

Course: Science Grade K	
Unit # 1: Trees and Weather	
Grade Level(s): Kindergarten	Length of Unit: 8 weeks in Fall (investig. 1-3); Daily observing/recording of weather over time; 2 weeks during the year (for investigation 4)
<p>Unit Rationale: In the Trees and Weather module, a systematic investigation of trees over the seasons will bring students to a better understanding of trees in a community. This 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. Students will also observe day-to-day changes in weather over the year, as well as the impact weather has on living things. By monitoring local weather, students will experience the patterns and variations in weather and come to understand the importance of weather forecasts. Students will 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. They will 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.</p>	
Stage 1 - Desired Results	
<p>Enduring Understandings: <i>Students will understand that...</i></p> <ul style="list-style-type: none"> ● Trees are useful to people and wild animals. ● There are a variety of trees. ● All trees have main parts in common. ● Trees have different shapes. ● There are similarities and differences in leaves. ● Leaves differ in size and shape. ● Weather is relative to air. ● There are five basic types of weather. ● A thermometer measures temperature. ● Some trees produce food. ● The effects of climate change. 	<p>Essential Questions:</p> <ul style="list-style-type: none"> ● What can we learn about trees by observing them? ● What do trees need in order to grow? ● What can we observe about leaves? ● How do trees change throughout the year? ● What is the weather today? ● What impact will climate change have on humans when discussing water, air and other living things in the environment?
<p>Content: <i>Students will know...</i></p> <ul style="list-style-type: none"> ● Trees are living plants. ● Trees have structure: branches, leaves, trunk, and roots. ● Trees differ in size and shape. 	<p>Skills: <i>Students will be able to...</i></p> <ul style="list-style-type: none"> ● Observe trees in the schoolyard, using their five senses. ● Compare trees for similarities and differences. ● Communicate observations made about different

- Plants have basic needs: water, light, air, nutrients, and space.
- Different kinds of trees have different leaves.
- Leaves have properties: size, shape, tip, edge, texture, and color.
- Leaves can be described and compared by their properties.
- Weather is the condition in the air outdoors and can be described; weather changes
- Temperature is how hot or cold it is; thermometers measure temperature.
- Sunlight warms the Earth's surface.
- Wind is moving air; a wind sock indicates wind direction and speed
- Weather forecasts help people be prepared.
- Seasons change in a predictable annual pattern; fall, winter, spring, and summer.
- Bark, twigs, leaves, buds, flowers, fruits, and seeds are parts of trees.
- The buds on twigs grow into leaves or flowers.
- Trees change through the seasons.
- Some trees produce seeds that can grow into new trees of the same kind.
- Some trees lose their leaves in winter; others do not.
- Trees are living, growing plants.
- Climate change may have an effect on the environment.

- kinds of trees, orally and through drawings.
- Identify trees as resources that are used in everyday life.
- Help plant and care for a tree.
- Observe the sizes, shapes, textures, and colors of tree leaves.
- Compare the shapes of leaves to common geometric shapes.
- Compare the sizes and edges of leaves.
- Record and communicate the similarities and differences among leaves.
- Observe and compare weather by using senses and tools.
- Record weather observations using pictures and words.
- Build and use a wind sock.
- Observe and describe seasonal changes in trees.
- Describe weather changes from season to season.
- Communicate observations and comparisons of trees.
- Discuss climate change.

NJ Student Learning Standards - Science

Performance Expectations:

- **K-LS1-1.** Use observations to describe patterns of what plants and animals (including humans) need to survive. *Investigations 1, 2, 4*
- **K-ESS2-1.** Use and share observations of local weather conditions to describe patterns over time. *Investigations 3, 4*
- **K-ESS2-2.** Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs. *Investigations 1, 2,*
- **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. *Investigation 1, 4*
- **K-ESS3-2.** Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather. *Investigation 3*
- **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-PS3-1.** Make observations to determine the effect of sunlight on Earth's surface. *Investigation 3*
- **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 object or tool.

Connected components -**Science and Engineering Practices:**

- **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. (KPS3-1)
- **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)
- **Asking Questions and Defining Problems.** Asking questions and defining problems in grades K-2 builds on prior experiences and progresses to simple descriptive questions that can be tested. (K-ESS3-2)
- **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. (K-ESS3-1)
- **Analyzing and Interpreting Data.** Analyzing data in K-2 builds on prior experiences and progresses to collecting, recording, and sharing observations. (K-ESS2-1), (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). (K-ESS2-2)
- **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. (K-ESS3-2)

Crosscutting Concepts:

- **Patterns:** Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (K-ESS2-1)
- **Systems and System Models:** Systems in the natural and designed world have parts that work together. (K-ESS2-2)

Career Education (Career Readiness, Life Literacies, and Key Skills Practices and 9.2 Standards)

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

CLKS Practices:

1. Consider the environmental, social and economic impacts of decisions
2. Demonstrate creativity and innovation

Connected Careers:

Meteorologist, Arborist

Explanation of how 9.2 standards connect to the unit:

After students study trees and weather they will be able to come up with a list of jobs they could have related

to these topics. They will then describe skills that are associated with each job they came up with.

Explanation of how CLKs connect to the unit:

Students will use the information they collected on trees and weather to look at the environmental and social impacts of their decisions. They will discuss ways to limit their impact.

Students will use creativity and innovation to study trees and weather. They will make crafts and record findings.

Explanation of how Connected Careers connect to the unit:

In this unit students will learn about trees. They will learn the different parts of a tree and observe the transitions it goes through each season. These are the necessary skills an Arborist needs to obtain. In this unit students will learn about weather. They will act as meteorologists as they record weather patterns and learn about wind direction.

Interdisciplinary Standards

English Language Arts:

- **W.IW.K.2.** Use a combination of drawing, dictating, and writing to compose informative/explanatory texts to convey ideas.

Mathematics:

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

Explanation of how interdisciplinary standards connect to the unit:

ELA: Students will observe and record noticed changes to the class tree throughout each season. They will record weather daily for the entire year using graphs. Retain the graphs and compare to weather changes in past years to observe changes in the climate of an area.

Math: Students will observe different types of trees and discuss how they are alike and different based on their measurable attributes.

Technology Integration (9.4 Standards):

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).

8.1.2.NI.2: Describe how the Internet enables Individuals to connect with others worldwide.

Explanation of how 9.4 standards connect to the unit:

Students will be observing and studying trees and weather. From their learning they will be able to gather information about climate change and brainstorm as a class ways to solve the problem.

As they brainstorm they will figure out different approaches and resources to gather ways to prevent

climate change.
 Students will understand that the internet enables individuals to connect with others worldwide.

Stage 2- Assessment Evidence:	
Assessment:	
<ul style="list-style-type: none"> ● Teacher observation - occurs on a daily basis and provides continuous monitoring of students’ learning ● Student participation- observation of students’ actions and engagement ● Science journals - an indication of students’ interpretation of material discussed 	
Formative	<p>Lab experiments: Use science journals to check student understanding of entries.</p> <p>Focus Questions: Students summarize their learning at the end of each lab experiment.</p> <p>Science Journal Check: Students record data in their science journals that describes the results during each lab. Journals are collected and assessed.</p> <p>Science Notes: Throughout the unit, students are full in content provided in the notes to act as the student textbook. Students may use prepared <i>notebook sheets</i> or may generate <i>free-form notebook entries</i> that could both be collected and assessed for student progress.</p>
Summative	<p>I-Check Performance Assessments: These are teacher prepared formal assessments that are appropriate for the students. They are up to one period in length and are taken individually. They are given at the end of the Investigation. This a performance based assessment.</p> <p>Survey/Posttest: A full-period assessment which consists of content questions, multiple choice, fill in the blank, and open-response questions.</p>
Alternative	<p>Response Sheet: Students provide content to answer a provided question. Evidence for an answer is required.</p> <p>Tutorials/Virtual Investigations: Virtual simulations are provided for each investigation to enrich lab experiences.</p>
Benchmark	I-Check Performance Assessments
Other (optional)	

Stage 3 - Learning Plan	
<p>Learning Activities:</p> <ul style="list-style-type: none"> - Investigation 1: Observing Trees - Investigation 2: Observing Leaves - Investigation 3: Observing Weather/ Climate Change 	<p>Differentiation:</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>ELL: <i>See chart below</i></p> </div>

<p>- Investigation 4: Trees Through the Seasons</p> <p>Related Application/Connection/Extension problems (Inv 1)</p> <ul style="list-style-type: none"> ● Investigation 1, Part 1: Observing Trees ● Investigation 1, Part 2: Tree Parts ● Investigation 1, Part 3: Tree Puzzles ● Investigation 1, Part 4: Tree Silhouettes <p>Related Application/Connection/Extension problems (Inv 2)</p> <ul style="list-style-type: none"> ● Investigation 2, Part 1: Leaf Walk ● Investigation 2, Part 2: Leaf Shapes ● Investigation 2, Part 3: Matching Leaf Silhouettes ● Investigation 2, Part 4: Leaf Books <p>Related Application/Connection/Extension problems (Inv 3)</p> <ul style="list-style-type: none"> ● Investigation 3, Part 1: Weather Calendar ● Investigation 3, Part 2: Recording Temperature ● Investigation 3, Part 3: Wind Direction <p>Related Application/Connection/Extension problems (Inv 4)</p> <ul style="list-style-type: none"> ● Investigation 4, Part 1: Fall - What Comes From Trees? ● Investigation 4, Part 2: Fall - Food From Trees ● Investigation 4, Part 3: Fall - Visit Trees ● Investigation 4, Part 4: Winter - Evergreen Hunt ● Investigation 4, Part 5: Fall - Twigs ● Investigation 4, Part 6: Winter - Visit Trees ● Investigation 4, Part 7: Spring - Forcing Twigs ● Investigation 4, Part 8: Spring - Bark Hunt ● Investigation 4, Part 9: Spring - Visit Trees 	<table border="1"> <tr> <td>G&T:</td> </tr> <tr> <td>Special Ed:</td> </tr> <tr> <td>504:</td> </tr> <tr> <td>Students at Risk:</td> </tr> </table> <p>Link to Science Differentiation Chart and Accommodations Chart</p>	G&T:	Special Ed:	504:	Students at Risk:
G&T:					
Special Ed:					
504:					
Students at Risk:					

<p>Core and Supplementary Instructional Materials</p> <table border="1"> <tr> <td>Teacher Pedagogical Resources:</td> </tr> </table>	Teacher Pedagogical Resources:
Teacher Pedagogical Resources:	

- FOSS Trees and Weather teacher manual
- FOSS Trees and Weather teacher toolkit and equipment kit
- *Trees and Weather* book
- FOSS technology website www.FOSSweb.com
- Bedwell Garden

Student Materials:

- *Trees and Weather* book
- FOSS technology website www.FOSSweb.com
- Bedwell Garden

Notes:

Inclusion of Climate Change Opportunities



Students will be learning about climate change while investigating trees and weather. Students will collectively brainstorm ways in which to fix the climate change problem.

Course: Science Grade K

Unit # 2: Materials and Motion

Grade Level(s): Kindergarten

Length of Unit: 3 weeks

Unit Rationale:

In the Materials and Motion module, students are provided with integrated experiences with physical, earth science, and engineering core ideas that relate to students’ interests and are teachable and learnable. The module begins with a study of some natural resources and properties of materials. Students come to understand that humans use natural resources for everything they do and that people affect the world around them. Students use these materials to engineer structures, applying physical science core ideas of energy transfer. After building a repertoire of practices with materials, students investigate the effect of pushes and pull, and apply their intuitive notion of the concept of variables to change the strength and direction of rolling balls to achieve specific outcomes.

Stage 1 - Desired Results	
<p>Enduring Understandings:</p> <p><i>Students will understand that...</i></p> <ul style="list-style-type: none"> ● Wood is a kind of material. ● There are many uses for wood. ● Paper is a kind of material. ● There are many uses for paper. ● Fabric is a kind of material. ● There are many uses for fabric. ● Gravity is a force. ● Push and pull are forces. ● Forces cause things to move. ● The results of a collision depend on the properties of the interacting objects. 	<p>Essential Questions:</p> <ul style="list-style-type: none"> ● Where does wood come from? ● What is made of paper? ● What is made of fabric? ● How are fabrics different? ● What causes objects to move? ● What happens when objects collide?
<p>Content:</p> <p><i>Students will know...</i></p> <ul style="list-style-type: none"> ● Wood can be described in terms of its properties ● Different kinds of wood come from different kinds of trees. ● Trees are natural resources. ● Paper has many observable properties. ● People make paper from wood. ● Many objects are made from paper. ● The properties of different papers determine their uses. ● Fabric is a flexible material with a wide range of properties. ● The properties of fabrics determine their uses. ● Fabric can be made of woven threads. ● Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. ● Gravity pulls things down. ● A bigger push or pull can make things move faster. ● When objects touch or collide, they push on one another, which can change the motion. 	<p>Skills:</p> <p><i>Students will be able to...</i></p> <ul style="list-style-type: none"> ● Identify natural wood sources. ● Identify products made from wood. ● Observe and compare properties of several kinds of paper. ● Determine the usefulness of different kinds of paper for writing and drawing. ● Observe and compare properties and structures of fabric. ● Observe and describe how and where fabrics are used. ● Observe and describe how objects move. ● Use knowledge of the motion of rolling objects to solve a problem.
<p>NJ Student Learning Standards - Science</p> <p>Performance Expectations (“the Standards”):</p> <ul style="list-style-type: none"> ● 2-PS1-2. Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose. <i>Investigations 1, 2, 3, 4</i> ● 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. *Investigations 1, 2, 3, 4*

- 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. *Investigation 4*
- 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. *Investigation 4*
- 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. *Investigation 4*
- 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. *Investigation 4*
- 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. *Investigation 4*

Connected components:

Science and Engineering Practices:

Asking Questions and Defining Problems - asking questions and defining problems in grades K-2 builds on prior experiences and progresses to simple descriptive questions that can be tested.

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.

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 explanation or design solutions.

Analyzing and Interpreting Data - analyzing data in K-2 builds on prior experiences and progresses to collecting, recording, and sharing observations.

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.

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).

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.

Crosscutting Concepts:

Cause and Effect: Events have causes that generate observable patterns. (K-PS3-1),(K-PS3-2)

Career Education (Career Readiness, Life Literacies, and Key Skills Practices and 9.2 Standards)

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

CLKS Practices:

1. Demonstrate creativity and innovation
2. Utilize critical thinking to make sense of problems and persevere in solving them

Connected Careers:

Weaver, Physicists

Explanation of how 9.2 standards connect to the unit:

After students study materials and motion they will be able to come up with a list of jobs they could have related to these topics. They will then describe skills that are associated with each job they came up with.

Explanation of how CLKs connect to the unit:

Students will demonstrate creativity and innovation as they learn how to build balloon rockets. They will have the opportunity to explore their invention.

Explanation of how Connected Careers connect to the unit:

In this unit students will learn about Materials, they will learn the types of textiles Weavers make. In this unit students will learn about Motion. They will learn about all the fundamental properties Physicists need to know to conduct experiments.

Interdisciplinary Standards**English Language Arts:**

- **W.IW.K.2.** Use a combination of drawing, dictating, and writing to compose informative/explanatory texts to convey ideas.

Mathematics

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

Explanation of how interdisciplinary standards connect to the unit:

ELA: Give students drawing paper and have them draw the runway's path. Have them write or dictate descriptions of their runways. They should describe where the ball or marble will start, what happens in the middle, and how it finishes the course.

Math: Ask students to design a roller coaster for a ball or marble. Have them close their eyes and imagine how their runway would start, what the middle would look like (does it include hills, loops, or curves), and how the runway would end. Students will have to decide how long the track has to be and if the marble or ball will fit on the track.

Technology Integration (9.4 Standards):

9.4.2.Cl.2: Demonstrate originality and inventiveness in work (e.g., 1.3A.2CR1a).

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.IML.1: Identify a simple search term to find information in a search engine or digital resource.

Explanation of how 9.4 standards connect to the unit:

Students will demonstrate originality and inventiveness as they design a roller coaster. Students will be able to decide what obstacles to include in their design. They will identify possible approaches to constructing a roller coaster. They will also use many resources to execute their plan.

Students will understand that digital tools and media resources provide access to vast stores of information that can be searched.

Stage 2- Assessment Evidence:

Assessment:

- Teacher observation - occurs on a daily basis and provides continuous monitoring of students' learning
- Student participation- observation of students' actions and engagement
- Science journals - an indication of students' interpretation of material discussed

Formative	<p>Lab experiments: Use science journals to check student understanding of entries.</p> <p>Focus Questions: Students summarize their learning at the end of each lab experiment.</p> <p>Science Journal Check: Students record data in their science journals that describes the results during each lab. Journals are collected and assessed.</p> <p>Science Notes: Throughout the unit, student full in content provided in the notes to act as the student textbook. Students may use prepared <i>notebook sheets</i> or may generate <i>free-form notebook entries</i> that could both be collected and assessed for student progress.</p>
Summative	<p>I-Check Performance Assessments: These are teacher prepared formal assessments that are appropriate for the students. They are up to one period in length and are taken individually. They are given at the end of the Investigation. This a performance based assessment.</p> <p>Survey/Posttest: A full-period assessment which consists of content questions, multiple choice, fill in the blank, and open-response questions.</p>
Alternative	<p>Tutorials/Virtual Investigations: Virtual simulations are provided for each investigation to enrich lab experiences.</p> <p>Response Sheet: Students provide content to answer a provided question. Evidence for an answer is required.</p>
Benchmark	I-Check Performance Assessments
Other (optional)	

Stage 3 - Learning Plan

Learning Activities:

- **Investigation 1:** Getting To Know Wood
- **Investigation 2:** Getting To Know Paper
- **Investigation 3:** Getting To Know Fabric
- **Investigation 4:** Getting Things To Move

Related Application/Connection/Extension problems (Inv 1)

- **Investigation 1, Part 1:** Observing Wood

Related Application/Connection/Extension problems (Inv 2)

- **Investigation 2, Part 1:** Paper Hunt
- **Investigation 2, Part 2:** Using Paper

Related Application/Connection/Extension problems (Inv 3)

- **Investigation 3, Part 1:** Feely Boxes and Fabric Hunt
- **Investigation 3, Part 2:** Taking Fabric Apart

Related Application/Connection/Extension problems (Inv 4)

- **Investigation 4, Part 1:** Pushes and Pulls
- **Investigation 4, Part 2:** Colliding Objects
- **Investigation 4, Part 3:** Rolling Outdoors
- **Investigation 4, Part 4:** Balloon Rockets

Differentiation:

ELL: *See chart above*

G&T:

Special Ed:

504:

Students at Risk:

Link to [Science Differentiation Chart](#) and [Accommodations Chart](#)

Core and Supplementary Instructional Materials

Teacher Pedagogical Resources:

- FOSS Materials and Motion teacher manual
- FOSS Materials and Motion teacher toolkit and equipment kit
- *Materials and Motion* book
- FOSS technology website www.FOSSweb.com

Student Materials:

- *Materials and Motion* book
- FOSS technology website www.FOSSweb.com

Course: Science Grade K	
Unit #3 : Animals Two By Two	
Grade Level(s): Kindergarten	Length of Unit: 5 weeks in January 2 weeks in Spring
<p>Unit Rationale: In the Animals Two By Two module, students are provided with close and personal interactions with some common land and water animals. Students observe and describe the structure of fish, birds, and snails. Appropriate classroom habitats are established, and students learn to care for the animals. In the investigations, animals are studied in pairs. Students observe and care for one animal over time, and then are introduced to another animal similar to the first one but with differences in structure and behavior. Students learn what animals need to survive and the relationship between their needs and where they live. 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.</p>	
Stage 1 - Desired Results	
<p>Enduring Understandings:</p> <p><i>Students will understand that...</i></p> <ul style="list-style-type: none"> ● Fish have structures ● Fish have observable behaviors ● Similar animals have structures and behaviors that can be compared. ● Water snails and land snails have physical characteristics and behaviors that they use to adapt to their surroundings. ● Shells can be organized into pairs or groups. ● The effects of climate 	<p>Essential Questions:</p> <ul style="list-style-type: none"> ● What are the parts of a goldfish? ● What do goldfish do and what do they need to live? ● How are guppies and goldfish the same and how are they different? ● What birds visit our schoolyard? ● What are the parts of a water snail? ● How can shells be grouped? ● What do land snails do? ● What impact will climate change have on humans when discussing water, air and other living things in the environment?
<p>Content:</p> <p><i>Students will know...</i></p> <ul style="list-style-type: none"> ● Fish are animals and have basic needs - water with oxygen, food, and space with shelter. 	<p>Skills:</p> <p><i>Students will be able to...</i></p> <ul style="list-style-type: none"> ● Observe and compare the structures and behaviors of two kinds of fish and ask questions

<ul style="list-style-type: none"> ● Fish 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. ● Birds are animals that have basic needs. ● Different kinds of birds have similar but different structures and behaviors. ● All animals deserve respect and gentle care. ● Different kinds of snails have some structures and behaviors that are the same and some that are different. ● Snails are animals and have basic needs - water, air, food, and space with shelter. ● There is great diversity among snails. ● Shells differ in size, shape, pattern, and texture. ● Snails have senses. ● Climate change may have an effect on the environment. 	<p>based on observations.</p> <ul style="list-style-type: none"> ● Help provide for the needs of aquarium fish. ● Observe and record changes in an aquarium over time. ● Observe and compare the structures and behaviors of two types of common schoolyard birds. ● Observe the structures and behaviors of land snails in a terrarium. ● Observe the structures and behaviors of water snails in an aquarium. ● Describe, compare, and communicate the similarities and differences of the two kinds of snails. ● Discuss Climate Change.
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**NJ Student Learning Standards - Science
Performance Expectations (“the Standards”):**

K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive. *Investigations 1, 2*

K-ESS2-2. Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs. *Investigations 1, 2,*

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. *Investigation 1, 2*

Connected components:

Science and Engineering Practices:

Asking Questions and Defining Problems - asking questions and defining problems in grades K-2 builds on prior experiences and progresses to simple descriptive questions that can be tested.

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.

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 explanation or design solutions.

Analyzing and Interpreting Data - analyzing data in K-2 builds on prior experiences and progresses to

collecting, recording, and sharing observations.

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.

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).

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.

Crosscutting Concepts:

Patterns: Patterns in the natural and human designed world can be observed and used as evidence. (K-LS1-1)

Career Education (Career Readiness, Life Literacies, and Key Skills Practices and 9.2 Standards)

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

CLKS Practices:

1. Consider the environmental, social and economic impacts of decisions
2. Demonstrate creativity and innovation

Connected Careers:

vet, zoologist

Explanation of how 9.2 standards connect to the unit:

After students study Animals they will be able to come up with a list of jobs they could have related to these topics. They will then describe skills that are associated with each job they came up with.

Explanation of how CLKs connect to the unit:

Students will demonstrate creativity and innovation as they make large paper fish to add to a class bulletin board. Students will work together to create a board that looks like the fish environment. As students discuss the environment students will consider the environmental impacts of their decisions and how it impacts the animals around them.

Explanation of how Connected Careers connect to the unit:

In this unit students will learn about Animals. They will learn about the skills necessary to be a Vet and a Zoologist. Students will look at the life cycles and anatomy of certain living things.

Interdisciplinary Standards

English Language Arts:

- **W.RW.K.7.** With prompting and support, engage in brief but regular writing and drawing tasks. (K-PS3-1), (K-PS3-2)
- **SL.UM.K.5.** Add drawings or other visual displays to descriptions as desired to provide additional detail.

Mathematics:

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

Explanation of how interdisciplinary standards connect to the unit:

ELA- Make one snail journal for the whole class and keep it at the snail center. One student at a time will be able to add observations to the journal. For added interest, cut the front and back cover in the shape of a snail and staple half sheets of writing paper inside.

Math- Students will compare animals using measurable attributes to describe them. They will record their findings in their observation journal.

Technology Integration (9.4 Standards):

9.4.2.Cl.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.Cl.2: Demonstrate originality and inventiveness in work (e.g., 1.3A.2CR1a).

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).

Explanation of how 9.4 standards connect to the unit:

Students will demonstrate an openness to new ideas and perspectives as they collaborate on creating an observation journal. Students will listen to others observations and perspectives to formulate their own opinion. Students will demonstrate originality and inventiveness as they create their own paper fish. Students will be given numerous materials to create their own rendition of the fish they study. Students will identify a problem then develop a plan to address it to solve the problem.

Stage 2- Assessment Evidence:

Assessment:

- Teacher observation - occurs on a daily basis and provides continuous monitoring of students’ learning
- Student participation- observation of students’ actions and engagement
- Science journals - an indication of students’ interpretation of material discussed

Formative

Lab experiments: Use science journals to check student understanding of entries.
Focus Questions: Students summarize their learning at the end of each lab experiment.
Science Journal Check: Students record data in their science journals that describes the results during each lab. Journals are collected and assessed.
Science Notes: Throughout the unit, students fill in content provided in the notes to act as the student textbook. Students may use prepared *notebook sheets* or may generate *free-form notebook entries* that could both be collected and assessed for student progress.

<p>Summative</p>	<p>I-Check Performance Assessments: These are teacher prepared formal assessments that are appropriate for the students. They are up to one period in length and are taken individually. They are given at the end of the Investigation. This a performance based assessment.</p> <p>Survey/Posttest: A full-period assessment which consists of content questions, multiple choice, fill in the blank, and open-response questions.</p>
<p>Alternative</p>	<p>Tutorials/Virtual Investigations: Virtual simulations are provided for each investigation to enrich lab experiences</p> <p>Response Sheet: Students provide content to answer a provided question. Evidence for an answer is required.</p>
<p>Benchmark</p>	<p>I-Check Performance Assessments.</p>
<p>Other (optional)</p>	

<p align="center">Stage 3 - Learning Plan</p>						
<p>Learning Activities:</p> <ul style="list-style-type: none"> - Investigation 1: Goldfish and Guppies - Investigation 2: Water and Land Snails <p>Related Application/Connection/Extension problems (Inv 1)</p> <ul style="list-style-type: none"> ● Investigation 1, Part 1: The Structure of Goldfish ● Investigation 1, Part 2: Caring for Goldfish ● Investigation 1, Part 3: Goldfish Behavior ● Investigation 1, Part 4: Comparing Guppies to Goldfish ● Investigation 1, Part 5: Comparing Schoolyard Birds <p>Related Application/Connection/Extension problems (Inv 2)</p> <ul style="list-style-type: none"> ● Investigation 2, Part 1: Observing Water Snails ● Investigation 2, Part 2: Shells ● Investigation 2, Part 3: Land Snails 	<p>Differentiation:</p> <table border="1" data-bbox="812 934 1516 1281"> <tr> <td data-bbox="812 934 1516 1008"> <p>ELL: <i>See chart below</i></p> </td> </tr> <tr> <td data-bbox="812 1008 1516 1081"> <p>G&T:</p> </td> </tr> <tr> <td data-bbox="812 1081 1516 1155"> <p>Special Ed:</p> </td> </tr> <tr> <td data-bbox="812 1155 1516 1228"> <p>504:</p> </td> </tr> <tr> <td data-bbox="812 1228 1516 1281"> <p>Students at Risk:</p> </td> </tr> </table> <p>Link to Science Differentiation Chart and Accommodations Chart</p>	<p>ELL: <i>See chart below</i></p>	<p>G&T:</p>	<p>Special Ed:</p>	<p>504:</p>	<p>Students at Risk:</p>
<p>ELL: <i>See chart below</i></p>						
<p>G&T:</p>						
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<p>Core and Supplementary Instructional Materials</p> <table border="1" data-bbox="110 1892 1516 1965"> <tr> <td data-bbox="110 1892 1516 1965"> <p>Teacher Pedagogical Resources:</p> </td> </tr> </table>	<p>Teacher Pedagogical Resources:</p>
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- FOSS Animals Two By Two teacher manual
- FOSS Animals Two By Two teacher toolkit and equipment kit
- *Animals Two By Two* book
- FOSS technology website www.FOSSweb.com

Student Materials:

- *Animals Two By Two* book
- FOSS technology website www.FOSSweb.com

Notes:**Inclusion of Climate Change Opportunities**

Animals live in different habitats that provide them with everything they need. Weather can change over time. Using simple language, discuss how animals can be affected .