4th Grade Unit 2 - Organism Structure and Function

Content Area: **Science**
Course(s): **Science Grade 4**
Time Period: **MP2**
Length: **22 days**
Status: **Published**

NJSLS - Science

SCI.4-PS4-2	Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.
SCI.4-LS1-1	Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.
SCI.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.

Science and Engineering Practices

Engaging in Argument from Evidence

Construct an argument with evidence, data, and/or a model. (4-LS1-1)

Developing and Using Models

Use a model to test interactions concerning the functioning of a natural system. (4-LS1-2)

Develop a model to describe phenomena. (4-PS4-2)

Disciplinary Core Ideas

LS1.A: Structure and Function

Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction. (4-LS1-1)

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. (4-LS1-2)

PS4.B: Electromagnetic Radiation

An object can be seen when light reflected from its surface enters the eyes. (4-PS4-2)

Crosscutting Concepts

Systems and System Models

A system can be described in terms of its components and their interactions. (4-LS1-1),(4-LS1-2)

Cause and Effect

Cause and effect relationships are routinely identified. (4-PS4-2)

Rationale and Transfer Goals

In this unit of study, students are expected to develop an understanding that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. By developing a model, they describe that an object can be seen when light reflected from its surface enters the eye. The crosscutting concepts of cause and effect, systems and system models, and structure and function are called out as organizing concepts for these disciplinary core ideas. Students are expected to demonstrate grade-appropriate proficiency in developing and using models and engaging in argument from evidence. Students are expected to use these practices to demonstrate an understanding of the core ideas.

Enduring Understandings

Scientists examine cause and effect to see relationships between organisms, places, things, ideas, and events.

Scientists analyze and recognize how organisms, places, things, and ideas change over time.

Essential Questions

How do internal and external parts of plants and animals help them to survive, grow, behave, and reproduce?

How do animals receive and process different types of information from their environment in order to respond appropriately?

What happens when light from an object enters the eye?

Content - What will students know?

- A system can be described in terms of its components and their interactions.
- 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 its interactions.
- 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.
- A system can be described in terms of its components and its interactions.
- 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.
- Cause and effect relationships are routinely identified.
- An object can be seen when light reflected from its surface enters the eyes.

Skills - What will students be able to do?

- Observe plants and animals in order to gather evidence that organisms are living systems.

- Observe that a system is made up of structures and processes that interact and enable the system to function.
- Describe the internal and external structures of a plant or animal and the function of each of those structures (limited to macroscopic structures)
- Describe the interactions that occur among the structures within the plant or animal system.
- Explain the function of each structure and describe how these structures help the organism grow, survive, and/or reproduce and use evidence to support their explanations.
- Use the concept of systems to understand that every animal has internal and external structures that allow it to take in information from the environment in which it lives, process that information, and respond in ways that increase its chances to grow, reproduce, and survive.
- Understand that all animals pick up information from their environment through senses or sensory receptors.
- Observe animals, either through direct observation or using text and digital resources, and then use models such as drawings, diagrams, and pictures to describe the ways that animals receive, process, store, and respond to information from the environment in order to survive, grow, and reproduce.
- Use models to understand and describe that light reflects from objects and enters the eye, allowing objects to be seen.

Activities - How will we teach the content and skills?

- Mystery Science Human Body, Vision, & The Brain Anchor Phenomenon
- Mystery Science Human Body, Vision, & The Brain Lesson 1
- Mystery Science Human Body, Vision, & The Brain Lesson 2
- Mystery Science Human Body, Vision, & The Brain Lesson 3
- Mystery Science Human Body, Vision, & The Brain Lesson 4
- Mystery Science Animal & Plant Adaptations Anchor Phenomenon
- Mystery Science Animal & Plant Adaptations Lesson 1
- Mystery Science Animal & Plant Adaptations Lesson 2
- Mystery Science Animal & Plant Adaptations Lesson 3

Formative Assessments

- Describe a system in terms of its components and their interactions.
- Construct an argument with evidence, data, and/or a model.
- Construct an argument to support the claim that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction (Limited to macroscopic structures).
- Use a model to test interactions concerning the functioning of a natural system.
- 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.
- Identify cause and effect relationships.
- Develop a model to describe phenomena
- Develop a model to describe that light reflection from objects and entering the eye allows objects to be seen.
- Mystery Science Human Body, Vision, & The Brain Lesson 1 Assessment
- Mystery Science Human Body, Vision, & The Brain Lesson 2 Assessment
- Mystery Science Human Body, Vision, & The Brain Lesson 3 Assessment
- Mystery Science Human Body, Vision, & The Brain Lesson 4 Assessment
- Mystery Science Animal & Plant Adaptations Lesson 1 Assessment
- Mystery Science Animal & Plant Adaptations Lesson 2 Assessment
- Mystery Science Animal & Plant Adaptations Lesson 3 Assessment
- Daily Exit Tickets
- Daily Formative Assessment

Summative Assessments

- Mystery Science Human Body, Vision, & The Brain Performance Assessment
- Mystery Science Animal and Plant Adaptations Performance Assessment
- Mystery Science Human Body, Vision, & The Brain Unit Assessment
- Mystery Science Animal and Plant Adaptations Unit Assessment

- Grade 4 Unit 2 Benchmark

Spiraling for Mastery

Content or Skill for this Unit	Spiral Focus from Previous Unit	Instructional Activity
• External parts of organisms. • Needs of living things. • How animals process information. • How objects can be seen. • Opacity of various objects. • Mirrors.	• Grade 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. • Grade 1: Plants also have different parts to help them survive and grow. • Grade 1: Animals have body parts that capture and convey different kinds of information needed for growth and survival. • Grade 1: Animals respond to these inputs with behaviors that help them survive. Plants also respond to some external inputs. • Grade 1: Objects can be seen if light is available to illuminate them or if they give off their own light. • Grade 1: Some materials allow light to pass through them, others allow only some light through and others block all light and create a dark shadow on any surface beyond them, where the light cannot reach.	• 1-LS1-1 Activities • 1-LS1-2 Activities • 1-PS4-2 Activities

	• Grade 1: Mirrors can be used to redirect a light beam.	

Key Resources

Mystery Science

Animal Mouth Structures

Pinhole Cameras

Time to Think

Career Readiness, Life Literacies, & Key Skills

PFL.9.1.5.CR.1	Compare various ways to give back and relate them to your strengths, interests, and other personal factors.
WRK.9.2.5.CAP.1	Evaluate personal likes and dislikes and identify careers that might be suited to personal likes.
WRK.9.2.5.CAP.3	Identify qualifications needed to pursue traditional and non-traditional careers and occupations.
WRK.9.2.5.CAP.4	Explain the reasons why some jobs and careers require specific training, skills, and certification (e.g., life guards, child care, medicine, education) and examples of these requirements.
TECH.9.4.5.CI.1	Use appropriate communication technologies to collaborate with individuals with diverse perspectives about a local and/or global climate change issue and deliberate about possible solutions (e.g., W.4.6, 3.MD.B.3,7.1.NM.IPERS.6).
TECH.9.4.5.CI.2	Investigate a persistent local or global issue, such as climate change, and collaborate with individuals with diverse perspectives to improve upon current actions designed to address the issue (e.g., 6.3.5.CivicsPD.3, W.5.7).
TECH.9.4.5.DC.4	Model safe, legal, and ethical behavior when using online or offline technology (e.g., 8.1.5.NI.2).
TECH.9.4.5.DC.8	Propose ways local and global communities can engage digitally to participate in and promote climate action (e.g., 6.3.5.GeoHE.1).

TECH.9.4.5.TL.2	Sort and filter data in a spreadsheet to analyze findings.
TECH.9.4.5.TL.3	Format a document using a word processing application to enhance text, change page formatting, and include appropriate images graphics, or symbols.
TECH.9.4.5.IML.2	Create a visual representation to organize information about a problem or issue (e.g., 4.MD.B.4, 8.1.5.DA.3).
TECH.9.4.5.IML.3	Represent the same data in multiple visual formats in order to tell a story about the data.

Interdisciplinary Connections

NJSLS ELA

W.AW.4.1. Write opinion pieces on topics or texts, supporting a point of view with reasons and information. (4-LS1-1)

A. Introduce a topic or text clearly, state an opinion, and create an organizational structure in which related ideas are grouped to support the writer's purpose.

B. Provide reasons that are supported by facts from texts and/or other sources.

C. Link opinion and reasons using words and phrases (e.g., for instance, in order to, in addition).

D. Provide a conclusion related to the opinion presented.

SL.UM.4.5. Add audio recordings and visual displays to presentations when appropriate to enhance the development of main ideas or themes. (4-LS1-2, 4-PS4-2)

NJSLS Mathematics

MP.4 Model with mathematics. (4-PS4-2)

4.G.A.3 Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded across the line into matching parts. Identify line-symmetric figures and draw lines of symmetry. (4-LS1-1)

4.G.A.1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures. (4-PS4-2)