

## Plants and Animals

### Lesson 4b: Investigating What Plants Need

<b>Grade:</b> Kindergarten	<b>Length of lesson:</b> 45 minutes	<b>Placement of lesson in unit:</b> 4b of 6 lessons on plants and animals
<b>Unit central question:</b> Do plants and animals need the same things to live and grow? Explain your thinking.		<b>Lesson focus questions:</b> Do plants need water to live and grow? What is your evidence?
<b>Main learning goal:</b> Plants need water to live and grow. Plants that don't have water turn brown and eventually die.		
<b>Science content storyline:</b> To find out whether plants need water to live and grow, we conducted an experiment where we watered some plants and didn't water other plants. The plants that had water stayed green and grew taller. The plants without water turned brown and wilted, and their leaves fell off. This is evidence that plants need water to live and grow. We now have evidence from our experiments to show that plants need air, light, and water to live and grow. But not all plants need soil.		
<b>Ideal student response to the focus questions:</b> To find out whether plants need water to live and grow, we put some plants in the light and other plants in the dark. The plants with water stayed green and grew taller. The plants without water turned brown, and the leaves fell off. This is evidence that plants need water to grow and live.		

#### Preparation

##### Materials Needed

- Science notebooks
- Chart paper and markers
- Circle map from lesson 3a (“Our Beginning Ideas: What Do Plants Need to Live and Grow?”)
- Class evidence charts (tree maps) for air, light, water, and soil from lessons 3a, 3b, 3c, and 4a
- Plants from the water experiment
- Crayons (1 set per pair of green, tan, brown, and yellow) (from lesson 3b)

##### Student Handouts and Teacher Masters

- **Optional:** 3.5 Observations Worksheet: Water Experiment (from lesson 3c)
- **Optional:** 4.1 Scientist Sophie Experiments with Plants (Teacher Master) (**Note:** Read only the water experiment for this lesson.)
- 4.3 Do Plants Need Water? (1 per student)
- 4.4 Bubble Map (1 per student)

##### Ahead of Time

- Review section 4 in the content background document, focusing on what plants need.
- Review Common Student Ideas about Plants and Animals, focusing on student ideas about plants.
- One or two days before this lesson, have students make their final plant observations for the water experiment and record in their science notebooks or handouts the evidence they'll analyze in this lesson.
- **ELL support:** Meet with ELL students in advance and introduce them to the lesson content, structure, materials, and activities so they know what's expected of them and can participate more fully in the lesson. Identify vocabulary terms in the lesson plan to review with students in advance, including *experiment*, *prediction/predict*, *claim*, *evidence*, the verb *record*, *observe*, and *environment*. Post any new vocabulary terms and definitions on a word wall for easy reference. Also have students record these terms in their science notebooks and in their picture dictionary if they've made one.

## Lesson 4b General Outline

Time	Phase of Lesson	How the Science Content Storyline Develops
2 min	<b>Link to previous lessons:</b> The teacher engages students in reviewing what they've discovered so far about what plants need to live and grow. Then the teacher revisits the water experiment and the question students are trying to answer.	<ul style="list-style-type: none"> <li>Experiments and observations help us find out what plants need to live and grow.</li> </ul>
2 min	<b>Lesson focus questions:</b> The teacher introduces the focus questions, <i>Do plants need water to live and grow? What is your evidence?</i> Then the teacher elicits ideas from students about how the water experiment can help them answer these questions.	
5 min	<b>Setup for activity:</b> The teacher prepares students to communicate in scientific ways as they examine the evidence they collected from their water experiment and use it to answer the question, "Do plants need water?"	<ul style="list-style-type: none"> <li>Scientists use observations and evidence to help them answer questions about the world around them.</li> </ul>
15 min	<b>Activity:</b> Working in pairs, students observe and compare the plants they grew in water and no-water conditions. Then they discuss whether plants need water based on the evidence they've collected and construct claims they support with evidence from the experiment.	<ul style="list-style-type: none"> <li>We have evidence from our experiment that plants need water to live and grow.</li> </ul>
10 min	<b>Follow-up to activity:</b> Pairs present their claims and evidence about whether plants need water to live and grow, and classmates communicate their feedback in scientific ways. The class works toward a consensus that plants need water to live and grow. Then the teacher summarizes the evidence that supports this claim.	
10 min	<b>Synthesize/summarize today's lesson:</b> The teacher reviews the circle map of students' initial ideas about the needs of plants, and students identify the needs they have evidence for. Then students complete a bubble map showing three things that plants need from their environment to live and grow.	<ul style="list-style-type: none"> <li>Based on evidence from our experiments, we know that plants need water, light, and air to grow and live, but not all plants need soil.</li> </ul>
2 min	<b>Link to next lesson:</b> The teacher revisits the unit central question and announces that in the next lesson, students will investigate whether plants need food like animals do.	

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
2 min	<p><b>Link to Previous Lessons</b></p> <p><b>Synopsis:</b> The teacher engages students in reviewing what they've discovered so far about what plants need to live and grow. Then the teacher revisits the water experiment and the question students are trying to answer.</p> <p><b>Main science idea(s):</b></p> <ul style="list-style-type: none"> <li>Experiments and observations help us find out what plants need to live and grow.</li> </ul>	Summarize key science ideas.	<p><b>Show slides 1 and 2.</b></p> <p><b>NOTE TO TEACHER:</b> <i>Have students sit together on the floor near the Communicating in Scientific Ways poster. Throughout this lesson, students will use and apply a number of the CSW concepts, including (1) ask how and why questions, (2) observe, (3) think of an idea or claim, (4) give evidence for their claims, (5) agree or disagree with others' ideas, (6) and add onto someone else's idea. Refer students to the CSW poster and sentence starters as needed to help them communicate in scientific ways. Also post the class evidence charts from the light, air, and soil experiments from lessons 3a, 3b, and 3d for students to refer to.</i></p> <p>What have we found out so far about what plants need to live and grow?</p> <p>What else do plants need?</p>	<p>Plants need light to live and grow.</p> <p>Because the plants we put in the dark turned from green to yellow and got all droopy.</p> <p>Plants need air.</p>	<p>How do we know that plants need light to live and grow?</p> <p>What evidence do we have that</p>

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
			<p>Have we found out anything else about what plants need to live and grow?</p> <p>So we have evidence that plants need light and air to live and grow. And we know that not all plants need soil because some plants can grow in water or air or even in damp paper towels.</p> <p><b>Show slide 3.</b></p> <p>Today we're going to find out what happened to the plants we observed with and without water, and we'll</p>	<p>When a scientist tried to grow a plant without any air, it died.</p> <p>We found out that not all plants need soil.</p> <p>We grew some seeds in soil and some seeds in paper towels without soil, and all of the seeds grew.</p> <p>We learned about some plants that grow in air and water.</p>	<p>plants need air?</p> <p>How do we know that not all plants need soil?</p>

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
			<p>talk about the evidence we collected.</p> <p>What are we trying to find out with this experiment?</p> <p>And what question are we trying to answer?</p> <p>That’s right! In this experiment, we’re trying to find out whether plants need water to live and grow. The evidence we’ve been collecting will help us answer our question, “Do plants need water?”</p>	<p>Whether plants need water to live and grow.</p> <p>Do plants need water?</p>	
2 min	<p><b>Lesson Focus Questions</b></p> <p><b>Synopsis:</b> The teacher introduces the focus questions, <i>Do plants need water to live and grow? What is your evidence?</i> Then the teacher elicits ideas from students about how the water experiment can help them answer these questions.</p>	<p>Set the purpose with a <u>focus question</u> or goal statement.</p> <p>Ask questions to elicit student ideas and predictions.</p>	<p><b>Show slide 4.</b></p> <p>Today’s focus questions are <i>Do plants need water to live and grow? What is your evidence?</i></p> <p><b>NOTE TO TEACHER:</b> <i>Write the questions on the board for students to refer to throughout the lesson and draw a box around them. Point to each word as you repeat the questions aloud.</i></p> <p>How can our experiment and observations of the plants help us answer our focus questions?</p>	<p>We can tell if plants need water by looking at what happened in our experiment.</p>	<p>And how will we</p>

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
				<p>We're looking to see if the plants stay green or turn brown.</p> <p>Whether the plants stand up straight or droop.</p> <p>Whether the plants are alive and growing.</p>	<p>know whether plants need water? What evidence are we looking for?</p> <p>What other evidence are we looking for?</p>
10 min	<p><b>Setup for Activity</b></p> <p><b>Synopsis:</b> The teacher prepares students to communicate in scientific ways as they examine the evidence they collected from their water experiment and use it to answer the question, "Do plants need water?"</p>	Highlight key science ideas and focus question	<p><b>NOTE TO TEACHER:</b> <i>Since you already discussed the Communicating in Scientific Ways poster in depth with students in the previous lesson, briefly review the key concepts, symbols, and sentences starters before the activity.</i></p> <p><b>Show slide 5.</b></p> <p>Let's review how we can communicate like scientists when we share our ideas with each other.</p> <p>What do scientists do with their eyes? <i>[Point to the</i></p>		

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
	<p><b>Main science idea(s):</b></p> <ul style="list-style-type: none"> <li>Scientists use observations and evidence to help them answer questions about the world around them.</li> </ul>	<p>throughout.</p> <p>Engage students in communicating in scientific ways.</p>	<p><i>eye symbol on the CSW poster.]</i></p> <p>In today’s lesson, you’ll observe your plants from the water experiment again and then describe what you see.</p> <p>What else do scientists do? <i>[Point to question mark on the poster.]</i></p> <p>Yes. Scientists ask how and why questions about all kinds of things in the world around us.</p> <p><b>Show slide 6.</b></p> <p>What question are you and your partner trying to answer about plants and water? Think about this for a moment and be prepared to share your answer with the class.</p> <p><b>Individual think time.</b></p> <p>So what question are you and your partner trying to answer about plants and water?</p> <p>Yes! The question we’re trying to answer in this water experiment is “Do plants need water?”</p> <p>Now let’s look at our class evidence chart.</p>	<p>They look at things.</p> <p>They observe things.</p> <p>They ask questions.</p> <p>Do plants need water to live and grow?</p>	

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions										
			<p><b>NOTE TO TEACHER:</b> <i>Display the evidence chart you created in lesson 3c. Then point to the investigation question at the top of the chart. If there isn't enough space at the bottom of the chart to add possible claims and evidence during the class discussion, use a separate sheet of chart paper.</i></p> <table border="1" data-bbox="869 630 1442 1018"> <thead> <tr> <th colspan="2" data-bbox="869 630 1442 662"><b>Do Plants Need Water?</b></th> </tr> <tr> <th colspan="2" data-bbox="869 662 1442 695"><b>Our Evidence</b></th> </tr> <tr> <th data-bbox="869 695 1157 727"><b>Plants with Water</b></th> <th data-bbox="1157 695 1442 727"><b>Plants with No Water</b></th> </tr> </thead> <tbody> <tr> <td data-bbox="869 727 1157 816"><i>Record student observations and evidence here.</i></td> <td data-bbox="1157 727 1442 816"><i>Record student observations and evidence here.</i></td> </tr> <tr> <td colspan="2" data-bbox="869 816 1442 1018"> <p><b>Our Claim Is ...</b></p> <p>Plants need water to live and grow. Our evidence is ...</p> <p>OR</p> <p>Plants do NOT need water to live and grow. Our evidence is ...</p> </td> </tr> </tbody> </table> <p><b>NOTE TO TEACHER:</b> <i>Highlight the different parts of the chart and read the words. Then point to the word evidence.</i></p> <p>What does it <i>evidence</i> mean?</p> <p><b>Show slide 7.</b></p>	<b>Do Plants Need Water?</b>		<b>Our Evidence</b>		<b>Plants with Water</b>	<b>Plants with No Water</b>	<i>Record student observations and evidence here.</i>	<i>Record student observations and evidence here.</i>	<p><b>Our Claim Is ...</b></p> <p>Plants need water to live and grow. Our evidence is ...</p> <p>OR</p> <p>Plants do NOT need water to live and grow. Our evidence is ...</p>		<p>Evidence is clues that give us proof.</p> <p>Evidence helps us answer questions or explain things.</p>	
<b>Do Plants Need Water?</b>															
<b>Our Evidence</b>															
<b>Plants with Water</b>	<b>Plants with No Water</b>														
<i>Record student observations and evidence here.</i>	<i>Record student observations and evidence here.</i>														
<p><b>Our Claim Is ...</b></p> <p>Plants need water to live and grow. Our evidence is ...</p> <p>OR</p> <p>Plants do NOT need water to live and grow. Our evidence is ...</p>															



Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
		Summarize key science ideas.	<p>That’s right! <i>Evidence</i> is a clue that helps us answer a question or explain something in the world around us. Evidence helps us figure out whether our ideas are right or wrong.</p> <p>Let’s review what our poster says about evidence.</p> <p><b>NOTE TO TEACHER:</b> <i>Point to the row that says “Give evidence for your idea or claim.”</i></p> <p>Like scientists, what words did you use last time when you talked about your evidence?</p> <p>What does the lightbulb in this row mean? <i>[Point to the lightbulb symbol on the CSW poster.]</i></p> <p>Yes, the lightbulb represents the ideas that scientists think of ideas to try to answer their questions. But what do scientists need to support their ideas? <i>[Point to the magnifying glass and the boy with the pointer on the poster.]</i></p> <p>So what does this question mark help you remember to do as a scientist? <i>[Point to the question mark on the</i></p>	<p>I said, “My evidence is,” and I talked about whether my plants were green and straight.</p> <p>It means that the person has a good idea.</p> <p>They need evidence and reasons.</p>	

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
		<p>Make explicit links between science ideas and activities <b>before</b> the activity.</p>	<p><i>poster.]</i></p> <p>What does the lightbulb remind you to do? <i>[Point to the lightbulb on the poster.]</i></p> <p>What does the magnifying glass help you remember? <i>[Point to the magnifying glass on the poster.]</i></p> <p>And what does this boy with the pointer remind you to do? <i>[Point to the boy with the pointer on the poster.]</i></p> <p><b>Show slide 8.</b></p> <p>So in a few minutes, you're going to <i>observe</i> the plants you've been growing with water and without water. <i>[Point to the eye on the poster.]</i></p> <p>Look carefully at your plants. Then look at the words and pictures you've recorded <i>[in your science notebooks/on your handouts]</i>. These are your observations.</p> <p>After you observe your plants, you're going to think of an idea about how to answer our question, "Do plants need water?" <i>[Point to the lightbulb on the poster and then point to the question mark.]</i></p> <p>Then you're going to give evidence and reasons for your idea. <i>[Point to the magnifying glass on the poster</i></p>	<p>Ask questions.</p> <p>Think of an idea to explain something.</p> <p>That we need evidence for our ideas.</p> <p>To give reasons for our ideas.</p>	

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
			<p><i>and then point to the boy with the pointer.]</i></p> <p>You and your investigation partner will work together on this activity.</p> <p><b>Show slide 9.</b></p> <p>Let’s review what you’ll be doing:</p> <ol style="list-style-type: none"> <li>1. First, you’ll observe your plants and look at the observations you recorded earlier in this unit.</li> <li>2. Next, you’ll talk with your partner and come up with an idea or claim to answer our question, “Do plants need water?”</li> <li>3. Then you and your partner will talk about the evidence and reasons you have to support your idea or claim.</li> </ol> <p><b>ELL support:</b> Go over the activity instructions with ELL students during the lesson preview and give them time to practice so they know what’s expected of them.</p>		
15 min	<p><b>Activity</b></p> <p><b>Synopsis:</b> Working in pairs, students observe and compare the plants they grew in water and no-water conditions. Then</p>		<p>Now I’d like you to pair up with your investigation partner, and then I’ll give you the handout you’ll be using for this activity.</p> <p><b>NOTE TO TEACHER:</b> <i>Have students pair up with their investigation partner. Then distribute handout 4.3 (Do Plants Need Water?) and direct students to</i></p>		

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
	<p>they discuss whether plants need water based on the evidence they've collected and construct claims they support with evidence from the experiment.</p> <p><b>Main science idea(s):</b></p> <ul style="list-style-type: none"> <li>We have evidence from our experiment that plants need water to live and grow.</li> </ul>	<p>Make explicit links between science ideas and activities <b>during</b> the activity.</p> <p>Ask questions to probe student thinking.</p> <p>Ask questions to challenge student thinking.</p> <p>Engage students in analyzing and interpreting data and observations.</p>	<p><i>write their names and the date at the top of the handout.</i></p> <p>Remember, you need to observe your plants and then look at the observations you recorded during the experiment before you talk about the claim and evidence you can use to answer our question, "Do plants need water?"</p> <p>I'll be walking around the room, so if you have any questions, just raise your hand.</p> <p><b>NOTE TO TEACHER:</b> <i>As pairs work together, circulate around the room and support them in (1) verbally constructing a claim (agreeing on whether plants need or don't need water), and (2) supporting the claim with evidence from the experiment (e.g., plant color, plant sturdiness or drooping). Ask probe and challenge questions to clarify student thinking. Give pairs about 10 minutes to make observations and develop their claims and evidence.</i></p> <p><b>ELL support:</b> Review the handout with ELL students during the lesson preview and have them practice completing it as a group so they understand what's expected of them and can participate more fully in the activity.</p> <p><b>Pairs work on claims and evidence (10 min).</b></p> <p>Now that you and your partner have discussed your</p>		<p><i>Questions to ask during pairs work:</i></p> <ul style="list-style-type: none"> <li>What is your claim?</li> <li>Do you both agree?</li> <li>What is your evidence?</li> </ul>

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
		Engage students in constructing explanations and arguments.	<p>ideas and evidence, I want you to write them down on your handouts. Then you'll share your conclusions with the rest of the class.</p> <p><b>NOTE TO TEACHER:</b> <i>Display the handout on a document reader as you discuss what students will do next.</i></p> <p>Look at the first section of your handout that says "Our claim is." Now look at the two claims. One claim says that plants need water, and the other claim says that plants do not need water. Talk with your partner about the claim you're making and then circle that claim on the handout.</p> <p>Then in the next section that says "Our evidence is," I want you to draw and write down the evidence you have to support your idea or claim. Give as many different kinds of evidence as you can from the observations you recorded during the experiment. For example, the color of the plants is one kind of evidence.</p> <p><b>NOTE TO TEACHER:</b> <i>Give pairs about 5 minutes to complete their handouts.</i></p>		
10 min	<p><b>Follow-Up to Activity</b></p> <p><b>Synopsis:</b> Pairs present their claims and evidence about whether plants need</p>		<p><b>NOTE TO TEACHER:</b> <i>Following the activity, have students sit on the floor near the class evidence chart (from lesson 3c). Decide whether to have them bring their plants with them as well. Choose a few pairs to share their claims and evidence with the class. Make</i></p>		

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
	<p>water to live and grow, and classmates communicate their feedback in scientific ways. The class works toward a consensus that plants need water to live and grow. Then the teacher summarizes the evidence that supports this claim.</p> <p><b>Main science idea(s):</b></p> <ul style="list-style-type: none"> <li>• We have evidence from our experiment that plants need water to live and grow.</li> </ul>		<p><i>sure at least two pairs of plants are visible during the discussion. During each presentation, display students' handouts on the document reader.</i></p> <p><b>ELL support:</b> Give ELL students an opportunity to practice presenting claims and evidence during the lesson preview so they know what's expected of them. Also have students practice giving feedback using the CSW sentence starters.</p> <p>Next, I'm going to ask a few of you to share your claims and evidence with the class. As you share, we'll display your handout on the document reader so that everyone can see the pictures you drew and what you wrote.</p> <p><b>NOTE TO TEACHER:</b> <i>Display a blank copy of handout 4.3 (Do Plants Need Water?) on a document reader and have students read the claim sentences with you.</i></p> <p><b>Show slide 10.</b></p> <p>If you're sharing your claim with us, I want you to say one of the two sentences on the handout. Let's say these sentences together:</p> <p><i>Plants need water to live and grow.</i></p> <p><i>Plants do NOT need water to live and grow.</i></p>		

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
			<p>If you and your partner decided that plants need water, say the first sentence. If you decided that plants don't need water, say the second sentence.</p> <p>Then I want you to say, "Our evidence is _____" when you share your evidence.</p> <p><b>Show slide 11.</b></p> <p>I want everyone else to listen carefully as your classmates share their claims and evidence. That means don't talk or move around.</p> <p>After each pair has finished sharing their claim and evidence, you'll have an opportunity to agree or disagree or add a new idea.</p> <p>Let's look at our Communicating in Scientific Ways poster again. Here's how I want you to talk like scientists.</p> <p>What does this sentence say you can do? <i>[Point to the row that says "Agree or disagree with others' ideas." and read the sentence aloud. Then point to the thumbs-up/thumbs-down symbol.]</i></p> <p>When you agree or disagree, always give a reason. Let's read the two sentence starters on the poster together:</p> <p><i>I agree with _____ because ...</i></p>	<p>We can agree or disagree.</p>	

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
			<p><i>I disagree with _____ because ...</i></p> <p>What does this sentence say you can do? [<i>Point to the row that says “Add onto someone else’s idea.” and read the sentence aloud. Then point to the plus sign on the poster.</i>]</p> <p>When you add on, use one of the sentence starters on our poster:</p> <p><i>I want to piggyback on _____’s idea.</i></p> <p><i>I want to add onto what _____ said.</i></p> <p>This is your job as scientists. You can agree or disagree with what someone else says, or you can add new ideas to what someone else shares.</p> <p>OK, let’s have one pair come up and share your claims and evidence with the class.</p> <p><b>NOTE TO TEACHER:</b> <i>Have the first pair you selected come to the front of the class and give you their handout(s) to display on the document reader.</i></p> <p>First, tell us what question you were trying to answer.</p> <p>What is your idea or claim? Make sure to use one of</p>	<p>We can add on to what someone else says.</p> <p>Do plants need water?</p>	



Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
			<p>the sentences on the handout.</p> <p>Now tell us about your evidence. Start with “Our evidence is ....</p> <p>Now let’s hear from other scientists. Do you agree or disagree with your classmates’ claim and evidence? Why? Do you have anything to add on?</p> <p><b>NOTE TO TEACHER:</b> <i>Record any new observations and evidence on the class evidence chart (tree map) during this discussion. Then have a few more pairs come up and share their claims and evidence.</i></p> <p>Let’s look at our class evidence chart. We have quite a</p>	<p>Plants need water to live and grow.</p> <p>Our evidence is that the plant without water got brown and dry and crumpled.</p> <p>I agree because the plant without water looks like it’s dying.</p> <p>I want to add on. The plant without water is losing its leaves too.</p>	<p><i>Questions to ask during the discussion:</i></p> <ul style="list-style-type: none"> <li>• How does your drawing show me that plants do/don’t need water?</li> <li>• Does anyone agree or disagree? Why?</li> <li>• Does anyone have a different idea or different evidence?</li> <li>• Does anyone have an idea to add?</li> </ul>

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
			<p>bit of evidence to support the claim that plants need water to live and grow.</p> <p>So do we agree that plants need water?</p> <p><b>NOTE TO TEACHER:</b> <i>Summarize the evidence on the class evidence chart and work toward a consensus that plants need water to live and grow. After the class reaches a consensus, display a clean copy of handout 4.3 on the document reader and circle the agreed-upon claim. Then write down the evidence that supports the claim.</i></p> <p><i>If the class is unable to reach a consensus that plants need water to live and grow, tell students that scientists often repeat their experiments many times to make sure of their findings.</i></p> <p><i>Then read the water experiment (Experiment 2: Do Plants Need Water?) from handout 4.1 (Scientist Sophie Experiments with Plants). Don't read any of the other experiments on the handout.</i></p> <p><i>After the reading, ask students the questions on the handout and ask students whether they can now agree that plants need water to live and grow.</i></p>		
10 min	<p><b>Synthesize/Summarize Today's Lesson</b></p> <p><b>Synopsis:</b> The teacher</p>	Highlight key science ideas	<p><b>Show slide 12.</b></p> <p>Today's focus questions are <i>Do plants need water to live and grow? What is your evidence?</i></p>		

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
	<p>reviews the circle map of students' initial ideas about the needs of plants, and students identify the needs they have evidence for. Then students complete a bubble map showing three things that plants need from their environment to live and grow.</p> <p><b>Main science idea(s):</b></p> <ul style="list-style-type: none"> <li>Based on evidence from our experiments, we know that plants need water, light, and air to grow and live, but not all plants need soil.</li> </ul>	<p>and focus question throughout.</p> <p>Engage students in making connections by synthesizing and summarizing key science ideas.</p> <p>Engage students in communicating in scientific ways.</p>	<p><b>NOTE TO TEACHER:</b> <i>Display the circle map from lesson 3a ("Our Beginning Ideas: What Do Plants Need to Live and Grow?"). Alternatively, you could focus the discussion on the evidence you recorded on the class evidence charts for air, light, soil, and water.</i></p> <p><b>Show slide 13.</b></p> <p>To help us answer these questions, let's revisit our circle map from lesson 3 that shows our beginning ideas about what plants need to live and grow.</p> <p>Last time, we circled some ideas because we have evidence from our experiments or from scientists' experiments that plants need these things. Who can tell me one idea we circled?</p> <p>What other idea did we circle on our map?</p>	<p>We circled <i>air</i>.</p> <p>In the scientist's experiment, the plant without air turned brown and shriveled up.</p> <p>We circled <i>light</i>.</p>	<p>Why did we circle air? What evidence do we have that plants need air to live and grow?</p> <p>What is our evidence that</p>

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
			<p><b>Turn and Talk:</b> Now talk with your partner about any other ideas you think we should circle. Do we have evidence that plants need anything else to live and grow?</p> <p><b>Whole-class discussion:</b> Do you think we should circle any other ideas on our map? What evidence do we have?</p> <p><b>EL Support:</b> Consider allowing students to demonstrate their understandings of the evidence by using nonlinguistic modes of expression, such as acting out their ideas and evidence.</p> <p>Since our evidence showed that plants need water to</p>	<p>In our experiment, the plant without light got pale and droopy.</p> <p>I think we should circle <i>water</i>.</p> <p>The plants without water in our experiment were dry and crinkled up.</p> <p>I want to add that the leaves turned brown and fell off the plant that didn't have water.</p>	<p>plants need light?</p> <p>What evidence do we have that plants need water to live and grow?</p> <p>Does anyone agree, disagree, or want to add on?</p>

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
			<p>live and grow, let's circle that idea on our map too.</p> <p>Do you think we should circle any other ideas?</p>	<p>I still think we should circle soil!</p> <p>Only a few plants can grow without soil, but we grow most plants in soil, so they must need it.</p> <p>I think we should circle <i>environment</i>.</p> <p>All of the plants that lived and grew were in an environment.</p> <p>I agree, because if there wasn't an environment, the plants couldn't get</p>	<p>What evidence do we have that plants need soil to live and grow?</p> <p>Does anyone agree or disagree?</p> <p>And what's our evidence?</p> <p>Does anyone agree, disagree, or want to add on?</p>

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
			<p><b>NOTE TO TEACHER:</b> <i>By the end of the discussion, water, light, and air should be circled. Students might also want to circle the word environment. If so, explain that plants get light and air <b>from</b> their environment, and you can't design an experiment with and without an environment. However, this may be too challenging for kindergarten students to understand, so feel free to circle environment as something plants need if your students argue for it. (See sample dialogue in columns 5 and 6.)</i></p> <p><i>If an idea on the chart wasn't addressed in any of the experiments, leave it on the chart and tell students that you don't have enough information from the experiments to know whether this is something plants need to live and grow. Keep this chart to use in lesson 5.</i></p> <p><b>Show slide 14.</b></p> <p>To show what you've learned from our experiments, I'd like you to write or draw three things that plants need to get from their environment to live and grow.</p> <p><b>NOTE TO TEACHER:</b> <i>Distribute handout 4.4 (Bubble Map) and have students write their names and the date at the top. Then read the sentence starter and direct students to complete the sentence by writing or drawing three things that plants need to live and grow.</i></p>	light and air.	

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
			<p><b>ELL support:</b> Review this handout with ELL students during the lesson preview and give them an opportunity to practice completing it so they know what’s expected of them. During the actual lesson, you may want to allow students to complete the handout in pairs.</p> <p><b>Individual work time.</b></p> <p><b>Whole-class share-out:</b> What did you write or draw on your handout? What three things do plants need from their environment to live and grow?</p> <p><b>Show slide 15.</b></p> <p>So we know from our experiments that plants need air, light, and water to live and grow because they wither and die without these things. We also know that not all plants need soil to live and grow. Some plants can grow in air or water.</p> <p><b>Show slide 16.</b></p> <p>Let’s look again at our beginning ideas about what plants need to live and grow.</p> <p><b>NOTE TO TEACHER:</b> <i>Point to the circle map from lesson 3a (“Our Beginning Ideas: What Do Plants Need to Live and Grow?”) and invite a few students to share how their beginning ideas have changed as a</i></p>	<p>Plants need air, light, and water to live and grow.</p>	

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
			<p><i>result of the plant experiments.</i></p> <p>Have any of your beginning ideas changed now that we know more about what plants need?</p>		
2 min	<p><b>Link to Next Lesson</b></p> <p><b>Synopsis:</b> The teacher revisits the unit central question and announces that in the next lesson, students will investigate whether plants need food like animals do.</p>	Link science ideas to other science ideas.	<p><b>Show slide 17.</b></p> <p>Who remembers the big question we’re trying to answer in this unit? Let’s read it this question together:</p> <p><i>Do plants and animals need the same things to live and grow? Explain your thinking.</i></p> <p><b>NOTE TO TEACHER:</b> <i>Direct students’ attention to the unit central question on the board and point to each word as you read the question together.</i></p> <p><b>Show slide 18.</b></p> <p>What have we learned about what animals need to live and grow?</p> <p>And what have we learned about what plants need to live and grow?</p> <p>So if plants need air and water like animals, do you think plants also need food?</p>	<p>Animals need air, water, and food to live and grow.</p> <p>Plants need air, light, and water to live and grow.</p>	



<b>Time</b>	<b>Phase of Lesson and How the Science Content Storyline Develops</b>	<b>STeLLA Strategy</b>	<b>Teacher Talk and Questions</b>	<b>Anticipated Student Responses</b>	<b>Possible Probe/Challenge Questions</b>
			We'll investigate this in our next lesson.		