

RESPeCT Study-Group Sessions

Study-Group Session 2





Focus Question

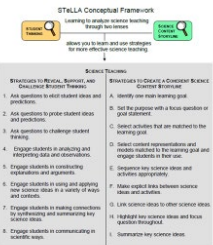
What can we learn about the STeLLA strategies, science content, and student thinking by analyzing our own classroom videos?

Overarching Learning Goals for All RESPeCT Study-Group Sessions

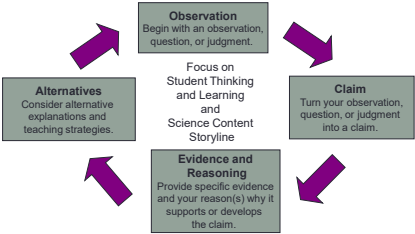
- Deepen teachers’ science-content knowledge and knowledge of effective science teaching.
- Develop teachers’ analytical skills to improve lesson-plan development and the teaching of science.
- Support teachers in the practical use of new knowledge and analytical skills in their own classrooms.
- Improve students’ science learning.
- Achieve sustainability by eventually reaching all K–6 teachers.

Preparation	Materials	Videos
<p>Ahead of Time</p> <ul style="list-style-type: none"> • 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. Be sure to address any science-content confusion you notice while reviewing the lesson videos. • Don’t focus all of your video clips on the elicit, probe, and challenge questioning strategies. Branch out and examine other strategies across the study groups. • 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 1 science ideas to explain a new situation. Consult with CPP faculty if you need suggestions. • Prepare charts (agenda, focus question, learning goals) and make copies of handouts. <p>On Meeting Day</p> <ul style="list-style-type: none"> • Check audiovisual equipment and have video clips ready to go. • Arrange furniture and food. • Put up posters and charts. 	<p>Posters and Charts</p> <ul style="list-style-type: none"> • STeLLA Framework and Strategies poster • Agenda (chart) • Focus Question(chart) • Learning Goals for Today (chart) • Norms for Working Together (chart) • Parking Lot poster <p>Handouts</p> <ul style="list-style-type: none"> • Transcript for each video clip • Lesson analysis protocol (LAP) for each video clip • Features analysis chart (FAC) for one PD test question. Each participant receives two copies: one for the pretest, and one for the posttest • Sample of a completed features analysis chart (FAC)—the Sun’s effect on climate, 5th–6th grades • Reflection sheet <p>Supplies</p> <ul style="list-style-type: none"> • Science-lesson materials kit (content area 1) • Chart paper and markers • Food <p>Resources</p> <ul style="list-style-type: none"> • STeLLA strategies booklet • RESPeCT PD program binder • RESPeCT lesson plans binder • Content background document (content area 1) 	<ul style="list-style-type: none"> • Video clips of classroom teaching selected for analysis

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
5 min Setting the Stage for the Study-Group Session Slides 1–7	<p>Purpose</p> <ul style="list-style-type: none"> To help participants situate themselves within the study-group setting To review the main learning goals for today, the STeLLA conceptual framework, and the process that will guide the lesson analysis To reconnect participants with the work they completed during the Summer Institute and strategies they may or may not have used early in the school year <p>Content</p> <ul style="list-style-type: none"> The substance of video-based lesson analysis in the RESPeCT PD program focuses on using the STeLLA conceptual framework and planning and teaching strategies to examine student thinking and learning. The process for analyzing video clips in the RESPeCT program incorporates the STeLLA viewing and analysis basics and the lesson analysis protocol. <p>What Participants Do</p> <ul style="list-style-type: none"> Review today's agenda and focus question, as well as the lesson analysis process and protocol and the viewing and analysis basics that will guide 	<div style="border: 1px solid gray; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center;">RESPeCT STUDY-GROUP SESSION 2</p> <hr style="border: 0.5px solid red;"/> <p>Date:</p> <div style="display: flex; justify-content: space-around; align-items: center;">     </div> </div> <div style="border: 1px solid gray; padding: 5px; margin-bottom: 5px;"> <p>Agenda</p> <ul style="list-style-type: none"> Opening: setting the stage (7 min) Lesson analysis (3 hours) Food break (20 min) Process for analyzing student learning (20 min) Science content deepening: use and apply (10 min) Closing and reflections (15 min) </div> <div style="border: 1px solid gray; padding: 5px;"> <p>Today's Focus Question</p> <p>What can we learn about the STeLLA strategies, science content, and student thinking by analyzing our own classroom videos?</p> </div>	<p>Display Slide 1. RESPeCT Study-Group Session 2 (Less than 1 min)</p> <ol style="list-style-type: none"> Insert the correct date on the slide. Greet participants as they enter the room. <p>Display Slide 2. Agenda (2 min)</p> <ol style="list-style-type: none"> Share the agenda with the group. Remind participants that the majority of this study-group session will be devoted to lesson analysis. Indicate that the process for analyzing student learning will focus on preparing participants to analyze the student pre- and posttests in Study Group 3. This will involve some homework. Encourage participants to ask questions concerning the agenda. <p>Display Slide 3. Today's Focus Question (Less than 1 min)</p> <ol style="list-style-type: none"> Share today's focus question.

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	the lesson analysis work.	<p>Learning Goals for Today</p> <p>Today's work will deepen your understandings of the following:</p> <ul style="list-style-type: none"> • 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. <p>It will also strengthen your ability to analyze student thinking, the STeLLA strategies, and science content in science teaching.</p>	<p>Display Slide 4. Learning Goals for Today (Less than 1 min)</p> <ol style="list-style-type: none"> Modify the slide to reflect the specific STeLLA strategies and science-content ideas you've identified for today's work. Share the learning goals with the group. 																				
		<p>STeLLA Strategies for Effective Science Teaching: The Student Thinking and Science Content Storyline Lenses</p>  <p>STeLLA Conceptual Framework</p> <p>Learning to analyze student thinking through the lenses of the Student Thinking and Science Content lenses allows you to learn and use strategies for more effective science teaching.</p> <p>STeLLA Strategies</p> <table border="1"> <thead> <tr> <th>Strategies to Monitor, Reflect, and Document Student Thinking</th> <th>Strategies to Create a Coherent Science Content Storyline</th> </tr> </thead> <tbody> <tr> <td>1. Ask questions to elicit student ideas and preferences.</td> <td>A. Identify the main learning goal.</td> </tr> <tr> <td>2. Ask questions to probe student ideas and positions.</td> <td>B. Set the purpose with a focus question or goal statement.</td> </tr> <tr> <td>3. Ask questions to challenge student thinking.</td> <td>C. Select activities that are matched to the learning goal.</td> </tr> <tr> <td>4. Engage students in collecting and recording data and observations.</td> <td>D. Select content representations and models matched to the learning goal and engage students in their use.</td> </tr> <tr> <td>5. Engage students in constructing explanations and arguments.</td> <td>E. Sequence key science ideas and address dependencies.</td> </tr> <tr> <td>6. Engage students in using and applying core science ideas in a variety of ways and contexts.</td> <td>F. Make explicit links between science ideas and activities.</td> </tr> <tr> <td>7. Engage students in making connections to understanding and maintaining key science ideas.</td> <td>G. Link student ideas to other science ideas.</td> </tr> <tr> <td>8. Engage students in communicating in scientific ways.</td> <td>H. Highlight key science ideas and focus learning throughout.</td> </tr> <tr> <td></td> <td>I. Summarize key science ideas.</td> </tr> </tbody> </table>	Strategies to Monitor, Reflect, and Document Student Thinking	Strategies to Create a Coherent Science Content Storyline	1. Ask questions to elicit student ideas and preferences.	A. Identify the main learning goal.	2. Ask questions to probe student ideas and positions.	B. Set the purpose with a focus question or goal statement.	3. Ask questions to challenge student thinking.	C. Select activities that are matched to the learning goal.	4. Engage students in collecting and recording data and observations.	D. Select content representations and models matched to the learning goal and engage students in their use.	5. Engage students in constructing explanations and arguments.	E. Sequence key science ideas and address dependencies.	6. Engage students in using and applying core science ideas in a variety of ways and contexts.	F. Make explicit links between science ideas and activities.	7. Engage students in making connections to understanding and maintaining key science ideas.	G. Link student ideas to other science ideas.	8. Engage students in communicating in scientific ways.	H. Highlight key science ideas and focus learning throughout.		I. Summarize key science ideas.	<p>Display Slide 5. The STeLLA Conceptual Framework (Less than 1 min)</p> <ol style="list-style-type: none"> “The focus of our lesson analysis work is on the STeLLA conceptual framework, including the two lenses—the Student Thinking Lens and the Science Content Storyline Lens—and the teaching strategies that support each of those lenses.”
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		<p>Lesson Analysis: Viewing Basics</p> <ul style="list-style-type: none"> • Viewing basic 1: Look past the trivial, or little things, that bug you. • Viewing basic 2: Avoid the “This doesn’t look like my classroom!” trap. • Viewing basic 3: Avoid making snap judgments about the teaching or learning in the classroom you’re viewing. 	<p>Display Slide 6. Lesson Analysis: Viewing Basics (Less than 1 min)</p> <p>a. “To prepare for the first video analysis, let’s review the viewing basics that will guide our work.”</p>
		<p>Lesson Analysis Basics</p> <ul style="list-style-type: none"> • Analysis basic 1: Focus on student thinking and the science content storyline. • Analysis basic 2: Look for evidence to support any claims. • Analysis basic 3: Look more than once (video and transcript). • Analysis basic 4: Consider alternative explanations and teaching strategies. 	<p>Display Slide 7. Lesson: Analysis Basics (Less than 1 min)</p> <p>a. Remind participants that these analysis basics will also guide their work as they construct claims, evidence, reasoning, and alternatives.</p>
<p>3 hours, 20 min (Includes 20-min food break)</p> <p>Lesson Analysis</p> <p>Slides 8–28</p>	<p>Purpose</p> <ul style="list-style-type: none"> • To deepen participants’ understandings of the selected STeLLA strategies • To deepen participants’ science-content understandings • To deepen participants’ ability to analyze students’ science thinking <p>Content</p> <ul style="list-style-type: none"> • The STeLLA video-based lesson analysis process includes identifying the selected 	<p>Lesson Analysis, Video Clip 1</p> <p>Now we’ll begin the lesson analysis process for video clip 1.</p>	<p>Display Slide 8. Lesson Analysis, Video Clip 1 (Less than 1 min)</p> <p>a. “Now we’ll begin the lesson analysis process for video clip 1.”</p> <p>Timing note: We’ve allotted approximately 60 minutes for each video analysis. If you finished three video clips in Study Group 1, you can carry over part or all of one analysis to Study Group 3. If you’re carrying over one analysis from Study Group 1, or if you have seven participants in your group, it’s essential that you finish three video analyses today. Watch your timing!</p>

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	<p>strategies (or missed opportunities) in a 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.</p> <ul style="list-style-type: none"> 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. <p>What Participants Do</p> <ul style="list-style-type: none"> Use the STeLLA lesson analysis process with the accompanying lesson analysis protocol (LAP) to support their analyses of classroom science teaching and learning in three video clips (from three different lessons). <p>Videos/Transcripts</p> <ul style="list-style-type: none"> Three video clips to be analyzed during this session A transcript and LAP for each video clip 	<p>Lesson Analysis Process</p> <ol style="list-style-type: none"> Review the lesson context: <ul style="list-style-type: none"> What is the ideal student response to the focus question? How is the clip situated in the content storyline? Identify and discuss the strategy that is the focus of analysis for each clip. Watch video clip(s). Analyze the video using the lesson analysis protocol. Reflect on the lesson analysis experience: <ul style="list-style-type: none"> As a reviewer As a teacher in the clip 	<p>Display Slide 9. Lesson Analysis Process (Less than 1 min)</p> <ol style="list-style-type: none"> Remind participants of the lesson analysis process they'll be using when they view the video clips. Let participants know that your main goal as a group is to be both supportive and challenging during the lesson analysis work. (Point to the chart of norms at the heart of STeLLA.) Emphasize that the focus of each analysis is on student thinking and a specific STeLLA strategy. 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 ways of thinking.
		<p>The CERA Framework</p> 	<p>Display Slide 10. The CERA Framework (Less than 1 min)</p> <ol style="list-style-type: none"> “To guide our video-analysis work, we’ll use the CERA framework (claim, evidence, reasoning, alternatives) represented on the slide.” “Many of you may be nervous about sharing videos of your classroom teaching and may feel as if the focus of the lesson analysis work will be on you.” “But according to this visual, what is the focus of our lesson analyses?” [Answer: The two STeLLA lenses—the Student Thinking Lens and the Science Content Storyline Lens.] 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

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		<p style="text-align: center;">Lesson Analysis Protocol for Video Clip 1</p> <p>1. Identify the Lens and Strategy Which STeLLA lens (Student Thinking Lens or Science Content Storyline Lens) and strategy are highlighted in this lesson?</p> <p>2. Analyze the Video Using the Focus Question(s)</p> <ul style="list-style-type: none"> • 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? <table border="1" data-bbox="758 337 1136 505"> <thead> <tr> <th>Lesson Analysis Step</th> <th>To Do</th> <th>Your Analysis</th> </tr> </thead> <tbody> <tr> <td>Claim</td> <td>Turn an observation, question, or judgment into a specific claim that answers the focus question.</td> <td></td> </tr> <tr> <td>Evidence and Reasoning</td> <td>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.</td> <td></td> </tr> <tr> <td>Alternatives</td> <td> <ol style="list-style-type: none"> 1. Consider an alternative interpretation or explanation. 2. Consider new questions this might raise. 3. Consider alternative questions, activities, or strategies. </td> <td></td> </tr> </tbody> </table> <p>3. Reflect and Apply Participating teachers reflect on the experience and practice.</p>	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	<ol style="list-style-type: none"> 1. Consider an alternative interpretation or explanation. 2. Consider new questions this might raise. 3. Consider alternative questions, activities, or strategies. 		<p>arguments (STeLLA strategy 5).</p> <p>Display Slide 11. Lesson Analysis Protocol for Video Clip 1 (2 min)</p> <ol style="list-style-type: none"> Replace the LAP image on the slide with an image of the first LAP you will be using for this session. Have participants locate the first LAP they will be using for this video clip. Ask: “What questions do you have about this protocol and the lesson analysis process?” Emphasize: “Reasoning is often the most difficult step of the analysis. Your reasoning should address why the claim and evidence are tied together, and why the claim is significant. For example, what does this claim reveal about the importance of the strategy or about student difficulties with this science content? Why is it important to notice this in the video clip? What does it tell us about science teaching or science learning?” In their first efforts to make claim, evidence, and reasoning statements, participants might use these sentence starters: <ul style="list-style-type: none"> • “My claim is ...” • “My evidence is ... because ...” • “This is important because ...” Ask: “What different types of alternatives can you offer?”
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		<p>Lesson Analysis 1: Review Lesson Context</p> <p>Main learning goal:</p> <p>Focus question:</p> <p>Main lesson activity:</p> <p>Review the lesson plan overview page:</p> <ul style="list-style-type: none"> • What important science ideas should students get from this lesson? • What are the ideal student responses to the focus question? <p>Context of the video clip:</p>	<p>Display Slide 12. Lesson Analysis 1: Review Lesson Context (4 min)</p> <ol style="list-style-type: none"> 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 the featured lesson 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.
		<p>Lesson Analysis 1: Identify the Strategy</p> <ol style="list-style-type: none"> 1. Review the lesson context. 2. Identify the strategy: <ul style="list-style-type: none"> • 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 lesson analysis protocol. 5. Reflect on the lesson analysis experience. 	<p>Display Slide 13. Lesson Analysis 1: Identify the Strategy (20 min)</p> <ol style="list-style-type: none"> a. Modify the slide to match your lesson analysis plan for video clip 1. b. If participants haven't done so, have them locate the LAP for video clip 1. c. Highlight step 1 (Identify the strategy) on the LAP and emphasize the strategy participants will be focusing on during this first analysis. <p>Note: You may want to remind participants that step 1 on the LAP is step 2 of the lesson analysis process on the</p>

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			<p>slide.</p> <p>d. Review the purpose(s) and key features of the 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.</p> <p>e. Show the video clip.</p> <p>f. Individuals: Have participants study the video transcript to identify clear examples of the selected strategy.</p> <p>g. Whole group: “What examples of the strategy did you find in the video clip?” Ask challenge questions to make sure participants understand the strategy:</p> <ul style="list-style-type: none"> • “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?” <p>Note 1: Encourage the teacher who is featured in the video to listen to and observe this discussion, not to participate.</p> <p>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?</p>
		<p style="text-align: center;">Lesson Analysis 1: Analyze the Video</p> <ol style="list-style-type: none"> 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. <ul style="list-style-type: none"> • Add analysis questions here. Examples include the following: <ul style="list-style-type: none"> • 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. 	<p>Display Slide 14. Lesson Analysis 1: Analyze the Video (30 min)</p> <p>a. Add analysis questions to the slide.</p> <p>b. Direct participants to step 2 of the LAP (Analyze the video).</p> <p>Note: You may to remind participants that step 2 on the LAP is step 4 of the lesson analysis process shown on the slide.</p> <p>c. If relevant: Notice that there are two analysis questions on the slide. You may choose one you want to address.</p> <p>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 were to teach lesson analysis or get through the video clip fast, the questions would focus</p>

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			<p>on more specific subject matter.</p> <ul style="list-style-type: none"> d. You may want to review the process involved in step 2 of the LAP, noting that participants will be making a claim that answers the focus question; supporting the claim with evidence from the transcript (including the time stamp); connecting the claim and evidence with reasoning based on the STeLLA strategies, science content, and research findings on learning; and then suggesting alternative interpretations, questions, or strategies. e. If time allows, have participants watch the video clip a second time. f. Individuals: Give participants time to study the video transcript; generate claims, 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. <p>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 all lesson analyses.</p> <p>Note 2: Be sure to listen 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. If confusion or lack of understanding emerges, 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).</p>

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		<p>Lesson Analysis 1: Reflect</p> <ol style="list-style-type: none"> 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: <ul style="list-style-type: none"> • What did you learn from the experience? 	<p>Display Slide 15. Lesson Analysis 1: Reflect (5 min)</p> <ol style="list-style-type: none"> 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. Video-recorded 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. <p>Note: If time is running short, ask only the teacher whose video was analyzed to share her or his reflection.</p>
		<p>Food Break</p> <p>Now we'll take a 20-minute food break.</p>	<p>Display Slide 16. Food Break (20 min)</p> <ol style="list-style-type: none"> a. Decide whether you want a food break here or after the analysis of video clip 2.
		<p>Lesson Analysis Continued</p> <p>Next we'll analyze video clip 2 using the same process.</p>	<p>Display Slide 17. Lesson Analysis Continued (Less than 1 min)</p> <ol style="list-style-type: none"> a. Transition: "Next we'll continue the same lesson analysis process for video clip 2."

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		<p style="text-align: center;">Lesson Analysis Protocol for Video Clip 2</p> <div style="border: 1px solid black; padding: 5px;"> <p>1. Identify the Lens and Strategy Which ST+LLA lens (Student Thinking Lens or Science Content Storyline Lens) and strategy are highlighted in this lesson?</p> <p>2. Analyze the Video Using the Focus Question(s)</p> <ul style="list-style-type: none"> • 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? <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Lesson Analysis Step</th> <th style="text-align: left;">To Do</th> <th style="text-align: left;">Your Analysis</th> </tr> </thead> <tbody> <tr> <td>Claim</td> <td>Turn an observation, question, or judgment into a specific claim that answers the focus question.</td> <td></td> </tr> <tr> <td>Evidence and Reasoning</td> <td>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 ST+LLA strategies, research on learning, your teaching experience, or scientific principles. Also look for evidence that challenges your claim.</td> <td></td> </tr> <tr> <td>Alternatives</td> <td>1. Consider an alternative interpretation or explanation. 2. Consider new questions this might raise. 3. Consider alternative questions, activities, or strategies.</td> <td></td> </tr> </tbody> </table> <p>3. Reflect and Apply Participating teachers reflect on the experience and practice.</p> </div>	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 ST+LLA 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.		<p>Display Slide 18. Lesson Analysis Protocol for Video Clip 2 (Less than 1 min)</p> <ol style="list-style-type: none"> 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 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 ST+LLA 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.														
		<p style="text-align: center;">Lesson Analysis 2: Review Lesson Context</p> <p>Main learning goal:</p> <p>Focus question:</p> <p>Main lesson activity:</p> <p>Review the lesson plan overview page:</p> <ul style="list-style-type: none"> • What important science ideas should students get from this lesson? • What are the ideal student responses to the focus question? <p>Context of the video clip:</p>	<p>Display Slide 19. Lesson Analysis 2: Review Lesson Context. (4 min)</p> <ol style="list-style-type: none"> a. Modify the slide for this video clip. Remember, you may need more than one slide for all this information. b. Review the lesson context for video clip 2, the main learning goal, the focus question, and the main lesson activity. c. Optional: Direct participants to the overview page of the lesson plan to identify important science ideas and an ideal student response to the focus question. d. Orient participants to where video clip 2 appears in the lesson. e. 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
		<p>Lesson Analysis 2: Identify the Strategy</p> <ol style="list-style-type: none"> Review the lesson context. Identify the strategy: <ul style="list-style-type: none"> 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?” Watch the video clip(s). Analyze the video using the lesson analysis protocol. Reflect on the lesson analysis experience. 	<p>Display Slide 20. Lesson Analysis 2: Identify the Strategy (20 min)</p> <ol style="list-style-type: none"> Modify the slide to match your lesson analysis plan for video clip 2. Make sure participants have the LAP for video clip 2. Highlight step 1 on the LAP (Identify the strategy) and emphasize the strategy participants will be focusing on while analyzing the video clip. <p>Note: You may want to remind participants that step 1 on the LAP is step 2 of the lesson analysis process on the slide.</p> 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 newly selected strategy. Have participants skim the relevant content in the STeLLA strategies booklet and/or refer to their Z-fold summary charts. Then have them share the purpose(s) and key features of the selected strategy. Show the video clip. Individuals: Have participants study the video transcript to identify clear examples of the selected strategy. Whole group: “What examples of the strategy did you find in the video clip?” Ask challenge questions to make sure participants understand the strategy: <ul style="list-style-type: none"> “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?” <p>Note 1: Encourage the teacher who is featured in the video to listen to and observe this discussion, not to participate.</p> <p>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?</p>

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		<p>Lesson Analysis 2: Analyze the Video</p> <ol style="list-style-type: none"> 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. <ul style="list-style-type: none"> • Add analysis questions here. Examples include the following: <ul style="list-style-type: none"> • 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. 	<p>Display Slide 21. Lesson Analysis 2: Analyze the Video (30 min)</p> <ol style="list-style-type: none"> a. Add analysis questions to the slide. b. Direct participants to step 2 of the LAP (Analyze the video). <p>Note: You may want to remind participants that step 2 on the LAP is step 4 of the lesson analysis process on the slide.</p> c. If relevant: Notice that there are two analysis questions on the slide. You may choose one you want to address. <p>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 were to teach lesson analysis or get through the video clip fast, the questions would focus on more specific subject matter.</p> d. If time allows, have participants watch the video clip a second time. e. Individuals: Give participants time to study the video transcript; generate claims, 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. Don't forget to allow time for some science-content-deepening work! <p>Note 1: By this time, you should no longer be using the round-robin group-discussion format. Instead, have one participant start the discussion by sharing her or his CERA. Then let participants respond with questions or connections. You can join in to ask probe and challenge questions as well. If discussion wanes, encourage others to share claims that are similar. Then ask for claims that are different.</p> <p>Note 2: Again, encourage the teacher who was featured in the video to listen to and observe this analysis discussion, not to participate.</p> <p>Note 3: Listen to participants as they share their understandings of the STeLLA strategies and science content. Ask questions to</p>

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			<p>both probe and challenge participants' ideas. If confusion emerges, 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).</p>
		<p>Lesson Analysis 2: Reflect</p> <ol style="list-style-type: none"> 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: <ul style="list-style-type: none"> • What did you learn from the experience? 	<p>Display Slide 22. Lesson Analysis 2: Reflect (5 min)</p> <ol style="list-style-type: none"> a. Individuals: Give participants time to reflect on and write about (if time allows) what they've learned through the 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. <p>Note: If time is running short, ask only the teacher whose video was analyzed to share her or his reflection.</p>
		<p>Lesson Analysis Continued</p> <p>Next we'll analyze video clip 3.</p>	<p>Display Slide 23. Lesson Analysis Continued (Less than 1 min)</p> <ol style="list-style-type: none"> a. Transition: "Next we'll continue the same lesson analysis process for video clip 3." <p>Timing note: If you find you're running out of time, and you completed three video analyses in Study Group 1, you can do the Identify phase of video clip 3 and postpone the Analyze phase until Study Group 3. Alternatively, you could postpone lesson analysis 3 entirely until Study Group 3. We've allowed some catch-up time in Study Group 3 to accommodate this possibility.</p>

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process												
		<p style="text-align: center;">Lesson Analysis Protocol for Video Clip 3</p> <div style="border: 1px solid black; padding: 5px;"> <p>1. Identify the Lens and Strategy Which ST+L+LA lens (Student Thinking Lens or Science Context: Storyline Lens) and strategy are highlighted in this lesson?</p> <p>2. Analyze the Video Using the Focus Question(s)</p> <ul style="list-style-type: none"> • 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? <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Lesson Analysis Step</th> <th style="text-align: left;">To Do</th> <th style="text-align: left;">Your Analysis</th> </tr> </thead> <tbody> <tr> <td>Claim</td> <td>Turn an observation, question, or judgment into a specific claim that answers the focus question.</td> <td></td> </tr> <tr> <td>Evidence and Reasoning</td> <td>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 ST+L+LA strategies, research on learning, your teaching experience, or scientific principles. Also look for evidence that challenges your claim.</td> <td></td> </tr> <tr> <td>Alternatives</td> <td> <ol style="list-style-type: none"> 1. Consider an alternative interpretation or explanation. 2. Consider new questions this might raise. 3. Consider alternative questions, activities, or strategies. </td> <td></td> </tr> </tbody> </table> <p>3. Reflect and Apply Participating teachers reflect on the experience and practice.</p> </div>	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 ST+L+LA strategies, research on learning, your teaching experience, or scientific principles. Also look for evidence that challenges your claim.		Alternatives	<ol style="list-style-type: none"> 1. Consider an alternative interpretation or explanation. 2. Consider new questions this might raise. 3. Consider alternative questions, activities, or strategies. 		<p>Display Slide 24. Lesson Analysis Protocol for Video Clip 3 (Less than 1 min)</p> <ol style="list-style-type: none"> 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 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 ST+L+LA strategies, research on learning, your teaching experience, or scientific principles. Also look for evidence that challenges your claim.														
Alternatives	<ol style="list-style-type: none"> 1. Consider an alternative interpretation or explanation. 2. Consider new questions this might raise. 3. Consider alternative questions, activities, or strategies. 														
		<p style="text-align: center;">Lesson Analysis 3: Review Lesson Context</p> <p>Main learning goal:</p> <p>Focus question:</p> <p>Main lesson activity:</p> <p>Review the lesson plan overview page:</p> <ul style="list-style-type: none"> • What important science ideas should students get from this lesson? • What are the ideal student responses to the focus question? <p>Context of the video clip:</p>	<p>Display Slide 25. Lesson Analysis 3: Review Lesson Context (4 min)</p> <ol style="list-style-type: none"> a. Modify the slide for this video clip. Remember, you may need more than one slide for all this information. b. Review the lesson context for video clip 3, the main learning goal, the focus question, and the main lesson activity. c. Optional: If helpful, have participants refer to the overview page of the lesson plan to identify important science ideas and review an ideal student response to the focus question. d. Orient participants to where video clip 3 appears in the lesson. e. 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
		<p>Lesson Analysis 3: Identify the Strategy</p> <ol style="list-style-type: none"> 1. Review the lesson context. 2. Identify the strategy: <ul style="list-style-type: none"> • 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. 	<p>Display Slide 26. Lesson Analysis 3: Identify the Strategy (20 min)</p> <ol style="list-style-type: none"> a. Modify the slide to match your lesson analysis plan for video clip 3. b. Have participants locate the LAP for video clip 3. c. Highlight step 1 on the LAP (Identify the strategy) and emphasize the strategy participants will be focusing on during this analysis. <p>Note: You may want to remind participants that step 1 on the LAP is step 2 of the lesson analysis process on the slide.</p> d. If the selected strategy for video clip 3 is different from the ones analyzed in previous clips, review the purpose(s) and key features of the selected strategy. Direct participants to skim the relevant content in the STeLLA strategies booklet and/or refer to their Z-fold summary charts to refresh their memories. Then have them share the purpose(s) and key features of the selected strategy. e. Watch the video clip. f. Individuals: Have participants study the video transcript to identify clear examples of the selected strategy. g. Whole group: “What examples of the strategy did you find in the video clip?” Ask challenge questions to make sure participants understand the strategy: <ul style="list-style-type: none"> • “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?” <p>Note 1: Encourage the teacher who is featured in the video to listen to and observe this discussion, not to participate.</p> <p>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?</p>

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		<p>Lesson Analysis 3: Analyze the Video</p> <ol style="list-style-type: none"> 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. <ul style="list-style-type: none"> • Add analysis questions here. Examples include the following: <ul style="list-style-type: none"> • 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. 	<p>Display Slide 27. Lesson Analysis 3: Analyze the Video (30 min)</p> <ol style="list-style-type: none"> a. Add analysis questions to the slide. b. Point participants to step 2 of the LAP (Analyze the video). <p>Note: You may want to remind participants that step 2 on the LAP is step 4 of the lesson analysis process on the slide.</p> c. If relevant: Notice that there are two analysis questions on the slide. You may choose one you want to address. <p>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 were to teach lesson analysis or get through the video clip fast, the questions would focus on more specific subject matter.</p> d. If time allows, have participants watch the video clip a second time. e. Individuals: Give participants time to study the video transcript; generate claims, 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 provide for a rich and fruitful dialogue regarding student thinking, the use of the STeLLA strategies, and science content. <p>Note 1: Encourage the teacher who was featured in the video clip to listen to and observe this analysis discussion, not to participate.</p> <p>Note 2: Continue listening to participants as they share their ideas and reveal strengths and weaknesses in their understandings of the STeLLA strategies and the science content. Ask questions to probe and challenge participants to elaborate and articulate 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).</p>

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		<p>Lesson Analysis 3: Reflect</p> <ol style="list-style-type: none"> 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: <ul style="list-style-type: none"> • What did you learn from the experience? 	<p>Display Slide 28. Lesson Analysis 3: Reflect (5 min)</p> <ol style="list-style-type: none"> a. Individuals: Give participants time to reflect on and write about (if time allows) what they've learned through the 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. <p>Note: If time is running short, ask only the teacher whose video was analyzed to share her or his reflection.</p>
<p>20 min</p> <p>Process for Analyzing Student Learning</p> <p>Slides 29–33</p>	<p>Purpose</p> <ul style="list-style-type: none"> • To introduce participants to the features analysis chart (FAC) that will be used to identify patterns, strengths, and weaknesses in student learning revealed in the pre- and posttests <p>Content</p> <ul style="list-style-type: none"> • The features analysis chart (FAC) supports analysis of students' responses to open-ended assessment items by identifying which specific 	<p>How Will We Know They “Got It”?</p> <ul style="list-style-type: none"> • Pre- and posttests are designed to reveal <ul style="list-style-type: none"> • how student thinking changes from pre to post; • what students understand, not just what they can memorize; • how students are using their new knowledge to explain new situations; and • misconceptions that students have both before and after the lessons. • Analytical tool: features analysis chart (FAC) 	<p>Display Slide 29. How Will We Know They “Got It”? (2 min)</p> <ol style="list-style-type: none"> a. Have participants locate the pre- and posttest assessments in their lesson plans binders (in the resources section). b. “As part of our work in Study Group 3, we’ll analyze these tests to understand the impact of the lessons on student learning. What did students get? What did they miss?” c. “This pre-post test is designed to elicit open-ended responses from students that will help us understand their thinking.” (Read the four bullet points on the slide.) d. “Today we’ll examine a tool that will help us analyze student responses to question X on the test.”

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
	<p>science ideas and misconceptions are present in each student's response.</p> <ul style="list-style-type: none"> The completed FAC for all students in the class provides a quick snapshot that helps teachers identify which ideas most students are grasping and which ideas remain problematic. Comparing pre- and posttest FACs enables teachers to identify areas of growth and areas needing further attention. <p>What Participants Do</p> <ul style="list-style-type: none"> Study a blank features analysis chart they'll use to analyze one question on their students' pre- and posttests. Practice interpreting a completed sample features analysis chart. 	<p>Overview of the Features Analysis Chart (FAC)</p> <ol style="list-style-type: none"> Read assessment item X from our pre- and posttests. Review the FAC for this item and complete these tasks: <ul style="list-style-type: none"> Find the ideal student response. Find the features of an accurate response. Find the features consistent with common misconceptions. What do you think the numbers 1–30 represent? <p>Practice Using a Sample Features Analysis Chart to Analyze Student Learning</p> <p>Look at the completed sample features analysis chart (pre- and posttest) for a test question about the Sun's effect on climate (5th or 6th grade):</p> <ol style="list-style-type: none"> What can you say about what student 6 learned? What can you say about what student 11 learned? Look at the results for the class as a whole: <ul style="list-style-type: none"> What can you say about the strengths in students' learning about why South America experiences summer in January? What can you say about any weaknesses in students' learning? 	<p>Display Slide 30. Overview of the Features Analysis Chart (FAC) (5 min)</p> <ol style="list-style-type: none"> Add the item number to the slide. Have participants locate the features analysis chart (FAC) they will use to analyze their students' responses to the selected question. Individuals: "Study the FAC, following the directions on the slide." Whole group: "What questions do you have so far about this tool? Were you able to answer the question on the slide?" <p>Display Slide 31. Practice Using a Sample Features Analysis Chart to Analyze Student Learning (5 min)</p> <ol style="list-style-type: none"> Have participants find the completed sample FAC for a test question about the Sun's effect on climate, used in 5th- and 6th-grade classrooms. Make sure participants see both the pre- and posttest results for a class of 25 students. Individuals: Have participants respond to the questions on the slide. Whole group: Discuss participants' responses to each question. <p>Anticipated responses:</p> <ol style="list-style-type: none"> Student 6 didn't use any of the intended science ideas in answering this question on the pretest; instead, the student indicated incorrectly that the equator is always the warmest place on Earth, so South America is always hot. The student's thinking changed quite a bit on the posttest, where she/he used three of the goal science ideas and no longer used the explanation that the equator is always the hottest place on Earth. Student 11 also initially thought that it's hot in January in South America because the equator is there, and it's always hot at the equator. On the posttest, the student still

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			<p>held on to this idea but also picked up a new idea that the Earth is tilted. The student has not yet figured out how to use the new idea of the tilted Earth to change her/his idea that the equator is always the hottest place.</p> <p>3. Results for the class overall:</p> <ul style="list-style-type: none"> • Strengths: On the posttest, most students are now using ideas about the Earth's tilt and the importance of direct Sun rays to explain why it is hot in January in South America. In addition, six out of 13 students dropped the misconception that the reason is that the equator is always the warmest place on Earth. • Weaknesses: Seven out of 13 students are still using the idea that the equator is always the hottest place on Earth, and that's why it's hot in South America. Only a few students are using ideas about hours of daylight (the last two goal features) in their explanations.
		<p style="text-align: center;">Making Predictions about Our Students</p> <p>Now look back at the FAC we'll use with our students:</p> <ol style="list-style-type: none"> 1. What patterns do you predict you'll see on the pretest? Why do you think so? 2. Realistically, what patterns do you predict you'll see on the posttest? Why do you think so? 	<p>Display Slide 32. Making Predictions about Our Students (5 min)</p> <ol style="list-style-type: none"> a. Direct participants' attention back to the FAC they will be using. b. Pairs: "Discuss the questions on the slide with your elbow partner." c. Whole group: Discuss the questions on the slide as a group.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		<p>Study Group 3 Preparation: Analysis of Student Pre- and Posttests</p> <p>Bring the following to Study Group 3:</p> <ul style="list-style-type: none"> • Three copies of your completed pre- and posttest features analysis charts • Three copies of three student pretests—one with strong responses, and two with average responses • Three copies of three student posttests—for the same three students whose pretests you selected • STeLLA strategies booklet • Lesson plans binder 	<p>Display Slide 33. Study Group 3 Preparation: Analysis of Student Pre- and Posttests (3 min)</p> <p>a. “You’ll need to do the following to prepare for Study Group 3:</p> <ol style="list-style-type: none"> 1. “Read through all your student pre- and posttests. 2. “For question X, fill out two FAC sheets—one FAC for the pretest, and one FAC for the posttest. 3. “Select three student pretests to share with the study group—one with strong responses, and two with average responses. Select posttests for the same three students. 4. “Make copies as indicated on the slide. 5. “Be sure to bring three copies of the entire pretest and posttest for the three selected students.”
<p>10 min</p> <p>Science Content Deepening: Use and Apply</p> <p>Slide 34</p>	<p>Purpose</p> <ul style="list-style-type: none"> • To deepen participants’ science-content understandings <p>Content</p> <ul style="list-style-type: none"> • 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. <p>What Participants Do</p> <ul style="list-style-type: none"> • Work individually and then as a group on a use-and-apply 	<p>Science Content Deepening: Use and Apply</p> <p>Write here a new use-and-apply question, scenario, data set, or phenomenon for participants to explain:</p> <p>Refer to the content background document in your lesson plans binder as needed (resources section).</p>	<p>Display Slide 34. Science Content Deepening: Use and Apply (10 min)</p> <p>Note: Make sure science-lesson materials are available from the lesson kit.</p> <p>a. Insert on the slide a new use-and-apply question, scenario, data set, or phenomenon for participants to explain. Ensure you have any materials you need if you want participants to observe a phenomenon.</p> <p>Note: This activity can be delayed until Study Group 3 if time is running short.</p> <p>b. Present the question, scenario, data set, or phenomenon</p>

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
	question, scenario, data set, or phenomenon: Write the question or scenario here and on the PPT slide.		<p>described on the slide.</p> <p>c. Individuals: Have participants work quietly using science ideas to answer the question or explain the scenario, data, or phenomenon. For support, they can use available resources, such as the content background document in the resources section of the lesson plans binder.</p> <p>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.</p> <p>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.</p> <p>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.</p>
<p>15 min</p> <p>Closing and Reflections</p> <p>Slides 35–38</p>	<p>Purpose</p> <ul style="list-style-type: none"> To close the session with a discussion of today's focus question, practical details, and reflections on today's learning <p>Content</p> <ul style="list-style-type: none"> Video-based lesson analysis supports participants' learning about the STeLLA framework and strategies, the science 	<p>Today's Focus Question</p> <p>What can we learn about the STeLLA strategies, science content, and student thinking by analyzing our own classroom videos?</p>	<p>Display Slide 35. Today's Focus Question (5 min)</p> <p>a. Individuals (1 min): Ask participants to silently think about the focus question.</p> <p>b. Whole group: Invite participants to share their thoughts with the group.</p>

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
	<p>content, and student thinking and learning.</p> <ul style="list-style-type: none"> • Systematic analysis of student responses to open-ended assessment items allows teachers to identify strengths, weaknesses, and patterns in student thinking and learning. 	<p>Next Study-Group Meeting</p> <p>Date: Time: Location:</p> <p>Bring your STeLLA strategies booklet, Summer Institute binder, and lesson plans binder.</p>	<p>Display Slide 36. Next Study-Group Meeting (Less than 1 min)</p> <ol style="list-style-type: none"> Modify the details on the slide. Inform participants of the date, time, and location of the next meeting.
		<p>Reflection Question</p> <p>What have you learned about the STeLLA strategies, science content, and/or student thinking by analyzing our own classroom videos (in Study Group 1 and today)?</p>	<p>Display Slide 37. Reflection Question (9 min)</p> <ol style="list-style-type: none"> Direct participants to the reflection sheet in their PD program binders and ask them to think about the question. Have participants write a response to the question on their reflection sheets.
		<p>Thank You!</p> <p>Thank you for your participation today!</p>	<p>Display Slide 38. Thank You! (Less than 1 min)</p> <ol style="list-style-type: none"> Before dismissing participants, thank them for their participation in the study group today.