RESPeCT Summer Institute Professional Development Leader Guide (PDLG)

Grade Level	5	**Day**	6	**STeLLA Strategy**	SCSL Strategies B, C, and I STL Strategy 7	**Subject Matter Focus**	Food Webs
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? • How do plants get the food (matter and energy) they need to live and grow? • How do living things grow bigger?						
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. • The feeding level that an organism occupies in a food web is its trophic level. Trophic levels include producers, primary consumers (herbivores), secondary consumers (small predators that are carnivores or omnivores), and top-level consumers (large predators that are carnivores or omnivores). • The process of photosynthesis converts carbon dioxide and water into sugars and released oxygen. • The sugars that photosynthesis produces can be used immediately or stored for growth or later use. • Most of the matter that plants use for growth comes originally from carbon dioxide and water. • The process of photosynthesis converts light energy to stored chemical energy in food molecules. • Organisms use some of the matter in food for growth—to build body structures.						

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.	**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	Video clips from one Food Webs lesson: • Video Clip 6.1: McCabe classroom (strategy B, beginning of lesson); 6.1_role001-2-284-lvtf_300_mccabe_c2 • Video Clip 6.2: McCabe classroom (strategies I and 7, end of lesson); 6.2_role001-2-284-lvtf_300_mccabe_c3 Video clips from another Food Webs lesson: • Video Clip 6.3: Belcastro classroom (strategies B and C); 6.3_stella_FW_belcastro_L2_c1 • Video Clip 6.4: Belcastro classroom (strategy C);

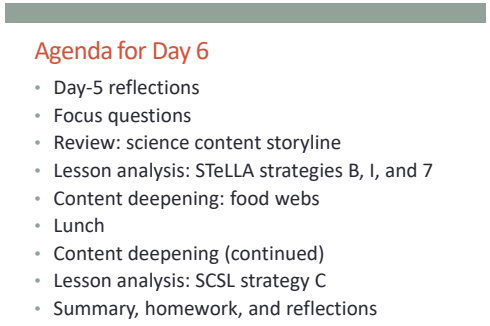
• Review the content deepening slides and determine the amount of time to allot for each slide based on the needs of your group. Add timing cues to PPTs, if desired, to help you stay on track.
• Review the reflections from day 5 and create a summary slide.
• Prepare charts for the day's agenda and focus questions.
• Watch video clips and read PD leader master guides for the McCabe and Belcastro clips. The analyses for the Belcastro clips are a little tricky, so make sure you understand how to use them effectively. The clips also include important opportunities to highlight STeLLA strategy 4 (engage students in analyzing and interpreting data and observations) and to help deepen participants' science-content knowledge.
	Summarizing Key Science Ideas (4 copies)
	• 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 (4 copies; first copy lists main learning goal for Food Webs lesson 2)
	• 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 Practice: Is the Activity Matched to the Main Learning Goal?
	• 6.10 Daily Reflections—Day 6
	
	Handouts in RESPeCT Lesson Plans Binder
	• 2.1 What Is Food for Plants? (from Food Webs lesson 2a)
	
	PD Leader Masters, Days 5–8
	• PD Leader Master: 5th-Grade Guide to McCabe Video Clips for Day 6
	• PD Leader Master: 5th-Grade Guide to Belcastro Video Clips for Day 6
	
	Supplies
	• Science notebooks
	• Chart paper and markers
	• **Optional:** Time-lapse videos showing growth
	  • Tomato seedlings (http://www.youtube.com /watch?v=LICDb8nM5rs)
	  • German shepherd (https://www.youtube.com /watch?v=ISYBpayqL-0)
	• Science-lesson materials kit (food webs)
	• For linking-cube activity from Food Webs lesson 3:
	  • Linking cubes (for each pair of participants): 10 blue, 5 red, 15 white (a total of 30 blue, 15 red, 45 white for three pairs) (Note: Some of these cubes will be reused later in the session.)
	  • For each pair of participants:
	  • 10 linking-cube water molecules
	  • 20 linking-cube carbon-dioxide molecules
	  • 4 linking-cube food/sugar molecules
		6.4_stella_FW_belcastro_L2_c2
		• Video Clip 6.5: Belcastro classroom (strategy C); 6.5_stella_FW_belcastro_L2_c3
		• Video Clip 6.6: Belcastro classroom (strategies C and I); 6.6_stella_FW_belcastro_L2_c4

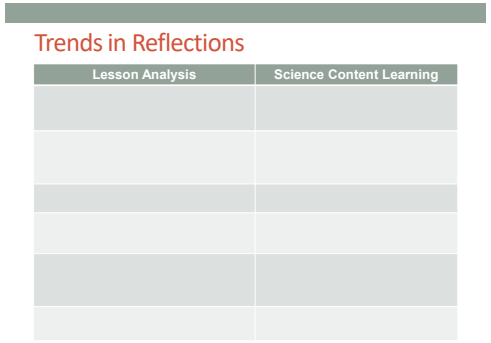
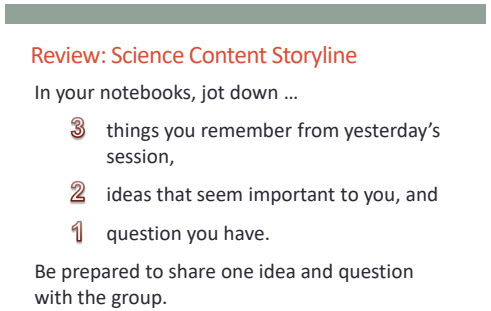
	• 3 gallon-sized plastic bags to store the cubes • 3 laminated organism posters/mats (tree, squirrel, mountain lion) • For photosynthesis demonstration (from Food Webs lesson 2b): • Green mixing bowl • Plastic baggie of CO_2 • Bottle of water • Flashlight • Hand-crank mixer or wire whisk • Sugar cubes **PD Resources** • STeLLA strategies booklet • RESPeCT PD program binder • RESPeCT lesson plans binder **Resources in Lesson Plans Binder** *Resources section:* • Food Webs Content Background Document • Common Student Ideas about Food Chains and Food Webs	

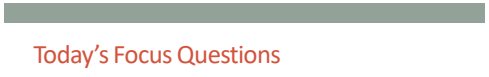
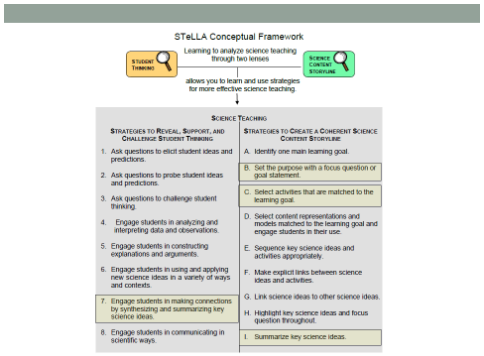
DAY 6 SESSION OUTLINE

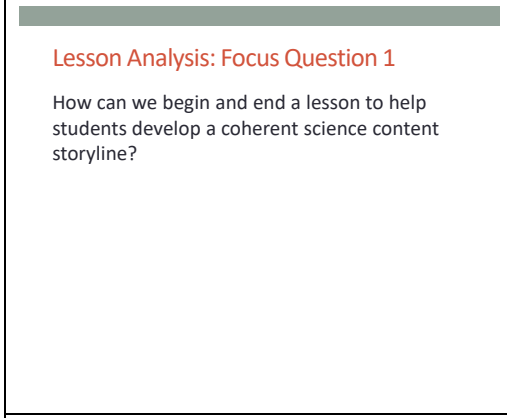
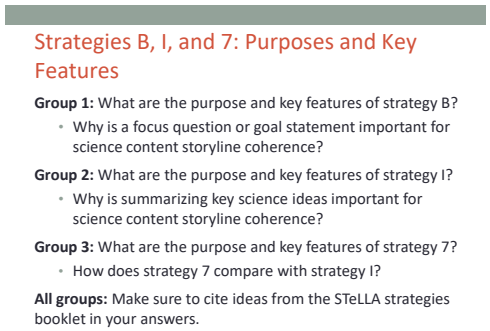
Time	Activities	Purpose
8:00–8:30 30 min	**Getting Started: Housekeeping, Agenda, Day-5 Reflections, Focus Questions**	• Build community by sharing participants' reflections from day 5. • Set the stage for a day of learning.
8:30–10:10 100 min (Includes 10-min break)	**Lesson Analysis: STeLLA Strategies, 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 food webs through lesson analysis.
10:10–12:00 110 min	**Content Deepening: Food Webs**	• Deepen participants' science-content knowledge of how matter and energy in systems can be traced and how photosynthesis works.
12:00–12:45 45 min	**LUNCH**	
12:45–1:15 30 min	**Content Deepening (Continued)**	• Deepen participants' science-content knowledge of how organisms get bigger.
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 food webs 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 Food Webs science content.

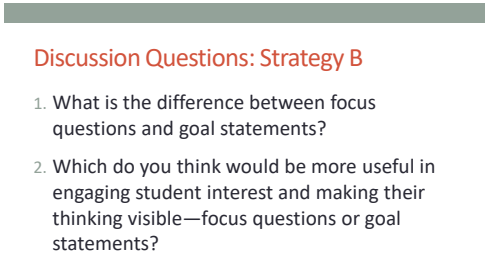
DAY 6

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.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 3.** Trends in Reflections (5 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.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 5.** Today's Focus Questions (2 min) a. Introduce today's focus questions.
			**Display Slide 6.** STeLLA Conceptual Framework (3 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 food webs 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. • Food Webs 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 Food Webs lesson. • Study the main learning goal (MLG), focus question, and summary in a Food Webs lesson plan.	 	**Display Slide 7.** Lesson Analysis: Focus Question 1 (Less than 1 min) a. "Now let's dig into our first focus question." **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

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
	Videos • Video Clip 6.1, McCabe classroom (beginning of lesson) • Video Clip 6.2, McCabe 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 **PD Leader Masters** • PD Leader Master: 5th-Grade Guide to McCabe Video Clips for Day 6 **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)		just get students interested in the lesson. It gets them thinking about a phenomenon or something 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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		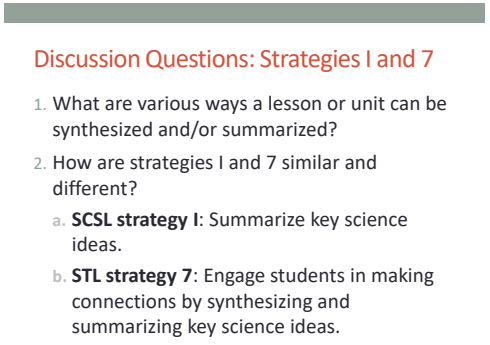	**Display Slide 10.** Discussion Questions: Strategies I and 7 (7 min) a. **Whole group:** Discuss the first question on the slide. Participants can refer to the information on strategy 7 in the STeLLA strategies booklet to identify a variety of ways in which key science ideas in a lesson can be synthesized. 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

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

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		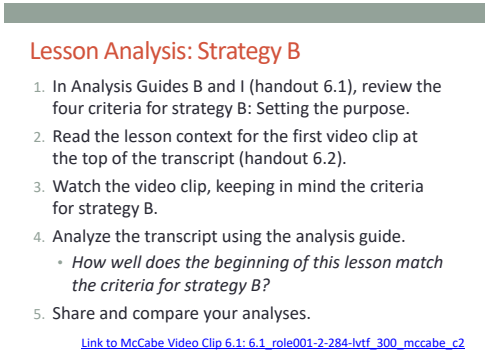	**Display Slide 12.** Lesson Analysis: Strategy B (20 min) a. Have participants locate Analysis Guides B and I (handout 6.1 in PD program binder) and spend 1 or 2 minutes reading the criteria for strategy B: Setting the purpose. b. **Ask:** "Do you have any questions about these criteria?" c. **Emphasize:** "Keep the criteria for strategy B in mind as you watch the video clip from the beginning of a Food Webs lesson." 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 1:** During the discussion, be on the lookout for opportunities to clarify science-content ideas. **Note 2:** For a sample analysis of the video clip using Analysis Guide B criteria, see PD Leader Master: 5th-Grade Guide to McCabe Video Clips for Day 6.

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		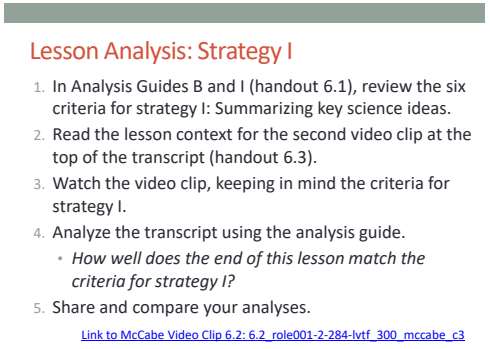	**Display Slide 13.** Lesson Analysis: Strategy I (20 min) a. Allow participants 1 or 2 minutes to read the six criteria in the analysis guide for strategy I: Summarizing key science ideas. b. **Ask:** "Do you have any questions about these criteria?" c. **Emphasize:** "Keep the criteria for strategy I in mind as you watch the video clip from the end of the same Food Webs lesson." d. **Individuals:** Give participants a couple of minutes to read and think about the lesson context at the top of the video transcript (handout 6.3). 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:** For a sample analysis of the video clip using criteria from Analysis Guide I, see PD Leader Master: 5th-Grade Guide to McCabe Video Clips for Day 6.

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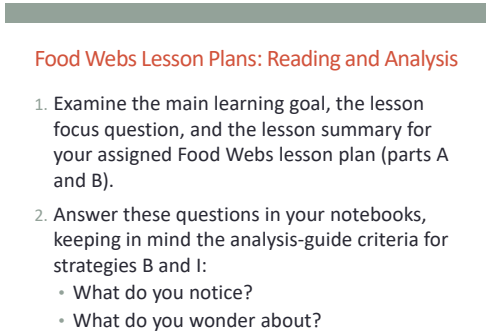
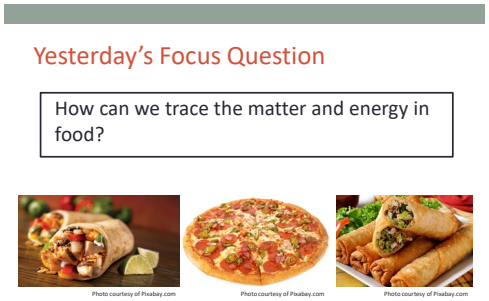
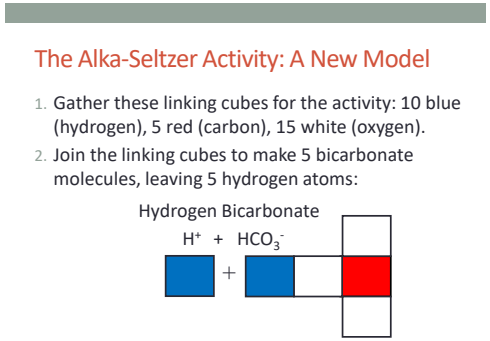
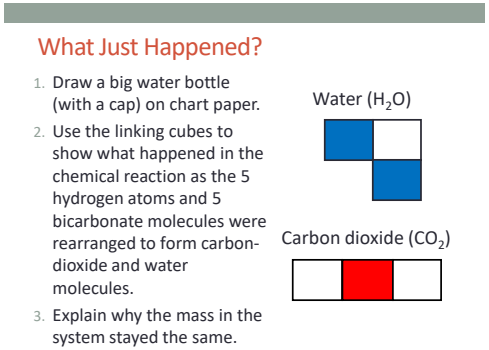
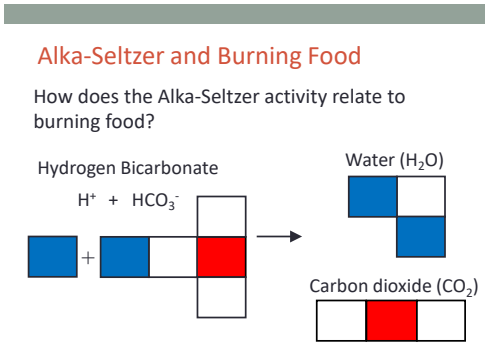
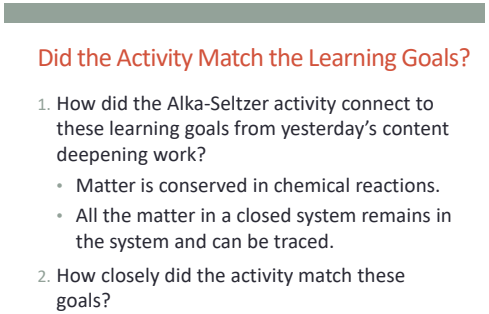
			**Display Slide 14.** Food Webs Lesson Plans: Reading and Analysis (10 min) **Note:** This slide can be abridged or skipped if time is running short. a. Read the instructions on the slide and assign a two-part lesson plan (parts A and B) to each participant. b. Ask participants if they have any questions 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." 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**		

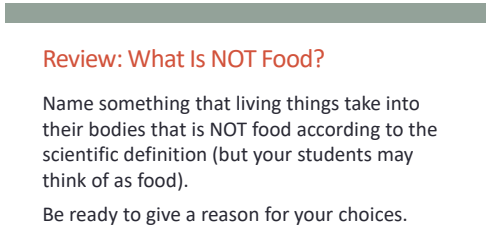
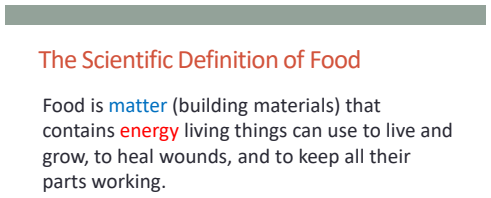
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
10:10–12:00 110 min **Content Deepening: Food Webs** Slides 15–44	**Purpose** • Deepen participants' science-content knowledge of how matter and energy in systems can be traced and how photosynthesis works. **Content** • The feeding level that an organism occupies in a food web is its trophic level. Trophic levels include producers, primary consumers (herbivores), secondary consumers (small predators that are carnivores or omnivores), and top-level consumers (large predators that are carnivores or omnivores). • The process of photosynthesis converts carbon dioxide and water into sugars and released oxygen. • The sugars that photosynthesis produces can be used immediately or stored for growth or later use. • Most of the matter that plants use for growth comes originally from carbon dioxide and water. • The process of photosynthesis converts light energy to stored chemical energy in food molecules.		**Display Slide 15.** Content Deepening: Food Webs **Note:** Throughout this content deepening phase, refer as needed to the Food Webs Content Background Document and Common Student Ideas about Food Chains and Food Webs. **PD leader move:** This slide marks the transition to the content deepening work. **Timing note:** To keep things moving so you don't run out of time during this phase, adhere as closely as possible to the time you've allotted for each slide. If you're running short on time, you may need to abridge or skip some of the group discussion.
			**Display Slide 16.** Yesterday's Focus Question **PD leader move:** Remind participants of the content deepening focus question from the previous session. **PD leader talk:** "For review and to help you conceptualize an answer to this focus question, we're going to make a model that demonstrates what happens in a closed system during a chemical reaction."

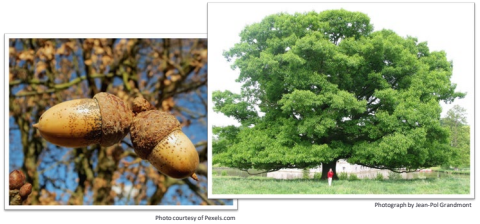
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process

	What Participants Do
	• Create a model representing what happens to matter in a closed system during a chemical reaction.
	• Compare and contrast two representations of photosynthesis.
	
	Handouts in Lesson Plans Binder
	• 2.1 What Is Food for Plants? (from Food Webs lesson 2a)
	
	Supplies
	• Science notebooks
	• Science-lesson materials kit for linking-cube activity (see overview page)
	• Materials for photosynthesis demonstration:
	  • Green mixing bowl
	  • Plastic baggie of CO_2
	  • Bottle of water
	  • Flashlight
	  • Hand-crank mixer or wire whisk
	  • Sugar cubes
	
	PD Resources
	• RESPeCT lesson plans binder
			**Display Slide 17.** The Alka-Seltzer Activity: A New Model
			
			PD leader talk: "Gather the linking cubes you'll need for this activity, as well as a piece of chart paper and a marker."
			
			PD leader move: As participants assemble these materials, tell them that each of the linking cubes represents a specific "bit," or atom, of matter. The model they'll be making will include three types of atoms:
			
			1. Hydrogen atoms (blue linking cubes)
			2. Oxygen atoms (white linking cubes)
			3. Carbon atoms (red linking cubes)
			
			PD leader talk: "One of the main components of Alka-Seltzer is sodium bicarbonate. As the tablet dissolves, the sodium bicarbonate breaks down to form bicarbonate ions, which react with hydrogen to form water and carbon-dioxide gas."
			
			PD leader move: Demonstrate for participants how to construct the bicarbonate ions with the linking cubes.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
	Resources in Lesson Plans Binder *Resources section:* • Content background document • Common Student Ideas		**Display Slide 18.** What Just Happened? **PD leader talk:** "Now I'd like you to work in small groups to complete the tasks on the slide." **PD leader move:** Have each small group demonstrate how the bicarbonate ions break down to form water and carbon dioxide. Ask probe and challenge questions to move participants' thinking forward. **PD leader move:** Following the activity, hold a brief whole-group discussion about what happened during the reaction. **PD leader talk:** "Why do you think the mass in the system stayed the same?" **Answer:** None of the bits of matter left the system, so the mass stayed the same. New molecules were formed when these bits of matter changed partners, but the matter was still matter. None of it disappeared or was destroyed in the reaction.
			**Display Slide 19.** Alka-Seltzer and Burning Food **PD leader move:** Briefly discuss the question on the slide, emphasizing that in both reactions (Alka-Seltzer and the burning food), carbon dioxide (CO_2) and water (H_2O) were released, and mass was conserved. So all the bits of matter (linking cubes, or atoms) that were present at the beginning of each activity were

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			still there at the end. **Note:** Most participants won't recognize this, but in both reactions, thermal energy was also released. **PD leader talk:** "When the food burned, most of the matter in the food underwent a chemical change, and carbon dioxide and water were released. If the food in a person's body burned, carbon dioxide would be exhaled, and the person would lose mass, since a body isn't a closed system."
	Purpose • Deepen participants' understandings of SCSL strategy C as they apply this strategy to the content deepening activities.		**Display Slide 20.** Did the Activity Match the Learning Goals? **PD leader move:** Read the content deepening learning goals on the slide and briefly discuss the question to help participants build connections between the science content and the activities. **PD leader talk:** "Did the Alka-Seltzer activity match these learning goals?"

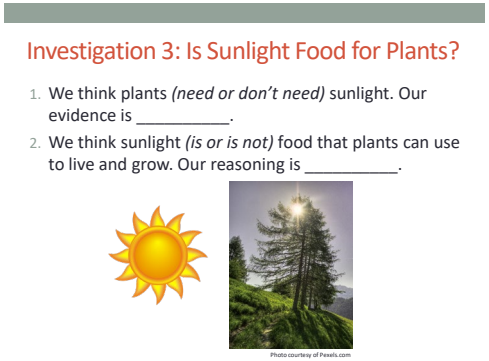
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 21.** Review: What Is NOT Food? **PD leader move:** Read the instructions on the slide. Mention that this activity comes from lesson 2a of the Food Webs unit, and the next segment of the content deepening phase will follow that lesson somewhat closely. **PD leader talk:** "Work individually for 1 or 2 minutes on this task. Make sure to name an item that is **not** considered food according to the scientific definition but may be something your students think of as food." **Note**: If participants need to review the scientific definition of *food*, show the next slide. **PD leader move:** Have participants share their responses with the group. Answers may include carbon dioxide, plant food, vitamins, diet sodas, or water.
			**Display Slide 22.** The Scientific Definition of *Food* **Note:** Refer to this slide if participants need to review the scientific definition of *food* to complete the task on the previous slide. **PD leader move:** Have participants write this definition in their notebooks (if they didn't yesterday).

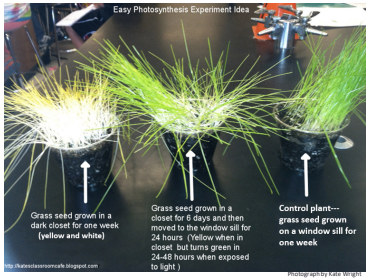
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		Content Deepening: Focus Question 1 How do plants get the food (matter and energy) they need to live and grow?	**Display Slide 23.** Content Deepening: Focus Question 1 **PD leader move:** Introduce the first content deepening focus question for the session. **PD leader talk:** "Take a moment to write this focus question in your science notebooks." **PD leader talk:** "Now let's talk about how yesterday's focus question ("How can we trace the matter and energy in food?") relates to this focus question. How do these questions create a coherent science content storyline?" **Note:** This focus question appeared in an earlier version of lesson 2 and doesn't reflect the current lesson plan.
		How Do Plants Get the Food They Need to Live and Grow? 	**Display Slide 24.** How Do Plants Get the Food They Need to Live and Grow? **PD leader talk:** "The large oak tree on this slide grew from a tiny acorn."

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 25.** Seedling to Sequoia **PD leader move:** Now show the images of a tiny sequoia sapling and a gigantic sequoia tree. **PD leader talk:** "How do trees get the food they need to live and grow bigger? How does a tiny sapling turn into a huge oak or sequoia tree?" **PD leader move:** Give participants a minute to discuss their ideas with a partner.
			**Display Slide 26.** How Do Plants Get Their Food? **PD leader talk:** "Let's hear your ideas about how plants get their food." **PD leader move:** Write each idea on chart paper, using the table on the slide as a model. After participants share four or five ideas, ask for evidence that supports and challenges each idea. Have participants write their supporting evidence on sticky notes and post them on the chart.

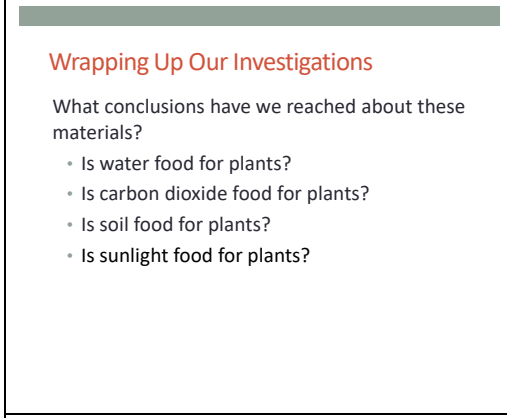
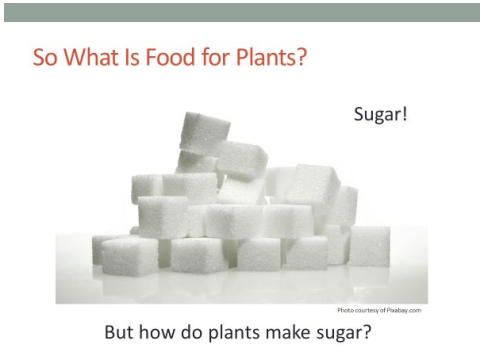
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		Investigation 1: Are Water and Carbon Dioxide Food for Plants? 1. I think water *(is or is not)* food for plants. My evidence is _____. 2. I think carbon dioxide *(is or is not)* food for plants. My evidence is _____. Now read the sections for activity 1 (including setup and follow-up) in lesson 2a. Discuss how the teacher engages students in using and talking about evidence.	**Display Slide 27.** Investigation 1: Are Water and Carbon Dioxide Food for Plants? **PD leader talk:** "Think about the scientific definition of food and whether you already have any evidence to answer the questions on the slide." **Note:** If it doesn't come up, encourage participants to consider evidence from the nutrition labels they looked at yesterday. **PD leader move:** Help participants come to the conclusion that both water and carbon dioxide have mass, but since they don't have energy plants can use, they aren't considered food. Again, it's important to note that water and carbon dioxide do indeed have energy. They just don't have the kind of energy plants can use to live and grow. **PD leader talk:** "Read the sections in the lesson plan where this activity appears." **Note:** Direct participants to activity 1 in lesson 2a, including the setup and follow-up sections. If participants notice that this focus question in the current lesson plan isn't the same as the one presented on slide 23 or in the video clips, remind them that the question appeared in an earlier version of lesson 2. **PD leader move:** After participants have read the relevant content in the lesson plan, have a

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			brief group discussion about the key STeLLA strategies highlighted in this lesson.
		Investigation 2: Is Soil Food for Plants? Read about Jan van Helmont's experiment.  	**Display Slide 28.** Investigation 2: Is Soil Food for Plants? **PD leader talk:** "Let's consider a classic experiment to help us answer the question, *Is soil food for plants?*" **PD leader move:** Ask participants to pair up and read about Jan van Helmont's experiment in Investigation 2 of Food Webs lesson handout 2.1 (What Is Food for Plants?). Then have them talk about the results and answer the analysis questions on page 3 of the handout. **PD leader move:** When pairs have completed their analyses, briefly discuss their observations and responses to the questions as a group. **PD leader talk:** "Now let's read and discuss the teacher's content note in the lesson plan that explains the loss of mass in Van Helmont's experiment:" **CONTENT NOTE:** *The slight loss of mass in the soil can be explained in several ways. It could have been a measurement error, especially given that measurement tools in Van Helmont's day weren't very sensitive. It also could have been that some dust in the soil got blown out of the pot. Or it could have been due to the non-energy-containing matter (minerals) that plants take in and use to maintain health and build cell parts (like vitamins for humans). This matter is partly what decomposers leave behind, but it*

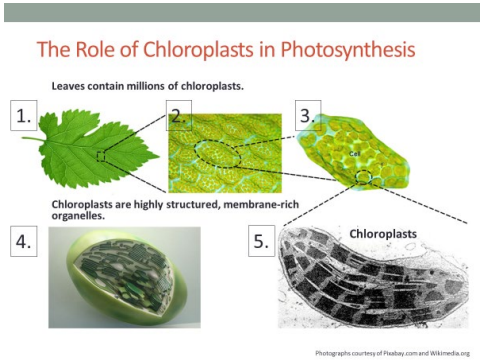
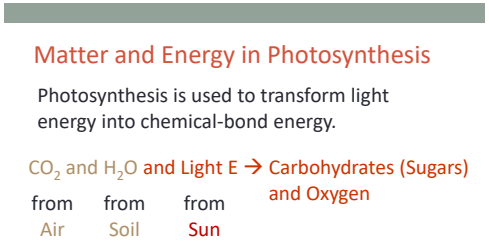
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			isn't energy-providing food. The minerals from the soil add a tiny bit of mass to the plant, but they don't provide energy or account for the large growth in the plant's mass over time. Avoid going into these details with students; instead, emphasize the main point that plants don't get their food energy from the soil. Therefore, soil (and minerals in the soil) aren't food for plants. **PD leader move:** Highlight the main conclusion about soil in the lesson plan: "Van Helmont's experiment shows us that soil is *not* food for plants because the mass of the soil stayed essentially the same over a period of five years, while the mass of the tree increased a lot."
			**Display Slide 29.** Investigation 3: Is Sunlight Food for Plants? **PD leader talk:** "The third investigation in the lesson handout explores the question, *Is sunlight food for plants?* To answer this question, pair up and complete the statements on the slide, making sure to provide evidence and reasoning for your responses." **PD leader move:** Give pairs 5 minutes to work on their answers; then elicit participants' ideas in a brief group discussion.

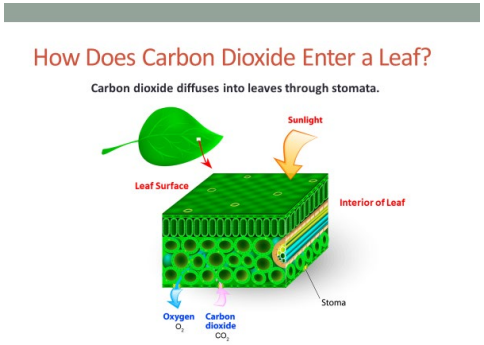
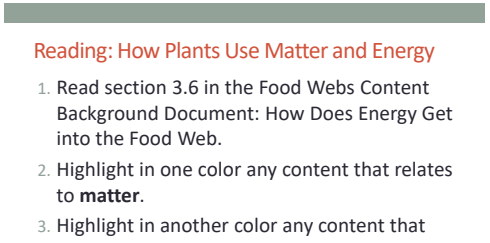
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		Mustard Plants 	**Display Slide 30.** Mustard Plants **PD leader talk:** "The small mustard plants in this photo were grown from seeds in light and dark conditions. The plants on the left were grown in the light, and the plants on the right were grown in the dark." **PD leader talk:** "How would you describe the differences between the plants grown in the light and those grown in the dark? What do you observe?"
		Grass Seed 	**Display Slide 31.** Grass Seed **PD leader move:** Show further examples of plants grown in the light and the dark. **PD leader talk:** "This image shows grass seed grown in light and dark conditions." **PD leader talk:** "From what you observe, do you think plants need sunlight to live and grow? Is sunlight food for plants? What is your evidence and reasoning?"

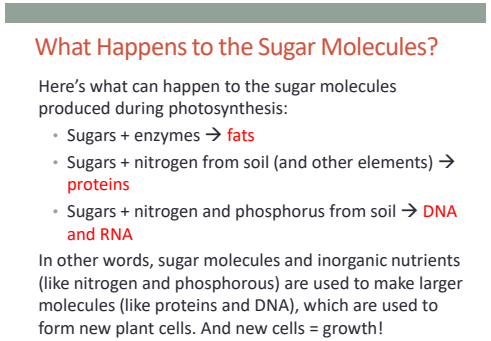
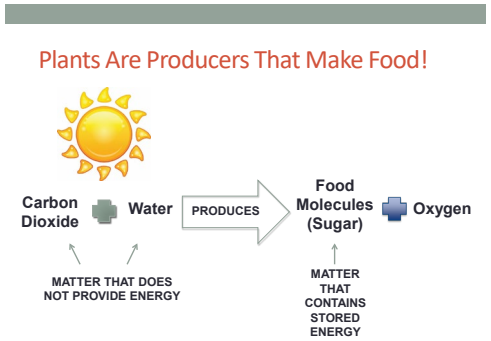
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		Bean Plants  Photograph by Kirsty Lawson	**Display Slide 32.** Bean Plants **PD leader move:** Show a final image of bean plants grown in the dark and the light. **PD leader talk:** "Based on this evidence, do you think many students will conclude that sunlight is food for plants? Why or why not?" **PD leader move:** Emphasize that the photos clearly demonstrate that plants need light, which may lead many students to conclude that plants "eat" light. **PD leader move:** Before displaying the next slide, read, as a group, the science-content paragraph on the last page of lesson handout 2.1.
		Is Sunlight Food for Plants? Sunlight *(is or is not)* food for plants by the scientific definition because _____.	**Display Slide 33.** Is Sunlight Food for Plants? **PD leader talk:** "So is sunlight food for plants? Complete the statement on the slide in your notebooks, making sure to support your answers with evidence."

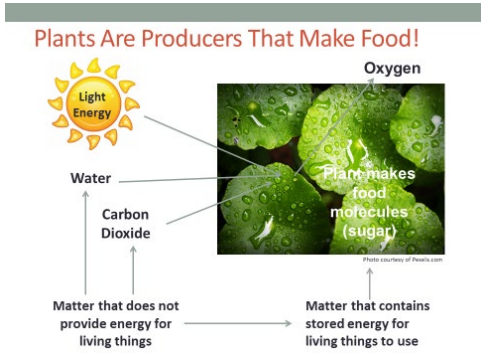
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 34.** Wrapping Up Our Investigations **PD leader talk:** "Now let's summarize the evidence we gathered in our investigations for why none of the materials listed on this slide are food for plants."
			**Display Slide 35.** So What Is Food for Plants? **PD leader move:** Click through the information on the slide, revealing one line at a time. **PD leader talk:** "Now I'm going to perform a short demonstration from one of the Food Webs lessons to help us think about how plants make sugar."
			**Display Slide 36.** Photosynthesis Demonstration **PD leader move:** Perform the demonstration from Food Webs lesson 2b described below. Alternatively, you could have participants review the procedure in the lesson plan, and a volunteer could lead the group through the demonstration. **PD leader talk:** "Scientists have learned that

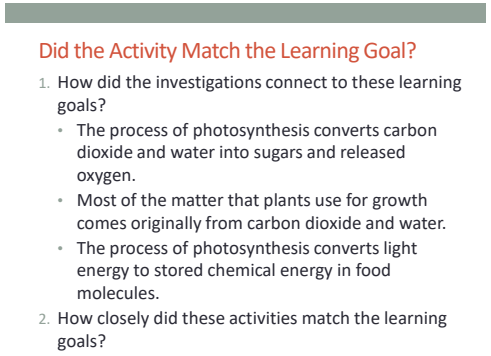
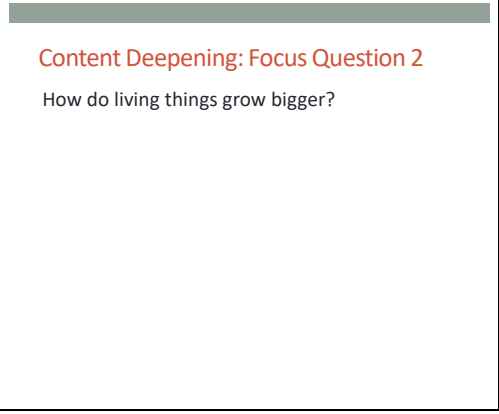
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			water, carbon dioxide, and sunlight are *not* by themselves food for plants. But plants can do something with these two kinds of matter (water and carbon dioxide) and one form of energy (sunlight). Here's one way of imagining what is happening inside a plant. "This green bowl represents a plant leaf. The leaf takes in water from the roots. Can someone pour some water into this leaf? 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? "Now we need someone to be the Sun and shine this flashlight on the leaf. When water, carbon dioxide, and sunlight come together, an amazing set of chemical reactions take place in the leaf. I'll represent those chemical reactions with this mixer. The plant rearranges the bits of carbon dioxide and water and changes them into sugar, which contains both matter and a new form of stored energy that we call *food energy*. [*Show some sugar or sugar cubes*.] "So carbon dioxide by itself isn't food for plants, water by itself isn't food for plants, and sunshine by itself isn't food for plants. But the plant can take these three things and *make* or *produce* food. This is why scientists call plants *producers*." **PD leader move:** Tell participants this process is called *photosynthesis*.

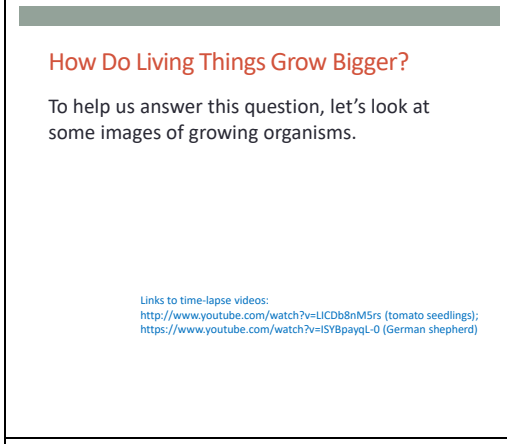
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 37.** The Role of Chloroplasts in Photosynthesis **PD leader move:** Briefly review some of the details of photosynthesis so participants have a stronger basis for understanding the model used in lesson 2b. **PD leader talk:** "Look at image 1 on the slide. If this leaf were magnified, you'd see that it's made up of tiny cells, seen in image 2. Image 3 shows a close-up of one of these cells, which has a lot of green ovals inside it. Each of these ovals is called a *chloroplast*. Image 4 is a prototype version of a chloroplast, and image 5 was taken with a special instrument called a *transmission electron microscope*, which shows the membranes inside a chloroplast. All the complex reactions that take place during photosynthesis occur in the chloroplast."
			**Display Slide 38.** Matter and Energy in Photosynthesis **PD leader talk:** "For photosynthesis to occur, plants need both matter and energy. Carbon dioxide from the air and water from the soil supply the matter, and sunlight provides the energy. When light energy from the Sun is present, plants convert the carbon dioxide and water into carbohydrates (sugars) and oxygen in a chemical reaction. Sugars make plants bigger and are also a source of energy."

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 39.** How Does Carbon Dioxide Enter a Leaf? **PD leader talk:** "For photosynthesis to happen, a plant needs to take in carbon dioxide from the air. The image on the slide shows a cross section of a leaf with a pore or hole on the underside called a *stoma.* This hole allows carbon dioxide to enter the leaf. Plants can open and close their stomata."
			**Display Slide 40.** Reading: How Plants Use Matter and Energy **PD leader move:** Have participants read section 3.6 in the content background document: How Does Energy Get into the Food Web? **PD leader move:** Emphasize the following teacher learning goals (from the Food Webs lesson plans binder): 1. The process of photosynthesis converts carbon dioxide and water into sugars and released oxygen (section 3Ta). 2. Photosynthesis produces sugars that can be used immediately or stored for growth or later use (section 3Tb). 3. Most of the matter plants use for growth originates from carbon dioxide and water (section 3Tc).

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 41.** What Happens to the Sugar Molecules? **PD leader move:** Read the information on the slide. These ideas also appear in the Food Webs Content Background Document. **PD leader talk:** "Many people think that plants only make sugars, but in fact, they use sugar molecules to produce other molecules, including proteins, fats, and DNA, which are used to form new cells and make the plants grow bigger."
			**Display Slide 42.** Plants Are Producers That Make Food! **PD leader talk:** "Now let's use the knowledge we've gained about photosynthesis to compare and contrast two diagrams." **PD leader move:** Review the diagram on this slide before advancing to the next slide.

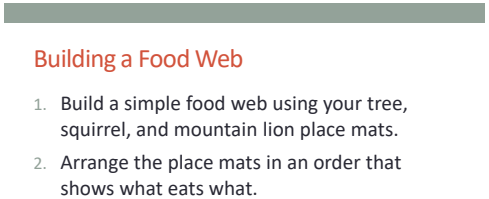
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 43.** Plants Are Producers That Make Food! **PD leader move:** First ask participants to compare and contrast the two representations of photosynthesis. (Switch back and forth between this slide and the previous slide as needed.) **PD leader move:** Highlight the following similarities and differences between the two representations of photosynthesis: • In both diagrams, matter that doesn't provide energy for living things is converted to matter that has stored energy living things can use. • The first diagram relies on words in an equation to make this point, while the second uses an image of plant leaves with labels and arrows to describe what happens during photosynthesis. • In the first diagram, students may not recognize that the sugars (food molecules) a plant produces are part of the plant itself. In the second diagram, this is clearer; however, it's less clear that a set of chemical reactions lead to the formation of food molecules (sugar) and oxygen. **PD leader talk:** "What are the strengths and weaknesses of each representation?" **Note:** Discussing content representations and engaging participants in their use foreshadows STeLLA strategy D, which will be the focus of the next session.

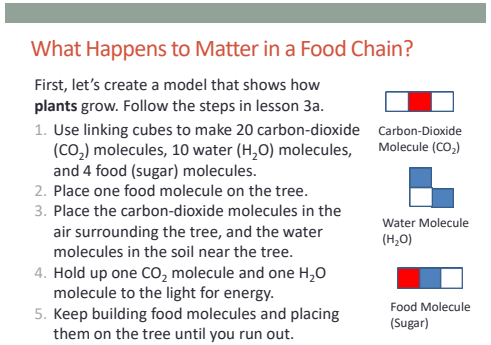
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 44.** Did the Activity Match the Learning Goals? **PD leader move:** To help participants build connections between the science content and the activities, read the learning goals on the slide and briefly discuss how well the investigations matched these goals.
12:00–12:45 45 min	**LUNCH**		
12:45–1:15 30 min **Content Deepening (Continued)** Slides 45–61	**Purpose** • Deepen participants' science-content knowledge of how organisms get bigger. **Content** • Organisms use some of the matter in food for growth—to build body structures. **What Participants Do** • Watch time-lapse videos or look at pictures of growing		**Display Slide 45.** Content Deepening: Focus Question 2 **PD leader move:** Read the second content deepening focus question on the slide.

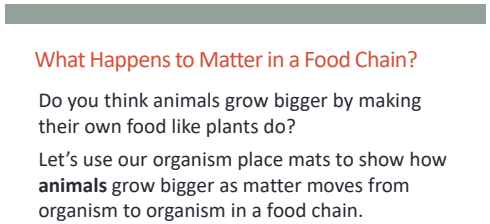
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
	organisms. • Discuss how living things grow bigger. • Build a food-web model. • Make and label a diagram of three organisms to show how they grow. **Supplies** • **Optional:** Time-lapse videos showing growth of tomato seedlings and a German shepherd • Science-lesson materials kit for linking-cube activity (see overview page)		**Display Slide 46.** How Do Living Things Grow Bigger? **Note:** Show participants either the time-lapse videos listed on this slide (if you have an Internet connection) or the photos of young and adult organisms on slides 47–53. **PD leader talk:** "As you [*watch the time-lapse videos/look at the pictures*] of growing organisms, think about the focus question, *How do living things grow bigger?*"
			**Display Slides 47–53.** Images of Growing Organisms

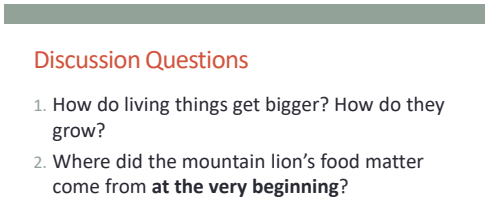
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		 Photo courtesy of Lynxexsitu.es  Photograph by Gregory Johnston  Photo courtesy of Pixabay.com	

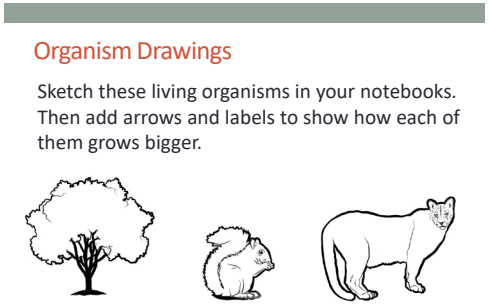
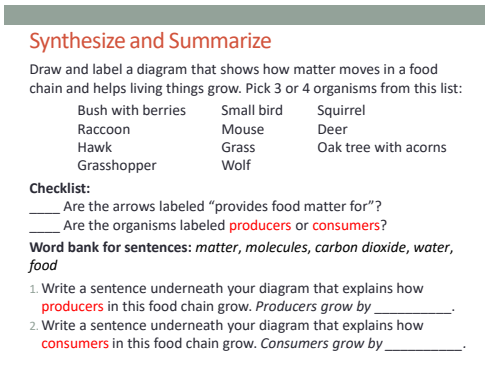
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		 Photo courtesy of Wikimedia.org  Photograph by Richard Ross  Photo courtesy of Pixabay.com	

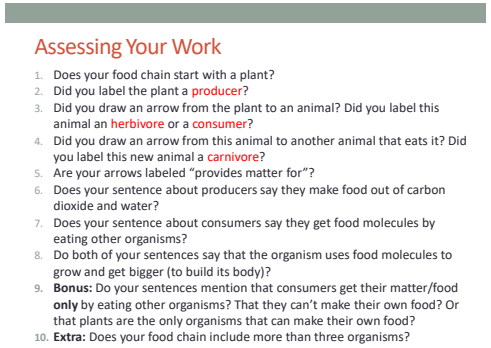
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 54.** How Do Living Things Grow Bigger? **PD leader move:** After participants have looked at the images, ask them to write a possible answer to the focus question in their science notebooks. Remind them to use complete sentences.
			**Display Slide 55.** Building a Food Web **PD leader move:** Distribute the laminated tree, squirrel, and mountain lion place mats from Food Webs lessons 3a and 3b (handouts 3.1, 3.2, and 3.3). **PD leader talk:** "Using your tree, squirrel, and mountain lion organism place mats, build a simple food web, arranging the mats in an order that shows which organism eats another organism."

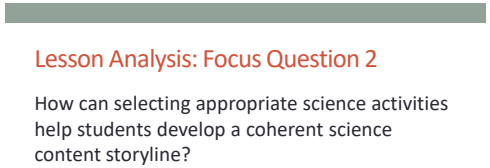
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 56.** What Happens to Matter in a Food Chain? **PD leader move:** Guide participants through this activity from Food Webs lesson 3a. To model plant growth for participants, demonstrate what the three types of molecules should look like based on the slide images. Make 20 linking-cube carbon-dioxide molecules, 10 linking-cube water molecules, and 4 linking-cube food/sugar molecules. **PD leader talk:** "Turn to the section in lesson 3a where this activity appears in your lesson plans binder. Then follow the steps to show how plants grow." 1. Place one food molecule on the tree poster/place mat. This baby tree is made up of food molecules, but not a lot of them. 2. Place the CO_2 molecules in the air surrounding the tree. 3. Place water molecules in the soil on the poster/place mat. 4. Take one CO_2 molecule and one water molecule and hold them together up toward the light (the Sun) to get energy. With this energy from the Sun, take the CO_2 and H_2O molecules apart and then rearrange the cubes to build sugar molecules. *Emphasize* that energy is now stored in the links between each of the cubes. The food molecules have stored energy. 5. As you build food molecules, place them

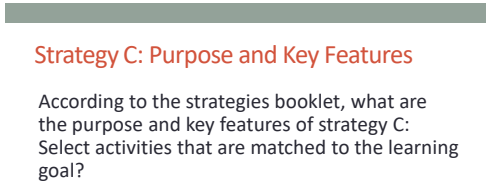
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			on the tree poster/mat. The tree gets bigger by making more and more food molecules and using them as building blocks for its body structures. 6. Keep going through this process of building food molecules and growing the tree until you run out of linking cubes. **Note:** A simplified version of a food molecule is used in this model to make the science content easier for students to grasp. In reality, a glucose or sugar molecule has a chemical formula of $C_6H_{12}O_6$ (which means there are 6 carbon atoms, 12 hydrogen atoms, and 6 oxygen atoms in one glucose molecule).
			**Display Slide 57.** What Happens to Matter in a Food Chain? **PD leader talk:** "Do you think animals can grow by making their own food molecules like plants do?" **PD leader move:** Emphasize that the answer to this question is no. Then demonstrate how animals grow bigger by guiding participants through these steps from lesson 3b: 1. To show how the squirrel gets bigger, let's imagine the squirrel eating some of the nuts on this tree. When it does this, it takes food molecules the tree made and adds these molecules to its own body to grow bigger. 2. To model how the squirrel grows bigger by using this matter, move some food molecules from the tree to the squirrel.

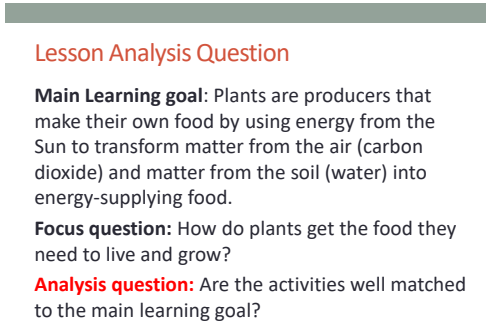
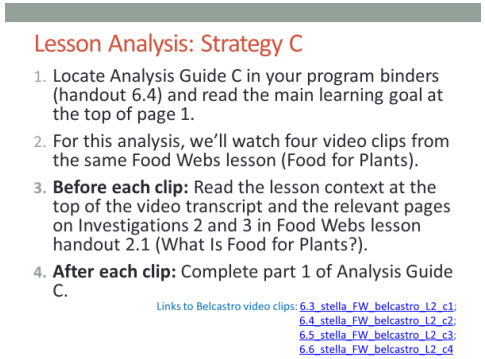
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			Don't move all of the food molecules, because the squirrel doesn't eat the whole tree! 3. The mountain lion is going to get the matter (food molecules) it needs to grow bigger by eating most of the squirrel (it doesn't eat the bones). 4. So move most of the food molecules from the squirrel to the mountain lion to show how the mountain lion will grow bigger using the matter (food molecules) it got from eating the squirrel.
			**Display Slide 58.** Discussion Questions **PD leader talk:** "Answer the questions on the slide in your notebooks, and be prepared to share your ideas with the group." **PD leader move:** Invite participants to briefly share their ideas about how living things grow and where the mountain lion's food matter originally came from.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 59.** Organism Drawings **PD leader talk:** "Sketch each of these organisms in your notebooks and then work with a partner to complete the task on the slide. Make sure to add arrows and labels to your diagrams to show how each organism grows." **PD leader move:** After the activity, ask one or two pairs to describe their completed diagrams to the rest of the group.
			**Display Slide 60.** Synthesize and Summarize **PD leader move:** If time allows, have participants complete the synthesizing/ summarizing task on the slide. **PD leader move:** When participants have finished this task, lead them through the assessment questions on the following slide.

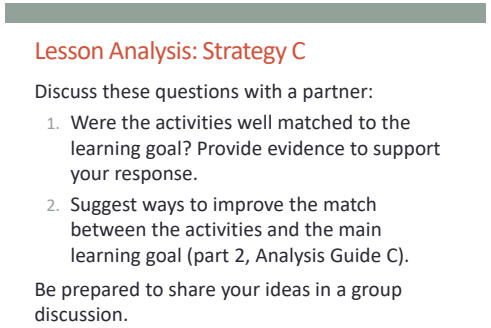
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 61.** Assessing Your Work **PD leader move:** Read through the assessment questions on the slide and direct participants to write their responses in their science notebooks. **PD leader talk:** "How has our content deepening work changed your thinking about the focus question, *How do living things grow bigger?*"

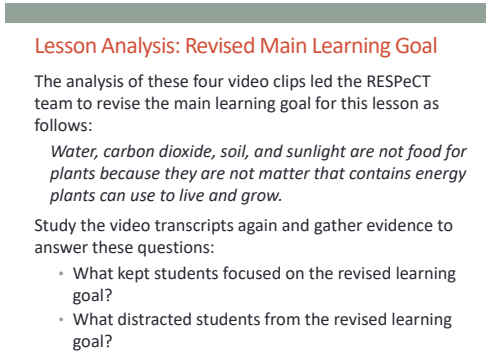
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
1:15–3:15 120 min (Includes 10-min break) **Lesson Analysis: SCSL Strategy C** Slides 62–68	**Purpose** • Use lesson analysis of classroom videos to better understand SCSL strategy C. • Deepen participants' science-content knowledge of food webs 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 Food Webs lesson (before, during, and after an activity). • Identify activities that are *not* matched to the lesson's main learning goal.		**Display Slide 62.** Lesson Analysis: Focus Question 2 (Less than 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."

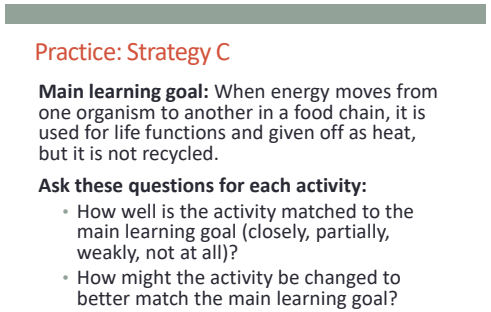
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
	Videos • Video Clip 6.3, Belcastro classroom • Video Clip 6.4, Belcastro classroom • Video Clip 6.5, Belcastro classroom • Video Clip 6.6, Belcastro classroom **Handouts in PD Binder** • 6.4 Analysis Guide C • 6.5 Transcript 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 • 6.9 Practice: Is the Activity Matched to the Main Learning Goal? **Handouts in Lesson Plans Binder** • 2.1 What Is Food for Plants? (from Food Webs lesson 2a) **PD Leader Masters** • PD Leader Master: 5th-Grade Guide to Belcastro Video Clips for Day 6 **Supplies** • Chart paper and markers **PD Resources** • STeLLA strategies booklet **Resources in Lesson Plans**		**Display Slide 63.** 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 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

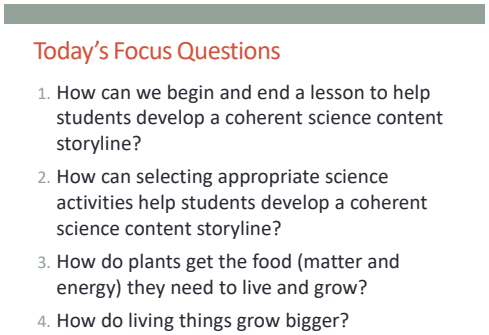
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
	Binder *Resources section:* • Content background document		related to the science concepts being taught?"
			**Display Slide 64.** Lesson Analysis Question (1 min) a. For this lesson analysis, participants will view a set of four video clips from one Food Webs lesson. b. Review the main learning goal and focus question on the slide. Then introduce the analysis question: *Are the activities well matched to the main learning goal?* **Note:** The focus question in these video clips appeared in an earlier version of lesson 2 and doesn't reflect the current lesson plan.
	10-MINUTE BREAK		
			**Display Slide 65.** Lesson Analysis: Strategy C (50 min) **Note:** Refer to the Food Webs Content Background Document as needed throughout this lesson analysis. a. Have participants locate Analysis Guide C (handout 6.4) in their PD binders and read the main learning goal at the top of page 1. Then orient them to part 1 of the analysis guide. b. **Before each clip:** First, have participants read the lesson context at the top of the

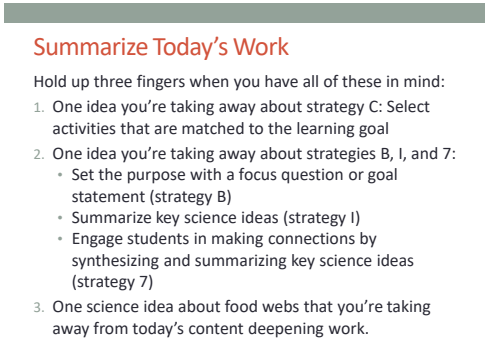
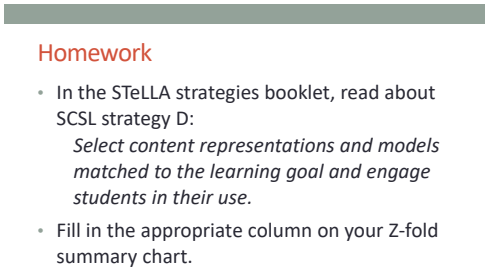
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			corresponding video transcript. Then have them read the relevant pages on Investigations 2 and 3 in Food Webs lesson handout 2.1, What Is Food for Plants? Video clip 4 addresses the question in Investigation 2, "Is soil food for plants?" and clip 5 addresses the question in Investigation 3, "Is sunlight food for plants? 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 1:** For sample responses to part 1 of the analysis guide for each clip, refer to PD Leader Master: 5th-Grade Guide to Belcastro Video Clips for Day 6. **Note 2:** Video clip 4 includes some nice illustrations of STL strategy 4 that you might want to highlight. See part 2 of the Belcastro PD leader master (point 2 under the question "What kept the students focused on the revised learning goal?").

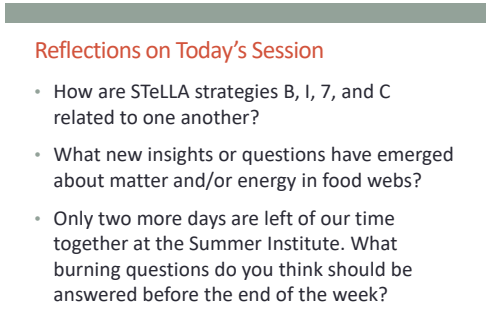
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 66.** Lesson Analysis: Strategy C (12 min) a. **Pairs:** "Discuss the questions on the slide and be ready to share your ideas with the group." b. **Whole group:** Assess how well the activities in the video clips matched the main learning goal, and ask participants to offer suggestions for improving the match. **Discussion notes:** • **Slide question 1:** Make sure participants understand that the lesson was originally intended to include another activity that would have directly addressed the main learning goal. But since the teacher ran out of time for that activity, participants may have different ideas about how well the activities in the clips matched the learning goal. Some may argue that laying the groundwork for the main learning goal was a pretty close but partial match. Others may argue that the activities (the Van Helmont experiment and the sunlight activity) weren't matched to the main learning goal at all. Either argument is fine. • **Slide question 2:** See the Belcastro PD leader master for suggestions on matching activities more closely to the learning goal. Participants may have other suggestions. • Inform participants that the analysis of this lesson ultimately led RESPeCT curriculum writers to revise and divide it

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			into two parts (lessons 2a and 2b), each with its own main learning goal. See the relevant discussion in the Belcastro PD leader master. **Note:** For sample responses in analyzing the use of strategy C in the video clips, see PD Leader Master: 5th-Grade Guide to Belcastro Video Clips for Day 6.
			**Display Slide 67.** Lesson Analysis: Revised Main Learning Goal (12 min) a. Have participants reconsider the four Belcastro video clips in light of the revised main learning goal on the slide. **Note:** The revised learning goal appeared in an earlier version of lesson 2 and varies slightly from the current lesson plan. b. **Individuals:** Direct participants to look for evidence in the video transcripts that will help them answer these questions: 1. What kept students focused on the revised learning goal? 2. What distracted students from the revised learning goal? c. **Whole group:** Ask participants to share their ideas and evidence in response to the questions. **Note 1:** For ideas on what to highlight during the group discussion, see the PD Leader Master: 5th-Grade Guide to Belcastro Video Clips for Day 6. **Note 2:** The second question (What distracted

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			students from the revised learning goal?) and the ideas about light energy that Harry and Blake were so passionately arguing for in clip 5 (that sunlight is food for plants) offer an excellent content deepening opportunity for the group discussion.
			**Display Slide 68.** Practice: Strategy C (10 min) **Note:** This activity may be skipped if time is running short. a. Have participants locate handout 6.9 in their PD binders (Practice: Is the Activity Matched to the Main Learning Goal?). b. **Individuals (2–3 min):** "Think about how well the activities on the handout are matched to the main learning goal. Be prepared to give a rationale for your answers." c. **Whole group:** Invite participants to share their ideas and reasoning with the group. **Ideal responses:** • **Activity 1—Burning peanut:** Partially matched or not matched to the learning goal. This activity addresses the idea that when food is used (burned), it gives off heat energy. But it doesn't address what happens to food inside organisms. To more closely match the activity with the learning goal, the teacher could ask, "What do you think will happen when a squirrel or a person eats a peanut?" • **Activity 2—Ocean food-chain diagram:** Matched to all aspects of the learning

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			goal. This is the activity in the Food Webs lesson series. • **Activity 3—String food web:** Partially matched to the learning goal. This activity focuses only on energy moving from one organism to another in a food chain. It doesn't address how each organism uses energy for life functions, or that energy is released as heat but is not recycled. The teacher could more closely match this activity to the main learning goal by adding the Sun to the food web and focusing only on what is happening to the light energy and food energy. However, it's difficult to imagine how this string representation could demonstrate in an accurate and meaningful way that energy is given off as heat but is not recycled.
3:15–3:30 15 min **Wrap-Up: Summary, Homework, and Reflections** Slides 69–72	**Purpose** • Summarize and reflect on key ideas about STeLLA strategies B, I, 7, and C, and the Food Webs 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		**Display Slide 69.** Today's Focus Questions (Less than 1 min) a. Remind participants of today's focus questions.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
	assignment for day 7. • Write reflections on today's learning. **Handouts in PD Binder** • 6.10 Daily Reflections—Day 6 **Supplies** • Science notebooks		**Display Slide 70.** 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.)
			**Display Slide 71.** 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.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 72.** 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 6.10 in PD program binder).