



**Department: SCIENCE**

**Course Name: KINDERGARTEN**

**Course Description :**

The performance expectations in kindergarten help students formulate answers to questions such as: “What happens if you push or pull an object harder? Where do animals live and why do they live there? What is the weather like today and how is it different from yesterday?” Students are expected to develop understanding of patterns and variations in local weather and the purpose of weather forecasting to prepare for, and respond to, severe weather. Students are able to apply an understanding of the effects of different strengths or different directions of pushes and pulls on the motion of an object to analyze a design solution. Students are also expected to develop understanding of what plants and animals (including humans) need to survive and the relationship between their needs and where they live. The crosscutting concepts of patterns; cause and effect; systems and system models; interdependence of science, engineering, and technology; and influence of engineering, technology, and science on society and the natural world are called out as organizing concepts for these disciplinary core ideas.

<b>UNIT 1 - Weather and Climate</b>	
<b>LEARNING GOALS</b>	
<p><b>Enduring Understanding(s):</b></p> <p>Weather is the description of the general air conditions at a particular point in time.</p> <p>The Sun drives most weather patterns.</p> <p>Weather can be predicted based upon our understandings of patterns.</p>	<p><b>Essential Question(s):</b></p> <p>What is the weather like today and how is it different from yesterday?</p>
<p><b>Content:</b></p> <ul style="list-style-type: none"> <li>• What is weather?</li> <li>• How do we measure weather?</li> <li>• The purpose of weather forecasting</li> <li>• Preparing and responding to severe weather</li> </ul> <p>Performance Expectations:  <i>Students will be able to:</i>                      Make observations to determine the effect of sunlight on Earth’s surface. (K-PS3-1)                      Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area. (K-PS3-2)                      Use and share observations of local weather conditions to describe patterns over time. (K-ESS2-1)                      Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.* (Engineering Design standard is embedded) (K-ESS3-2)</p>	

**Standards Addressed:**NGSS Disciplinary Core Ideas

## PS3.B: Conservation of Energy and Energy Transfer

- Sunlight warms Earth's surface.

## 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.

## 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 problems.

NGSS Scientific and Engineering Practices

Asking questions and Defining Problems

Planning and Carrying Out Investigations

Analyzing and Interpreting Data

Constructing Explanations and Designing Solutions

Obtaining, Evaluating and Communicating Information

NGSS Crosscutting Concepts

Patterns

Cause and Effect

## UNIT 2 - Pushes and Pulls

### LEARNING GOALS

#### Enduring Understanding(s):

Forces (pushes and pulls) can make objects move and change directions.

#### Essential Question(s):

What happens if you push or pull an object harder?

#### Content and Skills:

- What are pushes and pulls?
- Effects of different strengths of pushes and pulls on motion
- Effects of different directions of pushes and pulls on motion

#### Performance Expectations:

*Students will be able to:*

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. (K-PS2-1)

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.\* (Engineering Design Standards embedded) (K-PS2-2)

#### Standards Addressed:

##### NGSS Disciplinary Core Ideas

##### PS2.A: Forces and Motion

- 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.

##### PS2.B: Types of Interactions

- When objects touch or collide, they push on one another and can change motion.

##### PS3.C: Relationship Between Energy and Forces

- A bigger push or pull makes things speed up or slow down more quickly.

##### 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.

##### ETS1.C: Optimizing Design Solutions

- Because there is always more than one possible solution to a problem, it is useful to compare and test designs

##### NGSS Scientific and Engineering Practices

##### Planning and Carrying Out Investigations

##### Analyzing and Interpreting Data

##### NGSS Crosscutting Concepts

##### Patterns

##### Cause and Effect

## UNIT 3 - Plants, Animals and their Environment

### LEARNING GOALS

#### Enduring Understanding(s):

Living things (including humans) rely on their environment for survival.

#### Essential Question(s):

Where do animals live and why do they live there?

#### Content:

- Needs of living things for survival
- Living things and their habitats (the relationship between what they need and where they live)
- How living things (including humans) rely on the environment
- How living things (including humans) change the environment

#### Performance Expectations:

*Students will be able to:*

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

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

Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live. (K-ESS3-1)

Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.\* (Engineering Design standard is embedded) (K-ESS3-3)

#### Standards Addressed:

##### NGSS Disciplinary Core Ideas

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

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

##### ESS2.E: Biogeology

- Plants and animals can change their environment.

##### 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.

##### 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.

##### ETS1.B: Developing Possible Solutions

- Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people.

##### ETS1.A Defining and Delimiting Engineering Problems

- A situation that people want to change or create can be approached as a problem to be solved through engineering
- Before beginning to design a solution, it is important to clearly understand the problem

NGSS Scientific and Engineering Practices

Developing and Using Models

Analyzing and Interpreting Data

Engaging in Argument from Evidence

Obtaining, Evaluating and Communicating Information

NGSS Crosscutting Concepts

Patterns

Cause and Effect

Systems and System Models