

CURRICULUM

FOR

SCIENCE

KINDERGARTEN

This curriculum is part of the Educational Program of Studies of the Rahway Public Schools.

ACKNOWLEDGMENTS

Dr. Susan Dube, Program Supervisor of Math, Science, and Technology Education

The Board acknowledges the following who contributed to the preparation of this curriculum.

Dr. Susan Dube

Dr. Tiffany A. Beer, Director of Curriculum and Instruction

Subject/Course Title:
Science
Kindergarten

Date of Board Adoption:
September 19, 2023

RAHWAY PUBLIC SCHOOLS CURRICULUM

Science: Kindergarten

PACING GUIDE

Unit	Title	Pacing
1	Weather & Patterns	10 weeks
2	Living Things and Their Surroundings	18 weeks
3	Forces and Motion: Pushes and Pulls	12 weeks

ACCOMMODATIONS

<p>504 Accommodations:</p> <ul style="list-style-type: none"> ● Provide scaffolded vocabulary and vocabulary lists. ● Provide extra visual and verbal cues and prompts. ● Provide adapted/alternate/excerpted versions of the text and/or modified supplementary materials. ● Provide links to audio files and utilize video clips. ● Provide graphic organizers and/or checklists. ● Provide modified rubrics. ● Provide a copy of teaching notes, especially any key terms, in advance. ● Allow additional time to complete assignments and/or assessments. ● Provide shorter writing assignments. ● Provide sentence starters. ● Utilize small group instruction. ● Utilize Think-Pair-Share structure. ● Check for understanding frequently. ● Have student restate information. ● Support auditory presentations with visuals. ● Weekly home-school communication tools (notebook, daily log, phone calls or email messages). ● Provide study sheets and teacher outlines prior to assessments. ● Quiet corner or room to calm down and relax when anxious. ● Reduction of distractions. ● Permit answers to be dictated. ● Hands-on activities. ● Use of manipulatives. ● Assign preferential seating. ● No penalty for spelling errors or sloppy handwriting. ● Follow a routine/schedule. ● Provide student with rest breaks. ● Use verbal and visual cues regarding directions and staying on task. ● Assist in maintaining agenda book. 	<p>IEP Accommodations:</p> <ul style="list-style-type: none"> ● Provide scaffolded vocabulary and vocabulary lists. ● Differentiate reading levels of texts (e.g., Newsela). ● Provide adapted/alternate/excerpted versions of the text and/or modified supplementary materials. ● Provide extra visual and verbal cues and prompts. ● Provide links to audio files and utilize video clips. ● Provide graphic organizers and/or checklists. ● Provide modified rubrics. ● Provide a copy of teaching notes, especially any key terms, in advance. ● Provide students with additional information to supplement notes. ● Modify questioning techniques and provide a reduced number of questions or items on tests. ● Allow additional time to complete assignments and/or assessments. ● Provide shorter writing assignments. ● Provide sentence starters. ● Utilize small group instruction. ● Utilize Think-Pair-Share structure. ● Check for understanding frequently. ● Have student restate information. ● Support auditory presentations with visuals. ● Provide study sheets and teacher outlines prior to assessments. ● Use of manipulatives. ● Have students work with partners or in groups for reading, presentations, assignments, and analyses. ● Assign appropriate roles in collaborative work. ● Assign preferential seating. ● Follow a routine/schedule.
<p>Gifted and Talented Accommodations:</p> <ul style="list-style-type: none"> ● Differentiate reading levels of texts (e.g., Newsela). ● Offer students additional texts with higher lexile levels. ● Provide more challenging and/or more supplemental readings and/or activities to deepen understanding. ● Allow for independent reading, research, and projects. ● Accelerate or compact the curriculum. ● Offer higher-level thinking questions for deeper analysis. ● Offer more rigorous materials/tasks/prompts. ● Increase number and complexity of sources. ● Assign group research and presentations to teach the class. ● Assign/allow for leadership roles during collaborative work and in other learning activities. 	<p>ML Accommodations:</p> <ul style="list-style-type: none"> ● Provide extended time. ● Assign preferential seating. ● Assign peer buddy who the student can work with. ● Check for understanding frequently. ● Provide language feedback often (such as grammar errors, tenses, subject-verb agreements, etc...). ● Have student repeat directions. ● Make vocabulary words available during classwork and exams. ● Use study guides/checklists to organize information. ● Repeat directions. ● Increase one-on-one conferencing. ● Allow student to listen to an audio version of the text. ● Give directions in small, distinct steps. ● Allow copying from paper/book. ● Give student a copy of the class notes.

- Provide written and oral instructions.
- Differentiate reading levels of texts (e.g., Newsela).
- Shorten assignments.
- Read directions aloud to student.
- Give oral clues or prompts.
- Record or type assignments.
- Adapt worksheets/packets.
- Create alternate assignments.
- Have student enter written assignments in criterion, where they can use the planning maps to help get them started and receive feedback after it is submitted.
- Allow student to resubmit assignments.
- Use small group instruction.
- Simplify language.
- Provide scaffolded vocabulary and vocabulary lists.
- Demonstrate concepts possibly through the use of visuals.
- Use manipulatives.
- Emphasize critical information by highlighting it for the student.
- Use graphic organizers.
- Pre-teach or pre-view vocabulary.
- Provide student with a list of prompts or sentence starters that they can use when completing a written assignment.
- Provide audio versions of the textbooks.
- Highlight textbooks/study guides.
- Use supplementary materials.
- Give assistance in note taking
- Use adapted/modified textbooks.
- Allow use of computer/word processor.
- Allow student to answer orally, give extended time (time-and-a-half).
- Allow tests to be given in a separate location (with the ESL teacher).
- Allow additional time to complete assignments and/or assessments.
- Read question to student to clarify.
- Provide a definition or synonym for words on a test that do not impact the validity of the exam.
- Modify the format of assessments.
- Shorten test length or require only selected test items.
- Create alternative assessments.
- On an exam other than a spelling test, don't take points off for spelling errors.

UNIT OVERVIEW

Content Area: Earth Science

Unit Title: Weather & Patterns

Target Course/Grade Level: Science/Kindergarten

Unit Summary: In this unit of study, students develop an understanding of patterns and variations in local weather and the use of weather forecasting to prepare for and respond to severe weather. By monitoring local weather, students experience the patterns and variations in weather and come to understand the importance of weather forecasts to prepare for severe weather.

Approximate Length of Unit: 10 weeks

LEARNING TARGETS

NJ Student Learning Standards:

Science:

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

[Clarification Statement: Examples of qualitative observations could include descriptions of the weather (such as sunny, cloudy, rainy, and warm); examples of quantitative observations could include numbers of sunny, windy, and rainy days in a month. Examples of patterns could include that it is usually cooler in the morning than in the afternoon and the number of sunny days versus cloudy days in different months.] [Assessment Boundary: Assessment of quantitative observations limited to whole numbers and relative measures such as warmer/cooler.]

K-ESS3-2: Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.* [Clarification Statement: Emphasis is on local forms of severe weather.]

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

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

K-LS1-1: Use observations to describe patterns of what plants and animals (including humans) need to survive.

K-PS3-1: Make observations to determine the effect of sunlight on Earth's surface.

Science and Engineering Practices:

- Asking questions
- Planning and Carrying Out Investigations
- Analyzing and Interpreting Data

- Developing and Using Models
- Constructing Explanations
- Engaging in Argument from Evidence
- Obtaining, evaluating, and communicating information

Career Readiness, Life Literacies, and Key Skills:

9.4.2.CT.3: Use a variety of types of thinking to solve problems (e.g., inductive, deductive)

9.4.2.IML.2: Represent data in a visual format to tell a story about the data (e.g., 2.MD.D.10).

Interdisciplinary Connections and Standards:

English Language Arts:

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

RI.K.1: With prompting and support, ask and answer questions about key details in a text.

SL.K.3: Ask and answer questions in order to seek help, get information, or clarify something that is not understood.

SL.K.5: Add drawings or other visual displays to descriptions

RI.2.1: Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.

W.2.6: With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers.

W.2.8: Recall information from experiences or gather information from provided sources to answer a question

Mathematics:

Mathematical Practices:

MP.2: Reason abstractly and quantitatively. (K-ESS2-1),(K-2-ETS1-1)

MP.4: Model with mathematics. (K-ESS2-1),(K-ESS3-2),(K-2-ETS1-1)

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

NJSLS Math Standards:

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

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

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

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

2.MD.D.10: 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)

Unit Understandings:

Students will understand that...

- 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.
- People look for patterns in the weather data when they organize and order when making observations about the world.
- Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.
- Some kinds of severe weather are more likely than others in a given region
- Weather scientists forecast severe weather so that communities can prepare for and respond to these events.
- Events have causes that generate observable patterns.

Unit Essential Questions:

- What is the weather like today and how is it different from yesterday?
- How can someone predict what the weather will be tomorrow?
- How does weather forecasting help us to prepare for dangerous weather?

Knowledge and Skills:

Students will know...

- Weather is the condition of the air outdoors.
- Weather can be described as sunny, partly cloudy, overcast, rainy, or snowy.
- Temperature is how hot or cold it is.
- Thermometers measure temperature.
- Air temperature tells something about the weather.
- Sunlight warms Earth's surface.
- Wind is moving air.
- A wind sock indicates wind direction and speed.
- Some severe weather conditions are more likely in some areas than others; weather forecasts help people prepare.
- Seasons change in a predictable annual pattern: fall, winter, spring, and summer.

Students will be able to...

- Observe patterns in events generated by cause-and-effect relationships.
- Ask questions to obtain information about the purpose of weather forecasting to prepare for and respond to severe weather. (Emphasis is on local forms of severe weather.)
- Use a Weather Chart to make observations about weather patterns and answer questions about the data providing evidence from the chart
- Observe patterns in events generated due to cause-and-effect relationships.

EVIDENCE OF LEARNING

Assessment:

What evidence will be collected and deemed acceptable to show that students truly “understand”?

- **End of Unit Common Assessment & FOSS Module Assessment**

- **Common Assessment: See assessment folder for links to common assessments**
- Students use a weather chart to answer questions about patterns they observe
- Students will use a weather chart to create a model/drawing of what they would do and wear based on the weather shown in the chart
- Students will use pictures shown to compare the effects of the sun on different materials
- Students will use pictures of familiar surroundings to identify how the sun affects the local environment at different times of the day

Learning Activities:

What differentiated learning experiences and instruction will enable all students to achieve the desired results?

- Students will observe and compare weather by using senses and tools.
- Students record weather observations using pictures and words.
- Students will build and use a wind sock.
- Students will observe and describe seasonal changes in trees.
- Students describe weather changes from season to season.

RESOURCES

Teacher Resources:

- Weather Presentation: **P** Weather Presentation Kindergarten.pptx
- Sun Song video: [Sun Song Video](#)
- Cloud Video: [Cloud Video](#)
- Rainy Video: [Raindrop](#)
- Sun Song by Storybots: [Sun Song Storybots](#)
- Weather Watcher Video: [Weather Watcher Video](#)
- Weather Unit Worksheets: **W** Weather Worksheets Kindergarten
- Here Comes the Sun Video: [Here Comes the Sun Video](#)
- The Sun Song: [The Sun Song](#)
- Following the Sun Video: [Following the Sun Video](#)
- Globe Investigation Directions: **W** Globe Investigation
- The Sun's Heat Presentation: **P** The Sun's Heat Presentation Kindergarten.pptx
- Sidewalk Painting Investigation: **W** Sidewalk Painting Investigation.docx
- Water vs Sand Investigation: **W** Water vs Sand Investigation.docx
- [Kindergarten SEEd](#) (Resource contains informational text, weather charts, assessments, and phenomena depictions)
- Foss Kit: Trees and Weather
- Next Generation Science Standards (<https://www.nextgenscience.org/>)

Equipment Needed:

- Smartboard/Interactive board

- Word Wall Materials
- Foss Kit
- Science Notebook Sheets

UNIT OVERVIEW

Content Area: Life Science

Unit Title: Living Things and Their Surroundings

Target Course/Grade Level: Science/Kindergarten

Unit Summary: This unit provides students the opportunity to observe some land and water animals. Students observe and describe the structures and needs of fish, birds, snails, earthworms, chicks, and isopods. Students observe, compare and contrast similar animals with different structures and behaviors including guppies and goldfish, night crawlers and red worms, sow bugs and pill bugs. This unit also provides students with the opportunities to help them develop an understanding of what plants (and animals) need to survive and the relationship between their needs and where they live. Students explore how plants, animals, and humans interact and affect their surroundings (environment).

Approximate Length of Unit: 18 weeks

LEARNING TARGETS

NJ Student Learning Standards:

Science:

K-LS1-1: Use observations to describe patterns of what plants and animals (including humans) need to survive.

K-PS3-1: Make observations to determine the effect of sunlight on Earth's surface.

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

K-ESS3-1: Use a model to represent the relationship between the needs of different plants and animals and the places they live.

Science and Engineering Practices:

- Asking questions
- Planning and Carrying Out Investigations
- Analyzing and Interpreting Data
- Developing and Using Models
- Constructing Explanations
- Engaging in Argument from Evidence
- Obtaining, evaluating, and communicating information

Career Readiness, Life Literacies, and Key Skills:

9.4.2.CT.3: Use a variety of types of thinking to solve problems (e.g., inductive, deductive)

9.4.2.IML.2: Represent data in a visual format to tell a story about the data (e.g., 2.MD.D.10).

Interdisciplinary Connections and Standards:

English Language Arts:

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

RI.K.1: With prompting and support, ask and answer questions about key details in a text.

SL.K.5: Add drawings or other visual displays to descriptions

SL.K.3: Ask and answer questions in order to seek help, get information, or clarify something that is not understood.

RI.2.1: Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.

W.2.6: With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers.

W.2.8: Recall information from experiences or gather information from provided sources to answer a question

Mathematics:

Mathematical Practices:

MP.2: Reason abstractly and quantitatively. (K-ESS2-1),(K-2-ETS1-1)

MP.4: Model with mathematics. (K-ESS2-1),(K-ESS3-2),(K-2-ETS1-1)

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

NJSLS Math Standards:

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

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

K.CC.A: 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: 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)

Unit Understandings:

Students will understand that...

- Plants need water and light to live and grow and that animals need food.
- Animals obtain food from plants or other animals.
- Organisms survive and thrive in places that have the resources they need.

Unit Essential Questions:

- How do goldfish, isopods, worms, chicks, and snails live, grow, and respond to their environment?
- How and why is the worm's environment constantly changing?
- What is the relationship between the needs of the animals and their habitats?

- Where do plants and animals live and why do they live there?
- How can you tell if something is alive?
- What do animals and plants need to survive?
- How do people impact the environment as they gather and use what they need to live and grow?
- How can humans reduce their impact on the land, water, air, and other living things in the local environment?

Knowledge and Skills:

Students will know...

- Trees are living plants.
- Trees have structures-branches, leaves, trunk, and roots.
- Trees differ in size and shape.
- Trees have basic needs-light, air, nutrients, water, and space.
- Trees provide resources for animals, including people.
- Different kinds of trees have different leaves.
- Leaves have properties: size, shape, tip, edge, texture, and color.
- Leaf properties vary.
- Leaves can be described and compared by their properties.
- Bark, twigs, leaves, buds, flowers, fruits, and seeds are parts of trees.
- The buds on twigs grow into leaves or flowers.
- Some trees lose their leaves in winter; others do not.
- Trees change through the seasons.
- Some trees produce seeds that can grow into new trees of the same kind.
- Animals have basic needs-water with oxygen, food, and space with shelter.
- Animals have structures that help them live and grow-to find food, sense their habitat, and move from place to place.
- Different kinds of fish have similar but different structures and behaviors.
- Different kinds of birds have similar but different structures and behaviors.
- Different kinds of worms have similar but different structures and behaviors.
- Different kinds of isopods have similar but different structures and behaviors.
- All animals deserve respect and gentle care
- Humans have an impact on the environment.

Students will be able to...

- Draw and label structures of different types of trees, leaves based on first hand or media observations.
- Summarize their observations to describe the ways that leaves are different.
- Organize data in T graphs or Venn diagrams comparing and contrasting: (Tree, leaves).
- Sort leaves by shape.
- Collect data on leaf properties-size, shape, tip, edge, texture, and color.
- Use data to support their claim that all leaves are the same or all leaves are different.
- Identify and describe basic needs of a tree.
- Draw structures of different types of animals (fish, birds, snails, worms, chicks, and isopods) based on first hand or media observations.

- Organize data in a T graph or Venn diagram comparing and contrasting animals of the same species (guppies and goldfish, night crawlers and red worms, sow bugs and pill bugs).
- Use a model of an aquarium created by the student to demonstrate fish behavior.
- Identify and describe animal needs.
- Observe and compare multiple observations of living things.
- Identify whether the picture displayed is a living or nonliving thing.
- Use observations to describe patterns of what plants and animals need to survive.
- Construct an argument supported by evidence for how plants and animals can change the environment to meet their needs.
- Use a model to represent the relationship between the needs of different plants and animals and the places they live
- Begin to group plants and animals together based upon their similar environmental needs (water, sunlight) and the availability of their preferred food sources.
- Observe patterns in events generated due to cause-and-effect relationships.
- Identify the impact that humans have on the local environment.
- Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.

EVIDENCE OF LEARNING

Assessment:

What evidence will be collected and deemed acceptable to show that students truly “understand”?

- **End of Unit Assessment: See assessment folder for links to common assessments**
 - Students communicate orally, in writing, or through drawing that trees have structures using new vocabulary.
 - Students communicate orally or by drawing that trees are living organisms and have needs.
 - Students communicate orally or by drawing that trees change through the seasons
 - Students communicate orally, in writing, or through drawing that animals have structures using new vocabulary.
 - Students communicate orally or by drawing that animals have needs
 - Students communicate orally or by drawing that different animals have different behaviors

Learning Activities:





What differentiated learning experiences and instruction will enable all students to achieve the desired results?

- Students observe trees in the schoolyard using the five senses.
- Students will compare trees for similarities and differences.
- Students will communicate observations made about different kinds of trees, orally and through drawings.

- Students will help plant and take care of a tree.
- Students will observe the sizes, shapes, textures, and colors of tree leaves.
 - Students will compare the shapes of leaves to common geometric shapes.
 - Students will compare the sizes and edges of leaves.
 - Students will record and communicate the similarities and differences among leaves.
- Students communicate observations and comparisons of trees.
- Students will observe and compare multiple observations of living things.
- Students will observe their families in their day-to-day lives, paying attention to what they eat, what they throw away, when and how they use water, how they warm or cool their home, what types of appliances and gadgets they use, how they maintain their home and yard, what resources are used to make the clothes they wear, how they travel from place to place, and how they communicate with others.
- Students observe, identify, and draw the structures of a goldfish, water snail, chick, and red worm.
- Students will create a chart of similarities and differences among similar animals.
- Students make a model worm habitat and overtime observe changes in its environment.
- Students dig for worms, search for isopods and observe birds in their schoolyard.
- Students will verbally share their observations of animal structures, needs, and behaviors
- Students build a class terrarium for several animals to live together.

RESOURCES

Teacher Resources:

-  Plants and Animals Presentation Kindergarten.pptx
-  Plants and Animals Worksheets.doc
- Foss Kit (Trees and Weather Investigations 1, 2, 4)
-  Living Things & Their Surroundings: Evaluating Information
-  Living Things & Their Surroundings: Designing Solutions
- <https://jr.brainpop.com/science/plants/livingandnonlivingthings/>
- <https://jr.brainpop.com/science/plants/trees/>
- <https://jr.brainpop.com/science/plants/partsofaplant/>
- <https://jr.brainpop.com/science/conservation/naturalresources/>
- <https://jr.brainpop.com/science/conservation/reducereuserecycle/>
- <https://njctl.org/materials/courses/kindergarten-science/>
- <https://www.nextgenscience.org/>
- fossweb.com-eBooks-“Animals All Around Us’ and “Living and Nonliving”
- fossweb.com - student online activities: “Find the Parent”
- Youtube-The Needs of Animals- song and video by Harry Kindergarten
- Foss Kit Animals 2 X 2
- Next Generation Science Standards (<https://www.nextgenscience.org/>)

Equipment Needed:

- Smart Board/Interactive board
- Word Wall Materials
- Foss Kit
- Science Notebook Sheets

UNIT OVERVIEW

Content Area:Physical Science

Unit Title: Forces & Motion: Pushes and Pulls

Target Course/Grade Level: Science/Kindergarten

Unit Summary: This unit provides students the opportunity to observe the motion of objects being acted upon by a push or a pull. Students will investigate the effect of pushes and pulls and apply their concept of variables to change the strength and direction of rolling balls to achieve specific outcomes. The students will be asking questions, participating in investigations, observing, recording, and interpreting data to build explanations to achieve specific outcomes.

Approximate Length of Unit: 12 weeks

LEARNING TARGETS

NJ Student Learning Standards:

Science:

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-PS3-1: Make observations to determine the effect of sunlight on Earth's surface.

K-PS3-2: Use tools and materials provided to design and build a structure that will reduce the warming effect of sunlight on Earth's surface.

K-ESS3-1: Use a model to represent the relationship between the needs of different plants and animals 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.

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

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

Science and Engineering Practices:

- Asking questions
- Planning and Carrying Out Investigations

- Analyzing and Interpreting Data
- Developing and Using Models
- Constructing Explanations
- Engaging in Argument from Evidence
- Obtaining, evaluating, and communicating information

Career Readiness, Life Literacies, and Key Skills:

9.4.2.CT.3: Use a variety of types of thinking to solve problems (e.g., inductive, deductive)

9.4.2.IML.2: Represent data in a visual format to tell a story about the data (e.g., 2.MD.D.10).

Interdisciplinary Connections and Standards:

English Language Arts:

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

RI.K.1: With prompting and support, ask and answer questions about key details in a text.

SL.K.3: Ask and answer questions in order to seek help, get information, or clarify something that is not understood.

SL.K.5: Add drawings or other visual displays to descriptions

RI.2.1: Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.

W.2.6: With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers.

W.2.8: Recall information from experiences or gather information from provided sources to answer a question

Mathematics:

Mathematical Practices:

MP.2: Reason abstractly and quantitatively. (K-ESS2-1),(K-2-ETS1-1)

MP.4: Model with mathematics. (K-ESS2-1),(K-ESS3-2),(K-2-ETS1-1)

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

NJSLS Math Standards:

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

K.CC.A: 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: 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)

Unit Understandings:

Students will understand that...

- pushes and pulls are forces that can be acted upon objects.
- a ball and ramp system can be changed to cause different effects.

- stronger pushes and pulls cause objects to travel faster and farther than gentle pushes and pulls. A stronger push causes a bigger collision.

Unit Essential Questions:

- What happens if you push or pull an object harder?
- How can you design a simple way to change the speed or direction of an object using a push or pull from another object?
- How can you change the direction of an object?
- How can you change the speed of an object?

Knowledge and Skills:

Students will know...

- Pushes and pulls can have different strengths and directions.
- Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it.
- When objects touch or collide, they push on one another and can change motion.
- A bigger push or pull makes things speed up or slow down more quickly.
- Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it.
- When objects touch or collide, the object’s motion can be changed.
- The force of the push or pull will make things speed up or slow down more quickly.

Students will be able to...

- explain how children make scooters move.
- explain how you can make the scooter move faster.
- describe the motions you make with your body to make a scooter move.
- explain what you need to do to change the direction of the bike.
- Analyze data to determine how a design solution causes a change in the speed or direction of an object with a push or a pull.
- Plan and conduct an investigation to compare the effects of different strengths or different directions of forces on the motion of an object.

EVIDENCE OF LEARNING

Assessment:

What evidence will be collected and deemed acceptable to show that students truly “understand”?

- **End of Unit Assessments:** see **common assessments folder for links to assessments**
- **W Force & Motion Unit Activity Sheets Kindergarten.doc**
- **End of Unit Assessment: Performance Assessment**
 - Find an object to push and/or pull. Determine how you make it move. See if you can make it move at different speeds.




Learning Activities:

What differentiated learning experiences and instruction will enable all students to achieve the desired results?

- Students will observe and describe how objects move.
- Students will experiment with different objects making them move and changing the speed in which they move
- Students will experiment with different objects making them move and changing the direction of the object's movement
- Students will use knowledge of the motion of rolling objects to solve a problem.

RESOURCES

Teacher Resources:

-  Force & Motion Presentation Kindergarten.pptx
- Foss Kit: Materials and Motion
-  Pushes and Pulls
-  Pushes and Pulls: Swings
- <https://jr.brainpop.com/science/forces/pushesandpulls/>
- <https://www.nj.gov/education/cces/2020/NJSLS-Science.pdf>
- <https://www.nextgenscience.org/>
- [Kindergarten SEEd](#): (Resource contains informational text, weather charts, assessments, and phenomena depictions)
- FOSS Module: Materials and Motion

Equipment Needed:

- Smartboard/Interactive board
- Word Wall Materials
- Foss Kit
- Science Notebook Sheets