CA NGSS TIME Prescreen Review Guide

Plant and Animal Structures, Grade 4

Building Blocks OF SCIENCE™ | 3D

Building Blocks OF SCIENCE™ | 3D

Plant and Animal Structures

CAROLINA®
www.carolina.com

Building Blocks OF SCIENCE™ 3D

This prescreen tool uses one Building Blocks of Science™ 3D unit to provide a roadmap of how the program meets the criteria of the CA NGSS* Toolkit of Instructional Materials Evaluation. Each page of this document highlights features the Teacher's Guide, with page references from the printed version. All the information found in the printed Teacher's Guide is also accessible in the digital version of the Teacher's Guide, which you can view at www.carolina.com/bbs3dreview. Both versions of the Teacher's Guide will be provided to all teachers who implement Building Blocks of Science 3D. In addition to the digital support, the equipment for the investigations is also part of the all-inclusive package that teachers receive.

To help with your review, here's an overview of the program's organization:

- Building Blocks of Science 3D consists of 18 units that cover grade the CA NGSS Performance Expectations and the three dimensions
- There are three units per grade level
- Each unit is divided into lessons, each lesson is divided into investigations

The cornerstone of each lesson is a phenomena-based, hands-on, three-dimensional learning experience **for all students.** Each all-inclusive unit includes:

- Investigative phenomena that provides real-world context for each lesson
- Notebook prompts that help students use data and ideas to develop evidence-based claims
- Informational texts that support the science content—in English and in Spanish
- Thought-provoking questions in every investigation for the teacher to ask to support students' sensemaking
- A comprehensive assessment system that provides formative, summative, pre- and post-assessments
- A complete digital version for every classroom—instantly access instruction, simulations, literacy, assessments and more at www.carolina.com/bbs3dreview

* Next Generation Science Standards is a registered trademark of Achieve. Neither Achieve nor the lead states and partners that developed the Next Generation Science Standards was involved in the production of, and does not endorse, this product.

CA NGSS TIME Prescreen Review Guide

Table of Contents

All digital resources—no annual license fee

Leveled literacy

All-inclusive, phenomena-based science

Building Blocks of Science™ 3D has already been reviewed by the Instructional Materials Advisory Panel (IMAP) and the Content Review Panel (CRP). They determined that Building Blocks of Science 3D meets the requirements of Chapter 13 of the CA Science Framework. This takes the verification of program requirements as outlined by the Framework out of adoption committee's responsibility, allowing the committee time to focus on developing a district lens for review.

Plant and Animal Structures, Grade 4

The examples in this prescreen tool are reflective of formatting and features that consistently appear throughout each unit in the program.

You can review the scope and sequence of instruction for the entire unit in the Evidence of Instructional Scaffolding chart at the end of this Reviewer's Guide and in the unit's Teacher's Guide (pgs. xxii-xxiii).

To access resources online, visit **www.carolina.com/bbs3dreview** and click on ***Plant and Animal Structures.***

Criteria	Evidence from Plant and Animal Structures
Use Phenomena/Problems Materials provide relevant and authentic learning contexts through which students: • engage as directly as possible with phenomena or problems to ask and answer their questions as well as questions from other sources; and • have the potential to use the three dimensions to make sense of phenomena or design solutions to problems.	The **Anchoring Phenomenon** Phenomenon for the unit is understanding the internal and external structures of organisms and the conditions in which they function effectively. **1.** The unit begins instruction in Lesson 1 with an **Anchoring Phenomenon** (pg. 34) narrative, which is shared with the class. The **Phenomena Video** (pg. 34) accompanies this narrative. It is found at www.carolina.com/bbs3dreview • **Click on:** Unit Title > Unit Overview > Digital Resources **2.** A lesson-specific **Investigative Phenomenon** Phenomenon (pg. 34) opens each lesson. Students ask questions that they want to answer and that will be revisited at the end of each lesson in the Phenomenon discussion (pg. 41). **3. Investigation** titles are posed as a question to set a problem for students to solve (pg. 40). **4. Investigations** always put phenomena in students' hands. They are asked to gather and analyze information, share their learning with others, and provide claims based on evidence (pgs. 40-41, Investigation B, Step 6) **5. Tell Me More** prompts at the end of each investigation provide opportunities for formative assessment as students complete a task in which they apply their learning to additional phenomena, which helps students to develop more complex and complete understandings over time (pg. 41). **6. Using three dimensions:** The 3Ds are listed at the start of each investigation and are integrated into at point of use (pg. 40 and Student Investigation Sheet 1B, pg. 45).

Examples

ANCHORING PHENOMENON

Health is vitally important. Most students will be able to relate to visiting a doctor or may even have experience tending to the health of a pet or a garden. As students get older, they begin to draw connections between symptoms and a particular illness or condition. The anchoring phenomenon for *Plant and Animal Structures* is understanding the internal and external structures of organisms and the conditions in which they function effectively.

Read the investigative phenomenon aloud to the class. Encourage students to generate questions about what they hear. Keep track of students' questions on a class chart, or have students record the questions in their science notebooks. Refer to these questions questions at the end of the lesson and throughout the unit to support the unit's anchoring phenomenon.

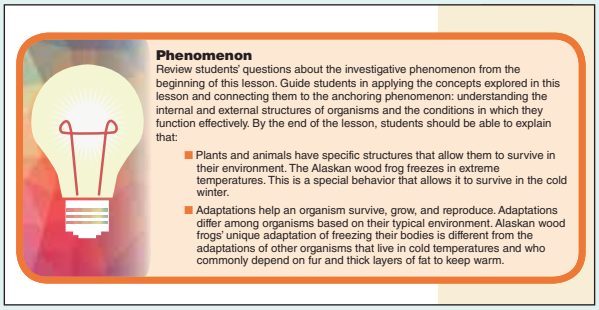
Investigative Phenomenon for Lesson 1: In Alaska, temperatures can be extremely cold—as low as -60°C (-76˚F). Few types of plants and animals can survive in such a climate, but the Alaskan wood frog is able to freeze its body, which stops its breathing and the beating of its heart. When the temperatures rise in spring, the frog thaws and returns to life. What does this make you wonder?

Anticipated Questions:

- How does the frog freeze its body?
- How can the frog stop breathing or stop its heart and still live?
- What other animals can survive through a cold winter?

Phenomena Video: Watch the phenomena video for *Plant and Animal Structures* as a class. As you watch, encourage students to record questions in their science notebooks about what they see in the video. At the end of the video, create a class chart of students' questions. Save this chart to refer to at the end of the unit.

1. Phenomena (pg. 34)



Phenomenon

Review students' questions about the investigative phenomenon from the beginning of this lesson. Guide students in applying the concepts explored in this lesson and connecting them to the anchoring phenomenon: understanding the internal and external structures of organisms and the conditions in which they function effectively. By the end of the lesson, students should be able to explain that:

- Plants and animals have specific structures that allow them to survive in their environment. The Alaskan wood frog freezes in extreme temperatures. This is a special behavior that allows it to survive in the cold winter.
- Adaptations help an organism survive, grow, and reproduce. Adaptations differ among organisms based on their typical environment. Alaskan wood frogs' unique adaptation of freezing their bodies is different from the adaptations of other organisms that live in cold temperatures and who commonly depend on fur and thick layers of fat to keep warm.

2. Phenomena (pg. 41)

Investigation B

WILL SEEDS GROW INSIDE A PLASTIC BAG?

MATERIALS

- **Student**
  - 1 Science notebook*
  - 1 Student Investigation Sheet 1B: *Will the Radish Seeds Grow?*
- **Team of four students**
  - 1 Bag of seeds*
  - 1 Foam tray
  - 4 Medium resealable plastic bags
  - 4 Paper towels
  - 1 Permanent marker*
- **Class**
  - 3 Plastic tanks, 1 gal
  - 1 gal Water*
  - Sunlit window or other warm area*
- **Teacher**
  - 8 Small resealable plastic bags
  - Paper towels*
  - Radish seeds

*These materials are needed but not supplied.

1. Ask students to identify the resources that humans need to survive *(water, food, air, shelter/space)*. Ask students to provide an example of how and where they find one of those resources. Prompt students to support their answer by describing which structures or behaviors they used to obtain the resource.

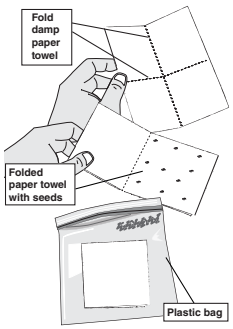
3. Investigations as questions (pg. 40)

Student Investigation Sheet 1B Name _____

Will the Radish Seeds Grow? Date _____

1. You will need the following materials to grow your radish seeds:
- 1 Bag of radish seeds (to share with your group members)
- 1 Paper towel
- 1 Permanent marker (to share with your group members)
- 1 Resealable plastic bag
- Water

2. Prepare a paper towel for your radish seeds. Place the paper towel into a container of water, then remove it and gently wring out all the extra water like your teacher modeled earlier. You do not want the paper towel dripping with water.



3. Write your name on your plastic bag with a permanent marker.

4. Fold your paper towel into fourths so it will fit neatly in the plastic bag. Check to make sure it fits before moving onto the next step.

5. Remove the paper towel from the bag and open up the last fold you made. Carefully place 10 radish seeds from your group's bag all over the paper towel. Make sure the seeds do not touch each other.

6. Refold the paper towel over to cover up your seeds. Press down on the paper towel to hold the seeds in place, and slip the folded paper towel back into the plastic bag.

7. Remove some air from the bag so it is flat when sealed. Press down on the seeds again to make sure they will stay in place.

8. Raise your hand when your bag is ready. When your teacher calls on you, carefully bring your sealed bag to your teacher in the palm of your hand.

9. In your science notebook, answer the following questions:
- Why don't you want the seeds to touch each other inside the bag?
- Do you think the seeds will be able to grow without soil? Why or why not?
- Draw a sketch of what you think the plant will look like when it is fully grown.

4. Phenomena in students' hands (pg. 45)

Some plants grow faster than others. An oak tree can take more than 30 years to grow to its full size. A rose bush will take about six weeks to begin to flower. Does the same idea relate to animals? Do animals grow at the same rate? Provide examples.

Tell Me More!

5. Formative assessment (pg. 41)

Disciplinary Core Idea
- **LS1.A:** Structure and Function

Science and Engineering Practice
- Engaging in Argument from Evidence

Crosscutting Concept
- Systems and System Models

5Es
- Engage
- Explore

Digital Components
- **Simulation:** Factors of Plant Growth, Part 2
- **Simulation:** Plant Life Cycle

Investigation B

WILL SEEDS GROW INSIDE A PLASTIC BAG?

MATERIALS

- **Student**
  - 1 Science notebook*
  - 1 Student Investigation Sheet 1B: *Will the Radish Seeds Grow?*
- **Team of four students**
  - 1 Bag of seeds*
  - 1 Foam tray
  - 4 Medium resealable plastic bags
  - 4 Paper towels
  - 1 Permanent marker*
- **Class**
  - 3 Plastic tanks, 1 gal
  - 1 gal Water*
  - Sunlit window or other warm area*
- **Teacher**
  - 8 Small resealable plastic bags
  - Paper towels*
  - Radish seeds

*These materials are needed but not supplied.

1. Ask students to identify the resources that humans need to survive *(water, food, air, shelter/space)*. Ask students to provide an example of how and where they find one of those resources. Prompt students to support their answer by describing which structures or behaviors they used to obtain the resource.

6. Integrated three dimensions (pg. 40)

Plant and Animal Structures, Grade 4

To access resources online, visit **www.carolina.com/bbs3dreview** and click on ***Plant and Animal Structures.***

Criteria	Evidence from Plant and Animal Structures
Presence of Logical Sequence Student learning across the three dimensions is: • arranged in a logical sequence; and • sufficient and appropriate for students to figure out the phenomena or problems.	***Plant and Animal Structures*** is a grade 4 life science unit. This unit supports NGSS Performance Expectations and provides connections to life science, physical science, and engineering: • **4-LS1-1; 4-LS1-2; 4-PS4-2; 3-5-ETS1-2** **1. NGSS** for the unit (pg. vi) **2. Evidence of Instructional Scaffolding** (pgs. xxii-xxiii) **3. Investigations** refer to previous learnings and provide multiple opportunities to use the 3Ds to make sense of phenomena and problems (Investigation B, pg. 57, Step 1) to build a conceptual progression upon prior learning. **4. Tell Me More** prompts at the end of each investigation provide opportunities for formative assessment as students complete a task in which they apply their learning to additional phenomena, developing more complex and complete understandings over time (pg. 62). **5. Notebooking** tasks for each investigation provide authentic opportunities for students to share evidence-based arguments and reasoning (pgs. 57-62).

Examples

Next Generation Science Standards

The Building Blocks of Science unit *Plant and Animal Structures* integrates process skills as defined by the Next Generation Science Standards (NGSS).

Performance Expectations
- **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.
- **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.

Disciplinary Core Ideas
- **LS1.A:** Structure and Function
- **LS1.D:** Information Processing
- **PS4.B:** Electromagnetic Radiation
- **ETS1.B:** Developing Possible Solutions

Science and Engineering Practices
- Developing and Using Models
- Constructing Explanations and Designing Solutions
- Engaging in Argument from Evidence

Crosscutting Concepts
- Cause and Effect
- Systems and System Models

1. NGSS for unit (pg. vi)

Evidence of Instructional Scaffolding

Scaffolding is a crucial yet natural element in all classrooms. Building Blocks of Science strives to simplify this instructional strategy by integrating this guided process into each unit, systematically building upon student knowledge, using hands-on learning to reinforce concepts, and employing student-driven inquiry. These strategies introduce new concepts and, with practice and review, lead students toward mastery. It is important to integrate scaffolding not only throughout the unit but also throughout each lesson. As students demonstrate understanding of a concept, they should be encouraged to take a leadership role in class or to attempt assignments independently. Additionally, scaffolding reveals opportunities for differentiation. Below-level learners require more reinforcement as they learn new skills, so the process toward mastery will need to be adjusted. Above-level learners do not need as much support and achieve mastery more quickly; therefore, these students can be assigned more independent study.

	Lesson 1 ▸	Lesson 2 ▸	Lesson 3 ▸
OBJECTIVES	■ Recognize that plants and animals have special structures and behaviors that enable them to survive in their environments. ■ Identify adaptations of plants and animals that are essential for survival, growth, and reproduction. ■ Design an environment for seeds to grow in and make predictions about their growth.	■ Describe structural adaptations and how they vary based on an animal's environment. ■ Use external and internal structures to explain how animals survive in their environments. ■ Argue how properly functioning external and internal structures are important for the survival of animals. ■ Investigate both internal and external adaptations using a preserved squid specimen.	■ Identify and explain the purpose of internal and external structures in a plant and how these structures help the plant survive, grow, and reproduce. ■ Examine and compare seeds to draw conclusions about plant development. ■ Describe the different appearances as adaptations. ■ Dissect and identify the internal structures of a flower and explain how they relate to reproduction.
SCAFFOLDING	Students should know: ■ Organisms have the same basic needs: water, shelter, food, and air. The amount of each resource required to survive differs among plants and animals. ■ Organisms have adaptations that help them survive, grow, and reproduce in their environments. ■ Adaptations can be structures, like gills, or behaviors, like migrating. ■ Plants require sunlight to make their own food through the process of photosynthesis.	Students should know: ■ Animals have structural and behavioral adaptations that assist in their survival, reproduction, and growth. ■ Internal and external structures must work together in order for an animal to thrive. ■ Certain structures are unique to animals in a certain environment. An animal may not be able to thrive in a nontypical area if it does not have the appropriate structures.	Students should know: ■ Plants begin as seeds, which have structures to protect the plant as it begins to grow. ■ Plants have internal and external structures that must work together in order for the plant to survive, grow, and reproduce. ■ Most plants have leaves, a stem, and roots, but some types have plants have specialized structures that are adapted to their environment. ■ The reproductive success of plants is dependent on the transportation of pollen.

2. Evidence of Instructional Scaffolding (pg. xxii)

Investigation B

HOW DO INTERNAL STRUCTURES SUPPORT SURVIVAL?

MATERIALS

■ **Student**
1 Science notebook*
1 Student Investigation Sheet 2B.1: *Do Animals Have Similar Internal Structures?*
1 Hand lens
1 Lab apron*
1 Pair of safety goggles
2 Pairs of disposable gloves

■ **Team of four students**
1 Student Investigation Sheet 2B.2: *What Are the Internal Structures of a Squid?*
1 Clothespin
1 Foam tray
1 Large resealable plastic bag
1 Pair of dissection scissors
1 Pair of forceps
1 Permanent marker*
1 Squid
1 Squid Dissection Mat

■ **Teacher**
1 Student Investigation Sheet 2B.2: *What Are the Internal Structures of a Squid?* (Teacher's Version)
1 Clothespin
1 Foam tray
1 Lab apron*
1 Large container*
1 Large resealable plastic bag
1 Large trash bag*
1 Pail opener
1 Pair of dissection scissors
1 Pair of forceps
1 Pair of safety goggles
3 Pairs of disposable gloves
1 Plant and Animal Structures Photo Card Set
2 Squid (one from Investigation A)
Chart paper or whiteboard*
Disinfecting cleaner*
Markers*
Paper towels*
Projection system* (optional)
*These materials are needed but not supplied.

1. Ask students to share evidence from Investigation A that suggests that external structures support the survival, growth, and reproduction of animals.

2. Explain that students will focus on the internal structures of animals during this investigation. In groups, have students brainstorm a list of structures inside the human body that help keep a person alive. Students should record their group's list in their science notebooks. After some time, review their ideas as a class. *(Students might suggest the brain, heart, blood, bones, muscles, liver, kidneys, and stomach.)* Choose one internal structure to focus on, and ask the following questions:

- What is the function of this structure? *(Answers will vary.)*
- Do other organisms have a structure that is similar to this one? Provide an example. *(Answers will vary.)*
- What would happen if this structure stopped working? *(Students should recognize that the human could not survive.)*

3. Build on prior learning (pg. 57)

Tell Me More!

How do external and internal structures work together to keep an organism alive? Use an example to support your answer.

4. Apply new learning (pg. 62)

7. Direct students to the "Growth" section of the "Thinking About Internal Animal Structures" chart. Ask students who responded to Prompt Set 2 to share their ideas with the class. Encourage them to cite specific differences in the development of a frog and a human, and write these on the chart. Use the questions below to facilitate a class discussion. Prompt students to keep notes in their science notebooks during the discussion.

- What evidence suggests that animals change as they get older? *(Animals look different as they get older.)*
- Are all animals born with the structures they need to survive? How do you know? *(No. For example, a frog is not born with legs.)*
- Do all animals grow at the same rate? *(No, some animals take longer to develop than others.)*
- Think about internal structures. Do these also grow and change like external structures do? How do you know? *(Yes, internal structures also grow. We know this because animals grow larger in size, suggesting that their bones and muscles are increasing in size.)*

8. Direct students to the section of the "Thinking About Internal Animal Structures" chart titled "Reproduction." Ask students who responded to Prompt Set 3 to share their ideas with the class. Encourage them to draw comparisons between the reproductive processes of lizards and cats. Use the questions below to facilitate a class discussion. Prompt students to keep notes in their science notebooks during the discussion.

- What evidence suggests that organisms have different methods of reproducing? *(Some animals are born from eggs, but other animals develop inside the mother until they are born.)*
- Why is reproduction important for animals? *(Reproduction makes more organisms of a species and so keeps a species or group of living things in existence.)*

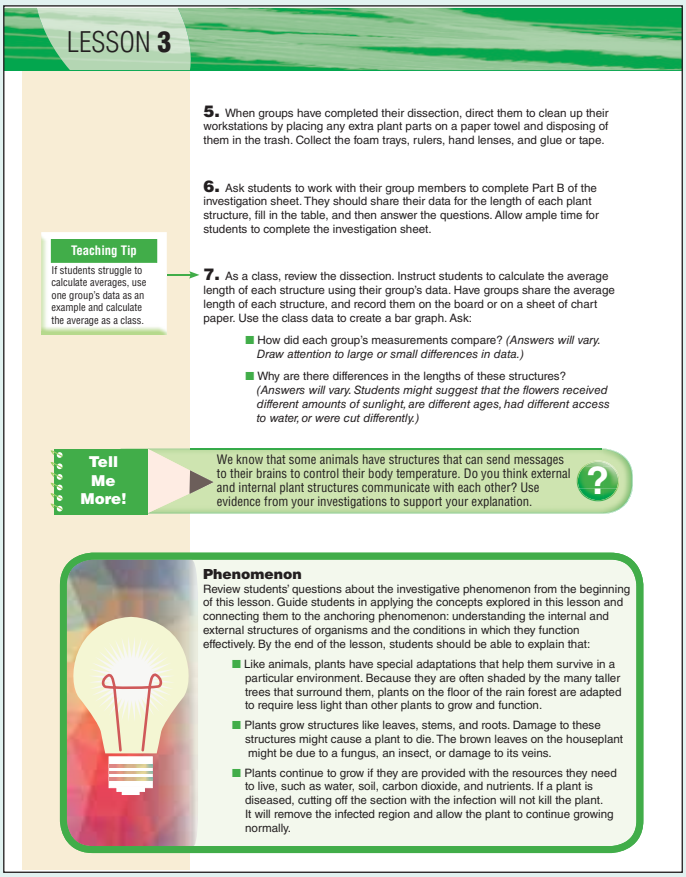
5. Notebooking (pgs. 57-62)

Plant and Animal Structures, Grade 4

To access resources online, visit **www.carolina.com/bbs3dreview** and click on ***Plant and Animal Structures.***

Criteria	Evidence from Plant and Animal Structures
Students Are Figuring Out Materials position students to make sense of phenomena and design solutions to problems by: • asking and answering questions that link learning over time; and • using the three dimensions to link prior knowledge and negotiate new understandings and abilities.	**1.** Each investigation provides an opportunity for students to make sense of phenomena (Investigation D, pgs. 97-98) students review past learning (Step 1], gather and organize data (Steps 2-4), answer questions and calculate the average length of each structure (Steps 6-7). **2.** Opportunities to engineer **design solutions** solutions are integrated into the instruction (pgs. 179-181); students work in groups to design and build a model of a more powerful eye, evaluate models and argue from evidence about the benefits of their model.

Examples



LESSON **3**

5. When groups have completed their dissection, direct them to clean up their workstations by placing any extra plant parts on a paper towel and disposing of them in the trash. Collect the foam trays, rulers, hand lenses, and glue or tape.

6. Ask students to work with their group members to complete Part B of the investigation sheet. They should share their data for the length of each plant structure, fill in the table, and then answer the questions. Allow ample time for students to complete the investigation sheet.

Teaching Tip

If students struggle to calculate averages, use one group's data as an example and calculate the average as a class.

7. As a class, review the dissection. Instruct students to calculate the average length of each structure using their group's data. Have groups share the average length of each structure, and record them on the board or on a sheet of chart paper. Use the class data to create a bar graph. Ask:

- How did each group's measurements compare? *(Answers will vary. Draw attention to large or small differences in data.)*
- Why are there differences in the lengths of these structures? *(Answers will vary. Students might suggest that the flowers received different amounts of sunlight, are different ages, had different access to water, or were cut differently.)*

Tell Me More!

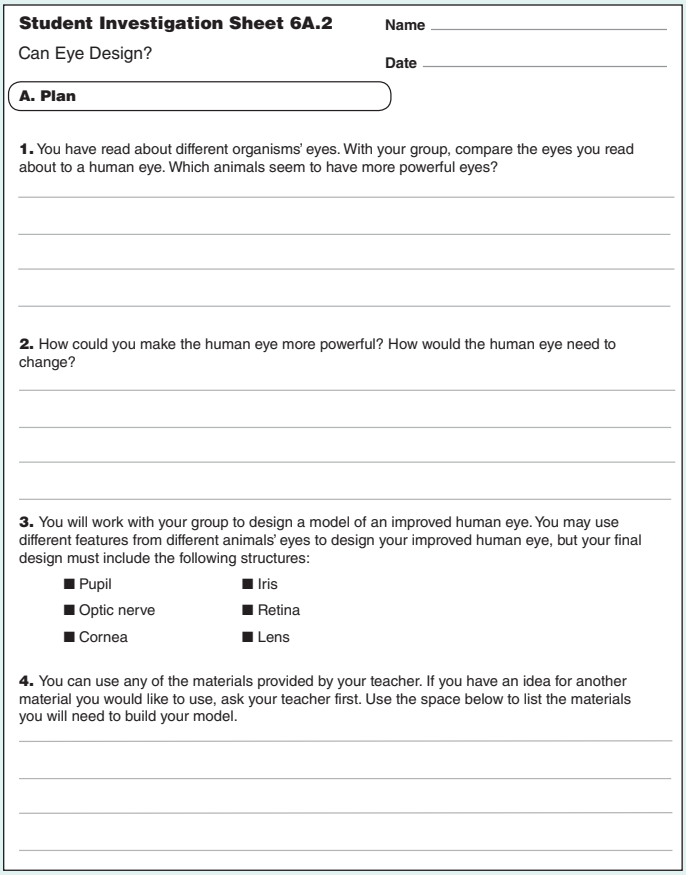
We know that some animals have structures that can send messages to their brains to control their body temperature. Do you think external and internal plant structures communicate with each other? Use evidence from your investigations to support your explanation.

Phenomenon

Review students' questions about the investigative phenomenon from the beginning of this lesson. Guide students in applying the concepts explored in this lesson and connecting them to the anchoring phenomenon: understanding the internal and external structures of organisms and the conditions in which they function effectively. By the end of the lesson, students should be able to explain that:

- Like animals, plants have special adaptations that help them survive in a particular environment. Because they are often shaded by the many taller trees that surround them, plants on the floor of the rain forest are adapted to require less light than other plants to grow and function.
- Plants grow structures like leaves, stems, and roots. Damage to these structures might cause a plant to die. The brown leaves on the houseplant might be due to a fungus, an insect, or damage to its veins.
- Plants continue to grow if they are provided with the resources they need to live, such as water, soil, carbon dioxide, and nutrients. If a plant is diseased, cutting off the section with the infection will not kill the plant. It will remove the infected region and allow the plant to continue growing normally.

1. Making sense of phenomena (pgs. 97-98)



Student Investigation Sheet 6A.2 Name _____

Can Eye Design? Date _____

A. Plan

1. You have read about different organisms' eyes. With your group, compare the eyes you read about to a human eye. Which animals seem to have more powerful eyes?

2. How could you make the human eye more powerful? How would the human eye need to change?

3. You will work with your group to design a model of an improved human eye. You may use different features from different animals' eyes to design your improved human eye, but your final design must include the following structures:

- Pupil
- Iris
- Optic nerve
- Retina
- Cornea
- Lens

4. You can use any of the materials provided by your teacher. If you have an idea for another material you would like to use, ask your teacher first. Use the space below to list the materials you will need to build your model.

2. Three dimensions applied to engineering challenge (pgs. 179-181)

Plant and Animal Structures, Grade 4

To access resources online, visit **www.carolina.com/bbs3dreview** and click on ***Plant and Animal Structures.***

Criteria	Evidence from Plant and Animal Structures
Three-dimensional Performances Materials include assessments designed to: • match the targeted learning goals; and • elicit evidence of students' use of the three dimensions to make sense of phenomena and/or to design solutions to problems.	Three-dimensional assessment system provides 3D assessment throughout the unit to monitor new growth over time. **1. Pre-Assessment:** Lesson 1, Investigation A (pgs. 37-39): Students draw upon prior knowledge to consider how different structures are linked to the survival, growth, and reproduction of organisms. **2. Formative assessment** opportunities are part of every lesson. The Tell Me More prompt on page 62 focuses on the 3Ds listed on page 57. **3. Assessment Strategies** at the end of every lesson (pg. 64) provide strategies for using Student Investigation Sheets and Tell Me More prompts to assess the 3Ds. Also available digitally at www.carolina.com/bbs3dreview • **Click on:** Unit Title > Unit Overview > Digital Resources **4. Summative Assessments** in every unit's final lesson provide a performance task for group assessment of the 3Ds (pgs. 179-181) and a written assessment (after Student Investigation Sheet 6A.2). A scenario-based assessment is available online at www.carolina.com/bbs3dreview • **Click on:** Unit Title > Unit Overview > Digital Resources **5. Summative Assessment Remediation Strategies** list lessons to revisit for Performance Expectations-specific remediation based on individual assessment items (chart follows Summative Assessment Answer Key).

Examples

Investigation A

PRE-UNIT ASSESSMENT: HOW ARE AN ORGANISMS' STRUCTURES ADAPTED FOR ITS ENVIRONMENT?

MATERIALS

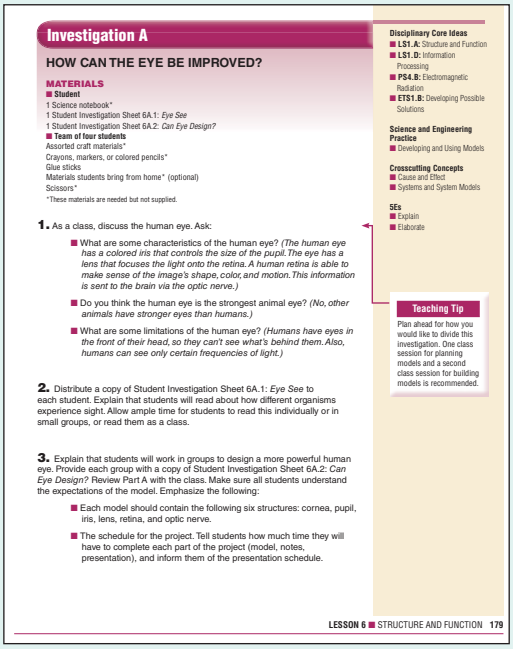
■ **Student**
1 Science notebook*
1 Student Investigation Sheet 1A: *Can You Sort the Structures?*
1 Pair of scissors*
1 Glue stick or roll of clear tape*

■ **Teacher**
1 Student Investigation Sheet 1A: *Can You Sort the Structures?* (Teacher's Version)
1 Plant and Animal Structures Photo Card Set
Chart paper or whiteboard*
Markers*
*These materials are needed but not supplied.

1. Introduce the unit by asking students to individually brainstorm the things that all organisms, or living things, need to survive. Instruct them to make a list in their science notebooks.

2. After some time, ask students to circle things on their list that are unique to animals and to underline the things that are unique to plants. Ask for a volunteer to identify the which needs plants and animals share. *(Students should cite air, water, food, and shelter [or space].)*

1. Pre-assessment (pgs. 37-39)



Investigation A

HOW CAN THE EYE BE IMPROVED?

MATERIALS
■ Student
1 Science notebook*
1 Student Investigation Sheet 6A.1: *Eye See*
1 Student Investigation Sheet 6A.2: *Can Eye Design?*
■ Team of four students
Assorted craft materials*
Crayons, markers, or colored pencils*
Glue sticks
Materials students bring from home* (optional)
Scissors*
*These materials are needed but not supplied.

1. As a class, discuss the human eye. Ask:
- What are some characteristics of the human eye? *(The human eye has a colored iris that controls the size of the pupil. The eye has a lens that focuses the light onto the retina. A human retina is able to make sense of the image's shape, color, and motion. This information is sent to the brain via the optic nerve.)*
- Do you think the human eye is the strongest animal eye? *(No, other animals have stronger eyes than humans.)*
- What are some limitations of the human eye? *(Humans have eyes in the front of their head, so they can't see what's behind them. Also, humans can see only certain frequencies of light.)*

2. Distribute a copy of Student Investigation Sheet 6A.1: *Eye See* to each student. Explain that students will read about how different organisms experience sight. Allow ample time for students to read this individually or in small groups, or read them as a class.

3. Explain that students will work in groups to design a more powerful human eye. Provide each group with a copy of Student Investigation Sheet 6A.2: *Can Eye Design?* Review Part A with the class. Make sure all students understand the expectations of the model. Emphasize the following:
- Each model should contain the following six structures: cornea, pupil, iris, lens, retina, and optic nerve.
- The schedule for the project. Tell students how much time they will have to complete each part of the project (model, notes, presentation), and inform them of the presentation schedule.

Disciplinary Core Ideas
■ LS1.A: Structure and Function
■ LS1.D: Information Processing
■ PS4.B: Electromagnetic Radiation
■ ETS1.B: Developing Possible Solutions

Science and Engineering Practice
■ Developing and Using Models

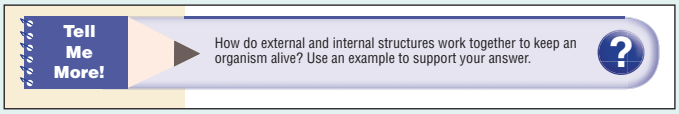
Crosscutting Concepts
■ Cause and Effect
■ Systems and System Models

SEs
■ Explain
■ Elaborate

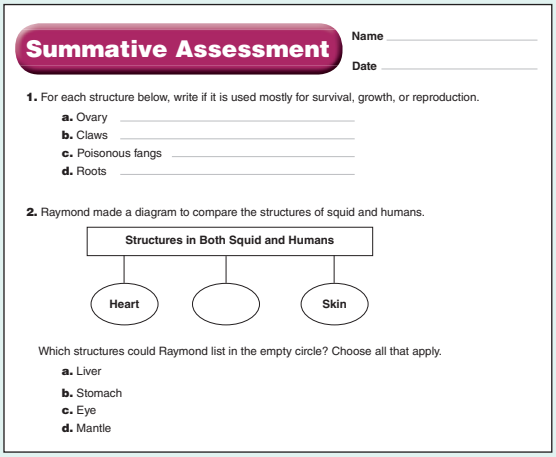
Teaching Tip
Plan ahead for how you would like to divide this investigation. One class session for planning models and a second class session for building models is recommended.

LESSON 6 ■ STRUCTURE AND FUNCTION 179

4. Summative assessment (pgs. 179-181)



2. Formative assessment (pg. 62)



Summative Assessment

Name _____

Date _____

1. For each structure below, write if it is used mostly for survival, growth, or reproduction.
- a. Ovary _____
- b. Claws _____
- c. Poisonous fangs _____
- d. Roots _____

2. Raymond made a diagram to compare the structures of squid and humans.

Which structures could Raymond list in the empty circle? Choose all that apply.
- a. Liver
- b. Stomach
- c. Eye
- d. Mantle

4. Summative assessment (pg. 189)

ASSESSMENT STRATEGIES

1. Investigation A

■ Review responses to Literacy and Science 2A: *All About Squid* to determine students' reading comprehension and ability to use evidence from the article to answer questions.

■ Use Student Investigation Sheet 2A: *What Are the External Structures of a Squid?* and students' responses during the review to gauge their ability to identify and describe external structures. Students should be able to relate structures to their functions and make comparisons between the structures of different animals.

■ Use students' responses to the Tell Me More question to determine their ability to compare the same structure on different organisms. Look for an explanation describing functions related to food, protection, and other uses. If students appear to struggle with this concept, you may provide supplemental review.

3. Assessment Strategies (pg. 64)

Summative Assessment Remediation Strategies

The chart below shows which lessons support the unit's performance expectations. Based on the outcome of each student's summative assessment, you can develop remediation strategies using the relevant lessons from the unit.

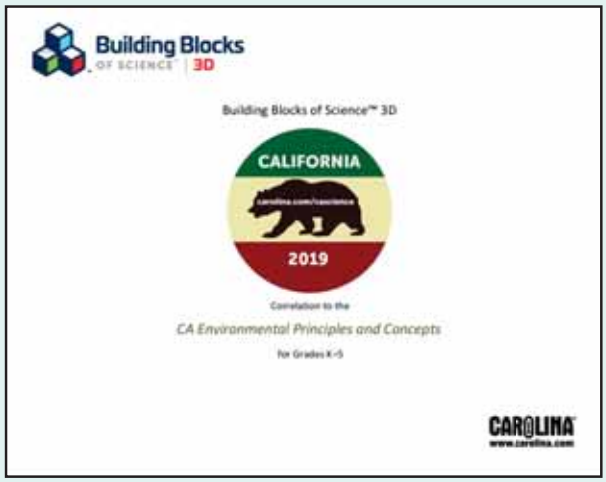
Summative Assessment Item Number	Performance Expectations Addressed	Lessons to Revisit
1	4-LS1-1	Lesson 1
2	4-LS1-1	Lesson 2
3	4-PS4-2	Lesson 5, Lesson 6
4	4-LS1-2	Lesson 4
5	4-LS1-1	Lesson 3
6	4-LS1-1	Lesson 2
7	4-LS1-2	Lesson 4
8	4-LS1-2, 4-PS4-2	Lesson 5, Lesson 6
9	4-LS1-2	Lesson 4
10	4-LS1-1	Lesson 3
11	4-LS1-1	Lesson 2
12	4-LS1-1	Lesson 3
13	4-LS1-1	Lesson 1
14	4-LS1-1	Lesson 1

5. Summative Assessment Remediation Strategies (pg. 196)

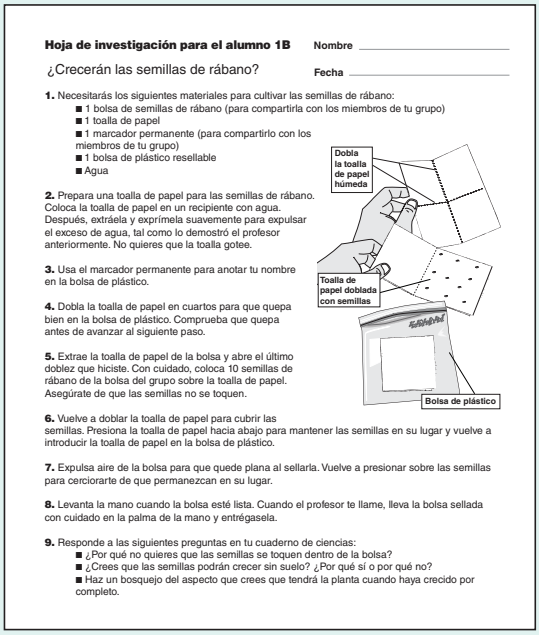
Plant and Animal Structures, Grade 4

To access resources online, visit **www.carolina.com/bbs3dreview** and click on ***Plant and Animal Structures.***

District Lens and Helpful Supports	Evidence from Plant and Animal Structures
1. Environmental Principles and Concepts (EP&Cs)	The unit focuses on the natural systems within plants, animals, and humans, comparing and contrasting structures and functions. A complete correlation of Building Blocks of Science 3D to the EP&C is available at www.carolina.com/cascience. • **Click on:** Building Blocks of Science 3D > Correlations
2. Spanish Teacher and Student Materials	All student-facing materials are available in Spanish in both print and digital formats. Teacher instruction is also available in Spanish.



Coming soon: Digital Spanish Teacher's Guide



Hoja de investigación para el alumno 1B Nombre _____

¿Crecerán las semillas de rábano? Fecha _____

1. Necesitarás los siguientes materiales para cultivar las semillas de rábano:
- 1 bolsa de semillas de rábano (para compartirla con los miembros de tu grupo)
- 1 toalla de papel
- 1 marcador permanente (para compartirlo con los miembros de tu grupo)
- 1 bolsa de plástico resellable
- Agua

2. Prepara una toalla de papel para las semillas de rábano. Coloca la toalla de papel en un recipiente con agua. Después, extráela y exprímela suavemente para expulsar el exceso de agua, tal como lo demostró el profesor anteriormente. No quieres que la toalla gotee.

3. Usa el marcador permanente para anotar tu nombre en la bolsa de plástico.

4. Dobla la toalla de papel en cuartos para que quepa bien en la bolsa de plástico. Comprueba que quepa antes de avanzar al siguiente paso.

5. Extrae la toalla de papel de la bolsa y abre el último doblez que hiciste. Con cuidado, coloca 10 semillas de rábano de la bolsa del grupo sobre la toalla de papel. Asegúrate de que las semillas no se toquen.

6. Vuelve a doblar la toalla de papel para cubrir las semillas. Presiona la toalla de papel hacia abajo para mantener las semillas en su lugar y vuelve a introducir la toalla de papel en la bolsa de plástico.

7. Expulsa aire de la bolsa para que quede plana al sellarla. Vuelve a presionar sobre las semillas para cerciorarte de que permanezcan en su lugar.

8. Levanta la mano cuando la bolsa esté lista. Cuando el profesor te llame, lleva la bolsa sellada con cuidado en la palma de la mano y entrégasela.

9. Responde a las siguientes preguntas en tu cuaderno de ciencias:
- ¿Por qué no quieres que las semillas se toquen dentro de la bolsa?
- ¿Crees que las semillas podrán crecer sin suelo? ¿Por qué sí o por qué no?
- Haz un bosquejo del aspecto que crees que tendrá la planta cuando haya crecido por completo.

District Lens and Helpful Supports	Evidence from Plant and Animal Structures
3. 5Es	The 5Es are identified for each lesson: • Lesson Overview Charts (pgs. xxv-xxix) • Side column at the start of each investigation
4. Alignment to ELA Programs and ELD Standards	Correlations to Benchmark, Wonders, and CA ELD Standards are found at www.carolina.com/cascience • **Click on:** Building Blocks of Science 3D > Correlations
5. Common Core Math and ELA	The Language Arts and Math Standards are identified for each lesson: • Lesson Overview Charts (pgs. xxv-xxx)

Disciplinary Core Idea
- **LS1.A:** Structure and Function

Science and Engineering Practice
- Engaging in Argument from Evidence

Crosscutting Concept
- Systems and System Models

5Es
- Engage
- Explore

Lesson 1: Structures Used for Survival

Investigation Overview

Investigation A: Pre-Unit Assessment: How Are an Organisms' Structures Adapted for Its Environment?

5Es: Engage

As a pre-unit assessment, students consider how different structures are linked to the survival, growth, and reproduction of organisms.

- **Teacher Preparation:** 10 minutes
- **Lesson:** 30 minutes

Tell Me More! A kangaroo keeps its baby in its pouch until the baby is old enough to walk and find food on its own. Is a kangaroo's pouch a structure for survival, growth, or reproduction? Explain.

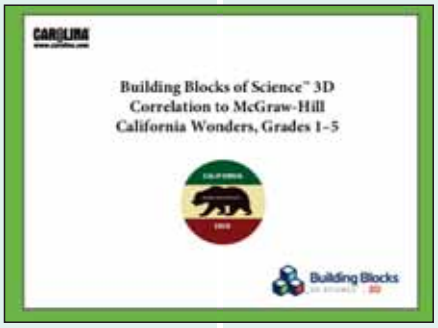
Investigation B: Will Seeds Grow Inside a Plastic Bag?

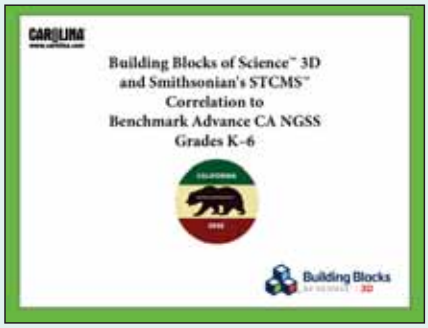
5Es: Engage, Explore

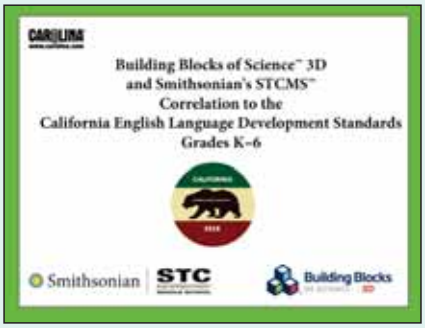
Students plant radish seeds in a plastic bag and make predictions about their growth.

- **Teacher Preparation:** 20 minutes
- **Lesson:** 30 minutes

Tell Me More! Some plants grow faster than others. An oak tree can take more than 30 years to grow to its full size. A rose bush will take about six weeks to begin to flower. Does the same idea relate to animals? Do animals grow at the same rate? Provide examples.







Language Arts and Math Standards

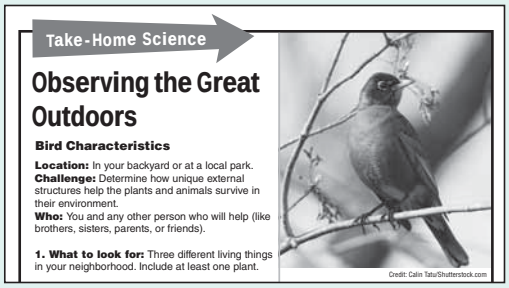
Language Arts
- **RI.4.1:** Key Ideas and Details
- **RI.4.2:** Key Ideas and Details
- **RI.4.3:** Key Ideas and Details
- **SL.4.1:** Comprehension and Collaboration
- **W.4.1:** Text Types and Purposes
- **W.4.2:** Text Types and Purposes

Math
- **4.OA.A:** Use the four operations with whole numbers to solve problems.

Plant and Animal Structures, Grade 4

To access resources online, visit **www.carolina.com/bbs3dreview** and click on ***Plant and Animal Structures.***

District Lens and Helpful Supports	Evidence from Plant and Animal Structures
6. Take-Home Science	Take-Home Science Activities reinforce learning.
7. Safety	Safety, pgs. xvii-xviii
8. Literacy Support	• Literacy Articles provide additional informational text to support investigations. • Literacy Connections (pgs. 200-202) provide additional literacy strategies
9. Science in the News	Pull phenomena from today's news into your classroom with these projects (pgs. 203-206).


Take-Home Science

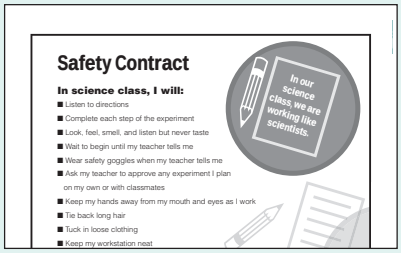
Observing the Great Outdoors

Bird Characteristics

Location: In your backyard or at a local park.
Challenge: Determine how unique external structures help the plants and animals survive in their environment.
Who: You and any other person who will help (like brothers, sisters, parents, or friends).

1. What to look for: Three different living things in your neighborhood. Include at least one plant.

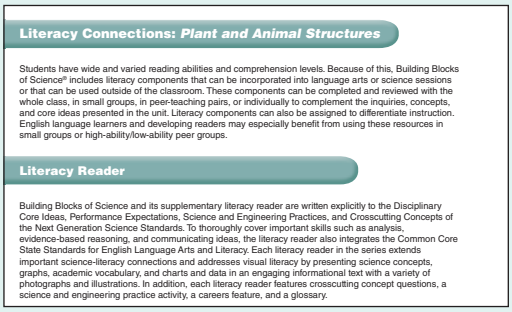
Credit: Calin Tatu/Shutterstock.com


Safety Contract

In science class, I will:

- Listen to directions
- Complete each step of the experiment
- Look, feel, smell, and listen but never taste
- Wait to begin until my teacher tells me
- Wear safety goggles when my teacher tells me
- Ask my teacher to approve any experiment I plan on my own or with classmates
- Keep my hands away from my mouth and eyes as I work
- Tie back long hair
- Tuck in loose clothing
- Keep my workstation neat

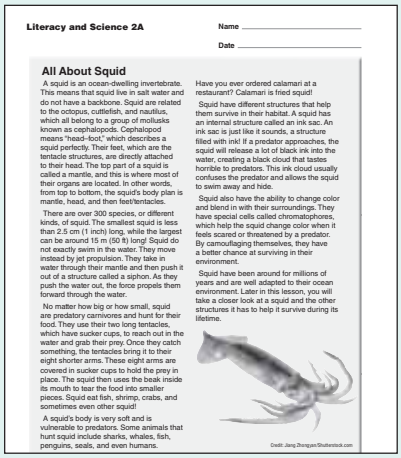
In our science class, we are working like scientists.


Literacy Connections: *Plant and Animal Structures*

Students have wide and varied reading abilities and comprehension levels. Because of this, Building Blocks of Science® includes literacy components that can be incorporated into language arts or science sessions or that can be used outside of the classroom. These components can be completed and reviewed with the whole class, in small groups, in peer-teaching pairs, or individually to complement the inquiries, concepts, and core ideas presented in the unit. Literacy components can also be assigned to differentiate instruction. English language learners and developing readers may especially benefit from using these resources in small groups or high-ability/low-ability peer groups.

Literacy Reader

Building Blocks of Science and its supplementary literacy reader are written explicitly to the Disciplinary Core Ideas, Performance Expectations, Science and Engineering Practices, and Crosscutting Concepts of the Next Generation Science Standards. To thoroughly cover important skills such as analysis, evidence-based reasoning, and communicating ideas, the literacy reader also integrates the Common Core State Standards for English Language Arts and Literacy. Each literacy reader in the series extends important science-literacy connections and addresses visual literacy by presenting science concepts, graphs, academic vocabulary, and charts and data in an engaging informational text with a variety of photographs and illustrations. In addition, each literacy reader features crosscutting concept questions, a science and engineering practice activity, a careers feature, and a glossary.


Literacy and Science 2A

Name _____

Date _____

All About Squid

A squid is an ocean-dwelling invertebrate. This means that squid live in salt water and do not have a backbone. Squid are related to the octopus, cuttlefish, and nautilus, which all belong to a group of mollusks known as cephalopods. Cephalopod means "head–foot," which describes a squid perfectly. Their feet, which are the tentacle structures, are directly attached to their head. The top part of a squid is called a mantle, and this is where most of their organs are located. In other words, from top to bottom, the squid's body plan is mantle, head, and then feet/tentacles.

There are over 300 species, or different kinds, of squid. The smallest squid is less than 2.5 cm (1 inch) long, while the largest can be around 15 m (50 ft) long! Squid do not exactly swim in the water. They move instead by jet propulsion. They take in water through their mantle and then push it out of a structure called a siphon. As they push the water out, the force propels them forward through the water.

No matter how big or how small, squid are predatory carnivores and hunt for their food. They use their two long tentacles, which have sucker cups, to reach out in the water and grab their prey. Once they catch something, the tentacles bring it to their eight shorter arms. These eight arms are covered in sucker cups to hold the prey in place. The squid then uses the beak inside its mouth to tear the food into smaller pieces. Squid eat fish, shrimp, crabs, and sometimes even other squid!

A squid's body is very soft and is vulnerable to predators. Some animals that hunt squid include sharks, whales, fish, penguins, seals, and even humans.

Have you ever ordered calamari at a restaurant? Calamari is fried squid!

Squid have different structures that help them survive in their habitat. A squid has an internal structure called an ink sac. An ink sac is just like it sounds, a structure filled with ink! If a predator approaches, the squid will release a lot of black ink into the water, creating a black cloud that tastes horrible to predators. This ink cloud usually confuses the predator and allows the squid to swim away and hide.

Squid also have the ability to change color and blend in with their surroundings. They have special cells called chromatophores, which help the squid change color when it feels scared or threatened by a predator. By camouflaging themselves, they have a better chance at surviving in their environment.

Squid have been around for millions of years and are well adapted to their ocean environment. Later in this lesson, you will take a closer look at a squid and the other structures it has to help it survive during its lifetime.

Credit: Jiang Zhongyan/Shutterstock.com

Teacher Sheet: Science in the News Article Report

To help students understand a concept, it is often helpful to associate it with an event or phenomenon. Depending on the topic, students may be able to draw connections to recent events in the news or to historical events in your area. Using a literacy tool like an article report is a helpful way to bring in literacy, reading comprehension, and science topics at any grade level.

Science in the News articles can be assigned at any point during a unit to assist students in seeing the "real-world connection" to a particular concept. These articles should be provided by the teacher in lower grades, but students in grades 3–5 may be ready for the challenge of selecting their own articles independently. The following guidelines will help you find appropriate articles. If you ask students to locate their own articles, you may wish to provide some of these guidelines along with the specific requirements for the assignment. Students at all grades are provided with an article report sheet to help them analyze their article and draw connections between it and the unit concepts. For students in grades 3–5, a rubric is provided in this appendix to help them to evaluate an article for bias and credibility.

District Lens and Helpful Supports	Evidence from Plant and Animal Structures
10. Innovators in Science	A diverse group of STEM professionals have impacted science. These scientists and engineers help students see themselves in these careers. Accessible at www.carolina.com/bbs3dreview • **Click on:** Unit Overview > Unit Resources > Digital Resources > Innovators in Science
11. Rubrics for Science	Appendix A, pg. 198
12. Literacy Connections	Appendix B, pgs. 200-202

General Rubric

	Exploration	Vocabulary	Concept Building	Science Notebook
4	Student displays a high level of interest by asking questions, building on concepts, and testing ideas. Provides input and participates in group settings.	Student uses a rich and varied vocabulary that includes appropriate scientific vocabulary that is used in an accurate manner. Writing displays a deep level of understanding of a concept.	Student's responses indicate a higher level of thinking by drawing connections between unit concepts and phenomena. Claims are supported with strong evidence and reasoning.	Student's entries display informative, in-depth responses that demonstrate an understanding of the content. Diagrams are detailed and labeled when applicable. Student draws strong conclusions.
3	Student remains engaged by participating, building on concepts, and testing ideas. Rarely asks questions but is cooperative in group settings.	Student uses a varied vocabulary that includes appropriate scientific vocabulary. Writing accurately describes a concept or experience.	Student's responses during investigations, conversations, and class discussions reflect growth of knowledge. Student understands concepts but may not be able to make strong connections. Claims are supported with evidence and reasoning.	Student's entries provide accurate and descriptive responses. Visual aids, such as data tables and diagrams, are included when applicable. Student draws a conclusion.

Literacy Connections: *Plant and Animal Structures*

Students have wide and varied reading abilities and comprehension levels. Because of this, Building Blocks of Science® includes literacy components that can be incorporated into language arts or science sessions or that can be used outside of the classroom. These components can be completed and reviewed with the whole class, in small groups, in peer-teaching pairs, or individually to complement the inquiries, concepts, and core ideas presented in the unit. Literacy components can also be assigned to differentiate instruction. English language learners and developing readers may especially benefit from using these resources in small groups or high-ability/low-ability peer groups.

District Lens and Helpful Supports	Evidence from Plant and Animal Structures
13. Differentiated Instruction	• Cross-curricular Extensions (pg. 99) • Teaching Tips (pg. 54) • Differentiation Strategies (pg. 37)
14. Teacher Preparation and Support	• Background Information (pg. 87) • Teacher preparation for investigations (pg. 86) • Teacher Answer Keys (pg. 141, Student Investigation Sheet 4A.2: Teacher's Version) • Teaching Tips (pg. 94)

EXTENSIONS

From Root to Tip
Ask students to measure the height of the radish plant they have been growing. Collect height data from the entire class and have students use it to create a line plot. Challenge students to use the line plot to answer the following questions:

- What is the difference in height between the tallest plant and the shortest plant in the classroom?
- Which height is the most common?
- What is the difference in height between your plant and the plant of the person sitting next to you?

The Giving Tree
Read *The Giving Tree* by Shel Silverstein. Compare the parts of a tree with the parts of a flower. Are these parts considered internal or external structures?

Teaching Tip

Challenge students by asking them to think about how animals grow and develop differently with exoskeletons and endoskeletons. You may want to discuss molting, or shedding, which is common for animals with exoskeletons.

Differentiation Strategy

Use a Venn diagram to help students organize their thoughts about organisms' structures and behaviors. You can compare plants and animals or two different types of animals or plants. Help students identify similarities and differences by noting structures or behaviors specific to each organism. For example, you may wish to compare land and marine organisms.

BACKGROUND INFORMATION

Like animals, plants have **internal** and **external structures** that serve different functions for survival, growth, and reproduction. **Leaves** are the site of photosynthesis, a key life process in plants. The leaves gather energy from the Sun and facilitate gas exchange. Roots anchor the plant, holding it upright in the soil. The roots also draw water and minerals from the soil and pass them upward to other parts of the plant. To assist in the movement of water, plants have internal, vein-like structures called vascular tissues. These veins carry the water and minerals absorbed from the roots to other parts of the plant. The stem supports the plant structures that are above ground and also contains veins to help transport water all around the plant.

Teacher Sheet 4B

Sheep Brain Dissection Guide and Questions

Follow these steps as you dissect the sheep brain for the class.

1. Put on disposable gloves, safety goggles, and an apron. Direct all students to do the same.

2. Hold up the sheep's brain for the class to observe. Explain that a sheep's brain looks similar to a human's, only smaller. Though not an exact match, students can get an idea of what their own brain looks like by observing this sheep's brain.

3. Ask students to locate the cerebrum, cerebellum, and brain stem on the sheep's brain. Review what each part does and then ask:

- Which part of the brain do you think processes the information from the eyes? The nose? The ears? The mouth? The skin? *(Cerebrum)*

NOTE: Refer to Student Investigation Sheet 4A.2: *What Does the Human Brain Look Like?* for sensory locations.

4. Explain that when we see, smell, taste, touch, or hear something, the information is immediately sent through sensory receptors such as nerves, to our brain. The brain helps us make sense of what we are seeing, smelling, tasting, touching, or hearing and helps us figure out the correct way to respond.

5. Use the scalpel to cut the brain in half lengthwise. Explain that there are specialized structures inside the brain. These parts tend to be small and difficult to find, but they are very similar to structures found in the human brain.

6. Explain that the brain can store information. We call this stored information "memory." Ask:

- How many of you can remember an event that happened last week? Last month? Last year? Several years ago?
- Have you ever smelled something that reminded you of something else? Maybe you were at a friend's house, and their mom was baking cookies. That smell made you think of your mom. Someone may have sprayed a perfume in the store that reminded you of a hug from grandma.
- Have you ever heard a song on the radio that made you feel strong emotions?
- Have you ever eaten food at a restaurant and it made you think of another time?

7. All of these are examples of how our brain can store memories that are associated with our senses. Little things we smell, taste, hear, see, or touch can remind of us something that happened in the past. (Refer to the diagram on Student Investigation Sheet 4A.2 for sensory locations as needed.)

8. Pass around the halves of the brain for students to observe. Encourage students to use their hand lenses during their observations.

Teaching Tip

Clarify that the veins in plants are different from the veins in humans. Plant veins move water and nutrients throughout a plant's body, while human veins move blood back to the heart. It may be helpful to refer to both arteries and veins as "blood vessels" when discussing the human circulatory system.

TEACHER PREPARATION

Investigation A

1. If you have not already done so, fill the plastic tank from the kit halfway with warm water. Add approximately 60 bean seeds, and soak them overnight before this investigation.

2. Make a copy of Student Investigation Sheet 3A: *What Are the Parts of a Seed?* for each student.

3. Prepare a foam tray for each group of four students. On each tray, place four pieces of paper towel, four dried bean seeds, four soaked bean seeds, and four hand lenses.

4. Have available students' bags of radish seeds from Lesson 1.

Summary of Evidence for *Plant and Animal Structures*

How does a phenomenon/problem organize the learning?

The unit begins with a class discussion of an **Anchoring Phenomenon** and a viewing of a Phenomena Video to generate student-driven questions about the unit's central phenomena. Each lesson kicks off with an **Investigative Phenomenon**, sparking student questions that can be explored through that lesson's investigations, which put phenomena directly into students' hands. Questions are provided for the teacher to help guide instruction, dispel misconceptions, and connect concepts to prior learning as students engage with the unit's the three dimensions through hands-on investigations, data gathering and analysis, notebooking, and discourse.

How are learning opportunities sequenced to enable students to make sense of the phenomena or problems?

The sequence is clearly presented in the **Evidence of Instructional Scaffolding** chart in the front of the Teacher's Guide. Performance Expectations were initially mapped out along with the Crosscutting Concepts, Science and Engineering Practices, and Disciplinary Core Ideas to ensure grade-level instruction of NGSS. Each lesson connects to the previous, creating a seamless, connected instructional path for students. Where appropriate, engineering and other science-discipline PEs are integrated to eliminate any "silos of science." Students experience science and engineering as an integrated whole.

What is the path of student thinking from their prior knowledge to the expected three-dimensional learning outcomes?

By starting with an **Anchoring Phenomenon** and a **Pre-Assessment** lesson to tap into students' prior knowledge, the teacher is able to evaluate what understandings students bring to the sequence of learning for the new unit. Teacher questioning strategies are built into each investigation to tie to the unit's three dimensions, clarify any misconceptions, and help students make meaning out of what they discover in the investigations.

How do students show/demonstrate their three-dimensional understanding of the phenomenon?

- **Pre-Unit Assessment and Post-Unit Assessment Opportunities:** The pre-unit assessment asks students to draw upon previous knowledge, allowing teachers to gauge their levels of understanding. The post-unit assessment touches upon the topics and concepts from the entire unit and evaluates students' learning. Students are asked to compare the pre-unit assessment and post-unit assessment activities to evaluate growth.
- **Formative Assessment Strategies:** At the end of each lesson, specific strategies are listed for each investigation. These include ways to utilize Student Investigation Sheets and Tell Me More prompts as assessment tools. In lower grades, an Assessment Observation Sheet lists what to look for as you work with small groups of students.
- **Literacy and Digital Components:** These resources can be assigned to differentiate assignments and to assess student progress as needed.
- **General Rubric: Appendix A** includes a rubric that provides an expected progression of skills and understanding of science content. These guidelines can be used to assess students throughout the course of the unit.
- **Summative Assessment:** This unit-specific, cumulative assessment allows students to demonstrate their understanding of content presented by responding to questions in a variety of formats. Each question is aligned to performance expectations and provides insight on students' understanding of the concepts addressed. An answer key is provided, as well as a chart that indicates the performance expectation addressed by each question and lessons to revisit if remediation is required.
- **Digital Scenario-based Assessment:** This digital assessment resource supplies phenomena-driven questions that apply the unit's learning to new, authentic situations. It provides an alternative form of summative assessment that can be administered and corrected by the computer. Scores are sent to a report for the teacher.

Evidence of Instructional Scaffolding

Scaffolding is a crucial yet natural element in all classrooms. Building Blocks of Science strives to simplify this instructional strategy by integrating this guided process into each unit, systematically building upon student knowledge, using hands-on learning to reinforce concepts, and employing student-driven inquiry. These strategies introduce new concepts and, with practice and review, lead students toward mastery. It is important to integrate scaffolding not only throughout the unit but also throughout each lesson. As students demonstrate understanding of a concept, they should be encouraged to take a leadership role in class or to attempt assignments independently. Additionally, scaffolding reveals opportunities for differentiation. Below-level learners require more reinforcement as they learn new skills, so the process toward mastery will need to be adjusted. Above-level learners do not need as much support and achieve mastery more quickly; therefore, these students can be assigned more independent study.

	Lesson 1 ▸	Lesson 2 ▸	Lesson 3 ▸
OBJECTIVES	■ Recognize that plants and animals have special structures and behaviors that enable them to survive in their environments. ■ Identify adaptations of plants and animals that are essential for survival, growth, and reproduction. ■ Design an environment for seeds to grow in and make predictions about their growth.	■ Describe structural adaptations and how they vary based on an animal's environment. ■ Use external and internal structures to explain how animals survive in their environments. ■ Argue how properly functioning external and internal structures are important for the survival of animals. ■ Investigate both internal and external adaptations using a preserved squid specimen.	■ Identify and explain the purpose of internal and external structures in a plant and how these structures help the plant survive, grow, and reproduce. ■ Examine and compare seeds to draw conclusions about plant development. ■ Describe the different appearances as adaptations. ■ Dissect and identify the internal structures of a flower and explain how they relate to reproduction.
SCAFFOLDING	Students should know: ■ Organisms have the same basic needs: water, shelter, food, and air. The amount of each resource required to survive differs among plants and animals. ■ Organisms have adaptations that help them survive, grow, and reproduce in their environments. ■ Adaptations can be structures, like gills, or behaviors, like migrating. ■ Plants require sunlight to make their own food through the process of photosynthesis.	Students should know: ■ Animals have structural and behavioral adaptations that assist in their survival, reproduction, and growth. ■ Internal and external structures must work together in order for an animal to thrive. ■ Certain structures are unique to animals in a certain environment. An animal may not be able to thrive in a nontypical area if it does not have the appropriate structures.	Students should know: ■ Plants begin as seeds, which have structures to protect the plant as it begins to grow. ■ Plants have internal and external structures that must work together in order for the plant to survive, grow, and reproduce. ■ Most plants have leaves, a stem, and roots, but some types have plants have specialized structures that are adapted to their environment. ■ The reproductive success of plants is dependent on the transportation of pollen.

	Lesson 4 ▸	Lesson 5 ▸	Lesson 6
OBJECTIVES	■ Investigate and analyze the five senses to determine their importance in survival. ■ Describe how information is processed, and predict the effects on information processing if the brain is damaged. ■ Explore the brain and use evidence to explain its role in sensing the world. ■ Identify the importance of memory when processing information in order to stay safe.	■ Identify the structures of the eye and their individual functions. ■ Explain how light waves and their frequencies affect our experience of vision. ■ Describe the role of the brain in processing information and its importance in recognizing color, shape, and motion. ■ Examine the cause-and-effect relationship between light and pupil size. ■ Use a cow eye to draw comparisons between human and animal eyes.	■ Develop a model that demonstrates an understanding of the human eye and how it could be more powerful. ■ Compare the eyes of other organisms to determine the weaknesses of the human eye. ■ Present models to communicate knowledge about the eye's structures and functions. ■ Evaluate models to argue which model is most successful.
SCAFFOLDING	Students should know: ■ The five main senses are touch, smell, taste, hearing, and sight. ■ Senses help an animal survive by making sense of the world around them. ■ All senses send messages to the brain; when a message is processed, the result is a thought or a reaction. ■ The brain is able to store information as memories to make information processing faster. ■ Different types of animals rely on different senses.	Students should know: ■ Vision is a sense that many animals use to survive, but all animals have a different experience of vision. ■ The eye contains special structures that transmit and interpret light waves. ■ Different frequencies of light create colors. ■ To prevent damage, the eye is able to change the amount of light that can enter the eye. This also helps to focus objects. ■ Images are inverted in the eye, but the brain is able to flip the image when it processes information.	Students should know: ■ Animal eyes are adapted to respond to light differently based on the needs of the animal. ■ Plants are able to respond to light; light is required for their growth, reproduction, and survival. ■ Not all animals have precise vision, but many are able to tell the difference between light and dark.

Building Blocks OF SCIENCE™ | 3D

CAROLINA®
www.carolina.com

Learning Framework

Kindergarten	**Push, Pull, Go** *K-PS2-1; K-PS2-2; K-2-ETS1-1; K-2-ETS1-2*	**Living Things and Their Needs** *K-LS1-1; K-ESS2-2; K-ESS3-1; K-ESS3-3; K-2-ETS1-2*	**Weather and Sky** *K-PS1-1; K-PS3-1; K-PS3-2; K-ESS2-1; K-ESS3-2; K-2-ETS1-1; K-2-ETS1-2*
1st Grade	**Light and Sound Waves** *1-PS4-1; 1-PS4-2; 1-PS4-3; 1-PS4-4; K-2-ETS1-1; K-2-ETS1-2*	**Exploring Organisms** *1-LS1-1; 1-LS1-2; 1-LS3-1; K-2-ETS1-2*	**Sky Watchers** *1-ESS1-1; 1-ESS1-2*
2nd Grade	**Matter** *2-PS1-1; 2-PS1-2; 2-PS1-3; 2-PS1-4; K-2-ETS1-1; K-2-ETS1-2*	**Ecosystem Diversity** *2-LS2-1; 2-LS2-2; 2-LS4-1; K-2-ETS1-2; K-2-ETS1-3*	**Earth Materials** *2-PS1-1; 2-ESS1-1; 2-ESS2-1; 2-ESS2-2; 2-ESS2-3; K-2-ETS1-1; K-2-ETS1-2*
3rd Grade	**Forces and Interactions** *3-PS2-1; 3-PS2-2; 3-PS2-3; 3-PS2-4; 3-5-ETS1-1; 3-5 ETS1-2*	**Life in Ecosystems** *3-LS1-1; 3-LS2-1; 3-LS3-1; 3-LS3-2; 3-LS4-1; 3-LS4-2; 3-LS4-3; 3-LS4-4; 3-5-ETS1-2*	**Weather and Climate Patterns** *3-ESS2-1; 3-ESS2-2; 3-ESS2-3; 3-ESS3-1; 3-5-ETS1-2*
4th Grade	**Energy Works** *4-PS3-1; 4-PS3-2; 4-PS3-3; 4-PS3-4; 4-PS4-1; 4-PS4-3; 4-ESS3-1; 3-5 ETS1-2; 3-5-ETS1-3*	**Plant and Animal Structures** *4-LS1-1; 4-LS1-2; 4-PS4-2; 3-5-ETS1-2*	**Changing Earth** *4-ESS1-1; 4-ESS2-1; 4-ESS2-2; 4-ESS3-2; 3-5-ETS1-2*
5th Grade	**Structure and Properties of Matter** *5-PS1-1; 5-PS1-2; 5-PS1-3; 5-PS1-4; 3-5-ETS1-2*	**Matter and Energy in Ecosystems** *5-PS3-1; 5-LS1-1; 5-LS2-1; 5-ESS2-1; 5-ESS3-1; 3-5-ETS1-3*	**Earth and Space Systems** *5-PS2-1; 5-ESS1-1; 5-ESS1-2; 5-ESS2-1; 5-ESS2-2; 5-ESS3-1; 3-5-ETS1-2*

Have questions? Please join us at www.carolina.com/bbs or www.carolina.com/cascience, or contact us at cascience@carolina.com.

CCPBB19031501