FOURTH GRADE: ANIMAL BEHAVIOR

Standards Bundle

Standards are listed within the bundle. Bundles are created with potential instructional use in mind, based upon potential for related phenomena that can be used throughout a unit.

4-LS1-1 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. (SEP: 7 ; DCI: LS1.A; CCC: Systems) [Clarification Statement: Examples of structures could include thorns, stems, roots, colored petals, heart, stomach, lung, brain, and skin.] *[Assessment Boundary: Assessment is limited to macroscopic structures within plant and animal systems.]*

4-LS1-2 Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways. (SEP: 2; DCI: LS1.D; CCC: Systems) [Clarification Statement: Emphasis is on systems of information transfer.] *[Assessment Boundary: Assessment does not include the mechanisms by which the brain stores and recalls information or the mechanisms of how sensory receptors function.]*

4-PS4-2 Develop a model to describe how light reflecting from objects and entering the eye allows objects to be seen. (SEP: 2 ; DCI: PS4.B; CCC: Cause/Effect) *[Assessment Boundary: Assessment does not include knowledge of specific colors reflected and seen, the cellular mechanisms of vision, or how the retina works.]*

Content Overview

This section provides a generic overview of the content or disciplinary core ideas as an entry point to the standards.

To support survival, growth, behavior, and reproduction both plants and animals have special features. Plants have structures like thorns, stems, and roots, while animals have structures like heart, stomach and lungs that support survival, growth, behavior and reproduction. Animals also use different senses to assist them with receiving and processing information and respond to this information in different ways. The sense of light is one sense that aids animals in processing information. When light reflects from objects and enters the eye, the objects are able to be seen.

Phenomena

Phenomena can be used at varying levels of instruction. One could be used to anchor an entire unit, while another might be more supplemental for anchoring just a unit. Please remember that phenomena should allow students to engage in the SEP and use the CCC/DCI to understand and explain the phenomenon.

- Bees collect pollen.
- Fireflies.
- Corn leaves start curling.
- Fish have gills.

- A tree can grow to be over 100 feet tall, but a vegetable plant only grows to be 2-3 feet tall.
- Bears hibernate.
- New moon.
- Bats cannot see very well, yet they can fly fast and not bump into anything.
- Touching a hot object.

Storyline

This section aims to decode not only the DCI connections, but also the SEP and CCC in a detailed account of how they possibly fit together in a progression for student learning, including both rationale and context for the bundle.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Developing and Using Models - Use a model to test interactions concerning the functioning of a natural system. - Develop a model to describe phenomena. **Engaging in Argument from Evidence** - Construct an argument with evidence, data, and/or a model.	**LS1.A: Structure and Function** - Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction. **LS1.D: Information Processing** - Different sense receptors are specialized for particular kinds of information, which may be then processed by the animal's brain. Animals are able to use their perceptions and memories to guide their actions. **PS4.B: Electromagnetic Radiation** - An object can be seen when light reflected from its surface enters the eyes.	**Systems and System Models** - A system can be described in terms of its components and their interactions. **Cause and Effect** - Cause and effect relationships are routinely identified.

Students can observe the many structures of plants and animals, how their parts interact with things around them, and make claims for how those structures play a role in the organism's ability to survive and grow. For example, a plant with thorns has a higher chance of survival because the thorns will prevent animals from eating it.

Students can extend their understanding of the structure and function of animal parts to include animal senses. A behavior structure, such as animal senses, can guide animals' actions and can help them survive. By investigating how senses like sight and touch work to collect information, students can create models that explain how that information might be transferred within an animal's body. Student models should include the process of information transfer and the parts of the system that might be impacting this process. For example, the nervous system transfers information about pain from the nerves to the brain. Plants also collect and transfer information leading to a response on what they need for growth.

Sight is a sense that can help animals collect information about things in their surrounding. Light reflects from an object and enters into the eye causing sensory details to send a message to the brain that are then interpreted as images. Students can create a model to show how information is collected, transferred, and responded to by an organism. One way students can collect data that leads them to this conclusion is examining a variety of objects in dark and light settings. When given a variety of opportunities to investigate how visible objects are in light and dark settings, students can draw conclusions that objects in the dark cannot be seen and that light is required for sight to occur.

Formative Assessment

Formative assessment is crucial because all learners benefit from timely and focused feedback from others. It promotes self-reflection, self-explanation, and social learning. It can also make learning more relevant. Each of the questions below might be used throughout the formative assessment process. Specific prompts may focus on individual practices, core ideas, or crosscutting concepts, but, together, the components need to support inferences about students' three-dimensional science learning as described in a given bundle, standard or lesson-level performance expectation.

SEP Engaging Arguments from Evidence
- How do animals use senses to help them survive?

SEP Developing and Using Models
- Develop a model that demonstrates how light is reflected to the eyes.

CCC Systems and Systems Models
- Draw a diagram showing how plants use sun and water to survive.

CCC Cause and Effect
- Why is it easier to see objects during the day than during the night?

Performance Outcomes

These are statements of how students use knowledge and are similar to the standards in how they blend DCI, SEP, and CCC, but at a smaller grain-size. These are potential outcomes for instruction as it plays out in lessons and activities in the classroom. It is important to also think of these as smaller outcomes that build toward the larger goal of mastering the standards.

- **Construct an argument** of how a specific *internal/external structure(s)* of a plant or animal *functions to support* survival, growth, behavior, and/or reproduction of that particular plant or animal.
- **Develop a model** to describe how animals receive different types of information *through their senses,* process the information in their brains, and respond to the information in different ways.
- **Create a model** to demonstrate how light *causes* humans and animals to see an object and how this *functions* to support survival.