RESPeCT Summer Institute Professional Development Leader Guide (PDLG)

Grade Level	6	Day	6	STeLLA Strategy	SCSL Strategies B, C, and I STL Strategy 7	Subject Matter Focus	The Sun's Effect on Climate (SEC)

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? • Why are places closer to Earth's equator hotter than places farther away from the equator? • Why is it summer in the United States (the Northern Hemisphere) when it's winter in Argentina (the Southern Hemisphere)? • Why is it warmer in the summer than in the winter?
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. • Because Earth is a sphere, sunlight hits the curved surface more directly closer to the equator and less directly closer to the poles. Variations in the angle at which sunlight strikes Earth's surface at different latitudes create uneven heating. • The consistent tilt of Earth on its axis produces opposite seasons in the Northern and Southern Hemispheres. • Earth's consistent tilt and the angle at which sunlight strikes the surface at different times of the year cause the Northern and Southern Hemispheres to experience different intensities of sunlight and, as a result, opposite periods of warmer and cooler temperatures (seasons).

Preparation	Materials	Videos
Daily Setup Tasks • Check that video clips are correctly linked to PowerPoint (PPT) slides. • Set up PowerPoint. • Make sure video clips play correctly with good sound. • Arrange furniture and food. • Arrange participant materials. • Put up posters and charts. **Planning and Preparation Tasks** • Study the PDLG, PowerPoint slides (PPTs), video clips, and handouts. Make changes to PPTs if needed. • Review the reflections from day 5 and create a	**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**	Video clips from one SEC lesson: • Video Clips 6.1 and 6.2: Crom classroom (strategies B, I, and 7, beginning and end of lesson); 6.1-6.2_stella_SEC_crom_L2_c1-c2 Video clips from another SEC lesson: • Video Clip 6.3: Evans classroom (strategy C); 6.3_stella_SEC_evans_L5_c1 • Video Clip 6.4: Evans classroom (strategy C); 6.4_stella_SEC_evans_L5_c2 • Video Clip 6.5: Evans classroom (strategy C); 6.5_stella_SEC_evans_L5_c3 • Video Clip 6.6: Evans classroom (strategy C, beginning and end of lesson); 6.6_stella_SEC_evans_L5_c4

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summary slide.
• Watch video clips and anticipate participant responses.
• Prepare charts for the day's agenda and focus questions.
• Review the activities for SEC lessons 2a/b, 3a/b, and 4a/b in the lesson plans binder.
• For content deepening:
  • Display the North Star image (handout 3.2 in lesson plans binder) near the ceiling of a north-facing wall for the investigation from lesson 3b. (Save this image for display again on day 8.)
	• 6.1 Analysis Guides B and I: Setting the Purpose and Summarizing Key Science Ideas
	• 6.2 Transcript for Video Clips 6.1 and 6.2
	• 6.3 The Sun's Incoming Energy (from SEC lesson 2b)
	• 6.4 Data Table—Number of Sun's Incoming Rays by Season at Different Latitudes (from SEC lesson 4a)
	• 6.5 Analysis Guide C: Selecting Activities Matched to the Learning Goal (4 copies)
	• 6.6 Transcript for Video Clip 6.3
	• 6.7 Transcript for Video Clip 6.4
	• 6.8 Transcript for Video Clip 6.5
	• 6.9 Transcript for Video Clip 6.6
	• 6.10 Daily Reflections—Day 6
	
	Handouts in RESPeCT Lesson Plans Binder
	• 2.2 The Sun's Incoming Energy—Angle Related to Latitude (Teacher Master) (from SEC lesson 2a)
	• 3.1 Earth's Orbit around the Sun (from SEC lesson 3b)
	• 3.2 Image of North Star (Teacher Master) (for display) (from SEC lesson 3b)
	• 4.2 The Sun's Incoming Energy with Tilt—Position 1 (from SEC lesson 4a)
	• 4.3 The Sun's Incoming Energy with Tilt—Position 3 (from SEC lesson 4a)
	• 4.5 The Sun's Incoming Energy—Angle Related to Latitude at Position 1 (Teacher Master) (from SEC lesson 4b)
	• 4.6 The Sun's Incoming Energy— Angle Related to Latitude at Position 3 (Teacher Master) (from SEC lesson 4b)
	
	Supplies
	• Science notebooks
	• Chart paper and markers
	• For lessons 2a/b investigations (1 setup per pair):
	  • 1 tray (plastic)
	  • 2 sheets of graph paper	

	• Flashlight • Pencil • Inflatable globe • For lessons 3a/b investigations (1 setup per pair): • Light setup (lightbulb, socket, plug) • Hula Hoop • Styrofoam ball • Wooden stick • Rubber band • 2 pushpins • Stand for Earth-Sun model **PD Resources** • STeLLA strategies booklet • RESPeCT PD program binder • RESPeCT lesson plans binder **Resources in Lesson Plans Binder** *Resources section:* • The Sun's Effect on Climate Content Background Document • Common Student Ideas about the Sun's Effect on Climate and Seasons	

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 the Sun's effect on climate through lesson analysis.
10:10–12:00 110 min	**Content Deepening: The Sun's Effect on Climate**	• Deepen participants' science-content knowledge of the Sun's effect on climate by conducting investigations from SEC lessons 2 and 3.
12:00–12:45 45 min	**LUNCH**	
12:45–1:15 30 min	**Content Deepening (Continued)**	• Deepen participants' science-content knowledge of the Sun's effect on climate by conducting investigations from SEC lesson 4.
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 the Sun's effect on climate 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 SEC science content.

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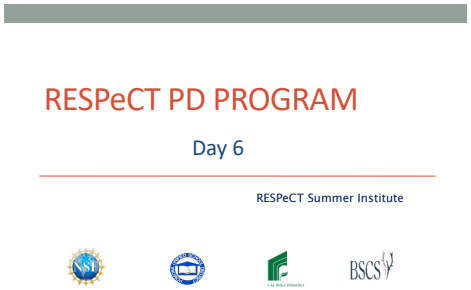
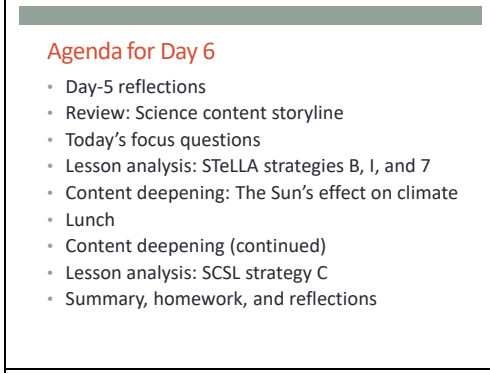
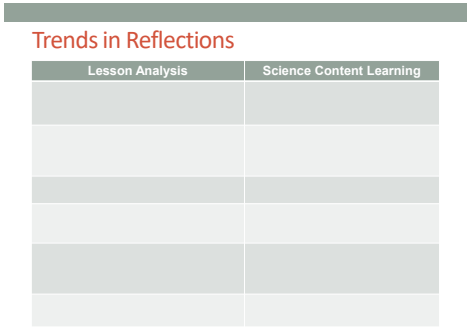
DAY 6

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.
			**Display Slide 3.** Trends in Reflections (7 min) a. Give participants time to review your feedback on their reflections from day 5 and offer reactions, comments, or follow-up questions.

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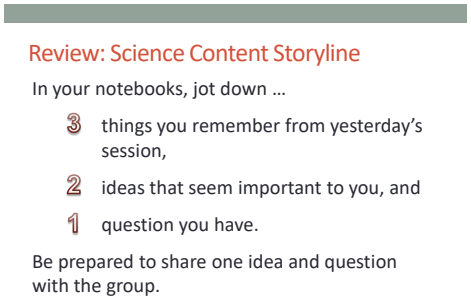
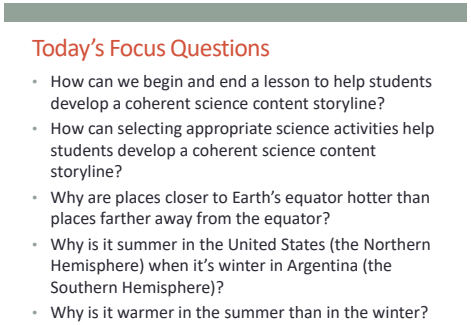
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 4.** Review: Science Content Storyline (10 min) a. Point out the three tasks on the slide. Allow 4–5 minutes for participants to write their responses in their science notebooks. b. Have each participant 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.
			**Display Slide 5.** Today's Focus Questions (2 min) a. Introduce today's focus questions.

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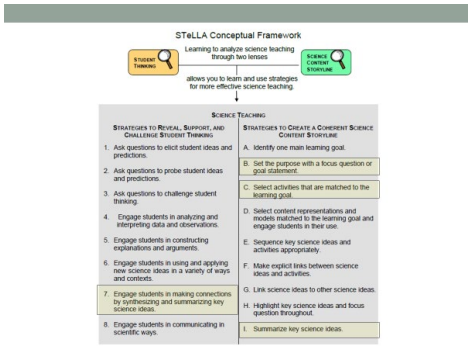
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 6.** STeLLA Conceptual Framework (1 min) a. "Today we'll be looking at four new STeLLA strategies. Three of them are Science Content Storyline Lens strategies, and one is a Student Thinking Lens strategy. Throughout the session, think about how these strategies are different from one another and how they are closely linked to each other."
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 the Sun's effect on climate through lesson analysis. **Content** • Strategies B, I, and 7 are like bookends that mark the beginning and end of a lesson. The science ideas used in the summary should match the focus question from the beginning of the lesson, and both the focus question and the summary should match the lesson's main learning goal. • The Sun's Effect on Climate science content emerges from video-based lesson analysis. **What Participants Do**	Lesson Analysis: Focus Question 1 How can we begin and end a lesson to help students develop a coherent science content storyline?	**Display Slide 7.** Lesson Analysis: Focus Question 1 (Less than 1 min) a. "Now let's dig into our first focus question."
		Strategies B, I, and 7: Purposes and Key Features **Group 1:** What are the purpose and key features of strategy B? ◦ Why is a focus question or goal statement important for science content storyline coherence? **Group 2:** What are the purpose and key features of strategy I? ◦ Why is summarizing key science ideas important for science content storyline coherence? **Group 3:** What are the purpose and key features of strategy 7? ◦ How does strategy 7 compare with strategy I? **All groups:** Make sure to cite ideas from the STeLLA strategies booklet in your answers.	**Display Slide 8.** Strategies B, I, and 7: Purposes and Key Features (25 min) a. **Pairs (3 min):** Direct participants to retrieve their Z-fold summary charts and share with a partner what they learned from their homework assignment about STeLLA strategies B, I, and 7. b. **Small groups (12 min):** Divide participants into three small groups and have them make charts that capture the purposes and key features of the three strategies.

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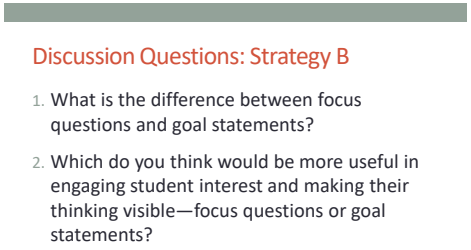
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
	• Make, share, and discuss charts summarizing the purposes and key features of strategies B, I, and 7. • Discuss questions about strategies B, I, and 7. • Analyze video clips from the beginning and end of an SEC lesson. • Study the main learning goal (MLG), focus question, and summary in an SEC lesson plan. **Videos** • Video Clips 6.1 and 6.2, Crom classroom (beginning and end of lesson) **Handouts in PD Binder** • 6.1 Analysis Guides B and I • 6.2 Transcript for Video Clips 6.1 and 6.2 **Supplies** • Science notebooks • Chart paper and markers **PD Resources** • STeLLA strategies booklet • RESPeCT lesson plans binder • Participants' SCSL and STL Z-fold summary charts (front pocket of PD binder)		**Note:** Challenge participants to imagine themselves in a Teacher Leader role. Ask them, "How would you explain these strategies to the teachers you're leading?" c. **Whole group (10 min):** Have small groups share their charts in a whole-group share-out. **Key ideas:** • Make sure participants understand that a focus question is designed to do more than just get students interested in the lesson. It gets them thinking about a phenomenon or something 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

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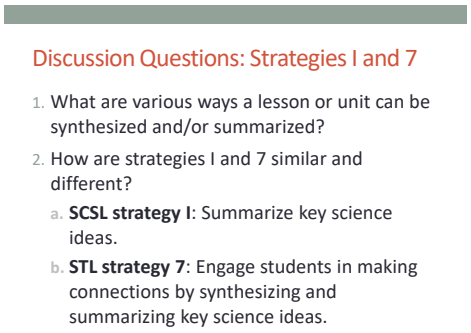
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			engaging student interest, making their thinking visible, and eliciting initial ideas at the beginning of a lesson. When posed at the end of a lesson, focus questions challenge students to use new ideas developed during the lesson.
			**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,

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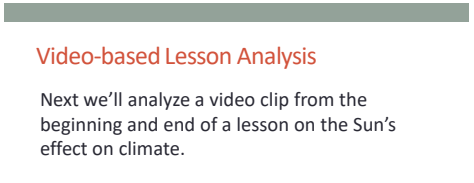
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			not activities; that is, focusing on "what we learned" versus "what we did." • For a variety of reasons, a lesson sometimes ends before the main learning goal has been fully developed. However, summarizing work should still take place. For example, the 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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		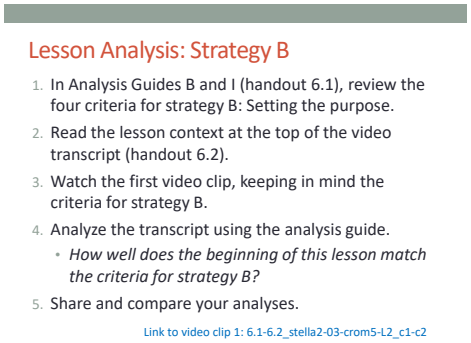	**Display Slide 12.** Lesson Analysis: Strategy B (20 min) a. Have participants locate Analysis Guides B and I (handout 6.1 in PD program binder) and spend 1 or 2 minutes reading the criteria for strategy B: Setting the purpose. b. **Ask:** "Do you have any questions about these criteria?" c. **Emphasize:** "Keep the criteria for strategy B in mind as you watch the first clip from the beginning of a lesson about the Sun's effect on climate." 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. This video has two clips (1 and 2). At this point, show only the first clip (47.1 seconds). f. **Whole group:** "How well does the beginning of this lesson match the criteria for strategy B?" **Note:** During the discussion, be on the lookout for opportunities to clarify science-content ideas. **Observations:** • The teacher reviews the focus question in language students can understand and highlights the idea of identifying patterns. It seems to be an appropriate opening for the lesson, and students should be able to anticipate the implied main learning goal: There are observable temperature patterns at different latitudes and times of the year.

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		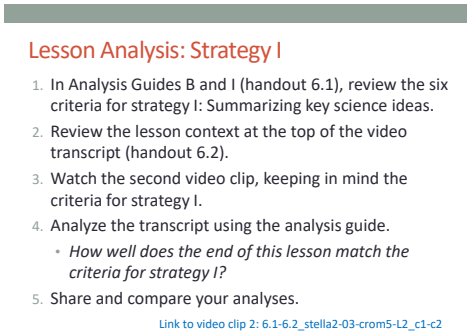	**Display Slide 13.** Lesson Analysis: Strategy I (20 min) a. Allow participants 1 or 2 minutes to read the six criteria in the analysis guide for strategy I: Summarizing key science ideas. b. **Ask:** "Do you have any questions about these criteria?" c. **Emphasize:** "Keep the criteria for strategy I in mind as you watch the next clip from the end of the same SEC lesson." d. **Individuals:** Give participants a couple of minutes to review the lesson context at the top of the video transcript (handout 6.2). e. Show the second video clip. **Note:** This clip begins at segment 00:00:56.4. f. **Whole group:** "How well does the end of this lesson match the criteria for strategy I? How well does the summary statement match the beginning of the lesson?" **Note:** During the discussion, be on the lookout for opportunities to clarify science-content ideas. **Observations:** • At the beginning of the second video clip, students articulate patterns they identified in the data: "It's warmer in July than January" in the Northern Hemisphere, and "it's warmer in January than July" in the Southern Hemisphere (video segments 00:01:20.7–00:02:06.0). • At segment 00:02:34.7, rather than articulating the pattern, the student poses the question, "Why do you think the temperatures are higher closer to the equator?" and responds,

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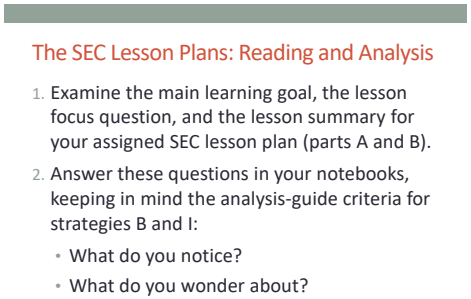
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			"Because the equator is warmer" (segment 00:02:40.5). Then echoing what Madison said, the teacher adds an idea: "The Sun's rays [hit the] 'middle of the Earth'" (segment 00:03:32.4). (That addition didn't really clarify anything for me!) • Finally the teacher prompts students to summarize the second pattern: Temperatures are warmer closer to the equator and cooler farther away from the equator (segments 00:04:23.7–00:04:57.5). • The summary might have been better had the teacher focused simply on clearly identifying the two patterns in the data rather than asking whether temperatures are the same north or south in relation to temperatures at the equator (segment 00:04:57.5). I wonder whether students thought they should know about temperature variations. At this point, the question had no good answer and distracted from clearly identifying the two patterns students would be explaining in the remaining lessons in the sequence.
			**Display Slide 14.** The SEC 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

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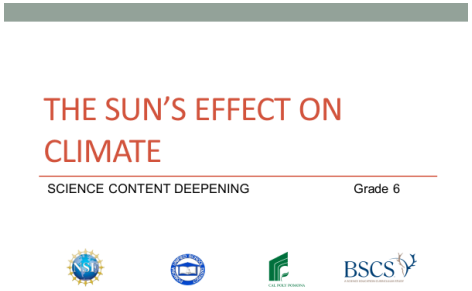
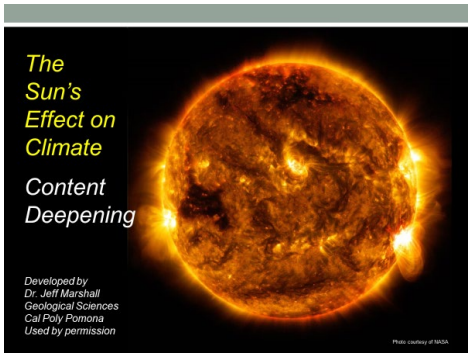
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			notebooks, keeping in mind the analysis-guide criteria." d. **Whole-group discussion (5 min):** Briefly discuss participants' observations and questions for their assigned lesson plans. **Note:** Participants should see 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**		
10:10–12:00 110 min **Content Deepening: The Sun's Effect on Climate**	**Purpose** • Deepen participants' science-content knowledge of the Sun's effect on climate by conducting investigations from SEC lessons 2 and 3. **Content** • Because Earth is a sphere, sunlight hits the curved surface more directly closer to the		**Display Slide 15.** Content Deepening: The Sun's Effect on Climate (Less than 1 min) a. **Transition:** This slide marks the transition to the content deepening work.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
Slides 15–42	equator and less directly closer to the poles. Variations in the angle at which sunlight strikes Earth's surface at different latitudes create uneven heating. • The consistent tilt of Earth on its axis produces opposite seasons in the Northern and Southern Hemispheres. **What Participants Do** • Conduct investigations from SEC lessons 2 and 3. • Explore and discuss key science ideas behind the SEC lessons. • Apply content learning to answer the SEC unit central question and the focus questions from lessons 2 and 3. **Handouts in PD Binder** • 6.3 The Sun's Incoming Energy (from SEC lesson 2b) **Handouts in Lesson Plans Binder** • 2.2 The Sun's Incoming Energy—Angle Related to Latitude (Teacher Master) (from SEC lesson 2a) • 3.1 Earth's Orbit around the Sun (from SEC lesson 3b) • 3.2 Image of North Star (Teacher Master) (from SEC lesson 3b) **Supplies** • Science notebooks • Chart paper and markers • For lessons 2a/b investigations:		**Display Slide 16.** Today's Content Deepening (Less than 1 min) a. "Our content deepening work today will focus on science ideas about the Sun's effect on climate from SEC lessons 2 through 4." **Note:** Throughout this content deepening phase, refer as needed to the Sun's Effect on Climate Content Background Document and Common Student Ideas about the Sun's Effect on Climate and Seasons.
			**Display Slide 17.** Unit Central Question (Less than 1 min) a. Review the unit central question on the slide.
			**Display Slide 18.** The Sun's Effect on Climate: Lesson 2a (Less than 1 min) a. "Next, we'll explore key science ideas about the Sun's effect on climate from SEC lesson 2a."

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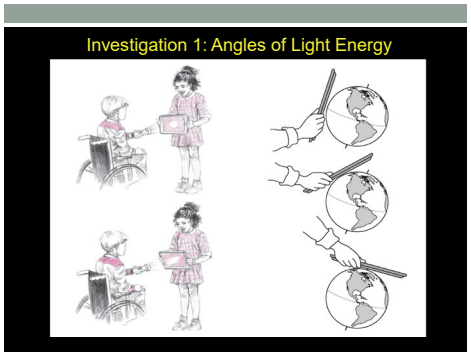
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process

	• 1 tray (plastic)
	• 2 sheets of graph paper
	• Flashlight
	• Pencil
	• Inflatable globe
	• For lessons 3a/b investigations:
	  • Light setup
	  • Hula Hoop
	  • Styrofoam ball
	  • Wooden stick
	  • Rubber band
	  • 2 pushpins
	  • Stand for Earth-Sun model
	
	PD Resources
	• RESPeCT lesson plans binder
	
	Resources in Lesson Plans Binder
	Resources section:
	• Content background document
	• Common Student Ideas
		Content Deepening: Focus Question 1
		
		Why are places closer to Earth's equator hotter than places farther away from the equator?
			Display Slide 19. Content Deepening: Focus Question 1 (Less than 1 min)
			
			a. Read the focus question on the slide.
			b. Emphasize that this focus question will guide student learning throughout SEC lessons 2a and 2b.
			c. Have participants write the question in their science notebooks and draw a box around it. Make sure they leave space below the question to write a response later.

			**Display Slide 20.** Investigation 1: Angles of Light Energy (1 min) a. "For this investigation, you'll work with a partner to explore variations in the intensity of light striking a surface at different angles." b. Have participants look over their supplies for this activity. Each pair should have a flashlight, a tray, two sheets of graph paper, and a pencil.
		Investigation 1: Angles of Light Energy **The task:** Investigate what happens when you shine a flashlight on a flat tray at different angles. **Test two scenarios:** 1. What happens when you hold the tray perpendicular to the light beam ("straight on")? 2. What happens when you tilt the tray away from the light beam (at an angle)? **Instructions:** 1. **Before each scenario,** tape a sheet of graph paper to the tray. 2. **Move ONLY the tray!** Keep the light beam parallel (horizontal) to the floor. Maintain the same distance between the flashlight and the tray at all times. 3. Using a pencil, trace the circular pattern of light (the brightest area) shining on the graph paper (for both scenarios).	**Display Slide 21.** Investigation 1: Angles of Light Energy (10 min) a. Read the instructions on the slide and emphasize the importance of following them carefully. b. "Work with your partner to complete the tasks on the slide." c. Make sure participants tape a sheet of graph paper to the top surface of the tray before they

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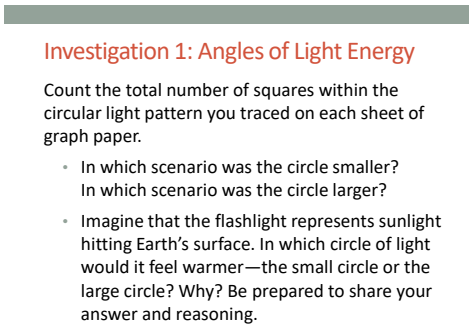
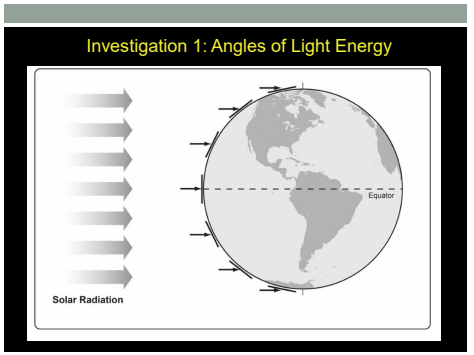
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			begin each scenario.
			**Display Slide 22.** Investigation 1: Angles of Light Energy (10 min) a. Read the instructions and questions on the slide. b. **Pairs:** "Work with your partner to complete the task on the slide. Then discuss your observations and answer the questions as concisely as possible in your science notebooks. Be prepared to share your ideas with the group." c. **Whole group**: Invite a few pairs to share their observations and answers to the questions. Probe and challenge participants' responses and elicit differing points of view.
			**Display Slide 23.** Investigation 1: Angles of Light Energy (Less than 1 min) a. "This diagram shows parallel ray's of sunlight approaching Earth's surface." b. Have participants locate handout 2.2 (The Sun's Incoming Energy—Angle Related to Latitude) in their lesson plans binders and refer to it throughout the investigation.

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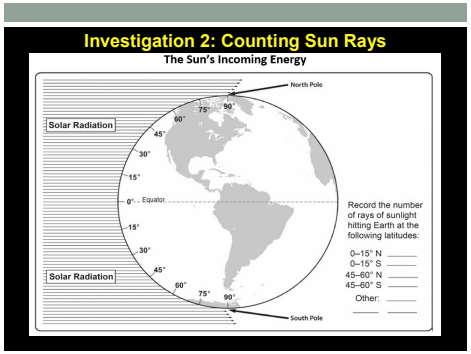
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		Investigation 1: Angles of Light Energy **Instructions:** • Examine the diagram showing parallel "rays" of sunlight approaching Earth. Note the relationship between these rays and the straight "tangent" lines at different points on Earth's curved surface. • Using the flashlight, tray, and inflatable globe, work with your partner to simulate sunlight striking Earth at each of these points. **Remember:** Keep the light beam in a horizontal position and maintain the same distance between the flashlight and tray. **Question:** How does this model help explain the temperature patterns observed in lessons 1a and 1b?	**Display Slide 24.** Investigation 1: Angles of Light Energy (10 min) a. Read the instructions and question on the slide. b. **Pairs:** "Work with your elbow partner to complete these tasks and answer the question as concisely as possible in your notebooks. Make sure to follow the instructions carefully." **Note:** Participants may refer to data and handouts from the previous session if they need to refresh their memories. c. **Whole group:** Invite a few pairs to share their observations and answers to the question. Probe and challenge participants' responses and elicit differing points of view.
			**Display Slide 25.** The Sun's Effect on Climate: Lesson 2b (Less than 1 min) a. "Now let's explore ideas about the Sun's effect on climate from SEC lesson 2b."

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 26.** Content Deepening: Focus Question 1 (Less than 1 min) a. Review the focus question on the slide. b. "We'll continue thinking about this question during the next investigation." c. Remind participants that this focus question will guide student learning throughout lesson 2b.
			**Display Slide 27.** Investigation 2: Counting Sun Rays (1 min) a. "The diagram on this slide is similar to the previous one. But in this investigation, you and your partner will explore how the amount of solar radiation hitting Earth varies based on latitude." b. Have participants locate handout 6.3 (The Sun's Incoming Energy) in their PD program binders and let them know they'll complete it during this investigation.

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

		Investigation 2: Counting Sun Rays
		• In this diagram, the incoming rays of sunlight appear as narrow, densely spaced parallel lines.
		• Work with your partner to count the number of lines that strike Earth's surface between the following latitudes and record the results on handout 6.3:
		  • 0–15° N • 45–60° N
		  • 0–15° S • 45–60° S
		• **Questions:**
		  • What happens to the number of lines as we move farther away from the equator north and south?
		  • How does this diagram relate to the tray-and-flashlight model?
			Display Slide 28. Investigation 2: Counting Sun Rays (10 min)
			
			a. Read the instructions and questions on the slide and remind participants to follow the instructions carefully.
			b. **Pairs:** "Work with your partner to complete these tasks and answer the questions as concisely as possible in your notebooks. Be prepared to share your observations and ideas with the group."
			c. **Whole group:** Invite a few pairs to share their observations and answers to the questions. Probe and challenge participants' responses and elicit differing points of view.

		Reflect: Content Deepening Focus Question 1 Why are places closer to Earth's equator hotter than places farther away from the equator?	**Display Slide 29.** Reflect: Content Deepening Focus Question 1 (7 min) a. Revisit the first content deepening focus question. b. Remind participants that this focus question from SEC lessons 2a and 2b appears in the scope and sequence and on the overview page for each lesson in their lesson plans binders. c. **Individuals:** Have participants answer the focus question in their science notebooks. d. **Whole group:** Ask a few participants to share their answers to this question with complete-sentence statements, using evidence from the investigations they just completed. e. As participants share their responses, record key ideas on chart paper. Direct others to listen carefully to the responses and be ready to

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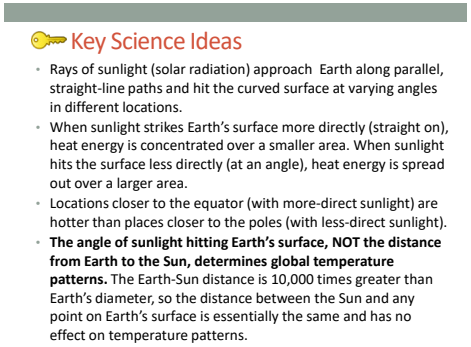
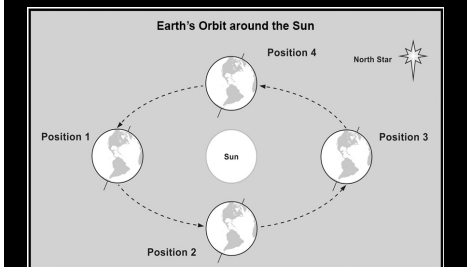
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			agree, disagree, or add ideas from the investigations.
			**Display Slide 30.** Key Science Ideas (7 min) a. Highlight the key science ideas on the slide that answer the first content deepening focus question. b. Emphasize that participants' observations from the investigations and the evidence they gathered helped to shape the answer to this question. c. **Whole group:** "Does everyone agree that these key ideas answer our focus question? Would you like to add or revise anything?" d. Ask participants to write these key ideas under the focus question in their science notebooks.
			**Display Slide 31.** The Sun's Effect on Climate: Lesson 3a (Less than 1 min) a. "Our next investigation is from SEC lesson 3a."

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		Content Deepening: Focus Question 2 Why is it summer in the United States (the Northern Hemisphere) when it's winter in Argentina (the Southern Hemisphere)?	**Display Slide 32.** Content Deepening: Focus Question 2 (Less than 1 min) a. Read the focus question on the slide. b. Have participants write the question in their science notebooks and draw a box around it. Make sure they leave space below the question to write a response later. c. Emphasize that this focus question will guide student learning throughout SEC lessons 3a and 3b.
		Investigation 3: Earth's Orbit around the Sun  	**Display Slide 33.** Investigation 3: Earth's Orbit around the Sun (2 min) a. "This slide shows a diagram of Earth's orbit around the Sun. In each orbital position, one of Earth's hemispheres is tilted toward the Sun, and one hemisphere is tilted away from the Sun." b. Have participants locate handout 3.1 (Earth's Orbit around the Sun) in their lesson plans binders and refer to it throughout the investigation. c. "In the next investigation, you and your partner will build a model to simulate Earth's orbit around the Sun." d. Have participants look over the supplies they'll need to build their Earth-Sun model: a lightbulb setup, a Hula Hoop, a Styrofoam ball, a wooden stick, a rubber band, two pushpins, and a stand to hold the model steady at a 23.5-degree angle.

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PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		Investigation 3: Earth's Orbit around the Sun What do these materials represent? • Lightbulb • Styrofoam ball • Rubber band • Hula Hoop • Wooden stick	**Display Slide 34.** Investigation 3: Earth's Orbit around the Sun (2 min) a. Discuss the question on the slide.
		Investigation 3: Earth's Orbit around the Sun **Instructions:** 1. Turn on the light setup and place it in the middle of the Hula Hoop on the table. 2. Place the rubber band around the middle of the Styrofoam ball. 3. Insert the wooden stick through the center of the ball and place the ball on the wooden stand to approximate Earth's tilt. 4. Place the light setup on a stack of books so it's in the same horizontal plane as the ball. 5. Position the Styrofoam ball (in the stand) next to the Hula Hoop and move it around the lightbulb to simulate Earth's yearly orbit around the Sun.	**Display Slide 35.** Investigation 3: Earth's Orbit around the Sun (10 min) a. Read the instructions on the slide and remind participants to follow them carefully as they assemble their models. **Note:** While participants are working on their models, circulate around the room to answer questions and provide help as needed.

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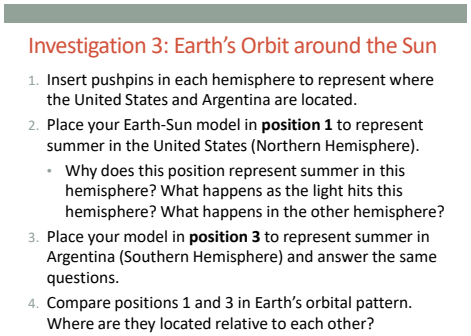
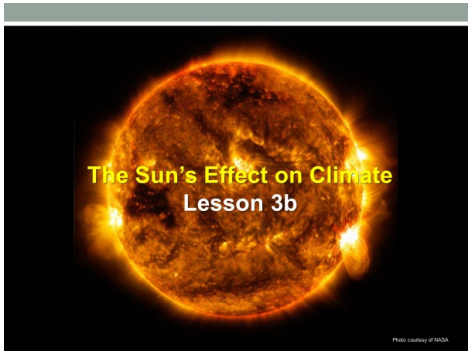
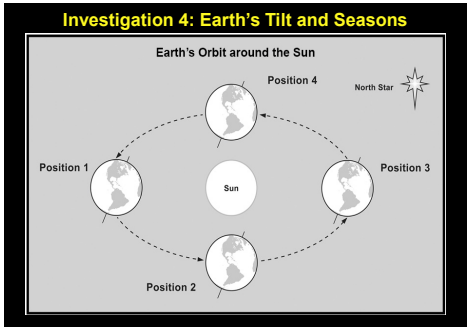
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 36.** Investigation 3: Earth's Orbit around the Sun (10 min) a. Read the instructions and questions on the slide and remind participants to follow the instructions carefully. b. **Pairs:** "Work with your partner to complete each task on the slide, discuss your observations, and answer the questions as concisely as possible in your notebooks. Be prepared to share your ideas with the group." c. **Whole group:** Invite a few pairs to share their observations and answers to the questions. Probe and challenge participants' responses and elicit differing points of view.
			**Display Slide 37.** The Sun's Effect on Climate: Lesson 3b (Less than 1 min) a. "Now we'll explore ideas about the Sun's effect on climate from SEC lesson 3b."

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		Content Deepening: Focus Question 2 Why is it summer in the United States (the Northern Hemisphere) when it's winter in Argentina (the Southern Hemisphere)?	**Display Slide 38.** Content Deepening: Focus Question 2 (Less than 1 min) a. Review the focus question on the slide. b. "We'll continue thinking about this focus question during the next investigation." c. Remind participants that this focus question will guide student learning throughout lesson 3b.
			**Display Slide 39.** Investigation 4: Earth's Tilt and Seasons (1 min) a. "In this investigation, we'll continue exploring Earth's orbit around the Sun and the relationship between Earth's tilt and seasons." b. Let participants know they'll need their Earth-Sun model and handout 3.1 for this investigation as well.
		Investigation 4: Earth's Tilt and Seasons • Another important component of our Earth-Sun model is the **North Star** (Polaris). During Earth's yearly orbit around the Sun, Earth's axis **always** points toward this star. So the Northern Hemisphere tilts toward the Sun (position 1) part of the year, and the Southern Hemisphere tilts toward the Sun (position 3) the other part of the year. • Using the handout diagram and the North Star on the wall as a guide, move your Earth-Sun model around the Hula Hoop to simulate Earth's orbit. Stop at each of the four orbital positions and answer these questions: 1. What is happening to the light in this position? 2. What season is each hemisphere experiencing in this position?	**Display Slide 40.** Investigation 4: Earth's Tilt and Seasons (10 min) a. Read the instructions and questions on the slide. Remind participants to follow the instructions carefully. b. Draw participants' attention to the image of the North Star on the wall and emphasize its importance in Earth's orbit around the Sun. c. **Pairs:** "Work with your partner to complete the

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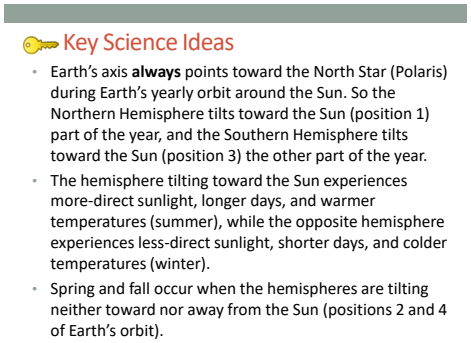
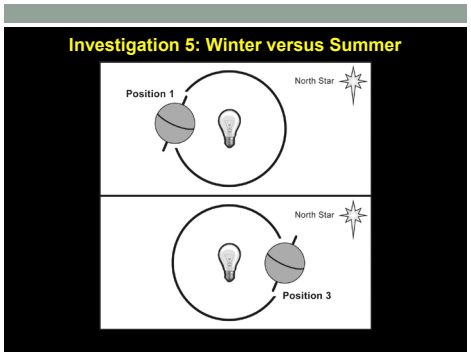
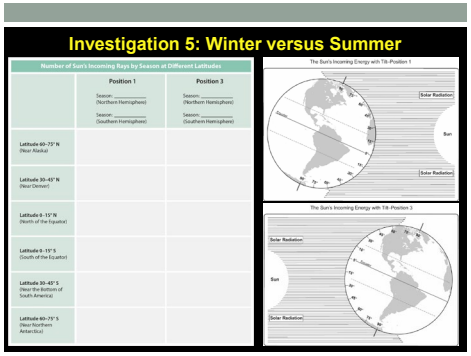
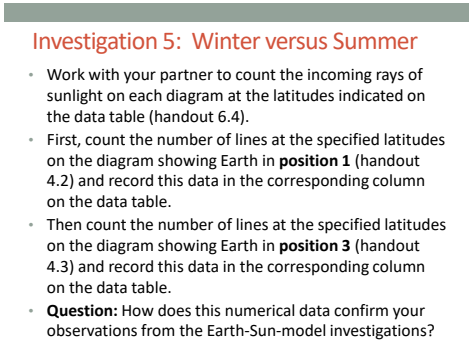
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			tasks on the slide. Then discuss your observations and answer the questions as concisely as possible in your notebooks. Be prepared to share your ideas with the group." d. **Whole group:** Invite a few pairs to share their observations and answers to the questions. Probe and challenge participants' responses and elicit differing points of view.
		 Reflect: Content Deepening Focus Question 2 Why is it summer in the United States (the Northern Hemisphere) when it's winter in Argentina (the Southern Hemisphere)?	**Display Slide 41.** Reflect: Content Deepening Focus Question 2 (7 min) a. Revisit the second content deepening focus question. b. Remind participants that this focus question from SEC lessons 2a and 2b appears in the scope and sequence and on the overview page for each lesson in their lesson plans binders. c. **Individuals:** Have participants answer the focus question in their science notebooks. d. **Whole group:** Ask a few participants to share their answers to this question with complete-sentence statements, using evidence from the investigations they just completed. e. As participants share their responses, record key ideas on chart paper. Remind others to listen carefully to the responses and be prepared to agree, disagree, or add ideas from the investigations.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 42.** Key Science Ideas (7 min) a. Highlight the key science ideas on the slide that answer the second content deepening focus question. Emphasize that participants' observations from the investigations and the evidence they gathered helped to shape the answer to this question. b. **Whole group:** "Does everyone agree that these key ideas answer our focus question? Would you like to add or revise anything?" c. Ask participants to write these key ideas under the focus question in their science notebooks.
12:00–12:45 45 min	**LUNCH**		
12:45–1:15 30 min **Content Deepening (Continued)** Slides 43–54	**Purpose** • Deepen participants' science-content knowledge of the Sun's effect on climate by conducting investigations from SEC lesson 4. **Content** • Earth's consistent tilt and the angle at which sunlight strikes the surface at different times of		**Display Slide 43.** The Sun's Effect on Climate: Lesson 4a (Less than 1 min) a. "Our next investigation is from SEC lesson 4a."

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
	the year cause the Northern and Southern Hemispheres to experience different intensities of sunlight and, as a result, opposite periods of warmer and cooler temperatures (seasons). **What Participants Do** • Conduct investigations from SEC lesson 4. • Explore and discuss key science ideas behind the SEC lessons. • Apply content learning to answer the SEC unit central question and the focus question from lesson 4. **Handouts in PD Binder** • 6.4 Data Table—Number of Sun's Incoming Rays by Season at Different Latitudes (from SEC lesson 4a) **Handouts in Lesson Plans Binder** • 4.2 The Sun's Incoming Energy with Tilt—Position 1 (from SEC lesson 4a) • 4.3 The Sun's Incoming Energy with Tilt—Position 3 (from SEC lesson 4a) • 4.5 The Sun's Incoming Energy— Angle Related to Latitude at Position 1 (Teacher Master) (from SEC lesson 4b) • 4.6 The Sun's Incoming Energy— Angle Related to Latitude at Position 3 (Teacher Master) (from SEC lesson 4b)	Content Deepening: Focus Question 3 Why is it warmer in the summer than in the winter?	**Display Slide 44.** Content Deepening: Focus Question 3 (Less than 1 min) a. Read the focus question on the slide. b. Have participants write the question in their science notebooks and draw a box around it. Make sure they leave space below the question to write a response later. c. Emphasize that this focus question will guide student learning throughout SEC lessons 4a and 4b.
			**Display Slide 45.** Investigation 5: Winter versus Summer (1 min) a. "In this investigation, you and your partner will focus on Earth's orbit around the Sun in positions 1 and 3 and explore how the angle of sunlight hitting Earth in these positions affects seasons at different latitudes."
			**Display Slide 46.** Investigation 5: Winter versus Summer (1 min) a. "The diagrams of Earth on this slide are similar to the diagram you used earlier to count the number of Sun rays striking Earth's surface. The only difference is that these diagrams show Earth tilted on its axis in positions 1 and 3." b. "In this investigation, you and your partner will count the lines of incoming rays of sunlight at

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
	Supplies • Science notebooks • Chart paper and markers **PD Resources** • RESPeCT lesson plans binder		various latitudes on the diagrams and then record the information on a data table." c. Have participants locate SEC lesson handouts 4.2 (The Sun's Incoming Energy with Tilt—Position 1) and 4.3 (The Sun's Incoming Energy with Tilt—Position 3) in their lesson plans binders, and handout 6.4 (Data Table—Number of Sun's Incoming Rays by Season at Different Latitudes) in their PD program binders.
			**Display Slide 47.** Investigation 5: Winter versus Summer (6 min) a. Read the instructions and question on the slide. Remind participants to follow the instructions carefully. **Note:** Participants may refer to their resources from the previous investigation to refresh their memories as needed. b. **Pairs:** "Work with your partner to complete the tasks on the slide, discuss your observations, and then answer the question. Be prepared to share your observations and ideas with the group." c. **Whole group:** Invite a few pairs to share their observations and answers to the question. Ask probe and challenge questions and elicit differing points of view.

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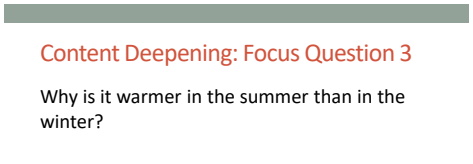
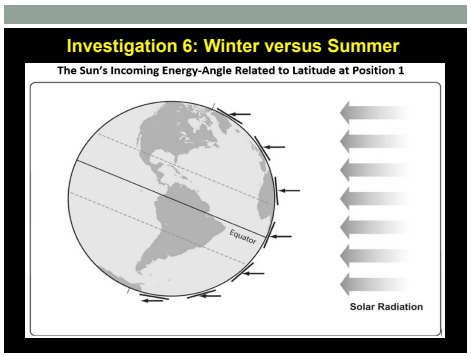
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 48.** The Sun's Effect on Climate: Lesson 4b (Less than 1 min) a. "Finally we'll explore ideas about the Sun's effect on climate from SEC lesson 4b."
			**Display Slide 49.** Content Deepening: Focus Question 3 (Less than 1 min) a. Review the focus question on the slide. b. "We'll continue thinking about this question during this investigation." c. Remind participants that this focus question will guide student learning throughout lesson 4b.
			**Display Slide 50.** Investigation 6: Winter versus Summer (1 min) a. "The diagram of Earth on this slide is similar to the one from lesson 2a, except that Earth is tilted on its axis in orbital position 1, with the Northern Hemisphere leaning toward the Sun." b. Remind participants that the thick arrows represent the incoming rays of sunlight, and the thin lines striking Earth's curved surface at

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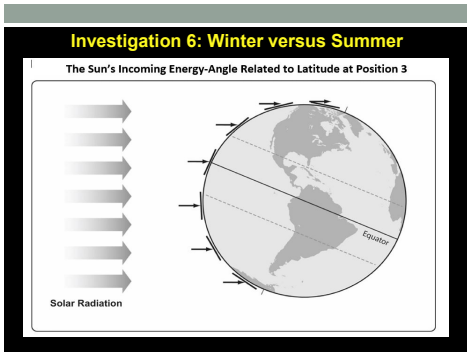
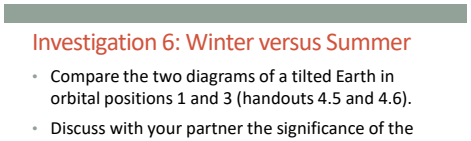
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			different latitudes are called *tangent lines*. c. Also point out the two dashed lines that run parallel to the equator around Earth's circumference, one in the Northern Hemisphere and one in the Southern Hemisphere. These lines represent the *Tropic of Cancer* and the *Tropic of Capricorn*. d. Have participants locate handout 4.5 (The Sun's Incoming Energy—Angle Related to Latitude at Position 1) in their lesson plans binders and refer to it throughout the investigation.
			**Display Slide 51.** Investigation 6: Winter versus Summer (1 min) a. "This diagram shows Earth in orbital position 3, with the Southern Hemisphere leaning toward the Sun. It also shows the arrows representing solar radiation and the dotted lines representing the Tropics of Cancer and Capricorn." b. Have participants locate handout 4.6 (The Sun's Incoming Energy—Angle Related to Latitude at Position 3) in their lesson plans binders and refer to it throughout the investigation.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 52.** Investigation 6: Winter versus Summer (6 min) a. Read the instructions on the slide and remind participants to follow them carefully. b. **Pairs:** "Work with your partner to complete the tasks on the slide. Then discuss your observations and the significance of the two dashed lines that run parallel to the equator on each diagram of Earth. Be prepared to share your observations and ideas with the group." c. **Whole group:** Invite a few pairs to share their observations and ideas. Ask probe and challenge questions and elicit differing points of view.
			**Display Slide 53.** Reflect: Content Deepening Focus Question 3 (6 min) a. Revisit the third content deepening focus question. b. Remind participants that this focus question from SEC lessons 4a and 4b appears in the scope and sequence and on the overview page for each lesson in their lesson plans binders. c. **Individuals:** Have participants answer the focus question in their science notebooks. d. **Whole group:** Ask a few participants to share their answers to this question with complete-sentence statements, using evidence from the investigations they just completed. e. As participants share their responses, record key ideas on chart paper. Remind others to listen carefully to the responses and be

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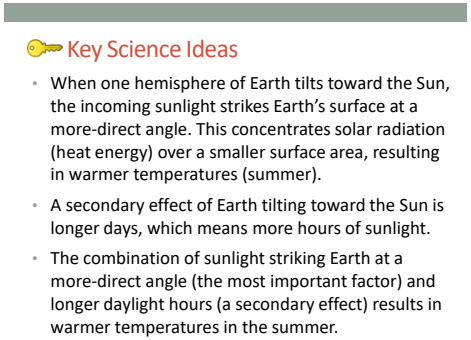
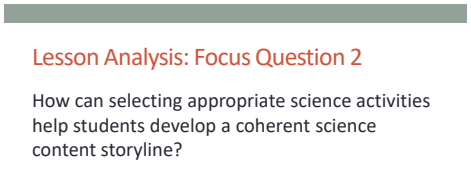
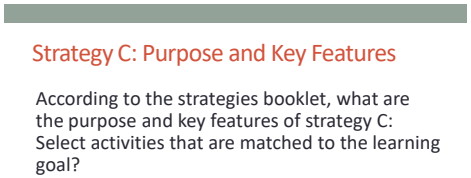
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			prepared to agree, disagree, or add ideas from the investigations.
			**Display Slide 54.** Key Science Ideas (6 min) a. Highlight the key science ideas on the slide that answer the third content deepening focus question. Emphasize that participants' observations from the investigations and the evidence they gathered helped to shape the answer to this question. b. **Whole group:** "Does everyone agree that these key ideas answer our focus question? Would you like to add or revise anything?" c. Ask participants to write these key ideas under the focus question in their science notebooks.
1:15–3:15 120 min (Includes 10-min break) **Lesson Analysis: SCSL Strategy C**	**Purpose** • Use lesson analysis of classroom videos to better understand SCSL strategy C. • Deepen participants' science-content knowledge of the Sun's effect on climate through lesson analysis. **Content** • To reflect the purpose and key		**Display Slide 55.** Lesson Analysis: Focus Question 2 (1 min) a. Read the focus question on the slide. b. "To help us answer this question, we're going to explore STeLLA strategy C: Select activities that are matched to the learning goal."

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
Slides 55–61	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 an SEC lesson (before, during, and after an activity). • Identify activities that are *not* matched to the lesson's main learning goal. **Videos** • Video Clip 6.3, Evans classroom • Video Clip 6.4, Evans classroom • Video Clip 6.5, Evans classroom • Video Clip 6.6, Evans classroom **Handouts in PD Binder** • 6.5 Analysis Guide C • 6.6 Transcript for Video Clip 6.3 • 6.7 Transcript for Video Clip 6.4 • 6.8 Transcript for Video Clip 6.5 • 6.9 Transcript for Video Clip 6.6 **Supplies** • Chart paper and markers **PD Resources** • STeLLA strategies booklet		**Display Slide 56.** 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 related to the science concepts being taught?"

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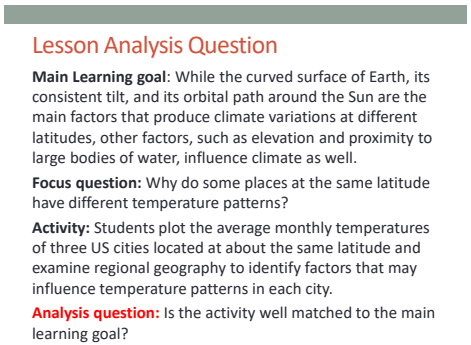
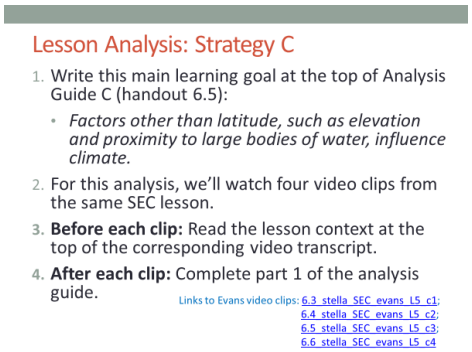
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
	Resources in Lesson Plans Binder *Resources section:* • Content background document		
			**Display Slide 57.** Lesson Analysis Question (2 min) a. For this lesson analysis, participants will view a set of four video clips from one SEC lesson. b. Review the main learning goal, focus question, and activity on the slide. Then introduce the analysis question: *Is the activity well matched to the main learning goal and focus question?*
	10-MINUTE BREAK		
			**Display Slide 58.** Lesson Analysis: Strategy C (60 min) **Note:** Refer to the SEC content background document as needed throughout this lesson analysis. a. Have participants locate Analysis Guide C (handout 6.5) in their PD binders and write the main learning goal for the selected SEC lesson at the top. Then orient them to part 1 of the analysis guide. b. **Before each video clip:** Have participants read the lesson context at the top of the corresponding video transcript (handout 6.6 for clip 3, handout 6.7 for clip 4, handout 6.8 for clip 5, and handout 6.9 for clip 6). c. Show each video clip. d. **After each clip (individuals or pairs):** Allow

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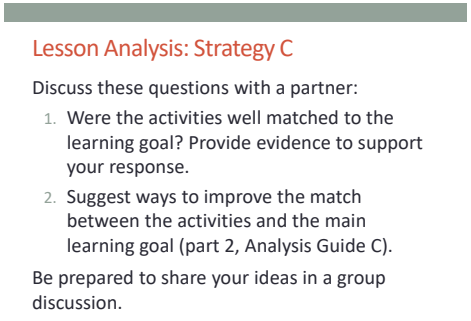
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			time for participants to review the analysis guide, write down science ideas revealed in the activity, and assess how well matched these ideas are to the main learning goal. **Observations:** • **Video Clip 6.3:** The teacher introduces the focus question, *Why do some places at the same latitude have different temperature patterns?* This question implies the main learning goal but doesn't introduce any science ideas. • **Video Clip 6.4:** In small groups, students are looking for temperature patterns in the United States in the summer and winter. They're also reviewing ideas they learned in previous lessons about why these patterns exist. Students bring up the science idea that the Sun's rays hit Earth most directly at the equator, so places in the US that are closer to the equator will be hotter (video segments 0:00:18.8–0:01:14.2 and 0:01:34.7–0:02:36.6), and places farther away from the equator will be colder. • At this point, students don't mention other possible factors that cause temperature variations, nor do they even acknowledge that the maps show temperature variations at the same latitude. The only factors they focus on are latitude and the angle of sunlight striking Earth at specific latitudes. • **Video Clip 6.5:** The teacher notes that during the class discussion, students observed that the Rocky Mountains might play a role in influencing temperature patterns at a given latitude because a dip in one of the color bands on the map indicates cooler temperatures in both the summer and winter right where the Rocky Mountains are located. However, it isn't

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			clearly stated that temperatures aren't the same in locations at similar latitudes or that factors like proximity to mountains might play a role in these temperature variations. • **Video Clip 6.6:** As students are creating graphs of monthly temperatures for three US cities, the teacher points out that students could use this data to find the average temperature over the year for each city, as well as the minimum and maximum temperatures, and the mode and then compare them across the three cities. However, there is no indication how this mathematical analysis might help them understand factors influencing climate in these three locations. These additional mathematical calculations seem to distract from the lesson focus.
			**Display Slide 59.** Lesson Analysis: Strategy C (10 min) a. **Pairs:** "Discuss the questions on the slide and be ready to share your ideas with the group." b. **Whole group:** Assess how well the activities in the video clips matched the main learning goal and ask participants to offer suggestions for improving the match. **Observations:** • The activity itself was well matched to the learning goal. The graphing activity presented a clear pattern in the data, indicating that the three selected cities have quite different patterns of temperatures and setting the stage for figuring out why these patterns exist. Juxtaposing the topographic map with the temperature patterns might prompt students to think about other factors that influence

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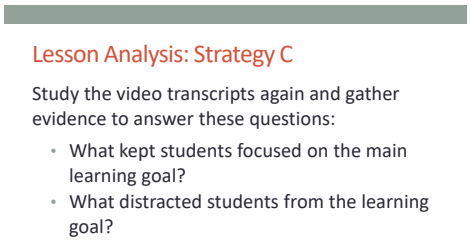
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			temperature patterns, such as elevation and proximity to a large body of water.
			**Display Slide 60.** Lesson Analysis: Strategy C (5 min) a. Read the questions on the slide. b. **Individuals:** Direct participants to look for evidence in the video transcripts that will help them answer these questions. c. **Whole group:** Ask one or two participants to share their ideas and evidence in response to the questions. **Observations:** • **Video Clip 6.3:** Introducing the focus question in this clip helped students understand why they're doing the graphing. • **Video Clip 6.4:** Quite a bit of review about the intensity of sunlight in this clip didn't specifically relate to the lesson focus. Perhaps the teacher should have emphasized the temperature variations at particular latitudes in his conversations with small groups in this portion of the lesson to keep students focused on the main learning goal. • **Video Clip 6.5:** In this clip, the teacher highlights the temperature anomalies at the same latitude; however, this introduction to the graphing activity could have been strengthened with a direct reference to the focus question. • **Video Clip 6.6:** In this clip, the teacher discusses alternative calculations that could be made from the data points students are graphing, but these calculations wouldn't help answer the focus question. The teacher diverts the focus from the main learning goal by

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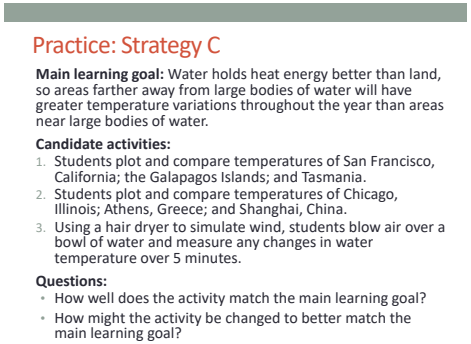
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			suggesting that other calculations might have furthered the storyline of the lesson.
			**Display Slide 61.** Practice: Strategy C (7 min) **Note:** This activity may be skipped if time is running short. a. **Individuals (2–3 min):** "Think about how well the activities on this slide are matched to the main learning goal. Be prepared to give a rationale for your choices." b. **Whole group:** Invite participants to share their ideas and reasoning with the group. **Ideal responses:** • **Activity 1:** This activity isn't matched to the main learning goal because the three cities are all close to large bodies of water. None of them experience large temperature swings throughout the year (although San Francisco and Tasmania have greater temperature swings than the Galapagos Islands, because the Galapagos are located at the equator and experience minimal temperature variations related to seasons). • **Activity 2:** This activity isn't matched to the main learning goal not only because all three cities are near a large body of water but also because there are a number of additional confounding variables that make temperature comparisons difficult. Chicago is situated at a more northerly latitude, and Shanghai is closer to the equator than the other two cities. Chicago is at the center of a continent near a large lake, whereas Athens is on a peninsula in the Mediterranean Sea. Shanghai sits along the east coast of a large land mass, where the

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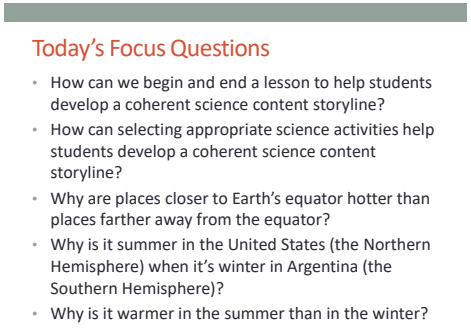
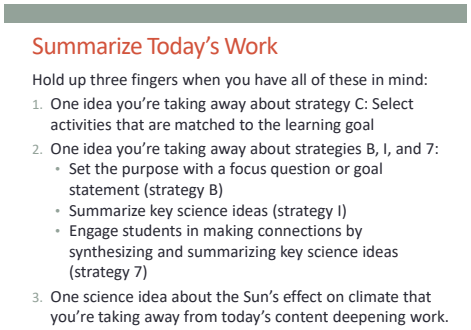
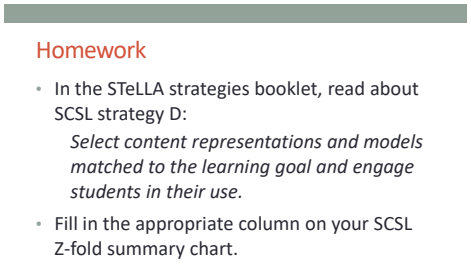
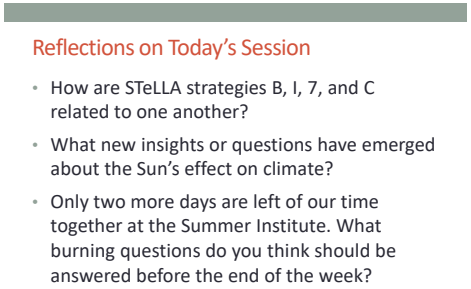
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			prevailing winds are offshore rather than onshore, which has less of an impact on temperatures than onshore winds in a West Coast city like San Francisco. • **Activity 3:** This activity isn't matched to the main learning goal. The direction of the prevailing winds blowing toward or away from a location on land does impact temperature, as does the temperature of the prevailing currents (such as a strong, warm or cold ocean current). However, blowing heated air over a bowl of water and measuring changes in *water* temperature isn't an effective way to simulate temperature variations on *land*.
3:15–3:30 15 min **Wrap-Up: Summary, Homework, and Reflections** Slides 62–65	**Purpose** • Summarize and reflect on key ideas about STeLLA strategies B, I, 7, and C, and the SEC science content. **What Participants Do** • Review today's focus questions. • Share key ideas about strategies B, I, 7, and C from the lesson analysis and content deepening work. • Copy down the homework assignment for day 7. • Write reflections on today's learning.		**Display Slide 62.** 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
	Handouts in PD Binder • 6.10 Daily Reflections—Day 6 **Supplies** • Science notebooks		**Display Slide 63.** 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 64.** Homework (Less than 1 min) a. Go over the homework assignment and have participants write it in their notebooks. b. Make sure participants understand each part of the assignment.
			**Display Slide 65.** 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).

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