

## Plants and Animals

### Lesson 3d.1: Investigating What Plants Need

<b>Grade:</b> Kindergarten	<b>Length of lesson:</b> 45 minutes	<b>Placement of lesson in unit:</b> 3d.1 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 question:</b> How can experiments help us find out whether plants need soil to live and grow?
<b>Main learning goal:</b> Designing an experiment to find out if plants need soil to live and grow involves asking a question, designing an experiment, making predictions, making observations, and gathering evidence.		
<b>Science content storyline:</b> To find out whether plants have the same or different needs as animals, we’re conducting experiments to test some of our ideas about what plants need. Today we designed an experiment to answer the question, “Do plants need soil?” We made predictions and set up our experiment. Now we’ll observe our plants and write down our observations to keep track of what happens. Then we’ll use the evidence we collect to figure out whether plants need soil to live and grow.		
<b>Ideal student response to the focus question:</b> As scientists, we can set up experiments to investigate the needs of plants. Today we set up a new experiment to find out whether plants need soil to live and grow. Then we made predictions about what will happen to the plants. Some of the seeds in our experiment will be planted with soil, and some will be planted without soil. All of our seeds will get water, air, and light. Now we’ll observe our plants and write down our observations to keep track of what happens. The evidence we collect will help us figure out whether plants need water to live and grow so we know if our predictions are right.		

#### 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?”)
- Crayons (green, tan, brown, yellow) (from lesson 3b)
- Materials for the soil experiment (see handout 3.9)

##### Student Handouts and Teacher Masters

- 3.9 Directions for Optional Soil Experiment (Teacher Master)
- 3.10 Soil Labels (Teacher Master) (1 page of Avery labels, 1" × 2 5/8")
- 3.11 No Soil Labels (1 page of Avery labels, 1" × 2 5/8")
- **Optional:** 3.12 Observations Worksheet: Soil Experiment (1 per student for each observation day; 5 per student for entire experiment)

##### Ahead of Time

- Review the set-up options in handout 3.9 (Directions for Optional Soil Experiment) for starting seeds without soil. Then decide which option to use and gather the necessary materials listed on the handout.
- Decide whether to set up the experiment ahead of time and then reveal the results during the lesson in a demonstration, or have the students set up the experiment as they did with the light and water experiments.
- 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.
- **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. Explain the logic involved in designing the science experiment and emphasize that only one need of plants (soil) is being tested. Identify vocabulary terms in the lesson plan to review with students in advance, including *experiment*, *prediction/predict*, *evidence*, and the verb *record*. 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 3d.1: General Outline

Time	Phase of Lesson	How the Science Content Storyline Develops
2 min	<b>Link to previous lesson:</b> The teacher reviews what students are trying to find out from their plant experiments. Then the teacher revisits the circle map of student ideas about what plants need and announces that students will set up a new experiment to find out whether plants need soil to live and grow.	<ul style="list-style-type: none"> <li>To live and grow, plants need to get air, light, and water from their environment.</li> </ul>
1 min	<b>Lesson focus question:</b> The teacher introduces the focus question, <i>How can experiments help us find out whether plants need soil to grow and live?</i>	
5 min	<b>Setup for activity:</b> The teacher elicits ideas from students about whether plants need soil to live and grow and records them on a tree map. As students share their ideas, the teacher challenges them to communicate in scientific ways.	<ul style="list-style-type: none"> <li>Many of us think that plants need soil because we see plants growing in soil, and we plant seeds in soil.</li> <li>Scientists communicate in scientific ways by sharing their ideas, supporting their ideas with observations or evidence, and giving reasons for agreeing or disagreeing with each other.</li> </ul>
20 min	<b>Activity:</b> Students come up with ideas for an experiment that will test whether plants need soil to live and grow. After agreeing on a plan, students set up their experiments and record their initial observations.	<ul style="list-style-type: none"> <li>A good experiment enables scientists to collect observable evidence and compare different conditions to help answer a question.</li> <li>Recording observations helps scientists keep track of and organize their evidence.</li> </ul>
10 min	<b>Follow-up to activity:</b> The teacher reviews the key question the experiment will help students answer. Then students predict what will happen to the plants with and without soil and present their claims and reasoning in a class discussion.	<ul style="list-style-type: none"> <li>Our experiment will help us find out whether plants need soil to live and grow.</li> <li>We can use the evidence we collect to see whether our predictions are correct.</li> </ul>
6 min	<b>Synthesize/summarize today's lesson:</b> The teacher reviews the focus question. Then students summarize the experiment they designed to find out whether plants need soil to live and grow.	<ul style="list-style-type: none"> <li>Collecting and recording evidence from observations is important when conducting an investigation.</li> <li>Our experiment will help us find out whether plants need soil to live and grow.</li> </ul>
1 min	<b>Link to next lesson:</b> The teacher announces that in the next lesson, students record their observations and collect evidence they can use to answer their questions about whether plants need soil to live and grow.	

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 Lesson</b></p> <p><b>Synopsis:</b> The teacher reviews what students are trying to find out from their plant experiments. Then the teacher revisits the circle map of student ideas about what plants need and announces that students will set up a new experiment to find out whether plants need soil to live and grow.</p> <p><b>Main science idea(s):</b></p> <ul style="list-style-type: none"> <li>To live and grow, plants need to get air, light, and water from their environment</li> </ul>	Make explicit links between science ideas and activities.	<p><b>Show slides 1 and 2.</b></p> <p>In this unit on plants and animals, we've been thinking about a big question. Let's read it aloud together:</p> <p><i>Do plants and animals need the same things to live and grow? Explain your thinking.</i></p> <p>To help us answer this question, we're conducting experiments to test some of our ideas about what plants need.</p> <p>In an earlier lesson, we looked at an experiment that a scientist conducted to find out whether plants need air.</p> <p>Who remembers what the scientist did with the two plants?</p> <p>What did we find out from her experiment?</p> <p><b>Show slide 3.</b></p> <p>We also set up our own plant experiments, didn't we? What are we trying to find out from these two experiments?</p>	<p>She put one in the air and the other one in a container without any air.</p> <p>Plants need air to live and grow!</p> <p>Whether plants need light to live and grow.</p> <p>Whether plants need water to live</p>	

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			<p>Let’s look at our circle map that shows our beginning ideas about what plants need to live and grow.</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?”) and make sure that everyone can see it.</i></p> <p>We’ve already put check mark next to air because we know from the scientist’s experiment that plants need air to live and grow. And we put a check mark next to light because we’re investigating that idea now. We also set up an experiment to find out whether plants need water, so let’s put a check mark next to that idea too.</p> <p>One of the other ideas on our map is soil. We’ll investigate that idea today.</p>	and grow.	
1 min	<p><b>Lesson Focus Question</b></p> <p><b>Synopsis:</b> The teacher introduces the focus question, <i>How can experiments help us find out whether plants need soil to grow and live?</i></p>	Set the purpose with a <u>focus question</u> or goal statement.	<p><b>Show slide 4.</b></p> <p>The focus question we’ll think about today is <i>How can experiments help us find out whether plants need soil to live and grow?</i></p> <p><b>NOTE TO TEACHER:</b> <i>Write the question on the board for students to refer to throughout the lesson and draw a box around it. Point to each word as you repeat the question aloud.</i></p> <p>To help us answer this question, let’s set up an experiment to find out whether plants need soil to live</p>		

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			and grow!		
5 min	<p><b>Setup for Activity</b></p> <p><b>Synopsis:</b> The teacher elicits ideas from students about whether plants need soil to live and grow and records them on a tree map. As students share their ideas, the teacher challenges them to communicate in scientific ways.</p> <p><b>Main science idea(s):</b></p> <ul style="list-style-type: none"> <li>• Many of us think that plants need soil because we see plants growing in soil, and we plant seeds in soil.</li> <li>• Scientists communicate in scientific ways by sharing their ideas, supporting their ideas with observations or evidence, and giving reasons for agreeing or disagreeing with each other.</li> </ul>	<p>Ask questions to elicit student ideas and predictions.</p> <p>Engage students in communicating in scientific ways.</p>	<p><b>Show slide 5.</b></p> <p>Do you think plants need soil to live and grow? Why or why not?</p> <p><b>Turn and Talk:</b> Turn to your elbow partner and talk about your ideas. Make sure to explain your reasons, too. And be ready to share your ideas and reasons with the class.</p> <p><b>Whole-class share-out:</b> So do you think plants need soil to live and grow? Let’s have a show of hands. Who thinks that plants need soil? Who thinks that plants don’t need soil?</p> <p>If you think that plants need soil, let’s hear your reasons. What is your evidence? When you share your ideas, remember to use the sentence starters, “My idea is ...” or “My evidence is....”</p> <p>Listen carefully as your classmates share their ideas and be ready to agree, disagree, or add your own ideas and evidence. Use the sentence started to tell us why you agree or disagree: “I agree because ...” or “I disagree because ....”</p> <p>As you share your ideas and evidence, I’ll write them on a tree map.</p> <p><b>NOTE TO TEACHER:</b> <i>Create a tree map with the title “Do Plants Need Soil? Our Evidence” at the top</i></p>	<p>My idea is that plants need soil. My evidence is that we always put</p>	

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			<p>and two columns with the headings “Plants Need Soil” and “Plants Don’t Need Soil.” (Use the following sample as a model.)</p> <table border="1" data-bbox="869 469 1442 659"> <thead> <tr> <th colspan="2" data-bbox="869 469 1442 550">Do Plants Need Soil? Our Evidence</th> </tr> <tr> <th data-bbox="869 550 1125 586">Plants Need Soil</th> <th data-bbox="1125 550 1442 586">Plants Don’t Need Soil</th> </tr> </thead> <tbody> <tr> <td data-bbox="869 586 1125 659"><i>[Student ideas and evidence]</i></td> <td data-bbox="1125 586 1442 659"><i>[Students ideas and evidence]</i></td> </tr> </tbody> </table> <p>As students share their initial ideas and evidence, record them on the map. <b>Don’t record ideas unless students provide evidence to support them.</b> Examples:</p> <ul style="list-style-type: none"> <li>• Yes, plants need soil: We always plant seeds in soil. All the plants in our classroom are growing in soil. Trees would fall over if they didn’t have roots in the soil.</li> <li>• No, plants don’t need soil: Plants just need air and water like animals do. Plants need light so they don’t die.</li> </ul> <p><b>ELL support:</b> During the lesson preview, give ELL students an opportunity to practice constructing explanations and using the sentence starters on the CSW poster. This will enable them to participate more fully in the lesson. They might also find it helpful to engage in a Think-Pair-Share before sharing their ideas with the class.</p>	Do Plants Need Soil? Our Evidence		Plants Need Soil	Plants Don’t Need Soil	<i>[Student ideas and evidence]</i>	<i>[Students ideas and evidence]</i>	<p>plants in soil to grow.</p> <p>Plants need soil for a home, like an environment.</p> <p>My evidence is that plants need soil to grow in to, like, hold themselves up.</p> <p>I agree. If you took plants out of the soil, they’d fall over.</p>	<p>Who has other evidence that plants need soil to live and grow?</p> <p>That’s your idea or your claim. But what evidence do you have that plants need soil for a home?</p> <p>So your evidence is that a tree can’t stand up unless it’s in soil.</p> <p>Does anyone agree or disagree?</p>
Do Plants Need Soil? Our Evidence											
Plants Need Soil	Plants Don’t Need Soil										
<i>[Student ideas and evidence]</i>	<i>[Students ideas and evidence]</i>										

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			<p>Now let's hear from those who think that plants <i>don't</i> need soil? Why do you think so? What's your evidence?</p> <p><b>NOTE TO TEACHER:</b> <i>It's possible that no one will think that plants don't need soil. If so, skip this part of the discussion.</i></p>	<p>I disagree. I think that soil is food for plants. The roots suck it up.</p> <p>Well, my evidence is that when you plant seeds, you always put them in soil, so they must need soil.</p> <p>I disagree. I think the plants are sucking up water for food, not soil.</p> <p>My idea is that plants don't need soil because it's just what they sit on. It's their environment, but</p>	<p>So your idea or claim is that plants get their food from the soil. What is your evidence for that? How do you know?</p> <p>Does that mean they're using the soil for food?</p>

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		<p>Make explicit links between science ideas and activities <b>before</b> the activity.</p>	<p>You have some interesting ideas and reasons for whether plants need soil! Some of us think that plants <i>do</i> need soil, and some of us think that plants <i>don't</i> need soil.</p> <p><b>NOTE TO TEACHER:</b> <i>Review the ideas and evidence you recorded on the tree map.</i></p> <p>Next, we'll set up an experiment to help us figure out whether plants do or don't need soil to live and grow.</p>	<p>they don't need it to live and grow.</p> <p>It's like we need a house, but we could still live and grow if we didn't have one. We would just be cold in the winter.</p>	<p>That's an interesting idea, but what evidence do you have that plants don't need soil?</p>
20 min	<p><b>Activity</b></p> <p><b>Synopsis:</b> Students come</p>	Link science	<p><b>Show slide 6.</b></p> <p>First, let's revisit the other experiments we set up to</p>		



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	<p>up with ideas for an experiment that will test whether plants need soil to live and grow. After agreeing on a plan, students set up their experiments and record their initial observations.</p> <p><b>Main science idea(s):</b></p> <ul style="list-style-type: none"> <li>• A good experiment enables scientists to collect observable evidence and compare different conditions to help answer a question</li> <li>• Recording observations helps scientists keep track of and organize their evidence.</li> </ul>	<p>ideas to other science ideas.</p>	<p>answer questions about what plants need to live and grow.</p> <p>How did we set up our experiment to find out whether plants need light? What did we do with our two plants?</p> <p>And how did we set up an experiment to find out whether plants need water? What did we do with our two plants?</p>	<p>We gave one plant light and the other plant no light.</p> <p>Air and water.</p> <p>One plant has light and one plant doesn't.</p> <p>We gave one plant water but didn't give any water to the other plant.</p> <p>They both get air and light.</p>	<p>And what did we make sure both plants have?</p> <p>So what is the only difference between the two plants?</p> <p>What do both plants get?</p> <p>So what is the only difference between the two plants?</p>

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		<p>Make explicit links between science ideas and activities <b>during</b> the activity.</p> <p>Ask questions to elicit student ideas and predictions.</p> <p>Ask questions to probe student ideas and predictions.</p>	<p><b>Show slide 7.</b></p> <p>Today we'll set up an experiment to help us answer the question, "Do plants need soil?"</p> <p><b>Turn and Talk:</b> So how could we plan an experiment to find out whether plants need soil? Talk with an elbow partner and come up with some ideas to share with the class.</p> <p><b>NOTE TO TEACHER:</b> <i>Give pairs 2 minutes to discuss their ideas.</i></p> <p><b>Whole-class discussion:</b> What ideas did you come up with? What kind of experiment could we conduct to find out whether plants need soil?</p> <p><b>NOTE TO TEACHER:</b> <i>Elicit a variety of ideas from students and record them on chart paper. Highlight any problems students might encounter during the experiment and discuss possible solutions. One problem they might encounter is water loss from the bottom of the cup without soil. One way to fix this would be to have seeds in the cup instead of plants. Another option would be to put damp paper towels in the cup without soil to support the plant that grows from the seeds.</i></p> <p><b>ELL support:</b> ELL students might find it helpful to engage in a Think-Pair-Share before sharing their ideas</p>	<p>One plant gets water and one doesn't.</p> <p>We could put one plant in a pot without any soil, and one plant in a pot with soil.</p> <p>Because we could compare the plants and see if the plant without soil stays healthy and grows</p>	<p>Why do you think that would help us find out whether plants need soil?</p>

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			<p>with the class. They can also benefit from having an opportunity to practice coming up with ideas during the lesson preview. This will enable them to participate more fully in the lesson.</p> <p>What should we give both plants?</p> <p><b>NOTE TO TEACHER:</b> <i>Discuss the options for the no-soil condition in handout 3.9 (Directions for Optional Soil Experiment) and reach a consensus as a class on the plan for the experiment. Then record the plan on a new sheet of chart paper. At the top of the page, write the title, “Do Plants Need Soil?” and remind students that they’ll try to answer this question in their investigation.</i></p> <p>Now that we’ve talked about our ideas and agreed on a plan for our experiment, I’m going to write our plan on a new sheet of chart paper.</p> <p>For this investigation, we’re going to act like scientists and collect evidence to help us answer the question, “Do plants need soil?”</p>	<p>or dies.</p> <p>It will be green and grow taller.</p> <p>Air, water, and light.</p> <p>So the only difference between them is soil and no soil.</p>	<p>How will we know if the plant without soil is healthy?</p> <p>Why should we give both plants air, water, and light?</p>

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			<p><b>NOTE TO TEACHER:</b> <i>If you decided to set up the experiment ahead of time rather than having students set up the experiment themselves, present the demo now and skip the following setup.</i></p> <p><i>If students will be setting up the experiment themselves, have them pair up. Then give each pair Soil and No Soil labels from handouts 3.10 (Soil Labels) and 3.11 (No Soil Labels). Each pair should receive one Soil label and one No Soil label. Show students how to label their cups; then walk them through setting up their experiment based on the instructions in handout 3.9 and the option you selected for starting the seeds with no soil.</i></p> <p><b>Show slide 8.</b></p> <p>Next, let’s set up our experiment. I’m going to give you two labels to identify your seeds. One label says “SOIL,” and the other says “NO SOIL.” Put the Soil label on the cup with the soil in it, and put the No Soil label on the other cup [<i>or plastic baggie/bowl</i>]. Then write your name [<i>or initials</i>] on both containers.</p> <p><b>NOTE TO TEACHER:</b> <i>If you’re using paper toweling with a waterproof plate or a plastic baggie to grow seeds without soil, have students place the No Soil label on the clear bowl or dish covering the plate or on the baggie instead of the cup.</i></p> <p>Now that we’ve finished setting up our experiment, I’d</p>		

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			<p>like you to look at your seeds <i>[or plants]</i> for a minute and then write down your observations.</p> <p>Who can tell me why it's important to write down our observations?</p> <p>That's right! To be good scientists, we need to write down our observations so we can keep track of our evidence. The evidence we collect will help us answer our question, "Do plants need soil?"</p> <p><b>ELL support:</b> To ensure that ELL students are prepared to participate more fully in the activity, make sure to preview it with them in advance.</p> <p><b>NOTE TO TEACHER:</b> <i>Have pairs observe both of their seeds/plants carefully for a minute or two. Then have students create a chart in their science notebooks (see following model) and record their observations. Encourage students to draw pictures of their seeds or plants and add labels.</i></p> <table border="1" data-bbox="825 1174 1436 1425"> <thead> <tr> <th colspan="2" data-bbox="825 1174 1436 1258">Do Plants Need Soil? Our Observations: Day 1</th> </tr> <tr> <th data-bbox="825 1258 1129 1312">Soil</th> <th data-bbox="1129 1258 1436 1312">No Soil</th> </tr> </thead> <tbody> <tr> <td data-bbox="825 1312 1129 1425"><i>Students write their observations and draw pictures here.</i></td> <td data-bbox="1129 1312 1436 1425"><i>Students write their observations and draw pictures here.</i></td> </tr> </tbody> </table>	Do Plants Need Soil? Our Observations: Day 1		Soil	No Soil	<i>Students write their observations and draw pictures here.</i>	<i>Students write their observations and draw pictures here.</i>	<p>To be good scientists!</p> <p>To keep track of our evidence.</p>	
Do Plants Need Soil? Our Observations: Day 1											
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			<p><i>Alternatively, distribute handout 3.12 (Observations Worksheet: Soil Experiment) and have students record their observations on the worksheet.</i></p> <p><b>Whole-class share-out:</b> Now let's talk about your beginning observations and record our evidence on our class evidence chart.</p> <p><b>NOTE TO TEACHER:</b> <i>As students share their observations and evidence, record them on the tree map you created earlier. Students will use this evidence in lesson 3d.2 to help them decide whether plants need soil to live and grow. Make sure to update this chart throughout the observation period.</i></p> <table border="1" data-bbox="825 873 1436 1167"> <thead> <tr> <th colspan="2" data-bbox="825 873 1436 956"><b>Do Plants Need Soil? Our Evidence</b></th> </tr> <tr> <th data-bbox="825 956 1129 1008"><b>Plants with Soil</b></th> <th data-bbox="1129 956 1436 1008"><b>Plants with No Soil</b></th> </tr> </thead> <tbody> <tr> <td data-bbox="825 1008 1129 1167"><i>Record student observations and evidence here.</i></td> <td data-bbox="1129 1008 1436 1167"><i>Record student observations and evidence here.</i></td> </tr> </tbody> </table> <p><i>After recording students' observations on the class evidence chart, collect all of the cups in a shallow pan and check water levels in the cups periodically and/or moisten the paper towels when needed.</i></p>	<b>Do Plants Need Soil? Our Evidence</b>		<b>Plants with Soil</b>	<b>Plants with No Soil</b>	<i>Record student observations and evidence here.</i>	<i>Record student observations and evidence here.</i>		
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10 min	<p><b>Follow-Up to Activity</b></p> <p><b>Synopsis:</b> The teacher reviews the key question the experiment will help students answer. Then students predict what will happen to the plants with and without soil and present their claims and reasoning in a class discussion.</p> <p><b>Main science idea(s):</b></p> <ul style="list-style-type: none"> <li>• Our experiment will help us find out whether plants need soil to live and grow.</li> <li>• We can use the evidence we collect to see whether our predictions are correct.</li> </ul>	<p>Highlight key science ideas and focus question throughout.</p> <p>Ask questions to elicit student ideas and predictions.</p> <p>Make explicit links between science ideas and activities <b>after</b> the activity.</p> <p>Engage students in communicating in scientific ways.</p> <p>Ask questions to probe</p>	<p><b>Show slide 9.</b></p> <p>Let’s be like scientists and make some predictions. Remember, making a prediction is telling what you think will happen and why.</p> <p>So what do you think, or predict, will happen to the seeds in our experiment? Do you think that only the seeds in the soil will live and grow, or do you think the seeds without soil will live and grow too?</p> <p><b>Turn and Talk (2 min):</b> Talk with your partner about what you think will happen to the seeds with soil and without soil. Be ready to share your ideas with the class.</p> <p><b>Show slide 10.</b></p> <p><b>Whole-class share-out:</b> Let’s hear your predictions. What do you think will happen to the seeds by the end of our experiment? When you share your prediction, say, “Our prediction is ....” And when you share your evidence, say, “Our evidence is ....”</p> <p>Listen carefully as your classmates share their ideas, and be ready to agree or disagree. If you agree, say, “I agree because ...” and if you disagree, say, “I disagree because ....”</p>	<p>Our prediction is that the seeds without soil won’t grow.</p>	<p>Why do you think that?</p>

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		<p>student ideas and predictions.</p> <p>Ask questions to challenge student thinking.</p>		<p>Because people always plant seeds in soil, so how could they live without it?</p> <p>We disagree because we think the seeds with and without soil will grow as long as they have light, air, and water.</p> <p>We think the soil just holds the seeds up, so if they have paper towels to do that, they can still grow.</p> <p>We think the seeds without soil will start to grow but won't be healthy or live very long.</p>	<p>Does anyone agree or disagree?</p> <p>So do you think that seeds don't need soil to live and grow?</p> <p>What do others think will happen to the seeds?</p> <p>What makes you think that?</p>



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			<p>So we have a lot of ideas about what will happen to our seeds. Over the next two weeks, we'll look at our seeds every few days and record our observations. Then at the end of our experiment, we'll look at the evidence we've collected and see whether our predictions are right.</p>	<p>Because soil is food for plants, and without food, they might start to grow but not be very healthy.</p> <p>They'll be skinny and small and not very green.</p>	<p>What do you think you'll see if the plants that grow from the seeds are unhealthy?</p>
6 min	<p><b>Synthesize/Summarize Today's Lesson</b></p> <p><b>Synopsis:</b> The teacher reviews the focus question. Then students summarize the experiment they designed to find out whether plants need soil to live and grow.</p> <p><b>Main science idea(s):</b></p>	<p>Highlight key science ideas and focus question throughout.</p> <p>Engage students in making connections by synthesizing</p>	<p><b>Show slide 11.</b></p> <p>The focus question we're thinking about today is <i>How can experiments help us find out whether plants need soil to live and grow?</i></p> <p>How do you think the experiment we set up today can help us find out whether plants need soil to live and grow?</p>	<p>It can help us see if seeds will grow without soil.</p> <p>We can compare</p>	

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	<ul style="list-style-type: none"> <li>Collecting and recording evidence from observations is important when conducting an investigation.</li> <li>Our experiment will help us find out whether plants need soil to live and grow.</li> </ul>	and summarizing key science ideas.	<p>How is today's experiment like our experiment with light?</p> <p><b>ELL support:</b> You might consider having ELL students engage in a Think-Pair-Share to help them formulate their responses before sharing them with the class.</p> <p>And how is today's experiment like our experiment with water?</p>	<p>the seeds in soil with the seeds in no soil to see which ones will live and grow.</p> <p><i>Possible response if students used cups:</i> We're using two cups like we did in the light experiment.</p> <p>We're only testing one thing, like we did for light.</p> <p>We're testing to see if seeds need soil to live and grow.</p> <p><i>Possible response if students used cups:</i> We had two cups for the water experiment, too.</p>	<p>What else is like the light experiment?</p> <p>And what are we testing in this experiment?</p> <p>That's right! What did both plants get in the</p>

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			<p>Remember the scientist who did the experiment to find out whether plants need air to live and grow?</p> <p>What did both the plants get?</p> <p>What will all of our seeds get in today's experiment?</p> <p>What is the only difference between our seeds?</p> <p>So why do you think it's important to plant some seeds in soil and some seeds with no soil for today's experiment? Why couldn't we just plant the seeds in one cup with soil and see what happens?</p>	<p>They both had light and air.</p> <p>One plant got water and the other one didn't.</p> <p>So we can compare the two plants to see what happens.</p> <p>They both got water and light.</p> <p>They'll get light, air, and water.</p> <p>Some have soil and some have no soil.</p> <p>Because that wouldn't help us answer our</p>	<p>water experiment?</p> <p>And what was different in the experiment?</p> <p>Why did we set up the water experiment this way?</p>

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			<p>That's right! It's important for us to compare the seeds planted in soil with the seeds planted with no soil so we can find out whether plants needs soil to live and grow.</p> <p>How will we know whether or not seeds need soil?</p>	<p>question about whether seeds need soil to live and grow.</p> <p>To answer the question, we need to see whether some seeds will grow without soil.</p> <p>If the seeds without soil die, we'll know that plants need soil to live and grow.</p>	<p>Tell me more about why this wouldn't help us answer our question.</p>
1 min	<p><b>Link to Next Lesson</b></p> <p><b>Synopsis:</b> The teacher announces that in the next lesson, students record their observations and collect evidence they can use to answer their questions about whether plants need soil to live</p>	<p>Link science ideas to other science ideas.</p>	<p><b>Show slide 12.</b></p> <p>So over the next two weeks, we'll look at our seeds every few days to see what happens to them. We'll also record our observations and collect evidence to help us figure out whether plants need soil to live and grow.</p> <p>Will our seeds grow without soil? Stay tuned to find out!</p>		

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	and grow.				