

Unit 2 Overview

SAMPLE Unit of Study: Science Grade 4

Structure, Function, and Information Processing

Overview

Unit Description

In this unit, 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. Students construct arguments that plants and animals have structures that function to support survival, growth, behavior, and reproduction. In addition, students develop and use a model to explain that animals receive different types of information through their senses. Students are expected to describe how animals process and respond to information in different ways.

In this unit, the fourth grade performance expectations include LS1, PS4, and ETS1 Disciplinary Core Ideas from the National Research Council's [A Framework for K–12 Science Education](#). This unit includes the integration of the three dimensions: Science and Engineering Practices, Disciplinary Core Ideas, and Cross Cutting Concepts. Students ask questions; develop and use models; plan and carry out investigations; analyze and interpret data; construct and design solutions; engage in arguments from evidence; and obtain, evaluate, and communicate information. Throughout this unit, students are expected to use these practices to demonstrate understanding of the disciplinary core ideas. Additional information about the [Next Generation Science Standards \(NGSS\)](#) is available to teachers, parents, and school administrators.

Big Ideas

- Plants and animals have internal and external structures that support survival, growth, behavior, and reproduction.
- Structures that support the survival, growth, behavior, and reproduction of plants and animals include thorns, stems, roots, colored petals, heart, stomach, lungs, brain, and skin.
- The brain has several roles, such as receiving information from the senses, processing information, and controlling muscles to enable movement.
- Information travels through paths.
- The eye is an important structure for animals.
- Plants and animals adapt to their environments.
- Some plants and animals have unique structures or behaviors that supports their survival, growth, and reproduction.

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Essential Questions

- How do internal structures support the survival, growth, behavior, and reproduction of plants and animals?
- How do the external structures support the survival, growth, behavior, and reproduction of plants and animals?
- Which structures help a plant to grow, reproduce, or survive?
- Are there any structures that have more than one function?
- What happens if one structure doesn't work?
- How does the function of the internal plant structure relate to the function of the external structure?
- How does the brain process information?
- How does the eye work?
- What can you conclude about the external and internal structures of all animals?
- What are the important roles of the brain?
- What do plants and animals have in common?
- How is the survival of animals and plants similar and different?
- How do animals process the world around them?

Key Standards

The following focus standards are intended to guide teachers to be purposeful and strategic in both what to include and what to exclude when teaching this unit. Although each unit emphasizes certain standards, students are exposed to a number of key ideas in each unit. As with every rich classroom-learning experience, these standards are revisited throughout the course to ensure that students master the concepts with an ever-increasing level of rigor.

Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.	4-LS1-1
Use 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.	4-LS1-2
Develop a model to describe that light reflecting from objects and entering the eyes allow objects to be seen.	4-PS4-2
Write opinion pieces on topics or texts, supporting a point of view with reasons and information. (4-LS1-1)	W.4.1
Model with mathematics. (4-PS4-2)	MP.4

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<p>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)</p>	<p>4.G.A.3</p>
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Recommended Structures

The unit outline included in this document provides a framework for weekly instruction, practice, and assessment. Each week of instruction includes digital lessons that students will complete independently, as well as opportunities for whole-group and small-group teacher-led instruction.

The unit outline will use the following icons.

Preparation for Weekly Instruction



Learning Goals



Edgenuity Digital Lessons

Modifications for Special Populations



Supporting English Learners



Work for Early Finishers

Additional Instructional Support



Developing Writing Skills



Common Misconceptions
& Reteaching Strategies



Social-Emotional
Learning Connections



Supporting Foundational
Science Skills

Week 1 – *Organisms and Plants Adapt*

Unit 2: Structure, Function, and Information Processing



Learning Goals

This week, students will:

- Identify structural adaptations that allow plants and animals to survive in an environment.
- Identify behavioral adaptations that allow plants and animals to survive in an environment.



Edgenuity Digital Lessons

Organisms and Animals Adapt:

- 34035 (Digital Lesson)
- 34038 (Digital Lesson)
- 3584 (Supported Practice)
- 3585 (Independent Practice)
- Organisms and Animals Adapt (Lesson Quiz)

Vocabulary

adaptation, behavior, growth, reproduction, survival, plant structures (thorns, stems, roots, petals), animal structures (heart, stomach, brain, skin), internal, external

Week at a Glance

Day 1

Introduce the unit by asking students if they have ever wondered how animals stay warm in icy water or why birds fly in a V formation.

Have students think and write questions similar to these on the class “Wall of Wonder.” Post chart paper around the classroom and provide markers for students to write their questions. Encourage students to jot down any questions they have about this unit. Then, allow students to circulate around the classroom to read questions from their classmates. Have students put a star or checkmark next to any new questions they have after reading other ones. Then, read aloud some of the intriguing inquiries students wrote on the Wall of Wonder.



	<p>Set up the purpose of unit. Tell students they’re going to learn about internal and external structures in plants and animals that function to support survival, growth, behavior, and reproduction. They will learn about different structural and behavioral adaptations of plants and animals.</p> <p>Close the lesson by playing the video about adaptations to excite and engage students about the unit. Make sure to turn on closed captioning when playing this video (or any video with this option) to make content accessible to all students.</p> <p> Developing Writing Skills</p> <p>End the lesson by asking students to write their questions from the prior activity in their personal science notebooks on a page titled “Wall of Wonder.” Then, tell students to select one question from the list. Have students write what they think the answer might be to that question, whether it’s correct or not. Remind students that asking simple questions and constructing explanations is a practice many scientists and engineers follow.</p>				
<p>Day 2</p>	<p>Whole Group Instruction: Use the digital lesson (34035), “Adaptations.”</p> <p>Before starting the digital lesson, display the five questions at the beginning to help students activate background knowledge of adaptations or gauge their understanding of this concept. Have students turn and discuss the five questions with a classmate.</p> <p>Begin the digital lesson. First, click behavioral adaptations, and then click structural adaptations. Use teacher discretion to stop the lesson as needed and check for student understanding, answer questions, or restate information from the lesson.</p>				

Use the questions below to review what has been covered in the digital lesson. Record the information on an anchor chart while students copy information into their personal science notebooks. Use the arrows to go back to find answers as needed.

- *What does adaptation mean?*
- *What does behavioral adaptation mean?*
- *What is migration?*
- *Why do animals migrate?*
- *Which animal migrates in the lesson? What happens to this animal during the four seasons?*
- *What is a structural adaptation?*
- *How does the neck of a giraffe help it to survive?*
- *Why are the eyes of an owl special?*
- *Why do some birds hunt in the day?*
- *What is camouflage?*
- *In what ways does camouflage help animals survive in their environments?*
- *How do bears prepare for hibernation?*

At the end of the lesson, students will be presented with a game of 12 questions about behavioral and structural adaptations. Provide an index card for each student. Have students write “Behavioral” on one side of the index card and “Structural” on the other side. Read the first four questions aloud and have students answer using the index card. Ask them to determine the type of adaptation by holding up the correct side of the index card. Scan student responses, and then provide corrective feedback as needed. Complete the rest of the game questions by having students turn and discuss the answers with a classmate.



Developing Writing Skills

End the lesson by asking students to write a summary of what they learned from the lesson in their personal science notebooks.

	Encourage students to think about behavioral and structural adaptations and animals studied in the lesson, and draw examples in their personal science notebooks.				
Day 3	<p>Start the lesson by selecting a few students to share their findings in their science notebooks from the day before with the class.</p> <p>Have students circulate through the science stations (centers). There will be several stations for students to complete either with a partner or independently.</p> <p>One station is for partner reading. Students will take turns reading information in the Supported Practice activity (3584). After taking turns reading, the pairs will complete the mini activities to check their understanding. It is important to pair students who complement each other, as well as reading abilities. Then, students will discuss the following questions: <i>Can you think of plants or animals that taste bad or smell bad? Why is a bad smell a good thing for some plants and animals?</i> Students will write their responses and turn them in to the teacher.</p> <p>Another station will be set up for students to work on the Independent Practice activity (3585). Students will read the slides and complete the mini activities on their own. In their personal science notebooks, students will write the definitions for <i>adaptation</i> and <i>migrate</i> based on what they learned from the activity, as well as a response to the following questions: <i>Can you think of other animals that change colors? How can this behavior be useful?</i></p> <p>An additional station will set up for students to independently go through the second digital lesson (34038). Students will complete all the mini activities in the lesson on their own.</p> <p>Another station will be set up for students to engineer different types of beaks birds use to eat food. Provide straws, small paper cups, scissors, and different-sized pasta noodles. Students will use the materials to design beaks that can be used to pick up the different-sized noodles. The noodles represent different seeds, insects, or prey that birds might eat. The straws and paper cups can be engineered into different beaks by cutting, bending,</p>	✖			

	<p>or folding them. Have students experiment with using their models to pick up the noodles and find solutions to their beak designs that will allow their beaks to pick up other types of noodles.</p> <p>Teacher decision-making: Some students may need to get additional support before beginning the second digital lesson (34038). If so, have students independently view the digital lesson (34035) again.</p> <p>Use a portion of this day to check for student understanding and identify any misconceptions or stumbling blocks. This might include clarifying vocabulary, providing additional examples, restating information, or summarizing big ideas.</p> <p>Refer to the Work for Early Finishers section for those who have completed the required work.</p> <p> Developing Writing Skills</p> <p>End the lesson by presenting two options students can write about in their personal science notebooks.</p> <p>Option 1: Generate a list of plants and animals that can be found where you live. Explain how these plants and animals survive. Use model drawings in your personal science notebook.</p> <p>Option 2: Describe the problems you faced when engineering bird beaks with the straws and paper cups. Include your solutions to some of these problems. Draw models in your personal science notebooks.</p> <p>If time permits, select a few students to share their responses with the class.</p>				
<p>Day 4</p>	<p>Review what students did and learned in the first three days. Encourage students to look back at their personal science notebooks to help them participate in the short discussion.</p>				

<p>Have all students independently complete the Lesson Quiz: Organisms and Animals Adapt. Monitor students who are struggling and provide individual attention as needed. Review completed lesson quizzes to make instructional adjustments.</p> <p>Have students begin the inquiry-based labs. Present the inquiry questions and allow students to form small groups based the inquiry they share. Make sure to briefly review science rules, procedures, and expectations before students begin working on any labs, activities, or projects in this unit.</p> <p>Inquiry 1: How do animals in the Arctic stay warm in icy water?</p> <p>Have students generate a list of animals in the Arctic that live in icy water or need to go in and out of icy water. Have students read a short description about blubber. Provide the following materials: a bowl of icy water, safe latex gloves, plastic wrap, a stopwatch (optional), and a large container of vegetable shortening. Tell students to design a model of the thick layer of fat that keeps animals warm and traps heat. Have students experiment with different thicknesses of fat, and how fat affects how long they are able to keep their hands in the icy water. Have students discuss and record their findings.</p> <p>Inquiry 2: How do penguins stay dry?</p> <p>Have students list possible reasons that penguins are able to stay dry. Think about why it is important that penguins stay dry. Provide crayons, a spray bottled filled with water, and black and white paper copies of penguins. Tell students to think about a solution to keep the penguin on the paper from absorbing too much water. Ask students to test different solutions using the crayons and spray bottle. Teacher note: Students should color the penguins heavily with crayons to notice that the wax acts like a covering that prevents water from absorbing. Avoid telling the students this; allow them to discover this structural adaptation on their own. Afterward, discuss how the wax on the penguins’ feathers repels water and helps keep the penguins dry.</p>				
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	 <p>Developing Writing Skills</p> <p>End the lesson by asking students to write a summary of what they learned from the inquiry lab they chose to do in their personal science notebooks. Encourage students to draw models as well. If time permits, have students turn and discuss what they learned with a classmate. Then, tell students to add any additional questions or findings in their personal science notebooks.</p>				
<p>Day 5</p>	<p>Use the data from the lesson quiz: Organisms and Animals Adapt to identify students who did not pass the quiz. These students will be Group A. Students who passed the quiz will be Group B.</p> <p>During the first part of the class period, pull Group A together for reteaching while Group B students work on the activity listed below. For the remaining time, work with students individually or in small groups as needed.</p> <p> Common Misconceptions & Reteaching Strategies</p> <p>Students might have difficulty recalling terms related to structural and behavioral adaptations (e.g., migration, hibernation, camouflage, mimicry, etc.). Provide visuals and hands-on matching or sorting activities to help reinforce academic vocabulary and definitions.</p> <p>Group A: Pull together these students for reteaching. As a group, go over the lesson quiz together, explaining the correct answers. Check for student understanding of the concepts.</p> <p>Group B: Have students begin working independently on the next digital lesson (40798), “Vertebrates and Invertebrates.” Also, refer to the Work for Early Finishers section for those who have completed the required work.</p> <p> Developing Writing Skills</p> <p>End the lesson with a writing activity. Ask students to answer the following question: <i>How do plant and animal structures support the survival, growth, behavior, and reproduction?</i></p>				

If time permits, select a few students to share their responses with the class.

Modifications for Special Populations



Supporting English Learners

Low Proficiency

Provide sentence stems for students to use when arguing, explaining, or communicating science ideas or findings. For example, “I found that . . .” or “I agree/disagree because . . .” or “My findings show that . . .” Post science sentence stems in the classroom where students can access them during class or when working with others.

Teacher Note: Opportunities to speak in science by providing sentence stems help to develop communication and language skills of English Language Learners. The development of speaking skills will support students across content areas.

High Proficiency

Have students look up information about animal structural and behavioral adaptations in their home language, or keep a bilingual vocabulary journal of new words learned. Students can refer to their bilingual vocabulary journal as needed.

Teacher Note: Many students continue to think in their first languages for years after they begin to learn their second language. Support students in building on their first language skills to gain a deeper understanding of science by encouraging students to look up information in their home language or keep a bilingual science vocabulary journal.



Work for Early Finishers

Literature: Have students read suggested literature related to the lesson.

- [Rain Forest Animal Adaptations by Julie Murphy](#)
- [Ocean Animal Adaptations by Julie Murphy](#)
- [Desert Animal Adaptations by Julie Murphy](#)
- [Polar Animal Adaptations by Julie Murphy](#)

Math: Research butterfly structures [online](#) and identify lines of symmetry on the bodies of butterflies.

Writing: Write a poem from an animal’s point of view about what it is like having special structural or behavioral adaptations. Include an illustration.

Engineering: Construct a simple bird feeder to observe birds up close to learn how birds use their beaks to eat, as well as the different sizes of beaks.

Present activities that develop understanding of basic structural (physical) adaptations.



**Supporting Foundational
Science Skills**

Picture Sort Activity: Provide a variety of pictures of animals. Have students sort the pictures based on their structural adaptations (e.g., beaks, webbed feet, fur color, teeth, and claws). Then, ask students to explain how and why it helps the animal survive in its environment. Some students may begin to recognize that animals may have more than one adaptation that helps them to survive. Allow students to sort the animals in different ways. For instance, a student might move a picture of a duck from “Beaks” to “Webbed Feet.” Have students explain how the duck relies on both structural adaptations. Continue the activity until all the pictures of animals have been sorted and discussed.



**Social-Emotional
Learning Connections**

Coping Strategies: Coping strategies are any activities that can help students calm their emotions and stress. When experiencing difficult emotions, students may not have an appropriate coping strategy to deal with these feelings, especially in school. Have a class discussion about ways to cope. Then, generate a list of coping strategies with the class. Have students create a personalized poster of coping strategies that they can use to help deal with their emotions and stress. Encourage students to refer to their personalized coping strategies poster when needed. Some coping strategies include deep breathing, taking a walk, using positive self-talk, practicing yoga, coloring, drawing, resting their head, or counting to 10.

Week 2 – Structures and Modifying the Environment

Unit 2: Structure, Function, and Information Processing



Learning Goals

This week, students will:

- Describe how the internal and external structures of vertebrates and invertebrates support survival, growth, behavior, and reproduction.
- Classify vertebrates and invertebrates based on their characteristics.
- Identify how animal behaviors are used to modify their environment to meet their needs.



Edgenuity Digital Lessons

Vertebrates and Invertebrates:

- 40798 (Digital Lesson)
- 539 (Independent Practice)
- 231 (Independent Practice)
- Vertebrates and Invertebrates (Lesson Quiz)

Modifying the Environment:

- 3572 (Digital Lesson)
- 3573 (Digital Lesson)
- Modifying the Environment (Lesson Quiz)

Vocabulary

adaptation, behavior, growth, reproduction, survival, plant structures (thorns, stems, roots, petals), animal structures (heart, stomach, brain, skin), internal, external hibernation, camouflage, migration, respiration, mimicry

Week at a Glance

Day 1

Review what was done and learned in the previous week. Have students turn and talk with a classmate and use their personal science notebooks to help them participate in the discussion.

Ask the class to think about what everyone in the room has in common. Generate a list on the board as students share their answers. Then, tell students to touch their own back using their finger and locate their backbone. Have them run their finger along a portion of their backbone. Share with the class that humans and other animals have a backbone. Ask: *Can you think of other animals that have a backbone? What about animals that do not have a backbone?* Have students turn and share their ideas with a classmate.

Set up the purpose of the week's lessons. Tell students that they're going to learn about internal and external structures like the backbone and learn about the function of certain animal characteristics that support survival, growth, behavior, and reproduction.



Whole Group Instruction: Use the digital lesson 40798, "Show Some Backbone."

Before starting the digital lesson, display the five questions at the beginning to help students activate background knowledge of vertebrates and invertebrates or gauge their understanding of this concept. Have students turn and discuss the answers to the five questions with a classmate.

Begin the digital lesson. Use teacher discretion to stop the lesson as needed and check for student understanding, answer questions, or restate information from the lesson.

	<p>Use the questions below to review what has been covered in the digital lesson. Record the information on an anchor chart while students copy information into their personal science notebooks. Use the arrows to go back to find answers as needed.</p> <ul style="list-style-type: none"> • <i>What special characteristic do mammals have?</i> • <i>What is another word for an animal that has a backbone?</i> • <i>What did you learn about the reproduction of reptiles, amphibians, fish, and birds?</i> • <i>What type of body structures allow amphibians to breathe?</i> • <i>What does it mean to be warm-blooded? How does this help animals survive in their environments?</i> <p>At the end of the lesson, students will be presented with a game of 10 questions about different internal and external structures of vertebrate animals. Have students work in small groups to discuss the answers. Allow students to keep track of the points earned for each correct answer. Ask questions to have students clarify or explain their reasoning. Complete the entire game before exiting. Use this game as an opportunity to check for student understanding.</p>  <p>Developing Writing Skills</p> <p>End the lesson by asking students to write 3–5 things they learned for the lesson in their personal science notebook. Encourage students to use vocabulary from the lesson and draw examples.</p> <p>If time permits, select a few students to share their findings with the class.</p>				
Day 2	<p>Show students a pair of swimming goggles, snorkel tube, and swim cap. Ask students to turn and discuss with a classmate what each item’s function might be. Ask: <i>How do these things help us when we’re swimming or snorkeling?</i> Have a class discussion and tell students that the equipment allows us to modify the environment to function and survive. For example, goggles allow us to see underwater, the snorkel tube allows us to breathe, and a swim cap helps us to stay dry and move smoothly in the water. Discuss how animals change their environment in order to meet their needs, survive, grow, and reproduce.</p>				

Whole Group Instruction: Use the digital lessons (3572), “Housekeeping and (3573), “Behaviors.”

Begin with the digital lesson (3572). Students may follow along on their own devices. Complete the mini activities as a class. Model the short activity with chart paper to show how beavers modify their environment by creating dams to live in and survive. Have students copy the information into their personal science notebooks.

Play the [video](#) about the ways wildlife survives in a desert. Tell students to think about the behavior of the animals in the video. Encourage students to jot down notes in their personal science notebooks as they watch the video.

Use the questions below after the video.

- *What did you learn about the mole?*
- *What special internal structure does the mole have?*
- *How does this internal structure allow the mole to modify the environment?*
- *What behaviors did you observe the mole doing that other animals are not able to do?*

Next, start the digital lesson (3573). Students may follow along on their own devices. Then, complete the two short activities as a class. Check for student understanding and ask any additional follow-up questions as needed.



Developing Writing Skills

End the lesson by asking students to write in their personal science notebooks about how humans modify their environment in order to live and survive. If time permits, select a few students to share their responses with the class.

<p>Day 3</p>	<p>Have students circulate through the science stations (centers). There will be several stations for students to complete with a partner or independently.</p> <p>One station is a cloze reading activity. The station will include a teacher-provided reading passage related to structural/behavior adaptation and their functions. Students will fill in the blanks within a passage with the correct words from a word bank.</p> <p>Another station will be set up for students to learn more about invertebrates. Students will work on the digital lesson (539), “Backbone Zone.” After the digital lesson, students will complete a teacher-supplied graphic organizer with information learned about invertebrates such as sponges, worms, sea urchins, jellyfish, and mollusks (snails, octopus, and squid).</p> <p>An additional station will be set up for students to play a teacher-created review game (e.g., board game, game show, Jeopardy) to review vertebrates and invertebrates. The questions from Lesson Quiz: Vertebrates and Invertebrates will be modified into a review game by the teacher and used as an informal assessment. Check for student understanding as students play and review vertebrates and invertebrates.</p> <p>Teacher decision-making: Use a portion of this day to check for student understanding and identify any misconceptions or stumbling blocks. This might include explaining information in chunks or using graphic organizers to put information into chunks for students.</p> <p>Refer to the Work for Early Finishers section for those who have completed the required work.</p> <p> Developing Writing Skills</p> <p>End the lesson by presenting three options for students to write about in their personal science notebooks.</p>				
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	<p>Option 1: Explain the function of long, sturdy tongues. Give reasons why it is important to an animal's survival and growth.</p> <p>Option 2: Explain the function of long eye lashes. Give reasons why it is important to an animal's survival.</p> <p>Option 3: Explain the function of producing milk. Give reasons why it is important to an animal's survival and growth.</p> <p>If time permits, select a few students to share their responses with the class.</p>				
<p>Day 4</p>	<p>Have all students independently complete the Lesson Quiz: Modifying the Environment. Monitor students who are struggling and provide individual attention as needed. Review completed lesson quizzes to make instructional adjustments.</p> <p>Have students begin the inquiry-based lab and pose the question: <i>Is the thumb important for human survival?</i></p> <p>Carefully tape each student's thumbs to their hands. Do not tell them how to use their hands to do the tasks. Allow students to identify different problems throughout the lab and to find solutions. Provide a sheet with a list of tasks to be done around the classroom using their hands with taped thumbs. Make sure students identify the different problems they face as they try each task. Some tasks are turning a doorknob, tying shoelaces, writing their first and last names, buttoning a shirt, sharpening a pencil, zipping up a jacket, putting papers in a folder, or typing on the computer. Then, allow students to find ways to modify their environment or the structure of their hands to do some of the tasks. Have students record their findings. Then, discuss as a class what students learned and have them connect this lab to what they have studied so far about how animals modify their environment or how animals have internal and external structures that are important to their survival.</p> <p>Refer to the Work for Early Finishers section for those who have completed the required work.</p>				

	 <p>Developing Writing Skills</p> <p>End the lesson by asking students to summarize the lab and describe what they learned. Encourage students to write additional inquiry questions in their personal science notebook.</p>				
<p>Day 5</p>	<p>Use the data from the Lesson Quiz: Modifying the Environment to identify students who did not pass the quiz. These students will be Group A. Students who passed the quiz will be Group B.</p> <p>During the first part of the class period, pull Group A together for reteaching while Group B students work on the activity listed below. For the remaining time, work with students individually or in small groups as needed.</p> <p> Common Misconceptions & Reteaching Strategies</p> <p>Students may lack exposure to animals from certain regions and environments. Provide opportunities for students to explore different animals and their structures using the internet or books and resources from your school or local library. Discuss the internal and external structures that allow them to meet their needs, survive, grow, and reproduce.</p> <p>Group A: Students will compare vertebrates and invertebrates using a Venn diagram. Present students with different pictures of animals and have students determine if each one belongs to “Vertebrate” or “Invertebrate” on the Venn diagram. Ask students to explain their thinking. Then, present students with words or phrases on cards that describe vertebrates and invertebrates. Have students distinguish where the words or phrases belong on the Venn diagram.</p> <p>Group B: Students will create a foldable model to review different structural adaptations of animals and function. For example, students will fill out quadrants of a folded piece of paper and select a structural adaptation from a list. They will then write the function of it. For example, “Green coloring/camouflage protects animals from predators.” Students will illustrate the paper foldable.</p>				

Modifications for Special Populations



Supporting English Learners

Low Proficiency

Preview any science texts with students before the lesson or before they read it. During the preview, help familiarize students with any science photographs, tables, graphs, or text features that students may struggle with on their own. Have students explain and summarize what they previewed.

Teacher Note: Previewing content before the lesson is a modification that is beneficial for English Language Learners in science and other content areas. Provide summaries of the content previewed to develop background knowledge.

High Proficiency

Explore vocabulary with students using dictionaries or [Google Translate](#). Model and practice how to write thoughts on paper.

Teacher Note: Opportunities to write in science can help develop communication and language skills. It is important to look beyond spelling or grammar errors and focus on the meaningful thoughts in a student's writing.



Work for Early Finishers

Literature: Have students read suggested literature related to the lesson.

- [What If You Had Animal Feet? by Sandra Markle](#)
- [What If You Had Animal Hair? by Sandra Markle](#)
- [What If You Had Animal Teeth? by Sandra Markle](#)
- [What If You Had an Animal Nose? by Sandra Markle](#)

Writing: Have students write a response to the prompt below in their personal science notebooks. Include examples and drawings.

- Would you rather be able to camouflage or hibernate? Explain your reasons.

	<p>Research: Have students explore different species of animals through the Independent Practice activity (231) to learn more about becoming a field researcher, and look at more vertebrates and invertebrates.</p>
 <p>Supporting Foundational Science Skills</p>	<p>Present activities that develop an understanding of animal life cycles.</p> <p>Life Cycle Activity: Provide cards that illustrate the life cycles of different animals, insects, or plants that students learned about in previous grades. Have students organize the cards to show the correct order of the life cycle for each animal. Have students describe the different stages in their own words.</p>
 <p>Social-Emotional Learning Connections</p>	<p>Kindness: Discuss what kindness is and what being kind to others means. Present the <i>100 Acts of Kindness</i> challenge to students. Tell students that they are challenged to do 100 acts of kindness around their school and classroom. This includes the hallways, library, cafeteria, playground, bus, or any other place where students can demonstrate kindness. Show students a printed 100 chart. Display the 100 chart in the classroom. Tell them that each time an act of kindness is completed, a sticker or an “X” will be marked until 100 acts of kindness are reached. Encourage students to share their acts of kindness at morning meetings or as an end-of-day closing activity, and praise them for their contributions.</p>

Week 3 – Plant Structure and Reproduction

Unit 2: Structure, Function, and Information Processing



Learning Goals

This week, students will:

- Identify the internal and external structures of plants that allow for reproduction, respiration, and growth.
- Explain the function of plant structures.
- Discuss how plant structures are important to survival, growth, and reproduction.



Edgenuity Digital Lessons

Life Cycle of a Plant:

- 5567 (Digital Lesson)
- 5568 (Digital Lesson)
- Life Cycle of a Plant (Lesson Quiz)

Reproduction of a Plant:

- 5565 (Digital Lesson)
- 5566 (Digital Lesson)
- Reproduction of a Plant (Lesson Quiz)

Vocabulary

adaptation, behavior, growth, reproduction, survival, plant structures (thorns, stems, roots, petals)

Week at a Glance

Day 1

Begin the lesson by taking a nature walk outside and around your school to observe the local plants, or take a virtual field trip and search for plants found in your state or different countries. Have students draw different plants in their personal science notebooks. Then, discuss some of the characteristics students observed about the plants.



	<p>Inform students of the learning goals for the week. Have students think about questions they have about plant structure, the functions of those structures, plant reproduction, etc. and write them on the Wall of Wonder. Post chart paper around the classroom and provide markers for students to write their questions. Then, allow students to circulate around the classroom to read questions from their classmates. Have students put a star or checkmark next to any new questions they have after reading other ones. Then, read aloud some of the intriguing inquiries students wrote on the Wall of Wonder.</p> <p> Developing Writing Skills</p> <p>End the lesson with a writing activity. Ask students to reflect on the lesson and the activity in their personal science notebooks. Students can also write down any additional questions they have.</p>				
<p>Day 2</p>	<p>Whole Group Instruction: Use the digital lessons (5567), “Life Cycle of a Plant” and (5568), “The Circle of Life.”</p> <p>Begin the digital lesson (5567). Have students identify the four important plant structures: roots, stems, leaves, and flowers and have them write notes in their personal science notebooks. Use teacher discretion to stop the lesson as needed and check for student understanding, answer questions, or restate information from the lesson. Then, begin the next digital lesson (5568).</p> <p>Discuss the modifications and adaptations to roots, leaves, and stems that provide a survival advantage over other plants as a class. Write student ideas on an anchor chart. After the class discussion, have students draw a plant and label the parts: roots, stem, leaves, and flower in their personal science notebooks. Students may also draw the internal structures of a plant that allow pollen to transfer.</p> <p> Developing Writing Skills</p> <p>End the lesson with a writing activity. Ask: <i>Do you ever notice along the highway there are patches of the same flowers, just feet from each other? Why do you think that happens?</i> Have students write their ideas in the personal science notebooks. Select a few students to share their responses, if time permits.</p>	<p></p>	<p></p>		

<p>Day 3</p>	<p>Present students with different small plants (choose from indoor plants, outdoor plants, fruit-bearing plants, cacti, succulents, etc.) that have destroyed, dying, or diseased parts. Have students sketch and color the plants in their personal science notebooks. Then, tell students to label what they observe in their drawings to indicate the part of the plant that has been destroyed, dying, or diseased. Students may also indicate what might have caused it.</p> <p>Next, arrange small groups of students to discuss the consequences of the problems they identified on each plant. Tell students to think about how it will impact the survival, growth, or reproduction of each plant. Have students also identify and discuss the plant adaptations observed (e.g., thorns on desert plants, the odor of the plants, spongy leaves on succulents, etc.). Have students write their ideas in their personal science notebooks.</p> <p> Common Misconceptions & Reteaching Strategies Students may struggle with applying cause and effect skills in science. Provide opportunities to practice applying cause and effect to basic science concepts. For example, when there is no rain for long periods or a drought occurs, what happens to the lake levels? What happens to livestock on farms? By practicing cause and effect in science, students are able to deepen this critical thinking skill.</p> <p>Regroup as a class to discuss their findings. Ask students to share information from their personal science notebooks and record common findings among the class in an anchor chart. Post this anchor chart in the classroom as a reference.</p> <p>Have all students independently complete the Lesson Quiz: Life Cycle of a Plant. Monitor students who are struggling and provide individual attention as needed.</p> <p>Refer to the Work for Early Finishers section for those who have completed the required work.</p>			
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	 <p>Developing Writing Skills</p> <p>End the lesson with a writing activity. Ask: <i>What can humans do to prevent plants that are diseased or decayed from dying?</i> Have students write their ideas in the personal science notebooks. Select a few students to share their responses, if time permits.</p>				
<p>Day 4</p>	<p>Review what was done and learned in the first three days. Encourage students to look back at their personal science notebooks to help them participate in the discussion.</p> <p>Use the digital lesson (5565), “Parts of Flowering Plants,” and the second digital lesson (5566), “Flowering Plants.” Use flowers (e.g., rose, daisy, or carnation) to show the petal structures to students. Later, pull petals off to show the structures needed for reproduction. Pass out the petals and allow students to observe the petals. Then, begin the digital lesson (5566) to discuss the internal reproduction structures that allow plants to reproduce. Have students draw and label the female and male plant diagrams from the lesson in their personal science notebooks. If time permits, do both mini activities at the end of each lesson as a class to check student understanding.</p> <p>Continue with a lab about the external structures of plants and its function. Provide a variety of plants for students to use in the lab. Tell students that they will observe and identify macroscopic plant structures using a magnifying glass, as well as use tools such as an eye dropper and ruler to examine other plant structures. Students will explain the functions of different plant structures they observe, sketch observations, and discuss their findings and ideas with a partner. For example, students may begin to notice the different leaf patterns and shapes or shiny coating. Students might discuss how the coating can protect it from some insects that could destroy it. During the lab, students will complete a teacher-supplied worksheet with lab instructions and questions.</p>				

	<p>In addition to the plants, provide other fruits and vegetables for dissection. Students can explore other internal structures and look for specific functions. Circulate the classroom as students work and make sure to monitor students, assess their understanding through questioning, and ensure they identify correctly.</p> <p> Developing Writing Skills</p> <p>End the lesson by asking students to summarize the lab and describe what they learned. Encourage students to write additional inquiry questions in their personal science notebooks.</p>				
<p>Day 5</p>	<p>Have all students independently complete the Lesson Quiz: Reproduction of a Plant. Monitor students who are struggling and provide individual attention as needed. Review completed lesson quizzes to make instructional adjustments.</p> <p>Then, all students will create an e-book that explains the internal and external characteristics of any plant. Tell students that they have been placed in a role of a biologist and to select one plant to write about. They must identify the internal and external characteristics of the plant and explain how each of these characteristics support growth, survival, or behavior. In addition, students must explain what the plant’s role is in their environment. The time to complete this activity will need to be allocated in the next instructional week, if needed. Students may also complete the e-book outside of class.</p> <p>End the week by having students complete a teacher-created exit ticket that includes some reflection questions and student interest about the concepts studied so far.</p>				

Modifications for Special Populations

	<p>Supporting English Learners</p>	<p>Low Proficiency</p> <p>Preteach important vocabulary words and phrases related to plant structures. Use pictures, slides, or information students are learning in science.</p>	<p>High Proficiency</p> <p>Use graphic organizers to organize new information students are learning in science.</p>
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	<p>photos to help expose students to vocabulary words they will learn about.</p> <p>Teacher Note: Preteaching vocabulary can help students make connections to the information they will be learning during science or other classes.</p>	<p>Students can complete the graphic organizers with the teacher or during class. Students can use Venn diagrams, flow charts, or concept maps. Have students use the graphic organizer to summarize information learned or use it as tool to help discuss information with peers.</p> <p>Teacher Note: Graphic organizers can show the relationship between new and existing concepts that can also facilitate exploration or the integration of new science ideas.</p>
 <p>Work for Early Finishers</p>	<p>Literature: Have students read suggested literature related to the lesson.</p> <ul style="list-style-type: none"> • <i>Amazing Plant Powers: How Plants Fly, Fight, Hide, Hunt, and Change the World</i> by Loreen Leedy and Andrew Schuerger <p>Vocabulary: Have students create a picture dictionary of new vocabulary words studied in this unit. Write the definitions in your own words.</p>	
 <p>Supporting Foundational Science Skills</p>	<p>Present activities that develop an understanding of what plants and animals need in order to survive.</p> <p>Sticky Note Activity: Have students place sticky notes with the names of plants and animals under categories that describe their needs, such as sunlight, air, water, insects, fruit, small animals, etc. Have students find the similarities and differences between the needs of plants and animals.</p>	
 <p>Social-Emotional Learning Connections</p>	<p>Understanding Social-Emotional Learning: Reflect on what social-emotional learning means and what has been learned so far. As a class, create a social-emotional learning alphabet that displays their knowledge and understanding of character traits (e.g., kindness), themes (e.g., never give up or growth mindset, inspirational quotes, or new vocabulary (e.g., empathy). Assign each student a letter from the</p>	

alphabet and have them create a poster using the letter. Then, have students write about what the chosen word, short phrase, or quote means to them. For example, *G stands for growth mindset. I learned that making mistakes in school is an important part of learning. Making mistakes is proof that I'm trying, and I can learn a lot from making mistakes.* Display the social-emotional learning alphabet in the classroom and refer to the posters throughout the year.

Week 4 – Compare Plants and Animals

Unit 2: Structure, Function, and Information Processing



Learning Goals

This week, students will:

- Identify the similarities and differences between plant and animal structures for reproduction, respiration, and growth.
- Understand how animals process information.



Edgenuity Digital Lessons

Compare Plants and Animals:

- 3580 (Digital Lesson)
- 3581 (Digital Lesson)
- Compare Plants and Animals (Lesson Quiz)

Vocabulary

adaptation, behavior, growth, reproduction, survival, plant structures (thorns, stems, roots, petals), animal structures (heart, stomach, brain, skin, eye), internal, external

Week at a Glance

Day 1

Begin the lesson by asking students to think about the differences between a plant and animal. Draw a Venn diagram on an anchor chart and label each side of it. Have students complete a Venn diagram in their personal science notebooks during the class discussion. Introduce the learning goals for the week. Ask students to write down any questions they might have in their personal science notebooks.

Have students turn and discuss these questions with a partner: *What is structure? What is function? What senses do some animals share? Can all animals hear, taste, smell, and feel? Can plants hear, taste, smell, and feel? How do animals process information it receives? What kind of information might an animal need to process? Why do they need to process information?*



Then, show short video clips to continue information processing: [video 1](#), [video 2](#), and [video 3](#).

Have students work in pairs or small groups to develop these two models.

Model 1:

Have students draw a model of how a bird’s eye sees its food. Ask students to think about where the information goes and how signals are sent for the bird to be able to see the food. Then, have students use recycled items (e.g., plastic water bottles, reused yarn, rubber band ball, construction paper, pencils, etc.) to build a model of how a bird’s eye sees its food. Have students write a short description of how the information is processed. This might include first, information travels to the bird’s brain (rubber band ball) and then, the brain sends a signal (string) for the bird to quickly react. Next, the bird retrieves the insect (small piece of construction paper) to eat.

Model 2:

Have students draw and develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen. Inform students of the materials in the classroom that are available to them: variety of lenses, mirrors, cardboard pieces, and pen light. Have students begin exploring the behavior of light when it comes into contact with these objects. Have students draw what they observe. In addition, remind students that several tests might be necessary. Next, have students try to design a pinhole viewer. When students have finished, have them write about the importance of the eye structure to humans and animals. Include functions of the eye structure to support human and animal survival.



Developing Writing Skills

Encourage students to think about how a Venus flytrap senses food or how a goldfish senses fish food. Have students draw models and explain how information is processed. If time permits, select a few students to share their model drawings with the class.

<p>Day 2</p>	<p>Continue working on the models from the previous day for half of Day 2.</p> <p>Regroup students and begin the digital lesson (3580). Tell students to draw a “plant-animal” from the lesson in their personal science notebooks. Have students turn and discuss their plant-animal with a partner.</p> <p>Continue the lesson and complete the mini activities as a class. At the end of the lesson, have students identify the characteristics plants and animals share. Then, identify the differences such respiration (i.e., animals take in oxygen and breathe out carbon dioxide and plants do the exact opposite). Record findings on an anchor chart. Have students pause and discuss how this is very important for life to exist on Earth. Ask students to think about the effect on humans and animals if there were no trees.</p> <p> Developing Writing Skills</p> <p>End the lesson by asking students to summarize what they learned in today’s lesson. Encourage students to write additional inquiry questions in their personal science notebooks.</p>				
<p>Day 3</p>	<p>Continue learning about the similarities and differences, including how animals and plants breathe. Begin the digital lesson (3581). Complete the mini activities in the lesson as a class. At the end of the lesson, have students draw a model that shows how plants breathe and label it. Then, draw a model that shows how humans breathe and label it. Encourage students to use the internet to find models for both to use in their personal science notebooks.</p> <p>Begin the next activity by asking students: <i>How do leaves breathe?</i> Have students turn and discuss this with a partner. Then, take students outside to collect active living leaves from trees or plants. Next, fill several glass bowls of warm water to allow students to see the leaf from different angles. Then, place one leaf in each bowl of water and put a small rock on top of it. This helps to submerge the entire leaf under water. Set a timer for about an hour. Have students return later in the day to observe the small bubbles that form around the leaf and the edges of the bowl. Tell students that the leaf is still using sunlight as part of the process (i.e., photosynthesis). This means the leaf converts sunlight to energy. This process is the reason we see bubbles</p>				

	<p>because as the leaf releases oxygen while being submerged, the oxygen can now be seen as bubbles. Be sure to emphasize that trees and plants breathe differently but they're both living organisms that need to breathe in order to survive.</p> <p> Developing Writing Skills</p> <p>End the lesson by asking students to summarize what they learned from the leaf activity. Encourage students to write additional inquiry questions in their personal science notebooks.</p>				
Day 4	<p>Have all students independently complete the Lesson Quiz: Compare Plants and Animals. Monitor students who are struggling and provide individual attention as needed. Review completed lesson quizzes to make instructional adjustments the next week.</p> <p>After the lesson quiz, explain the project below and have all students begin the project.</p> <p>Create a new plant or animal species. Design a fact sheet about the new plant or animal. Include information such as the name of the plant/animal, the plant's/animal's basic needs, the region/location it can be found in, a description of the environment it lives in, any structural or behavioral adaptations it possesses, and a colorful, labeled illustration of the new plant or animal in its environment.</p>				
Day 5	<p>Have students continue to work on the new plant/animal species project during class. Allow students to use the internet as a research tool, encourage students to discuss and design plants/animals together, and provide any materials students may need. When students have completed the project, do a "show and share" with the class. Have students talk about the new species. Encourage students to use academic vocabulary when presenting to the class.</p> <p>Work with any students who struggled on the lesson quiz. Pull a small group to review the answers and allow students to correct their work. Have students review any digital lessons based on teacher discretion.</p>				

Refer to the Work for Early Finishers sections for those who have completed the required work.



Common Misconceptions & Reteaching Strategies

Students may need to continue to work on identifying the similarities of structures of animals. Provide students with a matrix of animals and structures. With the students, go through the matrix to identify all the animals that have similar structures (e.g., animals with hearts, animals with wings, animals with fur, etc.) In addition, students can complete a matrix that includes information on plants and plant structures to compare animals and plants (e.g., *What has quills or needles?*)

End the week by having students complete a teacher-created exit ticket that includes their reflections about their interest in careers related to life science after this unit. Include a space for students to write about other concepts related to life science they are interested in learning more about.

Modifications for Special Populations



Supporting English Learners

Low Proficiency

Provide wait time for English language learners to process information and formulate answers or responses. Wait an extra 3–5 seconds after asking a question to allow students to think and compose their answer or idea.

Teacher Note: It is important to provide sufficient wait time after posing a question to the class or before calling on a student. If a student struggles with

High Proficiency

Reinforce vocabulary studied through a language based game such as Science Vocabulary Bingo or Science Pictionary. Students begin to correlate pictures with academic science vocabulary words.

Teacher Note: Playing language-based games encourages students with minimal spoken language skills to demonstrate their understanding of vocabulary words.

	<p>answering a question, let the student know you will provide more time. Guide students who may need help with a word or phrase in their explanation.</p>
 <p>Work for Early Finishers</p>	<p>Literature: Have students read suggested literature related to the lesson.</p> <ul style="list-style-type: none"> • <i>Amazing Plant Powers: How Plants Fly, Fight, Hide, Hunt, and Change the World</i> by Loreen Leedy and Andrew Schuerger • <i>Animal Touch</i> by Kirsten Hall <p>Writing: Have students write a response to the prompt below in their personal science notebooks. Include examples and drawings.</p> <ul style="list-style-type: none"> • Do you think animals that use odor to survive are bad animals? Explain why or why not.
 <p>Supporting Foundational Science Skills</p>	<p>Present activities that develop science vocabulary.</p> <p>Sticky Note Vocabulary Activity: Have students label important internal and external structures of plants and animals using sticky notes. Provide a variety of posters and diagrams of different animals and plants. Ask students to explain the function of the structures. Encourage students to use academic science vocabulary and provide assistance to vocabulary meaning and function as needed.</p>
 <p>Social-Emotional Learning Connections</p>	<p>Disagreeing Respectfully with Others: Discuss how disagreeing with people is okay, but it is important to disagree respectfully. Talk about the importance of working together and how to politely and respectfully disagree with someone. Explore ways to respectfully disagree by presenting different scenarios with students. For example, during science lab you might disagree with someone about their answer. Generate a list of times you might disagree with someone at school. Next, discuss ways you can disagree respectfully. Talk about tone, body language, and word choice. Brainstorm a list of sentence</p>

starters students can use with someone: *I disagree with you because, I think something different because, Can I tell you my thinking and why it is different?* Have students draw a comic strip cartoon to demonstrate how they might apply their new knowledge of disagreeing respectfully with others. Close the activity by doing a “gallery walk,” where students circulate around the classroom and read each other’s comic strip cartoon.