

### Kindergarten Topic Model

*Narrative and Rationale:* The three bundles in this Kindergarten model are characterized by the overarching ideas that weather, sunlight, and the needs of living things affect us daily—ideas that apply to the physical, life, and Earth and space sciences, as well as engineering.

Bundle 1 centers on a guiding question about pushes and pulls on objects and their effects. Bundle 2 centers on a guiding question about the needs of plants and animals for food, water, and sunlight to survive. Bundle 3 centers on a guiding question about the patterns and effects of sunlight. While this framework is arranged by topic, the study of weather occurs throughout the year, over time.

In Kindergarten students begin to build their understanding of the Crosscutting Concepts (CCCs) of patterns and the relationship 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 planning and carrying out investigations, analyzing and interpreting data, engaging in argument from evidence, and constructing explanations and designing solutions. However, additional SEPs should be used throughout instruction. The SEPs contribute to students’ understanding of both the CCCs and the Disciplinary Core Ideas (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.

<b>Bundle 1:</b> How do objects move and what happens when they interact?  <b>~4 weeks</b>	<b>Bundle 2:</b> What is the relationship between the needs of different plants and animals and the places they live?  <b>~18 weeks</b>	<b>Bundle 3:</b> What can we observe about sunlight?  <b>~14 weeks</b>
<p><b>K-PS2-1.</b> 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.</p> <p><b>K-PS2-2.</b> 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.*</p> <p><b>K-ESS2-1.</b> Use and share observations of local weather conditions to describe patterns over time.<sup>1</sup></p> <p><b>K-2-ETS1-3.</b> Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.</p>	<p><b>K-LS1-1.</b> Use observations to describe patterns of what plants and animals (including humans) need to survive.</p> <p><b>K-ESS2-1.</b> Use and share observations of local weather conditions to describe patterns over time.<sup>1</sup></p> <p><b>K-ESS2-2.</b> Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.</p> <p><b>K-ESS3-1.</b> Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live.</p> <p><b>K-ESS3-2.</b> Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to severe weather.</p> <p><b>K-ESS3-3.</b> Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.*</p> <p><b>K-2-ETS1-1.</b> 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.<sup>1</sup></p>	<p><b>K-PS3-1.</b> Make observations to determine the effect of sunlight on Earth’s surface.</p> <p><b>K-PS3-2.</b> Use tools and materials provided to design and build a structure that will reduce the warming effect of sunlight on Earth’s surface.*</p> <p><b>K-ESS2-1.</b> Use and share observations of local weather conditions to describe patterns over time.</p> <p><b>K-2-ETS1-2.</b> 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>

<sup>1.</sup> 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**

**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.

**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.

**Bundle 2**

**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 and to notice patterns over time.

**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.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.

**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-ESS3-2 and K-2-ETS1-1**

- A situation that people want to change or create can be approached as a problem to be solved through engineering.
- Asking questions, making observations, and gathering information are helpful in thinking about problems.

**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.

**Bundle 3**

**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.

**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.