Fairfield Public Schools
Science Curriculum

Pre-Kindergarten

Course: Description

The elementary science standards are driven by questions to spark curiosity, guide instruction, deepen investigation into phenomena, acquire rigorous content knowledge and enable students to transfer the knowledge of ideas in real-world situations and to design and find solutions to problems. In the performance expectations, students are expected to demonstrate grade-appropriate proficiency in asking questions, developing and using models, planning and carrying out investigations, analyzing and interpreting data, designing solutions, engaging in argument from evidence, and obtaining, evaluating, and communicating information. Students are expected to use these practices to demonstrate understanding of the disciplinary core ideas in earth science, life science and physical science. The standards define what students should know about the most essential ideas in the major science disciplines. Cross-cutting concepts provide students with connections and intellectual tools that are related across the differing areas of disciplinary content and can enrich their application of practices and their understanding of core ideas. These standards also tie together the influence of engineering, technology, and science on society and the natural world.

Pre-Kindergarten students are expected to develop understanding in the core disciplines. Exploration is an essential process in investigating phenomena. Students will observe local weather and communicate about the effect on living things. Students will investigate the factors that cause things to start, stop and change direction. Students identify attributes of common materials and decide how they can be used. Students will identify the characteristics of plants and animals and investigate how the environment effects the growth of living things.

Course: Overview

Essential Understandings

- Weather has observable patterns and variations that affect the environment and living things.
- Living things depend on their environment to grow and change.
- Objects are made of different materials and can move or stay still when forces are applied.

Course Essential Questions

- What are patterns and variations in local weather and how do they affect the environment and living things?
- What do living things need?
- How do objects move and why?
- What are things made of, how is it used, and why?

Course: Year-at-a Glance

Unit	Title	Unit Essential Questions
1	Earth Science	• What do you notice about the weather and how is it different from yesterday? • How does the weather affect the environment and living things?
2	Physical Science	• How can the speed and direction of an object change? • How are materials the same and different? • How can materials be used?
3	Earth Science	• What is the same and different in living things as they grow and change? • What do plants and animals need to live and grow?

NGSS Standards For Kindergarten

SCIENCE AND ENGINEERING PRACTICES (SEP):

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.

- Ask questions based on observations to find more information about the designed world. (K-ESS3-2)

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)

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-ESS2-1)

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)

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)

CROSS-CUTTING CONCEPTS (CCC):

Patterns

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

Cause and Effect

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

Systems and System Models

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

Earth Science

Overview

Earth Science

Pre-Kindergarten learning experiences will focus on understanding the features of the Earth. Students will focus on the study of weather and climate in this unit. Students will observe local weather conditions in order to make observations, ask questions, collect data, identify and predict patterns, and use evidence to communicate their reasoning about local weather conditions. Students will investigate and understand the effects of weather (temperature, precipitation, wind) on the environment and on living things.

Unit Content Objectives

At the conclusion of this unit, students will be able to:

- **S.48.10** Observe, record, and note patterns regarding weather and the effects on the immediate environment
- **FES.48.11** Investigate how water interacts with other earth materials and living things
- **S.48.12** Investigate how humans use design solutions to adapt natural resources to meet basic needs
- **S.60.14** Give examples of ways in which weather variables (hot/cold temperatures, amount and intensity of precipitation, wind speed) affect us and/or cause changes to earth's features
- **FES.60.15** Identify how humans have an impact on the environment and how the environment has an impact on humans.

Unit Essential Questions

- What do you notice about the weather and how is it different from yesterday?
- How does the weather affect the environment and living things?

NGSS Unit Standards - Kindergarten

DISCIPLINARY CORE IDEAS (DCI):

PS3.B: Conservation of Energy and Energy Transfer
Sunlight warms Earth's surface. (K-PS3-1),(K-PS3-2)

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)

ESS3.B: Natural Hazards
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)

ETS1.A: Defining and Delimiting an Engineering Problem
Asking questions, making observations, and gathering information are helpful in thinking about problem (secondary to K-ESS3-2)

SCIENCE AND ENGINEERING PRACTICES (SEP):

- **Asking Questions and Defining Problems**
- **Planning and Carrying Out Investigations**
- **Analyzing and Interpreting Data**
- **Constructing Explanations and Designing Solutions**
- **Obtaining, Evaluating, and Communicating Information**

CROSS-CUTTING CONCEPTS (CCC):

- **Patterns**
- **Cause and Effect**

Physical Science

Overview

Pre-Kindergarten learning experiences will focus on an understanding of physical sciences. Students will focus on the study of energy, force and motion, and matter and its properties. Students will make observations, ask questions, collect data, and use evidence to communicate their reasoning about why objects start, stop, and change direction.

Unit Content Objectives

At the conclusion of this unit, students will be able to:

- **FPS.1** Investigate, make predictions, and conduct simple experiments to change direction, speed and distance of moving objects
- **S.60.11** Determine cause and effect of push/pull/collision that make objects, start, stop and change direction
- **S.48.9** Compare and contrast attributes of common materials related to their function (e.g., flexibility, transparency, strength)
- **S.60.12** Evaluate the appropriateness of a material for a given purpose based upon its properties
- **S.60.13** Observe how heating and cooling cause changes to properties of materials

Unit Essential Questions

- How can the speed and direction of an object change?
- How are materials the same and different?
- How can materials be used?

NGSS Unit Standards - Kindergarten

DISCIPLINARY CORE IDEAS (DCI):

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. (K-PS2-1),(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)

ETS1.A: Defining 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. (secondary to K-PS2-2)

SCIENCE AND ENGINEERING PRACTICES (SEP):

- **Planning and Carrying Out Investigations**
- **Analyzing and Interpreting Data**

CROSS-CUTTING CONCEPTS (CCC):

- **Cause and Effect**

Corresponding CT Core Standards:

Common Core State Standards Connections:
ELA/Literacy –
RI.K.1 With prompting and support, ask and answer questions about key details in a text. (K-PS2-2)
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-PS2-1)
SL.K.3 Ask and answer questions in order to seek help, get information, or clarify something that is not understood. (K-PS2-2)
Mathematics –
MP.2 Reason abstractly and quantitatively. (K-PS2-1)
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”/p“less of” the attribute, and describe the difference. (K-PS2-1)

Life Science

Overview

Pre-Kindergarten learning experiences will support children to understand patterns, process and relationships of living things. Students will ask questions, make observations and communicate the patterns they notice about the relationship between features and functions (e.g., body parts and their uses) of living things. They will identify what plants and animals depend upon in their environment to live and grow.

Unit Content Objectives

At the conclusion of this unit, students will be able to:

- FS.48.5 Identify basic features of living things (e.g., body parts and their uses).
- S.60.7 Group and classify living things based upon features, providing evidence to support groupings.
- FLS.60.8 Recognize and identify how living things grow and change through predictable stages (e.g., birth, growth, reproduction, death).
- FLS.48.7 Ask questions and investigate how animals depend upon the environment for food, water and shelter.
- S.60.9 Provide examples of how animals depend on plants and other animals for food.

Unit Essential Questions

- What is the same and different in living things as they grow and change?
- What do plants and animals need to live and grow?

NGSS Unit Standards - Kindergarten

DISCIPLINARY CORE IDEAS (DCI):

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
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),(K-ESS3-3)

ETS1.B: Developing Possible Solutions Developing and Using Models
Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. (secondary to K-ESS3-3)

SCIENCE AND ENGINEERING PRACTICES (SEP):

- **Developing and Using Models**
- **Analyzing and Interpreting Data**
- **Engaging in Argument from Evidence**
- **Obtaining, Evaluating, and Communicating Information**

CROSS-CUTTING CONCEPTS (CCC):

- **Patterns**
- **Cause and Effect**
- **Systems and System Models**