RESPeCT Study-Group Sessions
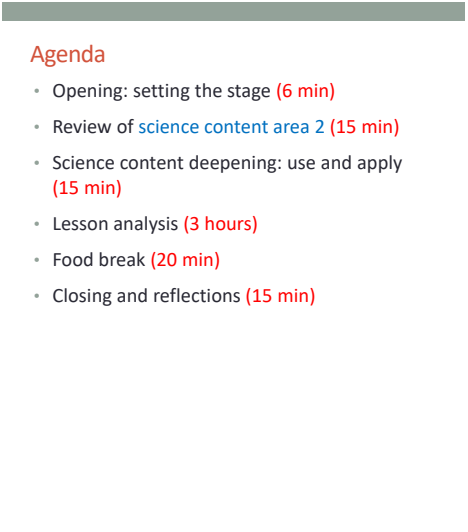## Study-Group Session 4

Focus Questions
- What are the key science ideas we as teachers need to understand in order to teach content area 2 well?
- What can we learn about the STeLLA strategies, science content, and student thinking by analyzing our own classroom videos?

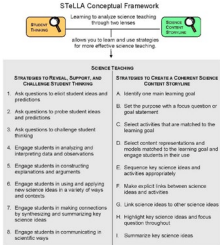**Overarching Learning Goals** for All RESPeCT Study-Group Sessions
- Deepen teachers' science-content knowledge and knowledge of effective science teaching.
- Develop teachers' analytical skills to improve lesson-plan development and the teaching of science.
- Support teachers in the practical use of new knowledge and analytical skills in their own classrooms.
- Improve students' science learning.
- Achieve sustainability by eventually reaching all K–6 teachers.

Preparation	Materials	Videos
Ahead of Time • Review the PDLG and PowerPoints (PPTs) to plan the session. Modify text highlighted in light-blue font on slides and/or in PDLG to make it specific for your group. • Select classroom video clips and identify specific teacher learning goals for this session related to the STeLLA strategies and science content. Make sure to address any science-content confusion you notice while reviewing the lesson videos. • Create a lesson analysis protocol (LAP) for each video to be analyzed. (Add identification and analysis questions to each LAP template.) • Identify a good use-and-apply question, scenario, data set, or phenomenon that will challenge participants to use and apply content area 2 science ideas to explain a new situation. Consult with CPP faculty if you need suggestions. • Prepare charts (agenda, focus questions, lesson sequence overview), and make copies of handouts. **On Meeting Day** • Check audiovisual equipment and have video clips ready to go. • Arrange furniture and food.	**Posters and Charts** • STeLLA Framework and Strategies poster • Agenda (chart) • Focus Questions (chart) • Lesson Sequence Overview Chart • Norms for Working Together (chart) • Parking Lot poster **Handouts** • Transcript for each video clip • Lesson analysis protocol (LAP) for each video clip • Reflection sheet **Supplies** • Science-lesson materials kit (content area 2) • Chart paper and markers • Food **Resources** • STeLLA strategies booklet • RESPeCT PD program binder • RESPeCT lesson plans binder • Content background document (content area 2)	• Video clips of classroom teaching selected for analysis Structure of the Lesson Sequence Overview Chart **Unit central question(s):** | Lesson Number	Focus Question	Main Activity (Brief Phrase)
1a		
1b		
2a		
2b		
3a		
3b		
Etc.		

Preparation	Materials	Videos
• Put up posters and charts.		

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
6 min **Setting the Stage for the Study-Group Session** Slides 1–7	**Purpose** • To clarify today's focus questions and learning goals **Content** • RESPeCT video-based lesson analysis is always organized around the STeLLA conceptual framework, which focuses teachers' attention on the Student Thinking Lens, the Science Content Storyline Lens, and a set of teaching strategies that support each lens. • Teacher learning goals and norms for working together help keep the analysis focused on improving students' science learning. **What Participants Do** • Review today's agenda, focus questions, RESPeCT PD program goals, and norms for working together.	RESPeCT STUDY-GROUP SESSION 4 Date: NSF · [logo] · CAL POLY POMONA · BSCS	**Display Slide 1.** RESPeCT Study-Group Session 4 (Less than 1 min) a. Insert the correct date on the slide. b. Greet participants as they enter the room.
		Agenda • Opening: setting the stage (6 min) • Review of science content area 2 (15 min) • Science content deepening: use and apply (15 min) • Lesson analysis (3 hours) • Food break (20 min) • Closing and reflections (15 min)	**Display Slide 2.** Agenda (Less than 1 min) a. Modify the slide to reflect the science-content area in focus. b. Share the agenda with the group. c. Remind participants that the majority of this study-group session will be devoted to lesson analysis. d. Ask participants if they have any questions about the agenda.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		Today's Focus Questions • What are the key science ideas we as teachers need to understand in order to teach content area 2 well? • What can we learn about the STeLLA strategies, science content, and student thinking by analyzing our own classroom videos?	**Display Slide 3.** Today's Focus Questions (Less than 1 min) a. Share the focus questions, noting that focus question 1 will be addressed in both an introductory review of science content area 2 and throughout the video-based lesson analysis. b. **Emphasize:** Science content deepening should occur throughout the lesson analysis.
		Overall Goals of the RESPeCT PD Program • Deepen teachers' science-content knowledge and knowledge of effective science teaching. • Develop teachers' analytical skills to improve lesson-plan development and the teaching of science. • Support teachers in the practical use of new knowledge and analytical skills in their own classrooms. • Improve students' science learning. • Achieve sustainability by eventually reaching all K–6 teachers.	**Display Slide 4.** Overall Goals of the RESPeCT PD Program (Less than 1 min) a. Remind participants of the RESPeCT PD program goals. b. Emphasize the goal of improving students' science-content learning.
		Learning Goals for Today Today's work will deepen your understanding of the following: • STeLLA strategies and how they can be used in science teaching List here the STeLLA strategies that will be examined in the lesson analysis work. • Science-content ideas List here 1–3 science-content ideas that will be addressed during the video-clip analyses and/or during the use-and-apply activity at the end of the session. It will also strengthen your ability to analyze student thinking, the STeLLA strategies, and science content in science teaching.	**Display Slide 5.** Learning Goals for Today (1 min) a. Modify the slide to reflect the specific STeLLA strategies and science-content ideas you've identified for today's work. b. Share the learning goals with the group.

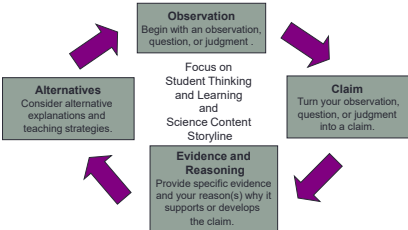| PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process

		STeLLA Strategies for Effective Science Teaching: **The Student Thinking and Science Content Storyline Lenses**	**Display Slide 6.** The STeLLA Conceptual Framework (1 min)
			
			a. Highlight the STeLLA strategies that will be the focus of today's analysis.
			
			b. Encourage participants to think about how other strategies might be relevant to the video clips.
			
			c. Remind participants to refer to their STeLLA strategies booklet during the video analysis to
			
			   1. help them remember the purpose(s) and key features of the strategies, and
			
			   2. double-check their understandings of the target strategy for each video clip.

		Norms for Working Together: The Heart **Purpose:** Build trust and develop a productive study group for all participants. **The Heart of RESPeCT Lesson Analysis and Content Deepening** · Keep the goal in mind: analysis of teaching to improve student learning. · Share your ideas, uncertainties, confusion, disagreements, questions, and good humor. All points of view are welcome. · Expect and ask questions to deepen everyone's learning; be constructively challenging. · Listen carefully; seek to understand other participants' points of view.	**Display Slide 7.** Norms for Working Together: The Heart (2 min) a. Read through the norms at the heart of the RESPeCT PD program. b. Point out that everyone will have some science-content uncertainties, confusion, disagreements, or questions, which is why it's crucial that everyone be willing to share! c. Emphasize the importance of directing questions to peers that challenge them to elaborate, reconsider, or support their claims with evidence. This may be uncomfortable, but they should be getting better at it now that they have three study-group sessions under their belts.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
15 min **Review of Content Area 2: The Science Content Storyline across Lessons** Slides 8–9	**Purpose** • To review science content related to content area 2 • To identify science-content confusion that needs to be addressed during this session or in future sessions **Content** • There is a coherent science content storyline across the STeLLA content area 2 science lessons. • Looking closely at the STeLLA content area 2 lesson plans might reveal participant confusion regarding the science content. **What Participants Do** • Study a chart of the focus questions and main activities of each lesson in content area 2. Pairs are assigned two or three lessons and discuss how the science ideas in these lessons can help students answer the unit central question(s). • Wrestle with a use-and-apply question, scenario, data set, or phenomenon that challenges them to clarify their own understandings of the science content.	Focus Question 1 What are the key science ideas we as teachers need to understand in order to teach content area 2 well? Content Area 2: The Science Content Storyline across Lessons **Unit central question(s):** INSERT QUESTION(S) HERE **Pairs work:** How do the science ideas developed in your assigned lessons help answer the unit central question(s)?	**Display Slide 8.** Focus Question 1 (Less than 1 min) a. **Transition slide:** Focus participants' attention on the science content in content area 2 lessons. **Display Slide 9.** Content Area 2: The Science Content Storyline across Lessons (15 min) a. Insert the unit central question(s) on the slide. 　**Note:** Make sure not to exceed 15 minutes for this segment. It could easily take up much more time, but it's intended to **briefly** get everyone's heads back into the science ideas in the lessons. b. Note any science-content confusion that will need to be addressed during the lesson analysis or future study-group sessions. c. Draw participants' attention to the large Lesson Sequence Overview Chart and say, "To get our heads back into the science content of these content area 2 lessons, let's think about the science content storyline and the science ideas we're helping students develop across the sequence of lessons." (1 min)

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			Structure of the Lesson Sequence Overview Chart Unit central question(s): | Lesson Number	Focus Question	Main Activity (Brief Phrase)
---	---	---
1a		
1b		
2a		
2b		
3a		
3b		
Etc.		
			  d. Assign two or three 2-part lessons to each pair of participants to make sure all of the lessons are addressed. **Note:** A single lesson has two parts (e.g., lesson 1a and 1b). e. **Pairs (4 min):** Have participants look at the lesson-sequence chart and discuss this question in pairs**:** *How can the science ideas developed in your assigned lesson(s) help students answer the unit central question?* Participants should refer to their lesson plans binders as needed. **Note:** Listen to participants during the pairs work and whole-group discussion to identify and note any science-content confusion that will need to be addressed at some point. **Whole group (10 min):** Have pairs report **briefly** on how the science ideas in their assigned lesson(s) help students answer the unit central question(s).

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
5 min **Science Content Deepening: Use and Apply** Slide 10	**Purpose** • To deepen participants' science-content understandings **Content** • List the specific science ideas that will be needed to answer the use-and-apply question or explain the scenario, data, or phenomenon described on the slide. **What Participants Do** • Work individually and then as a group on a use-and-apply question, scenario, data set, or phenomenon: Write the question or scenario here and on the PPT slide.	Science Content Deepening: Use and Apply Insert here a use-and-apply question for participants to answer, or a scenario, data set (graphs, data charts), or phenomenon for them to explain. Use your content background document as needed (resources section of your lesson plans binder).	**Display Slide 10.** Science Content Deepening: Use and Apply (5 min) **Note:** Make sure science-lesson materials are available from the lesson kit. a. Insert on the slide a new use-and-apply question, scenario, data set, or phenomenon from content area 2 for participants to explain. Ensure you have any materials you need if you want participants to observe a phenomenon. b. Present the question, scenario, data set, or phenomenon described on the slide. c. **Individuals or pairs:** Have participants work individually or in pairs using science ideas from content area 2 to answer the question or explain the scenario, data set, or phenomenon. They can refer to available resources as needed, such as the content background document. d. **Whole group:** Challenge participants to reach an agreement on how to answer the question or explain the scenario, data, or phenomenon without any intervention from you until they've either solved the problem accurately or hit a dead end and can't agree. e. **Synthesize/summarize:** If participants come up with a strong response for the use-and-apply question or scenario, have one of them provide a summary. If they haven't formulated a strong response, give them a complete explanation as a model. **Note:** Remind participants not only of the science content but the lesson activities that provide supporting evidence for the ideas. Address any confusion that emerges about the lesson content.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
3 hours, 20 min (Includes 20-min food break) **Lesson Analysis** Slides 11–32	**Purpose** • To deepen participants' understandings of the selected STeLLA strategies • To deepen participants' science-content understandings • To deepen participants' ability to analyze students' science thinking **Content** • The STeLLA video-based lesson analysis process includes identifying the selected teaching strategies (or missed opportunities) in the video clip and then analyzing the clip by making a claim, providing evidence and reasoning to support the claim, and proposing an alternative claim or alternative teaching approach. • Analyzing video clips provides opportunities to deepen participants' understandings of the selected STeLLA strategies. • Analyzing video clips provides opportunities to deepen participants' understandings of science-content ideas featured in the selected clips. **What Participants Do** • Use the lesson analysis process and lesson analysis protocol (LAP) to support their analyses of classroom science	**Focus Question 2** What can we learn about the STeLLA strategies, science content, and student thinking by analyzing our own classroom videos?	**Display Slide 11.** Focus Question 2 (Less than 1 min) a. **Transition:** This slide marks the transition to the video-based lesson analysis. b. Read the focus question.
		Lesson Analysis, Video Clip 1 Now we'll begin the lesson analysis process for video clip 1.	**Display Slide 12.** Lesson Analysis, Video Clip 1 (Less than 1 min) a. "Now we'll begin the lesson analysis process for video clip 1." **Timing note:** We've allotted approximately 60 minutes for the first and second lesson analyses, and 55 minutes for the third. But don't feel rushed. If you find you are running out of time, you can do the Identify phase of the third video clip and postpone the Analyze phase until Study Group 5. Alternatively, you could postpone lesson analysis 3 entirely until Study Group 5. We've allowed some catch-up time in Study Group 6 to accommodate this possibility.

		Lesson Analysis Process
		1. Review the lesson context:
		  • What is the ideal student response to the focus question?
		  • How is the clip situated in the content storyline?
		2. Identify and discuss the strategy that is the focus of analysis for each clip.
		3. Watch video clip(s).
		4. Analyze the lesson using the lesson analysis protocol.
		5. Reflect on the lesson analysis experience:
		  • As a reviewer
		  • As a teacher in the clip
			Display Slide 13. Lesson Analysis Process (2 min)
			
			a. Remind participants of the lesson analysis process they'll be using when they view the video clips.
			
			b. Emphasize that the focus of each analysis is on student thinking, science ideas, and a specific STeLLA strategy.
			
			c. Remind participants that they'll be looking at only 5–7 minutes of teaching, and that students in the video clips are wrestling with difficult science ideas. The goal is to understand how the appropriate use of the STeLLA strategies will support students in learning challenging science ideas and scientific
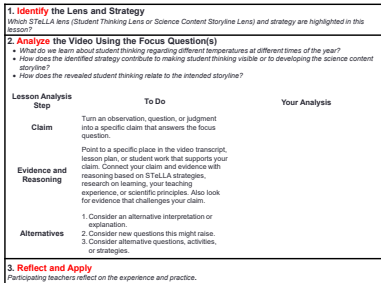
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
	teaching and learning in three video clips (from three different lessons).		ways of thinking.
	Videos/Transcripts • Three video clips to be analyzed during this session • A transcript and LAP for each video clip	The CERA Framework **Observation** Begin with an observation, question, or judgment. Focus on Student Thinking and Learning and Science Content Storyline **Alternatives** Consider alternative explanations and teaching strategies. **Claim** Turn your observation, question, or judgment into a claim. **Evidence and Reasoning** Provide specific evidence and your reason(s) why it supports or develops the claim.	**Display Slide 14.** The CERA Framework (2 min) a. Remind participants that they will be using the CERA framework during lesson analysis, which involves (1) making a claim based on an observation, (2) providing evidence and reasoning to support the claim, and (3) considering alternative interpretations or teaching strategies to address missed opportunities. b. Reasoning should address why the claim and evidence are significant. For example, what does the claim reveal about student difficulties with the science content or the importance of the strategy being implemented? Participants might use these sentence starters when formulating claim, evidence, and reasoning statements: • "My claim is …" • "My evidence is … because …" • "This is important because …" c. Emphasize that in addition to using the CERA framework to analyze their own science teaching in these study-group sessions, they will use it in the classroom as a tool for teaching students how to develop scientific explanations and arguments (STeLLA strategy 5).

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		Lesson Analysis Protocol for Video Clip 1 **1. Identify the Lens and Strategy** *Which STeLLA lens (Student Thinking Lens or Science Content Storyline Lens) and strategy are highlighted in this lesson?* **2. Analyze the Video Using the Focus Question(s)** • *What do we learn about student thinking regarding different temperatures at different times of the year?* • *How does the identified strategy contribute to making student thinking visible or to developing the science content storyline?* • *How does the revealed student thinking relate to the intended storyline?* **Lesson Analysis Step** / **To Do** / **Your Analysis** Claim — Turn an observation, question, or judgment into a specific claim that answers the focus question. Evidence and Reasoning — Point to a specific place in the video transcript, lesson plan, or student work that supports your claim. Connect your claim and evidence with reasoning based on STeLLA strategies, research on learning, your teaching experience, or scientific principles. Also look for evidence that challenges your claim. Alternatives — 1. Consider an alternative interpretation or explanation. 2. Consider new questions this might raise. 3. Consider alternative questions, activities, or strategies. **3. Reflect and Apply** *Participating teachers reflect on the experience and practice.*	**Display Slide 15.** Lesson Analysis Protocol for Video Clip 1 (Less than 1 min) a. Replace the LAP image on the slide with an image of the first LAP you will be using for this session. b. Have participants locate the LAP they will be using for the video clip.
		Lesson Analysis 1: Review Lesson Context Main learning goal: Focus question: Main lesson activity: Review the lesson plan overview page: • What important science ideas should students get from this lesson? • What are the ideal student responses to the focus question? Context of the video clip:	**Display Slide 16.** Lesson Analysis 1: Review Lesson Context (4 min) a. Modify the slide for this video clip. All of the information may not fit on one slide. b. Review the context for the video clip that will be analyzed. Some participants may need help getting their heads back into these lesson plans if they haven't taught the lessons yet. c. Remind participants of the main learning goal, the focus question, and the main activity in this lesson. d. **Optional:** Direct participants to look at the overview page of the lesson plan to identify important science ideas and an ideal student response to the focus question. e. Orient participants to where video clip 1 appears in the lesson. f. Ask the teacher whose clip you will be analyzing to add other contextual factors that may be pertinent to the upcoming analysis.

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

		Lesson Analysis 1: Identify the Strategy
		
		1. Review the lesson context.
		2. **Identify the strategy:**
		  • Add here the strategy that is the focus of the analysis for the video clip. Add page numbers for the strategy from the STeLLA strategies booklet.
		  • Add here the identification question you wrote on the LAP. An example of an identification question is "What clear examples of probe and challenge questions can you identify in this clip?"
		3. Watch the video clip(s).
		4. Analyze the video using the lesson analysis protocol.
		5. Reflect on the lesson analysis experience.
			Display Slide 17. Lesson Analysis 1: Identify the Strategy (20 min)
			
			Note: Focus only on the Identify step at this point (highlighted in red on the slide).
			
			a. Modify the slide to match your lesson analysis plan for video clip 1.
			
			b. Highlight step 1 on the LAP (Identify the strategy) and emphasize the strategy participants will be focusing on during the first analysis.
			
			    Note: Remind participants that step 1 on the LAP is step 2 of the lesson analysis process shown on the slide.
			
			c. Review the purpose(s) and key features of the selected strategy. Have participants skim the relevant content in their STeLLA strategies booklets and/or refer to their Z-fold summary charts.
			
			d. Show the video clip.
			
			e. **Individuals:** Have participants study the video transcript to identify clear examples of the selected strategy.
			
			f. **Whole group:** "What examples of the strategy did you find?" Ask challenge questions to make sure participants understand the strategy:
			
			  • "What makes this an example of strategy X?"
			  • "Can you point to text in the strategies booklet that clarifies why this is an example of strategy X?"
			
			Note 1: Encourage the teacher who was featured in the video clip to listen to and observe this discussion, not to participate.
			
			Note 2: In assessing participants' understandings of the strategy, pay attention to their reasoning. Are they clear about the purpose(s) of the strategy and how it is different from other strategies?

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

		Lesson Analysis 1: Analyze the Video
		
		1. Review the lesson context.
		2. Identify the strategy.
		3. Watch the video clip(s).
		4. **Analyze the video using the lesson analysis protocol.** Make a claim and support with evidence.
		• Add analysis questions here. Examples include the following:
		• What do students seem to understand (or not) about temperature patterns on Earth and the Sun's effect on climate and seasons?
		• How did the use of the identified strategy make student thinking more visible?
		5. Reflect on the lesson analysis experience.
			Display Slide 18. Lesson Analysis 1: Analyze the Video (30 min)
			
			Note: Focus only on the Analyze step here.
			
			a. Add analysis questions to the slide.
			
			b. Direct participants to step 2 of the LAP (Analyze the video).
			
			  Note: Remind participants that step 2 of the LAP is step 4 of the lesson analysis process shown on the slide.
			
			c. **If relevant:** Notice that there are two analysis questions on the slide. You may choose which one you want to address.
			
			  Note: Since the goal is content deepening, the focus is on asking more open-ended, content-related questions that guide the lesson analysis. If the goal was to teach lesson analysis or get through the video clip fast, the questions would focus on more specific subject matter.
			
			d. If time allows, have participants watch the video clip a second time.
			
			e. **Individuals:** Give participants time to study the video transcript; generate their claim, evidence, and reasoning; and come up with alternatives (CERA) after watching the video.
			
			f. **Whole group:** Have participants share their CERAs with the group, noting similarities and differences that ensure a rich and fruitful dialogue regarding student thinking, the use of the STeLLA strategies, and the science content.
			
			Note 1: Encourage the teacher who was featured in the video clip to listen to and observe this analysis discussion, not to participate. Follow this pattern throughout the lesson analyses.
			
			Note 2: Be sure to listen to participants as they share their ideas and reveal strengths and weaknesses in their understandings of the STeLLA strategies and science content. Ask questions to probe and challenge participants to elaborate and articulate their ideas more clearly and precisely. If confusion or lack of understanding emerges, point participants back to the STeLLA resources (e.g., the video transcript, the content

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			background document, the STeLLA strategies booklet, and the lesson plans binder).
		Lesson Analysis 1: Reflect 1. Review the lesson context. 2. Identify the strategy. 3. Watch the video clip(s). 4. Analyze the video using the lesson analysis protocol. Make a claim and support with evidence. 5. **Reflect** on the lesson analysis experience: • What did you learn from the experience?	**Display Slide 19.** Lesson Analysis 1: Reflect (5 min) **Note:** Focus only on the Reflect step here. a. **Individuals:** Give participants time to reflect on and write about (if time allows) what they've learned through this analysis process. b. **Whole group:** Ask participants to share what they've learned, starting with the teacher whose video was analyzed. Keep them focused on what they learned about the target strategy, the science content, or the students' challenges in understanding the content. Teachers tend to focus initially on what they did wrong, but this type of reflection is less helpful for the group than focusing on what they learned. **Note:** If time is running short, ask only the teacher whose video was analyzed to share her or his reflection.
		Food Break Now we'll take a 20-minute food break.	**Display Slide 20.** Food Break (20 min) a. Decide when you want to schedule the food break and rearrange the slides accordingly. **Note:** Keep the break to 20 minutes. If necessary, participants can continue eating as you dig into the next lesson analysis.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		Lesson Analysis Continued Next we'll analyze video clip 2 using the same process.	**Display Slide 21.** Lesson Analysis Continued (Less than 1 min) a. **Transition:** "Next we'll continue the same lesson analysis process for video clip 2."
		Lesson Analysis Protocol for Video Clip 2 **1. Identify the Lens and Strategy** *Which STeLLA lens (Student Thinking Lens or Science Content Storyline Lens) and strategy are highlighted in this lesson?* **2. Analyze the Video Using the Focus Question(s)** • *What do we learn about student thinking regarding different temperatures at different times of the year?* • *How does the identified strategy contribute to making student thinking visible or to developing the science content storyline?* • *How does the revealed student thinking relate to the intended storyline?* | Lesson Analysis Step	To Do	Your Analysis
Claim	Turn an observation, question, or judgment into a specific claim that answers the focus question.	
Evidence and Reasoning	Point to a specific place in the video transcript, lesson plan, or student work that supports your claim. Connect your claim and evidence with reasoning based on STeLLA strategies, research on learning, your teaching experience, or scientific principles. Also look for evidence that challenges your claim.	
Alternatives	1. Consider an alternative interpretation or explanation. 2. Consider new questions this might raise. 3. Consider alternative questions, activities, or strategies.	| **3. Reflect and Apply** *Participating teachers reflect on the experience and practice.*	**Display Slide 22.** Lesson Analysis Protocol for Video Clip 2 (Less than 1 min) a. Replace the LAP image on the slide with an image of the LAP participants will be using for this video clip. b. Have participants locate the LAP.
		Lesson Analysis 2: Review Lesson Context Main learning goal: Focus question: Main lesson activity: Review the lesson plan overview page: ◦ What important science ideas should students get from this lesson? ◦ What are the ideal student responses to the focus question? Context of the video clip:	**Display Slide 23.** Lesson Analysis 2: Review Lesson Context (4 min) a. Modify the slide for this video clip. All of the information may not fit on one slide. b. Review the context for the video clip that will be analyzed. c. Remind participants of the main learning goal, the focus question, and the main activity in this lesson. d. **Optional:** Direct participants to look at the overview page of the lesson plan to identify important science ideas and an ideal student response to the focus question. e. Orient participants to where video clip 2 appears in the

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			lesson. f. Ask the teacher whose clip you will be analyzing to add other contextual factors that may be pertinent to the upcoming analysis.

		Lesson Analysis 2: Identify the Strategy
		
		1. Review the lesson context.
		2. **Identify** the strategy:
		   • Add here the strategy that is the focus of the analysis for the video clip. Add page numbers for the strategy from the STeLLA strategies booklet.
		   • Add here the identification question you wrote on the LAP. An example of an identification question is "What clear examples of probe and challenge questions can you identify in this clip?"
		3. Watch the video clip(s).
		4. Analyze the video using the lesson analysis protocol.
		5. Reflect on the lesson analysis experience.
			Display Slide 24. Lesson Analysis 2: Identify the Strategy (20 min)
			
			a. Modify the slide to match your lesson analysis plan for video clip 2.
			
			b. Highlight step 1 on the LAP (Identify the strategy) and emphasize the strategy participants will be focusing on while analyzing the video clip.
			
			c. If the selected strategy for video clip 2 is different from the focal strategy in video clip 1, review the purpose(s) and key features of the new selected strategy. Have participants skim the relevant content in the STeLLA strategies booklet and/or refer to their Z-fold summary charts. Then have participants share the purpose(s) and key features of the selected strategy.
			
			d. Show the video clip.
			
			e. **Individuals:** Have participants study the video transcript to identify clear examples of the selected strategy.
			
			f. **Whole group:** "What examples of the strategy did you find?" Ask challenge questions to make sure participants understand the strategy:
			   • "What makes this an example of strategy X?"
			   • "Can you point to text in the strategies booklet that clarifies why this is an example of strategy X?"
			
			Note 1: Encourage the teacher who was featured in the video clip to listen to and observe this discussion, not to participate.
			
			Note 2: In assessing participants' understandings of the strategy, pay attention to their reasoning. Are they clear about

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			the purpose(s) of the strategy and how it is different from other strategies?
		Lesson Analysis 2: Analyze the Video 1. Review the lesson context. 2. Identify the strategy. 3. Watch the video clip(s). 4. **Analyze** the video using the lesson analysis protocol. Make a claim and support with evidence. • Add analysis questions here. Examples include the following: • What do students seem to understand (or not) about temperature patterns on Earth and the Sun's effect on climate and seasons? • How did the use of the identified strategy make student thinking more visible? 5. Reflect on the lesson analysis experience.	**Display Slide 25.** Lesson Analysis 2: Analyze the Video (30 min) a. Add analysis questions to the slide. b. Direct participants to step 2 of the LAP (Analyze the video). c. **If relevant:** Notice that there are two analysis questions on the slide. You may choose which one you want to address. **Note:** Since the goal is content deepening, the focus is on asking more open-ended, content-related questions that guide the lesson analysis. If the goal was to teach lesson analysis or get through the video clip fast, the questions would focus on more specific subject matter. d. You may want to review the process involved in step 2 of the LAP. Encourage participants to ask clarification questions about what is involved in generating a claim, identifying evidence, providing reasoning, and suggesting alternatives (CERA). e. If time allows, have participants watch the video clip a second time. f. **Individuals:** Give participants time to study the video transcript; generate their claim, evidence, and reasoning; and come up with alternatives (CERA) after watching the video. g. **Whole group:** Have participants share their CERAs with the group, noting similarities and differences that ensure a rich and fruitful dialogue regarding student thinking, the use of the STeLLA strategies, and science content. **Don't forget to allow time for some science-content-deepening work!** **Note 1:** Encourage the teacher who was featured in the video clip to listen to and observe this analysis discussion, not to participate. **Note 2:** Listen to participants as they share their understandings

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			of the STeLLA strategies and science content. Ask questions that will probe and challenge participants' ideas. If confusion emerges, point participants back to the STeLLA resources (i.e., the video transcript, the content background document, the STeLLA strategies booklet, and the lesson plans binder).
		Lesson Analysis 2: Reflect 1. Review the lesson context. 2. Identify the strategy. 3. Watch the video clip(s). 4. Analyze the video using the lesson analysis protocol. Make a claim and support with evidence. 5. **Reflect on the lesson analysis experience:** 　• What did you learn from the experience?	**Display Slide 26.** Lesson Analysis 2: Reflect (5 min) a. **Individuals:** Give participants time to reflect on and write about (if time allows) what they've learned through this analysis process. b. **Whole group:** Ask participants to share what they've learned, starting with the teacher whose video was analyzed. Keep them focused on what they learned about the target strategy, the science content, or the students' challenges in understanding the content, not on what they did wrong. **Note:** If time is running short, ask only the teacher whose video was analyzed to share the reflection.
		Lesson Analysis Continued Next we'll analyze video clip 3.	**Display Slide 27.** Lesson Analysis Continued (Less than 1 min) a. **Transition:** Continue the same analysis process for video clip 3. **Timing note:** If you find you're running out of time, you can do the Identify phase of the third video clip and postpone the Analyze phase until Study Group 5. Alternatively, you could postpone lesson analysis 3 until Study Group 5. We've allowed some catch-up time in Study Group 6 to accommodate this possibility.

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		Lesson Analysis Protocol for Video Clip 3	**Display Slide 28.** Lesson Analysis Protocol for Video Clip 3 (Less than 1 min) a. Replace the LAP image on the slide with an image of the LAP participants will be using for this video clip. b. Have participants locate the LAP.
		Lesson Analysis 3: Review Lesson Context Main learning goal: Focus question: Main lesson activity: Review the lesson plan overview page: • What important science ideas should students get from this lesson? • What are the ideal student responses to the focus question? Context of the video clip:	**Display Slide 29.** Lesson Analysis 3: Review Lesson Context (5 min) a. Modify the slide for this video clip. Remember, you may need more than one slide for all this information. b. Review the context for the video clip that will be analyzed. c. Remind participants of the main learning goal, the focus question, and the main activity in this lesson. d. **Optional:** Direct participants to look at the overview page of the lesson plan to identify important science ideas and an ideal student response to the focus question. e. Orient participants to where video clip 3 appears in the lesson. f. Ask the teacher whose video clip you will be analyzing to add other contextual factors that may be pertinent to the upcoming analysis.

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		Lesson Analysis 3: Identify the Strategy 1. Review the lesson context. 2. **Identify** the strategy: • Add here the strategy that is the focus of the analysis for the video clip. Add page numbers for the strategy from the STeLLA strategies booklet. • Add here the identification question you wrote on the LAP. An example of an identification question is "What clear examples of probe and challenge questions can you identify in this clip?" 3. Watch the video clip(s). 4. Analyze the video using the lesson analysis protocol. 5. Reflect on the lesson analysis experience.	**Display Slide 30.** Lesson Analysis 3: Identify the Strategy (20 min) a. Modify the slide to match your lesson analysis plan for video clip 3. b. Highlight step 1 on the LAP (Identify the strategy) and emphasize the strategy participants will be focusing on during this analysis. c. If the selected strategy is different from the ones analyzed in previous clips, have participants skim the relevant content in the STeLLA strategies booklet and/or refer to their Z-fold summary charts to refresh their thinking about the target strategy. Then have participants share the purpose(s) and key features of the new strategy. d. Show the video clip. e. **Individuals:** Have participants study the video transcript to identify clear examples of the selected strategy. f. **Whole group:** "What examples of the strategy did you find?" Ask challenge questions to make sure participants understand the strategy: • "What makes this an example of strategy X?" • "Can you point to text in the strategies booklet that clarifies why this is an example of strategy X?" **Note 1:** Encourage the teacher who was featured in the video to listen to and observe this discussion, not to participate. **Note 2:** In assessing participants' understandings of the strategy, pay attention to their reasoning. Are they clear about the purpose(s) of the strategy and how it is different from other strategies?

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		Lesson Analysis 3: Analyze the Video
		
		1. Review the lesson context.
		2. Identify the strategy.
		3. Watch the video clip(s).
		4. **Analyze** the video using the lesson analysis protocol. Make a claim and support with evidence.
		 • Add analysis questions here. Examples include the following:
		  • What do students seem to understand (or not) about temperature patterns on Earth and the Sun's effect on climate and seasons?
		  • How did the use of the identified strategy make student thinking more visible?
		5. Reflect on the lesson analysis experience.
			Display Slide 31. Lesson Analysis 3: Analyze the Video (25 min)
			
			a. Add analysis questions to the slide.
			
			b. Direct participants to step 2 of the LAP (Analyze the video).
			
			c. **If relevant:** Notice that there are two analysis questions on the slide. You may choose which one you want to address.
			
			  Note: Since the goal is content deepening, the focus is on asking more open-ended, content-related questions that guide the lesson analysis. If the goal was to teach lesson analysis or get through the video clip fast, the questions would focus on more specific subject matter.
			
			d. If time allows, have participants watch the video clip again.
			
			e. **Individuals:** Give participants time to study the video transcript; generate their claim, evidence, and reasoning; and come up with alternatives (CERA) after watching the video.
			
			f. **Whole group:** Have participants share their CERAs, noting similarities and differences that ensure a rich and fruitful dialogue regarding student thinking, the use of the STeLLA strategies, and science content.
			
			Note 1: Encourage the teacher who was featured in the video clip to listen to and observe this analysis discussion, not to participate.
			
			Note 2: Continue listening to participants as they share their understandings of the STeLLA strategies and science content. Ask probe questions that will encourage participants to share their ideas more clearly and precisely. When confusion arises, point them back to the STeLLA resources (e.g., the video transcript, the content background document, the STeLLA strategies booklet, and the lesson plans binder).

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		Lesson Analysis 3: Reflect 1. Review the lesson context. 2. Identify the strategy. 3. Watch the video clip(s). 4. Analyze the video using the lesson analysis protocol. Make a claim and support with evidence. 5. **Reflect** on the lesson analysis experience: • What did you learn from the experience?	**Display Slide 32.** Lesson Analysis 3: Reflect (5 min) a. **Individuals:** Give participants time to reflect on and write about (if time allows) what they've learned through this analysis process. b. **Whole group:** Ask participants to share what they've learned, starting with the teacher whose video was analyzed. Keep them focused on what they learned about the target strategy, the science content, or the students' challenges in understanding the content, not on what they did wrong. **Note:** If time is running short, ask only the teacher whose video was analyzed to share the reflection.
15 minutes **Closing and Reflections** Slides 33–38	**Purpose** • To close the session with a discussion of today's focus questions, practical details, and reflections on today's learning **Content** • Lesson video analysis supports participants' learning about the STeLLA framework and strategies, about science content, and about student thinking and learning.	**Learning from One Another** **Questions for teachers who have taught the lessons:** • While teaching the lessons, what aha moments did you have about the content? About the strategies? • What would you do differently the next time you teach the lessons? • What specific suggestions would you give round-2 teachers? **Questions for teachers who haven't taught the lessons yet:** • What questions about teaching the lessons would you like to have answered?	**Display Slide 33.** Learning from One Another (5 min) a. **Individuals:** Have participants think about the questions on the slide and write down their responses. b. **Whole group:** 1. Ask participants who have taught the lessons to share key ideas. 2. Ask participants who have not yet taught the lessons to share their thoughts and any questions they may have.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		Today's Focus Questions • What are the key science ideas we as teachers need to understand in order to teach content area 2 well? • What can we learn about the STeLLA strategies, science content, and student thinking by analyzing our own classroom videos?	**Display Slide 34.** Today's Focus Questions (3 min) a. **Individuals (1 min):** Ask participants to silently think about the focus questions and be ready to share their ideas. b. **Whole group:** Invite participants to share their thoughts with the group (round-robin style).
		Reminder: Student Pre- and Posttests • Make sure to give students the pretest **before** you start teaching the lessons. • Give students the posttest **after** teaching the lesson sequence. • **Save all of these tests!** We'll examine them to analyze changes in student understanding from pre to post. This will be the focus of Study Group 6.	**Display Slide 35.** Reminder: Student Pre- and Posttests (1 min) a. Remind participants that they need to give their students the pre- and posttests **before** and **after** teaching the lesson sequence. **Note: It's very important that participants keep these tests**, because they'll be analyzing changes in student understanding from pre- to posttest during Study Group 6.
		Next Study-Group Meeting Date: Time: Location: Bring your STeLLA strategies booklet, Summer Institute binder, and lesson plans binder. **Don't forget** to give the PD pre/posttests to your students before and after teaching the lessons! And make sure to **save the tests** for use in Study Group 6.	**Display Slide 36.** Next Study-Group Meeting (1 min) a. Modify the details on the slide. b. Inform participants of the date, time, and location of the next meeting. **Note:** Remind participants to give their students the pretests/posttests before and after teaching the lessons, and to save them for use in Study Group 6.

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		Reflection Questions • What did you learn today, and how do you think it will influence your teaching of future lessons? Please be specific. • What are you thinking now about sharing your own classroom videos with your study-group colleagues?	**Display Slide 37.** Reflection Questions (5 min) a. **Individuals:** Direct participants to the reflection sheet and ask them to think about the questions. b. **Pairs:** Have participants share their responses with a partner before writing them on the handout.
		Thank You! Thank you for your participation today!	**Display Slide 38.** Thank You! (Less than 1 min) a. Before dismissing participants, thank them for their participation in the study group today.