UNIT 3: Structures and Functions

Topics at a Glance: Students will identify internal and external structures of plants and animals and use a model to describe information transfer of an animal. Students will develop models to describe waves and reflection of light.

It is recommended for students to have a science journal that will allow them to display their thoughts and ideas, define vocabulary, and respond to discussion and writing prompts.

Unit Vocabulary

internal	external	reproduction
receptors	perceptions	processed

Stage 1 – Desired Results (Also see Disciplinary Core Ideas below)

Performance Expectations: (PE)

4-LS1-1: Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

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.

4-PS4-2 Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.

Enduring Understandings (1-3 max)	Essential Questions
Students will understand that: (connects with EQ 1)*Students who understand the concepts are able to* ● Describe a system in terms of its components and their interactions ● 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. Emphasis is on systems of information transfer. Students will understand that: (connects with EQ 2) *Students who understand the concepts are able to* ● Identify cause-and-effect relationship ● Develop a model to describe phenomena.	**Guiding Question: How do the internal and external parts of plants and animals support their survival, growth, behavior, and reproduction?** EQ 1: ● How do animals receive and process different types of information from their environment in order to respond appropriately? EQ 2: ● *What happens when light from an object enters the eye?*

○ An object can be seen when light reflected from its surface enters the eyes. ● Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen. *(Assessment does not include knowledge of specific colors reflected and seen, the cellular mechanisms of vision, or how the retina works)*	

Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Developing and Using Models - Model to test interactions concerning the functioning of a natural system. (4-LS1-2) - Develop a model to describe phenomena. (4-PS4-2)	**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	**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)

Stage 2 – Model Assessments

Summative Performance Task(s)	Guiding Question: How do the internal and external parts of plants and animals support their survival, growth, behavior, and reproduction?
- Create 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. ○ Different sense receptors are	EQ 1:How do animals receive and process

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.

- Develop a model to describe that light reflecting from objects and entering the eye allows for objects to be seen.
    - Student Performance:
        - An object can be seen when light reflected from its surface enters the eyes.
        - Components of the model
        - Relationships
        - Connections

different types of information from their environment in order to respond appropriately?
- Writing Connection: Larry states an animals fur helps it survive by protecting it from predators. Do you agree or disagree? Provide evidence to support your claim.

EQ 2: *What happens when light from an object enters the eye?*

- Writing connection: Nocturnal animals are able to see in the dark. Explain how their eyes work in order for this to occur. Utilize all vocabulary and concepts taught in this unit to explain your thinking

- Unit 3 Navigating Nonfiction- Use the skills and mini-lessons taught in this unit to read informational texts presented in this Science unit.

Stage 3 – Learning Plan / Road Map (Design to make as student centered as possible)

Suggested Resources for Planning:

Mystery Science, NewsELA, Tower Garden Lessons, NJCTL.org, thewonderofscience.org, and other relevant resources.

Learning Activities:

Learning Goal: Students will identify internal and external structures of plants and animals and use a model to describe information transfer of an animal. Students will develop models to describe waves and reflection of light.

Tower Garden lessons
1. https://www.towergarden.com/content/dam/towergarden/resources/lesson-plans/grades-2-and-up-pollination.pdf
2. https://www.towergarden.com/content/dam/towergarden/resources/lesson-plans/tower-garden-blogging-G4-5.pdf
3. https://www.towergarden.com/content/dam/towergarden/resources/lesson-plans/tower-garden-math-page-G4-5.pdf
4. https://www.towergarden.com/content/dam/towergarden/resources/lesson-plans/tower-garden-mini-poster-G4-5.pdf

Mystery Science Resources

Mystery 1: Why do your biceps bulge?

Standard:4-LS1-1

Target:
- I can identify internal and external structures of plants and animals.
- Anchor Chart 1
- Anchor Chart 2-Structures and functions

Mystery 2: What do blind people see?

Standard:4-LS1-1, 4-LS1-2, 4-PS4-2

Target:
- I can identify internal and external structures of plants and animals.
- I can use a model to describe information transfer of an animal.
- I can develop models to describe waves and reflection of light.
- Anchor Chart
- Anchor Chart 2-Structures and functions

NewsELA-

How insects breathe?

Mystery 3: How can some animals see in the dark?

Standard:4-LS1-1, 4-LS1-2, 4-PS4-2

Target:

- I can identify internal and external structures of plants and animals.
- I can use a model to describe information transfer of an animal.
- I can develop models to describe waves and reflection of light.
- [Anchor Chart](#)
- [Anchor Chart 2](#)-Structures and functions

NewsEla

[Information Transfer](#)

[Mystery 4: How does your brain control your body?](#)

 Standard:4-LS1-1, 4-LS1-2

Target:

- I can identify internal and external structures of plants and animals.
- I can use a model to describe information transfer of an animal.

NewsELA

- **[Structure](#)**

Additional Resources:

Books: Eye to Eye: How Animals The World. Steve Jenkins

Suggested Methods:

Phenomena:

● Why do some plants have thorns and others do not?

● Why are some animals colorful and others camouflaged?

● What happens when light from an object enters the eye?

Links to Additional Phenomena:

- [4-LS1-1 Polar Bears are Actually Black](#)
- [4-LS1-2, 4-PS4-2 Mysterious Glowing Ball](#)
- [4-LS1-1 Why Do Sunflowers Follow the Sun?](#)
- [4-LS1-2, 4-LS4-2 What Does a Soccer Player See?](#)

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