Kenilworth Public Schools

Curriculum Guide

Content Area: Science
Grade: K
BOE Approved: 7/11/2016

Revision Date: March 2022
Submitted by: Stacey Miller
BOE Revision Approved: 4/11/22

Science- Kindergarten Scope and Sequence

Unit 1- Trees and Weather	Unit 2- Animals Two by Two	Unit 3- Materials and Motion
Weeks 1-8	Weeks 9-16	Weeks 17-24
Unit Description: Students observe and describe the structures of trees and plants that live and grow through the seasons. 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 Description:* 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.	*Unit Description:* 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 Learning Targets *Students will develop and understanding that …* ● 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	**Unit Learning Targets** *Students will develop and understanding that …* • 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.	**Unit Learning Targets** *Students will develop and understanding that …* • 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.

annual patterns. • Weather is the condition in the air outdoors and can be described; weather changes. • Weather is the condition in the air outdoors can be described; weather changes. • Temperature is how hot or cold it is; thermometers measure temperature. • Sunlight warms Earth's surface. • Wind is moving air; a wind sock indicates wind direction and speed. • Weather forecasts help people prepare for the severe weather that is likely in that area.	• 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. • 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. • Different kinds of snails have some structures and behaviors 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 and density.	• 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. • 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.

Science- Kindergarten Trees and Weather

Unit Title: Trees and Weather

Unit Summary: Students observe and describe the structures of trees and pants that live and grow through the seasons. 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.

Primary Interdisciplinary Connections: ELA: RI.2.1-3, RI.2.9, W.2.6-8, SL.2.2, SL.2.5 Mathematics: MP.2, MP.4-5, 2.NBT.A, 2.NBT.A.3, 2.MD.B.5, 2.MD.D.1

Career Readiness, Life Literacies, and Key Skills: 9.1.2.CR.1-2; 9.1.2. FI.1; 9.1.2.FP.13; 9.1.2.PB.1-2; 9.1.2.RM.1; 9.1.2.CAP.1-4; 9.4.2.CI.1-2; 9.4.2.CT.1-3; 9.4.2.DC.1-7; 9.4.2.GCA:1; 9.4.2.IML.1-4; 9.4.2.TL.1-7

Learning Targets

NJSLS Standards: 1-ESS1-1; 1-ESS1.A-B; 1-ESS1-2; K-2-ETS1-1; K-2-ETS1-2; K-2-ETS1-3

Computer Science and Design Thinking Standards: 8.1.2.CS.1-3; 8.1.5.NI.1-4; 8.1.2.IC.1; 8.1.2.DA.1-4; 8.1.2.AP.1-6; 8.2.2.ED.1-4; 8.2.2.ITH.1-5; 8.2.2.NT.1-2; 8.2.2.ETW.1-4; 8.2.2.EC.1;

ELA Companion Standards: RI 1: Ask and answer questions about key details. RI 2: Identify main topic and retell key details. RI 3: Describe the connection between two ideas. RI 4: Ask and answer questions about unknown words. RI 7: Describe the relationship between illustrations and the text. RI 9: Identify similarities in and differences between two texts on the same topic. RI 10: Actively engage in group reading activities with purpose and understanding. W 5: Strengthen writing. W 8 Gather information to answer a question. SL 1: Participate in collaborative conversations. SL 4: Describe with details.

Content Statements:

1	3.1.K.C.2 Describe changes animals and plants undergo throughout the seasons. (adaption)
2	3.1.K.C.3 Describe the changes that occur as a result of climate.
3	3.2.K.B.3 Describe how temperature can affect the body.
4	3.3.K.A.5 Record daily weather conditions using simple charts and graphs. Identify seasonal changes in the environment. Distinguish between types of precipitation.

Big Idea: Trees are plants that live and grow through the seasons.

Unit Essential Questions:	**Unit Enduring Understandings:**
• What do trees need to live and grow? • How does weather affect trees? • What changes do trees cause in their surroundings?	• Trees are living organisms that have basic needs to row. • Trees are all made of parts (branches, roots, leaves, trunks).

• What makes a tree a tree? • How are leaves the same and different? • What is weather, where does it happen, and how does it affect us? • How do trees change through the seasons? • How do trees change their surroundings?	• Tree shape and features vary based on the type. • Leaves grow on trees and change throughout their life cycle. • Not all leaves are the same, the properties of a leaf depend on the tree in which it grows. • We use an instrument called a thermometer to measure air temperature. • Windsocks are used to observe moving air. • A tree's life cycle progresses through each season resulting in predictable seasonal changes.

Unit Learning Targets

Students will develop an understanding that …

- 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.
- Weather is the condition in the air outdoors and can be described; weather changes.
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- Temperature is how hot or cold it is; thermometers measure temperature.
- Sunlight warms Earth's surface.
- Wind is moving air; a wind sock indicates wind direction and speed.
- Weather forecasts help people prepare for the severe weather that is likely in that area.

Evidence of Learning

Summative Assessment: Investigation Checks

Formative Assessments:

- FOSS investigations, science notebooks

Lesson Plans

Activities/Interdisciplinary Connections	*Timeframe*

• Use observations to describe patterns of what plants and animals (including humans) need to survive. • Use and share observations of local weather conditions to describe patterns over time. • Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs. • Use a model to represent the relationship between the needs of different plants or animals. • Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather. • Make observations to determine the effect of sunlight on Earth's surface. • 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. • Observe trees in the school year using the five senses. • 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. • 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.	8 weeks
Teacher Resources	*Teacher Note*
• Technology Tools -Google Classroom -Seesaw -Pear Deck -BrainPOP	

-Book Creator	

Differentiating Instruction: Students with Disabilities, English Language Learners, and Gifted & Talented Students

Examples of Strategies and Practices that Support Students with Disabilities:
• Use of visual and multisensory formats
• Use of assisted technology
• Use of prompts
• Modification of content and student products
• Testing accommodations
• Authentic assessments

Examples of Strategies and Practices that Support Gifted & Talented Students:
• Adjusting the pace of lessons
• Curriculum compacting
• Inquiry-based instruction
• Independent study
• Higher-order thinking skills
• Interest-based content
• Student-driven instruction
• Real-world problems and scenarios

Examples of Strategies and Practices that Support English Language Learners:
• Pre-teaching of vocabulary and concepts
• Visual learning, including graphic organizers
• Use of cognates to increase comprehension
• Teacher modeling
• Pairing students with beginning English language skills with students who have more advanced English language skills
• Scaffolding
•Word walls
•Sentence frames
•Think-pair-share
•Cooperative learning groups

Science- 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.

Primary Interdisciplinary Connections: ELA: RI.2.1-3, RI.2.9, W.2.6-8, SL.2.2, SL.2.5 Mathematics: MP.2, MP.4-5, 2.NBT.A, 2.NBT.A.3, 2.MD.B.5, 2.MD.D.1

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Content Statements:

1	3.1.K.C.2 Describe the different resources that plants and animals need to live.
2	3.1.K.A.4. Describe the basic needs of living things and their dependence on light, food, air, water, and shelter.
3	3.2.K.A.3 Construct and interpret models and diagrams of various animal and plant life cycles.
4	3.3.K.A.5 Observe and describe structures and behaviors of a variety of common animals.

Big Idea: The driving questions for the module are how are animal structures similar and different? What do animals need to live and grow?

Unit Essential Questions:	**Unit Enduring Understandings:**
• How do organisms live, grow, respond, to their environment, and reproduce? • How are the characteristics of one generation passed to the next?	• Animals have identifiable structures and behaviors. • Animals resemble their parents.

• How can individuals of the same species and even siblings have different characteristics? • How can there be so many similarities among organisms yet so many different kinds of plants, animals, and microorganisms? • How do earth's processes and human activities affect teach other?	• Although plants and animals have similarities they meet their needs in different ways adapting to their surroundings. • Living things need water, air, and resources, from the land. Organisms live in place that have the things they need.

Unit Learning Targets

Students will develop an understanding that…

- 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.
- 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.
- Different kinds of snails have some structures and behaviors snails are animals and have basic needs—water, air, food, and space with shelter
- There is great diversity among snails. - shells differ in size

Evidence of Learning

Summative Assessment: Investigation Checks

Formative Assessments:

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Lesson Plans

Activities/Interdisciplinary Connections	*Timeframe*
• Students first engage with the phenomenon of fish. Students observe the structures and behaviors of goldfish. They feed the fish and enrich the environment in which the fish live. They compare the structures and	8 weeks

behaviors of the goldfish to those of other fish, guppies. Students compare photos of fish and read about fish. Students then engage with the phenomenon of local birds. They go bird watching in the schoolyard and compare features and behaviors of birds. • Students observe goldfish living in a simple aquarium. They look for and name different parts of the fish, such as fins, tail, mouth, and gills. They look to see if all the fish are alike, or if there are differences such as color and size. They draw a picture and dictate a sentence to record what they see. • Students engage with the phenomenon of snails. Students observe the structures and behaviors of two kinds of water snails. Students work with a variety of seashells, discussing similarities and differences in their size, shape, color, and texture. Students match shell pairs, make designs, and create patterns. Students explore the schoolyard to find local land snails and compare their structures and behaviors to water snails. • Students observe seashells. Using their experience with living snails, they look for shells that they think might have belonged to relatives of the water snail they observed. They organize the shells into pairs or groups and give rationales for their decisions. • Students engage with the phenomenon of earthworms. Students dig for redworms, rinse them off, and look at their structures. They study their behavior. They construct worm jars and provide for the needs of the composting worms. Students observe how the worms change the plant material into soil. They compare the redworms to night crawlers, which are much larger. Students compare photos and read about worms and their activities in soil. • Students engage with the phenomenon of isopods. Students observe structures of two kinds of isopods. They learn to identify which are pill bugs and which are sow bugs. They hold isopod races. Students make a terrarium in which all the land animals live together. They compare photos and read about isopods. They read about and compare illustrations of a variety of animals and discuss the differences between living and nonliving things.	
Teacher Resources	*Teacher Note*

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•Cooperative learning groups

Science- Materials and Motion

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. 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.

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ELA Companion Standards:

Content Statements:

1	4.3 KA.D Identify some renewable resources used in the classroom.
2	4.3 KA.B Identify waste and practice ways to reduce, reuse, and recycle.
3	4.2.K.B.3 Recognize the importance of conserving natural resources
4	3.2.1.B1Demonstrate various types of motion. Observe and describe how pushes and pulls ch ange the motion of objects.
5	3.2.3.B1 Explain how movement can be described in many ways.
6	4.3.K.A.5 Identify different types of pollution (land, air, water) and their sources

Big Idea: Trees are plants that live and grow through the seasons.

Unit Essential Questions:	Unit Enduring Understandings:
• What is a natural resource? • How are natural resources changed to make new materials? • How can we conserve natural resources? • What causes objects to move? • What happens when objects collide?	• Natural resources are resources such as wood, paper, and fabric that are created from only the earth's materials. • Natural resources are changed to make new material useful to humans. • We reduce, reuse, and recycle to conserve natural resources.

• Where can balls roll on the schoolyard? • How can we change how far a balloon rocket travels?	• 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.

Unit Learning Targets

Students will develop an understanding that …

- Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature.
- Matter can be described and classified by its observable properties.
- Different properties are suited to different purposes.
- A great variety of objects can be built up from a small set of pieces.
- Pushes and pulls can have different strengths and directions.
- Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it.
- When objects touch or collide, they push on one another and can change motion.
- A bigger push or pull makes things go faster.
- 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.
- 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.
- Because there is always more than one possible solution to a problem, it is useful to compare and test designs.
- 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.
- Identify natural resources and their importance to the earth.
- Participate in experiments to determine how natural resources can be changed to make new materials.

Evidence of Learning

Summative Assessment: Investigation Checks

Formative Assessments:

- FOSS investigations, science notebook

Lesson Plans

Activities/Interdisciplinary Connections	*Timeframe*
• 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. • 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. • 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. motion. • Students work with five different wood samples to observe their properties. They begin with free exploration, go on a hunt for matching samples, drop water on the samples, and float them in basins. They test the wood to find out how many paper clips it takes to sink it, then organize their results by making a concrete graph. Students use sandpaper to change the shape of wood. They compare sawdust and shavings and how	8 weeks

they interact with water. They simulate the manufacture of two kinds of wood—particleboard and plywood. • Students observe and compare the properties of ten kinds of paper and go on a hunt for matching samples. They compare how well the papers fold and which has the best surface for writing. They test papers for absorption, then soak the samples overnight. Students learn how to recycle paper by making new paper from old and crafting papier-mâché bowls. • Students observe and compare the properties of ten kinds of fabric and search for different ways fabrics are used. They take apart fabrics to learn how they are woven from threads. Students investigate how fabrics interact with water. They consider the properties of different fabrics and decide which fabric are good choices for clothing. Students plan how they can conserve, reuse, and recycle. They observe the warming effect of the Sun and design a structure to reduce the effect of heating. • Experiments include: Observing Wood • Wood and Water • Testing a Raft • Sanding Wood • Sawdust and Shavings • Making Particleboard • Making Plywood • Paper Hunt • Using Paper • Paper and Water • Paper Recycling • Papier-Mache • Feely Boxes and Fabric Hunt • Taking Fabric Apart • Water and Fabric • Graphing Uses • Reuse and Recycle Resources • Building Structures • Pushes and Pulls • Colliding Objects • Rolling Outdoors • Balloon Rockets	
Teacher Resources	*Teacher Note*
• Technology Tools -Google Classroom -Seesaw -Pear Deck -BrainPOP -Book Creator	

Differentiating Instruction:
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