



Science / Kindergarten

Unit 1: Trees and Weather

Subject
Science

Grade
Kindergarten

Unit
Trees and Weather

Suggested Timeline

Grade Level Summary

The kindergarten science curriculum focuses on giving students a broad understanding of world around them and how each concept is subject to change based on the surrounding environment. The focus is on physical science, earth science, life/biological science, technology and engineering education, and crosscutting concepts. Students will experience an inquiry based learning approach using observation and scientific method that encourages collaboration, critical thinking, creativity, and communication.

Grade Level Units: Trees and Weather

Materials

Motion

Animals Two By Two

Unit Title

Trees and Weather

Unit Summary

Students will study trees by looking at the variety and structure. Students will compare and contrast leaves attributes by participating in nature walks and collecting leaves to create an informative booklet. Using instruments students will measure the air and the temperature. Students will make observations to compare and contrast the life cycle of trees and its parts each season.

Unit Essential Questions

1. What are the parts of trees?
2. What shapes are trees?
3. What do trees need to grow?
4. What can we observe about the properties of leaves?
5. How can we measure the air temperature?
6. What does a wind sock tell us about the wind?
7. How do trees change each season?

Key Understandings

1. Trees are living organisms that have basic needs to grow.
2. Trees are all made of parts (branches, roots, leaves, trunks).
3. Tree shape and features vary based on the type.
4. Leaves grow on trees and change throughout their life cycle.
5. Not all leaves are the same, the properties of a leaf depends on the tree in which it grows.
6. We use an instrument called a thermometer to measure air temperature.
7. Windsocks are used to observe moving air.
8. A tree's life cycle progresses through each season resulting in predictable seasonal changes.

Focus Standards Addressed in the Unit

These are the strands Foss states it covers.

3.1.K.C2	Describe changes animals and plants undergo throughout the seasons. (adaption)
3.1.K.C3	Describe the changes that occur as a result of climate.
3.2.K.B.3	Describe how temperature can affect the body
3.3.K.A5	Record daily weather conditions using simple charts and graphs. Identify seasonal changes in the environment. Distinguish between types of precipitation.

Important Standards Addressed in the Unit

Foss covers the standards listed above through their kits. With appropriate planning we will be mindful to incorporate the below standards into this foss unit.

4.1.K	Identify how the changes of season affect their local environment.
4.2.K.A	Identify components of the water cycle.

Misconceptions	Proper Conceptions
<ul style="list-style-type: none"> Trees are not living. Trees are not made up of parts. All trees and leaves are the same. The way the air around us feels on our skin is the only way to determine the temperature. The wind just exists and blows any which way. Trees do not change, but leaves do. 	<ul style="list-style-type: none"> Trees need sunlight, air, soil, and water because they are living things. Tree have leaves, branches, trunks, and roots. You can measure the temperature using a thermometer. Wind is moving air that can be observed with windsocks. Trees change each season in predictable annual patterns.

Concepts	Competencies	Vocabulary
<ul style="list-style-type: none"> Trees are living plants. Trees have structures: branches, leaves, trunk, and roots. Plants have basic needs: water, light, air, nutrients, and space. Leaves properties vary. Temperature is how hot or cold it is; thermometers measure temperature. Wind is moving air; a wind sock indicates wind direction and speed. Seasons change in a predictable annual pattern: fall, winter, spring, and summer 	<ul style="list-style-type: none"> Observe trees in the school year using the five sense. Compare trees for similarities and differences. Communicate observations made about different kinds of trees orally and through drawings. Help plant and care for a tree. Observe the size, shapes, textures, and colors of tree leaves. Compare the shapes of leaves to common geometric shapes. Compare the sizes and edges of leaves. 	Tree Leaves Branches Trunk Roots Living Non living Seasons Thermometer Windsock Wind Temperature Instrument Streamer Blowing Moving air Direction

	<ul style="list-style-type: none"> ● Record and communicate the similarities and differences among leaves. ● Observe and compare weather by using senses and tools. ● Observe and describe seasonal changes in trees. 	
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Assessments:

Teacher Observation
 Science Journal Entries
 Think-Pair-Share
 “Ticket out the Door”

Suggested Strategies to Support Design of Coherent Instruction

Charlotte Danielson’s Framework for Teaching: Domain 3 Instruction

Read appropriate nonfiction texts.
 Watch videos various natural resources, recycling and pollution.
 Complete classroom projects to highlight the various natural resources, pollution and recycling.
 Make anchor charts to organize information learned.
 Promote recycling in the school.

Differentiation:

Preview vocabulary
 Use various forms of media to present material

Interdisciplinary Connections:

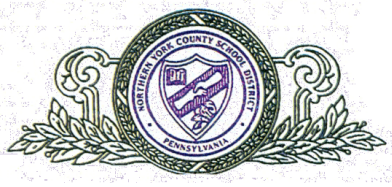
See FOSS and Common Core ELA- Kindergarten Guide
 See FOSS and Common Core Math- Kindergarten Guide

Additional Resources:

Brain Pop Jr.
 Digital-Only Resources (www.fossweb.com)
 Nonfiction text
 Informational posters

Created By:

Beth Barlup, Jessica Rohm, & Amy Albert



Science / Kindergarten

Unit 2: Materials

Subject Science	Grade Kindergarten	Unit Materials	Suggested Timeline
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Grade Level Summary

The kindergarten science curriculum focuses on giving students a broad understanding of world around them and how each concept is subject to change based on the surrounding environment. The focus is on physical science, earth science, life/biological science, technology and engineering education, and crosscutting concepts. Students will experience an inquiry based learning approach using observation and scientific method that encourages collaboration, critical thinking, creativity, and communication.

Grade Level Units

Materials and Motion
Animals Two By Two
Trees and Weather

Unit Title

Materials and Motion

Unit Summary

Students observe and explore how natural resources are made and how water affects natural resources. Students will explore how natural resources can be reused or made into new resources. Students engage in science and engineering practices by asking questions, participating in collaborative investigations, observing, recording, and interpreting data to build explanations.

Unit Essential Questions

1. What is a natural resource?
2. How are natural resources changed to make new materials?
3. How can we conserve natural resources?

Key Understandings

1. Natural resources are resources such as wood, paper, and fabric that are created from only the earth's materials.
2. Natural resources are changed to make new material useful to humans.
3. We reduce, reuse, and recycle to conserve natural resources.

Focus Standards Addressed in the Unit

These are the strands Foss states it covers.

4.3.KA	Identify some renewable resources used in the classroom.
4.5.K.D	Identify waste and practice ways to reduce, reuse, and recycle.
4.3.K.B	Recognize the importance of conserving natural resources

4.5.K.C	Identify different types of pollution (land, air, water) and their sources
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Important Standards Addressed in the Unit

Foss covers the standards listed above through their kits. With appropriate planning we will be mindful to incorporate the below standards into this foss unit.

3.3.K.A4	Identify sources of water for human consumption and use.
3.3.K.A1	Distinguish between three types of earth materials- rock, soil, and sand

Misconceptions	Proper Conceptions
<ul style="list-style-type: none"> Materials like paper, fabric, and wood just exist. Waste does not have an effect on the earth. Rocks, soil, and sand are just things found on the ground. Trees, water, and clean air are abundant and continuously regenerating on their own. 	<ul style="list-style-type: none"> Using natural resources we create materials such as paper, fabric, and wood for human uses and needs. Not disposing of waste properly pollutes the earth. Rock, soil, and sand are part of the earth. We must use the earth's natural resources wisely and take measures to help the earth renew them.

Concepts	Competencies	Vocabulary
<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. Some kinds of wood are processed and made by people. Wood floats in water but can be made to sink. Wood can be changed by sanding and mixing with water. Sawdust is tiny wood pieces that can be recycled. Basic materials can be transformed into new materials (particleboard and plywood) Paper has many observable properties. People make paper from wood. The properties of papers determine their uses. Some papers absorb water; others do not. Some paper changes when soaked in water. Some paper breaks down into small fibers. Paper can be reused, recycled, and fabricated. Fabric is a flexible material with a wide range of properties. The 	<ul style="list-style-type: none"> Identify natural resources and their importance to the earth. Participate in experiments to determine how natural resources can be changed to make new materials. . Produce ideas of how to reduce, reuse, and recycle materials. Using evidence, state an argument how pollution is harmful to the earth. 	<p>Natural resource</p> <p>Material</p> <p>Sanding</p> <p>Mixing</p> <p>Recycle</p> <p>Sawdust</p> <p>Sink</p> <p>Float</p> <p>Wood</p> <p>Absorb</p> <p>Fabric</p> <p>Plywood</p> <p>Particleboard</p> <p>Paper</p> <p>Water</p> <p>Trees</p> <p>Reduce</p> <p>Reuse</p> <p>Pollution</p> <p>Conserve</p> <p>Transmit</p> <p>Repel</p> <p>Solutions</p>

<p>properties of fabrics determine their uses.</p> <ul style="list-style-type: none"> ● Fabric can be made of woven threads. ● Fabrics can absorb, transmit, or repel water. ● Wet fabric dries when water evaporates, leaving the fabric unchanged. ● Land, air, water, and trees are natural resources. ● People reuse and recycle to conserve natural resources. ● The Sun warms Earth’s surface. ● Engineers design and test solutions to problems. 		
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Assessments:

Teacher Observation
 Science Journal Entries
 Think-Pair-Share
 “Ticket out the Door”

Suggested Strategies to Support Design of Coherent Instruction

Charlotte Danielson’s Framework for Teaching: Domain 3 Instruction

Read appropriate nonfiction texts.
 Watch videos various natural resources, recycling and pollution.
 Complete classroom projects to highlight the various natural resources, pollution and recycling.
 Make anchor charts to organize information learned.
 Promote recycling in the school.

Differentiation:

Preview vocabulary
 Use various forms of media to present material

Interdisciplinary Connections:

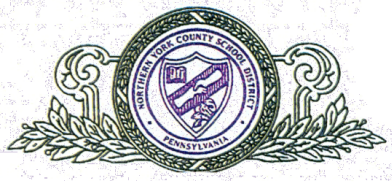
See FOSS and Common Core ELA- Kindergarten Guide
 See FOSS and Common Core Math- Kindergarten Guide

Additional Resources:

Brain Pop Jr.
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 Nonfiction text
 Informational posters

Created By:

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Science / Kindergarten
Unit 3: Motion

Subject Science	Grade Kindergarten	Unit Motion	Suggested Timeline
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Grade Level Summary
The kindergarten science curriculum focuses on giving students a broad understanding of world around them and how each concept is subject to change based on the surrounding environment. The focus is on physical science, earth science, life/biological science, technology and engineering education, and crosscutting concepts. Students will experience an inquiry based learning approach using observation and scientific method that encourages collaboration, critical thinking, creativity, and communication.

Grade Level Units:
Trees and Weather
Materials
Motion
Animals Two By Two

Unit Title
Motion

Unit Summary
Students investigate the strength of pushes and pulls needed to move objects. They use gravity to pull balls down slopes to investigate collisions. Students find ways to change the strength and direction of the pull on a rolling ball to meet design challenges. Students change the strength of the push on a balloon rocket flying on a line to explore cause and effect.

<p>Unit Essential Questions</p> <ol style="list-style-type: none"> 1. What causes objects to move? 2. What happens when objects collide? 3. Where can balls roll on the schoolyard? 4. How can we change how far a balloon rocket travels? 	<p>Key Understandings</p> <ol style="list-style-type: none"> 1. Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. 2. Gravity pulls things down. 3. A bigger push or pull makes things go faster. 4. When objects touch or collide, they push on one another and can change motion.
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Focus Standards Addressed in the Unit

3.2.1.B1	Demonstrate various types of motion. Observe and describe how pushes and pulls change the motion of objects.
3.2.3.B1	Explain how movement can be described in many ways.

Misconceptions	Proper Conceptions
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<ul style="list-style-type: none"> • Non-living objects can move on their own. • Wind is the force that moves objects. • All objects move at the same pace. 	<ul style="list-style-type: none"> • Non-living objects must be moved by a push or pull. • Gravity is a force that pushes objects down. • Objects move differently depending on their size, shape, weight, and amount of push or pull being used.
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<p>Concepts</p> <ul style="list-style-type: none"> • 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 makes things go faster. • When objects touch or collide, they push on one another and can change motion. 	<p>Competencies</p> <ul style="list-style-type: none"> • Identify the amount of push or pull needed to make an object move. • Participate in experiments to determine how the force of push or pull can change the speed or direction of an object’s motion. • Understand that weight is determined by gravity. • Using experiments explore how objects touching or colliding can change motion. 	<p>Vocabulary</p> <p>Gravity Push Pull Motion Force Collide Speed Object</p>
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Assessments:
 Teacher Observation
 Science Journal Entries
 Think-Pair-Share
 “Ticket out the Door”

Suggested Strategies to Support Design of Coherent Instruction

Charlotte Danielson’s Framework for Teaching: Domain 3 Instruction

- Read appropriate nonfiction texts.
- Watch videos various natural resources, recycling and pollution.
- Complete classroom projects to highlight the various natural resources, pollution and recycling.
- Make anchor charts to organize information learned.
- Promote recycling in the school.

Differentiation:
 Preview vocabulary
 Use various forms of media to present material

Interdisciplinary Connections:
 See FOSS and Common Core ELA- Kindergarten Guide
 See FOSS and Common Core Math- Kindergarten Guide

Additional Resources:
 Brain Pop Jr.
 Digital-Only Resources (www.fossweb.com)
 Nonfiction text

Informational posters

Created By:

Beth Barlup, Jessica Rohm, & Amy Albert



Science / Kindergarten Unit 4: Animals Two by Two

Subject
Science

Grade
Kindergarten

Unit
Animals Two By Two

Suggested Timeline

Grade Level Summary

The kindergarten science curriculum focuses on giving students a broad understanding of world around them and how each concept is subject to change based on the surrounding environment. The focus is on physical science, earth science, life/biological science, technology and engineering education, and crosscutting concepts. Students will experience an inquiry based learning approach using observation and scientific method that encourages collaboration, critical thinking, creativity, and communication.

Grade Level Units:

Trees and Weather

Materials

Motion

Animals Two By Two

Unit Title

Animals Two by Two

Unit Summary

Students observe and describe the structures of fish, birds, snails, earthworms, and isopods. Appropriate classroom habitats are established, and students learn to care for the animals. In four investigations, animals are studied in pairs. Students engage in science and engineering practices by asking questions, participating in collaborative investigations, observing, recording, and interpreting data to build explanations.

Unit Essential Questions

1. How do organisms live, grow, respond, to their environment, and reproduce?
2. How are the characteristics of one generation passed to the next?
3. How can individuals of the same species and even siblings have different characteristics?
4. How can there be so many similarities among organisms yet so many different kinds of plants, animals, and microorganisms?
5. How do earth's processes and human activities affect each other?

Key Understandings

1. Animals have identifiable structures and behaviors.
2. Animals resemble their parents.
3. Although plants and animals have similarities they meet their needs in a different ways adapting to their surrounding.
4. Living things need water, air, and resources, from the land. Organisms live in place that have the things they need.

Focus Standards Addressed in the Unit

These are the strands Foss states it covers.

3.1.4.A.2

Describe the different resources that plants and animals need to live.

3.1.3.A.2	Describe the basic needs of living things and their dependence on light, food, air, water, and shelter.
3.1.4.A.8	Construct and interpret models and diagrams of various animal and plant life cycles.
3.1.3.C.2	Describe animal characteristics that are necessary for survival.
3.1.K.A.5	Observe and describe structures and behaviors of a variety of common animals.

Important Standards Addressed in the Unit

Foss covers the standards listed above through their kits. With appropriate planning we will be mindful to incorporate the below standards into this foss unit.

3.1.K.B.1	Observe and describe how young animals resemble their parents and other animals of the same kind. (heredity)
4.2.K.B	Differentiate between terrestrial, aquatic and wetland ecosystems in PA
4.2.K.C	Identify there are living and nonliving components in an aquatic habitat

Misconceptions

- All born as babies and look like parents.
- Baby animals need adults to survive their whole life.
- Animal coverings are the same (fur, feathers and etc)
- All surrounding environments are the same.

Proper Conceptions

- Each animal has a life cycle that results in them resembling their parents.
- Animals have adaptations so that they can survive in their environment without adult.
- Animals have different coverings based on their animal group.
- Aquatic ecosystems are ponds, streams, river, oceans.
- Wetlands are wet and dry at times and consist of marshes, bogs, swamps.
- Terrestrial is an environment that is dry, such as woods, fields, deserts, mountains.

Concepts	Competencies	Vocabulary
<ul style="list-style-type: none"> • Fish are animals and have basic needs. • Fish have structures that help them live and grow. • Different kinds of fish have similar but different structures and behavior • birds are animals that have basic needs. • Different kinds of birds have similar but different structures and behaviors. • Different kinds of snails have some structures and behaviors 	<ul style="list-style-type: none"> • Use observations to describe what animals need to survive. • Use a model to explain their relationship between the needs of different plants or animals and the places they live. • Observe and describe structures of organisms and functions of the structures. • Using evidence, state an argument how plants and 	<ul style="list-style-type: none"> Argument Evidence Habitat Model Needs Relationship Environment Survive Structure Patterns Organisms Function Living Nonliving Wetland

<p>that are the same and some that are different.</p> <ul style="list-style-type: none"> ● 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 ● worms are animals and have basic needs. ● worms have identifiable structures. ● Different kinds of worms have similar structures ● and behaviors; they also have differences (size,color). ● worm behavior is influenced by conditions in the environment ● worms change plant material into soil. ● isopods are animals and have basic needs—water, air, food, and space with shelter. ● Different kinds of isopods have some structures ● and behaviors that are the same and some that are different ● There is great diversity among isopods. ● isopod behavior is influenced by conditions in the environment. 	<p>animals can change the environment to meet their needs.</p>	<p>Terrestrial Aquatic</p>
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Assessments:

Teacher Observation
 Science Journal Entries
 Think-Pair-Share
 “Ticket out the Door”

Suggested Strategies to Support Design of Coherent Instruction

Charlotte Danielson’s Framework for Teaching: Domain 3 Instruction

Read appropriate nonfiction texts.
 Watch videos various animal groups and habitats
 Complete classroom projects to highlight the various animal groups.
 Make anchor charts to organize information learned.
 Observe animals in their habitats during the ZooAmerica field trip.

Differentiation:

Preview vocabulary
 Use various forms of media to present material

Interdisciplinary Connections:

See FOSS and Common Core ELA- Kindergarten Guide

See FOSS and Common Core Math- Kindergarten Guide

Additional Resources:

Brain Pop Jr.

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Nonfiction text

Informational posters

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