

1st Grade Topic Model

Narrative and Rationale: The three bundles in this 1st grade model are characterized by the study of patterns of light, sound, and organism structure. Bundle 1 centers on the theme of seeing objects, with a study of both light and solar patterns, and students could begin year-long observations of seasonal changes. Bundle 2 builds on the ideas about light and introduces a study of sound and communication. Bundle 3 introduces basic concepts of heredity, structure, and function relationships in organisms. Throughout the year, students have opportunities to build and apply their science knowledge through engineering practices and DCIs. In addition, the crosscutting concepts of patterns and structure and function can be a focus of instruction throughout the year.

Note that the practices and crosscutting concepts described are intended as end-of-instructional unit expectations and not curricular designations—additional practices and crosscutting concepts should be used throughout instruction in each bundle.

Bundle 1: Light and Solar Patterns	Bundle 2: Light, Sound, Space and Communication	Bundle 3: Structures and Behaviors in
~8 Weeks	~12 Weeks	Organisms
		~12 Weeks
1-PS4-2. Make observations to construct an evidence-based account that objects in darkness can be seen only when illuminated. ¹ 1-PS4-3. Plan and conduct investigations to determine the effect of placing objects made with different materials in the path of a beam of light. 1-ESS1-2. Make observations at different times of year to relate the amount of daylight to the time of year. ¹	1-PS4-1. Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate. 1-PS4-2. Make observations to construct an evidence-based account that objects in darkness can be seen only when illuminated. 1-PS4-4. Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.* 1-ESS1-1. Use observations of the sun, moon, and stars to describe patterns that can be predicted. 1-ESS1-2. Make observations at different times of year to relate the amount of daylight to the time of year. 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. 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	1-LS1-1. Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.* 1-LS1-2. Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive. 1-LS3-1. Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents. 1-ESS1-2. Make observations at different times of year to relate the amount of daylight to the time of year.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.

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

NGSS Example Bundles

Bundle 1

PS4.B as found in 1-PS4-2

• Objects can be seen if light is available to illuminate them or if they give off their own light.

PS4.B as found in 1-PS4-3

 Some materials allow light to pass through them, others allow only some light through and others block all the light and create a dark shadow on any surface beyond them, where the light cannot reach. Mirrors can be used to redirect a light beam. (Boundary: The idea that light travels from place to place is developed through experiences with light sources, mirrors, and shadows, but no attempt is made to discuss the speed of light.)

ESS1.B as found in 1-ESS1-2

• Seasonal patterns of sunrise and sunset can be observed, described, and predicted.

Bundle 2

PS4.A as found in 1-PS4-1

• Sound can make matter vibrate, and vibrating matter can make sound.

PS4.B as found in 1-PS4-2

 Objects can be seen if light is available to illuminate them or if they give off their own light.

PS4.C as found in 1-PS4-4

• People also use a variety of devices to communicate (send and receive information) over long distances.

ESS1.A as found in 1-ESS1-1

• Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted.

ESS1.B as found in 1-ESS1-2

 Seasonal patterns of sunrise and sunset can be observed, described, and predicted.

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.
- Asking questions, making observations, and gathering information are helpful in thinking about problems.
- Before beginning to design a solution, it is important to clearly understand the problem.

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 3

LS1.A as found in 1-LS1-1

 All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow.

LS1.B as found in 1-LS1-2

 Adult plants and animals can have young. In many kinds of animals, parents and the offspring themselves engage in behaviors that help the offspring to survive.

LS1.D as found in 1-LS1-1

 Animals have body parts that capture and convey different kinds of information needed for growth and survival.
 Animals respond to these inputs with behaviors that help them survive. Plants also respond to some external inputs.

LS3.A as found in 1-LS3-1

 Young animals are very much, but not exactly like, their parents. Plants also are very much, but not exactly, like their parents.

LS3.B as found in 1-LS3-1

• Individuals of the same kind of plant or animal are recognizable as similar but can also vary in many ways.

ESS1.B as found in 1-ESS1-2

• Seasonal patterns of sunrise and sunset can be observed, described, and predicted.

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.