

Unit 1: Plant and Animal Structures

Content Area: **Science**
Course(s): **Science - Grade 4**
Time Period: **8 weeks**
Length: **Weeks**
Status: **Published**

Unit Overview

Students watch a series of videos and ask questions about plant structures. They analyze a diagram and a video about photosynthesis. They conduct a celery investigation to learn about the vascular system. Students explore the various structures plants use for protection. They use what they learn to design and present a method of protecting a hypothetical plant. Students dissect a flower and draw its reproductive parts. They explain how the components of a flower's reproductive system interact. They form an argument about the structures plants use for reproduction. Students use their bodies to model how a plant might respond to its environment. The model will provide evidence that plants use various structures to respond to the environment around them.

Pairs watch several silent videos depicting how animals carry out digestion and circulation. They write and record a narration for each video and share it with the class. Students observe and ask questions about pill bugs. They look for evidence that pill bugs have structures and systems they use for support, protection, and movement. Students fly around the world to different ecosystems in a hot air balloon. They descend to the ground and observe the reproductive structures of various animals. Students build a pinhole camera. They use this camera as a model for understanding how an eye sees images. Students use their senses to find Snowball, a lost pet rabbit. Students use a model of how animals respond to their environment to describe how a rabbit would react to different sensory information. Then they look at their evidence and construct an argument about where to find Snowball.

Transfer

Students will be able to independently use their learning to...

- A system can be described in terms of its components and their interactions.
 - Construct an argument with evidence, data, and/or a model.
 - Identify limitations of models.
 - Develop and/or use models to describe and/or predict phenomena.
 - Communicate scientific and/or technical information orally and/or in written formats, including various forms of media as well as tables, diagrams, and charts.
 - Cause and effect relationships are routinely identified.
 - Use a model to test interactions concerning the functioning of a natural system.
 - Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered
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Meaning

Understandings

Students will understand that...

- Plant structures are used for support and growth.
- Plant structures are used for protection.
- Plant structures are used for reproduction.
- Plants respond to their environment.
- Animal structures are used for support, movement and protection.
- Animal structures are used for reproduction.
- Animal structures are used for sensing the environment.
- Animals respond to their environment.

Essential Questions

Students will keep considering...

- What plant structures are used for support and growth?
- What plant structures are used for protection?
- What plant structures are used for reproduction?
- How do plants respond to their environment?
- What animal structures are used for digestion and circulation?
- What animal structures are used for support, movement and protection?
- What animal structures are used for reproduction?
- What animal structures are used for sensing the environment?
- How do animals respond to their environment?

Application of Knowledge and Skill

Students will know...

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- Plant structures are used for support and growth.
- Plant structures are used for protection.
- Plant structures are used for reproduction.
- Plants respond to their environment.
- Animal structures are used for support, movement and protection.
- Animal structures are used for reproduction.
- Animal structures are used for sensing the environment.
- Animals respond to their environment.

Students will be skilled at...

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Academic Vocabulary

chlorophyll

leaf

photosynthesis

root

stem

vascular system

bark

spine

thorn

cone

fertilization

ovary

pistel

pollen

reproduction

seed

spore

stamen

gravity

response

stimulus

arteries

blood

circulation

digestion

heart

large intestine

lungs

small intestine

stomach

veins

bone

exoskeleton

feather

fin

joint

muscle

scale

skeleton

egg

sperm

antenna

ear

eardrum

eye

sense receptor

taste bud

behavior

brain

instinct

memory

nerve

reflex

spinal cord

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

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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.

Target 1 - Lessons 1, 2, 3

Discuss the internal and external structures of plants that serve various functions in growth, survival, behavior, and reproduction.

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Target 2 - Lesson 4

Describe the various ways plants respond to their environment.

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Target 3 - Lessons 5, 6, 7

Discuss the internal and external structures of animals that serve various functions in growth, survival, behavior, and reproduction.

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Learning Goal 2 - Lesson 8

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

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SCI.4-PS4-2

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Target 1 - Lesson 8

Explain how sight is related to light.

- Explain how sight is related to light.

Target 2 - Lesson 8

Discuss the different ways animals use light to see.

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Learning Goal 3 - Lessons 8 & 9

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.

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SCI.4-LS1-2

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Target 1 - Lesson 8

Different sense receptors are specialized for particular kinds of information, which may be then processed by the animal's brain

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Target 2 - Lesson 9

Animals are able to use their perceptions and memories to guide their actions.

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Learning Goal 4 - Engineering and Design Standard

Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

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SCI.3-5-ETS1-2

Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

Target 1

Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints.

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Formative Assessment and Performance Opportunities

Interactive notebook

Lesson Games

Quizzes

Written assessments (can be modified)

Summative Assessment

- Class participation
- Vocabulary cards
- Interactive Tutorial
- Cooperative groups
- Centers
- Investigations

Accommodations/Modifications

Differentiation

- Give Sentence Starters
- Provide video scripts
- Support Note Taking
- Have students identify difficult vocabulary
- Reduce the number of placards
- Assist student brainstorming
- Support the processing assignment
- Provide options for claim and evidence
- Support the experiential nature of the investigation
- Help students focus on the science connection
- Give example answers

- Designate partners
- Modify the narration requirements
- Model the procedures
- Reduce note taking requirements
- Support the process of making connections and drawing conclusions
- Strengthen the connection between the model and the eye
- Build cameras before class
- Modify the processing assignment
- Utilize student muscle memory
- Scaffold note taking
- Complete the investigation as a class

Enrichment

Make predictions about plant growth

- Learning from plant structure
- Create a 3D model of a flower
- Researching evergreens
- Systems work together
- Create an Act-It-Out card
- Design a peacock's tail
- Describing the sense of touch
- Senses story

Unit Resources

TCI website

TCI material kits

21st Century Life and Careers

CAEP.9.2.4.A.1	Identify reasons why people work, different types of work, and how work can help a person achieve personal and professional goals.
CAEP.9.2.4.A.2	Identify various life roles and civic and work - related activities in the school, home, and community.
CAEP.9.2.4.A.3	Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.
CAEP.9.2.4.A.4	Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.

Interdisciplinary Connections

MA.K-12.4	Model with mathematics.
LA.RI.4.1	Refer to details and examples in a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text.
LA.RI.4.9	Integrate and reflect on (e.g., practical knowledge, historical/cultural context, and background knowledge) information from two texts on the same topic in order to write or speak about the subject knowledgeably.
LA.W.4.1	Write opinion pieces on topics or texts, supporting a point of view with reasons and information.
LA.W.4.7	Conduct short research projects that build knowledge through investigation of different aspects of a topic.
LA.W.4.9	Draw evidence from literary or informational texts to support analysis, reflection, and research.
MA.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.
MA.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 along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.
LA.SL.4.5	Add audio recordings and visual displays to presentations when appropriate to enhance the development of main ideas or themes.