

Unit 4: The Power of Pollinators

WEEK 3 Lesson 2

Science and Engineering: Life Sciences Ecosystems: Learning about Roots and Measuring Growth

Big Idea	The parts of an organism have specific functions.
Guiding Question	Why are the particular parts of an organism important?
Content Objectives	I can record my observations of roots in drawing and writing. (W.1.2.b) I can use my five senses to gather information about the structure and function of roots on my plant. (Practice 6, 2-LS2-3(MA)) I can use a ruler to measure the length of my plant. (Practice 5)
Language Objective	I can discuss my observations of roots with my peers. (SL.1.2)
Vocabulary	develop: to form new parts drought: a time with very little rainfall, leading to a shortage of water grow: to get bigger radicle: the root part of the embryo, an undeveloped root root: the part of the plant that grows underground and collects water and nutrients
Materials and Preparation	Read the background information in Science in Unit 4 (Unit Introduction). <ul style="list-style-type: none">● started seeds in plastic bags, organized by group Choose one bag and, if the full root is not visible, gently unwrap it and place it back inside the bag.● Science and Engineering packets● writing and drawing tools● Plant Growth Graphing paper, 1 sheet starting at zero for each child● chart paper, 1 blank sheet● markers, various colors● rulers, 1 for each child

	<ul style="list-style-type: none"> ● About Plants chart, from previous weeks ● Roots slides ● projector and screen
<p>Opening 2 minutes</p>	<p>To clarify the purpose of this lesson, refer to the Weekly Question, What do bees need to survive?</p> <p><i>The seeds you planted are growing and developing: getting bigger and forming new parts. We will continue to observe our plants' development. Just like before, you will record the date and the question you are investigating at the top of your page. Today you will also measure and record the plants' growth, and we'll talk about one structure of a plant that helps it grow.</i></p> <p><i>We'll use rulers to measure how much the plants are growing. What suggestions do you have for placing the ruler to measure this plant?</i></p> <p>Integrate children's knowledge about measurement by discussing how to place the ruler to place zero at the base of the plant.</p> <p><i>The <u>start point</u> is where you begin measurement, at the zero. We will start measuring at the bottom of the longest root.</i></p> <p><i>The <u>end point</u> will be the top of the plant. That's how tall it is, or its height.</i></p> <p>Demonstrate how to use the ruler to measure the length of the entire plant, including the longest root. Then measure the length of just the stem. Finally, measure the length of the roots. Add the plant's length to the Plant Growth Graphing Paper.</p> <p><i>In Text Talk we are learning about bees and their body parts. Bees are organisms that are important to many plants. Bees have specific structures to help them survive. Plants also have specific structures that help them get what they need to survive. Today we will see if we can find one of those structures on our beans.</i></p> <p><i>The seeds in our plastic bags have been sprouting for two weeks. Today you will make careful observational recordings of the seeds, paying especially close attention to the roots. As you are making your observations, make and record three measurements: the length of the entire plant, the length of the stem, and the length of the roots. Also include your ideas about how roots help the plant get what it needs to grow. We will then gather to share what we observed and questions we might have.</i></p> <p>Rewrap the seed and new plant in paper towels, if needed.</p>
<p>Investigation 15 minutes</p>	<p>As children record their observations, circulate to support them. Ask the following questions.</p>

	<p><i>How long is the entire plant?</i> <i>How long is the stem?</i> <i>How long are the roots?</i> <i>What do you notice about the roots of this plant?</i> <i>How might the roots help the plant live and grow?</i> <i>Why do you think there are so many roots?</i> <i>Why do you think the roots are the first part of the plant to develop from the seed?</i> <i>What other changes do you notice in these seeds?</i></p>
<p>Discussion and slides 13 minutes</p>	<p>Gather children back in the large group with their packets. Use one bean plant as a model to create a class diagram. Invite children to take turns contributing to a large, collaborative diagram of a sprouted bean seed. Have children measure and record the length of the roots, stem, and the entire plant.</p>
<p>slides 2-3</p>	<p>Show slides 2 and 3. Revisit the experience of opening seeds and looking at the labeled diagram. Note that the scientist who made this diagram included labels for different parts of the embryo, including the radicle.</p>
<p>slide 4</p>	<p>Reintroduce how a time-lapse video works (showing a long process in a much-shortened period of time), and then show the video on slide 4.</p> <p><i>What do you notice about the plant in this video?</i> <i>How did the plant change from day to day?</i> <i>What are some functions of a root system? How do they help a plant survive?</i> <i>Why do you think there are so many roots?</i> <i>Why do you think the roots keep growing longer?</i></p>
<p>slides 5-6</p>	<p>Show slides 5 and 6.</p> <p><i>What do you notice about the lengths of the roots of these plants?</i> <i>Why do you think some plants have roots that are much longer than the rest of the plant?</i> <i>We talked about roots when we were learning about erosion, remember? While roots are growing to soak up water and its nutrients, they are also helping to hold the plant and the land around it in place.</i></p>
	<p><i>Look back at your observational drawings. What do you notice about how your plants are developing?</i> <i>Is the stem unfolding?</i> <i>Are there any leaves showing?</i></p> <p>Note that various bean seeds might be more or less developed; some seeds</p>

	<p>may not have sprouted at all. Ask children why this might be the case, and refer to the seeds' various growing conditions. Throughout the discussion, refer to the About Plants chart, as appropriate.</p>
Closing	<p><i>Today we looked carefully at our developing plants, and especially at the roots. Roots are for collecting water and nutrients. These nutrients are like vitamins, to help the plants grow healthy and strong. Roots also store nutrients for when there is a period of drought—when there is very little water in the environment.</i></p>
Standards and Practices	<p>SL.1.2 Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups.</p> <p>W.1.2.b Gather information from provided sources and/or recall information from experiences in order to answer questions.</p> <p>2-LS2-1 Plan and conduct an investigation to determine if plants need sunlight and water to grow.</p> <p>2-LS2-2 Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.</p>
Ongoing assessment	<p>Reflect on the class discussions.</p> <p>What language do children use to describe the roots?</p> <p>What connections do children make between the structure of the roots and their function?</p> <p>In what ways do children connect this discussion to understandings developed in Unit 2?</p>

Notes