

**Grade 4:** Life Science Module

# Lesson Sequence 7: Plant Structures Are a System

## Lesson Sequence 7: Plant Structures Are a System

### Overview

**Total Time: 2.5 hours of instruction (divided into three sections)**

In this lesson sequence, students learn that, like animals, plants have structures that function together as a system for survival. Students first observe a variety of plant parts and predict the function of each part. They then draw a simple plant diagram, and practice turning the diagram into an explanatory model. Finally, students read a text on the different functions of the basic parts of a plant.



### Lesson Sequence Focusing Question and Big Ideas

**How do plants meet their needs for survival as a system?**

- Plants have an interworking set of structures that are specialized for survival in specific ecosystems.

### Long-Term Learning Addressed (Based on NGSS)

Develop a model with evidence that supports an explanation that roots, stems, veins, leaves, and flowers function as a system to support growth and reproduction. (Based on NGSS 4-LS1-1)

This lesson sequence explicitly addresses:

#### Science and Engineering Practices:

- Developing and Using Models:** Develop a model using an analogy, example, or abstract representation to describe a scientific principle or design solution. *Students develop a model of a plant and show the components working together for survival. They label roots, stems, and leaves and show the relationships among them. Note: This Science and Engineering Practice is not explicitly aligned with 4-LS1-1.*

#### Crosscutting Concepts:

- Systems and Systems Model:** A system can be described in terms of its components and their interactions. *A plant is a system of structures composed of roots, stems, veins, leaves, and flowers. Additionally, plants are a combination of many systems that produce energy derived from sunlight, water, and air that are necessary for growth and reproduction.*
- Structure and Function:** The way in which a living thing is shaped and its substructures determine its properties and function. *Students draw parallels between animal and plant structures and add examples of plant structures and their functions to an anchor chart. Note: This Crosscutting Concept is not explicitly aligned with 4-LS1-1.*

#### Disciplinary Core Ideas:

- LS1.A Structure and Function:** Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction. *Students learn the structures and functions of roots, stems, and leaves and how they help plants survive and reproduce.*



## Lesson Sequence Learning Targets

- I can create a model that shows how plants have special structures for completing specific functions.
- I can explain how the parts of a plant work together as a system for survival.

## Ongoing Assessment

- Student science notebook: Plant Structures Are a System entry
  - Reading about Specialized Structures and Functions
- Participation in Back-to-Back and Face-to-Face protocol

## Agenda

**Total Time: 2.5 hours of instruction**

### Section 1

#### 1. Opening

- A. Observing Plant Parts (10 minutes)
- B. Reviewing Learning Targets (5 minutes)

#### 2. Evaluating and Communicating Information

- A. Diagramming Grass Plants (25 minutes)

*Optional Extension: Lemon of a Lesson*

### Section 2

#### 1. Obtaining Information

- A. Close Reading: “Roots, Stems, Leaves, Oh My!” (25 minutes)
- B. Adding to Plant Structures and Functions Anchor Chart (15 minutes)

#### 2. Constructing Explanations

- A. Back-to-Back and Face-to-Face: Trading Cards (15 minutes)
- B. Adding to Concepts Scientists Think About Anchor Chart (5 minutes)

*Optional Extension: Parts of Plants Experiment*

### Section 3

#### 1. Evaluating and Communicating Information

- A. Diagramming Plants from an Ecosystem (25 minutes)

#### 2. Obtaining Information

- A. Revisiting Plant Cards for an Ecosystem (15 minutes)

#### 3. Evaluating and Communicating Information

- A. Adding to Plant Structures and Functions Anchor Chart (10 minutes)

### Teaching Notes

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#### **Purpose of lesson sequence and alignment with NGSS standards:**

- In this lesson sequence, students deepen their understanding of structure and function (a Crosscutting Concept) by examining the basic structures of plants (a Disciplinary Core Idea).
- In Section 1, students observe a variety of plant parts and predict the function of each part. They then draw a plant diagram.
- In Section 2, students read text to gather information about the different structures of plants and how they function. Students learn how these structures work as a system (a Crosscutting Concept), and how they must all be present in order for the plant to survive. Students add this information to a plant diagram, turning it into an explanatory model (a Science and Engineering Practice).
- In Section 3, students learn how the general structures of a plant (leaf, stem, and roots) can be specialized for survival in a specific ecosystem. They create an explanatory model of a plant specific to their assigned ecosystem.

#### **How it builds on previous work in the Life Science Module:**

- Students have studied the structures of animals and how the structures work together for survival. They have also looked at structures that are particularly suited for survival within an ecosystem. Now they will look at how plants also have structures for survival. In Section 3, they will look at plant structures that are particularly suited for survival within specific ecosystems. By studying the plants in an ecosystem, students construct a deeper understanding of the desert, grassland, and tundra ecosystems. Students also build on the work they started in Lesson Sequence 5 in developing explanatory models.

#### **How it reinforces the CCSS Standards and EL Education’s Language Arts Grade 4 Module 2:**

- Language Arts Grade 4 Module 2 focuses on defense mechanisms needed for survival. Encourage students to see the connections between animal adaptations for survival and plant adaptations for survival.
- Students do a close read in this lesson in order to determine the gist, identify unfamiliar vocabulary words, and learn about how structures function in plants. Students use some of the same practices for close reading that they are familiar with from the Language Arts Grade 4 Module 2. The close reading in this lesson sequence provides students the opportunity to practice reading informational texts (CCSS ELA RI.4.1 and RI.4.3).
- Students may be familiar with the Back-to-Back and Face-to-Face protocol from the Language Arts Grade 4 Module 2. This protocol provides students the opportunity to practice speaking and listening skills (CCSS ELA SL.4.1)

#### **Possible student misconceptions:**

- Students may have the misconception that plants are not alive because they don’t see plants move like animals. Explain that plants are indeed alive and, as is the case with animals, can survive, thrive, or die in an environment depending on their access to the resources that they need for survival.

- Students may not think of trees, grass, or vegetables as plants. In fact, while the leaves, roots, and stems of these various plants all look different, all of them are plants and have these basic structures in common.
- Students may believe that plants absorb all the resources that they need for survival through their roots. Plants actually absorb oxygen and solar energy through their leaves; water and minerals are absorbed through the roots.

**Possible broader connections:**

- Encourage students to think of how they interact with plants throughout their day. Examples: Sports fields are covered in grass, the food we eat comes from plants, and much of our clothing is made from plant fibers.
- Connect the structures and functions of plant parts to the structures and functions of animal and human bodies. Example: The bones of a vertebrate support the body and give it a shape, and the stem of a plant fulfills a similar function.
- Make connections among animal, plant, and designed structures. Example: The veins of a leaf are shaped and function like the arteries in a human. Both have a similar structure and function to that of a drinking straw.
- Consider growing additional plants in your classroom. Students benefit from casual observations of growing and living things. Students can also take responsibility for the care of the plants.

**Areas where students may need additional support:**

- Students may need additional support with drawing neat, accurate diagrams. Using the student diagrams from Lesson Sequence 5 as a guide, consider how to support students. Example: Place a piece of Plexiglass over the actual plant and have students trace the plant using transparency paper on top of the Plexiglass.
- If students are unfamiliar with the close reading practices used in Language Arts Grade 4 Module 2, take a few minutes to introduce them to these practices. Consider providing additional support:
  - For students who are overwhelmed by too much print on a page: Consider copying the text so that there is only one paragraph on each page, with an organized space for recording the gist and meanings of the unfamiliar words on that page.
  - For students who may need additional support with paraphrasing: Consider providing running notes on today's text.
  - Offer selected shorter passages to specific groups based on the readiness and needs of the group. This gives students an opportunity to read a complex text within the 4th grade level span but differentiates the length of the text, not the complexity.
  - For ELLs and students who may need additional support with reading and/or writing: Strategically pair students with a peer model.
  - For students who may need additional support determining the gist: Consider highlighting or underlining key phrases in their individual copy of the text in advance. This will highlight or clearly identify the gist up for them.

### Down the road:

- Continue to care for the grass and radish plants seeded in preparation for the next lesson sequence, in which students will design their own experiment with these plants.
- Students will use the information from the Plant Structures and Functions anchor chart in the final performance task.
- Students will draw an explanatory model of their fictional animal in Lesson Sequence 11. Use the plant diagrams in this lesson sequence as formative assessment and consider how best to prepare students for the performance task.

### In advance:

- Read each section and complete the Preparing to Teach: Self-Coaching Guide.
- Review the Back-to-Back and Face-to-Face protocol (see Classroom Protocols pack on Curriculum.ELeducation.org).
- Choose a student exemplar explanatory model of a chicken wing from Lesson Sequence 5 to use as a model during Section 1 to show students.
- Set up a document camera to display the student exemplar explanatory model and other documents throughout the lesson sequence (Optional).
- Recall students ecosystems expert groups from Lesson Sequence 2. Students will move into these groups during Section 3.
- Gather:
  - Gather the following plant cards from Lesson Sequence 2: coneflower, prickly pear cactus, and diamond leaf willow. The Desert expert group will use the prickly pear cactus plant card, the Grassland expert group will use the coneflower plant card, and the Tundra expert group will use the diamond leaf willow plant card. Each ecosystem expert group needs at least three copies of their card so students can read the cards. Make copies as needed.
  - One live desert, one live tundra, and one live grassland plant from an exotic plant nursery (if possible) for Evaluating and Communicating Information in Section 3. If this is not possible, distribute the plant cards from Lesson Sequence 2 earlier in Section 3.
  - Gather a variety of plant parts—such as seeds, burs, thorns, leaves, and flowers—for students to examine during the Opening in Section 1.
  - Gather whole grass plants for students to use in Evaluating and Communicating Information in Section 1. You will need one per every four students. Include the roots, and if possible collect grass plants that have gone to seed. If you cannot gather grass plants locally, consider buying ornamental grass plants from a nursery.
  - Post: Lesson sequence focusing question, lesson sequence learning targets, Plant Structures and Functions anchor chart, Scientists Do These Things anchor chart, Concepts Scientists Think About anchor chart.

### Optional extensions:

- *Lemon of a Lesson:* Consider using if students require additional support in making detailed observations. <<https://www.nsta.org/elementaryschool/connections/200802MinogueConnection.pdf>>

- *Parts of Plants Experiment:* Students design an experiment to isolate the function of the different parts. In one variable, they pick off all the leaves. For another, they break the stem. In yet another, they cut off the roots and replant. Students observe the effects.

## Vocabulary

**leaf:** where food is made

**veins:** tubes that go throughout the plant and carry food and water

**roots:** anchor the plant in the soil and absorb water and nutrients

**tap root:** one main root that goes deep down

**fibrous roots:** many small roots that branch apart and are close to the surface

**stem:** connects the roots to the leaves and gives structure to the plant

**flower:** where seeds are made

**reproduce:** how an adult organism creates a baby organism

**seed:** what an adult plant makes to be able to grow a new, baby plant

**thorn:** a specialized leaf that is adapted to protect a plant from predators

**diagram:** a scientific drawing that is used to show the parts of something

## Materials

### General Materials

- ✓ Lesson sequence focusing question (One to display)
- ✓ Teacher science notebook (From Lesson Sequence 1; one for teacher use)
- ✓ Document camera (Optional)
- ✓ Exemplar student explanatory model of a chicken wing (From Lesson Sequence 5; one to display; see Teaching Notes)
- ✓ Scientists Do These Things anchor chart (Begun in Lesson Sequence 2; added to in Section 1)
- ✓ Student science notebook (From Lesson Sequence 1; one per student)
  - Plant Structures Are a System entry (Page 36 of student science notebook)
- ✓ Grass diagram (One to display)
- ✓ “Roots, Stems, Leaves, Oh My!” (One per student)
- ✓ Plant Structures and Functions anchor chart (New; co-created with students during Section 2)
- ✓ Parts of Plants trading cards (One set per student)
- ✓ Concepts Scientists Think About anchor chart (Begun in Lesson Sequence 2; added to in Section 2)
- ✓ Coneflower diagram (One per two students in Grassland expert group)
- ✓ Prickly pear cactus diagram (One per two students in Desert expert group)
- ✓ Diamond leaf willow diagram (One per two students in Tundra expert group)
- ✓ Extra copies of coneflower, prickly pear cactus, and diamond leaf willow plant cards (From Lesson Sequence 2; see Teaching Notes)

### Science-Specific Materials (gathered by the teacher)

- Variety of plants and plant parts (One set for the class; used in Section 1)
  - Plants with specialized structures, such as cacti or aloe
  - Variety of flowers and leaves
  - Seeds such as burrs, helicopters, pea pods
- Whole grass plants with roots (One for every four students; used in Section 1; see Teaching Notes)
- Plexiglass or transparency sheet (Optional, one per student; used in Section 1; see Teaching Notes)
- Live plants (Optional, one per class; used in Section 3)
  - Desert plant: prickly pear cactus
  - Tundra plant: diamond leaf willow
  - Grasslands plant: coneflower

## Section 1: Opening

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### A. Observing Plant Parts (10 minutes)

- Gather students in a circle on the floor or around a large table.
- Tell them that while they have been learning about the special structures that animals have for survival, plants also have structures for specific functions.
- Direct students' attention to the posted **lesson sequence focusing question**. Read it aloud as students follow along, reading silently in their heads:
  - “How do plants meet their needs for survival as a system?”
- Remind students that they should be thinking about this question as they work through this lesson sequence.
- Place a **variety of plants and plant parts** in the center of the circle. Allow students to examine the plant parts closely, being careful with plants that are still alive <sup>(1)</sup> <sup>(2)</sup>.
- Ask students to keep the lesson sequence focusing question in the back of their minds as they turn and talk to an elbow partner:

*“What is the purpose of each plant structure?” (Responses will vary. Use this time to formatively assess how familiar students are with the structure of plants.)*
- Invite a few students to share out.

### Preparing to Teach: Self-Coaching Guide

1. How can I manage the plant materials for this lesson? How will I ensure that all students can actively observe plants?
2. How can I sustain the students' interest in this activity? (Consider posting specific discussion questions.)

**B. Reviewing Learning Targets (5 minutes)**

- Direct students' attention to the posted lesson sequence learning targets. Ask a volunteer to read them aloud as other students follow along, reading silently in their heads:
  - *“I can create a model that shows how plants have special structures for completing specific functions.”*
  - *“I can explain how the parts of a plant work together as a system for survival.”*
- Invite students to think about what they have already learned about the specialized structures of animals and the functions of these structures. Encourage students to think broadly about possible connections, accepting suggestions that may not be scientifically accurate at this point. Ask <sup>(3)</sup>:
  - *“What structures do you think plants might have that serve a similar function as the structures of animals?”*
- Invite a few volunteers to share out. Record their ideas in the **teacher science notebook** to be returned to later.

**Preparing to Teach: Self-Coaching Guide**

1. How can I use what my students know about the structures and functions of animal parts to support this new learning? Listen for students to suggest structures and functions, such as: “The skeleton and stem both hold up their organism” or “Fur might be similar to the bark because they both cover their organism.”

**Section 1: Evaluating and Communicating Information****A. Diagramming Grass Plants (25 minutes)**

- Point out to students that one of this lesson sequence's learning targets is to create a model about the structures and functions of plants.
- Remind students that they have created models previously when they drew their explanatory model of the chicken wing and earthworm in Lesson Sequence 5.
- Use a **document camera** to display an **exemplar student explanatory model of a chicken wing** <sup>(3)</sup>.
- Tell students that this is a strong example of an explanatory model and give them a few minutes to observe it.
- After 2 minutes, use a total participation technique to invite responses from the group:
  - *“What makes this a strong example of an explanatory model?” (Explains how something works with labels, precise, detailed, revision)*
- Record students explanations on the **Scientists Do These Things anchor chart** under the “Making Models” column.
- Arrange students into groups of four, asking them to take their **student science notebook** with them.
- Ask students to open their student science notebook to the **Plant Structures Are a System entry**.

- Place a **whole grass plant** in the middle of each group of students.
- Tell students that they will now complete a diagram of the grass in the “Diagramming Grass Plant” section of the Plant Structures Are a System entry. Explain that they will return to this drawing multiple times to add labels and descriptions about the function of the various structures, as well as how the structures work together as a system.
- Ask students to start their diagram <sup>(2)</sup>.
- After 10–15 minutes, give students specific positive feedback on their attention to detail and precision in noticing different parts of the grass plant.
- Using a document camera, display the **grass diagram**.
- Tell students to compare their drawing to the grass diagram, and note the parts of the picture that differ from their observation.
- Invite students to turn and talk to an elbow partner:  
*“How do you plan to revise your diagram based on what you’ve noticed in the grass diagram?” (Add more detail, add the different labels)*
- Give students a few minutes to add labels and details to their drawing.
- Remind them that they have been engaged in the work of scientists. Say:  
*“One of the jobs of scientists is to create models. You’ve drawn several explanatory models in past lesson sequences. The grass drawing is becoming an explanatory model. This model is not complete, though, because as scientists learn more, they return to their models and add more information, and change things based on new observations and new learning. You will do the same with this explanatory model.”*

### Preparing to Teach: Self-Coaching Guide

1. Which student exemplar should I use? How can I reinforce the Praise, Question, Suggestion protocol?
2. How can I use this activity as an informal assessment, and capture which students know the basic parts of plants and which do not? (Students may not know the names of the basic parts of plants. Do not give them that information. Encourage students to add labels using their own words. They can revise the labels with the correct terminology when they compare their explanatory model with the grass diagram.)

## Section 2: Obtaining Information

### A. Close Reading: “Roots, Stems, Leaves, Oh My!” (25 minutes)

- Distribute **“Roots, Stems, Leaves, Oh My!”**
- Tell students that they will work hard as readers today to learn about the basic structures of plants and their functions. Remind students that when they read complex texts, they often need to read the text multiple times. Tell them that it’s okay if they do not understand everything the text says the first time <sup>(1)</sup>.
- Remind students of some of the close reading practices they follow in their Language Arts lessons <sup>(2)</sup>:

- Read small chunks of the text slowly and think about the gist.
- Talk with my partner or group about the text.
- Circle or underline words I don't know.
- Write notes or answer questions about the text.
- Refer students to the “Obtaining Information” section in the Plant Structures Are a System entry in their student science notebook. Let students know they are going to have the opportunity to independently read the text. Tell them to stop after each paragraph during this first read and jot down the gist of that paragraph and any unfamiliar vocabulary in their notebook. Review and model finding the gist as necessary.
- Ask students to begin reading. Circulate and support them as they read and determine the gist.
- After 7 minutes, ask students to turn and talk to an elbow partner <sup>(3)</sup>:

***“What gist notes or vocabulary words did you write down? What similarities and differences are there between our notes?”***

- After 5 minutes, refocus the whole class. Point out to students that their job is to learn everything they can about plant structures and their functions. Explain that they should gather as many *facts*, *definitions*, and *details* as they can as they read. Clarify these terms as needed <sup>(4)</sup>.
- Tell students they are going to read the text again. This time, they should read closely for details to add to the “Reading Closely about Structures and Functions” graphic organizer in the Plant Structures Are a System entry of their science notebook.
- Consider doing a brief guided practice, as necessary <sup>(5)</sup>.
- Give students 10 minutes to reread the text on their own, writing down key details on their graphic organizer in their science notebook.
- Ask students to begin reading. Circulate and support students as they read.
- Invite students to periodically Think-Pair-Share:

***“What is one structure you noticed in the first paragraph? What is the function of that structure?” (Roots—anchoring plants into the ground)***

### **Preparing to Teach: Self-Coaching Guide**

1. How can I support my readers who struggle?
2. Are my students familiar with the Close Readers Do These Things anchor chart? Can I use that to support them for this reading?
3. What norms are in place for elbow partners? What would help my students to keep those norms?
4. What do my students understand about *facts*, *definitions*, and *details*?
5. What structure will I use for the guided practice?

### **B. Adding to Plant Structures and Functions Anchor Chart (15 minutes)**

- Remind students that they captured their thinking about the special structures that animals have for survival on the Animal Structures and Functions anchor chart in Lesson Sequences 3–5, and they will use the same method of recording their learning about the special structures of plants.

- Direct students' attention to the posted **Plant Structures and Functions anchor chart**.
- Point out that it looks different, but the thinking is the same. Plants have structures that fulfill functions. Students should add reasoning that explains how the structures fulfill the function <sup>(1)</sup>.
- Using a total participation technique, invite responses from the group <sup>(2)</sup>:  
***“What are the basic structures and functions of plants that we read about in ‘Roots, Stems, Leaves, Oh My!’?” (Responses will vary. Record all valid answers on the Plant Structures and Functions anchor chart and refer to the supporting materials for possible responses.)***
- Encourage students to add new information to the Reading Closely about Structures and Functions graphic organizer in their science notebook as the information is recorded on the class anchor chart.
- Give students 5 minutes to return to their grass plant explanatory model from Evaluating Information and add the function to each labeled part.

### Preparing to Teach: Self-Coaching Guide

1. How successfully has the class used the Animal Structures and Functions anchor chart? What additional support may they need?
2. After previewing the text, what do I anticipate my students will say? How will I capture these on the Plant Structures and Functions anchor chart?

## Section 2: Constructing Explanations

### A. Back-to-Back and Face-to-Face: Trading Cards (15 minutes)

- Distribute the **Parts of Plants trading cards**.
- Tell students they are going to use the Back-to-Back and Face-to-Face protocol. Remind them that they used this protocol in the Language Arts module. Review as necessary. Refer to the Classroom Protocols pack on Curriculum.ELeducation.org for the full version of the protocol.
- Explain that each card has a scenario about a plant structure. Students will have time to prepare an explanation for the scenario before beginning the protocol. Remind them to give some evidence to support their thinking. Model as needed.
- Give students 2 minutes to prepare a response for their given scenario. If they want, they can capture their thinking in their student science notebook.
- Tell students they are going to practice constructing an explanation using the Back-to-Back and Face-to-Face protocol <sup>(1)</sup>.
  - Have students find a partner and stand back-to-back with each other, being respectful of space.
  - Ask students the following question and give them 30 seconds to consider how they will respond:

***“Read the scenario on your card aloud. What is your explanation for the question written on your card?”***

- Invite students to turn face-to-face to share their responses.
- Have students repeat with a new partner.
- As students share, circulate to take notes on student conversations in the teacher science notebook.
- Once students have shared with a few partners, invite them to return to their seats <sup>(2)</sup>.

### Preparing to Teach: Self-Coaching Guide

1. It may be helpful to let students trade cards during each round of the Back-to-Back and Face-to-Face protocol. That way they can practice making multiple explanations. Can I give extra time to this activity?
2. Would it be helpful for some students with exemplary explanations to share their explanations with evidence aloud to the whole class?

### B. Adding to the Concepts Scientists Think About Anchor Chart (5 minutes)

- Refocus students' attention on the posted lesson sequence focusing question:
  - “How do plants meet their needs for survival as a system?”
- Using a total participation technique, invite responses from the group:
 

*“Which part of the question can you answer, and which part can't you answer yet?” (Responses will vary. Students may be able to name the basic structures that work together as a system but will not be able to be fully understand what it means for a plant to survive.)*
- Draw students' attention to the **Concepts Scientists Think About anchor chart**. Read aloud what is already written under the “System” column <sup>(1)</sup>.
- Ask:
 

*“What happened when any part of the plant was removed?” (When the plant doesn't have roots it can't get water, so it will die. All the parts of the plant have to be present so that the plant can survive. This makes plants a system, because they are made up of a bunch of parts that all have to be present and work together in order for the plant to survive.)*
- Add student thinking to the definition of *system*. Example: “If any of the parts are taken out, the system doesn't work.” Add “plant” as an example of a system to the Concepts Scientists Think About anchor chart.

### Preparing to Teach: Self-Coaching Guide

1. How can I quickly focus students on the anchor charts and capture their learning?

## Section 3: Evaluating and Communicating Information

### A. Diagramming Plants from an Ecosystem (25 minutes)

- To activate student thinking around the relationship between specific ecosystems and specialized structures, ask:
 

*“What are some of the specialized structures that animals have that help them survive in the tundra? What about the desert and grasslands?” (Responses will vary)*

- Tell students that while they have learned about the basic structures that all plants must have to be a system, these basic structures can also be more specialized to help plants survive in specific ecosystems. Just like animals, plants have specialized structures, too. Remind students that when they completed the Mock Google Earth tour, they observed specific plants living in each of the ecosystems that they have researched; now they are going to learn more about these specific plants.
- Invite students to take their student science notebooks and move into their ecosystem expert groups from Lesson Sequence 2. Remind students of groupings, as necessary.
- Distribute **live plants (if available) or multiple copies of coneflower, prickly pear cactus, and diamond leaf willow plant cards** based on students expert groups.
- Tell students that they will use the strategies that they used earlier in this lesson sequence for creating an explanatory model of a grass plant to now create an explanatory model of their expert plant in the “Evaluating and Communicating Information” section of the Plant Structures Are a System entry of their student science notebook <sup>(1)</sup>.
- Invite a volunteer to read the qualities of scientific drawings that were added to the Scientists Do These Things anchor chart earlier in the lesson sequence.
- Invite students to open their notebooks to the “Evaluating and Communicating Information” section and to begin drawing.
- Circulate to monitor for labeling of the basic structures as well as students noticing the unique structures of these plants.
- As you circulate, prompt individual student thinking with questions as necessary:
  - *“What do you notice that is different about this plant compared to the grass plant that we already drew?”*
  - *“What do you notice that is similar between this plant and grass?”*
  - *“Why do you think this plant has a structure like this?”*
  - *“How do you think this structure might help this plant survive in its specific ecosystem?”*
- After 10–15 minutes, give students specific positive feedback on their attention to detail and precision in noticing different parts of the grass plant.
- Distribute the following diagrams according to students’ expert groups: **coneflower diagram, prickly pear cactus diagram, and diamond leaf willow diagram.**
- Tell students to compare their drawing to the diagrams you just distributed, and to note the parts of the picture that differ from their observation.
- Invite students to turn and talk to an elbow partner:
  - *“How do you plan to revise your model based on what you’ve noticed in this new diagram?” (Add labels, more details)*
- Give students a few minutes to add labels and details to their drawing <sup>(2)</sup>.
- Tell students that they have done a great job of creating an explanatory model, but it is not complete yet. Like scientists, they will continue to learn more about these plants and as they do, they will return to their models and add more information and make changes, based on new observations and new learning.

### Preparing to Teach: Self-Coaching Guide

1. Based on my students experience with making the grass model, what support will they need?
2. It may be useful to distribute colored pencils so students can use a different color and clearly see the way they revised the model.

## Section 3: Obtaining Information

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### A. Revisiting Plants Cards for an Ecosystem (15 minutes)

- Tell students that they will work hard as readers today to learn about the specialized structures that they have observed in their expert groups.
- Distribute the **extra copies of coneflower, prickly pear cactus, and diamond leaf willow plant cards** (if not already distributed) to the appropriate ecosystem expert groups <sup>(1)</sup>.
- Refer students to the Plant Structures Are a System entry of their student science notebook. Remind them that they can use their notebook for jotting down vocabulary and structures as they read the first time for gist, and during the second read they will add details about the function of each structure in the Reading about Specialized Structures and Functions graphic organizer in their science notebook.
- Give students 3 minutes to read the text on their own. Circulate and support them as they read.
- Then give students 3 minutes to discuss with their partner what they wrote. Consider posing questions such as: “Do you have similar words circled?” and “Did you notice similar structures?”
- After 3 minutes, refocus the whole class. Point out to students that their job is to learn everything they can about specialized plant structure and their functions in a particular ecosystem.
- During the second read, they will add details to the Structures and Functions graphic organizer in their student science notebook.
- If needed, do a brief guided practice with an additional plant card. (Example: “The big sagebrush has a big taproot that grows deep in the ground to get water. It lives in the desert where it is dry, so this is an important specialized structure. I’m going to write it down.”)
- Give students 3 minutes to reread the text on their own, writing down key details on their graphic organizer in their student science notebook.
- Have students return to their plant explanatory model and add the function to each labeled part.

### Preparing to Teach: Self-Coaching Guide

1. Some of my proficient readers may be able to read an additional plant card. Which cards will I make available?

## Section 3: Evaluating and Communicating Information

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### A. Adding to Plant Structures and Functions Anchor Chart (10 minutes)

- Ask students to name a specialized structure that they've just read about on the plant cards, and how that structure helps the plant function in a particular ecosystem <sup>(1)</sup>.
- Have students turn and share with a neighbor a structure and function that they have recorded in their graphic organizer, then cold call a few students to share.
- Record student thinking on the Plant Structures and Functions anchor chart.
- Students can add new information to the graphic organizer in their student science notebook as the information is recorded on the class anchor chart.
- Have students return to their plant explanatory model and add the function to each labeled part.

### Preparing to Teach: Self-Coaching Guide

1. What specialized structures do I expect my students to name? (Prickly flowers, long taproot, bitter leaves of the coneflower, spines and modified stem of the prickly pear cactus, furry leaves, flexible twigs and truncated stem of the diamond leaf willow)