Willingboro
Public Schools

"Where Excellence is the Expectation"

Willingboro Public Schools
Science - Grade K

Revised June, 2022
Jennifer Brandon - Supervisor of Science

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SCIENCE CURRICULUM AND INSTRUCTION:

The Willingboro Public Schools Science program is dedicated to delivering our students an innovative hands-on science program. Our program supports the State's vision that scientifically literate students will gain the knowledge and understanding of scientific concepts as required for personal decision-making, participation in civic and cultural affairs, and economic productivity.

Students are encouraged to ask questions about the world around them and practice science skills.

- Students' science experiences teach them to connect science concepts to their experience, see how human nature influences science, and explore how science and technology affects their lives.
- The science classes include activities that engage students in applying their science skills and understandings to examine social issues, solve real problems and make decisions.
- Students have the opportunity to use a variety of equipment and technology in their scientific investigations.
- Students learn how to find out and make up their own minds by experimenting and investigating how the world works rather than just memorizing facts.
- Students are learning how to conduct scientific inquiry and use data to explain their conclusions.
- The process of investigation and explanation is just as important as knowing "the" answer.

Teachers plan instruction that builds on what students know and think to increase students' scientific understanding.

- Teachers use the New Jersey Student Learning Standards in Science to plan lessons that are challenging, engaging and age appropriate.
- There are resources and opportunities for students to do at-home science activities like participating in the STEM Conference.

Course Sequence/Table of Contents:

Click here for the Kindergarten Science Pacing Guide.

Within each unit, please find:

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Overview	Content Standards - Arranged by Disciplinary Core Idea (DCI) *Students who demonstrate understanding can:*	Unit Focus
Unit **Trees and Weather**	**K-PS3: Energy** ● **K-PS3-1** Make observations to determine the effect of sunlight on Earth's surface. [Clarification Statement: Examples of Earth's surface could include sand, soil, rocks, and water] [Assessment Boundary: Assessment of temperature is limited to relative measures such as warmer/cooler.] **K-LS1: From Molecules to Organisms: Structures and Processes** ● **K-LS1-1** Use observations to describe patterns of what plants and animals (including humans) need to survive. [Clarification Statement: Examples of patterns could include that animals need to take in food but plants do not; the different kinds of food needed by different types of animals; the requirement of plants to have light; and, that all living things need water.] **K-ESS2: Earth Systems** ● **K-ESS2-1** Use and share observations of local weather conditions to describe patterns over time. [Clarification Statement: Examples of qualitative observations could include descriptions of the weather (such as sunny, cloudy, rainy, and warm); examples of quantitative observations could include numbers of sunny, windy, and rainy days in a month. Examples of patterns could include that it is usually cooler in the morning than in the afternoon and the number of sunny days versus cloudy days in different months.] [Assessment Boundary: Assessment of quantitative observations limited to whole numbers and relative measures such as warmer/cooler.] ● **K-ESS2-2** Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs. [Clarification Statement: Examples of plants and animals changing their environment could include a squirrel digs in the ground to hide its food and tree roots can break concrete.] **K-ESS3: Earth and Human Activity** ● **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. [Clarification Statement: Examples of	The Trees and Weather Module provides students with solid experiences to help them develop an understanding of what plants (and animals) need to survive and the relationship between their needs and where they live. 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. Throughout the module, students engage in science and engineering practices by asking questions, participating in collaborative investigations, observing, recording, and interpreting data to build explanations, and obtaining information from photographs. Students gain experiences that will contribute to an understanding of the crosscutting concepts of patterns; cause and effect; scale, proportion, and quantity; systems and system models; structure and function; and stability and change

Overview	Content Standards - Arranged by Disciplinary Core Idea (DCI) *Students who demonstrate understanding can:*	Unit Focus
	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-ESS3-2** 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: Engineering Design** ● **K-2-ETS1-2** Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.	
Unit 1: ***Suggested Open Educational Resources***	● Unit 1 Reflection Science ● FOSS Next Generation Science Curriculum Resources ○ Think Link ○ Student Resource Books ● Generation Genius	
Unit **Materials and Motion**	**K-PS2: Motion and Stability: Forces and Interactions** ● **K-PS2-1** Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object. [Clarification Statement: Examples of pushes or pulls could include a string attached to an object being pulled, a person pushing an object, a person stopping a rolling ball, and two objects colliding and pushing on each other.] [Assessment Boundary: Assessment is limited to different relative strengths or different directions, but not both at the same time. Assessment does not include non-contact pushes or pulls such as those produced by magnets.] ● **K-PS2-2** Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull. [Clarification Statement: Examples of problems requiring a solution could include having a marble or other object move a certain distance, follow a particular path, and knock down other objects. Examples of solutions could include	The Materials and Motion Module provides kindergartners with integrated experiences with physical science, earth science, and engineering core ideas that relate to students' interests and are teachable and learnable. Students investigate the anchor phenomenon that objects are made of materials—wood, paper, and fabric—and how material properties determine their use. Students use those materials to engineer structures, applying physical science ideas of energy transfer. The driving questions for the module are what is made of wood, paper, and fabric, and how are the properties of those materials useful to us? Students come to understand that humans use natural resources for everything they do and that people impact the world around them. After building a repertoire of practices with materials and objects, students investigate the effect of pushes and pulls on objects, and apply their intuitive notion of the concept of variables to change the speed and direction of rolling balls and balloon rockets to achieve

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Overview	Content Standards - Arranged by Disciplinary Core Idea (DCI) *Students who demonstrate understanding can:*	Unit Focus
	tools such as a ramp to increase the speed of the object and a structure that would cause an object such as a marble or ball to turn.] [Assessment Boundary: Assessment does not include friction as a mechanism for change in speed.] **K-PS3: Energy** ● **K-PS3-1** Make observations to determine the effect of sunlight on Earth's surface. [Clarification Statement: Examples of Earth's surface could include sand, soil, rocks, and water] [Assessment Boundary: Assessment of temperature is limited to relative measures such as warmer/cooler.] ● **K-PS3-2** Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area. [Clarification Statement: Examples of structures could include umbrellas, canopies, and tents that minimize the warming effect of the sun.] **K-ESS3: Earth and Human Activity** ● **K-ESS3-3** Communicate solutions that will reduce the impact of climate change and humans on the land, water, air, and/or other living things in the local environment. [Clarification Statement: Examples of human impact on the land could include cutting trees to produce paper and using resources to produce bottles. Examples of solutions could include reusing paper and recycling cans and bottles.] **K-2-ETS1: Engineering Design** ● **K-2-ETS1-1** Ask questions, make observations, and gather information about a situation people want to change (e.g., climate change) to define a simple problem that can be solved through the development of a new or improved object or tool. ● **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.	specific outcomes. The guiding question is how can we change the motion of an object? Students engage in science and engineering practices by asking questions, participating in collaborative investigations, observing, recording, and interpreting data to build explanations, and designing objects and systems to achieve outcomes. Students gain experiences with crosscutting concepts: patterns; cause and effect; scale, proportion, and quantity; systems and system models; energy and matter; and structure and function.

Overview	**Content Standards - Arranged by Disciplinary Core Idea (DCI)** *Students who demonstrate understanding can:*	**Unit Focus**
Suggested Open Educational Resources	● FOSS Next Generation Science Curriculum Resources ○ Think Link ○ Student Resource Books ● Generation Genius	
Unit **Animals Two by Two**	**K-LS1: From Molecules to Organisms: Structures and Processes** ● **K-LS1-1** Use observations to describe patterns of what plants and animals (including humans) need to survive. [Clarification Statement: Examples of patterns could include that animals need to take in food but plants do not; the different kinds of food needed by different types of animals; the requirement of plants to have light; and, that all living things need water.] **K-ESS2: Earth Systems** ● **K-ESS2-2** Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs. [Clarification Statement: Examples of plants and animals changing their environment could include a squirrel digs in the ground to hide its food and tree roots can break concrete.] **K-ESS3: Earth and Human Activity** ● **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. [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.]	The Animals Two by Two Module provides students with close and personal interaction with some common land and water animals. The animals and their survival needs are the engaging anchor phenomena. Students study the phenomena by observing and describing the structures of fish, birds, snails, earthworms, and isopods. Appropriate classroom habitats are established for some organisms and students find out what the animals need to live and grow. In four investigations, animals are studied in pairs. Students observe and care for one animal over time, and then they are introduced to another animal similar to the first but with differences in structure and behavior. The driving questions for the module are how are animal structures similar and different? and what do animals need to live and grow? The firsthand experiences are enriched with close-up photos of animals, some related to animals that students have observed in class and some to animals that are new. This process enhances observation, communication, and comparison. Throughout the Animals Two by Two Module, students engage in science and engineering practices by asking questions, participating in collaborative investigations, observing, recording, and interpreting data to build explanations, and obtaining information from photographs. Students gain experiences that will contribute to an understanding of the crosscutting concepts of patterns; cause and effect; systems and system models; and structure and function.
Unit 3:	● FOSS Next Generation Science Curriculum Resources ○ Think Link ○ Student Resource Books	

Overview	**Content Standards - Arranged by Disciplinary Core Idea (DCI)** *Students who demonstrate understanding can:*	**Unit Focus**
Suggested Open Educational Resources		

Trees and Weather: Life and Physical Sciences

Overview

The Trees and Weather Module provides students with solid experiences to help them develop an understanding of what plants (and animals) need to survive and the relationship between their needs and where they live. 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.

Throughout the module, students engage in science and engineering practices by asking questions, participating in collaborative investigations, observing, recording, and interpreting data to build explanations, and obtaining information from photographs. Students gain experiences that will contribute to an understanding of the crosscutting concepts of patterns; cause and effect; scale, proportion, and quantity; systems and system models; structure and function; and stability and change

Essential Questions	Enduring Understandings
Overarching Guiding Questions: *What do plants (and animals) need to survive?* *How can weather have variations and also predictable patterns?* *What is the importance of weather forecasting, especially for severe weather?* **Focus Questions Investigation 1:** ● What do trees need to grow? ● How are tree species similar and different? **Focus Questions Investigation 2:** ● How different are the leaves on different kinds of trees? **Focus Questions Investigation 3:** ● How does weather change? ● What can we measure about the air and wind? **Focus Questions Investigation 4:** ● How do trees look different through the seasons?	**Enduring Understandings Investigation 1:** ● Trees are living, growing plants and have basic needs: light, air, nutrients, water, and space. ● Trees differ in size and shape but have similar structures: branches, leaves, trunk, and roots. ● Trees provide resources for animals, including people. ● Plants and animals can change their surroundings. **Enduring Understandings Investigation 2:** ● 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. **Enduring Understandings Investigation 3:** ● Weather is the condition in the air outdoors and can be described; weather changes. ● Wind is moving air; a wind sock indicates wind direction and speed. ● Temperature is how hot or cold it is; thermometers measure temperature. ● Sunlight warms Earth's surface. ● Weather forecasts help people prepare for the severe weather that is likely in that area. **Enduring Understandings Investigation 4:** ● Seasons change in a predictable annual pattern: fall, winter, spring, and summer. ● Trees change through the seasons. ● Trees can change their surroundings.

Trees and Weather Life and Physical Sciences

NJSLS Science Content Standards - Arranged by Disciplinary Core idea (DCI)

Students who demonstrate understanding can:

K-PS3: Energy

- **K-PS3-1** Make observations to determine the effect of sunlight on Earth's surface. [Clarification Statement: Examples of Earth's surface could include sand, soil, rocks, and water] [Assessment Boundary: Assessment of temperature is limited to relative measures such as warmer/cooler.]

K-LS1: From Molecules to Organisms: Structures and Processes

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

K-ESS2: Earth Systems

- **K-ESS2-1** Use and share observations of local weather conditions to describe patterns over time. [Clarification Statement: Examples of qualitative observations could include descriptions of the weather (such as sunny, cloudy, rainy, and warm); examples of quantitative observations could include numbers of sunny, windy, and rainy days in a month. Examples of patterns could include that it is usually cooler in the morning than in the afternoon and the number of sunny days versus cloudy days in different months.] [Assessment Boundary: Assessment of quantitative observations limited to whole numbers and relative measures such as warmer/cooler.]
- **K-ESS2-2** Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs. [Clarification Statement: Examples of plants and animals changing their environment could include a squirrel digs in the ground to hide its food and tree roots can break concrete.]

K-ESS3: Earth and Human Activity

- **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. [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-ESS3-2** 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: Engineering Design

- **K-2-ETS1-2** Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

Science and Engineering Practices

Asking Questions and Defining Problems

- Asking questions and defining problems in K–2 builds on prior experiences and progresses to simple descriptive questions that can be tested.
  - Ask questions based on observations to find more information about the natural and/or designed world(s). (K-2- ETS1-1), (K-ESS3-2)
  - 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

Trees and Weather Life and Physical Sciences

NJSLS Science Content Standards - Arranged by Disciplinary Core idea (DCI)

- Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions.
    - Use a model to represent relationships in the natural world. (K-ESS3-1)
    - Develop a simple model based on evidence to represent a proposed object or tool. (K-2-ETS1-2)

Planning and Carrying Out Investigations

- Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.
    - Make observations (firsthand or from media) to collect data that can be used to make comparisons. (K-PS3-1)

Obtaining, Evaluating, and Communicating Information

- Obtaining, evaluating, and communicating information in K–2 builds on prior experiences and uses observations and texts to communicate new information.
    - Read grade-appropriate texts and/or use media to obtain scientific information to describe patterns in the natural world. (K-ESS3-2)
    - Communicate solutions with others in oral and/or written forms using models and/or drawings that provide detail about scientific ideas. (K-ESS3-3)

Analyzing and Interpreting Data

- Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.
    - Analyze data from tests of an object or tool to determine if it works as intended. (K-2-ETS1-3)
    - Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (K-ESS2-1), (KLS1-1)

Engaging in Argument from Evidence

- Engaging in argument from evidence in K–2 builds on prior experiences and progresses to comparing ideas and representations about the natural and designed world(s).
    - Construct an argument with evidence to support a claim. (K-ESS2-2)

Disciplinary Core Ideas

PS3.B: Conservation of Energy and Energy Transfer

- Sunlight warms Earth's surface. (K-PS3-1)

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)

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)

ESS2.E: Biogeology

- Plants and animals can change their environment. (K-ESS2-2)

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)

ESS3.B: Natural Hazards

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Trees and Weather Life and Physical Sciences

NJSLS Science Content Standards - Arranged by Disciplinary Core idea (DCI)

- 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)

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), (secondary to KESS2-2)

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)
- Ask questions, make observations, and gather information about a situation people want to change (e.g., climate change) to define a simple problem that can be solved through the development of a new or improved object or tool. (K-2- ETS1-1)
- Before beginning to design a solution, it is important to clearly understand the problem. (K-2- ETS1-1)
- Asking questions, making observations, and gathering information are helpful in thinking about problems. (secondary to KESS3-2)

ETS1.B: Developing Possible Solutions

- Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions, such as climate change, to other people. (K-2-ETS1-2), (secondary to K-ESS3-3)

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)

Crosscutting Concepts

Patterns

- Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (K-ESS2-1), (K-LS1-1)

Cause and Effect

- Events have causes that generate observable patterns. (K-ESS3-2), (K-ESS3-3), (K-PS3-1)

Systems and System Models

- Systems in the natural and designed world have parts that work together. (K-ESS3-1), (K-ESS2-2)

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 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-ESS3-2)

Connections to Nature of Science

Scientific Investigations Use a Variety of Methods

- Scientists use different ways to study the world. (K-PS3-1)

Science Knowledge is Based on Empirical Evidence

- Scientists look for patterns and order when making observations about the world. (K-ESS2-1), (K-LS1-1)

Student Learning Objectives

Students will be able to…

Investigation 1:

- engage with the phenomenon of trees.
- begin their study of trees by looking at the variety and structure of trees in the neighborhood.
- work with representational materials to look more closely at the shapes of trees and their parts.
- adopt neighborhood trees to observe changes throughout the year. A living tree also becomes part of the classroom for several weeks.
- complete the investigation by planting a tree.

Investigation 2:

- engage with the phenomenon of leaves.
- begin with a neighborhood walk, focusing on the leaves of trees.
- match leaves with geometric shapes.
- go on a leaf hunt to compare properties of leaves
- work at centers with representational materials, and make a leaf book.

Investigation 3:

- engage with the phenomenon of local weather.
- share what they know about weather and how it relates to air.
- record daily weather observations on a class calendar.
- use weather pictures to indicate five basic types of weather.
- use a thermometer to measure relative temperature (how hot or cold it is)
- make a wind sock to observe the wind direction and speed.
- observe and compare objects in the sky during the day and at night.

Investigation 4:

- engage with the phenomenon of seasons.
- extend their understanding of trees as growing, changing, living part of their world.
- visit the neighborhood trees during each season; observe trees' twigs, leaves, flowers, and seeds; and compare them to those from a previous season.
- observe how trees can change their surroundings.

Integrated Accommodations and Modifications		
Special Education Students	**English Language Learners**	**At Risk**
• Utilize modifications & accommodations delineated in the student's IEP • Provide additional manipulatives to support instruction • Allow for alternative strategies to solve algorithms or tasks • Provide the steps needed to complete the task • Model frequently • Provide repetition and practice. • Use visuals to demonstrate/model the processes • Restate, reread, and clarify directions/questions • Ask students to restate information, directions, and assignments. • Provide copy of class notes • Distribute study guide for classroom tests. • Provide preferential seating to be mutually determined by the student and teacher • Provide extra textbooks for home. • Provide regular parent/ school communication • Allow extended time to complete assignment • Establish procedures for accommodations / modifications for assessments • Allow student to take/complete tests in an alternate setting as needed Appendix A: Special Education Accommodations and Modifications	WIDA Can Do Descriptors https://wida.wisc.edu/teach/can-do/descriptors • Modify Assignments • Use testing and portfolio assessment • Utilize Native Language Translation (peer, online assistive technology, translation device, bilingual dictionary) • Repeat, rephrase, paraphrase key concepts and directions • Allow for extended time for assignment completion as needed • Highlight key vocabulary • Define essential vocabulary in context • Use graphic organizers, visuals, manipulatives and other concrete materials • Use gestures, facial expressions and body language • Read aloud • Build on what students already know and prior experience	• Pair visual prompts with verbal presentations • Ask students to restate information, directions, and assignments. • Provide repetition and and practice • Model skills / techniques to be mastered. • Provide extended time to complete class work • Provide copy of class notes • Provide preferential seating to be mutually determined by the student and teacher • Allow the use of a computer to complete assignments. • Establish expectations for correct spelling on assignments • Provide extra textbooks for home. • Provide Peer Support • Increase one on one time

Gifted and Talented Students	504 Plan
• Utilize advanced, accelerated, or compacted content • Provide assignments that emphasize higher- level thinking skills. • Allow for individual student interest	• Pair visual prompts with verbal presentations • Ask students to restate information, directions, and assignments. • Provide repetition and and practice

• Gear assignments to development in areas of affect, creativity, cognition, and research skills • Allow for a variety in types of resources • Provide problem-based assignments with planned scope and sequence • Utilize inquiry-based instruction • Adjust the pace of lessons • Utilize Choice Boards • Provide Problem-Based Learning • Establish flexible Grouping	• Model skills / techniques to be mastered. • Provide extended time to complete class work • Provide copy of class notes • Break long assignments into smaller parts • Assist student in setting short term goals • Allow for preferential seating to be mutually determined by the student and teacher • Provide extra textbooks for home. • Model and reinforce organizational systems (i.e. color-coding) • Write out homework assignments, check student's recording of assignments
Interdisciplinary Connections	**Computer Science and Design Thinking**
Connections to NJSLS - English Language Arts *Reading* • RL.K.1 With prompting and support, ask and answer questions about key details in a text (e.g., who, what, where, when, why, how). (K-ESS2-2), (K-ESS3-2) *Writing* • W.K.1 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.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-ESS2- 2), (K-ESS3-2) • 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. (K-2-ETS1-1) • 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). (K-PS3-1), (K-PS3-2), (K-LS-1), (K-ESS2-1) • 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. (K-2-ETS1-1), (K-2-ETS1-3) • W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (K-2-ETS1-1), (K-2-ETS1-3) *Speaking and Listening*	**Computer Science and Design Thinking Practices** 1. ☐ Fostering an Inclusive Computing and Design Culture 2. ✓ Collaborating Around Computing and Design 3. ☐ Recognizing and Defining Computational Problems 4. ✓ Developing and Using Abstractions 5. ☐ Creating Computational Artifacts 6. ☐ Testing and Refining Computational Artifacts 7. ☐ Communicating About Computing and Design **Computer Science and Design Thinking Standards** *Data and Analysis* • Individuals collect, use, and display data about individuals and the world around them. • 8.1.2.DA.1: Collect and present data, including climate change data, in various visual formats. • Data can be used to make predictions about the world. • 8.1.2.DA.3: Identify and describe patterns in data visualizations. • 8.1.2.DA.4: Make predictions based on data using charts or graphs. *Algorithms & Programming* • Complex tasks can be broken down into simpler instructions, some of which can be broken down even further. • 8.1.2.AP.4: Break down a task into a sequence of steps.

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- SL.2.5 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.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)

Connections to NJSLS - Mathematics

- MP.2 Reason abstractly and quantitatively. (K-2-ETS1-1), (K-2-ETS1-3), (K-ESS2-1), (K-ESS3-1)
- MP.4 Model with mathematics. (K-2-ETS1-1), (K-2-ETS1-3), (K-ESS2-1), (K-ESS3-1)
- MP.5 Use appropriate tools strategically. (K-2-ETS1-1), (K-2-ETS1-3)
- K.CC.A Know number names and the count sequence. (K-ESS2-1), (K-ESS3-1)
- 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.A.2 Directly compare two objects with a measurable attribute in common, to see which object has "more of/less of" the attribute, and describe the difference.
- 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)K-PS3-1), (K-PS3-2), (K-LS-1)
-

Engineering Design

- Engineering design is a creative process for meeting human needs or wants that can result in multiple solutions.
  - 8.2.2.ED.1: Communicate the function of a product or device.
  - 8.2.2.ED.2: Collaborate to solve a simple problem, or to illustrate how to build a product using the design process.
  - 8.2.2.ED.3: Select and use appropriate tools and materials to build a product using the design process.
- Limitations (constraints) must be considered when engineering designs.
  - 8.2.2.ED.4: Identify constraints and their role in the engineering design process.

Nature of Technology

- Innovation and the improvement of existing technology involves creative thinking
  - 8.2.2.NT.2: Brainstorm how to build a product, improve a designed product, fix a product that has stopped working, or solve a simple problem.

Career Readiness, Life Literacies and Key Skills

Career Readiness, Life Literacies and Key Skills Practices

- Act as a responsible and contributing community member and employee.
- Attend to financial well-being.
- Consider the environmental, social and economic impacts of decisions.
- Demonstrate creativity and innovation.
- 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, increase collaboration and communicate effectively.
- Work productively in teams while using cultural/global competence.

Career Readiness, Life Literacies and Key Skills Standards

9.1 Personal Financial Literacy

Civic Responsibility

- 9.1.2.CR.1: Recognize ways to volunteer in the classroom, school and community.
- 9.1.2.CR.2: List ways to give back, including making donations, volunteering, and starting a business

9.2 Career Awareness, Exploration, Preparation, and Training

Career Awareness and Planning

- 9.1.2.CAP.1: Make a list of different types of jobs and describe the skills associated with each job

9.4 Life Literacies and Key Skills

Creativity and Innovation

- 9.4.2.CI.1: Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2).
- 9.4.2.CI.2: Demonstrate originality and inventiveness in work (e.g., 1.3A.2CR1a).

Critical Thinking and Problem-solving

- 9.4.2.CT.1: Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).
- 9.4.2.CT.2: Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3). • 9.4.2.CT.3: Use a variety of types of thinking to solve problems (e.g., inductive, deductive).

Digital Citizenship

- 9.4.2.DC.7: Describe actions peers can take to positively impact climate change (e.g., 6.3.2.CivicsPD.1).

Information and Media Literacy

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

Climate Change

K-PS3: Energy

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

K-LS1: From Molecules to Organisms: Structures and Processes

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

K-ESS2: Earth Systems

- **K-ESS2-1** Use and share observations of local weather conditions to describe patterns over time.
- **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-ESS3-2** Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.

K-2-ETS1: Engineering Design

- **K-2-ETS1-2** Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

SEL Competencies

- **Self - Awareness**
- **Self - Management**

- **Social Awareness**
- **Responsible Decision Making**
- **Relationship Skills**

https://www.nj.gov/education/safety/wellness/selearning/index.shtml

District/School Formative Assessment Plan	District/School Summative Assessment Plan
Formative assessment informs instruction and is ongoing throughout a unit to determine how students are progressing against the standards. Teachers are encouraged to incorporate Formative Assessments into all lessons. During instruction, teachers will collect ongoing information on students' mastery of content through a variety of methods: ● Pre-Assessment ● Questioning: using Socratic method, probing questions, a hierarchical system in complexity (Bloom's Taxonomy) ● Exit tickets, rotational activities (stations), quizzes, and small group activities ● Classwork, homework, group work (formative assessment) ● Teacher's observation, class discussion, and Student Notebook	*Summative assessment is an opportunity for students to demonstrate mastery of the skills taught during a particular unit.* **Benchmark Assessments:** ● Assessment 1.1: Mid-Unit Assessment ● Assessment 1.2: End of Unit Assessment ● Assessment 1.3: End of Unit Performance Assessment **Standardized Assessments:** ● NJSLA **Other Summative Assessments:** Teachers are encouraged to design and implement their own assessments (topic/module tests and quizzes) individually and/or with their department or grade-level partners, as per Uniform Grading Profile.

Targeted Academic Vocabulary

Tree, variety, structure, shape, trunk, bark, stem, roots, branch, twig, leaf, flowers, seeds, fruit, living, growing, plant, properties, season, weather, weather patterns, air, temperature, thermometer, freezing, warm, wind sock, graph, data, sun, sunlight

District/School Tasks	District/School Primary and Supplementary Resources
• Common Formative Assessments • Common District Summative Assessments • See above Assessment Sections for more information	**District-Mandated Resources** • FOSS Curriculum **Assessment Resources:** • Available on FOSS - ThinkLink • For additional resources, log in to https://edconnectnj.schoolnet.com **Other Resources:** • We are Teachers.com: Social-Emotional Activities for Preschool and Kindergarten (SEL Resource) • Famous African American Climate Scientists (Amistad) • Teaching about the Holocaust/Genocide, Prejudice & Bullying Using UDL (Grades K5) (Holocaust) • Climate Change Activities for Early Elementary (Climate Change) • Kindergarten STEM Activities • Generation Genius: Intro to Weather • Youtube.com • Brainpop.com • www.teachersdomain.org • www.sciencenetlinks.com • Thesciencespot.com • Mystery Science • Quizlet.com • Kahoot.com **Project Ideas:** • Tree planting • (Plant) “Growth Mindset” SEL Activities • Weather Patterns Project • Predicting the effects of weather (ex: wind) on a tree and observe results.

Instructional Best Practices and Exemplars
See Appendix A for Instructional Best Practices and Exemplars

Pacing Guide
<**Kindergarten Unit 1 "Trees and Weather" Pacing Guide**>

Materials and Motion: Life and Physical Sciences

Overview

The Materials and Motion Module provides kindergartners with integrated experiences with physical science, earth science, and engineering core ideas that relate to students' interests and are teachable and learnable. Students investigate the anchor phenomenon that objects are made of materials—wood, paper, and fabric—and how material properties determine their use. Students use those materials to engineer structures, applying physical science ideas of energy transfer. The driving questions for the module are what is made of wood, paper, and fabric, and how are the properties of those materials useful to us? Students come to understand that humans use natural resources for everything they do and that people impact the world around them.

After building a repertoire of practices with materials and objects, students investigate the effect of pushes and pulls on objects, and apply their intuitive notion of the concept of variables to change the speed and direction of rolling balls and balloon rockets to achieve specific outcomes. The guiding question is how can we change the motion of an object? Students engage in science and engineering practices by asking questions, participating in collaborative investigations, observing, recording, and interpreting data to build explanations, and designing objects and systems to achieve outcomes. Students gain experiences with crosscutting concepts: patterns; cause and effect; scale, proportion, and quantity; systems and system models; energy and matter; and structure and function.

Essential Questions	Enduring Understandings
Overarching Guiding Questions *How do the properties of different materials determine their use?* *How can we change the motion of an object?* *How can we use materials in engineering a structure?* **Focus Questions for Investigation 1:** What in our world is made of wood and what properties make wood useful? **Focus Questions for Investigation 2:** What in our world is made of paper and what properties make paper useful? **Focus Questions for Investigation 3:** What in our world is made of fabric and what properties make fabric useful? **Focus Questions for Investigation 4:** How can we change the motion of an object?	**Anchoring Phenomenon: Objects are made of materials with distinct properties** ● Humans use natural resources for everything they do and people impact the world around them. ● Land, air, water, and trees are natural resources. ● Trees are natural resources. ● Materials can be described in terms of their properties. ● People make paper from wood. ● Paper can be reused, recycled, and fabricated. ● Fabric is a flexible material with a wide range of properties. The properties of fabrics determine their uses. ● People reuse and recycle to conserve natural resources. ● The Sun warms Earth's surface. ● Engineers design and test solutions to problems. ● Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. A bigger push or pull makes things go faster. ● Gravity pulls things down. ● When objects touch or collide, they push on one another and can change motion.

Materials and Motion

NJSLS Science Content Standards - Arranged by Disciplinary Core idea (DCI)

Students who demonstrate understanding can:

K-PS2: Motion and Stability: Forces and Interactions

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

K-PS3: Energy

- **K-PS3-1** Make observations to determine the effect of sunlight on Earth's surface. [Clarification Statement: Examples of Earth's surface could include sand, soil, rocks, and water] [Assessment Boundary: Assessment of temperature is limited to relative measures such as warmer/cooler.]
- **K-PS3-2** Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area. [Clarification Statement: Examples of structures could include umbrellas, canopies, and tents that minimize the warming effect of the sun.]

K-ESS3: Earth and Human Activity

- **K-ESS3-3** Communicate solutions that will reduce the impact of climate change and humans on the land, water, air, and/or other living things in the local environment. [Clarification Statement: Examples of human impact on the land could include cutting trees to produce paper and using resources to produce bottles. Examples of solutions could include reusing paper and recycling cans and bottles.]

K-2-ETS1: Engineering Design

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

- Asking questions and defining problems in K–2 builds on prior experiences and progresses to simple descriptive questions.
  - Ask questions based on observations to find more information about the natural and/or designed world(s). (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

- Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions.

Materials and Motion

NJSLS Science Content Standards - Arranged by Disciplinary Core idea (DCI)

- Develop a simple model based on evidence to represent a proposed object or tool. (K-2-ETS1-2)

Planning and Carrying Out Investigations

- Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.
  - With guidance, plan and conduct an investigation in collaboration with peers. (K-PS2-1)
  - Make observations (firsthand or from media) to collect data that can be used to make comparisons. (K-PS3-1)

Constructing Explanations and Designing Solutions

- Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions.
  - Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem. (K-PS3-2)

Analyzing and Interpreting Data

- Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.
  - Analyze data from tests of an object or tool to determine if it works as intended. (K-PS2-2), (K-2-ETS1-3)

Obtaining, Evaluating, and Communicating Information

- Obtaining, evaluating, and communicating information in K–2 builds on prior experiences and uses observations and texts to communicate new information
  - Communicate solutions with others in oral and/or written forms using models and/or drawings that provide detail about scientific ideas. (K-ESS3-3)

Disciplinary Core Ideas

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. (KPS2-1), (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)

PS3.B: Conservation of Energy and Energy Transfer

- Sunlight warms Earth's surface. (K-PS3-1), (K-PS3-2)

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.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. Such problems may have many acceptable solutions. (K-2- ETS1-1), (secondary to K-PS2-2)
- Ask questions, make observations, and gather information about a situation people want to change (e.g., climate change) to define a simple problem that can be solved through the development of a new or improved object or tool. (K-2- ETS1-1)
- Before beginning to design a solution, it is important to clearly understand the problem. (K-2- ETS1-1)

ETS1.B: Developing Possible Solutions

Materials and Motion

NJSLS Science Content Standards - Arranged by Disciplinary Core idea (DCI)

- Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions, such as climate change, to other people. (K-2-ETS1-2)

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)

Crosscutting Concepts

Cause and Effect

- Events have causes that generate observable patterns. (K-PS3-1), (K-PS3-2), (K-ESS3-3)

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 Investigations Use a Variety of Methods

- Scientists use different ways to study the world. (K-PS2-1), (K-PS3-1)

Student Learning Objectives

Integrated Accommodations and Modifications		
Special Education Students	**English Language Learners**	**At Risk**
• Utilize modifications & accommodations delineated in the student's IEP • Provide additional manipulatives to support instruction	WIDA Can Do Descriptors https://wida.wisc.edu/teach/can-do/descriptors • Modify Assignments • Use testing and portfolio assessment	• Pair visual prompts with verbal presentations • Ask students to restate information, directions, and assignments. • Provide repetition and and practice • Model skills / techniques to be mastered.

• Allow for alternative strategies to solve algorithms or tasks • Provide the steps needed to complete the task • Model frequently • Provide repetition and practice. • Use visuals to demonstrate/model the processes • Restate, reread, and clarify directions/questions • Ask students to restate information, directions, and assignments. • Provide copy of class notes • Distribute study guide for classroom tests. • Provide preferential seating to be mutually determined by the student and teacher • Provide extra textbooks for home. • Provide regular parent/ school communication • Allow extended time to complete assignment • Establish procedures for accommodations / modifications for assessments • Allow student to take/complete tests in an alternate setting as needed <u>Appendix A: Special Education Accommodations and Modifications</u>	• Utilize Native Language Translation (peer, online assistive technology, translation device, bilingual dictionary) • Repeat, rephrase, paraphrase key concepts and directions • Allow for extended time for assignment completion as needed • Highlight key vocabulary • Define essential vocabulary in context • Use graphic organizers, visuals, manipulatives and other concrete materials • Use gestures, facial expressions and body language • Read aloud • Build on what students already know and prior experience	• Provide extended time to complete class work • Provide copy of class notes • Provide preferential seating to be mutually determined by the student and teacher • Allow the use of a computer to complete assignments. • Establish expectations for correct spelling on assignments • Provide extra textbooks for home. • Provide Peer Support • Increase one on one time

Gifted and Talented Students	**504 Plan**
• Utilize advanced, accelerated, or compacted content • Provide assignments that emphasize higher- level thinking skills. • Allow for individual student interest • Gear assignments to development in areas of affect, creativity, cognition, and research skills • Allow for a variety in types of resources • Provide problem-based assignments with planned scope and sequence • Utilize inquiry-based instruction • Adjust the pace of lessons • Utilize Choice Boards • Provide Problem-Based Learning • Establish flexible Grouping	• Pair visual prompts with verbal presentations • Ask students to restate information, directions, and assignments. • Provide repetition and and practice • Model skills / techniques to be mastered. • Provide extended time to complete class work • Provide copy of class notes • Break long assignments into smaller parts • Assist student in setting short term goals • Allow for preferential seating to be mutually determined by the student and teacher • Provide extra textbooks for home. • Model and reinforce organizational systems (i.e. color-coding) • Write out homework assignments, check student's recording of assignments

Interdisciplinary Connections	Computer Science and Design Thinking
Connections to NJSLS - English Language Arts *Reading* ● RI.K.1 With prompting and support, ask and answer questions about key details in a text. (K-PS2-2) *Writing* ● 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) ● 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). (K-PS2-1), (K-PS3-1), (K-PS3-2) *Speaking and Listening* ● SL.K.3 Ask and answer questions in order to seek help, get information, or clarify something that is not understood. (K-PS2-2) **Connections to NJSLS - Mathematics** ● MP.2 Reason abstractly and quantitatively. (K-PS2-1) ● MP.4 Model with mathematics. (K-2-ETS1-1), (K-2-ETS1-3) ● MP.5 Use appropriate tools strategically. (K-2-ETS1-1), (K-2-ETS1-3) ● K.MD.A.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. (K-PS2-1) ● K.MD.A.2 Directly compare two objects with a measurable attribute in common, to see which object has "more of/less of" the attribute, and describe the difference. (K-PS2-1), (K-PS3-1), (K-PS3-2)	**Computer Science and Design Thinking Practices** 1. ☐ Fostering an Inclusive Computing and Design Culture 2. ✓ Collaborating Around Computing and Design 3. ☐ Recognizing and Defining Computational Problems 4. ✓ Developing and Using Abstractions 5. ☐ Creating Computational Artifacts 6. ☐ Testing and Refining Computational Artifacts 7. ☐ Communicating About Computing and Design **Computer Science and Design Thinking Standards** *Data and Analysis* ● Individuals collect, use, and display data about individuals and the world around them. ● 8.1.2.DA.1: Collect and present data, including climate change data, in various visual formats. ● Data can be used to make predictions about the world. ● 8.1.2.DA.3: Identify and describe patterns in data visualizations. ● 8.1.2.DA.4: Make predictions based on data using charts or graphs. *Algorithms & Programming* ● Complex tasks can be broken down into simpler instructions, some of which can be broken down even further. ● 8.1.2.AP.4: Break down a task into a sequence of steps. *Engineering Design* ● Engineering design is a creative process for meeting human needs or wants that can result in multiple solutions. ○ 8.2.2.ED.1: Communicate the function of a product or device. ○ 8.2.2.ED.2: Collaborate to solve a simple problem, or to illustrate how to build a product using the design process. ○ 8.2.2.ED.3: Select and use appropriate tools and materials to build a product using the design process. ● Limitations (constraints) must be considered when engineering designs. ○ 8.2.2.ED.4: Identify constraints and their role in the engineering design process.

Back to Contents Page

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Career Readiness, Life Literacies and Key Skills

Career Readiness, Life Literacies and Key Skills Practices

- Act as a responsible and contributing community member and employee.
- Attend to financial well-being.
- Consider the environmental, social and economic impacts of decisions.
- Demonstrate creativity and innovation.
- 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, increase collaboration and communicate effectively.
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Career Readiness, Life Literacies and Key Skills Standards

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- 9.1.2.CR.2: List ways to give back, including making donations, volunteering, and starting a business

9.2 Career Awareness, Exploration, Preparation, and Training

Career Awareness and Planning

- 9.1.2.CAP.1: Make a list of different types of jobs and describe the skills associated with each job

9.4 Life Literacies and Key Skills

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- 9.4.2.CI.1: Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2).
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- 9.4.2.CT.1: Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).
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Digital Citizenship
- 9.4.2.DC.7: Describe actions peers can take to positively impact climate change (e.g., 6.3.2.CivicsPD.1).

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

Climate Change

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- **K-PS3-1** Make observations to determine the effect of sunlight on Earth's surface.
- **K-PS3-2** Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area.

K-ESS3: Earth and Human Activity
- **K-ESS3-3** Communicate solutions that will reduce the impact of climate change and humans on the land, water, air, and/or other living things in the local environment.

K-2-ETS1: Engineering Design
- **K-2-ETS1-1** Ask questions, make observations, and gather information about a situation people want to change (e.g., climate change) to define a simple problem that can be solved through the development of a new or improved object or tool.
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SEL Competencies
- **Self - Awareness**
- **Self - Management**
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- **Responsible Decision Making**
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https://www.nj.gov/education/safety/wellness/selearning/index.shtml

District/School Formative Assessment Plan	District/School Summative Assessment Plan
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• Classwork, homework, group work (formative assessment) • Teacher's observation, class discussion, and Student Notebook	**Standardized Assessments:** • NJSLA **Other Summative Assessments:** Teachers are encouraged to design and their own assessments (topic/module tests and quizzes) individually and/or with their department or grade-level partners, as per Uniform Grading Profile.

Targeted Academic Vocabulary

Materials, properties, wood, trees, natural resources, conserve, processed, fabricated, flexible, paper, recycle, reuse, fabric, engineer, design, test, Sun, Earth, sunlight, push, pull, speed, direction, collide, gravity, movement, motion

District/School Tasks	District/School Primary and Supplementary Resources
• Common Formative Assessments • Common District Summative Assessments • See above Assessment Sections for more information	**District-Mandated Resources** • FOSS Curriculum **Assessment Resources:** • Available on FOSS - ThinkLink • For additional resources, log in to https://edconnectnj.schoolnet.com **Other Resources:** • We are Teachers.com: Social-Emotional Activities for Preschool and Kindergarten (SEL Resource) • Famous African American Climate Scientists (Amistad) • Teaching about the Holocaust/Genocide, Prejudice & Bullying Using UDL (Grades K5) (Holocaust) • Climate Change Activities for Early Elementary (Climate Change) • 30 Push and Pull Activities for Kindergarten • Generation Genius: Natural Resources, Classification of Materials, Material Properties and Purposes etc • Youtube.com • Brainpop.com • www.teachersdomain.org • www.sciencenetlinks.com

	● Thesciencespot.com ● Mystery Science ● Quizlet.com ● Kahoot.com **Project Ideas:** ● Build, test, and refine a structure made of paper, wood, and/or fabric designed to control or affect the motion of an object ○ Marble run, toy car ramp, etc.
Instructional Best Practices and Exemplars	
See Appendix A for Instructional Best Practices and Exemplars	
Pacing Guide	
Kindergarten Unit 2, "Materials and Motion" Pacing Guide	

Animals Two by Two: Life and Physical Sciences

Overview

The Animals Two by Two Module provides students with close and personal interaction with some common land and water animals. The animals and their survival needs are the engaging anchor phenomena. Students study the phenomena by observing and describing the structures of fish, birds, snails, earthworms, and isopods. Appropriate classroom habitats are established for some organisms and students find out what the animals need to live and grow. In four investigations, animals are studied in pairs. Students observe and care for one animal over time, and then they are introduced to another animal similar to the first but with differences in structure and behavior.

The driving questions for the module are how are animal structures similar and different? and what do animals need to live and grow? The firsthand experiences are enriched with close-up photos of animals, some related to animals that students have observed in class and some to animals that are new. This process enhances observation, communication, and comparison.

Throughout the Animals Two by Two Module, students engage in science and engineering practices by asking questions, participating in collaborative investigations, observing, recording, and interpreting data to build explanations, and obtaining information from photographs. Students gain experiences that will contribute to an understanding of the crosscutting concepts of patterns; cause and effect; systems and system models; and structure and function.

Essential Questions	Enduring Understandings
Overarching Guiding Questions *How are animal structures similar and different?* *What do animals need to live and grow?* **Focus Questions for Investigation 1:** How are the structures and behaviors of different kinds of fish similar and different? How are the structures and behaviors of different kinds of birds similar and different? What do animals such as fish and birds need to live and grow? **Focus Questions for Investigation 2:** How are the structures and behaviors of different kinds of snails similar and different? What do animals such as snails need to live and grow? **Focus Questions for Investigation 3:** How are the structures and behaviors of different kinds of worms similar and different? What do animals such as worms need to live and grow? **Focus Questions for Investigation 4:** How are the structures and behaviors of different kinds of isopods similar and different? What do animals such as isopods need to live and grow?	***Anchoring Phenomena: Animals and their Survival Needs*** ● Animals have basic needs—water, air, food, and space with shelter. ● Animals have identifiable structures that help them live and grow. ● Different kinds of animals have similar but different structures and behaviors. ● There is great diversity among animals. ● Animals have senses. ● Animal behavior is influenced by conditions in the environment.

Animals Two by Two: Life and Physical Sciences

NJSLS Science Content Standards - Arranged by Disciplinary Core idea (DCI)

Students who demonstrate understanding can:

K-LS1: From Molecules to Organisms: Structures and Processes

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

K-ESS2: Earth Systems

- **K-ESS2-2** Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs. [Clarification Statement: Examples of plants and animals changing their environment could include a squirrel digs in the ground to hide its food and tree roots can break concrete.]

K-ESS3: Earth and Human Activity

- **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. [Clarification Statement: Examples of relationships could include that deer eat buds and leaves, therefore, they usually live in forested areas; and, grasses need sunlight, so they often grow in meadows. Plants, animals, and their surroundings make up a system.]

Science and Engineering Practices

Developing and Using Models

- Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions.
    - Use a model to represent relationships in the natural world. (K-ESS3-1)

Analyzing and Interpreting Data

- Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.
    - Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (K-LS1-1)

Engaging in Argument from Evidence

- Engaging in argument from evidence in K–2 builds on prior experiences and progresses to comparing ideas and representations about the natural and designed world(s).
    - Construct an argument with evidence to support a claim. (K-ESS2-2)

Disciplinary Core Ideas

LS1.C: Organization for Matter and Energy Flow in Organisms

- All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow. (K-LS1-1)

ESS2.E: Biogeology

- Plants and animals can change their environment. (K-ESS2-2)

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)

ESS3.C: Human Impacts on Earth Systems

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Animals Two by Two: Life and Physical Sciences

NJSLS Science Content Standards - Arranged by Disciplinary Core idea (DCI)

- Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. (secondary to K-ESS2-2)

Crosscutting Concepts

Patterns

- Patterns in the natural world can be observed, used to describe phenomena, 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)

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)

Student Learning Objectives

Integrated Accommodations and Modifications		
Special Education Students	**English Language Learners**	**At Risk**
• Utilize modifications & accommodations delineated in the student's IEP • Provide additional manipulatives to support instruction • Allow for alternative strategies to solve algorithms or tasks • Provide the steps needed to complete the task • Model frequently	WIDA Can Do Descriptors https://wida.wisc.edu/teach/can-do/descriptors • Modify Assignments • Use testing and portfolio assessment • Utilize Native Language Translation (peer, online assistive technology, translation device, bilingual dictionary)	• Pair visual prompts with verbal presentations • Ask students to restate information, directions, and assignments. • Provide repetition and and practice • Model skills / techniques to be mastered. • Provide extended time to complete class work • Provide copy of class notes

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• Provide repetition and practice. • Use visuals to demonstrate/model the processes • Restate, reread, and clarify directions/questions • Ask students to restate information, directions, and assignments. • Provide copy of class notes • Distribute study guide for classroom tests. • Provide preferential seating to be mutually determined by the student and teacher • Provide extra textbooks for home. • Provide regular parent/ school communication • Allow extended time to complete assignment • Establish procedures for accommodations / modifications for assessments • Allow student to take/complete tests in an alternate setting as needed Appendix A: Special Education Accommodations and Modifications	• Repeat, rephrase, paraphrase key concepts and directions • Allow for extended time for assignment completion as needed • Highlight key vocabulary • Define essential vocabulary in context • Use graphic organizers, visuals, manipulatives and other concrete materials • Use gestures, facial expressions and body language • Read aloud • Build on what students already know and prior experience	• Provide preferential seating to be mutually determined by the student and teacher • Allow the use of a computer to complete assignments. • Establish expectations for correct spelling on assignments • Provide extra textbooks for home. • Provide Peer Support • Increase one on one time

Gifted and Talented Students	504 Plan
• Utilize advanced, accelerated, or compacted content • Provide assignments that emphasize higher- level thinking skills. • Allow for individual student interest • Gear assignments to development in areas of affect, creativity, cognition, and research skills • Allow for a variety in types of resources • Provide problem-based assignments with planned scope and sequence • Utilize inquiry-based instruction • Adjust the pace of lessons • Utilize Choice Boards • Provide Problem-Based Learning • Establish flexible Grouping	• Pair visual prompts with verbal presentations • Ask students to restate information, directions, and assignments. • Provide repetition and and practice • Model skills / techniques to be mastered. • Provide extended time to complete class work • Provide copy of class notes • Break long assignments into smaller parts • Assist student in setting short term goals • Allow for preferential seating to be mutually determined by the student and teacher • Provide extra textbooks for home. • Model and reinforce organizational systems (i.e. color-coding) • Write out homework assignments, check student's recording of assignments

Interdisciplinary Connections	Computer Science and Design Thinking
Connections to NJSLS - English Language Arts *Reading*	**Computer Science and Design Thinking Practices** 1. ☐ Fostering an Inclusive Computing and Design Culture

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

Writing

- W.K.1 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.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-ESS2- 2)
- 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). (K-LS1-1)

Speaking and Listening

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

Connections to NJSLS - Mathematics

- MP.2 Reason abstractly and quantitatively.(K-ESS3-1)
- MP.4 Model with mathematics. (K-ESS3-1)
- K.CC.A Know number names and the count sequence. (K-ESS3-1)
- K.MD.A.2 Directly compare two objects with a measurable attribute in common, to see which object has “more of/less of” the attribute, and describe the difference. (K-LS1-1)

2. ✓ Collaborating Around Computing and Design
3. ☐ Recognizing and Defining Computational Problems
4. ✓ Developing and Using Abstractions
5. ☐ Creating Computational Artifacts
6. ☐ Testing and Refining Computational Artifacts
7. ☐ Communicating About Computing and Design

Computer Science and Design Thinking Standards

Data and Analysis

- Individuals collect, use, and display data about individuals and the world around them.
    - 8.1.2.DA.1: Collect and present data, including climate change data, in various visual formats.
- Data can be used to make predictions about the world.
    - 8.1.2.DA.3: Identify and describe patterns in data visualizations.
    - 8.1.2.DA.4: Make predictions based on data using charts or graphs.

Algorithms & Programming

- Complex tasks can be broken down into simpler instructions, some of which can be broken down even further.
    - 8.1.2.AP.4: Break down a task into a sequence of steps.

Engineering Design

- Engineering design is a creative process for meeting human needs or wants that can result in multiple solutions.
    - 8.2.2.ED.1: Communicate the function of a product or device.
    - 8.2.2.ED.2: Collaborate to solve a simple problem, or to illustrate how to build a product using the design process.
    - 8.2.2.ED.3: Select and use appropriate tools and materials to build a product using the design process.
- Limitations (constraints) must be considered when engineering designs.
    - 8.2.2.ED.4: Identify constraints and their role in the engineering design process.

Nature of Technology

- Innovation and the improvement of existing technology involves creative thinking

	○ 8.2.2.NT.2: Brainstorm how to build a product, improve a designed product, fix a product that has stopped working, or solve a simple problem.

Career Readiness, Life Literacies and Key Skills

Career Readiness, Life Literacies and Key Skills Practices

- Act as a responsible and contributing community member and employee.
- Attend to financial well-being.
- Consider the environmental, social and economic impacts of decisions.
- Demonstrate creativity and innovation.
- 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, increase collaboration and communicate effectively.
- Work productively in teams while using cultural/global competence.

Career Readiness, Life Literacies and Key Skills Standards

9.1 Personal Financial Literacy

Civic Responsibility

- 9.1.2.CR.1: Recognize ways to volunteer in the classroom, school and community.
- 9.1.2.CR.2: List ways to give back, including making donations, volunteering, and starting a business

9.2 Career Awareness, Exploration, Preparation, and Training

Career Awareness and Planning

- 9.1.2.CAP.1: Make a list of different types of jobs and describe the skills associated with each job

9.4 Life Literacies and Key Skills

Creativity and Innovation

- 9.4.2.CI.1: Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2).
- 9.4.2.CI.2: Demonstrate originality and inventiveness in work (e.g., 1.3A.2CR1a).

Critical Thinking and Problem-solving

- 9.4.2.CT.1: Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).
- 9.4.2.CT.2: Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3). • 9.4.2.CT.3: Use a variety of types of thinking to solve problems (e.g., inductive, deductive).

Digital Citizenship

- 9.4.2.DC.7: Describe actions peers can take to positively impact climate change (e.g., 6.3.2.CivicsPD.1).

Information and Media Literacy

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

Climate Change

K-LS1: From Molecules to Organisms: Structures and Processes

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

K-ESS2: Earth Systems

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

SEL Competencies

- **Self - Awareness**
- **Self - Management**
- **Social Awareness**
- **Responsible Decision Making**
- **Relationship Skills**

https://www.nj.gov/education/safety/wellness/selearning/index.shtml

District/School Formative Assessment Plan	District/School Summative Assessment Plan
Formative assessment informs instruction and is ongoing throughout a unit to determine how students are progressing against the standards. Teachers are encouraged to incorporate Formative Assessments into all lessons. During instruction, teachers will collect ongoing information on students' mastery of content through a variety of methods: ● Pre-Assessment ● Questioning: using Socratic method, probing questions, a hierarchical system in complexity (Bloom's Taxonomy) ● Exit tickets, rotational activities (stations), quizzes, and small group activities ● Classwork, homework, group work (formative assessment) ● Teacher's observation, class discussion, and Student Notebook	*Summative assessment is an opportunity for students to demonstrate mastery of the skills taught during a particular unit.* ● *Summative Benchmark Assessment and Evaluation* ● *Summative Performance Assessment and Evaluation* **Benchmark Assessments:** ● Assessment 1.1: Mid-Unit Assessment ● Assessment 1.2: End of Unit Assessment ● Assessment 1.3: End of Unit Performance Assessment **Standardized Assessments:** ● NJSLA **Other Summative Assessments:** Teachers are encouraged to design and their own assessments (topic/module tests and quizzes) individually and/or

	with their department or grade-level partners, as per Uniform Grading Profile.

Targeted Academic Vocabulary

Animals, fish, bird, isopod, earthworm, organism, similar, different, structure, behavior, live, living, non-living, grow, observation, comparison, food, habitat

District/School Tasks	District/School Primary and Supplementary Resources
• Common Formative Assessments • Common District Summative Assessments • See above Assessment Sections for more information	**District-Mandated Resources** • FOSS Curriculum **Assessment Resources:** • Available on FOSS - ThinkLink • For additional resources, log in to https://edconnectnj.schoolnet.com **Other Resources:** • We are Teachers.com: Social-Emotional Activities for Preschool and Kindergarten (SEL Resource) • Famous African American Climate Scientists (Amistad) • Teaching about the Holocaust/Genocide, Prejudice & Bullying Using UDL (Grades K5) (Holocaust) • Climate Change Activities for Early Elementary (Climate Change) • Generation Genius: "Living vs. Nonliving Things", "Biodiversity of Life on Earth", "Animals Need Food", "External Animal Parts"etc • Youtube.com • Brainpop.com • www.teachersdomain.org • www.sciencenetlinks.com • Thesciencespot.com • Mystery Science • Quizlet.com • Kahoot.com **Project Ideas:** • Birdwatching notebook

	• Worm composting photo timeline/book • Snail shell pattern art • Students Present Favorite Animal/Favorite Animal Show-and-Tell
Instructional Best Practices and Exemplars	
See Appendix A for Instructional Best Practices and Exemplars	
Pacing Guide	
Kindergarten Unit 3: "Animals Two by Two" Pacing Guide	

Appendix A: **Instructional Best Practices and Exemplars**

Appendix A: Instructional Best Practices and Exemplars: Unit 1

Appendix A: Instructional Best Practices and Exemplars: Unit 2

Appendix A: Instructional Best Practices and Exemplars: Unit 3

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Appendix B:
Exemplars and Explanations

Appendix B: Instructional Exemplars and Explanations: Unit 1

Appendix B: Instructional Exemplars and Explanations: Unit 2

Appendix B: Instructional Exemplars and Explanations: Unit 3

Appendix C:

<subject> Classroom Philosophy, Schedule, Structure, and Expectations

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