Lesson 2.3
Investigating How Roots and Leaves Grow
Lesson Overview

Students apply what they’ve learned about the role of roots and leaves and explore what the roots and leaves of a plant need in order to grow. In their notebooks, students write about how the roots and leaves of a plant help the plant grow. The teacher introduces a new Investigation Question focused on reasons plants can’t always get the water and sunlight they need to grow. Partners play the Growing Roots Game to learn about what happens when plants grow near one another. The teacher introduces the Sunlight and Leaves Model to represent what happens when leaves of one plant block the leaves of another plant. Finally, groups create their own models by building on the Plant Growth Body Model to explore what happens when multiple plants grow in the same space. The purpose of this lesson is for students to build a preliminary understanding that the roots and leaves of a plant need space so they can get water and sunlight.

Anchor phenomenon: No new chalta trees are growing in the Bengal Tiger Reserve in India.
Investigative phenomenon: Plants get water and sunlight.

Students learn:

- A plant needs to spread its roots so it can get the water it needs to grow.
- A plant needs to grow its leaves out of the shade of other leaves so it can get the sunlight it needs to grow.
- A model is something scientists make to answer questions about the real world.
Writing About Roots and Leaves

Students reread a section of *A Plant Is a System* to support writing about how a plant is a system.

Instructional Guide

1. Connect to prior learning.

   We have been working as plant scientists to investigate plants in their habitats. What have you learned about how new plants grow?
   
   [New plants grow from seeds when they get enough water and sunlight.]

2. Hold up *A Plant Is a System* and review previous purpose for reading. Refer to the Setting a Purpose chart.

   In our last lesson, we read this book. Our purpose for reading was to find out how a plant uses its parts to get the water and sunlight it needs to grow.

   What have you learned about how plants get the water and sunlight they need to grow?
   
   [Plants use their roots to get water and their leaves to get sunlight.]

3. Review system. Remind students that the book is called *A Plant is a System*, and review that a system is a group of parts that work together.

4. Set the purpose for rereading and recording.

   Today we will read part of this book again to think more about how a plant can be a system.

   Scientists record important ideas they have learned, so as plant scientists, we’re going to use what we read to write down our ideas about how a plant is a system.
5. **Project notebook page 32.** Have students turn to page 32, A Plant Is a System, in their notebooks. Read aloud the directions.

6. **Designate pairs and distribute books.** Have student pairs read and complete the notebook page.

7. **Share out.** Have student pairs explain how a plant is like a system.

**Teacher Support**

**Instructional Suggestion**

**Providing More Experience: Today’s Daily Written Reflection**

In the book *A Plant Is a System, what’s something that you found surprising or interesting?* This prompt (on page 31 in the Investigation Notebook) asks students to reflect on the text they read in Lesson 2.2. The purpose of this prompt is to give students an opportunity to think about what they read and consider how it might have supported, expanded, or changed what they already knew. Giving students an opportunity to reflect on the text provides them with a useful and low-stakes sense-making opportunity.

**Rationale**

**Literacy Note: Reflective Writing**

The writing activity on page 32, *A Plant Is a System*, in the Investigation Notebook encourages students to reflect on what they’ve learned about how plants use their parts to get what they need to grow. Writing about roots and leaves gives students the opportunity to reflect on their ideas, make connections, and practice using science vocabulary. Student responses also provide a good window into students’ understanding of key concepts.

**Possible Responses**

**Investigation Notebook**

*A Plant Is a System* (page 32)

How is a plant a system? How does it use its parts to get what it needs to grow?

A plant is a system because it has parts that work together. The leaves get sunlight to make food for the plant, the roots take in water for the plant, and the stem moves the food and water to all parts of the plant.
A Plant Is a System

Directions:
1. Read pages 8–10 in A Plant Is a System with your partner.
2. Label each part of the plant in the box below.
3. Draw arrows to show how the plant uses sunlight and water.
4. Answer the questions below.

How is a plant a system? How does it use its parts to get what it needs to grow?

___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
Writing About Roots and Leaves

Students reread a section of *A Plant Is a System* to support writing about how a plant is a system.

**Instructional Guide**

1. **Connect to prior learning.**

   - Hemos estado trabajando como científicos y científicas de plantas para investigar las plantas en sus hábitats. ¿Qué han aprendido sobre cómo crecen las plantas nuevas? [Las plantas nuevas crecen de semillas cuando reciben agua y luz del sol suficientes].

2. **Hold up *A Plant Is a System* and review previous purpose for reading.** Refer to the Setting a Purpose chart.

   - En nuestra lección anterior, leímos este libro. Nuestro propósito para leer era descubrir cómo una planta usa sus partes para obtener el agua y la luz del sol que necesita para crecer.

   - ¿Qué han aprendido acerca de cómo obtienen las plantas el agua y la luz del sol que necesitan para crecer? [Las plantas usan sus raíces para obtener agua y sus hojas para obtener luz del sol].

3. **Review system.** Remind students that the book is called *A Plant is a System*, and review that a system is a group of parts that work together.

4. **Set the purpose for rereading and recording.**

   - Hoy leeremos partes de este libro de nuevo para pensar más acerca de cómo una planta puede ser un sistema.

   - Los científicos apuntan ideas importantes que han aprendido, así que como científicos y científicas de plantas, vamos a usar lo que leímos para escribir nuestras ideas sobre cómo una planta es un sistema.
5. **Project notebook page 32.** Have students turn to page 32, A Plant Is a System, in their notebooks. Read aloud the directions.

6. **Designate pairs and distribute books.** Have student pairs read and complete the notebook page.

7. **Share out.** Have student pairs explain how a plant is like a system.

**Teacher Support**

**Instructional Suggestion**

**Providing More Experience: Today’s Daily Written Reflection**

In the book *A Plant Is a System*, what’s something that you found surprising or interesting? This prompt (on page 31 in the Investigation Notebook) asks students to reflect on the text they read in Lesson 2.2. The purpose of this prompt is to give students an opportunity to think about what they read and consider how it might have supported, expanded, or changed what they already knew. Giving students an opportunity to reflect on the text provides them with a useful and low-stakes sense-making opportunity.

**Rationale**

**Literacy Note: Reflective Writing**

The writing activity on page 32, *A Plant Is a System*, in the Investigation Notebook encourages students to reflect on what they’ve learned about how plants use their parts to get what they need to grow. Writing about roots and leaves gives students the opportunity to reflect on their ideas, make connections, and practice using science vocabulary. Student responses also provide a good window into students’ understanding of key concepts.

**Possible Responses**

Investigation Notebook

*A Plant Is a System* (page 32)

How is a plant a system? How does it use its parts to get what it needs to grow?

A plant is a system because it has parts that work together. The leaves get sunlight to make food for the plant, the roots take in water for the plant, and the stem moves the food and water to all parts of the plant.
Una planta es un sistema

Instrucciones:
1. Lee las páginas 8 a 10 en Una planta es un sistema con tu compañero o compañera.
2. Identifica y nombra cada parte de la planta en el cuadro debajo.
3. Dibuja flechas para mostrar cómo la planta usa la luz del sol y el agua.
4. Responde las preguntas siguientes.

¿Cómo es que una planta es un sistema? ¿Cómo usa sus partes para obtener lo que necesita para crecer?

___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________

© 2018 The Regents of the University of California. All rights reserved.