RESPeCT Summer Institute Professional Development Leader Guide (PDLG)

Grade Level	K	Day	6	STeLLA Strategy	SCSL Strategies B, C, and I STL Strategy 7	Subject Matter Focus	Plants and Animals (P&A)
Focus Questions	• How can we begin and end a lesson to help students develop a coherent science content storyline? • How can selecting appropriate science activities help students develop a coherent science content storyline? • What do plants need from their environment to live and grow? Why do they need these things?						
Main Learning Goals	Participants will understand the following: • STeLLA strategies B, I, and 7 are like bookends that mark the beginning and end of a lesson. The science ideas in the summary should match the focus question from the beginning of the lesson, and both the focus question and the summary should match the lesson's main learning goal. • Activities should be selected because they will help students engage in making sense of the main learning goal, not because they're fun, easy to do, or only topically related. Therefore, activities must be closely matched to the main learning goal. • Plants take in carbon dioxide and water from their environment and combine them with sunlight to make energy-supplying food they can use to live and grow. This process is called *photosynthesis*.						

Preparation	Materials	Videos
Daily Setup Tasks • Check that video clips are correctly linked to PowerPoint (PPT) slides. • Set up PowerPoint. • Make sure video clips play correctly with good sound. • Arrange furniture and food. • Arrange participant materials. • Put up posters and charts. **Planning and Preparation Tasks** • Study the PDLG, PowerPoint slides (PPTs), video clips, and handouts. Make changes to PPTs if needed. • Review the reflections from day 5 and create a summary slide. • Watch video clips and anticipate participant responses. • Prepare charts for the day's agenda and focus questions. • For content deepening:	**Posters and Charts** • STeLLA Framework and Strategies poster • Day-6 Agenda (chart) • Day-6 Focus Questions (chart) • Norms for Working Together (chart) • Strategy charts from days 1–5 (STL strategies 1–6 and SCSL strategy A) • Parking Lot poster **Handouts in RESPeCT PD Binder Front Pocket** • Participants' SCSL and STL Z-fold summary charts **Handouts in RESPeCT PD Binder, Day 6** • 6.1 Analysis Guides B and I: Setting the Purpose and Summarizing Key Science Ideas • 6.2 Transcript for Video Clip 6.1 • 6.3 Transcript for Video Clip 6.2 • 6.4 Analysis Guide C: Selecting Activities Matched to the Learning Goal	Video clips from one P&A lesson: • Video Clip 6.1: Tanguma classroom (strategy B, beginning of lesson); 6.1_mspcp_kinder.pa.tanguma_L5_c1 Video Clip 6.2: Tanguma classroom (strategy I, end of lesson); 6.2_mspcp_kinder.pa.tanguma_L5_c2 Video clips from another P&A lesson: • Video Clip 6.3: Tanguma classroom (strategy C); 6.3_mspcp_kinder.pa.tanguma_L5_c3–4 • Video Clip 6.4: Tanguma classroom (strategy C); 6.4_mspcp_kinder.pa.tanguma_L5_c5–6 • Video Clip 6.5: Tanguma classroom (strategy C); 6.5_mspcp_kinder.pa.tanguma_L5_c7 • Video Clip 6.6: Tanguma classroom (strategy C, beginning and end of lesson); 6.6_mspcp_kinder.pa.tanguma_L5_c8–9

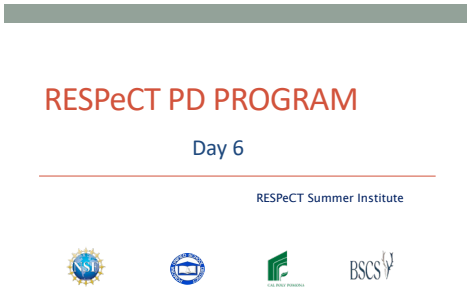
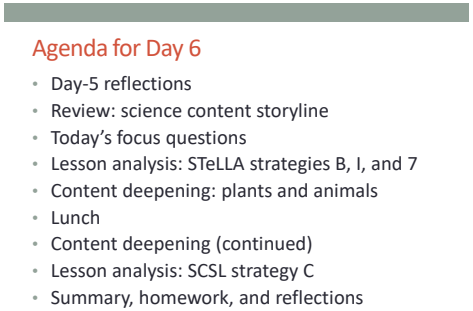
• Practice the mixing-bowl analogy of photosynthesis (slide 30).
• **Optional bean-seed experiment:** Four weeks ahead of time, grow some bean plants in transparent plastic cups containing cotton balls and/or soil. Place from one to three bean seeds in each cup. One week before the Summer Institute, place one of the cups in a location where it receives water, light, and air. Place another cup in a location where it receives air and water but no light. Place the third cup in a location where it receives air and light but no water. Display these cups during the content deepening session (slide 23).
• Provide water and food for the organisms in the group terrarium (see handout 1.1 in lesson plans binder).
	• 6.5 Transcript for Video Clip 6.3
	• 6.6 Transcript for Video Clip 6.4
	• 6.7 Transcript for Video Clip 6.5
	• 6.8 Transcript for Video Clip 6.6
	• 6.9 Food versus Not Food
	• 6.10 Nutrition Labels
	• 6.11 Three Representations of Photosynthesis
	• 6.12 Daily Reflections—Day 6
	
	Handouts in RESPeCT Lesson Plans Binder
	• 1.1 Terrarium Instructions and Mantis Care (from lesson 1a)
	
	PD Leader Masters, Days 5–8
	• PD Leader Master: Analysis Guide C: Selecting Activities Matched to the Learning Goal (Answer Key)
	
	Supplies
	• Science notebooks
	• Chart paper and markers
	• Terrarium (from day 5)
	• For mixing-bowl analogy (content deepening):
	  • Green mixing bowl
	  • Flashlight
	  • Zip-seal, plastic bag (filled with air)
	  • Bottle of water
	  • Hand mixer/beater
	  • Sugar cubes
	• **For optional bean-seed experiment:**
	  • 18 bean seeds
	  • Cotton balls
	  • Potting soil
	  • 4-6 transparent plastic cups
	
	PD Resources
	• STeLLA strategies booklet
	• RESPeCT PD program binder
	• RESPeCT lesson plans binder
	
	Resources in Lesson Plans Binder
	Resources section:	

	• Plants and Animals Content Background Document • Common Student Ideas about Plants and Animals	

DAY 6 SESSION OUTLINE

Time	Activities	Purpose
8:00–8:30 30 min	**Getting Started: Housekeeping, Agenda, Day-5 Reflections, Focus Questions**	• Build community by sharing participants' reflections from day 5. • Set the stage for a day of learning.
8:30–10:10 100 min (Includes 10-min break)	**Lesson Analysis: STeLLA Strategies, B, I, and 7**	• Use lesson analysis of classroom videos to better understand STeLLA strategies B, I, and 7. • Deepen participants' science-content knowledge of plants and animals through lesson analysis.
10:10–12:00 110 min	**Content Deepening: Plants and Animals**	• Deepen participant's science-content knowledge of plants and photosynthesis.
12:00–12:45 45 min	**LUNCH**	
12:45–1:15 30 min	**Content Deepening (Continued)**	• Deepen participant's science-content knowledge of plants and photosynthesis.
1:15–3:15 120 min (Includes 10-min break)	**Lesson Analysis: SCSL Strategy C**	• Use lesson analysis of classroom videos to better understand SCSL strategy C. • Deepen participants' science-content knowledge of plants and animals through lesson analysis.
3:15–3:30 15 min	**Wrap-Up: Summary, Homework, and Reflections**	• Summarize and reflect on key ideas about STeLLA strategies B, I, 7, and C, and the P&A science content.

DAY 6

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
8:00–8:30 30 min **Getting Started** Slides 1–6	**Purpose** • Build community by sharing participants' reflections from day 5. • Set the stage for a day of learning. **What Participants Do** • Review the day's agenda. • Discuss reflections from day 5. • Review key areas of learning from day 5. • Read today's focus questions. **Posters and Charts** • STeLLA Framework and Strategies poster • Day-6 Agenda (chart) • Day-6 Focus Questions (chart) **Supplies** • Science notebooks		**Display Slide 1.** RESPeCT PD Program (5 min) a. Take care of any housekeeping issues.
			**Display Slide 2.** Agenda for Day 6 (5 min) a. Go over the agenda for the day.

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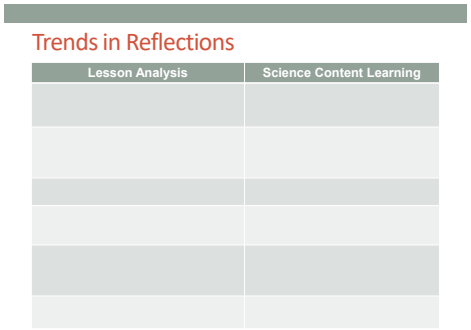
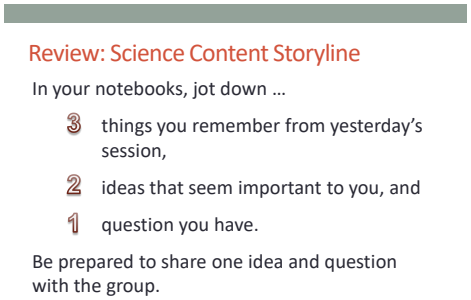
			**Display Slide 3.** Trends in Reflections (7 min) a. Give participants time to review your feedback on their reflections from day 5 and offer reactions, comments, or follow-up questions.
			**Display Slide 4.** Review: Science Content Storyline (10 min) a. Point out the three tasks on the slide. Allow 4–5 minutes for participants to write their responses in their science notebooks. b. Have each participant share one idea about the science content storyline that she or he thinks is really important. c. Then ask participants to share their questions. If you can answer them quickly, go ahead and do so. If a question needs a more detailed response, write it down and schedule a time to address it.

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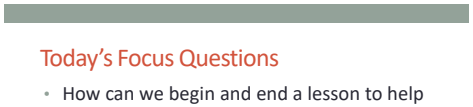
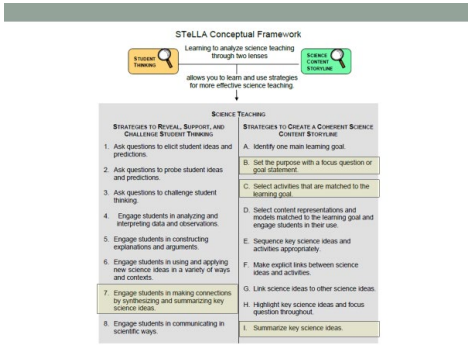
			**Display Slide 5.** Today's Focus Questions (2 min) a. Introduce today's focus questions.
			**Display Slide 6.** STeLLA Conceptual Framework (1 min) a. "Today we'll be looking at four new STeLLA strategies. Three of them are Science Content Storyline Lens strategies, and one is a Student Thinking Lens strategy. Throughout the session, think about how these strategies are different from one another and how they are closely linked to each other."

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
8:30–10:10 100 min (Includes 10-min break) **Lesson Analysis: STeLLA Strategies B, I, and 7** Slides 7–14	**Purpose** • Use lesson analysis of classroom videos to better understand STeLLA strategies B, I, and 7. • Deepen participants' science-content knowledge of plants and animals through lesson analysis. **Content** • Strategies B, I, and 7 are like bookends that mark the beginning and end of a lesson. The science ideas used in the summary should match the focus question from the beginning of the lesson, and both the focus question and the summary should match the lesson's main learning goal. • The Plants and Animals science content emerges from video-based lesson analysis. **What Participants Do** • Make, share, and discuss charts summarizing the purposes and key features of strategies B, I, and 7. • Discuss questions about strategies B, I, and 7. • Analyze video clips from the beginning and end of a lesson about how plants get their food. • Study the main learning goal (MLG), focus question, and summary in the P&A lesson plan. **Videos**	Lesson Analysis: Focus Question 1 How can we begin and end a lesson to help students develop a coherent science content storyline?	**Display Slide 7.** Lesson Analysis: Focus Question 1 (Less than 1 min) a. "Now let's dig into our first focus question."
		Strategies B, I, and 7: Purposes and Key Features **Group 1:** What are the purpose and key features of strategy B? • Why is a focus question or goal statement important for science content storyline coherence? **Group 2:** What are the purpose and key features of strategy I? • Why is summarizing key science ideas important for science content storyline coherence? **Group 3:** What are the purpose and key features of strategy 7? • How does strategy 7 compare with strategy I? **All groups:** Make sure to cite ideas from the STeLLA strategies booklet in your answers.	**Display Slide 8.** Strategies B, I, and 7: Purposes and Key Features (25 min) a. **Pairs (3 min):** Direct participants to retrieve their Z-fold summary charts and share with a partner what they learned from their homework assignment about STeLLA strategies B, I, and 7. b. **Small groups (12 min):** Divide participants into three small groups and have them make charts that capture the purposes and key features of the three strategies. **Note:** Challenge participants to imagine themselves in a Teacher Leader role. Ask them, "How would you explain these strategies to the teachers you're leading?" c. **Whole group (10 min):** Have small groups share their charts in a whole-group share-out. **Key ideas:** • Make sure participants understand that a focus question is designed to do more than just get students interested in the lesson. It gets them thinking about a phenomenon or something

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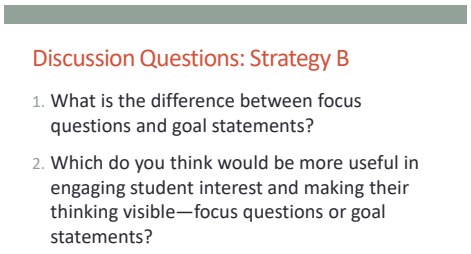
	• Video Clip 6.1, Tanguma classroom (beginning of lesson) • Video Clip 6.2, Tanguma classroom (end of lesson) **Handouts in PD Binder** • 6.1 Analysis Guides B and I • 6.2 Transcript for Video Clip 6.1 • 6.3 Transcript for Video Clip 6.2 **Supplies** • Science notebooks • Chart paper and markers **PD Resources** • STeLLA strategies booklet • RESPeCT lesson plans binder • Participants' SCSL and STL Z-fold summary charts (front pocket of PD binder)		else they've never thought about before. It also reveals important things about the knowledge and experiences they're bringing to the lesson, it conceptually situates the learning, and it's referred to throughout the lesson. • STeLLA strategies B, I, and 7 are like bookends that mark the beginning and end of a lesson. The science ideas used in the summary should match the focus question from the beginning of the lesson, and both the focus question and the summary should match the lesson's main learning goal.
			**Display Slide 9.** Discussion Questions: Strategy B (7 min) a. **Whole group:** Discuss the questions on the slide as a group. **Key ideas:** • A focus question is designed to be answered using the lesson's main learning goal and supporting science ideas. A goal statement describes the main science idea to be learned. • Focus questions are always used in RESPeCT lesson plans because they're useful in engaging student interest, making their thinking visible, and eliciting initial ideas at the beginning of a lesson. When posed at the end of a lesson, focus questions challenge students to use new ideas developed during the lesson.

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		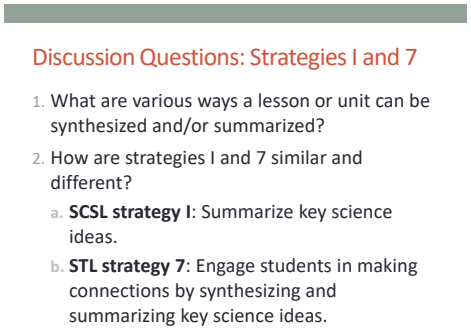	**Display Slide 10.** Discussion Questions: Strategies I and 7 (7 min) a. **Whole group:** Discuss the first question on the slide. Participants can refer to the information on strategy 7 in the STeLLA strategies booklet to identify a variety of ways in which key science ideas in a lesson can be synthesized. b. **Emphasize:** "Toward the end of a unit, an entire lesson may be devoted to strategy 7, which engages students in synthesizing and summarizing science ideas across several lessons." c. Discuss the second question on the slide. **Key ideas:** • In strategy I, the *teacher* creates a summary of key science ideas in the lesson. Strategy 7, however, engages *students* in synthesizing and summarizing key science ideas in the lesson. When *students themselves* perform this work, it makes their thinking visible, engages them in active sensemaking, and reveals to the teacher any misunderstandings or gaps in knowledge. Using both strategies brings coherence to a science lesson and is a powerful way to end it. • In strategy 7, summarizing involves making connections between key science ideas, which helps students *synthesize* the main learning goal or big idea in a lesson. • Summaries should focus on key science ideas, not activities; that is, focusing on "what we *learned*" versus "what we *did*." • For a variety of reasons, a lesson sometimes ends before the main learning goal has been fully developed. However, summarizing work should still take place. For example, the

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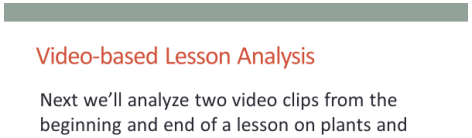
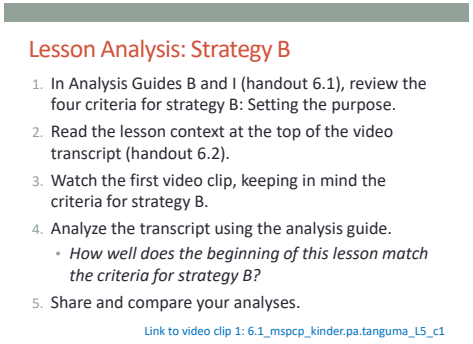
			teacher might say, "Our focus question today was *How do plants get their food?* What have we found out so far?" After students respond, the teacher could reply, "Yes, so far we've discovered that water and soil aren't food for plants. But we still haven't figured out what is food for plants. We'll continue working on this question next time."
			**Display Slide 11.** Video-based Lesson Analysis (Less than 1 min) a. **Transition:** This slide marks the transition to video-based lesson analysis.
			**Display Slide 12.** Lesson Analysis: Strategy B (20 min) a. Have participants locate Analysis Guides B and I (handout 6.1 in PD program binder) and spend 1 or 2 minutes reading the criteria for strategy B: Setting the purpose. b. **Ask:** "Do you have any questions about these criteria?"

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			c. **Emphasize:** "Keep the criteria for strategy B in mind as you watch the first clip from the beginning of a lesson about plants and animals." d. **Individuals:** Give participants a couple of minutes to read and think about the lesson context at the top of the video transcript (handout 6.2). e. Show the video clip. f. **Whole group:** "How well does the beginning of this lesson match the criteria for strategy B?" **Note:** During the discussion, be on the lookout for opportunities to clarify science-content ideas. **Sample analysis from Analysis Guide B:** • *Implied main learning goal:* The focus question *Do plants need food?* suggests that the main learning goal will be "Plants need food to live and grow." However, in the introductory discussion, the teacher asks "*How* do [plants] get food?" (video segment 00:14). This assumes that students already know plants need food. But later (segments 00:55 and 01:34), the teacher asks students, "Do you think plants need food?" However, the discussion that follows focuses predominantly on *what* is food for plants and *where* or *how* they get their food rather than on whether they need food. So the main learning goal seems to go beyond the focus question to address *how* plants get their food. Perhaps the part of the focus question that asks students to explain their thinking is intended to get them to consider how plants get their food, not just whether they need food. • *Uses everyday language:* The focus question

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			uses everyday language that kindergartners can understand. • *Scientifically accurate: Food* is a challenging word because it has a different meaning in science than it does in everyday life. It's good that the focus question uses this word, since it not only reflects everyday language but is also scientifically appropriate. Hopefully, the lesson will clarify how scientists define *food*. • *Goal statement:* There is no goal statement. **Content deepening opportunities:** • At segments, 00:25–00:30 and 02:35–02:36, students suggest that seeds may be food for plants. This is partly true. Seeds *do* provide food for plants, but only at the very beginning of their lives. The adult plant stores some of the food it makes in the seeds so that the young seedlings have a food source as they begin to grow. Once the seedlings grow leaves, they begin to make their own food. • At segment 01:48, a student explains that dirt is food for plants because it makes them grow. This idea is incorrect. It's true that dirt contains some minerals that support plant growth and health, but minerals don't supply energy plants need to live and grow. Plants get their energy exclusively from the food they make during photosynthesis. • At segment 02:04–02:31, a student states that water is food for plants. While it's true that water is necessary for plants to make their own food, it doesn't provide energy-supplying food that plants need to live and grow.

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		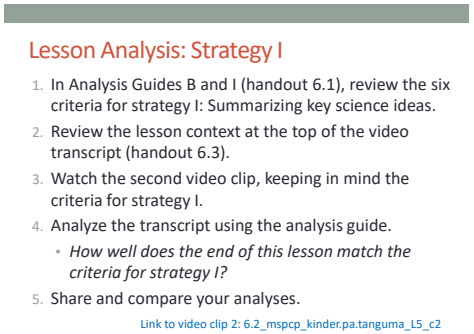	**Display Slide 13.** Lesson Analysis: Strategy I (20 min) a. Allow participants 1 or 2 minutes to read the six criteria in the analysis guide for strategy I: Summarizing key science ideas. b. **Ask:** "Do you have any questions about these criteria?" c. **Emphasize:** "Keep the criteria for strategy I in mind as you watch the next clip from the end of the same P&A lesson." d. **Individuals:** Give participants a couple of minutes to review the lesson context at the top of the video transcript (handout 6.3). e. Show the video clip. f. **Whole group:** "How well does the end of this lesson match the criteria for strategy I? How well does the summary statement match the beginning of the lesson? **Note:** During the discussion, be on the lookout for opportunities to clarify science-content ideas. **Sample analysis from Analysis Guide I:** • *Summary statement/activity:* The teacher gives a summary statement at video segment 01:34–01:44. In addition, students are engaged in summarizing key ideas when they explain how the grass and the tree in the picnic picture are getting their food (segment 00:27–01:09). • *Conceptual understanding:* The summary focuses on the big idea (concept) that plants and animals get their food in fundamentally different ways. There isn't a focus on memorizing details and facts. • *Matched to the MLG and FQ:* The science

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			ideas in the teacher's summary statement don't directly address the focus question, *Do plants need food?* but focus instead on *how* plants make food using sunlight, air, and water. The ideas students summarize also focus on *how* plants get their food rather than whether plants need food. A better focus question might be, *How do plants get their food?* or *What is food for plants?* • *Scientifically accurate:* The summary statement is scientifically accurate and emphasizes that plants make food "inside of themselves." The summary could have been improved if the teacher had emphasized that plants make food out of water, air, and sunlight and that none of these substances are food for plants. • *Sensemaking:* The teacher engaged students in sensemaking with a Turn and Talk about what the tree and the grass in the picnic picture were doing to get food. Some probe questions might have clarified the extent of students' understandings. For example, did the student at segment 00:45 understand that Sun, water, and air aren't the plants' food but are used to make their food? The teacher also could have challenged students to critique her summary ("Did I leave anything out?"), or she could have asked them to create their own summary statements. • *Improvements:* The summary statement could be improved by getting more students involved in sensemaking and by highlighting the differences between how plants and animals get their food. For example, the teacher could have asked students to imagine making food inside their bodies using water, air, and sunlight.

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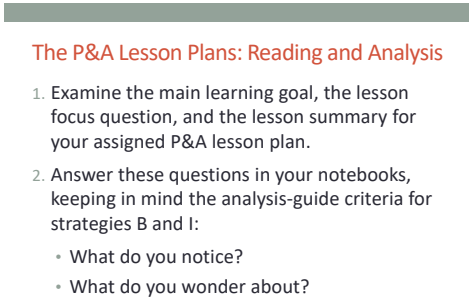
			Content deepening opportunity: • It's important for students to understand that plants and people "make" food in completely different ways. Plants don't make their own food the way we make dinner! Plants take nonenergy-supplying materials into their bodies and, through complex internal chemical reactions, turn them into energy-supplying food. Humans take matter that already has energy-supplying potential and cook it, thereby rearranging the molecules by heating the food matter. As humans, we can't make energy-supplying food inside our own bodies! We must find food in our environment that already has energy stored in it, and then we must prepare (cook) and eat it to get the energy we need.
			**Display Slide 14.** The P&A Lesson Plans: Reading and Analysis (10 min) **Note:** This slide can be abridged or skipped if time is running short. a. Read the instructions on the slide and assign a two-part lesson plan (parts A and B) to each participant. **Note:** Some of the P&A lessons have more than two parts (lessons 1, 3, and 5), so you'll need to decide how you want to divide them up among participants. b. Ask participants if they have any questions about the assignment. c. **Individual reading-and-analysis time (5 min):** "Answer the slide questions in your notebooks, keeping in mind the analysis-guide criteria."

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			d. **Whole-group discussion (5 min):** Briefly discuss participants' observations and questions for their assigned lesson plans. **Note:** Participants should see a close match between the main learning goal, the lesson focus question, and the summary. However, also welcome critiques and suggestions for improvement. Just make sure critiques are based on good understandings of the strategies involved.
10:00–10:10 10 min	**BREAK**		
10:10–12:00 110 min **Content Deepening: Plants and Animals**	**Purpose** • Deepen participants' science-content knowledge of plants and photosynthesis. **Content** • Plants and people make food in completely different ways. Plants combine non-energy-containing matter (air and water) with sunlight to make their own		**Display Slide 15.** Content Deepening: Plants and Animals (Less than 1 min) a. **Transition:** This slide marks the transition to the content deepening work.

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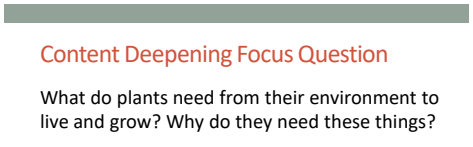
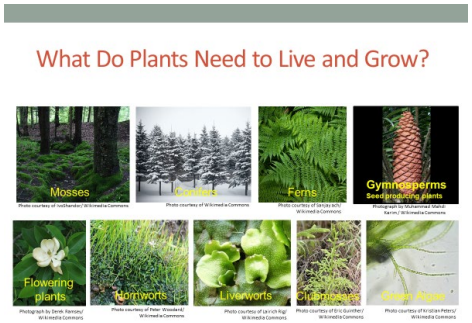
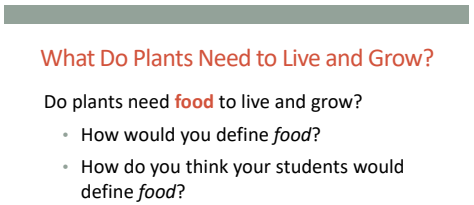
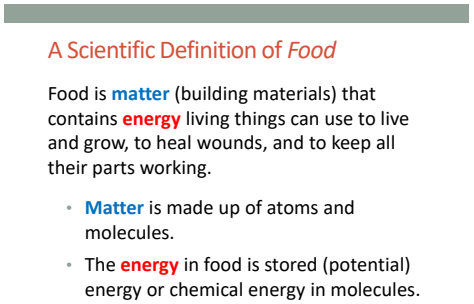
Slides 15–33	energy-supplying food. People can't do this. • Seeds contain food the parent plant stores. Seedlings use this food to help them grow until they're big enough to make their own food. • Plants take in carbon dioxide and water from their environment and combine them with sunlight inside their leaves to make energy-supplying food they can use to live and grow. This process is called *photosynthesis*. • Photosynthesis involves a biochemical reaction in which water and carbon-dioxide molecules are broken down and rearranged into sugar (glucose) molecules in the presence of sunlight. **What Participants Do** • Share initial ideas about what plants need to live and grow. • Analyze data to consider whether soil, water, carbon dioxide, and minerals in the soil (plant food) are food for plants. • Read about sunlight and consider whether it's food for plants. • Observe a demonstration using a mixing-bowl analogy that shows how plants make their own food. • Analyze three representations of photosynthesis. **Handouts in PD Binder**		**Display Slide 16.** Content Deepening Focus Question (Less than 1 min) a. Read the focus question on the slide. b. Ask participants to write the question in their science notebooks and leave space to write a response later. c. Note that in the Plants and Animals lesson series, students explore what plants need from their environment, but not why they need these things.
			**Display Slide 17.** What Do Plants Need to Live and Grow? (8 min) a. **Individuals and pairs:** "Make a list in your science notebooks of what you think plants need to live and grow. Then share your ideas with an elbow partner." b. **Whole-group share-out:** "So what do you think plants need from their environment to live and grow? Let's hear your ideas." c. As participants share their ideas, record them on chart paper. Accept all ideas at this point without correcting them. Ask probe questions to clarify participants' thinking, but don't label ideas as right or wrong. **Possible responses:** • Air (carbon dioxide) • Water • Food • Soil • Light • Nutrients/minerals from the soil

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process

	• 6.9 Food versus Not Food
	• 6.10 Nutrition Labels
	• 6.11 Three Representations of Photosynthesis
	
	Supplies
	• Science notebooks
	• Chart paper and markers
	• For mixing-bowl analogy:
	  • Green mixing bowl
	  • Flashlight
	  • Zip-seal, plastic bag (filled with air)
	  • Hand mixer/beater
	  • Sugar cubes
	
	PD Resources
	• RESPeCT lesson plans binder
	
	Resources in Lesson Plans Binder
	Resources section:
	• Content background document
	• Common Student Ideas
			• Fertilizer/plant food
			• The right temperature

			**Display Slide 18.** What Do Plants Need to Live and Grow? (6 min) a. "First, let's think about whether plants need *food* to live and grow." b. Read the questions on the slide. c. **Individuals:** Ask participants to answer the questions in their science notebooks. d. **Whole group:** Invite participants to share their definitions with the group. Accept all ideas at this point. Ask probe questions to clarify participants' thinking, but don't correct their ideas or label them as right or wrong.
			**Display Slide 19.** A Scientific Definition of *Food* (6 min) **Note:** Initially show only the definition at the top of the slide. a. "Now let's look at a scientific definition of *food*." b. Read the definition on the slide. c. Ask participants, "How does this definition compare with the definitions you wrote? How is it similar or different?" d. Draw participants' attention to the highlighted words in the definition; then reveal the rest of the slide. e. Emphasize that food is *matter*, but energy isn't. *Matter* is made up of atoms and molecules.

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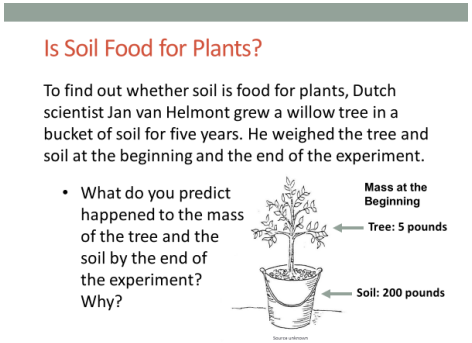
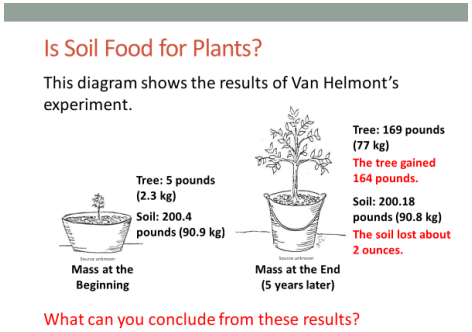
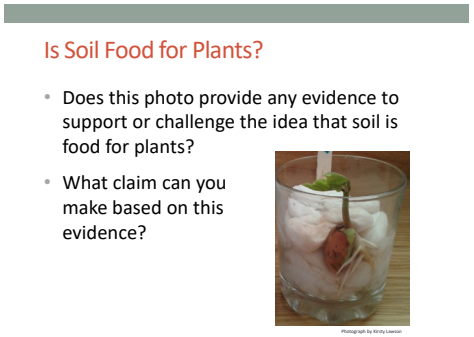
			The energy in food is referred to as *stored or potential energy* because the energy is stored in molecules and has the potential of being released and used when the chemical bonds are broken. Potential energy is also called *chemical energy*. f. Write this definition on chart paper and post it to the wall so that everyone can refer to it. Also have participants copy the definition into their science notebooks.
			**Display Slide 20.** What Is Food for Plants? (10 min) a. "Next, we'll think about the question, "What is food for plants?" b. Have participants make a two-column chart in their notebooks like the one on the slide and write the title "What Is Food for Plants?" at the top. c. **Individuals (5 min):** "In the first column on your chart, write down everything you can think of that might be food for plants. In the second column, write down any evidence you can think of to support your ideas. Your evidence can include facts or information from science resources, as well as your own observations and experiences. It's OK if you aren't able to provide evidence for all of your ideas." d. While participants are working on the task, create a three-column chart on chart paper titled "Our Ideas and Evidence." Use the column headings "Our Ideas," "Supporting Evidence," and "Challenging Evidence." e. **Whole group (5 min):** Invite participants to

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			share their ideas and evidence with the group. Accept all ideas and evidence at this point and record them on the group chart. Encourage participants to agree or disagree with one another's ideas and add any evidence that supports or challenges the ideas. For example: • **Idea:** Water is food for plants. • **Supporting evidence:** If you don't water plants, they die. • **Challenging evidence:** Water has no energy (Calories), so it doesn't meet the scientific definition of *food*. f. "Now let's investigate some of these ideas and see if the evidence we find supports or challenges them." **Note:** Participants will likely list water, soil, air, and minerals/nutrients from the soil on their charts. If participants mention that plants make their own food by photosynthesis or that they've seen gardeners add manure, hair clippings, and coffee grounds to the soil, add these to the group chart as well.
			**Display Slide 21.** Is Soil Food for Plants? (5 min) a. "First, we'll investigate the idea that soil is food for plants." b. "In the mid-1600s, a Dutch scientist named Jan van Helmont designed an experiment to test the dominant theory that plants ate soil to live and grow. Van Helmont's experiment involved planting a young willow tree in a bucket of soil and giving it only water. First, he weighed the soil and found that its mass was 200 pounds. Then he weighed the tree and found that its

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			mass was 5 pounds. Five years later, he weighed the tree and the soil again. What do you predict happened to the mass of the tree and the soil by the end of the experiment? Did the mass increase, decrease, or stay about the same? Why do you think so?" c. **Individuals:** "Write your predictions and reasoning in your science notebooks and be prepared to share your ideas with the group." d. **Whole group:** Invite participants to share their ideas with the group. Record their predictions and reasoning on chart paper. Ask probe questions to clarify participants' thinking.
			**Display Slide 22.** Is Soil Food for Plants (10 min) a. "This slide shows the results of Van Helmont's experiment. In the five-year period when the tree only received water, its mass increased from 5 pounds to 169 pounds, an increase of 164 pounds. But the soil only lost around 2 ounces." b. **Think-Pair-Share:** "Study this diagram and think about what you can conclude from these results. Then share your ideas with an elbow partner and come to a consensus about the conclusion you can draw from the results. Develop a claim stating your conclusion and support your claim with evidence. Be prepared to share your claims and evidence with the group." **Note:** Challenge participants to be precise in their claims. Emphasize that their claims and evidence should be limited to willow trees.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			c. **Whole group:** Invite pairs to share their claims and evidence with the group. Encourage participants to agree or disagree with one another's ideas and add any supporting or challenging evidence. Record claims and evidence on chart paper and work together to reach a consensus. **Ideal response:** • **Claim:** Soil could not have been food for the willow tree. • **Evidence:** The tree gained about 164 pounds, but the soil only lost a couple of ounces. Assuming conservation of matter, the additional mass of the tree didn't come from the soil. It must have come from somewhere else. d. "Van Helmont concluded that the willow tree grew by drinking water. Do you agree or disagree with his claim? Why?" **Ideal response:** • Van Helmont's experiment didn't provide evidence that the willow tree used water as a source of food or that water caused the tree to grow. However, water is a logical variable to research, and it's reasonable to hypothesize that water is food for plants.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 23.** Is Soil Food for Plants? (8 min) **Note:** If you conducted the optional bean-seed experiment in advance, display the plants and discuss the results with participants during this investigation. a. "The bean seed in this picture is growing in a glass filled with moist, wadded-up paper towels." b. **Turn and Talk:** "Study this photo; then discuss the questions on the slide with an elbow partner and work together to develop a claim based on this evidence. Be prepared to share your claim and evidence with the group." **Note:** Challenge participants to be precise in their claims. Emphasize that their claims and evidence should be limited to bean seeds. c. **Whole group:** Ask a few pairs of participants to share their claims and evidence with the group. Record claims and evidence on chart paper and encourage participants to agree or disagree, ask questions, or add evidence that supports or challenges the claims. **Ideal response:** • **Claim:** Soil isn't food for bean seeds. • **Evidence:** The bean seed is growing without soil, so the food it needs to grow must come from somewhere else. • **A strong challenge:** But the plant might eventually die without soil. Maybe it can use the food stored in the seed as it begins to grow, but when it gets bigger, it will need soil.

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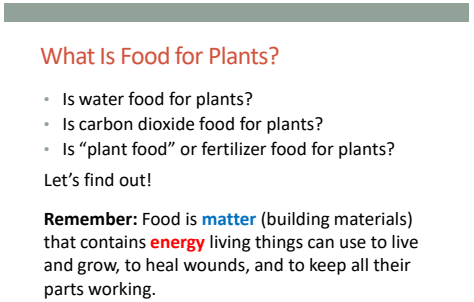
			d. Ask participants, "Why do you think the plant can still grow in the absence of soil?" Elicit a variety of responses. **Possible response:** "Maybe the plant can get everything it needs from the air, and it only needs soil for support and as a conduit for water. I've heard that plants that can grow hydroponically with their roots in water, not soil. Maybe different plants get food in different ways." e. Ask participants, "How do you think your kindergartners would interpret this experiment?" f. "So our evidence shows that soil isn't food for plants. Now let's investigate some of our other ideas."
			**Display Slide 24.** What Is Food for Plants? (2 min) **Note:** Hide the definition at the bottom of the slide. a. "Next, we'll investigate other possible sources of food for plants." b. Read the questions on the slide. c. Ask participants, "What two things must food provide that living things can use to live and grow?" **Ideal response:** Matter and energy. d. Show the definition of food at the bottom of the slide and ask participants to read it aloud. Then emphasize the following ideas: • Food provides living things with *both* matter

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			and energy. • Living things use food **matter** to grow bigger. • Living things need **energy** from food to power all of their functions, including digestion, breathing, growth, cell repair and maintenance, and movement.
			**Display Slide 25.** Investigation: Food versus Not Food (15 min) a. Direct participants to locate handout 6.9 (Food versus Not Food) in their PD program binders. b. **Individuals:** Ask participants to indicate on their handouts which materials they think are food and which aren't. c. **Pairs:** After participants finish marking their handouts, have them pair up with an elbow partner and discuss their predictions and reasoning. d. "Now let's find out whether our predictions are correct." e. Have participants locate handout 6.10 (Nutrition Labels) in their PD program binders. Then take a moment to orient participants to the labels. f. **Whole group:** Discuss the information on the labels and what it indicates about the materials listed on the chart. Then compare the evidence from the nutrition labels with participants' predictions. Ask participants to explain the reasons for their selections. g. Work toward a consensus about which items on handout 6.9 are food and which aren't. Record the group's decisions on chart paper or

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			mark a copy of the handout on a document reader.
		Make a Claim! Are water, carbon dioxide, and "plant food" or fertilizer food for plants? • Make a claim based on the evidence you've collected.	**Display Slide 26.** Make a Claim! (7 min) a. Read the question on the slide. b. **Pairs:** Ask participants to work with an elbow partner to develop a claim that answers the question and support the claim with evidence. c. **Whole group:** Invite a few participants to share their claims and evidence with the group. Record key ideas on chart paper and ask questions to clarify participants' thinking. **Ideal response:** • The evidence shows that water, carbon dioxide (carbonated water), and "plant food" (fertilizer) are not food by the scientific definition. These materials don't contain any energy (Calories) that living things can use to live and grow, so they can't be food for plants. Plants must get the energy they need from a different source.
		Where Do Plants Get Energy? Where do you think plants get the energy they need to live and grow? • Do you think that sunlight is food for plants? Why or why not? • What arguments support or challenge this idea? 	**Display Slide 27.** Where Do Plants Get Energy? (8 min) **Note:** Hide the sunlight photograph and the corresponding question. a. "Based on the evidence we've collected, we know that soil, water, carbon dioxide, and plant food or fertilizer provide matter for plants, but they don't provide the energy plants need to live and grow. So these materials can't be food for plants by the scientific definition." b. "Where do you think plants get the energy they

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			need to live and grow? Let's hear your ideas." **Note:** Participants will likely say that plants get the energy they need from the Sun. c. Reveal the next set of questions and the Sun photograph on the slide. d. **Individuals:** "Is sunlight food for plants? Why or why not? Think about these questions for a moment and be prepared to share your ideas and reasoning with the group. What arguments can you think of that support or challenge this idea?" e. **Whole group:** "So do you think that sunlight is food for plants? Let's hear your ideas. Make sure to explain your reasoning, as well as any arguments that support or challenge this idea." **Ideal responses:** *Supporting arguments:* • Plants die if they're left in the dark. They need light to stay alive. • Plants need light to grow. Without light, they wither. • Sunlight is a form of energy, so it can provide plants with the energy they need to live and grow. *Challenging arguments*: • Many healthy plants live and grow in the shade and inside where they don't get sunlight. • Light might be helpful for plants, but it's not food. We know that plants die without water, but the evidence shows that water isn't food for plants. So maybe it's the same with sunlight. Plants need it, but it's not their food.

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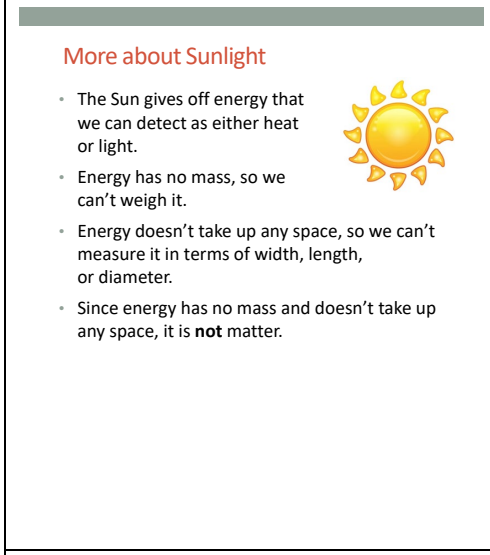
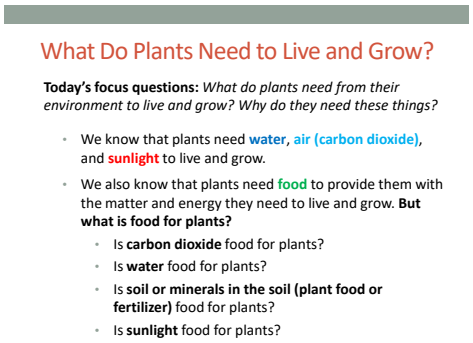
			**Display Slide 28.** More about Sunlight (3 min) a. Read the key science ideas on the slide. b. Ask participants, "Does this information give you any new ideas to consider in our debate about whether sunlight is food for plants?" c. "It's strange to think about something we can see that doesn't have mass or take up space, isn't it? So if energy isn't matter, can it be food for plants? Think about the scientific definition of *food*." d. Based on this information, participants should quickly conclude that sunlight by itself isn't food for plants because it doesn't provide any matter that living things can use to grow and develop.
			**Display Slide 29.** What Do Plants Need to Live and Grow? (3 min) **Note:** Initially show only the focus question on the slide. a. "Let's take stock of what we know so far that can help us answer today's focus questions." b. Review the focus questions on the slide. Then reveal and read each of the following bullet points one at a time. c. Then ask the question, "But what is food for plants." d. Reveal one question on the slide at a time and ask participants what they've learned so far about each item and whether it is food for plants. e. **Concluding statement:** "So all of these

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			materials seem important, but none of them are food for plants because they don't provide *both* the matter and energy plants need to live and grow. But if none of these things are food for plants, what is? That's what we'll explore next."
			**Display Slide 30.** What Happens Inside a Plant? (7 min) **Note:** Gather the materials you need to demonstrate the mixing-bowl analogy of photosynthesis. You can use the following lesson script for the demonstration or your own explanation. a. "Over the course of many years and experiments, scientists have discovered water, carbon dioxide, and sunlight are not, by themselves, food for plants. But plants do something with these two kinds of matter (water and carbon dioxide) and one form of energy (sunlight). Let me show you one way you can help your students visualize what happens inside a plant." b. "This green bowl represents a plant leaf. The leaf takes in water from the roots. Can someone pour some water into this leaf?" c. "The leaf also takes in carbon dioxide from the air that enters through tiny holes in the leaf. I have a baggie filled with air that contains carbon dioxide. Can someone give the leaf some carbon dioxide?" d. "Now we need someone to be the Sun and shine this flashlight on the leaf." e. "When water, carbon dioxide, and sunlight come together, an amazing set of chemical

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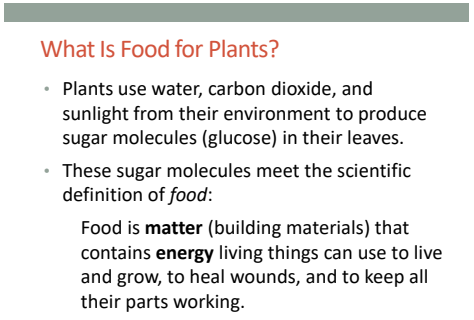
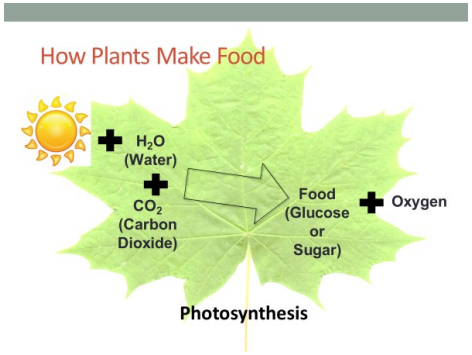
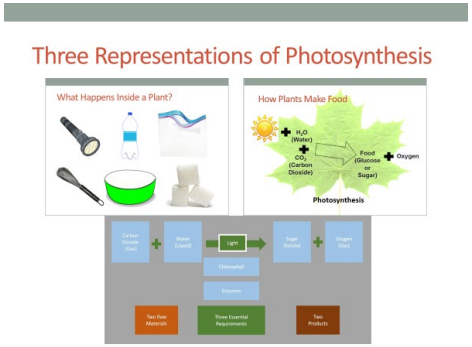
			reactions take place in the leaf. I'll represent those chemical reactions with this mixer, but keep in mind that these materials aren't just mixing together." f. "In the presence of sunlight, the plant can break apart molecules of water and carbon dioxide and rearrange the atoms to form new kinds of molecules: sugar molecules and oxygen molecules. At the same time, light energy from the Sun is being transformed into food or chemical energy that is stored in the sugar molecules. So the sugar molecules contain *both* matter and a new form of stored energy that we call *food energy*." [*Show some sugar or sugar cubes*.] g. "So carbon dioxide by itself isn't food for plants, water by itself isn't food for plants, and sunlight by itself isn't food for plants. But plants can take these three things and *make* or *produce* their own food in the form of simple sugars called *glucose*. This is why we call plants *producers*."
			**Display Slide 31.** What Is Food for Plants? (Less than 1 min) a. Read the key science ideas on the slide.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 32.** How Plants Make Food (2 min) a. "Plants make their own food through a biochemical process called *photosynthesis* in which light, water, and carbon dioxide react chemically to produce glucose. A byproduct of this process is oxygen." b. The word photo means *light* and *synthesis* means "putting together" or "producing." c. "What are plants putting together or synthesizing during photosynthesis?" **Ideal response:** • Plants are synthesizing or putting together sugar molecules from water and carbon-dioxide molecules that break down and rearrange in a chemical reaction with sunlight.
			**Display Slide 33.** Three Representations of Photosynthesis (10 min) a. Have participants locate handout 6.11 (Three Representations of Photosynthesis) in their PD program binders. Then walk participants through the instructions. b. **Individuals:** Have participants work independently to complete the tasks on the handout. c. **Whole group:** Invite participants to display their diagrams on a document reader and explain them to the group. d. Ask participants, "What are the strengths and weaknesses of each representation?"

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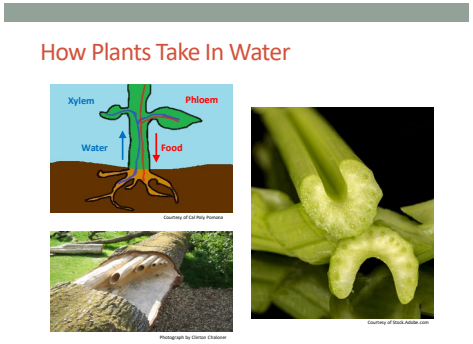
12:00–12:45 45 min	**LUNCH**		
12:45–1:15 30 min **Content Deepening (Continued)** **Slides 34–41**	**Purpose** • Deepen participants' science-content knowledge of plants and photosynthesis. **Content** • Plants take in carbon dioxide and water from their environment and combine them with sunlight inside their leaves to make energy-supplying food they can use to live and grow. This process is called *photosynthesis*. • Plants take in water through their roots, and tubes called *xylem* transport the water to the leaves. • Plants take in carbon dioxide (air) through tiny holes in the undersides of the leaves called *stomata*. • Photosynthesis takes place within highly structured, membrane-rich organelles called *chloroplasts*. Chloroplasts are located in the cells of plant leaves. Each leaf contains millions of chloroplasts. • A substance called *chlorophyll* in the chloroplasts absorbs sunlight.		**Display Slide 34.** How Plants Take in Water (1 min) a. "Plant structures are essential to ensure that plants get what they need from the environment so they can make food." b. "The top left-hand image on this slide shows how plants take in water through their roots. The water is then carried up to the leaf through tubes called *xylem*. These tubes are visible in the pictures of the tree trunk and the celery stalks." **Note of interest:** *Phloem* carries food down from the leaves to all of the plant cells. The photograph of the tree trunk shows xylem tubes for carrying water up to the tree leaves and phloem tubes for carrying maple sap down to "feed" the cells in the roots. To make maple syrup, people tap into the phloem tubes in the spring when the new leaves are producing a lot of sugar and transporting it to cells throughout the tree.

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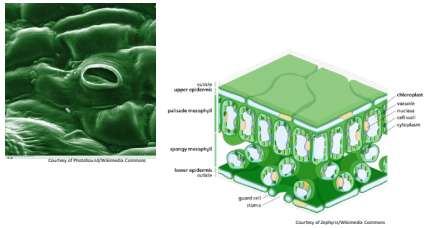
	What Participants Do • Explore how plants take in sunlight. • Take an imaginary tour inside a leaf and describe what they discover about photosynthesis. • Study diagrams that show how photosynthesis occurs on a microscopic level. • Use what they've learned about plants and photosynthesis to answer the content deepening focus questions. **Supplies** • Science notebooks • Chart paper and markers **PD Resources** • RESPeCT lesson plans binder **Resources in Lesson Plans Binder** *Resources section:* • Content background document • Common Student Ideas	How Plants Take In Carbon Dioxide 	**Display Slide 35.** How Plants Take In Carbon Dioxide (1 min) a. "Plants take in carbon dioxide through holes in the underside of the leaf called *stoma* or *stomata*. Stomata also allow water vapor and oxygen escape from the leaf. The leaf is able to control how much water vapor escapes by opening or closing the stomata." b. "Can you identify the stomata in these diagrams?"
		How Do Plants Take In Sunlight? 	**Display Slide 36.** How Do Plants Take In Sunlight? (2 min) a. "How do you think plants take in sunlight? Let's hear your ideas." b. As participants share their ideas, record them on chart paper. **Note:** Participants are likely to say that the leaves of the plant absorb the light. This explanation is accurate but limited. The following slide will elaborate.

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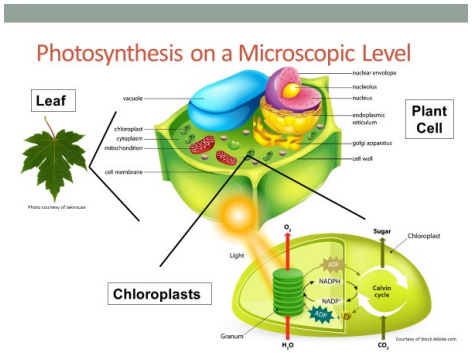
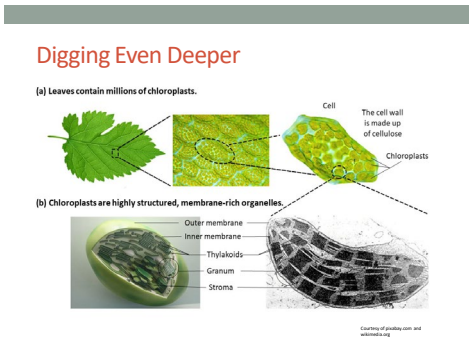
			**Display Slide 37.** Photosynthesis on a Microscopic Level (10 min) a. "Next, we'll explore photosynthesis on a microscopic level. This slide shows the relationship between a leaf, a cell within the leaf, and the chloroplast inside the cell." b. "Imagine that you're Ms. Frizzle taking your class on a Magic School Bus tour inside a leaf to find out where photosynthesis is occurring. What would you say about your travels and what you learned about photosynthesis? You don't need to use all the details on the slide." c. **Pairs:** "Pair up with an elbow partner and study the diagrams on the slide. Then work together to write a description of your journey inside a leaf. Be prepared to share with the group." d. **Whole group:** Invite pairs to describe their journey inside a leave and what they discovered about photosynthesis. **Note:** Participants' descriptions should include the observation that the biochemical reaction called *photosynthesis* occurs in the chloroplast.
			**Display Slide 38.** Digging Even Deeper (2 min) **Note:** You can skip this slide if time is running short. a. "This slide shows a macroscopic view of a plant leaf and then zooms in to show a microscopic view of the cell wall, an individual cell, and chloroplasts, the organelles within the cell where photosynthesis occurs. A substance called *chlorophyll* in the chloroplasts absorbs

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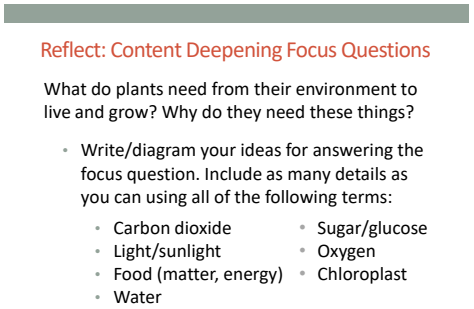
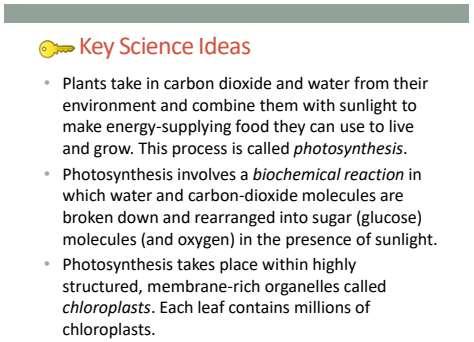
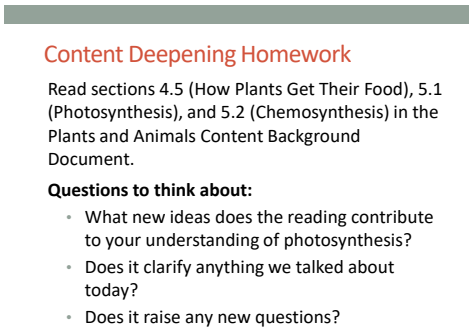
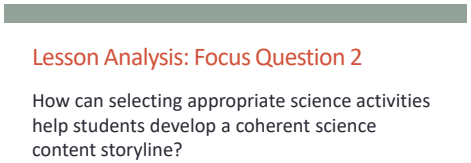
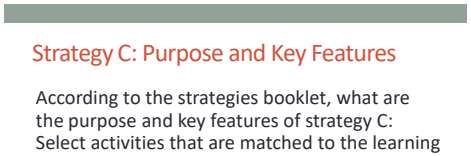
			sunlight." b. "What do these diagrams show that you didn't see in the previous diagrams?" **Ideal responses:** • These diagrams show the arrangement of the chloroplasts in cells and the membrane-rich structure of chloroplasts. • This view highlights the large surface area in a leaf for the chlorophyll to absorb sunlight.
			**Display Slide 39.** Reflect: Content Deepening Focus Questions (10 min) a. Review the focus question on the slide. b. **Individuals:** "Answer the question in your science notebooks using as many details as you can, including all of the words on the slide. You may also include a diagram to illustrate your ideas. Be prepared to share your ideas and reasoning with the group." c. **Whole group:** Invite participants to share their answers and reasoning with the group. Have them display their diagrams on a document reader as they explain their ideas. Ask probe and challenge questions to clarify their reasoning and encourage others to agree or disagree, ask questions, or add on. Record key ideas on chart paper.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 40.** Key Science Ideas (3 min) a. Highlight the key science ideas on the slide that answer the content deepening focus questions. b. **Ask:** "Does everyone agree that these key ideas answer our focus questions? Would you like to add or revise anything?" c. Have participants write these key ideas in their science notebooks.
			**Display Slide 41.** Content Deepening Homework (1 min) a. Go over the content deepening homework on the slide and have participants copy it into their science notebooks. b. "Be prepared to discuss the questions in our next content deepening session."

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
1:15–3:15 120 min (Includes 10-min break) **Lesson Analysis: SCSL Strategy C** Slides 42–48	**Purpose** • Use lesson analysis of classroom videos to better understand SCSL strategy C. • Deepen participants' science-content knowledge of plants and animals through lesson analysis. **Content** • To reflect the purpose and key features of strategy C, activities should be selected that can help students engage in making sense of the main learning goal, not because they're fun, easy to do, or only topically related. **What Participants Do** • Make and discuss a chart summarizing the purpose and key features of strategy C. • Use the criteria in Analysis Guide C to analyze video clips from a P&A lesson (before, during, and after an activity). • Identify activities that are *not* matched to the lesson's main learning goal. **Videos** • Video Clip 6.3, Tanguma classroom • Video Clip 6.4, Tanguma classroom • Video Clip 6.5, Tanguma classroom • Video Clip 6.6, Tanguma		**Display Slide 42.** Lesson Analysis: Focus Question 2 (1 min) a. Read the focus question on the slide. b. "To help us answer this question, we're going to explore STeLLA strategy C: Select activities that are matched to the learning goal."
			**Display Slide 43.** Strategy C: Purpose and Key Features (25 min) a. Ask participants to locate the section on strategy C in the STeLLA strategies booklet. b. Have one participant lead the group in creating a chart that summarizes the purpose and key features of strategy C: Select activities that are matched to the learning goal. c. **Ask:** "What does the strategies booklet say about science activities that are fun and engaging for students? **Ideal responses:** • Activities should be selected because they can support students in understanding the main learning goal, *not* because they're fun or easy to do. • Avoid activities that are only topically related (e.g., something about plants); instead, activities should focus on a specific science idea that is closely linked to the main learning goal (e.g., Plants get their food by making it out of carbon

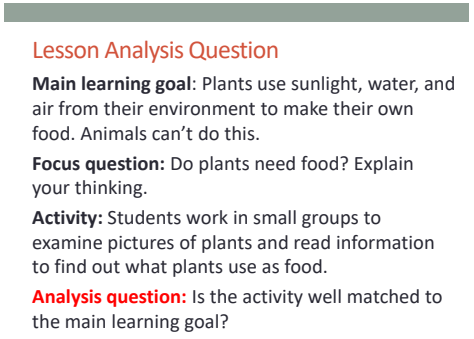
<table>
<tr><th>PD Model: Time/Phase</th><th>Purpose, Content, and What Participants Do</th><th>Slides</th><th>Process</th></tr>
<tr><td></td><td>classroom

Handouts in PD Binder
• 6.4 Analysis Guide C
• 6.5 Transcript for Video Clip 6.3
• 6.6 Transcript for Video Clip 6.4
• 6.7 Transcript for Video Clip 6.5
• 6.8 Transcript for Video Clip 6.6

Supplies
• Chart paper and markers

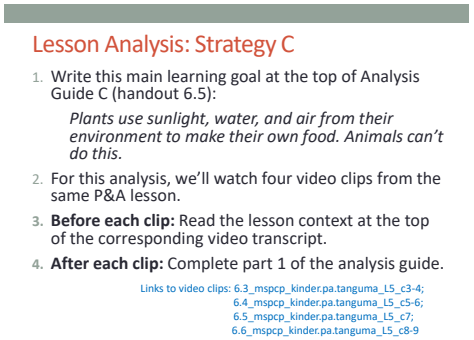
PD Resources
• STeLLA strategies booklet

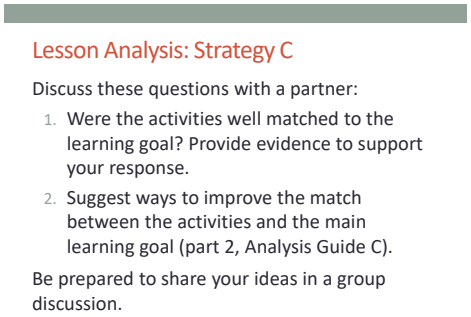
Resources in Lesson Plans Binder
Resources section:
• Content background document</td><td></td><td>dioxide, water, and light energy).
• Activities should not just be interesting supplements to the science content storyline; they should help develop it.

d. Follow-up: “Think back on science-lab activities in high school or college. Did these activities play a key role in helping you better understand the science concepts presented in textbooks or lectures? Or were they more like add-on activities that were only loosely related to the science concepts being taught?”</td></tr>
<tr><td></td><td></td><td> 
</td><td>Display Slide 44. Lesson Analysis Question (2 min)

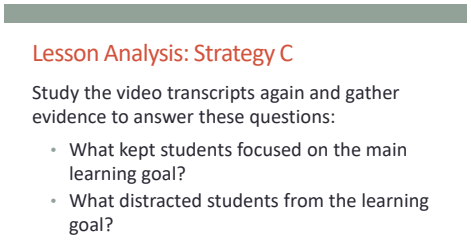
a. For this lesson analysis, participants will view a set of four video clips from one P&A lesson.

b. Review the main learning goal, focus question, and activity on the slide. Then introduce the analysis question: Is the activity well matched to the main learning goal and focus question?</td></tr>
<tr><td></td><td colspan="3">10-MINUTE BREAK</td></tr>
</table>

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 45.** Lesson Analysis: Strategy C (60 min) **Note:** Refer to the content background document as needed throughout this lesson analysis. a. Have participants locate Analysis Guide C (handout 6.4) in their PD binders and write the main learning goal for the selected P&A lesson at the top. Then orient them to part 1 of the analysis guide. b. **Before each video clip:** Have participants read the lesson context at the top of the corresponding video transcript (handout 6.5 for clip 3, handout 6.6 for clip 4, handout 6.7 for clip 5, and handout 6.8 for clip 6). c. Show each video clip. d. **After each clip (individuals or pairs):** Allow time for participants to review the analysis guide, write down science ideas revealed in the activity, and assess how well matched these ideas are to the main learning goal. **Note:** For a sample analysis of the video clips, see PD Leader Master: Analysis Guide C: Selecting Activities Matched to the Learning Goal (Answer Key).

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 46.** Lesson Analysis: Strategy C (15 min) a. **Pairs:** "Discuss the questions on the slide and be ready to share your ideas with the group." b. **Whole group:** Assess how well the activities in the video clips matched the main learning goal and ask participants to offer suggestions for improving the match. **Observations:** 1. The small-group folder activity had too many different questions: • Blue folder: How do plants get the water they need? • Yellow folder: How do plants get the sunlight they need? • Red folder: How do plants get the air they need? • Green folder: Do plants need food? How do they get their food? During the activity, only the students using the green folder had access to ideas that were closely matched to the main learning goal. The ideas the other groups were exploring distracted students from the main learning goal. 2. The ideas in the book that the teacher read to the class were quite well matched to the main learning goal. 3. This lesson really had more than one learning goal. It would have been better to keep the focus on how plants make food. A separate lesson could focus on the main learning goal that plants use their leaves and roots to take in

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			the sunlight, air, and water they need to make food. 4. The activity didn't focus on the part of the main learning goal that animals aren't able to make food. 5. The folder activity could be improved by having all students focus on the questions that best match the main learning goal: *Do plants need food? How do plants get their food?* **Note:** For a sample analysis, see the PD leader master for Analysis Guide C.

			**Display Slide 47.** Lesson Analysis: Strategy C (7 min)
			c. Read the questions on the slide.
			d. **Individuals:** Direct participants to look for evidence in the video transcripts that will help them answer these questions.
			e. **Whole group:** Ask one or two participants to share their ideas and evidence in response to the questions.
			Observations:
			• The small-group folder activity had too many different questions:
			  • Blue folder: How do plants get the water they need?
			  • Yellow folder: How do plants get the sunlight they need?
			  • Red folder: How do plants get the air they need?
			  • Green folder: Do plants need food? How do they get their food?
			During the activity, only the students using

<table>
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<tr><td></td><td></td><td></td><td>the green folder had access to ideas that were closely matched to the main learning goal. The ideas the other groups were exploring distracted students from the main learning goal. Having all students focus on the questions that were closely matched to the main learning goal (Do plants need food? How do they get their food?) would have prevented distractions.

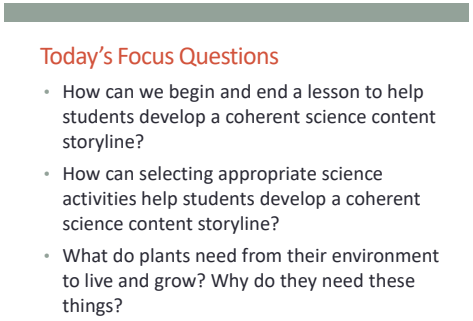
Note: See the sample analysis in the PD leader master for Analysis Guide C.</td></tr>
<tr><td rowspan="2">3:15–3:30
15 min

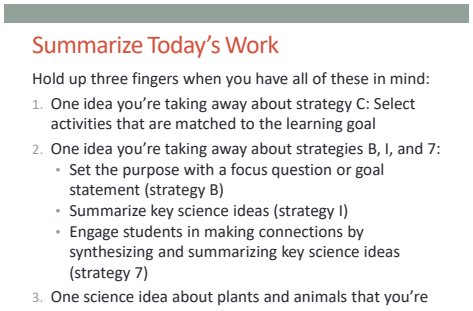
Wrap-Up: Summary, Homework, and Reflections

Slides 48–51</td><td rowspan="2">Purpose
• Summarize and reflect on key ideas about STeLLA strategies B, I, 7, and C, and the P&A science content.

What Participants Do
• Review today’s focus questions.
• Share key ideas about strategies B, I, 7, and C from the lesson analysis and content deepening work.
• Copy down the homework assignment for day 7.
• Write reflections on today’s learning.

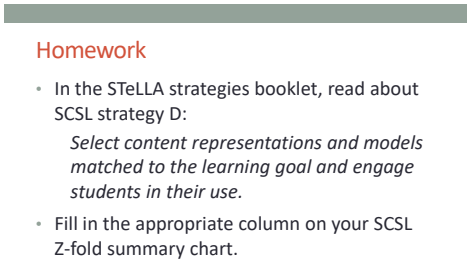
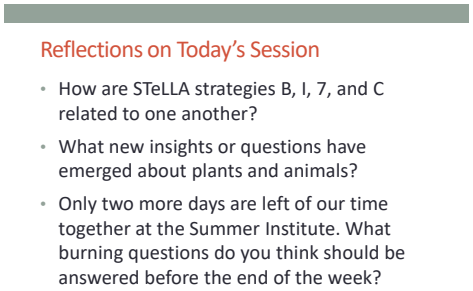
Handouts in PD Binder
• 6.12 Daily Reflections—Day 6

Supplies
• Science notebooks</td><td> 
</td><td>Display Slide 48. Today’s Focus Questions (Less than 1 min)

a. Remind participants of today’s focus questions.</td></tr>
<tr><td> 
</td><td>Display Slide 49. Summarize Today’s Work (7 min)

a. Individuals: Read the instructions on the slide and give participants enough time to come up with three ideas to summarize today’s work.

b. Whole group: In a round-robin, invite participants to share a key idea for each category on the slide. (Allow participants to pass if they wish.)</td></tr>
</table>

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 50.** Homework (Less than 1 min) a. Go over the homework assignment and have participants write it in their notebooks. b. Make sure participants understand each part of the assignment.
			**Display Slide 51.** Reflections on Today's Session (7 min) a. Allow participants **at least 5 minutes** to think about today's session and write their reflections and feedback on the Daily Reflections sheet (handout 6.12 in PD program binder).