Plants and Animals Lesson 5a: Food for Plants

6	Grade: Kindergarten	Length of lesson: 43 minutes	Placement of lesson in unit: 5a of 6 lessons on plants and animals	
	Init central question: D b live and grow? Explain	1 6	Lesson focus questions: Do plants need food? What is our evidence?	

Main learning goal: Like animals, plants need food to live and grow. But plants make their own food with sunlight, water, and air they get from their environment. Animals can't do this.

Science content storyline: We know that plants need sunlight, water, and air to live and grow. But just like animals, plants also need food. Plants get their food in a very different way from animals. Animals catch food and take it into their bodies by eating it, but plants make their own food inside their leaves by using the sunlight, water, and air they get from their environment. This explains why plants need these things to live and grow.

Ideal student response to the focus questions: Plants need food to live and grow just like animals. But they get their food in a different way. Instead of eating the food they catch like animals do, plants make their own food inside their leaves. Plants use sunlight, water, and air that they get from the environment to make their food.

Preparation

Materials Needed

- Science notebooks
- Chart paper and markers
- Scissors and tape (for teacher)
- Circle maps of lion, praying mantis, earthworm, and ladybug or tree map of what animals need (from lessons 2a/b).
- Circle map from lesson 3a ("Our Beginning Ideas: What Do Plants Need to Live and Grow?")

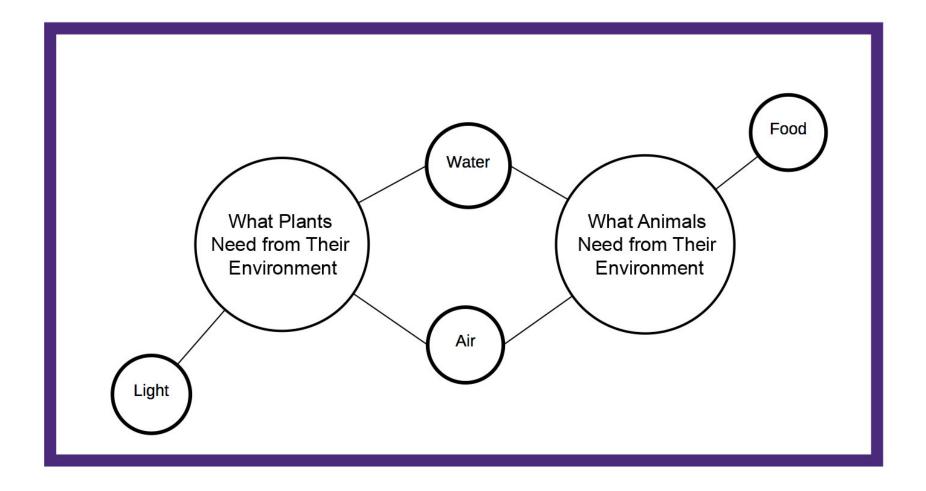
Student Handouts and Teacher Masters

• 5.1 *From Seed to Pumpkin* (book by Wendy Pfeffer) (Teacher Master) (1 laminated flip book per pair, 13 total copies)

Ahead of Time

- Review section 5 in the content background document.
- Prepare copies of handout 5.1 (*From Seed to Pumpkin*) and laminate (cover and pages 10–11). Create 13 flip books for pairs to use.
- Prepare two circle maps on chart paper. Use the titles "What Animals Need from Their Environment," and "What Plants Need from Their Environment."
- Prepare a double bubble thinking map on chart paper, with two bubbles titled "What Plants Need from Their Environment" and "What Animals Need from Their Environment." You'll add to these bubbles in lessons 5a–5d. (See Double Bubble Answer Key on the following page.)
- 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. Read the story *From Seed to Pumpkin* to students and show them the pictures. Identify vocabulary terms in the lesson plan to review with students in advance, including *thinking map/bubble map, energy, mixed together* (not mixing ingredients to make food), and *sugar*. 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.

Double Bubble Answer Key: End of Lessons 5a–5d



Lesson 5a General Outline

Time	Phase of Lesson	How the Science Content Storyline Develops
10 min	Link to previous lessons: The teacher engages students in synthesizing prior learning by creating circle maps and a double bubble thinking map to help them compare plant and animal needs.	• Plants need to get light, air, and water from their environment to live and grow. Animals need to get food, air, and water from their environment to live and grow. Both plants and animals need water and air, but only plants need light. Animals need food, but do plants need food too?
2 min	Lesson focus questions: The teacher introduces the focus questions, <i>Do plants need food? What is our evidence?</i> and elicits initial ideas from students.	
7 min	Setup for activity: The teacher sets up an activity in which students study pictures and information about plants to find out whether plants need food, and if so, how they get it.	• We know that animals need food to live and grow. But do plants need food like animals?
10 min	Activity: Working in pairs, students study pictures and information about plants to see if they can find clues to help them answer the focus questions. Then they share their findings with the class.	• Like animals, plants need food to live and grow. But instead of catching and eating their food like animals do, plants take in sunlight, air, and water from their environment and use them to make their own food inside their leaves.
8 min	Follow-up to activity: The teacher reviews the focus questions. Then students share what they've learned so far about whether plants need food and how they get it.	
5 min	Synthesize/summarize today's lesson: Students look at a picture of a plant and share their ideas about how plants get their food. Then the teacher summarizes key ideas from the lesson.	• Like animals, plants need food to live and grow. But they get their food in a very different way. Plants make their own food in their leaves by using sunlight, water, and air from their environment.
1 min	Link to next lessons: The teacher foreshadows what students will learn about in the following lessons.	

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
10 min	 Link to Previous Lessons Synopsis: The teacher engages students in synthesizing prior learning by creating circle maps and a double bubble thinking map to help them compare plant and animal needs. Main science idea(s): Plants need to get light, air, and water from their environment to live and grow. Animals need to get food, air, and water from their environment to live and grow. Both plants and animals need water and air, but only plants need light. Animals need food, but do plants need food too? 	Link science ideas to other science ideas. Engage students in making connections by synthesizing and summarizing key science ideas. Select content representations and models matched to the learning goal and engage students in their use.	 Show slides 1 and 2. The big question we're trying to answer in this unit about plants and animals is <i>Do plants and animals need the same things to live and grow? Explain your thinking.</i> Let's review what we've learned so far about what plants and animals need to live and grow. To help us summarize our ideas, we're going to make a circle map. NOTE TO TEACHER: <i>Display the circle map you created on chart paper (or electronically) and point to the heading in the center circle: What Plants Need from Their Environment.</i> Show slide 3. Let's start with what we've learned about plants from our experiments. What does it say in the middle circle? I'll give you 30 seconds to think about what plants need from their environment and any evidence you have to support your ideas. Be ready to say in two sentences, 	What plants need from their environment.	

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		Ask questions to elicit student ideas and predictions. Ask questions to probe student ideas and predictions. Ask questions to challenge student thinking. Engage students in communicating in scientific	 Plants need My evidence is Individual think time (30 sec). Whole-class share-out: Let's hear your ideas. What do plants need from their environment? Make sure to support your answers with evidence. NOTE TO TEACHER: As students share their ideas, add them to the circle map. At the end of this discussion, the map should show that plants need water, air, and sunlight to live and grow. At this point, food shouldn't be included on the map, since students don't know yet whether plants need food. This will be added at the end of the lesson. Dirt or soil shouldn't be on the map either because it isn't something that all plants need. During this discussion, ask questions to probe and challenge student thinking. Also encourage students to communicate in scientific ways. If students insist that plants need soil, make sure to challenge this idea. If you decide to add it to the thinking map, include a question mark so students realize that the evidence they've collected doesn't support this idea/claim. 	Plants need light. My evidence is that the plants we grew in the dark turned yellow and drooped. Plants need water. My evidence is that the plants in our experiment that didn't have water turned brown and dry. Plants need air. My evidence is that the plant without air in the scientist's experiment turned brown, and the leaves fell off. Plants need soil. My evidence is that we always grow plants	Questions to ask during the discussion: • Does anyone agree or disagree? Why? • Can anyone add on to that? • What is your evidence? • How do you know? • Did we learn about anything else that plants need to live and grow?

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		ways.	 We've learned a lot about what plants need from their environments, haven't we? But what about animals? What do they need to get from their environment? NOTE TO TEACHER: Display the circle map you created on chart paper (or electronically) and point to the heading in the center circle: What Animals Need from Their Environment. Show slide 4. 	in soil. I don't think plants need soil. My evidence is that our seeds grew without soil in the paper towels. They had air, water, and light, but no soil. I agree. We saw photos of plants that live only in air or water, so I don't think that plants need soil to live and grow.	Does anyone have evidence to show that plants do <i>not</i> need soil? Does anyone agree or disagree?

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			 What does it say in the center circle of our new circle map? I'll give you 30 seconds to think about what animals need from their environment and any evidence you have to support your ideas. Be ready to say in two sentences, Animals need My evidence is Individual think time (30 sec). 	What animals need from their environment.	
			Whole-class share-out: Let's hear your ideas. What do animals need from their environment? Make sure to support your answers with evidence. NOTE TO TEACHER: As students share their ideas, add them to the circle map. If students come up with reasonable answers beyond food, water, and air (and possibly environment), add them to the circle map as well. At the end of this discussion, the map should show that animals need water, air, and food to live and grow.	Animals need to breathe air, drink water, and eat food. Animals need food. My evidence is that the praying mantis and ladybugs eat insects. Animals need air. My evidence is that the praying mantis and ladybugs have	 Questions to ask during the discussion: Does anyone agree or disagree? Why? Can anyone add on to that? What is your evidence? How do you know? Did we learn about anything else that animals need to live and

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				tiny holes along their bodies to take in air. Animals need an environment. My evidence is that the praying mantis lives in a terrarium. Animals need to be taken care of. [<i>Misconception</i>]	grow? Do you mean they need people to take care of them? Is this true for <i>all</i> animals?
			Show slide 5. Now let's compare the needs of plants and animals. When we compare, we're looking for something that is the <i>same</i> about two things or two groups of things. Look at our two circle maps.	My evidence is that the lion, the praying mantis, and the ladybugs all drink water.	

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			 What do both plants and animals need from their environment to live and grow? Raise your hand if you see something that both plants and animals need. When I call on you, come up and point to where you see a match between what plants need and what animals need. What do you see on our circle maps that both plants and animals need? So both plants and animals need air. To show that both animals and plants need air, we're going to cut the word <i>air</i> from both of our circle maps and tape them to a new map called a <i>double bubble map</i>. Then we'll draw lines from the air bubble to the bubbles for plants and animals to connect them. This tells us that both plants and animals need air out of <i>both circle maps and tape them on top of each other in the middle of the double bubble map</i> (<i>between the plants and animals bubbles</i>) so that only one of the words is visible. Then circle the word air and draw a line to connect the air bubble to the plants and animals bubbles. Is there anything else that both plants and animals need? 	They both need air.	

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			 NOTE TO TEACHER: Repeat the previous steps, cutting out the word water out of both circle maps and taping the words on top of each other in the middle of the double bubble map. Then draw lines from the water bubble to the bubbles for plants and animals. (If students want to include environment on the map, you can add it, but explain that plants and animals get the things they need from the environment, and it isn't possible to test whether living things need an environment because they can't create a condition where there is no environment.) Now can you name something that plants need but animals don't need? Right! Plants need light, but we don't have that on our list of needs for animals, do we? So let's cut the word sunlight out of the plant circle map and put it on the <i>left</i> side of our double bubble map to show that only plants need sunlight from their environment. A double bubble map can help us see how two things are different, too. We won't put the word in the middle of the map because we can't connect sunlight to the animals bubble, since animals don't need light. NOTE TO TEACHER: Cut out the word sunlight on the plants circle map and tape it on the double 	Both plants and animals need water. Sunlight.	

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			 bubble map on the left side of the plants bubble (not in the middle of the map). Then draw a line from the sunlight bubble to the plants bubble (but not to the animals bubble). Do you see anything on our animals circle map that isn't on our plants circle map? Let's put the word food on the right side of our double bubble map to show that it's on our circle map for animals but isn't on our circle map for plants. NOTE TO TEACHER: Cut out the word food on the animals circle map and tape it on the double bubble map on the right side of the animals bubble (not in the middle of the map). Then draw a line from the food bubble to the animals bubble (but not to the plants bubble). So we know from learning about different animals that all animals need food. But we haven't learned whether plants need food. That's what we'll find out today! 	Food!	
2 min	Lesson Focus Questions		Show slide 6.		
	Synopsis: The teacher introduces the focus questions, <i>Do plants need</i> <i>food? What is our</i>	Set the purpose with a <u>focus</u> <u>question</u> or goal statement.	In this lesson, we'll think about the focus questions, <i>Do plants need food? What is our evidence?</i>		

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	<i>evidence?</i> and elicits initial ideas from students.	Ask questions to elicit student ideas and predictions.	 NOTE TO TEACHER: Write the focus 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. Do you think that plants need food? Let's hear your ideas. NOTE TO TEACHER: As students share their initial ideas, record them on chart paper. 	 <i>Expected responses:</i> Plants don't need food because they don't eat. Plants can't catch food like animals, so they don't have anything to eat. My family gives our plants plant food, so they must need food. Plants use [water, soil, whatever they take in] as their food. 	
7 min	Setup for Activity Synopsis: The teacher sets up an activity in which students study pictures and information about plants to find out whether plants need food, and if so, how they get it.	Make explicit links between science ideas and activities before the activity.	Show slide 7.You have a lot of good ideas about plants and food.Today we're going to investigate whether plants need food like animals do. We'll also find out which of our ideas match what scientists have learned.		

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	Main science idea(s): • We know that animals need food to live and grow. But do plants need food like animals?	Highlight key science ideas and focus question throughout.	 Show slide 8. To help us answer our focus questions, we're going to look at some pictures and words about plants from one of our books. You and a partner will need to study the pictures very carefully and read as many of the words as you can. Your job or goal is to figure out whether plants need food. See if you can find clues in the pictures and the words that will help us answer our focus questions, <i>Do plants need food? What is our evidence?</i> NOTE TO TEACHER: <i>Have students repeat the focus questions aloud with you as you point to each word on the board. Then have students pair up with an elbow partner and give each pair a flip book (</i>From Seed to Pumpkin). ELL support: During the lesson preview, have ELL students look at the pictures and support them in reading the text. Introduce the key terms <i>energy, make food</i>, and <i>sugar</i>. Although the terms <i>make food</i> and <i>sugar</i> may be familiar to students, the meanings and the way they're used in this lesson are slightly different from everyday usage. 		

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10 min	Activity Synopsis: Working in pairs, students study pictures and information about plants to see if they can find clues to help them answer the focus questions. Then they share their findings with the class. Main science idea(s): • Like animals, plants need food to live and grow. But instead of catching and eating their food like animals do, plants take in sunlight, air, and water from their environment and use them to make their own food inside their leaves.	Make explicit links between science ideas and activities during the activity. Engage students in analyzing and interpreting data and observations. Engage students in communicating in scientific ways. Ask questions to probe student ideas and predictions. Ask questions to challenge student thinking.	 OK, let's begin looking for clues in our story about whether plants need food! Be prepared to share what you find out with the class. NOTE TO TEACHER: As pairs study the pictures and text, circulate around the room and help them stay focused on the questions they're trying to answer: Do plants need food? What is our evidence? Ask them to show you evidence from the pictures and text that supports their ideas. Show slide 9. Whole-class share-out: What did you find out from studying the pictures and words in our book? First, do plants need food? Who can point to a picture or word that can help us answer this question? NOTE TO TEACHER: You may want to have students engage in a Turn and Talk before sharing their findings with the class. So the book says that plants need food. What clues did you find about how plants get their food? What other pictures or words tell you that plants 	We found the word food on this page, so we think that plants need food. We agree, because on page 10 it says, "Plants need food to grow."	Does anyone agree or disagree?

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			need food?	The picture on page 11 has arrows going into the leaves, so we think that air is going into the leaves, and maybe air is the plant's food.	Does anyone agree, disagree, or want to add on?
				Maybe that's right, but this picture shows a boy watering the soil, and it shows the roots in the soil, so we think that water is going into the roots and might be food for the plant.	Anyone want to
				I agree, because this other picture on page 11 shows rain going into the soil, and it shows roots, too. So it's kind of	add on to that? Does anyone agree or disagree?
				the same.	Does anyone have other evidence to

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			NOTE TO TEACHER: If you have some good readers in your class, they'll notice that plants use sunlight, water, and air to make food in their leaves, and that these substance aren't actually food for plants. But don't worry if no one notices this, because they'll learn about it in the next lesson when you read the book How Do Plants Get Food?	This picture shows arrows going into the leaves, and the words say that light and air go into the leaves. Maybe light and air are food for plants. This page says that a plant needs air, water, and light to <i>make</i> food. It doesn't say that air, water, and light <i>are</i> food for plants. This other page says the same thing: "To <i>make</i> food, plants need light, water, and air."	share? What do you think that tells us about what is food for plants?

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8 min	Develops Follow-Up to Activity Synopsis: The teacher reviews the focus questions. Then students share what they've learned so far about whether plants need food and how they get it. Main science idea(s): • Like animals, plants need food to live and grow. But instead of catching and eating their food like animals do, plants take in sunlight, air, and water from their environment and use them to make their leaves.	Highlight key science ideas and focus question throughout. Make explicit links between science ideas and activities after the activity. Ask questions to probe student ideas and predictions. Ask questions to challenge student thinking.	Show slide 10. Let's think about what we learned from our reading that can help us answer our focus questions, Do plants need food? What is our evidence? Let's start with the first question: Do plants need food? What did we find out from our reading? How do plants get food? What did we find out? So what do plants need from their environment? Look at our double bubble map.	Yes, plants need food just like animals. The book said that plants need food. Plants make food! They make it out of air, water, and light. They need air, light, and water.	And what is our evidence for that? How do they do that? Does anyone agree, disagree, or want to add on? And what do they do with the air, light and water?
				They put them together to make	

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			 I'll write "Plants use air, water, and light to make food" at the bottom of our double bubble map. So do plants get their food by catching it and eating it like animals do? Is this like how animals get their food, or is it different? 	food. The leaves do. Plants use those things to make their own food inside themselves. No. Plants don't catch and eat their food! They make it! They use sunlight, air, and water to make their own food. It's different because plants don't have mouths. It's different because animals can't eat sunlight.	What part of the plant does that? How do they get their food? Can anyone add more details?

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			 NOTE TO TEACHER: The misconception that light is food for plants will be addressed in the reading in lesson 5b. If students think that water, air, and sunlight are food for plants, emphasize from the pictures and text in From Seed to Pumpkin that these three things are mixed together to make food, but they aren't food by themselves. After reviewing this information, ask students, "Is water food for plants?" "Is air food for plants?" "Is sunlight food for plants?" Then ask how each of these things relates to food. Make sure students understand that water, food, and sunlight are all used or mixed together to make food. ELL support: During the lesson preview, discuss with ELL students what making food means in this context. They're likely to think that plants mix water, air, and light together like their families mix ingredients together to make food. Make sure they understand that what plants do is a different kind of mixing together. 	They don't eat sunlight, but it's their food. [Misconception]	Do plants eat sunlight?
5 min	Synthesize/Summarize Today's Lesson Synopsis: Students look at a picture of a plant and share their ideas about how plants get their food. Then the teacher	Engage students in making connections by synthesizing and summarizing	Show slide 11. Turn and Talk: Now I'd like you to pair up with an elbow partner and study the plant on this slide. What does this picture tell you about how plants get their food? Talk about your ideas and be ready to share them with the class.		

summarizes key ideas from the lesson.key science ideas.Whole-class share-out: What does this picture tell you about how plants get their food?Here wabul how plants get their food?Main science idea(s): • Like animals, plants need food to live and grow. But they get their food in a very different way. Plants make their own food in their leaves by using sunlight, water, and air from their environment.When you share your ideas, use the sentence starter, "Plants get their food by"Plants get their food by making it.ELL support: During the lesson preview, give ELL students time to practice using the sentence starter to share their ideas so they understand what's expected of them and can participate more fully in the discussion.Plants get their food by taking in sunlight, water, and air from their environment.I agree, that plants need air, water, and sunlight, but I disagree that those things are their food.I agree. They use those things to make their food.	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 So we've learned that plants use water, air, and		 from the lesson. Main science idea(s): Like animals, plants need food to live and grow. But they get their food in a very different way. Plants make their own food in their leaves by using sunlight, water, and air from their 	ideas.	 you about how plants get their food? When you share your ideas, use the sentence starter, "Plants get their food by" Be good listeners as your classmates share their ideas and be ready to agree, disagree, or add on. ELL support: During the lesson preview, give ELL students time to practice using the sentence starter to share their ideas so they understand what's expected of them and can participate more fully in the discussion. I like how you're talking like scientists! Show slide 12. 	by making it. Plants get their food by taking in sunlight, water, and air from their environment. I agree that plants need air, water, and sunlight, but I disagree that those things are their food. I agree. They use those things to make	agree, disagree, or

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		science ideas.	sunlight to make their own food. They get these things from their environment and turn them into food inside their leaves.		
1 min	Link to Next Lessons		Show slide 13.		
	Synopsis: The teacher foreshadows what students will learn about in the following lessons.	Link science ideas to other science ideas.	Isn't it amazing that plants can make their own food by using water, air, and sunlight? In our next few lessons, we'll find out more about how plants get their food!		