Plants and Animals
Lesson 5d: Food for Plants

Grade: Kindergarten	**Length of lesson:** 35 minutes	**Placement of lesson in unit:** 5d of 6 lessons on plants and animals
Unit central question: Do plants and animals need the same things to live and grow? Explain your thinking.		**Lesson focus question:** What is another way we can show how plants make their own food?
Main learning goal: We can use a role-play as a model to show how plants take in light, water, and air from their environment and make food they can use to live and grow. Animals can't do this.		
Science content storyline: We've learned that plants take in light, water, and air from their environment and make food inside their leaves that they can use to live and grow. Animals can't do this. There are different ways we can show what happens inside a plant when it makes food. In our last lesson, we used a mixing-bowl model and a diagram to show how plants make food inside their leaves. Today we used a role-play to help us think about happens when plants make food. Models are similar to and different from the real-life things they represent. All three of our models showed that plants take in light, air, and water from their environment and make food inside their leaves that they use to live and grow.		
Ideal student response to the focus question: In our last lesson, we used a mixing-bowl model and a diagram to show how plants make food inside their leaves. Today we did a role-play. All three of our models showed in different ways how plants get air, water, and sunlight from their environment and make food inside their leaves that they use to live and grow.		

Preparation

Materials Needed
- Science notebooks
- Chart paper and markers
- A leafy, green plant or a collection of 5–10 leaves
- Construction paper for AIR, WATER, and LIGHT posters (for role-play)
- Yarn (for posters)
- Flashlight (for role-play)
- Marked-up copy of the plant diagram the class created in lesson 5c
- Mixing-bowl model (from lesson 5c; for display only)

Student Handouts and Teacher Masters
- 5.3 Air, Water, and Light Labels (Teacher Master)

Ahead of Time
- Review section 5 in the content background document.
- Use the air, water, and light labels (from handout 5.3) to make posters out of construction paper for the role-play. Punch two holes in each poster and attach yarn so that students can hang the posters around their necks to show what parts they're playing in the role-play.
- **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. Introduce the idea of a role-play as a type of model they can use to show how plants make their own food. Give students an opportunity to practice the role-play so they understand what to do and feel more comfortable acting out various parts during the actual lesson.

Lesson 5d General Outline

Time	Phase of Lesson	How the Science Content Storyline Develops
6 min	**Link to previous lesson:** The teacher engages students in reviewing key ideas from the previous lesson and the models they used to show how plants make their own food.	• Plants take in light, water, and air from their environment and use these things to make their own food inside their leaves. Plants use the food they make to live and grow. Animals can't do this.
1 min	**Lesson focus question:** The teacher introduces the focus question, *What is another way we can show how plants make their own food?*	
5 min	**Setup for activity:** The teacher introduces a role-play as another model students can use to show how plants make their own food.	• Scientists use models to help them think about how things work in the world around them. For example, scientists can use a model to show what happens inside a leaf. Models are similar to and different from the real-life things they represent.
12 min	**Activity:** The teacher engages students in acting out a role-play to model how plants make their own food.	• Scientists use models to help them understand and explain how things work in the world around them. We can use a role-play to show how plants make their own food. • Plants take in light, water, and air from their environment to make their own food inside their leaves, and they use this food to live and grow.
5 min	**Follow-up to activity:** The teacher reviews the focus question. Then students work in pairs to construct summary statements that explain what the mixing-bowl model, the plant diagram, and the role-play showed about plants.	• We can use different kinds of models, including diagrams and role-plays, to show how plants make their own food. • All three of our models showed that plants take in light, air, and water from their environment and make their own food inside their leaves. Then they use this food to live and grow.
5 min	**Synthesize/summarize today's lesson:** Students share the summary statements they constructed to explain what the three models showed about plants. Then they discuss which model made the most sense to them.	
1 min	**Link to next lesson:** The teacher foreshadows the next lesson in which students consider what they've learned so far that can help them answer the unit central question.	

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6 min	**Link to Previous Lesson** **Synopsis:** The teacher engages students in reviewing key ideas from the previous lesson and the models they used to show how plants make their own food. **Main science idea(s):** • Plants take in light, water, and air from their environment and use these things to make their own food inside their leaves. Plants use the food they make to live and grow. Animals can't do this.	Link science ideas to other science ideas. Engage students in analyzing and interpreting data and observations. Ask questions to elicit student ideas and predictions. Ask questions to probe student ideas and predictions. Ask questions to challenge student ideas and predictions.	**Show slide 1.** Look at the plant diagram we created in our last lesson. **NOTE TO TEACHER:** *Display on a document reader the plant diagram the class created during the previous lesson.* What does this diagram show us about how plants make their own food? What do these arrows show us? **NOTE TO TEACHER:** *Point to the arrows showing sunlight going into the leaves.* How about these arrows over here? **NOTE TO TEACHER:** *Point to the arrows showing air going into the leaves.*	It shows the roots of the plant taking in water from the soil, and the water going up the stem to the leaves. The leaves take in air and sunlight, and they mix together with the water to make food. These arrows show that sunlight is going into the leaves. These arrows show air going into the leaves.	What happens in the leaves?

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		Engage students in making connections by synthesizing and summarizing key science ideas.	And what do the leaves do with the water, air, and sunlight they get from their environment? What did we find out about what the plant's food is? Are water, air, and sunlight food for plants? **NOTE TO TEACHER:** *The anticipated student responses in column 5 are* ***ideal****. We included this additional lesson because we expect that students will still think that the light, air, and water plants take in from the environment are their food rather than the raw materials plants use to make energy-providing food in their leaves during photosynthesis. Students might also still think that soil is food for plants or that plants take in their food from the soil. Make sure to challenge these ideas by asking probe and challenge questions. Support students in understanding that plants use light, air, and water to make their own food, but these substances aren't food by themselves.* **Show slide 2.** So do plants and animals get their food the same way or in different ways?	They mix them together to make food for the plant. No. The leaves make sugar for the plant to use as food. Plants and animals get their food in different ways.	Tell me how plants and animals get their food in different

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					ways.
				Animals have to get their food from their environment, but plants make their own food inside their leaves.	
			And what do plants need from their environment to make their own food?	Water, light, and air.	
			Isn't that amazing? We have to get our food from the grocery store or from a garden, but plants can make their own food inside their leaves!		
			Show slide 3.		
			Last time, we used two different models to show how plants make their own food.		
			NOTE TO TEACHER: *Display the models students used in lesson 5c as a visual reminder.*		
			What is a model?	It's like the real thing, but it isn't real.	
				A model shows how something works in the real world.	
				A model helps scientists understand	

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			Show slide 4. So how is a model different from the real thing? How was our mixing bowl different from a real leaf? How were the water, air, and light in our model different from what happens in real leaves?	and explain things that happen in the real world. Models are made of plastic or something else, but they aren't made out of the same stuff that real things are made of. Models are smaller or bigger than the real thing, like a toy truck is smaller than a real truck. The mixing bowl was made of plastic, and leaves aren't plastic. We poured water into the bowl from a bottle. We put air in a balloon and then poured it into the bowl.	

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			And when we mixed the light, air, and water together in our model, what did we get? Do you think sugar cubes are inside real leaves? How was our plant diagram different from what happens in real life? So our models weren't *exactly* like the real thing, but they helped us show what happens inside leaves when they use water, air, and sunlight from their environment to make sugar as food for plants. It's hard for scientists—and for us—to understand how plants make food inside their leaves because we can't see what's going on in there. But we can use models to better understand and explain what happens when plants make food.	The flashlight wasn't really sunlight from the Sun. Sugar cubes! No! They're too big to fit inside leaves. The diagram was just a picture of what happens. In real life, there aren't any arrows pointing to plants or labels for air, water, and light.	

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1 min	**Lesson Focus Question** **Synopsis:** The teacher introduces the focus question, *What is another way we can show how plants make their own food?*	Set the purpose with a focus question or goal statement.	**Show slide 5.** Today we're going to explore another kind of model that can help us show how plants make food. We'll also think about a new focus question, *What is another way we can show how plants make their own food?* **NOTE TO TEACHER:** *Write the focus 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.*		
5 min	**Setup for Activity** **Synopsis:** The teacher introduces a role-play as another model students can use to show how plants make their own food. **Main science idea(s):** • Scientists use models to help them think about how things work in the world around them. For example, scientists can use a model to show what happens inside a leaf. Models are similar to and different from the real-life things they	Highlight key science ideas and focus question throughout.	**Show slide 6.** Have any of you ever heard of or acted in a role-play before? **NOTE TO TEACHER:** *Scientists engage in a type of modeling called* embodied imagining *to help them think about how systems behave, so we can reasonably consider role-plays another kind of model for students.* That's right! In a role-play, we pretend to be someone or something else. We use our imaginations to act like another person or an animal or the wind or other things. A role-play is a different kind of model than the	No. Yes. We pretended that we were animals in a story we read.	Do you remember what you did in the role-play?

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	represent.	Make explicit links between science ideas and activities **before** the activity.	mixing bowl or the plant diagram, but it's still a model because it shows how something happens in the real world.		
12 min	**Activity** **Synopsis:** The teacher engages students in acting out a role-play to model how plants make their own food. **Main science idea(s):** • Scientists use models to help them understand and explain how things work in the world around them. We can use a role-play to show how plants make their own food. • Plants take in light, water, and air from their environment to make their own food inside their leaves, and they use this food to live and grow.	Make explicit links between science ideas and activities **during** the activity.	So today we're going to be human models and pretend that we're plants making our own food. Our role-play will help us show how plants make food inside their leaves. **NOTE TO TEACHER:** *Feel free to modify the following directions to best meet the needs of your students.* **Show slide 7.** Now I'd like everyone to stand up. You're going to be a human model by pretending to be a plant. Your legs are your roots. Show me your roots planted firmly in the soil. Your body is the stem. Move your stem side to side as if it's bending in the breeze.		

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			Your arms are branches. Move your branches to make them sway in the wind. And your hands are leaves. Flutter your leaves to show that they're moving too. Now let's think about what we need as plants to make our own food. We'll need water, so let's have a volunteer be the rain falling from the sky to water us. **NOTE TO TEACHER:** *Give one volunteer a poster labeled WATER to wear around his or her neck during the role-play. To link this with the mixing-bowl analogy in lesson 5c, you may want to give the volunteer an* ***unopened*** *bottle of water to "shake" over the "plants."* What else do we need to make our own food? Yes. We need someone to be sunlight and shine on all of us. **NOTE TO TEACHER:** *Give another volunteer the SUNLIGHT poster to wear around his or her neck, as well as a flashlight to shine on the plants.* So now we have water and sunlight for our plants. Do we need anything else?	Sunlight!	

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			OK. We need a volunteer to be the air all around us. **NOTE TO TEACHER:** *Give a third volunteer the AIR poster to wear during the role-play. To connect this with the mixing-bowl analogy in lesson 5c, you could give this student an inflated balloon or a baggie of air (or a fan) to give air to the plants.* Now we have everything we need from our environment so we can make our own food inside our leaves. Let's have our WATER volunteer come and rain on all of us and on the ground around us. Imagine the water soaking into the soil. **NOTE TO TEACHER:** *Have the volunteer with the WATER poster walk around and "rain" on the students who are acting like plants. Direct the volunteer to wiggle his or her fingers to simulate rain falling from the sky.* When it rains, what will we do, plants? OK. I want you to imagine taking in water from the soil with your roots, or legs. Where does the water go after our roots take it in? So imagine the water moving up your legs into your body or stem and then into your leaves or hands.	We need air. We'll take in the water with our roots. It goes up our stems and into our leaves.	

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			Do we need anything else to make our food? Let's have our AIR volunteer walk around us and give us the air we need to make our food. Plants, how will we take in our air? So imagine the air going into your leaves, or hands. Now we have the water and air we need. What else do we need to make food? Yes! We need light? Let's have our SUNLIGHT volunteer shine on us. **NOTE TO TEACHER:** *Have the SUNLIGHT volunteer walk around and shine a flashlight on all of the student plants.* Imagine the sunlight soaking into your leaves. Can you feel the warmth and energy of the Sun? OK. Now I want you to imagine the air, light, and water in your leaves mixing together. Wave your hands around to show this. What are your leaves making with all of that mixing? Great job with the role-play, everyone! You can return to your seats now.	Air. Through tiny holes in our leaves. We need sunlight! Sugar! Food!	

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		Summarize key science ideas.	So our role-play told the story of how plants take in air, water, and sunlight from their environment and mix them together inside their leaves to make food they can use to live and grow.		
5 min	**Follow-Up to Activity** **Synopsis:** The teacher reviews the focus question. Then students work in pairs to construct summary statements that explain what the mixing-bowl model, the plant diagram, and the role-play showed about plants. **Main science idea(s):** • We can use different kinds of models, including diagrams and role-plays, to show how plants make their own food. • All three of our models showed that plants take in light, air, and water from their environment and make their own food inside their leaves. Then they use this food to live and grow.	Highlight key science ideas and focus question throughout. Make explicit links between science ideas and activities **after** the activity.	**Show slide 8.** Next, let's revisit our focus question, *What is another way we can show how plants make their own food?* To answer this question, let's think about all of the different ways we've showed how plants make their food. How many different ways or models have we used to show how plants make food? Who can describe the three models we used? **Show slide 9.** What did all three of our models show about plants? **Turn and Talk:** Talk about this question with an elbow partner. Then work together to complete the sentence on the slide: *All three models showed that …* Be ready to share your sentences with the class.	Three. We used a mixing bowl, a picture, and a role-play.	

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			ELL support: During the lesson preview, give ELL students time to discuss the follow-up question and practice using the sentence starter so they understand what's expected of them and can participate more fully in the activity.		
5 min	**Synthesize/Summarize Today's Lesson** **Synopsis:** Students share the summary statements they constructed to explain what the three models showed about plants. Then they discuss which model made the most sense to them. **Main science idea(s):** • We can use different kinds of models, including diagrams and role-plays, to show how plants make their own food. • All three of our models showed that plants take in light, air, and water from their environment and make their own food inside their leaves. Then they use this food to live	Engage students in making connections by synthesizing and summarizing key science ideas. Engage students in communicating in scientific ways.	Let's hear the sentences you came up with to summarize what all three of our models showed. As your classmates share their ideas, be good listeners and see if you can suggest ways they might make their sentences clearer or better. **NOTE TO TEACHER:** *Invite students to share their sentences one at a time. Record key ideas on chart paper and encourage students to give one another feedback.*	All three models showed that plants make their own food. All three models showed that plants need food to live and grow. All three models showed that plants need water, air, and sunlight to make their own food. All three models showed plants getting water, sunlight, and air	*Questions to ask during the discussion:* • Do you agree or disagree with this idea? • Do you have anything to add on? • Do you have any ideas for making this sentence clearer?

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	and grow.		**Show slide 10.** Which of our three models made the most sense to you? Why? Which model did you like best and why?	from their environment and mixing those things together in their leaves to make food they can use to live and grow.	
1 min	**Link to Next Lesson** **Synopsis:** The teacher foreshadows the next lesson in which students consider what they've learned so far that can help them answer the unit central question.	Link science ideas to other science ideas.	**Show slide 11.** Who remembers the big question we've been thinking about in this unit on plants and animals? Let's read it together: *Do plants and animals need the same things to live and grow? Explain your thinking.* **NOTE TO TEACHER:** *Draw students' attention to the unit central question on the board and point to each word as you read the question aloud together.* Next time, we'll think about what we've learned that can help us answer this question.		