RESPeCT Summer Institute Professional Development Leader Guide (PDLG)

Grade Level	K	**Day**	7	**STeLLA Strategy**	SCSL Strategy D: Select Content Representations and Models	**Subject Matter Focus**	Plants and Animals (P&A)

Focus Questions	• How do you know when a content representation is appropriate and matched to the main learning goal? • How can we engage students in using content representations and models in meaningful ways? • What happens to the food (glucose) and oxygen that plants make during photosynthesis?
Main Learning Goals	Participants will understand the following: • Content representations can be helpful tools if they're matched to the learning goal of a lesson, are scientifically accurate, and address common student misconceptions. In addition, they must be comprehensible to students without reinforcing or introducing misconceptions and without distracting students with too many details or new terms. • To ensure meaningful learning from content representations, students need to be engaged in modifying or creating the representations, in analyzing their meaning, and in critiquing them. • Plants take in sunlight, water, and carbon dioxide from their environment and use them to make energy-supplying food they need to live and grow. This process is called *photosynthesis*. Plants need all three of these things to make their own food. • All plant and animal cells need broken-down food matter and oxygen to release stored energy they can use to live and grow. This energy is released when the food matter and oxygen cells react chemically in a process called *cellular respiration*.

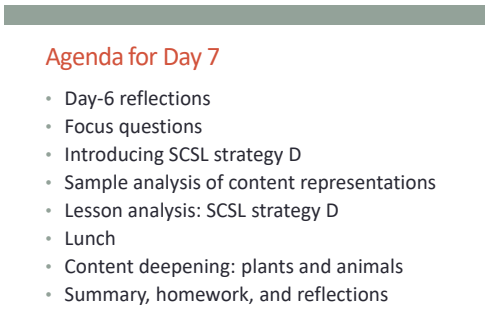
Preparation	**Materials**	**Videos**
Daily Setup Tasks • Check that video clips are correctly linked to PowerPoint (PPT) slides. • Set up PowerPoint. • Make sure video clips play correctly with good sound. • Arrange furniture and food. • Arrange participant materials. • Put up posters and charts. **Planning and Preparation Tasks** • Study the PDLG, PowerPoint slides (PPTs), video clips, and handouts. Make changes to PPTs if needed. • Review the reflections from day 6 and create a summary slide. • Watch the video clips and anticipate	**Posters and Charts** • STeLLA Framework and Strategies poster • Day-7 Agenda (chart) • Norms for Working Together (chart) • Day-7 Focus Questions (chart) • Strategy charts from days 1–6 (STL strategies 1–7 and SCSL strategies A, B, C, and I) • Parking Lot poster **Handouts in RESPeCT PD Binder Front Pocket** • Z-fold summary chart: Science Content Storyline Lens Strategies **Handouts in RESPeCT PD Binder, Day 7** • 7.1 Analysis Guide D: Selecting and Using Content Representations (five copies: three for sample analysis of content representations, and	• Video Clip 7.1: Tanguma classroom (SCSL strategy D); 7.1_mspcp_kinder.pa_tanguma_L5_c10–12 • Video Clip 7.2: Tanguma classroom (SCSL strategy D); 7.2_mspcp_kinder.pa_tanguma_L6_c7–8

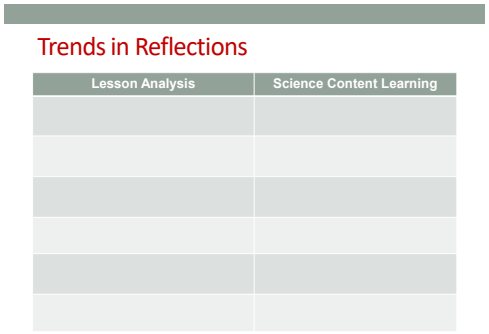
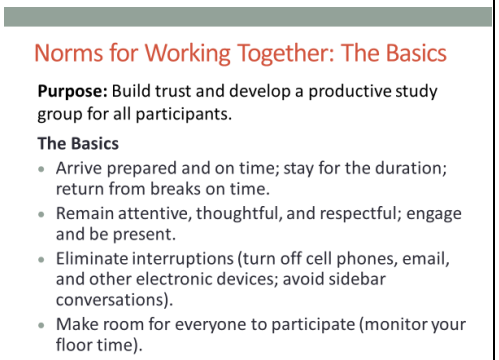
participant responses.
• Prepare charts for the day's agenda and focus questions.
	two for video-based lesson analysis)
	• 7.2 Transcript for Video Clip 7.1
	• 7.3 Transcript for Video Clip 7.2
	• 7.4 The Human Body
	• 7.5 Cellular Respiration in Plants and Animals
	• 7.6 Let's Summarize!
	• 7.7 Daily Reflections—Day 7
	
	PD Leader Masters, Days 5–8
	• PD Leader Master: Role-Play and Mixing-Bowl Analogy of Photosynthesis
	
	Supplies
	• Science notebooks
	• Chart paper and markers
	• For the mixing-bowl analogy (from day 6):
	  • Green leaf or a plant with green leaves
	  • Large green mixing bowl
	  • Flashlight
	  • Zip-seal, plastic bag (filled with air
	  • Bottle of water
	  • Hand mixer/wire whisk
	  • Sugar cubes
	
	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 7 SESSION OUTLINE

Time	Activities	Purpose
8:00–8:25 25 min	**Getting Started: Housekeeping, Agenda, Day-6 Reflections, Norms, Focus Questions**	• Build community by sharing participants' reflections from day 6. • Set the stage for a day of learning.
8:25–9:00 35 min	**Introducing SCSL Strategy D**	• Deepen participants' knowledge of the purpose and key features of SCSL strategy D.
9:00–10:20 80 min (Includes 10-min break)	**Sample Analysis of Content Representations**	• Develop participants' ability to analyze content representations to determine how well they match the main learning goal. • Deepen participants' science-content knowledge as it emerges from analyzing content representations.
10:20–12:00 100 min	**Lesson Analysis: SCSL Strategy D**	• Develop participants' ability to analyze content representations to determine how well engaged students are in their use. • Use lesson analysis of classroom videos to better understand STeLLA strategy D. • Deepen participants' science-content knowledge of plants and animals through lesson analysis.
12:00–12:45 45 min	**LUNCH**	
12:45–3:15 150 min (Includes 10-min break)	**Content Deepening: Plants and Animals**	• Deepen participants' understanding of cellular respiration and how it relates to photosynthesis.
3:15–3:30 15 min	**Wrap-Up: Summary, Homework, and Reflections**	• Summarize and reflect on key ideas about SCSL strategies A, B, C, D, and I and the P&A science content, lesson plans, and lesson analysis work.

DAY 7

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
8:00–8:25 25 min **Getting Started** Slides 1–7	**Purpose** • Build community by sharing participants' reflections from day 6. • Set the stage for a day of learning. **What Participants Do** • Review the day's agenda. • Discuss reflections from day 6. • Review and discuss progress on the RESPeCT program norms. • Read today's focus questions. **Posters and Charts** • STeLLA Framework and Strategies poster • Day-7 Agenda (chart) • Norms for Working Together (chart) • Day-7 Focus Questions (chart)		**Display Slide 1.** RESPeCT PD Program (5 min) a. Take care of any housekeeping issues.
			**Display Slide 2.** Agenda for Day 7 (5 min) a. Talk through 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 6 and offer reactions, comments, or follow-up questions.
			**Display Slide 4.** Norms for Working Together: The Basics (2 min) a. Review the norms and ask participants to think about areas where they could improve individually or as a group. b. "How do you think we're doing individually and as a group applying these norms? Do you have any comments or suggestions about areas where we could improve?"

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		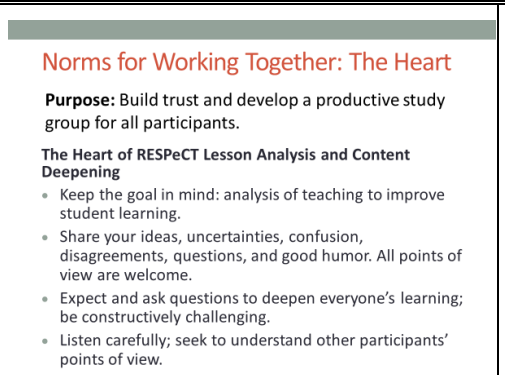	**Display Slide 5.** Norms for Working Together: The Heart (5 min) a. Review the norms that are at the heart of the RESPeCT program and ask participants to think about areas where they could improve individually or as a group. b. **Emphasize:** "We're doing quite well with our norms, but as we approach the fall, I hope to see our interactions evolving so that you feel comfortable interacting less through your PD leaders as the 'teachers' and direct more of your questions and comments to one another, challenging each other, piggybacking on each other's ideas, and listening carefully to one another so that everyone is contributing to the kind of productive analysis that will help us figure out ways to strengthen our students' science learning." c. Offer an opportunity for participants to comment on how the group is doing with these norms. Ask, "Are there any areas where we could improve? Any suggested changes?"

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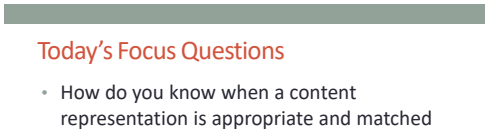
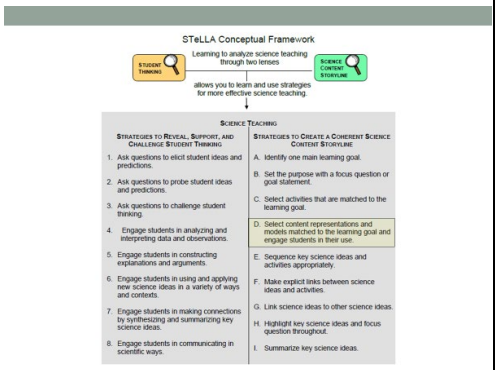
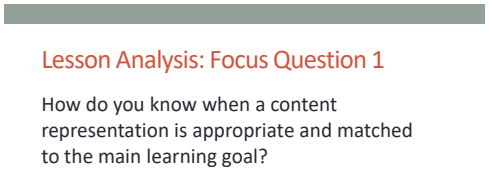
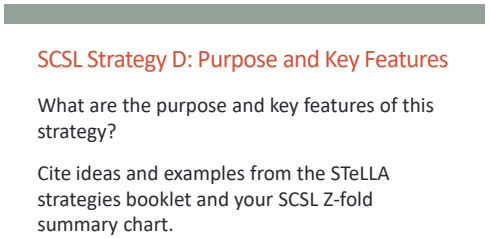
			**Display Slide 6.** Today's Focus Questions (1 min) a. Introduce the focus questions on the slide.
			**Display Slide 7.** STeLLA Conceptual Framework (2 min) a. "We'll be focusing on STeLLA strategy D today. Notice that this SCSL strategy has two parts. The first part—select content representations and models matched to the learning goal—sounds similar to strategy C—select activities that are matched to the learning goal. The second part focuses on *engaging* students in the use of content representations. This ensures that students aren't just *looking* at diagrams or models but are *actively engaging* with them."

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
8:25–9:00 35 min **Introducing SCSL Strategy D** Slides 8–10	**Purpose** • Deepen participants' knowledge of the purpose and key features of SCSL strategy D. **Content** • Strategy D content representations can be especially useful in helping students see how the science content storyline fits together. Content representations (such as diagrams, analogies, graphs, concept maps, models, videos, simulations, and role-plays) can make science ideas more concrete and real for students. • Content representations are most meaningful when students are engaged in constructing and critiquing them. • Content representations support English language learners by providing a variety of ways for them to understand science ideas that extend beyond words. **What Participants Do** • Make, share, and discuss charts summarizing the purpose and key features of SCSL strategy D. • Discuss questions about strategy D. **Supplies** • Chart paper and markers		**Display Slide 8.** Lesson Analysis: Focus Question 1 (Less than 1 min) a. "Now let's explore the first part of strategy D and our first focus question." b. Read the focus question on the slide.
			**Display Slide 9.** SCSL Strategy D: Purpose and Key Features (25 min) a. **Small groups (13 min):** Divide participants into two groups and have each group make a chart identifying the purpose and key features of strategy D described in their SCSL Z-fold summary charts and the STeLLA strategies booklet. b. **Whole group (12 min):** Have groups report out. Then ask, "What differences do you notice between the two charts?" **Key ideas:** • Content representations can help students envision things that are too big or too small for them to see firsthand in the classroom, or processes that take place too quickly or slowly for them to perceive. • Content representations give students access to different ways of making sense of key science ideas. • If content representations or models are

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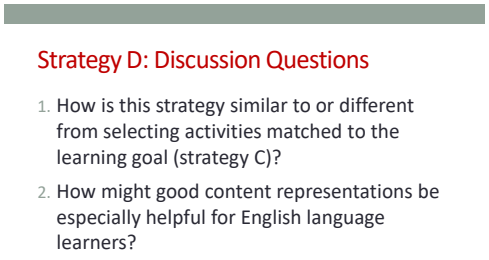
	PD Resources • STeLLA strategies booklet • SCSL Z-fold summary chart (front pocket of PD binder)		closely matched to the main learning goal, they can be especially useful in helping students see how the science content storyline fits together. • There are many different types of content representations (analogies, metaphors, and visual representations, such as diagrams, charts, graphs, concept maps, models, and role-plays). • Content representations can reveal and challenge student thinking if students are involved in creating, modifying, and analyzing the representations (instead of just listening to the teacher explain them).
			**Display Slide 10.** Strategy D: Discussion Questions (10 min) a. **Whole group:** Discuss the questions on the slide. **Key ideas:** • **Slide question 1:** Both strategy C and strategy D emphasize that all activities must be matched to the main learning goal. Strategy D, however, emphasizes a very important kind of activity: content representations. It also emphasizes that teachers should actively engage students in creating, modifying, and using content representations. • **Slide question 2:** Good content representations can benefit all students, but they especially benefit ELL students because they present science ideas in pictures, images, and other visual formats

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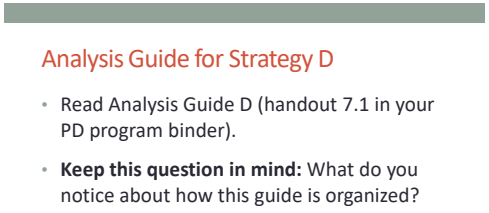
			in addition to words.
9:00–10:20 80 min (Includes 10-min break) **Sample Analysis of Content Representations** Slides 11–20	**Purpose** • Develop participants' ability to analyze content representations to determine how well they match the main learning goal. • Deepen participants' science-content knowledge as it emerges from analyzing content representations. **Content** • Six criteria are used in analyzing and selecting a content representation that is matched to the main learning goal. • The Plants and Animals lessons use content representations of photosynthesis (leaf diagram, role-play, and mixing-bowl analogy) to illustrate how plants use sunlight, water, and air to make the food (sugar) they need to live and grow. **What Participants Do** • Study how Analysis Guide D is organized. • Use the analysis guide to analyze three examples of P&A content representations (drawn from content deepening sessions or P&A lessons). **Handouts in PD Binder**		**Display Slide 11.** Analysis Guide for Strategy D (6 min) a. Have participants locate Analysis Guide D in their PD program binders (handout 7.1). b. **Individuals:** "As you read the analysis guide, keep in mind the discussion question on the slide." c. **Whole group:** Discuss the question on the slide. **Key ideas:** • This analysis guide focuses on the main learning goal by having participants write that down first. • The guide is divided into three parts. Part 1 focuses on how well matched the content representation is to the main learning goal. Part 2 focuses on how well engaged students are in using the content representation. • The guide ends with identifying ways to improve the content representation and its use in a lesson (part 3).

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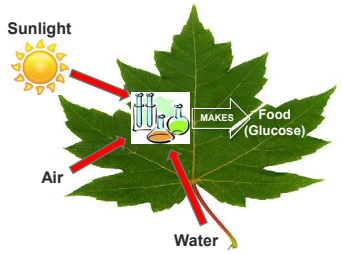
	• 7.1 Analysis Guide D (three copies—one for the leaf diagram of photosynthesis, one for the photosynthesis role-play, and one for the mixing-bowl analogy)
	
	Supplies
	• For the mixing-bowl model:
	  • Green leaf or a plant with green leaves
	  • Large green mixing bowl
	  • Flashlight
	  • Zip-seal, plastic big (filled with air)
	  • Bottle of water
	  • Hand mixer/wire whisk
	  • Sugar cubes
	
	PD Resources
	• STeLLA strategies booklet
	• RESPeCT lesson plans binder
		Content Representation 1: Leaf Diagram of Photosynthesis
		
		Read the main learning goal and description of the content representation in **Analysis Guide D1** (page 1 of handout 7.1).
			Display Slide 12. Content Representation 1: Leaf Diagram of Photosynthesis (2 min)
			
			a. **Set the context:** "Now we're going to analyze a content representation to see how well it's matched to the stated learning goal."
			b. Have participants read the main learning goal and description of the content representation in **Analysis Guide D1** (page 1 of handout 7.1).

		Content Representation 1: Leaf Diagram of Photosynthesis  	**Display Slide 13.** Content Representation 1: Leaf Diagram of Photosynthesis (8 min) a. **Individuals:** Have participants work independently on part 1 of Analysis Guide D1. b. **Pairs: "**Now pair up and discuss your answers to the analysis questions." c. Emphasize that the content representation participants are analyzing is *not just the image* but the *entire activity*.

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		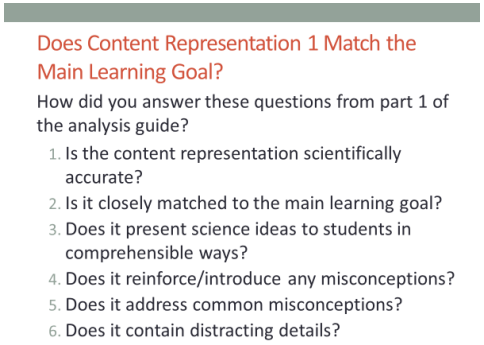	**Display Slide 14.** Does Content Representation 1 Match the Main Learning Goal? (10 min) a. **Whole group:** Discuss participants' responses to the questions in part 1 of Analysis Guide D1. b. **Ask:** "How might this content representation be improved? Would you use it with your students?" **Sample analysis, part 1 of Analysis Guide D1:** • *Scientifically accurate?* The diagram is scientifically accurate. It should be noted, however, that it omits the ideas that energy from the Sun powers the chemical reaction, and oxygen is another product of photosynthesis. • *Closely matched to the MLG?* The diagram is closely matched to key parts of the learning goal. However, it doesn't address the idea that the plant uses the food it makes to live and grow. It also surpasses the learning goal by using the words *photosynthesis* and *glucose*. • *Science ideas comprehensible?* The diagram might confuse students because the leaf is detached from the plant. Students also might not understand that the chemical apparatus represents a reaction involving sunlight, water, and carbon dioxide that creates food. Will they understand that the three ingredients on the left side of the diagram are changed into food? Will they understand that this is happening *inside* the leaf, and not on top

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			of it? Will they understand what the arrow represents? • *Reinforces misconceptions?* The diagram doesn't reinforce any key misconceptions. • *Addresses misconceptions?* The diagram addresses the misconception that water and/or soil are food for the plant. • *Contains distracting details?* The vocabulary of "photosynthesis" and "glucose" is distracting and not necessary to match the learning goal. **Possible improvements:** • To avoid confusion, show a diagram of the entire plant rather than just a leaf. • Remove the words *photosynthesis* and *glucose* from the diagram. **Take-home message:** Trying to address all six criteria in the analysis guide is a balancing act or trade-off. To make complex science ideas meaningful and comprehensible to students, the content representation needs to be simplified, but simplifications can sometimes be misleading in terms of scientific accuracy. The important thing is for teachers to be aware of such problems so they can be addressed.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		Content Representation 2: Photosynthesis Role-Play • Read the main learning goal and description of the content representation in **Analysis Guide D2** (page 2 of handout 7.1). • Use your experience with this content representation to complete part 1 of the analysis guide.	**Display Slide 15.** Content Representation 2: Photosynthesis Role-Play (5 min) a. Set the context for analyzing another content representation. b. Have participants turn to **Analysis Guide D2** (page 2 of handout 7.1) and read the main learning goal and description of the content representation.
		Content Representation 2: Photosynthesis Role-Play 	**Display Slide 16.** Content Representation 2: Photosynthesis Role-Play (7 min) a. **Whole group:** Have participants stand up. Then lead them through the photosynthesis role-play using the script in the PD Leader Master (Role-Play and Mixing Bowl Analogy of Photosynthesis). b. **Individuals:** Following the role-play, have participants work independently on part 1 of Analysis Guide D2. **Note:** If time is short, just do partner work. c. **Pairs:** "Now pair up and discuss your answers to the analysis questions."

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		Does Content Representation 2 Match the Main Learning Goal? How did you answer these questions from part 1 of the analysis guide? 1. Is the content representation scientifically accurate? 2. Is it closely matched to the main learning goal? 3. Does it present science ideas to students in comprehensible ways? 4. Does it reinforce/introduce any misconceptions? 5. Does it address common misconceptions? 6. Does it contain distracting details?	**Display Slide 17.** Does Content Representation 2 Match the Main Learning Goal? (10 min) a. **Whole group:** Discuss participants' responses to the questions in part 1 of Analysis Guide D2. b. **Ask:** "How might this content representation be improved? Would you use it with your students?" **Sample analysis, part 1 of Analysis Guide D2:** • *Scientifically accurate?* The role-play is scientifically accurate, but it greatly simplifies a very complex process and leaves out several important ideas, such as the conversion of energy from light to chemical food energy, the concept of cells, and the production of glucose and oxygen during photosynthesis. • *Closely matched to the MLG?* The role-play is closely matched to the main learning goal, including the idea that plants use the food they make to live and grow. • *Science ideas comprehensible?* The role-play simplifies the process of making food and presents it in a way that young students can understand. • *Reinforces misconceptions?* The human analogy might reinforce or introduce a misconception that plants can think like people do. In addition, students might not catch on that the food being made in the leaves is the plants' only food source. They might still think that water, air, and

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			sunlight are also food for plants. • *Addresses common misconceptions?* The role-play doesn't address the misconceptions that water is food for plants, that anything plants take in is food, or that plants not only make food but also take in food. • *Contains distracting details?* There are no distracting details in the role-play. **Possible improvements:** • The role-play could be modified to clarify and emphasize that plants can't grow if they don't make food, and that growth doesn't happen just because plants take in sunlight, water, and air. Growth only happens when plants turn these three things into food in their leaves. **Take-home message:** Trying to address all six criteria in the analysis guide is a balancing act or trade-off. To make complex science ideas meaningful and comprehensible to students, the content representation needs to be simplified, but simplifications can sometimes be misleading in terms of scientific accuracy. The important thing is for teachers to be aware of such problems so they can be addressed.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		Content Representation 3: Mixing-Bowl Analogy Read the main learning goal and description of the content representation in **Analysis Guide D3** (page 3 of handout 7.1).	**Display Slide 18.** Content Representation 3: Mixing-Bowl Analogy (5 min) **Note**: If time is running short, this content representation can be skipped. a. Have participants turn to **Analysis Guide D3** (page 3 of handout 7.1) and read the main learning goal and description of the content representation.
		Content Representation 3: Mixing-Bowl Analogy 	**Display Slide 19.** Content Representation 3: Mixing-Bowl Analogy (7 min) a. "Our next content representation is the mixing-bowl analogy of photosynthesis that we demonstrated in our last content deepening session." b. **Whole group:** Repeat the demonstration of the mixing-bowl analogy using the script in the PD Leader Master (Role-Play and Mixing-Bowl Analogy of Photosynthesis). c. **Individuals:** Have participants work independently on part 1 of Analysis Guide D3. **Note:** If time is short, just do partner work. d. **Pairs:** "Now pair up and discuss your answers to the analysis questions."

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		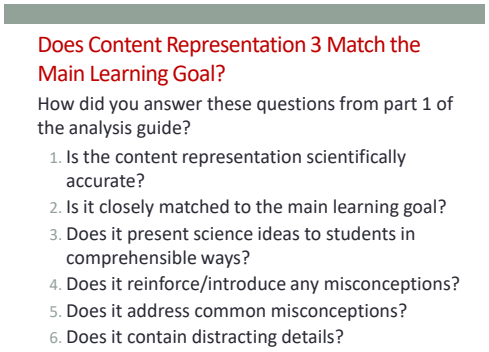	**Display Slide 20.** Does Content Representation 3 Match the Main Learning Goal? (10 min) a. **Whole group:** Discuss participants' responses to the questions in part 1 of Analysis Guide D3. b. **Ask:** "How might this content representation be improved? Would you use it with your students?" **Sample analysis, part 1 of Analysis Guide D3:** • *Scientifically accurate?* It isn't scientifically accurate to say that air, sunlight, and water "mix together" to make food. In scientific terms, when substances are mixed together, they retain their unique properties (like mixing different fruits together to make a fruit salad). Conversely, photosynthesis is a chemical reaction in which water and carbon dioxide, powered by light energy from the Sun, are transformed into a completely new substance: food (glucose). However, the appearance of the sugar cubes at the end of the demonstration suggests that "mixing" sunlight, water, and air produced something completely new, so that helps move the demonstration toward scientific accuracy. Another inaccuracy is the suggestion that sunlight is mixed together with water and air. Sunlight is a form of energy that powers the chemical reaction of photosynthesis. It is *not* a substance (matter) that can be rearranged and made into a new substance.

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			• *Closely matched to the MLG?* The mixing-bowl analogy closely matches the part of the learning goal about plants using air, sunlight, and water to make food, but it doesn't address the part about plants using the food to live and grow. • *Science ideas comprehensible?* If students make the connection that the bowl is like the inside of a leaf, they might find this idea comprehensible. But will they be able to make the connection? • *Reinforces misconceptions?* Pouring water into the bowl could reinforce the misconception that water is food for plants. Also, making the sugar cubes suddenly appear at the end of the demonstration while students' eyes are closed could introduce the misconception that photosynthesis is magic instead of a process that can be explained scientifically. • *Addresses common misconceptions?* By emphasizing that sunlight, water, and air change into food at the end of the demonstration, the mixing-bowl analogy attempts to address the misconception that water, air, and sunlight by themselves are food for plants. • *Contains distracting details?* Including carbon dioxide in the analogy is a distracting detail. Kindergartners will have no idea what that is or that air is composed of different gases. **Possible improvements:** • Remove the reference to carbon dioxide. • Emphasize that water, air, and sunlight by themselves are not food for plants. • Emphasize that scientists have studied

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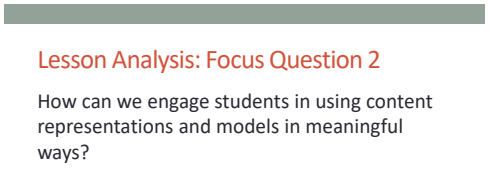
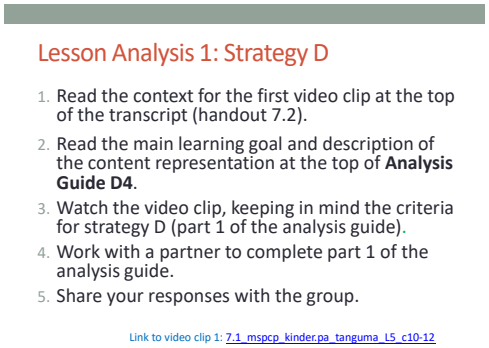
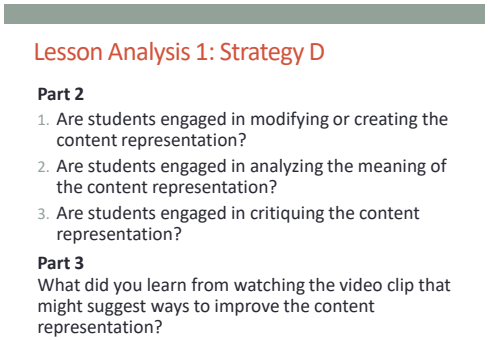
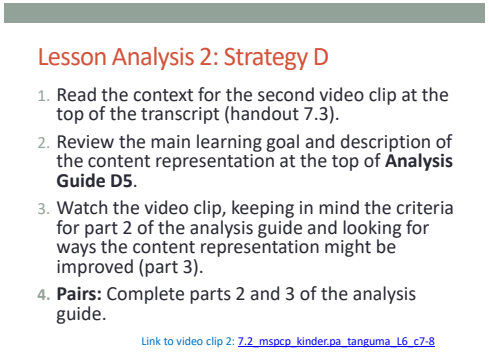
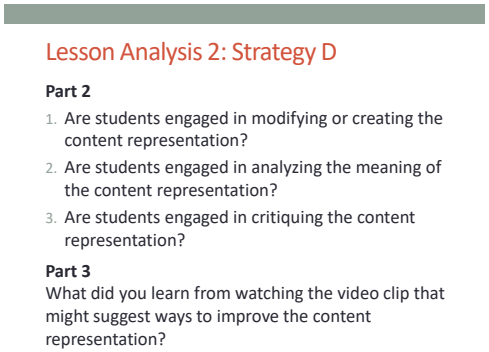
			how plants use sunlight to change water and carbon dioxide into food. End with a discussion about how plants use the food they make to live and grow. **Take-home message:** Trying to address all six criteria in the analysis guide is a balancing act or trade-off. To make complex science ideas meaningful and comprehensible to students, the content representation needs to be simplified, but simplifications can sometimes be misleading in terms of scientific accuracy. The important thing is for teachers to be aware of such problems so they can be addressed.
10:10–10:20 10 min	**BREAK**		
10:20–12:00 100 min **Lesson Analysis: SCSL Strategy D** Slides 21–28	**Purpose** • Develop participants' ability to analyze content representations to determine how well engaged students are in their use. • Use lesson analysis of classroom videos to better understand STeLLA strategy D. • Deepen participants' science-content knowledge of plants and animals through lesson analysis.		**Display Slide 21.** Lesson Analysis: Focus Question 2 (Less than 1 min) a. **Transition slide:** "Next we'll watch two video clips of strategy D in use during P&A lessons. In addition to completing part 1 of Analysis Guide D4, we'll focus on parts 2 and 3: *How well engaged are students in using the content representation? And what suggestions do you have for improving the content representation and its use with students?"*

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

	Content
	• Six criteria are used in analyzing and selecting a content representation that is well matched to the main learning goal.
	• Three criteria are used in analyzing how well teachers engage students in using content representations.
	• The following science ideas should be addressed in these analyses:
	  • Plants and animals have similar and different needs. They both need food, water, and air from their environment, but plants also need sunlight to make their own food out of water and air (carbon dioxide). Animals can't make their own food.
	  • Animals don't directly need sunlight to live and grow. However, they depend on plants for food, and plants need sunlight to make food. Therefore, animals indirectly need sunlight to live and grow.
	
	What Participants Do
	• Use Analysis Guide D to analyze student engagement with content representations in two video clips.
			**Display Slide 22.** Lesson Analysis 1: Strategy D (20 min)
			
			a. Orient participants to **Analysis Guide D4** and the transcript for video clip 1 (handout 7.2 in PD binder).
			
			b. Have participants read the main learning goal and description of the content representation at the top of the analysis guide.
			
			c. Show the video clip.
			
			d. **Pairs:** Have participants pair up and complete part 1 of the analysis guide.
			
			e. **Whole group:** Discuss participants' responses to the questions in part 1 of the guide.
			
			Sample analysis, part 1 of Analysis Guide D4:
			• *Scientifically accurate?* The thinking map is scientifically accurate.
			• *Closely matched to the MLG?* The map is closely matched to the main learning goals from previous lessons.
			• *Science ideas comprehensible?* It's unclear whether students understand what the circles and lines represent.
			• *Reinforces misconceptions?* The map might reinforce the misconception that dirt or soil is food for plants. But students might interpret this to mean that plants need dirt to hold them up.
			• *Addresses common misconceptions?* The map addresses the common misconception that only animals need

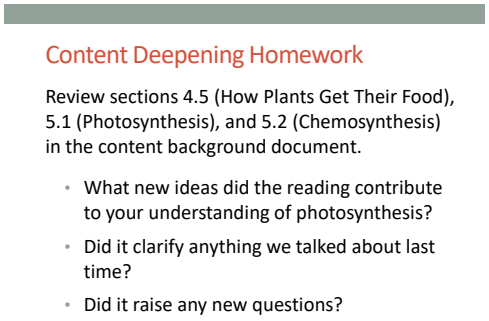
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
	• Identify key ideas participants have learned about strategy D and the science content from the lesson analysis work. **Videos** • Video Clip 7.1, Tanguma classroom • Video Clip 7.2, Tanguma classroom **Handouts in PD Binder** • 7.1 Analysis Guide D • 7.2 Transcript for Video Clip 7.1 • 7.3 Transcript for Video Clip 7.2 **PD Resources** • STeLLA strategies booklet • RESPeCT lesson plans binder • SCSL Z-fold summary chart (front pocket of PD binder) **Resources in Lesson Plans Binder** *Resources section:* • Content background document		food by showing that plants need food as well. • *Contains distracting details?* There are no distracting details in the map.
			**Display Slide 23.** Lesson Analysis 1: Strategy D (15 min) a. "Now we're going to turn our attention to part 2 of strategy D, which engages students in using content representations. We'll also consider ways the content representation could be improved." b. **Individuals:** "Study the video transcript again and think about parts 2 and 3 of **Analysis Guide D4**. Be ready to share evidence that supports your conclusions." c. **Pairs:** "Compare your conclusions about student engagement with the content representation." d. **Whole group:** Review participants' responses to parts 2 and 3 of the analysis guide. Challenge participants to support their answers with evidence from the video transcript. e. If it didn't already come up in the discussion, ask participants, "How might the teacher have engaged these students in analyzing or critiquing the representation?" **Sample analysis, part 2 of Analysis Guide D4** • *Modifying/creating the CR?* Students help create the content representation (thinking map) by sharing their ideas about what

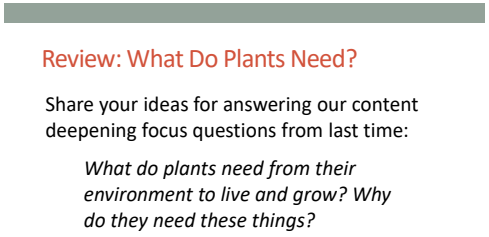
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			plants and animals need. • *Analyzing the CR?* Students don't analyze the meaning of the content representation, since they aren't asked to interpret or explain it. • *Critiquing the CR?* Students don't critique the content representation. **Possible improvements, part 3 of Analysis Guide D4:** • Make sure that the things both plants and animals need (water, food, air, environment) are all nicely lined up between the two circles on the bubble map ("What Animals Need" and "What Plants Need"). This would help emphasize similarities and highlight that only plants need sunlight (and dirt/soil). • To improve their understanding of the representation, students could be asked to explain what each connecting line tells them about the needs of plants and animals. Then they could analyze similarities and differences among these needs.
			**Display Slide 24.** Lesson Analysis 2: Strategy D (20 min) a. Orient participants to **Analysis Guide D5** and the transcript for the second video clip (handout 7.3 in PD binder). b. Have participants review the main learning goal and description of the content representation at the top of the analysis guide. **Emphasize** that they'll focus only on parts 2 and 3 of the guide

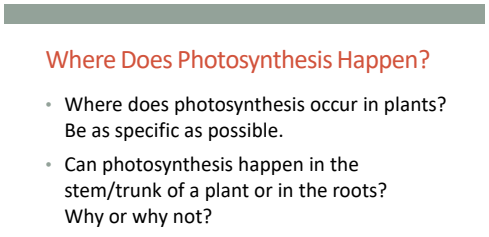
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			for this clip. c. "For this analysis, we're going to look at a new classroom video and examine how students are (or are not) engaged in using the content representation." d. Show the video clip. e. **Pairs:** Have participants pair up and complete parts 2 and 3 of the analysis guide.
			**Display Slide 25.** Lesson Analysis 2: Strategy D (10 min) a. **Whole group:** Discuss participants' responses to parts 2 and 3 of **Analysis Guide D5**. Challenge participants to support their answers with evidence from the video transcript. b. If it didn't already come up in the discussion, ask participants, "How might the teacher have engaged these students in analyzing or critiquing the representation?" **Sample analysis, part 2 of Analysis Guide D5:** • *Modifying/creating the CR?* Students create the content representations by drawing pictures to compare the needs of plants and animals. • *Analyzing the CR?* Two students describe and explain their content representations. The teacher asks if others agree or disagree or have anything to add to the drawings, which are all forms of analysis (video segments 00:02–00:09; 01:12;

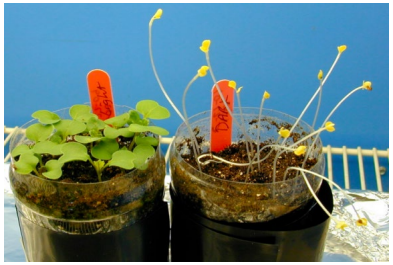
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			01:19; 01:23). The teacher also engages students in comparing (analyzing) Astraya's picture with the class double bubble map about the needs of plants and animals. However, the teacher uses yes-or-no questions (segments 03:35; 03:39; 03:42) instead of challenge questions. • *Critiquing the CR?* The teacher asks students to critique the CR when she invites them to agree or disagree. **Sample analysis, part 3 of Analysis Guide D5:** • Instead of asking for a thumbs-up to indicate agreement (video segment 01:23), the teacher could have asked students to find something in Kiara's picture that they want to know more about and then follow up by asking if they can add anything. • The teacher could engaged students more in comparing the class double bubble map with the two girls' drawings. For example, have a student stand up and point to what all plants and animals need on the double bubble map; then have a different student find each of those things in the girls' pictures. Alternatively, the teacher could ask students to look at their own pictures and analyze whether they showed everything on the double bubble map. • The teacher could have asked both girls why they included sunlight in the list of what animals need. • The teacher could ask more challenge questions (segment 03:42) instead of leading questions (00:42) and yes-or-no questions (01:12; 01:19; 03:31; 03:35;

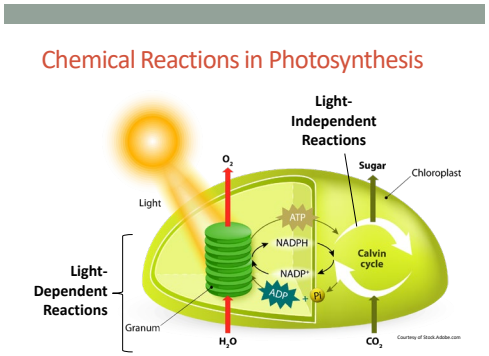
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			03:39). For example, the teacher could have asked, "How does Kiara's picture show how plants and animals are the same?" "How does Astraya's picture show how plants and animals get their food?"
		Strategy D: Synthesize and Summarize 1. What new ideas do you have about these aspects of today's lesson analysis work? • How to select content representations • How to engage students in using content representations 2. Did our content-representation work give you any new insights about plants and animals?	**Display Slide 26.** Strategy D: Synthesize and Summarize (10 min) a. **Individuals (5 min):** Have participants work on the slide questions. Encourage them to use their resources (e.g., the strategies booklet, their Z-fold summary charts, the content background document, notes they've taken). b. **Whole group (5 min):** Have participants share their new ideas for each question in a round-robin format, if time allows. Otherwise, have a couple of volunteers share their ideas for each question.
12:00–12:45 45 min	**LUNCH**		
12:45–3:15 150 min (Includes 10-min break) **Content Deepening: Plants and Animals**	**Purpose** • Deepen participants' understanding of cellular respiration and how it relates to photosynthesis. **Content** • Plants take in sunlight, water, and carbon dioxide from their environment and use them to make energy-supplying food they	PLANTS AND ANIMALS SCIENCE CONTENT DEEPENING Kindergarten BSCS	**Display Slide 27.** Content Deepening: Plants and Animals (Less than 1 min) a. **Transition:** This slide marks the transition to the content deepening phase of the session. **Note:** Throughout this content deepening session, refer as needed to the content background document and Common Student Ideas about Plants and Animals.

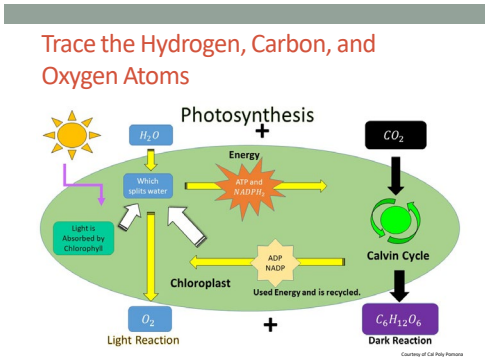
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
Slides 27–49	need to live and grow. This process is called *photosynthesis*. Plants need all three of these things to make their own food. • All plant and animal cells need broken-down food matter and oxygen to release stored energy they can use to live and grow. This energy is released when the food matter and oxygen cells react chemically in a process called *cellular respiration*. **What Participants Do** • Discuss the content deepening homework from the previous session. • Review what plants and animals need from their environment. • Use key ideas about photosynthesis to explain how seeds are able to grow in dark conditions. • Examine detailed representations of photosynthesis. • Create visual representations of photosynthesis that show what happens in light-dependent and light-independent reactions. • Share initial ideas about what happens to the food matter (glucose) and oxygen that plants produce during photosynthesis. • Compare common student ideas and science ideas regarding what happens to food matter and oxygen in animals and plants. • Analyze diagrams that show what		**Display Slide 28.** Content Deepening Homework (7 min) a. "Let's talk about the content deepening homework from our last session." b. **Individuals:** Have participants review sections 4.5, 5.1, and 5.2 in the content background document and their responses to the questions on the slide. c. **Whole group:** Discuss the questions on the slide and invite participants to share any new ideas they gleaned from the reading. **Note:** New ideas should include xylem, phloem, the role of chlorophyll in photosynthesis, two phases of photosynthesis, chemosynthesis, and the history of how cells evolved to make complex food molecules. d. Take time to address any questions or confusion participants have about *basic concepts* related to photosynthesis. e. **Emphasize:** "In today's content deepening session, we'll dig into more of the details about photosynthesis."

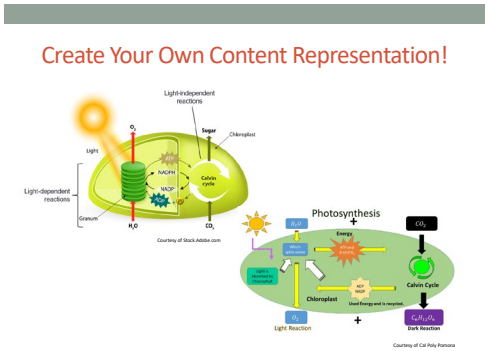
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
	happens to food matter and oxygen in animals and plants. • Analyze and compare content representations of cellular respiration in animals and plants. **Handouts in PD Binder** • 7.4 The Human Body • 7.5 Cellular Respiration in Plants and Animals • 7.6 Let's Summarize! **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		
			**Display Slide 29.** Review: What Do Plants Need? (3 min) **Note:** Use this slide as an optional review. a. Give participants an opportunity to share their ideas (writings/drawings) for answering the content deepening focus questions from day 6 if they didn't have a chance to do so in the previous session. b. Have participants 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.

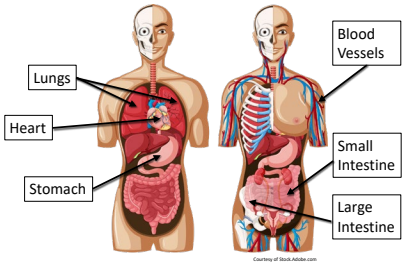
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 30.** Where Does Photosynthesis Happen? (6 min) a. Read the questions on the slide. b. **Turn and Talk:** "Discuss these questions with an elbow partner and be prepared to share your answers and explanations with the group." c. **Whole group:** Discuss participants' responses to each question and challenge them to explain their reasoning. **Ideal response to the first question:** Photosynthesis occurs in the chloroplasts of cells in the plants' leaves. d. **Emphasize:** Only the *green* parts of plants can photosynthesize. Not all plant cells have chloroplasts that contain chlorophyll, the pigment that captures light energy so that enzymes can convert it to chemical energy during photosynthesis. In addition to leaves, some stems can photosynthesize. For example, cactus plants don't have leaves, so they make food in the green cells in their "stems."

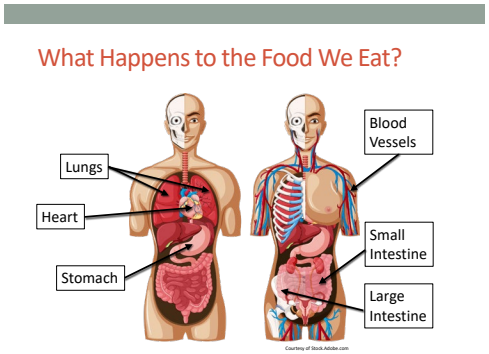
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		Can Seeds Grow in the Dark?  Photo courtesy of Wisconsin Fast Plants Program, College of Agricultural and Life Sciences, University of Wisconsin-Madison, Fastplants.org	**Display Slide 31.** Can Seeds Grow in the Dark? (8 min) a. "In the experiment on the slide, seeds were planted in soil in two different containers. Then the container on the left was placed in the Sun, and the container on the right was placed in the dark." b. "What do you observe about the seedlings that were placed in the dark? How do you explain what happened?" c. **Turn and Talk:** "Discuss your observations and ideas with an elbow partner, and be prepared to share with the group." d. **Whole group:** Invite participants to share their observations and explanations with the group. Record key ideas on chart paper and ask probe questions to clarify participants' thinking. Encourage participants to agree or disagree with one another's ideas, add on, or ask questions. e. Make sure participants grapple with the idea that the seeds were able to grow in the dark. How could this happen? f. If it doesn't come up during the discussion, explain that seeds contain stored food that the parent plant produced during photosynthesis. Young seedlings use this food to live and grow until they sprout leaves and can make their own food.

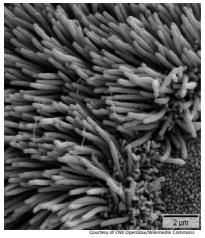
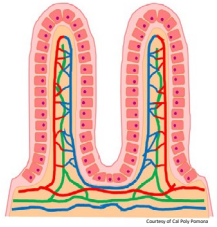
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 32.** Chemical Reactions in Photosynthesis (10 min) a. "This slide gives us a closer look at photosynthesis. Inside the chloroplast, two different reactions take place: a light-dependent reaction, and a light-independent reaction, or dark reaction." b. **Pairs:** Have participants pair up and explain each of the chemical reactions on the slide, starting with sunlight, water, and carbon dioxide entering the cell. c. **Whole group:** Invite participants to share their explanations of the reactions. Ask probe questions to clarify participants' thinking and correct any misconceptions or errors. Encourage participants to respond to one another's ideas by agreeing or disagreeing, adding on, or asking questions. Record key ideas on chart paper. d. Explain that ATP is a molecule that stores and transfers energy in cells. When energy is needed for a task, ATP converts to ADP. NADPH is produced during the first stage of photosynthesis and powers the reactions in the second stage. **Ideal explanation:** • Light and water generate ATP and NADPH molecules in a light-dependent reaction. • ATP, NADPH, and CO_2 (from the air) are then involved in a light-independent reaction (also known as the *Calvin cycle*),

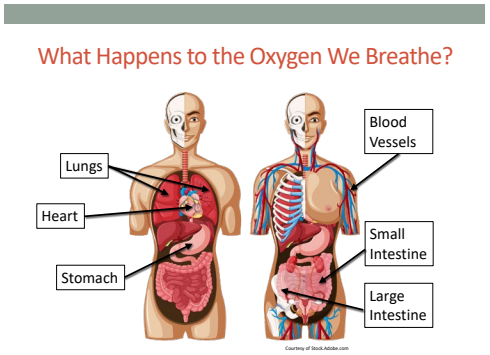
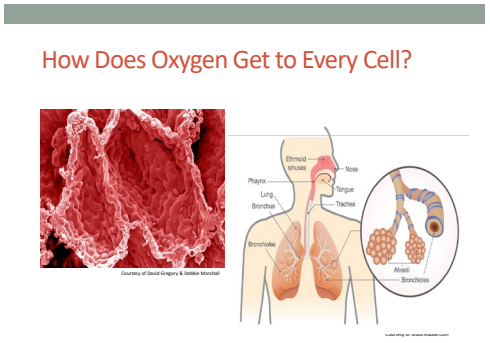
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			and glucose is produced!
			**Display Slide 33.** Trace the Hydrogen, Oxygen, and Carbon Atoms (10 min) a. "This slide shows another content representation of the chemical reactions in photosynthesis." b. **Pairs:** Work with a partner to trace what happens to the hydrogen, oxygen, and carbon atoms in these two reactions. c. **Whole group:** Invite participants to share their ideas with the group. Ask probe questions to clarify participants' thinking. **Key ideas:** • The water molecules are split in the light-dependent reaction, releasing hydrogen atoms and oxygen atoms. The oxygen atoms produced in this reaction aren't involved any further in photosynthesis. • The hydrogen atoms from the light-dependent reaction enter the Calvin cycle (dark reaction), where they "meet up with" carbon-dioxide molecules. • In the light-independent (dark) chemical reaction, the carbon and oxygen atoms from carbon dioxide join together with the hydrogen atoms from the water molecule to form sugar/glucose molecules ($C_6H_{12}O_6$).

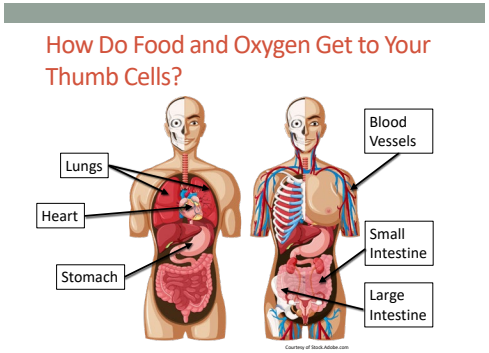
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 34.** Create Your Own Content Representation! (15 min) a. "Now I'd like you to make visual representations that will help you make sense of these ideas. Your representations don't have to show all of the details in these slide diagrams, but they should include key aspects of the light and dark reactions." b. **Individuals:** Challenge participants to create their own representations of photosynthesis that include key aspects of the light and dark reactions. c. **Pairs:** Have participants share their representations with an elbow partner. d. **Whole group:** Invite a few participants to share their representations with the group. Display the diagrams on a document reader as participants share. Encourage participants to ask questions and offer feedback during the share-out.
	10-MINUTE BREAK		

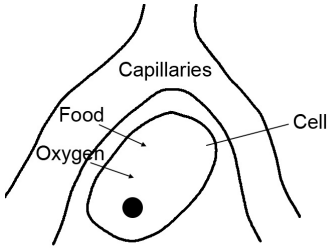
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		Content Deepening Focus Question What happens to the food (glucose) and oxygen that plants make during photosynthesis?	**Display Slide 35.** Content Deepening Focus Question (5 min) a. "In our previous content deepening session, we investigated what plants need from their environment to live and grow, and why they need these things. What did we discover?" **Ideal response:** Plants need sunlight, carbon dioxide, and water from their environment to make their own food during photosynthesis. b. Read the focus question on the slide. c. **Individuals:** Ask participants to write the question in their science notebooks. Then have them jot down their initial ideas for answering this question before advancing to the next slide.
		What Do Humans Do with the Food and Oxygen Plants Make?  	**Display Slide 36.** What Do Humans Do with the Food and Oxygen Plants Make? (8 min) a. "Let's think about our focus question in terms of what humans do with the products of photosynthesis." b. **Pairs:** Have participants pair up with an elbow partner and share their ideas. c. **Whole group:** "What ideas do you have for answering our focus question as it relates to humans? Don't worry about making sure your ideas are scientifically accurate. At this point, we just want to get

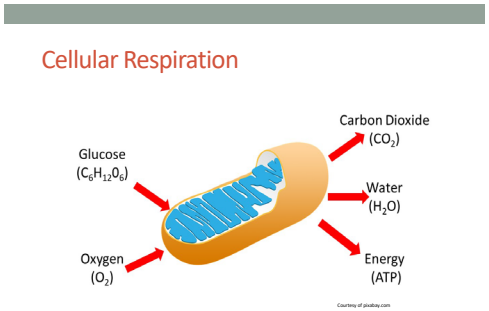
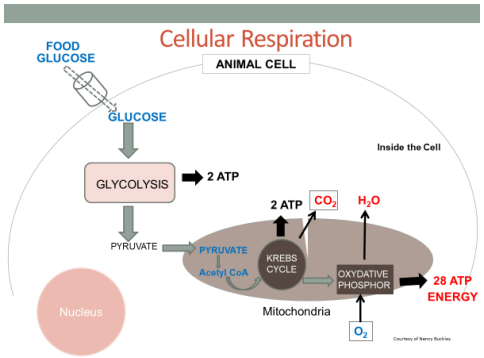
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			our initial ideas down on paper." d. "Let's begin with what happens when we eat a plant. Which parts of the human body are involved?" e. On chart paper, create a two-column chart with the headings "Food" and "Oxygen." As participants share their ideas, record them on the chart and ask probe questions to clarify their thinking. Avoid labeling ideas as right or wrong or leading participants to the "correct" answer. f. "Next, let's talk about what we do with oxygen. Which parts of the human body are involved?" g. Record ideas on the chart and ask participants probe questions to clarify their thinking.
			**Display Slide 37.** What Happens to the Food We Eat? (7 min) a. Have participants locate Common Student Ideas about Plants and Animals in the resources section of their lesson plans binders. b. **Individuals:** Direct participants to read idea 17 and the corresponding scientific explanation. c. **Whole group:** "Did the scientific explanation give you any new ideas about what happens to the food we eat?" **Key ideas:** • Food must be broken down into smaller pieces before it can be transported to

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			every cell in the body. • Cellular respiration causes a chemical reaction to occur between oxygen and food molecules in the cells so that stored energy in the food molecules is released.
		How Does Food Get to Every Cell?  	**Display Slide 38.** How Does Food Get to Every Cell? (3 min) a. "So how does food get to every cell in our bodies? The answer is the circulatory system. Food molecules have to be small enough to diffuse into blood vessels so they can be transported to cells all over the body." b. **Ask:** "Do you have any ideas about what the images on this slide represent?" c. **Explain:** "The images on this slide show the lining of the small intestines. The tiny projections in the photo on the left are called *villi*, which provide ample surface area for tiny food molecules to diffuse through the cell lining of the small intestine (which is just one cell layer thick) and then quickly diffuse into tiny blood vessels called *capillaries*. Once in the bloodstream, the food molecules can travel to cells all over your body, from your toes to your brain."

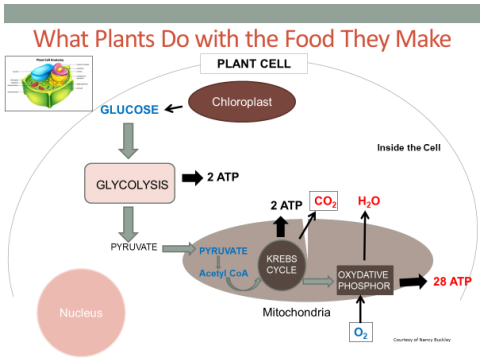
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 39.** What Happens to the Oxygen We Breathe? (7 min) a. **Individuals:** Direct participants to read idea 18 and the corresponding scientific explanation in the Common Student Ideas resource document. a. **Whole group:** "Did the scientific explanation give you any new ideas about what happens to the oxygen we breathe in?" **Key ideas:** • When animals breathe in oxygen, it travels to the lungs, where it's transported to every cell in the body. In each cell, a chemical reaction (cellular respiration) occurs between oxygen and food molecules to release stored energy the cells need to function. • During cellular respiration, the oxygen and food molecules rearrange to form carbon-dioxide and water molecules that animals exhale.
			**Display Slide 40.** How Does Oxygen Get to Every Cell? (7 min) a. "So how does oxygen get to every cell in our bodies? The answer is the circulatory system. Oxygen molecules have to be small enough to diffuse into blood vessels so they can be transported to cells all over the body." b. **Ask:** "Do you have any ideas about what the images on this slide show?"

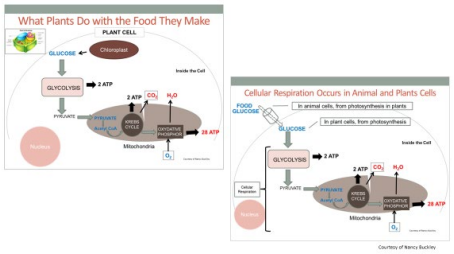
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			c. **Explain:** "The images on this slide show how the design of the lungs allows oxygen molecules come into close contact with tiny blood vessels or capillaries and move from the lungs into the circulatory system. Once in the bloodstream, the oxygen molecules are transported to cells all over the body. In the lungs, structures called *alveoli* allow oxygen molecules to diffuse into the capillaries. This is similar to what happens in the small intestines when villi allow food molecules to diffuse into the capillaries. But the alveoli are more complicated because they also allow carbon-dioxide molecules to diffuse from the circulatory system into the lungs so they can be exhaled."
			**Display Slide 41.** How Do Food and Oxygen Get to Your Thumb Cells? (8 min) a. Read the question on the slide. b. Ask participants to locate handout 7.4 (The Human Body) in their PD program binders. c. **Pairs:** Direct participants to pair up and use the handout to help them describe how food and oxygen molecules travel to their thumb cells. d. **Whole group:** Have participants explain how food and oxygen molecules travel through the body to thumb cells. Record key ideas on chart paper and ask probe questions to clarify participants' thinking. **Key ideas:**

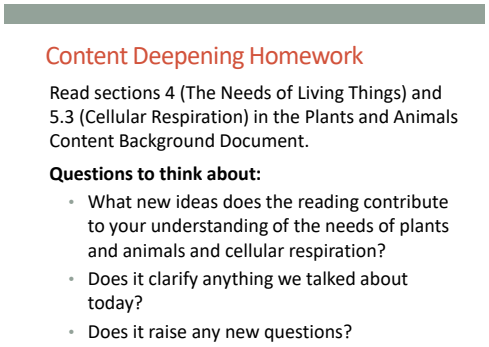
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			• **Food:** We take food into our mouths and chew it to break it down into smaller pieces. The food then travels through the esophagus to the stomach and into the small intestines, where it's broken down further into tiny molecules that can diffuse into the bloodstream through a single layer of cells in the villi that line the small intestines. The food molecules then travel through the bloodstream to cells all over the body, including the thumb cells. • **Oxygen:** We breathe in oxygen through our nostrils or mouths. Then it travels through the trachea to the lungs (through the bronchus and bronchioles), where it diffuses through the alveoli into the bloodstream. Once in the bloodstream, the oxygen molecules travel to cells all over the body, including the thumb cells.
		What Happens in the Cells?  	**Display Slide 42.** What Happens in the Cells? (1 min) a. "What does this diagram show?" **Answer:** The diagram shows the bloodstream transporting food and oxygen molecules to a body cell. b. "After the food and oxygen molecules reach the cells, what happens to them? How are they used? That's what we'll explore next."

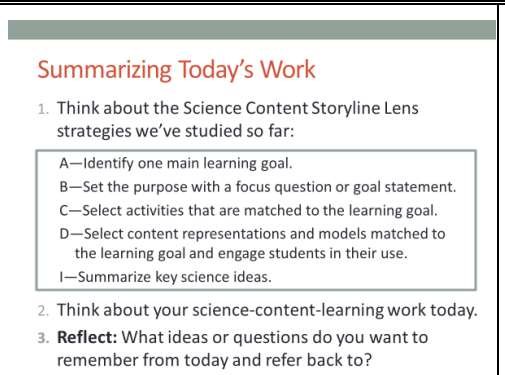
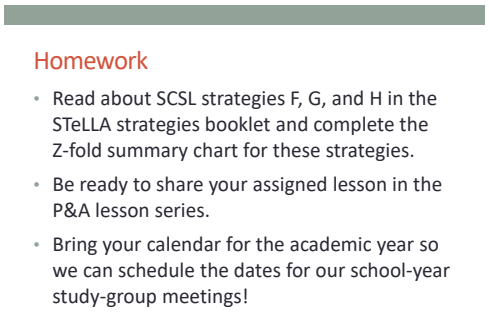
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 43.** Cellular Respiration (2 min) a. "This slide shows a diagram of an organelle in each human cell called a *mitochondrion*." b. **Ask:** "Based on this diagram, what do you think is happening in the mitochondrion?" **Key ideas:** • Glucose and oxygen are undergoing a chemical reaction in which the atoms recombine to form carbon dioxide and water, and the chemical energy stored in the glucose molecules is released so it can be used.
			**Display Slide 44.** Cellular Respiration (5 min) a. "Now let's examine this detailed diagram of cellular respiration in animal cells." b. Describe the process illustrated on the slide and respond to participants' questions. **Diagram notes:** • Blue font = inputs to the reactions • Red Font = outputs of the reactions • In cellular respiration, food is broken down into *glucose* (6 carbon molecule), which is broken down further into *pyruvate* (3 carbon molecule) through the process of glycolysis. • *Pyruvate* then enters the mitochondrion and is converted to *acetyl coenzyme A*

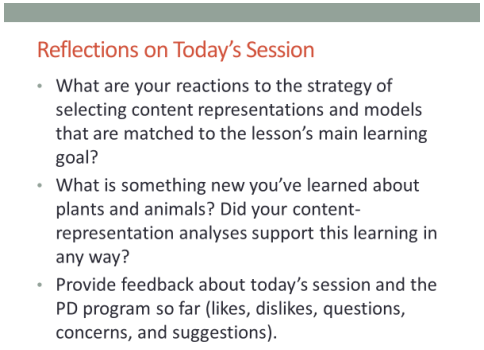
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			(acetyl-CoA). • Then acetyl-CoA reacts with *oxygen* to release stored energy in the form of ATP, which the organism can use to live and grow. • Byproducts of cellular respiration are CO_2 (carbon dioxide) and H_2O (water).
		What about Plants? What do plants do with the food (glucose) and oxygen they make? 	**Display Slide 45.** What about Plants? (8 min) a. "Now we know what humans do with the food and oxygen plants make, but what do plants do with them?" b. **Individuals:** Direct participants to read ideas 16 and 19 and the corresponding scientific explanations in the Common Student Ideas resource document. c. **Whole group:** "Did these explanations give you any new ideas about how plants use the food and oxygen they make?" **Key ideas:** • Just as cellular respiration occurs in all animals, including humans, it also occurs in plant cells. Oxygen needs to reach each and every plant cell so it can react with food (glucose) molecules to release energy the plant can use to function and keep on living. Just as in animals, carbon dioxide and water are given off in this chemical reaction. • Interestingly, most people think that plants only need carbon dioxide. While they do, in fact, need carbon dioxide in specialized leaf cells for photosynthesis to occur, they also need oxygen to reach every cell for

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			cellular respiration to take place.
			**Display Slide 46.** What Plants Do with the Food They Make (5 min) a. "Now let's look more closely at the diagram on the slide to see what plants do with the food they make." b. Have participants locate handout 7.5 (Cellular Respiration in Plants and Animals) in their PD program binders. c. Explain the following process that takes place in the plant cell: • Glucose is produced through photosynthesis in the chloroplast. • Glucose is then broken down into pyruvate through glycolysis. • Pyruvate is converted to acetyl coenzyme A (acetyl-CoA) in the mitochondria. • Acetyl-CoA and oxygen are used to generate precious energy in the form of ATP. • Carbon dioxide (CO_2) and water (H_2O) are produced as byproducts. • Carbon dioxide and water (both of which are generated as byproducts in the cell and from the environment) can be used in photosynthesis.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		Cellular Respiration in Plants and Animals  	**Display Slide 47.** Cellular Respiration in Plants and Animals (6 min) a. **Individuals or pairs:** Have participants compare the diagrams on handout 7.5 (Cellular Respiration in Plants and Animals) and note any similarities and differences. b. **Whole group:** Ask participants to share the similarities and differences they identified between the two content representations of cellular respiration. **Key ideas:** • The process of cellular respiration is identical in plant and animal cells. • The difference is how plants and animals get the food (glucose) they need for the process.
		Reflect: Content Deepening Focus Question What happens to the food (glucose) and oxygen that plants make during photosynthesis?	**Display Slide 48.** Reflect: Content Deepening Focus Question (8 min) a. Review the focus question on the slide. b. Have participants locate handout 7.6 (Let's Summarize!) in their PD program binders. c. **Individuals:** "Now I'd like you to answer our focus question by finishing the diagram on this handout and adding a title. Include as many details as possible to show what happens to the food and oxygen in the cell. You may use any available resources, such as handouts, your notes, the content background

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			document, and the Common Student Ideas document as you work on your diagrams. Be prepared to share your diagrams with the group." d. **Whole group:** Invite as many participants as possible to share their diagrams with the group. Have them display their diagrams on a document reader as they explain them. **Ideal response:** • The diagram should show water and carbon dioxide leaving the cell and diffusing into the capillaries. The release of energy for the cell to use should be represented as well. Participants should also draw a mitochondrion in the cell with an arrow pointing to it to indicate that this is where cellular respiration takes place. Additional details would be nice but aren't essential. • **Possible diagram title:** Cellular respiration in Plants and Animals.
			**Display Slide 49.** 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
3:15–3:30 15 min **Wrap-Up: Summary, Homework, and Reflections** Slides 50–52	**Purpose** • Summarize and reflect on key ideas about SCSL strategies A, B, C, D, and I and the P&A science content, lesson plans, and lesson analysis work. **What Participants Do** • Write about and share key ideas from SCSL strategies A, B, C, D, and I. • Write about and share key ideas about today's content deepening work. • Copy down the homework assignment for day 8. • Write reflections on today's learning. **Handouts in PD Binder** • 7.7 Daily Reflections—Day 7 **Supplies** • Science notebooks		**Display Slide 50.** Summarizing Today's Work (6 min) a. **Individuals (4 min):** Ask participants to think about the first two tasks on the slide and respond to the reflection question in their notebooks. b. **Whole group (2 min):** Ask for volunteers to share an idea or question from their responses to the reflection question.
			**Display Slide 51.** Homework (3 min) a. Review the homework assignment and have participants write it in their notebooks. b. Make sure participants understand the assignment. c. "We won't address strategy E about sequencing science ideas and activities until the school year, since you'll learn a lot about sequencing from teaching the RESPeCT lesson plans."

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 52.** Reflections on Today's Session (6 min) a. Allow **at least 5 minutes** for participants to think about today's session and write their reflections and feedback on the Daily Reflections sheet (handout 7.7 in PD program binder).