?	Foundational for K-PS2-1 K-PS2-2	Pushes, Pulls & "Work Words"	There are many different types of machines and each one has a unique job. Machines help people by making their work faster and easier. Machines help people do things like dig, lift, dump, push, and mix! Without machines, it would take a lot longer to build new things. **DCIs: *Foundational* for PS2.A, PS2.B, PS2.C**	Students **obtain information** through footage of different construction equipment being used in different ways. Student **communicate about the information** by discussing what each machine does using "work words".	Students consider the **cause and effect** relationship between the movement of a machine and the work it can do.
Mystery 3 How can you knock down a wall made of concrete?	K-PS2-1 K-PS2-2	Strength & Direction of Force	Machines create pushes and pulls, or "forces". A wrecking ball is a machine that uses a push to knock things over. By changing the strength and direction of the push, you can make the force larger or smaller. **DCIs: PS2.A, PS2.B, *Foundational* PS3.C and ETS1.A**	Students **carry out an investigation** to determine how far back they should pull their **model** wrecking ball to knock down a wall, but not the houses behind it. They **analyze the data** collected in their investigation to discuss how the force of the wrecking ball changes when you change the strength and direction of its push.	Students analyze the **effect** of changing the strength and direction of a wrecking ball's push. They experiment with different heights to determine how the push, or force, is changed.

<u>Force Olympics</u> (6-9 weeks)

Forces, Machines, & Engineering

(continued)

Kindergarten Physical Science	Performance Expectations	Topics	Disciplinary Core Ideas (DCIs) (Mystery Conceptual Flow)	Scientific & Engineering Practices (SEPs)	Crosscutting Concepts (CCC)
Mystery 4 Read Along How can you knock down the most bowling pins?	K-PS2-1	Strength & Direction of Force	To move an object farther or faster, a bigger push or pull is needed. When objects collide they push on one another causing a change in direction and speed. By changing the force acting on an object, you can change the motion of the object. **DCIs: PS2.A, PS2.B, *Foundational PS3.C***	Students **carry out an investigation** by 'bowling' with solo cups (pins), a tennis ball (bowling ball), and pool noodles (bumpers). They explore the forces at work when one thing hits another, and how changing the size of the force affects the motion of an object.	Students analyze the **cause and effect** relationship between the size of the force on an object and the direction or speed it goes.
Mystery 5 How can we protect a mountain town from falling rocks?	K-PS2-1 K-PS2-2 K-2-ETS1-2 K-2-ETS1-3	Forces & Engineering	Pushes and pulls can have different strengths. The faster an object moves, or the larger it is, the stronger it pushes on something when it bumps into it. Sometimes a push or pull is so strong that it makes an object start moving, or stop moving! Pushing or pulling on an object can even change the direction an object is going. We can use scientific knowledge to help people solve a problem. **DCIs: PS2.A, PS2.B, PS3.C, ETS1.B, ETS1.C**	Students use a **model** of a mountain town, Tiny Town, to **conduct an investigation** of how to protect the town from a falling boulder. They **design a solution** to safely guide a boulder down the hill so it doesn't hit the town and rolls into a dump truck. Using pushpin poles, students change the direction the boulder is rolling.	Students consider the **cause and effect** relationship between a force and an object's speed or direction.
Mystery 6 Read Along How could you invent a trap?	K-PS2-2 K-2-ETS1-2	Forces & Engineering	Inventors design solutions to solve problems. Anyone can be an inventor! Inventors create new ideas, and many use engineering and design to help them. Inventors use their knowledge to create something new. In this story, two inventors use a pull to help them solve a problem. **DCIs: PS2.A, ETS1.A, ETS1.B, ETS1.C**	Students **design a solution** to help the boo characters solve a problem. Then, they **define a problem** by choosing a chore they don't like doing. Next, they **design solution** by sketching a machine that could help them. They compare their solutions with a partner.	Students consider the **structure and function** of existing materials and tools in order to create new uses for them in order to solve a problem.

<u>Weather Watching</u> (6-9 weeks)

Weather Conditions, Instruments, & Seasons

Profound Perspective: This unit will help students develop the habit of becoming weather watchers who take pleasure in noticing weather patterns and predicting changes.

Kindergarten Earth and Space Science	Performance Expectations	Topics	Disciplinary Core Ideas (DCIs) (Mystery Conceptual Flow)	Scientific & Engineering Practices (SEPs)	Crosscutting Concepts (CCC)
Mystery 1 Have you ever watched a storm?	K-ESS2-1	Weather Conditions & Tracking	The weather is always changing around us! For example, sometimes we need a coat, or an umbrella, and other days we don't. Weather isn't just one thing, there are different factors that affect the weather. When you are a weather watcher, you observe the weather around you. **DCIs: ESS2.D**	Students **obtain information** through observations of the weather. They **communicate the information** by acting as a weather watcher and creating drawings of the weather conditions.	Students observe weather **patterns**. They understand weather as a pattern in the natural world.
Mystery 2 Read Along How can you get ready for a big storm?	K-ESS3-2	Weather Conditions & Preparation	Weather is usually mild but it can quickly become severe. Weather tracking helps us know when to prepare for weather hazards. When the weather becomes severe you may see the sky get darker, the temperature drop, the wind increase, and even precipitation fall. Knowing how to prepare for weather hazards keeps people safe. **DCIs: ESS3.B, ETS1.A**	Students track the weather daily and **analyze the data** by collecting, recording, and sharing their observations. They act as weather reporters and **ask questions** based on observations of weather to find out more information about the natural world.	Students observe weather **patterns**. They understand weather as a pattern in the natural world. Students explore the **cause and effect** relationship between weather tracking and hazard preparation.

Mystery 3 What will the weather be like on your birthday?	K-ESS2-1	Seasons & Patterns	"Weather watchers" see that there are four seasons that each have their own type of weather! Winter is cold, snowy, and trees are bare; spring is warmer, rainy, and new leaves begin to grow; summer is hot and trees have a lot of leaves; autumn is chilly and the leaves begin to fall. The seasons don't just stop, they repeat in a cycle. Therefore, the weather and seasons are a pattern. **DCIs: ESS2.D**	Students **obtain and evaluate information** in a series of unnamed drawings of each season. They use clues in the picture to **argue** for the season they think the picture represents. Next, they use these clues to sequence the seasons in the correct cycle.	Students use their observations of the weather in each season to identify **patterns**. They determine the order of the seasons, and notice the **pattern** that all four seasons repeat each year.

Weather Watching (6-9 weeks)

Weather Conditions, Instruments, & Seasons

(continued)

Kindergarten Earth and Space Science	Performance Expectations	Topics	Disciplinary Core Ideas (DCIs) (Mystery Conceptual Flow)	Scientific & Engineering Practices (SEPs)	Crosscutting Concepts (CCC)
Mystery 4 Read Along How do you know what to wear for the weather?	K-ESS2-1	Weather & Daily Patterns	Weather changes over time, like in the seasons, but it can also change throughout the day. It is usually cooler in the mornings and evenings when the sun isn't out, and warmer in the afternoon when the sun is shining high above us. **DCIs: ESS2.D**	Students **develop and use models** of weather instruments and use them to **carry out an investigation**. Using the instruments students determine the direction of the wind, and how much rain has fallen. Students **analyze the data** to determine weather trends.	Students observe weather **patterns**. They understand temperature changes throughout the day as a **pattern** in the natural world.

Mystery 5 How could you warm up a frozen playground?	K-PS3-1 K-PS3-2* K-2-ETS1-2 K-2-ETS1-3	Sun, Heat, & Engineering	The sun is very far away from earth, but also very important to us. It gives off *so* much light and heat that it warms Earth's surface. If a place doesn't get enough sunlight, it becomes very cold. Engineers can solve this problem by designing a tool that increases the warming effect of the sun on a specific place. *This Mystery uses an activity that *increases* the warming effect of sunlight on an area. **DCI's: PS3.B, ETS1.B, ETS1.C**	Students **define the problem** that Chill City, a valley town surrounded by mountains, does not get enough sunlight in the winter. Using various materials, they **carry out an investigation** to test which materials can redirect sunlight. Using this information, they **design a solution** to help bring sunlight to various locations in Chill City.	Students consider the **cause and effect** relationship between sunlight exposure and the temperature on Earth's surface.
Mystery 6 Read Along How could you walk barefoot across hot pavement without burning your feet?	K-PS3-1 K-PS3-2	Sun & Heat	The sun warms Earth's surface. Places that get a lot of sunlight have warmer temperatures, and shaded places that get less sunlight have cooler temperatures. **DCI's: PS3.B**	Students **obtain and evaluate information** from a map of the pool. Analyzing the hot and cool surfaces, they **design a solution** to get a person across the pool without burning their feet. Students analyze an image of a playground and **construct an explanation** about what areas would be coolest and hottest. Students **conduct an investigation** to determine the warmest and coldest spots outside on a sunny day.	Students consider the **cause and effect** relationship between the amount of sunlight an area gets and its temperature.

Unit 1
Plant and Animal Secrets
Summary and Rationale
This unit helps students develop the concept that animals and plants need things in order to survive, and their lives are all about meeting those needs… it's the secret to why they do the many strange and wonderful things that they do! Knowing how they meet their needs can even help students find plants and animals near them.

Recommended Pacing	
6-9 weeks	
Standards	
K-LS1-1	Use observations to describe patterns of what plants and animals (including humans) need to survive
K-ESS2-2	Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.
K-ESS3-1	Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.
K-ESS3-3	Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.
Interdisciplinary Connections	
ELA/Literacy RI.K.1 With prompting and support, ask and answer questions about key details in a text. (K-ESS3-2) W.K.2 Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic. (K-ESS3-3) SL.K.3 Ask and answer questions in order to seek help, get information, or clarify something that is not understood. (K-ESS3-2) SL.K.5 Add drawings or other visual displays to descriptions as desired to provide additional detail. (K-ESS3-1)	

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

Integration of Technology	
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).

Instructional Focus

Enduring Understandings:	**Essential Questions:**
Students will articulate an understanding of the differences between plants and animals as living beings. Students will identify the various habitats of animals and plants, explaining why each one is appropriate to the living thing. Students will identify the needs of living things. Students will demonstrate knowledge of the relationship between the needs of living things and where they live.	Why do woodpeckers peck wood? Where do animals live? Where can you find animals in the woods? How do animals make their home in the forest? How do plants and trees grow? Why would you want an old log in your backyard?

Evidence of Learning (Assessments)

https://mysteryscience.com/secrets/plant-animal-needs/assessments
Pre-Assessment
Entrance/Exit Tickets
Formal quiz/test assessments
Inquiries/Labs

Objectives (SLO)	
Students will know: The things that plants and animals need for survival, the manner in which those things are obtained and what happens when they are not.	Students will be able to: Articulate that all animals need to find food for survival. Articulate that animals search for and obtain food in different ways dependent upon factors such as habitat, size of the animal, characteristics of the animal, etc. Act out different ways animals can find food. Argue and provide evidence of the actions animals are taking to find food. Articulate the role of shelter in the life of an animal. Define the term “comfort” as it relates to animal needs. Define the term “safety” as it relates to animal needs. Discuss the different types of animal shelters and apply the terms “comfort” and “safety” to those shelters for particular animals. Identify patterns of animals in the process of finding food, seeking shelter and maintaining safety and comfort. Utilize observed patterns to find the location of animals in the forest based upon clues of the habitat. Identify the things that plants need to survive. Compare and contrast the needs of plants and animals. Identify light and water as the two main components of survival for plants.

	Explain the role of water and light in the growth process of plants using evidence from exploration in explanation. Discuss the role humans play in the needs, safety and comfort of plants and animals in the wild. Discuss the things humans do to make themselves comfortable and safe that can be harmful to plants and animals in the wild.

Suggested Resources/Technology Tools

www.mysteryscience.com
https://jr.brainpop.com/
Epic!

Modifications

Teachers can choose from any of the suggested modifications that follow based upon teaching style, instructional method and needs of individual students.

General Modifications for students struggling to learn -

- Focus on building relationships in the classroom.
- Control the stressors for the student and manage alternate pathways for completion of assignments.
- Provide feedback utilizing a growth mindset and praise what is done correctly based upon effort, attitude and strategy.
- Boost engagement with material by providing opportunities of differentiation, group work and alternative assignments/assessments where appropriate.

ELL -

- Provide additional wait time for student responses to questions to allow students the ability to undergo the process of translation between languages, composition of response and attempted response.
- Simplification of sentence structure and repetition of questions/sentences exactly as stated before trying to rephrase to allow ELL students to hear the sentence and try to comprehend it.

- Rephrase idioms and teach their meanings as when learning a new language, translations are often very literal. IE “Take a stab at it.” Ensure students understand what is meant.
- Use directed reading activities. Ensure preview of text before assigned/read, provide pre-reading questions about the main idea and offer help utilizing key words.
- Allow the use of Google Translate where appropriate.
- Utilize bilingual reading texts provided by the STC program.

Gifted and Talented -
Utilize differentiation in the areas of acceleration, enrichment, and grouping. Examples include, but are not limited to:

- interdisciplinary and problem-based assignments with planned scope and sequence
- advance, accelerated, or compacted content
- abstract and advanced higher-level thinking
- allowance for individual student interests
- assignments geared to development in areas of affect, creativity, cognition, and research skills
- complex, in-depth assignments
- diverse enrichment that broadens learning
- variety in types of resources
- internships, mentorships and independent study where applicable

504/IEP -
Modifications and accommodations must be aligned to stated plan and uphold expectations of the plan lawfully. Every student requires a different set of accommodations based upon need. Examples specific to science practice include, but are not limited to:

- Note taker or lab assistant
- Group lab assignments
- Use of scribe
- Adjustable tables and lab equipment within reach
- Classrooms, labs and field trips in accessible locations
- Additional time and separate room for test taking
- Additional time for in-class assignments
- Additional time in lab
- Visual and tactile instructional demonstrations
- Computer with voice output, spelling and grammar checker
- Seating in the front of the class
- Tactile drawings and graphs, and three-dimensional models

- Assignments in electronic format
- Large-print handouts, lab signs and equipment labels
- TV monitor connected to microscope to enlarge images
- Computer equipped to enlarge screen characters and images
- Auditory lab warning signals
- Adaptive lab equipment (talking calculators, talking thermometers, light probes, tactile timers)
- Staples on sticks to indicate units of measurement
- Visual warning system for lab emergencies

21ST CENTURY LIFE AND CAREER STANDARDS

Please select all standards that apply to this unit of study:

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

Suggestions on integrating these standards can be found at: http://www.state.nj.us/education/cccs/2014/career/9.pdf

LINKS TO CAREERS:

https://www.stlzoo.org/animals/soyouwanttobeazookeeper

http://www.turningpointcareers.org/how-to-become-a-professional-gardener/

Unit 2	
Weather Watching	
Summary and Rationale	
This unit helps students develop the habit of becoming weather watchers who take pleasure in noticing weather patterns and predicting changes.	
Recommended Pacing	
6-9 weeks	
Standards	
K-LS1-1	Use observations to describe patterns of what plants and animals (including humans) need to survive.
K-ESS3-2	Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather
K-ESS3-3	Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment
K-ESS2-2	. Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs

Interdisciplinary Connections
ELA/Literacy RI.K.1 With prompting and support, ask and answer questions about key details in a text. (K-ESS3-2) W.K.2 Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic. (K-ESS3-3) SL.K.3 Ask and answer questions in order to seek help, get information, or clarify something that is not understood. (K-ESS3-2) SL.K.5 Add drawings or other visual displays to descriptions as desired to provide additional detail. (K-ESS3-1) Mathematics MP.2 Reason abstractly and quantitatively. (K-ESS3-1) MP.4 Model with mathematics. (K-ESS3-1),(K-ESS3-2) K.CC Counting and Cardinality (K-ESS3-1),(K-ESS3-2)

Integration of Technology	
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).

Instructional Focus

Enduring Understandings:	**Essential Questions:**
Weather is present everywhere in the world and is ever-changing. Weather patterns are able to be predicted but sometimes, weather does not follow predictions and can cause emergency weather situations. Weather follows general patterns of seasonal stability. Sun plays a major role in the weather.	Have you ever watched a storm? How do you get ready for a big storm? What will the weather be like on your birthday? How do you know what to wear for the weather? How do you warm up a frozen playground? How could you walk across hot pavement without burning your feet?

Evidence of Learning (Assessments)

https://mysteryscience.com/watching/weather-seasons/assessments
Pre-Assessment
Entrance/Exit Tickets
Formal quiz/test assessments
Inquiries/Labs

Objectives (SLO)

Students will know: The weather is always changing around us! For example, sometimes we need a coat, or an umbrella, and other days we don't. Weather isn't just one thing, there are different factors that affect the weather. When you are a weather watcher, you observe the weather around you. Weather is usually mild but it can quickly become severe. Weather tracking helps us know when to prepare for weather hazards. When the weather becomes severe you may see the sky gets darker, the temperature drops, the wind increases, and even precipitation falls. Knowing how to prepare for weather hazards keeps people safe. "Weather watchers" see that there are four seasons that each have their own type of weather! Winter is cold, snowy, and trees are bare; spring is warmer, rainy, and new leaves begin to grow; summer is hot and trees have a lot of leaves; autumn is chilly and the leaves begin to fall. The seasons don't just stop, they repeat in a cycle. Therefore, the weather and seasons are a pattern. Weather changes over time, like in the seasons, but it can also change throughout the day. It is usually cooler in the mornings and evenings when the sun isn't out, and warmer in the afternoon when the sun is shining high above us. The sun is very far away from earth, but also very important to us. It gives off so much light and heat that it warms Earth's surface. If a place doesn't get enough sunlight, it becomes very cold. Engineers can solve this problem by designing a tool that increases the warming effect of the sun on a specific place. The sun warms Earth's surface. Places that get a lot of sunlight have warmer temperatures, and shaded places that get less sunlight have cooler temperatures	Students will be able to: Observe weather patterns and obtain information through those observations. Make predictions based upon data collected about current weather patterns. Understand the connection between weather patterns and emergency preparations. Students use their observations of the weather in each season to identify patterns. They determine the order of the seasons, and notice the pattern that all four seasons repeat each year. Students consider the cause and effect relationship between the amount of sunlight an area gets and its temperature.

Suggested Resources/Technology Tools

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Modifications

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- Allow the use of Google Translate where appropriate.
- Utilize bilingual reading texts provided by the STC program.

Gifted and Talented -
Utilize differentiation in the areas of acceleration, enrichment, and grouping. Examples include, but are not limited to:

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21ST CENTURY LIFE AND CAREER STANDARDS

Please select all standards that apply to this unit of study:

- ❑ Act as a responsible and contributing citizen and employee.
- ❑ Apply appropriate academic and technical skills.
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- ❑ Communicate clearly and effectively and with reason.
- ❑ Consider the environmental social and economic impacts of decisions.
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- ❑ Model integrity, ethical leadership, and effective management.
- ❑ Plan education and career paths aligned to personal goals.
- ❑ Use technology to enhance productivity.
- ❑ Work productively in teams while using cultural global competence.

Suggestions on integrating these standards can be found at: http://www.state.nj.us/education/cccs/2014/career/9.pdf

LINKS TO CAREERS:

https://www.weatherwizkids.com/career-becoming-meteorologist.htm

Unit 3	
Force Olympics	
Summary and Rationale	
This unit helps students develop their first concept of "force," and the idea that by playing with forces and thinking about them, we can accomplish surprisingly big things.	
Recommended Pacing	
6-9 weeks	
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
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
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

Interdisciplinary Connections
ELA/Literacy RI.K.1 With prompting and support, ask and answer questions about key details in a text. (K-ESS3-2) W.K.2 Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic. (K-ESS3-3) SL.K.3 Ask and answer questions in order to seek help, get information, or clarify something that is not understood. (K-ESS3-2) SL.K.5 Add drawings or other visual displays to descriptions as desired to provide additional detail. (K-ESS3-1) Mathematics MP.2 Reason abstractly and quantitatively. (K-ESS3-1) MP.4 Model with mathematics. (K-ESS3-1),(K-ESS3-2) K.CC Counting and Cardinality (K-ESS3-1),(K-ESS3-2)

Integration of Technology	
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).

Instructional Focus

Enduring Understandings:	**Essential Questions:**
Machines can make work easier. The manner in which machines change work. We have the ability to change, initiate and stop the motion of an object through our use of forces, whether they be pushes or pulls. Some forces we can see in action because of the interactions between objects but, more often than not, forces are invisibly working around us all of the time and we don't realize it.	What's the biggest excavator? Why do builders need so many machines? Can you knock down a wall of concrete? How can you knock down the most bowling pins? How can we protect a mountain town from falling rocks? How could you invent a trap?

Evidence of Learning (Assessments)

https://mysteryscience.com/pushes/forces-machines-engineering/assessments
Pre-Assessment
Entrance/Exit Tickets
Formal quiz/test assessments
Inquiries/Labs

Objectives (SLO)

Students will know: Machines multiply the work a human can do - making the work easier! A machine's force is stronger than a human's force. For example, digging a hole takes less work with a shovel than it does with your hands. It takes even less work if you use a bigger machine, like a bulldozer. There are many different types of machines and each one has a unique job. Machines help people by making their work faster and easier. Machines help people do things like dig, lift, dump, push, and mix! Without machines, it would take a lot longer to build new things. Machines create pushes and pulls, or "forces". A wrecking ball is a machine that uses a push to knock things over. By changing the strength and direction of the push, you can make the force larger or smaller. To move an object farther or faster, a bigger push or pull is needed. When objects collide they push on one another causing a change in direction and speed. By changing the force acting on an object, you can change the motion of the object. Pushes and pulls can have different strengths. The faster an object moves, or the larger it is, the stronger it pushes on something when it bumps into it. Sometimes a push or pull is so strong that it makes an object start moving, or stop moving! Pushing or pulling on an object can even change the direction an object is going. We can use scientific knowledge to help people solve a problem. Inventors design solutions to solve problems. Anyone can be an inventor! Inventors create new ideas, and many use engineering and design to help them. Inventors use their knowledge to create something new. In this story, two inventors use a pull to help them solve a problem.	Students will be able to: Students obtain information through observations of different machines. They use evidence from their observations to argue for their explanation of why machines make work easier. Students act out the "work words" of different machines. Students consider the effects that machines can have when completing a task. Students obtain information through footage of different construction equipment being used in different ways. Students communicate about the information by discussing what each machine does using "work words". Students consider the cause and effect relationship between the movement of a machine and the work it can do. Students carry out an investigation to determine how far back they should pull their model wrecking ball to knock down a wall, but not the houses behind it. They analyze the data collected in their investigation to discuss how the force of the wrecking ball changes when you change the strength and direction of its push. Students analyze the effect of changing the strength and direction of a wrecking ball's push. They experiment with different heights to determine how the push, or force, is changed. Students carry out an investigation by 'bowling' with solo cups (pins), a tennis ball (bowling ball), and pool noodles (bumpers). They explore the forces at work when one thing hits another, and how changing the size of the force affects the motion of an object. Students analyze the cause and effect relationship between the size of the force on an object and the direction or speed it goes. Students use a model of a mountain town, Tiny Town, to conduct an investigation of how to protect the town from a falling boulder. They design a solution to safely guide a boulder down the hill so it doesn't hit the town and rolls into a dump truck. Using pushpin poles, students change the direction the boulder is rolling. Students consider the cause

	and effect relationship between a force and an object's speed or direction. Students design a solution to help the boo characters solve a problem. Then, they define a problem by choosing a chore they don't like doing. Next, they design solution by sketching a machine that could help them. They compare their solutions with a partner. Students consider the structure and function of existing materials and tools in order to create new uses for them in order to solve a problem.

Suggested Resources/Technology Tools

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