

Kindergarten Thematic Model

Narrative and Rationale: The three bundles in this Kindergarten model were built to focus on the observation of patterns in the natural and designed world(s), an idea that applies to the physical, life, and earth and space sciences, as well as engineering.

Bundle 1 centers on a guiding question about the needs of plants and animals for food, water, and sunlight to survive. Bundle 2 centers on guiding questions about patterns in weather data. Bundle 3 centers on a guiding question about pushes and pulls on an object and their effects. Weather-related phenomena are also used as a way to connect bundles, allowing students to develop a deep understanding of the CCCs and DCIs that are introduced in Kindergarten.

Kindergarten students begin their understanding of the Crosscutting Concepts (CCCs) of patterns and the relationships between cause and effect in a logical progression over time. This model also introduces students to the Science and Engineering Practices (SEPs). It places special emphasis on asking questions, using observations and models, analyzing data, and carrying out investigations. However, additional SEPs should be used throughout instruction. The SEPs contribute to students' understanding of the CCCs and DCIs they explore in Kindergarten. Students become familiar with SEPs over the course of the year, and the level of sophistication at which they are able to engage in the SEPs increases over time.

<p>Bundle 1: What do plants and animals need to meet their needs and survive within environments? ~14 weeks</p>	<p>Bundle 2: Can changes in weather patterns be observed over the course of the year? Can weather influence the ability of plants and animals to meet their needs in their environment? ~18 weeks</p>	<p>Bundle 3: How do pushes and pulls affect the motion of an object? ~4 weeks</p>
<p>K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive. K-ESS2-1. Use and share observations of local weather conditions to describe patterns over time.¹ K-ESS2-2. Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs. K-ESS3-1. Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live. 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.* 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.¹</p>	<p>K-PS3-1. Make observations to determine the effect of sunlight on Earth's surface. K-PS3-2. Use tools and materials provided to design and build a structure that will reduce the warming effect of sunlight on Earth's surface.* K-ESS2-1. Use and share observations of local weather conditions to describe patterns over time. K-ESS3-2. Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.* 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.¹ 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.</p>	<p>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. 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.* K-ESS2-1. Use and share observations of local weather conditions to describe patterns over time. 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.¹ 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.¹</p>

^{1.} The bundle only includes part of this PE; the PE is not fully assessable in a unit of instruction leading to this bundle.

Bundle 1

Bundle 2

Bundle 3

LS1.C as found in K-LS1-1

- 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.D as found in K-ESS2-1

- 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.

ESS2.E as found in K-ESS2-2

- Plants and animals can change their environment.

ESS3.A as found in K-ESS3-1

- 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 as found in K-ESS2-2 and K-ESS3-3

- 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.A as found in K-2-ETS1-1

- A situation that people want to change or create can be approached as a problem to be solved through engineering.

ETS1.B as found in K-ESS3-3

- 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.

PS3.B as found in K-PS3-1 and K-PS3-2

- Sunlight warms Earth's surface.

ESS2.D as found in K-ESS2-1

- 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 as found in K-ESS3-2

- 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.

ETS1.A as found in K-ESS3-2 and K-2-ETS1-1

- Asking questions, making observations, and gathering information are helpful in thinking about problems.

ETS1.B as found in K-2-ETS1-2

- 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.

PS2.A as found in K-PS2-1 and K-PS2-2

- 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 as found in K-PS2-1

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

PS3.C as found in K-PS2-1

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

ESS2.D as found in K-ESS2-1

- 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.

ETS1.A as found in K-PS2-2

- 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 as found in K-2-ETS1-3

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