Unit 3: Life Science: Structures and Functions of Living Things

Content Area: **Science**
Course(s):
Time Period: **Trimester 3**
Length: **10-12 weeks**
Status: **Published**

Summary

In this unit of study, students develop an understanding that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. Students will also explore how living things receive information through their senses. Students will gain an understanding that 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.
The crosscutting concepts of systems and system models are called out as organizing concepts for this disciplinary core idea. Students are expected to demonstrate grade-appropriate proficiency in engaging in argument from evidence. Students are also expected to use this practice to demonstrate understanding of the core idea.

This unit will be taught utilizing the required resource in Life Science : Environments FOSS program kit.

Revision Date July 2026

Essential Questions/ Enduring Understandings

Essential Questions:

- How are animals and plants similar and different?
- How do internal and external parts of animals help them to survive, grow, behave, ad reproduce?
- How do similar structures compare across different living things?
- How do animals receive and process different types of information from their environments in order to respond appropriately?
- In what ways does nature influence scientific design?

Enduring Understandings:

- Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction.
- 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.

Objectives

Students know that...

- Animals have internal and external structures that support their growth, reproduction, and survival.
- Plants have internal and external structures that support their growth, reproduction, and survival.
- Animals receive information through their senses.
- Animals use information received through their senses to respond to different stimuli.

Students will be skilled at...

- Asking questions and defining problems
- Developing and using models
- Planning and carrying out investigations
- Analyzing and interpreting data
- Using mathematics and computational thinking
- Constructing explanations and designing solutions
- Engaging in argument from evidence
- Obtaining, evaluating and communicating information

Learning Plan

FOSS Investigation 1: Environmental Factors

Part 1: Observing Mealworms

Students observe mealworms and describe their structures and behaviors. They ask questions to determine what they need to do to provide a proper environment for the mealworms to thrive. Each group sets up a mealworm environment and keeps it at room temperature. The class keeps additional mealworm environments at colder temperatures. At the end of this lesson, students should know that organisms have structures that allow them to survive in their environment. Students should be able to explain some of the external structures of the mealworm and how it helps it to meet its needs.

To assess, you can use student mealworm observation entries.

Part 2: Designing an Isopod Environment:

The class conducts two different investigations to find out how isopods respond to the environmental factors of water and light. Based on their findings, students design an isopod environment in a terrarium. The focus of this lesson is that the isopods are receiving information from their environment through their senses and using that information to make decisions for survival.

To assess, you can

- use student mealworm observation entries and the "Response Sheet- Investigation 1" notebook entry. (No. 5- Notebook Master)

- Investigation 1 i-Check

FOSS Investigation 2: Ecosystems

Part 2: Food Chains and Food Webs

Students work with ecosystem cards to create food chains and food webs in a woodland ecosystem that includes terrestrial and aquatic environments. Students learn that by using the Sun's energy, plants and algae are the primary source of matter and energy entering moist food chains and food webs. Students are introduced to the terms for different functional roles that organisms play in food chains. It would be good to touch on the different structures that each animal has to find food. For example, herbivores usually have flatter teeth for grinding up plants while carnivores have sharp teeth for tearing meet. Also, animals who are typically prey for larger carnivores have larger spaced eyes and ears for protection.

In this investigation, it is also important to focus on the specific structures each organism has to help it find and eat food.

Part 3: Population Stimulation

Students go to the schoolyard to stimulate a population of deer foraging for food in its home range. Students are introduced to the concept of carrying capacity, the greatest number of organisms that can be supported (carried) by an area without damaging it. Students should gain an understanding of how adn why organisms interact with their environment and what the effects of those interactions are. In addition, this lesson supports the concept of information processing, how organisms live, grow, and respond to their environment.

Part 4: Sound Off

Students go to the school yard and pretend to be animals who have poor vision or are active at night. The animals communicate with one unique sound and try to find others of their kind before being captured by a predator. After three rounds of this activity, students sit silently and listen to animals in the schoolyard.

** In this investigation you can also discuss structures that animals have to protect themselves from predators as well as how animals receive information through their senses**

To assess, you can

- use the “Response Sheet- Investigation 2” notebook entry (No. 13- Notebook Master)

- Investigation 2 iCheck

Brainpop videos that support this lesson (search “senses”)

Each of these focus on how we receive and process information through our senses. The quizzes can be used as assessments.

- Smell

- Touch

- Taste

Investigation 3: Brine Shrimp Hatching (This entire investigation is optional)

Investigation 4: Range of Tolerance

Part 1: Water or Salt Tolerance and Plants

Half of the class sets up an experiment to determine the range of water tolerance for the early growth of four different plants. The other half of the class sets up a controlled experiment to test the effect of salinity on the same four plants. Students should understandthat organisms have specific requirements for growth, development, and reproduction. There is a relationship between environmental factors and how well an organism can grow.

To assess, you can

- use the “Response Sheet- Investigation 4” notebook entry (No. 25- Notebook Master)

Supplemental activities can be found in the “Materials” section. They include the following

“Monster Plants”- students learn about the different structures of carnivorous plants. Then they use what they have learned to create their own carnivorous plant.

“Biomimicry Engineering Design Challenge”- Students learn about how nature has influenced many technologies we use today. Students will then use inspiration from nature to help create something to help someone survive in the Atacama Desert.

“Animal Adaptations” Project- Students choose a fictional environment. They learn about the climate, natural resources, etc. of that environment and design an imaginary animal with specific structures to help them

survive in that environment.

Optional Engineering Design Challenge

Assessment

Formative: teacher observation, student responses during lessons, exit tickets, science notebook questions/observation

Summative: investigation response sheets, science notebooks, quizzes, Survey/Posttest Questions

Benchmark: iChecks, Science Notebooks

Alternative: oral presentation with visual model such as a Google slideshow to demonstrate understanding of concepts, drawing models, FOSS extensions

Standards

P.1	Act as a responsible and contributing community members and employee.
	You can give back in areas that matter to you.
P.3	Consider the environmental, social and economic impacts of decisions.
P.3	Consider the environmental, social and economic impacts of decisions.
P.4	Demonstrate creativity and innovation.
P.5	Utilize critical thinking to make sense of problems and persevere in solving them.
P.8	Use technology to enhance productivity increase collaboration and communicate effectively.
P.9	Work productively in teams while using cultural/global competence.
RI.CR.4.1	Refer to details and examples as textual evidence when explaining what an informational text says explicitly and make relevant connections when drawing inferences from the text.
RI.CI.4.2	Summarize an informational text and interpret the author's purpose or main idea citing key details from the text.
RI.MF.4.6	Use evidence to show how graphics and visuals (e.g., illustrations, charts, graphs, diagrams, timelines, animations) support central ideas.
RI.AA.4.7	Analyze how an author uses facts, details and explanations to develop ideas or to support their reasoning.
4-LS1-1	Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.
SL.PE.4.1	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.
	Examples of structures could include thorns, stems, roots, colored petals, heart, stomach,

	lung, brain, and skin.
	Engaging in Argument from Evidence
SL.II.4.2	Paraphrase portions of a text read aloud or information presented in diverse media and formats (e.g., visually, quantitatively, and orally).
SL.PI.4.4	Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.
	Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction.
	A system can be described in terms of its components and their interactions.
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.
	Developing and Using Models
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.
	Systems and System Models
4-ESS3	Earth and Human Activity

Materials

Core Book List

FOSS Kit Unit 3- Environments

Discovery Education/BrainPOP

Mystery Science

Animal Structures Visual

Comparing Structures across Species

Bimimicry Engineering Design Challenge:

Bimimicry Video Part 1

Biomimicry Video Part 2

Biominucry Design Planning Sheet

Patent Template

Plant Structures: Monster Plants Project

Brain Pop

Monster Plants: Part 1

Monster Plants: Part 2

Monster Plants: Part 3

Seed Dispersal Transport Engineering Design Challenge

Integrated Accommodations and Modifications, Special Education students, English Language Learners, At-Risk students, Gifted and Talented students, Career Education, and those with 504's

Integrated Accommodations and Modifications