RESPeCT Summer Institute Professional Development Leader Guide (PDLG)

Grade Level	1	**Day**	4	**STeLLA Strategy**	STL Strategy 6: Use and Apply New Science Ideas	**Subject Matter Focus**	Sound
Focus Questions	• Why is it necessary to engage students in using and applying new science ideas in a variety of ways and contexts? • How will the Student Thinking Lens strategies help you teach the Sound lessons? • Why do we hear sound? • What does nonstandard measurement look like?						
Main Learning Goals	Participants will understand the following: • In order to develop meaningful understandings of science ideas, students need multiple opportunities to try using and applying new science ideas in a variety of ways and contexts. • Soundmakers must vibrate to produce sounds we can hear. • When objects vibrate, they cause the air around them to vibrate. These vibrations move as sound waves through the air (matter) in all directions. • Vibrating air can make other objects vibrate. When vibrating air makes our eardrums vibrate, we hear sound. • Nonstandard measurement can be used to help students develop conceptual understandings of measurement that reflect the Common Core math standards.						

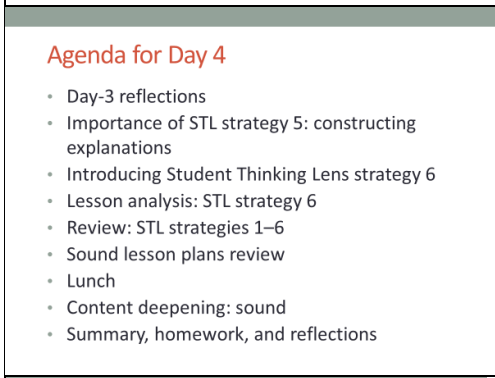
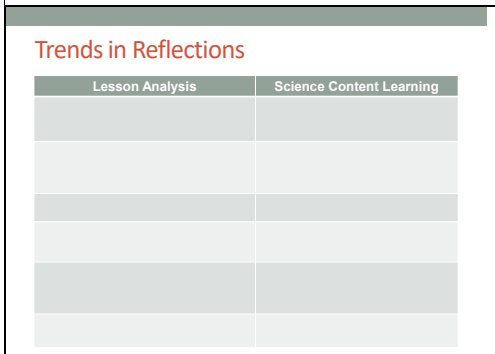
Preparation	**Materials**	**Videos**
Daily Setup Tasks • Check that video clips are correctly linked to PowerPoint (PPT) slides. • Set up PowerPoint. • Make sure video clips play correctly with good sound. • Arrange furniture and food. • Arrange participant materials. • Put up posters and charts. **Planning and Preparation Tasks** • Study the PDLG, PowerPoint slides (PPTs), video clips, and handouts. Make changes to PPTs if needed. • Review the reflections from day 3 and create a summary slide. • Watch video clips and anticipate participant responses. • Prepare charts for the day's agenda and focus	**Posters and Charts** • STeLLA Framework and Strategies poster • Day-4 Agenda (chart) • Day-4 Focus Questions (chart) • Norms for Working Together (chart) • Strategy charts from days 1–3 (STL strategies 1–5) • Chart of STL strategies highlighted in Sound lesson plans (see PPT slide 24 for model) • Parking Lot poster **Handouts in RESPeCT PD Binder Front Pocket** • Z-fold summary chart: Student Thinking Lens Strategies **Handouts in RESPeCT PD Binder, Day 4** • 4.1 Importance of Engaging Students in Constructing Scientific Explanations (task	• Hershberger video clip, *Introducing the CER* (on companion DVD for Zembal-Saul book *What's Your Evidence?*) • Video Clip 4.1: Doody classroom (use and apply, strategy 6); 4.1_mspcp_gr1_sound_doody_L8_c1 • Video Clip 4.2: Derose classroom (review Student Thinking Lens strategies); 4.2_mspcp_gr1_sound_derose_L2_c1

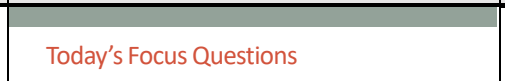
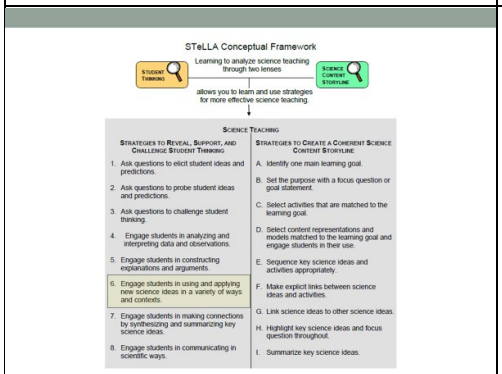
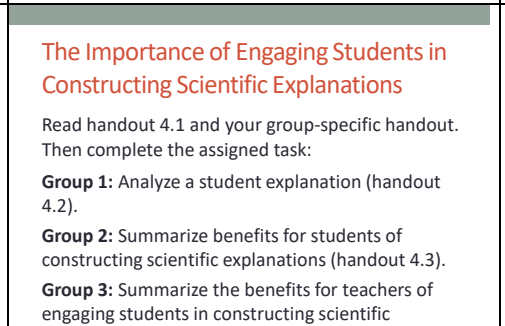
questions. • Using PPT slide 24 as a model, prepare a chart of the STL strategies highlighted in the Sound lesson plans.	sheet) • 4.2 Student Work from Zembal-Saul Book *What's Your Evidence?* • 4.3 Benefits of Engaging Students in Constructing Scientific Explanations • 4.4 Transcript for Video Clip 4.1 • 4.5 Transcript for Video Clip 4.2 • 4.6 Identifying Student Thinking Lens Strategies • 4.7 Falling-Tree Scenario • 4.8 Baseball Scenario • 4.9 Spaceship Scenario • 4.10 Broken-Guitar Scenario • 4.11 Ladybug Tape • 4.12 Measuring Distance • 4.13 Daily Reflections—Day 4 **PD Leader Masters, Days 1–4** • PD Leader Master: Identifying Student Thinking Lens Strategies (Answer Key) **Supplies** • Science notebooks • Chart paper and markers • Lesson materials kit (optional) • Large paper clips **PD Resources** • STeLLA strategies booklet • RESPeCT PD program binder • RESPeCT lesson plans binder **Resources in Lesson Plans Binder** *Resources section:* • Sound Content Background Document • Common Student Ideas about Sound	

DAY 4 SESSION OUTLINE

Time	Activities	Purpose
8:00–8:15 15 min	**Getting Started: Housekeeping, Agenda, Day-3 Reflections, Focus Questions**	• Build community by sharing participants' reflections from day 3. • Set the stage for a day of learning.
8:15–8:50 35 min	**Importance of STL Strategy 5: Constructing Explanations**	• Develop an appreciation for the multiple ways in which engaging students in constructing scientific explanations can have an impact on student learning within and beyond science.
8:50–9:10 20 min	**Introducing Student Thinking Lens (STL) Strategy 6**	• Develop an initial understanding of the purpose and key features of strategy 6: Engage students in using and applying new science ideas in a variety of ways and contexts.
9:10–10:10 60 min	**Lesson Analysis: STL Strategy 6**	• Use lesson analysis of classroom videos to better understand strategy 6. • Deepen science-content knowledge of sound through lesson analysis.
10:10–10:55 45 min (Includes 10-min break)	**Review: STL Strategies 1–6**	• Review and deepen understandings of key similarities and differences among STL strategies 1–6.
10:55–12:00 65 min	**Sound Lesson Plans Review**	• Understand why the Sound lesson plans are so scripted and how they should be used before and during the lessons. • Understand the conceptual flow within and across the Sound lessons. • Understand the focus question, main learning goal, and main activity in each lesson. • Understand how STL strategies 1–6 are embedded in the lessons.
12:00–12:45 45 min	**LUNCH**	
12:45–3:15 150 min (Includes 10-min break)	**Content Deepening: Sound**	• Reinforce participants' science-content understandings of sound by engaging in use-and-apply activities. • Develop participants' understandings of Common Core math standards as they relate to standard and nonstandard measurement.
3:15–3:30 15 min	**Wrap-Up: Summary, Homework, and Reflections**	• Summarize and reflect on key ideas from today's learning and preview the transition to the Science Content Storyline Lens (SCSL) strategies.

DAY 4

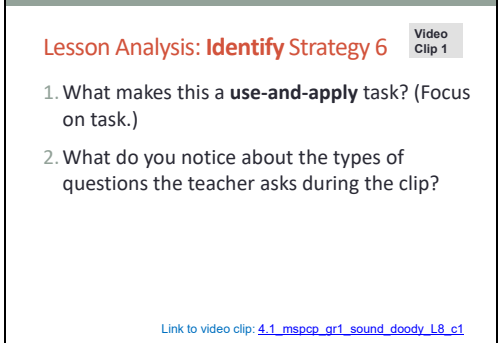
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
8:00–8:15 15 min **Getting Started** Slides 1–5	**Purpose** • Build community by sharing participants' reflections from day 3. • Set the stage for a day of learning. **What Participants Do** • Review the day's agenda. • Discuss the reflections from day 3. • Read today's focus questions. **Posters and Charts** • STeLLA Framework and Strategies poster • Day-4 Agenda (chart) • Day-4 Focus Questions (chart)		**Display Slide 1.** RESPeCT PD Program (5 min) a. Take care of any housekeeping issues.
			**Display Slide 2.** Agenda for Day 4 (3 min) a. Talk through the agenda for the day.
			**Display Slide 3.** Trends in Reflections (5 min) a. Invite participants to look at your feedback on their reflections from day 3 and offer reactions, comments, or follow-up questions.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 4.** Today's Focus Questions (1 min) a. Introduce the focus questions that will guide today's work. b. "Like STeLLA strategies 4 and 5, the goal of strategy 6 is to move student thinking forward toward deeper understandings of science ideas."
			**Display Slide 5.** STeLLA Conceptual Framework (1 min) a. Draw participants' attention to the new strategy highlighted on the slide. b. "Strategy 6 is the third STL strategy that is a type of activity designed to move student thinking forward."
8:15–8:50 35 min **Importance of STL Strategy 5: Constructing Explanations** Slides 6–7	**Purpose** • Develop an appreciation for the multiple ways in which engaging students in constructing scientific explanations can have an impact on student learning within and beyond science. **Content** • Engaging students in constructing scientific explanations helps them develop meaningful understandings of science ideas and how scientists work.		**Display Slide 6.** The Importance of Engaging Students in Constructing Scientific Explanations (25 min) **Note:** If you need some time to catch up on day-3 activities, you can skip this slide. However, this activity is beneficial for reviewing strategy 5 (constructing explanations) and helping participants understand why explanation building is such important work in science and beyond. **Timing note:** For this segment, allot 5 minutes for reading, 10 minutes to prepare for a group share-out, and 10 minutes for the share-out. a. Divide participants into three groups or pairs. Assign

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
	What Participants Do • Review jigsaw-strategy readings about the importance of scientific explanations and examine a sample of student work. • Share key ideas about constructing scientific explanations. • Watch and discuss a lesson video in which the teacher explicitly teaches 3rd graders how to construct explanations that include a claim, evidence, and reasoning that connects to science ideas. **Posters and Charts** • STeLLA Framework and Strategies poster • Strategy charts from days 1–3 (STL strategies 1–5) **Videos** • Hershberger video clip, *Introducing the CER* **Handouts in PD Binder** • 4.1 Importance of Engaging Students in Constructing Scientific Explanations (task sheet) • 4.2 Student Work from Zembal-Saul Book *What's Your Evidence?* • 4.3 Benefits of Engaging Students in Constructing Scientific Explanations **PD Resources** • STeLLA strategies booklet		each group a number (1, 2, 3). b. Direct participants to three handouts: 1. Importance of Engaging Students in Constructing Scientific Explanations (handout 4.1 in PD program binder) (This handout describes what groups are to do with the following two handouts.) 2. Student Work from Zembal-Saul Book *What's Your Evidence*? (handout 4.2 in PD binder) (Group 1's task is linked to this handout.) 3. Benefits of Engaging Students in Constructing Scientific Explanations (handout 4.3 in PD binder) (Tasks for Groups 2 and 3 are linked to this handout.) c. After participants have read the designated handouts for their groups and completed their assigned tasks, invite them to share out.
		The CERA Framework for Constructing Scientific Explanations • Next, we'll watch video clip of a 3rd-grade teacher instructing students how to construct scientific explanations. • Think about ideas this clip gives you for helping your students learn to construct scientific explanations by making a claim, supporting it with evidence and reasoning, and considering alternative explanations and strategies (CERA). Link to *Introducing the CER* video clip.	**Display Slide 7.** The CERA Framework for Constructing Scientific Explanations (10 min) **Note:** This activity is optional but powerful. a. "Let's watch how one 3rd-grade teacher taught her students to construct scientific explanations. This is the teacher whose student writing Group 1 just read about. The class in this video clip has been studying simple machines (such as pulleys and levers)." b. "We're not going to analyze this video clip in terms of STeLLA strategies. Instead, think about ideas this clip gives you as to how you might introduce your students to the CERA framework for constructing scientific explanations, which involves making a claim, supporting it with evidence and reasoning, and considering alternative explanations and strategies." c. After watching the clip, discuss participants' reactions and any ideas it gave them about how

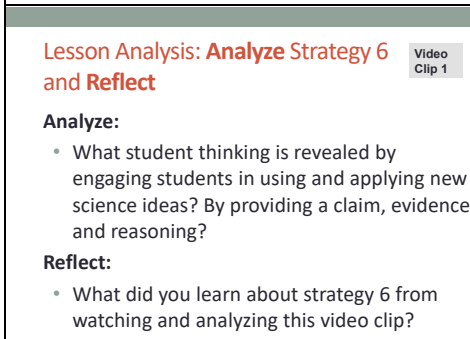
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			they might help their students learn to construct strong scientific explanations. **Note:** Make sure participants are aware that in addition to using the CERA framework as a tool for teaching students how to develop scientific explanations and arguments (STeLLA strategy 5) in the classroom, they will be using the same framework for videocase-based lesson analysis of their science teaching in RESPeCT study groups throughout the school year.
8:50–9:10 20 min **Introducing Student Thinking Lens (STL) Strategy 6** Slide 8	**Purpose** • Develop an initial understanding of the purpose and key features of strategy 6: Engage students in using and applying new science ideas in a variety of ways and contexts. **Content** • After students encounter new science ideas, they need opportunities to practice them and see their usefulness in explaining a variety of phenomena. Activities that challenge students to use and apply new ideas give them the time and space to really make sense of the concepts. **What Participants Do** • Make and discuss charts highlighting the purpose and key features of strategy 6. **Supplies** • Chart paper and markers **PD Resources** • STeLLA strategies booklet • STL Z-fold summary chart (front	Introducing STL Strategy 6 Engage students in using and applying new science ideas in a variety of ways and contexts. 1. What are the purpose and key features of this strategy? 2. Why do you think use-and-apply questions or activities are often shortchanged in science teaching?	**Display Slide 8.** Introducing STL Strategy 6 (20 min) a. **Small groups (10 min):** Divide participants into two groups to make charts highlighting the purpose and key features of strategy 6: Engage students in using and applying new science ideas in a variety of ways and contexts. Encourage participants to refer to the STeLLA strategies booklet and STL Z-fold summary chart for this activity. b. **Whole group (10 min):** Have groups present their charts in a whole-group share-out and compare them. Ask participants, "What differences and similarities do you notice when you compare your charts with those of other groups?" **Key ideas:** • Strategy 6 is a time for "strategic telling" and making sure students are using science ideas accurately. • A use-and-apply question or activity is introduced *after* students have experienced/encountered a new science idea. It provides an opportunity for students to use and apply the idea in a new context or novel way and/or link two or more science ideas together. • A common misconception is that use-and-apply questions or activities *assess* student learning. Teachers often talk about asking these kinds of questions on tests. However, according to research findings published in *How People Learn* (National

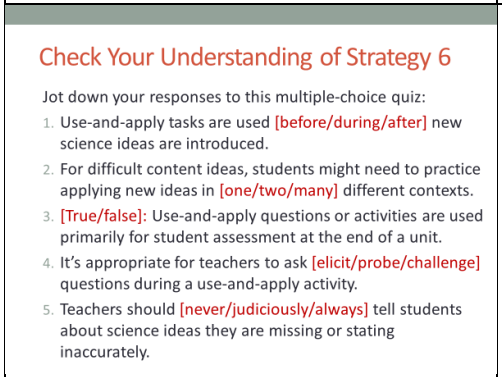
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
	pocket of PD binder)		Academy of Sciences, 2000), *application* is part of the learning process, or developing a conceptual framework. If application is treated like assessment, students may encounter a use-and-apply question on a test without ever having had the opportunity to practice this way of thinking as part of their learning.
9:10–10:10 60 min **Lesson Analysis: STL Strategy 6** Slides 9–14	**Purpose** • Use lesson analysis of classroom videos to better understand strategy 6. • Deepen science-content knowledge of sound through lesson analysis. **Content** • Strategy 6 involves engaging students in using and applying new science ideas in a variety of ways and contexts. **What Participants Do** • Watch a classroom video clip to identify strategy 6 and analyze student thinking that is revealed and challenged from using this strategy. • Check their understandings of strategy 6 by taking a quick multiple-choice quiz. **Videos** • Video Clip 4.1, Doody classroom **Handouts in PD Binder** • 4.4 Transcript for Video Clip 4.1 **PD Resources** • STeLLA strategies booklet	Lesson Analysis: Focus Question 1 Why is it necessary to engage students in using and applying new science ideas in a variety of ways and contexts?	**Display Slide 9.** Lesson Analysis: Focus Question 1 (Less than 1 min) a. Highlight the focus question that will guide the lesson analysis work during this phase.
		Lesson Analysis: **Review** Lesson Context Video Clip 1 Read the lesson context for this video clip at the top of the transcript (handout 4.4 in your PD program binder).	**Display Slide 10.** Lesson Analysis: Review Lesson Context, Video Clip 1 (2 min) a. "Read the lesson context at the top of the video transcript (handout 4.4 in your PD program binders)." b. Make sure participants understand the science content and activity that are the focus of this video clip. c. **Note:** Refer to the Sound Content Background Document as needed throughout the lesson analysis.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
	Resources in Lesson Plans Binder *Resources section:* • Content background document		**Display Slide 11.** Lesson Analysis: Identify Strategy 6, Video Clip 1 (25 min) a. "As you watch the video, think about what makes the activity in this clip a use-and-apply task. What science ideas should students be using and applying in each scenario? Also notice what kinds of questions the teacher asks." b. Show the video clip. c. **Individuals:** "Think about the questions on the slide and mark the transcript as you identify the use of strategy 6." d. **Whole group:** Discuss participants' responses to the questions. **Ideal observations:** • This is a use-and-apply task because it doesn't introduce any new science ideas or practices. Instead, students use what they've learned about sound waves and how they're represented to arrange sample sound waves in order from loudest to quietest. • During a use-and-apply task, the teacher should ask many probe and challenge questions. Challenge questions should be open ended enough to reveal whether students understand the science content. Probe questions should help the teacher determine whether students are using science ideas accurately. Additional challenge questions should push students' thinking forward toward more-scientific understandings, as well as encourage students to add more detail to their answers and connect their thinking to science ideas. • In this clip, the teacher asks challenge questions and at times follows up with probe questions but stops asking questions before students are able to make a connection to the science idea that the size of a sound wave determines the level of sound

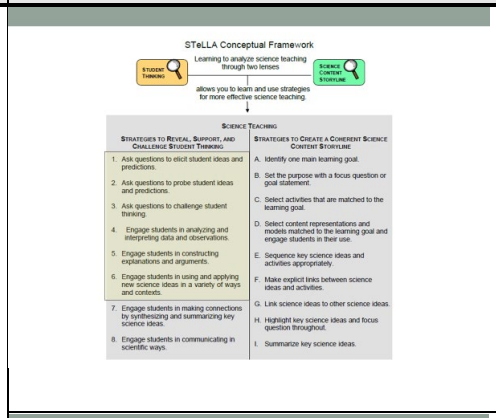
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process

			produced.
			• Examples of leading questions in which the teacher does the cognitive work for students:
			  • **Video segment 00:06:18:** "Are they higher or what? What's that word you were just labeling with?
			  • **Segment 00:06:25:** "You guys are in line from what? The …."
			  • **Segments 06:32 and 06:35:** "I didn't say line them up the biggest. What did I say?"; "The loudest to the …."

			**Display Slide 12.** Lesson Analysis: Analyze Strategy 6 and Reflect, Video Clip 1 (25 min) a. **Individuals:** "For the analysis questions on the slide, study the video transcript and come up with a claim, evidence, and reasoning to support your claim." b. **Whole-group share-out:** As participants share their claims, evidence, and reasoning, encourage them to challenge one another by asking questions, disagreeing, and suggesting improvements or alternative explanations and arguments. (Refer to the norms at the heart of the RESPeCT program.) **Note:** You may also want to ask participants whether they noticed in the transcript any missed opportunities for engaging students in using and applying new science ideas. c. **Reflect (1 min):** Give participants time to think about the reflection question on the slide. d. **Whole-group discussion:** Discuss the reflection question as a group. Make sure participants note specifically what they learned about strategy 6 from watching and analyzing this video clip. **Possible claim:** The student volunteers were able to correctly line up the sound waves from loudest to

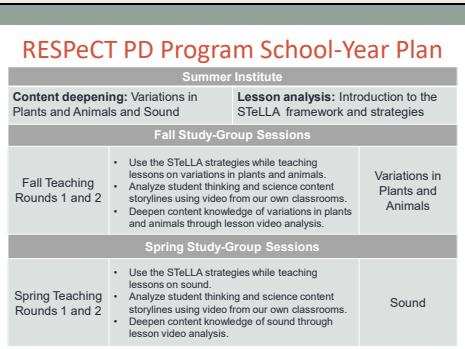
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			quietest, but some students struggled to articulate why they were arranged that way. **Evidence:** 05:21; 05:26 **Reasoning:** Students recognized that the order was correct, but they didn't necessarily attribute the height of the crest to the volume of the sound. **Alternative:** The teacher could ask another student to explain his or her diagram and then ask questions to help students compare all of the diagrams.
			**Display Slide 13.** Check Your Understanding of Strategy 6 (5 min) **Note:** This activity is optional if time is running short. a. "To check your understanding of STL strategy 6, jot down your responses to this multiple-choice quiz." b. Have participants discuss their answers either in pairs or as a group. (If time is short, just read the answers aloud.) **Answer key:** 1. After 2. Many 3. False 4. Challenge (and probe) 5. Judiciously (defined as "good or discriminating judgment; wise, sensible, or well advised")

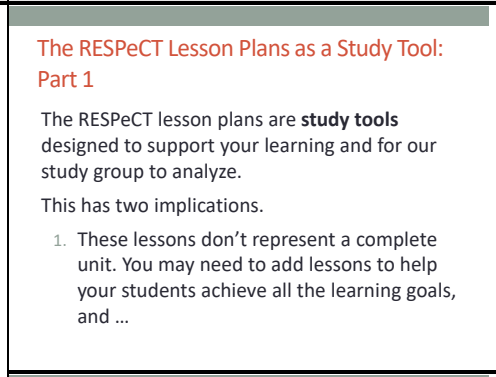
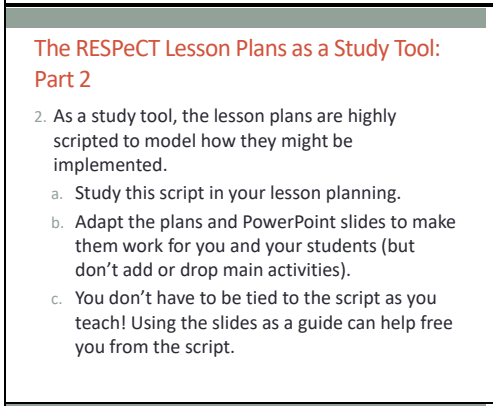
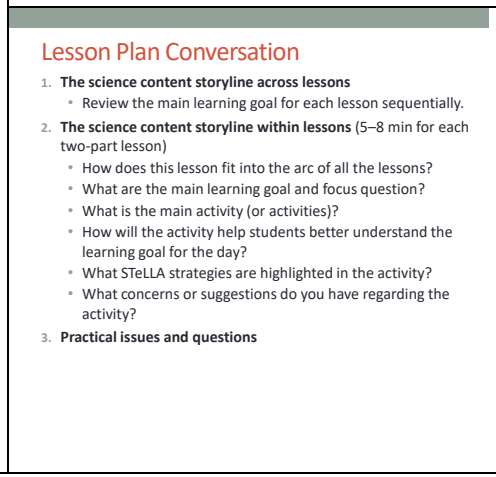
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		 Why is it necessary to engage students in using and applying new science ideas in a variety of ways and contexts?	**Display Slide 14.** Reflect: Lesson Analysis Focus Question 1 (3 min) a. **Individuals (1 min):** "Think for a moment about how you would answer the focus question on this slide." b. **Whole-group share-out (2 min):** Have a few participants share their ideas. **Ideal response:** • The first time students try using and applying new science ideas, they'll struggle and make mistakes. Use-and-apply tasks can help you diagnose where students are having difficulties so you can clarify the concepts. Only after multiple attempts to use and apply new science ideas do students truly begin to understand and internalize them. • By using and applying new science ideas in a variety of ways and contexts, students learn firsthand how important and useful the ideas are in explaining a variety of phenomena in the world around them.
10:10–10:55 45 min (Includes 10-min break) **Review: STL Strategies 1–6**	**Purpose** • Review and deepen understandings of key similarities and differences among STL strategies 1–6. **Content** • STL strategies 1–6 reveal, support, and challenge student thinking. **What Participants Do** • Study the Summary of STeLLA Student Thinking Lens Strategies	 How will the Student Thinking Lens strategies help you teach the Sound lessons?	**Display Slide 15.** Lesson Analysis: Focus Question 2 (Less than 1 min) a. **Transition:** "Now we'll shift our attention to the second lesson analysis focus question and spend some time summarizing what we've learned so far about Student Thinking Lens strategies 1–6. Then we'll review the Sound lesson plans and highlight how these strategies are used in the lessons you'll start teaching in January."

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
Slides 15–19	chart in the STeLLA strategies booklet. • Discuss patterns, similarities, and differences among STL strategies 1–6. • Watch a classroom video clip and identify any STL strategies used during the lesson. Discuss observations and missed opportunities. **Posters and Charts** • Strategy charts from days 1–3 (STL strategies 1–5) **Videos** • Video Clip 4.2, Derose classroom **Handouts in PD Binder** • 4.5 Transcript for Video Clip 4.2 • 4.6 Identifying Student Thinking Lens Strategies **PD Resources** • STeLLA strategies booklet	 Review: Student Thinking Lens Strategies Review the STL summary chart in the STeLLA strategies booklet and discuss these questions: 1. What pattern(s) do you see in this arrangement (organization) of the STL strategies? 2. How does this arrangement (organization) highlight the differences and similarities among the Student Thinking Lens strategies?	**Display Slide 16.** STeLLA Conceptual Framework (Less than 1 min) a. "These are the Student Thinking Lens strategies we've explored so far. You'll get practice using them as you teach the lessons on variations in plants and animals and the lessons on sound next year." **Display Slide 17.** Review: Student Thinking Lens Strategies (3 min) a. **Individuals:** Have participants review STL strategies 1–6 on the summary chart in the strategies booklet (Summary of STeLLA Student Thinking Lens Strategies). b. **Whole group:** Discuss the questions on the slide. **Key ideas:** • Strategies 1–3 are types of questions, and strategies 4–6 are activities designed to move student thinking forward toward more-scientific understandings. • Some strategies are used at any time during the lesson (e.g., probe questions); others are used at specific times (e.g., elicit questions used *before* students have been introduced to new science ideas; use-and-apply activities used *after* students have been introduced to new science ideas). • Each strategy has its own specific purpose(s), but the strategies are closely connected to one another. That is, these strategies aren't used in isolation; they're complementary.

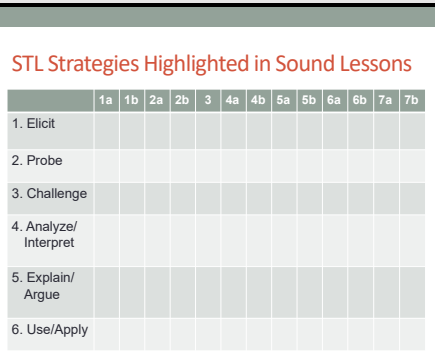
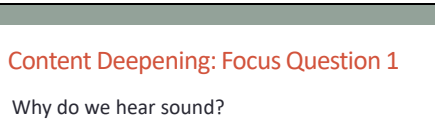
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		Lesson Analysis: **Review** Lesson Context Video Clip 2 Read the lesson context for this video clip at the top of the transcript (handout 4.5 in your PD program binder).	**Display Slide 18.** Lesson Analysis: Review Lesson Context, Video Clip 2 (1 min) a. "Read the lesson context at the top of the video transcript (handout 4.5 in your PD program binders)." b. Make sure participants understand the science content and activity that are the focus of this video clip.
		Lesson Analysis: **Identify** Student Thinking Lens Strategies Video Clip 2 • What Student Thinking Lens strategies can you identify in this video clip? • After watching the video, study the transcript (handout 4.5) and fill in handout 4.6 (Identifying Student thinking Lens Strategies). • Be ready to share your findings with the group, including any missed opportunities. Link to video clip: 4.2_mspcp_gr1_sound_derose_L2_c1	**Display Slide 19.** Lesson Analysis: Identify Student Thinking Lens Strategies, Video Clip 2 (30 min) **Note:** If absolutely necessary, you can skip this video analysis. a. Orient participants to handout 4.6, Identifying Student Thinking Lens Strategies. b. Make sure participants understand the context of the video clip (from the transcript). c. Show the video clip. d. **Individuals:** "Study the video transcript and complete handout 4.6, Identifying Student Thinking Lens Strategies." e. **Whole group:** "What STL strategies did you identify in the video transcript? Did you spot any missed opportunities?" **Note:** See PD Leader Master: Identifying Student Thinking Lens Strategies (Answer Key) for possible responses and examples from the video clips. Participants may come up with different responses.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
10:45–10:55 10 min	**BREAK**		

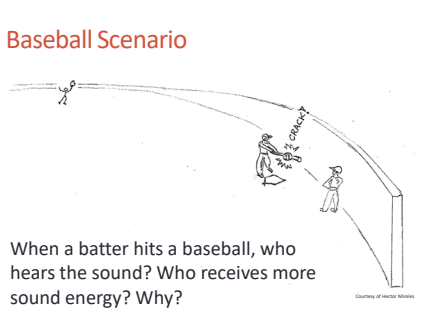
10:55–12:00
 	
65 min
 	
Sound Lesson Plans Review
 	
Slides 20–24
	Purpose
	• Understand why the Sound lesson plans are so scripted and how they should be used before and during the lessons.
	• Understand the conceptual flow within and across the Sound lessons.
	• Understand the focus question, main learning goal, and main activity in each lesson.
	• Understand how STL strategies 1–6 are embedded in the lessons.
	
	Content
	• All lessons are designed to support the science content storyline within and across lessons. Each lesson contains a focus question, a main learning goal, and an activity.
	• The Student Thinking Lens strategies work together across lessons according to the following pattern:
	  • Elicit and probe strategies are very important in lesson 1.
	  • Probe and challenge strategies are used throughout all the lessons.
	  • Strategies 4 and 5 are highlighted in the middle lessons.
	  • Strategy 6 is highlighted toward the end of the lesson, after students encounter new science ideas but before final unit
			**Display Slide 20.** RESPeCT PD Program School-Year Plan (1 min)
			
			a. "Before we share our reports about each of the Sound lesson plans and how they support you in practicing these Student Thinking Lens strategies, let's review the plan for the school year."
			
			b. "In the fall you'll teach the **Variations in Plants and Animals** lessons, and we'll meet in our study group to analyze video clips and student work from these lessons. This analysis will help us deepen our understandings of the STeLLA strategies, the science content, the lesson plans, and our students' thinking and learning."
			
			c. "Starting in January, you'll teach the **Sound** lessons, and we'll meet in our study group to analyze video clips and student work from these lessons. Do you have any questions?"
			
			d. **Important reminder:** "Remember that we're analyzing video clips of our own classroom teaching to help us all learn, not to evaluate and critique one another. Everyone is learning to use both new strategies and new lesson plans, so it's predictable that our first attempts at teaching these lessons will have rough spots. We need to appreciate and acknowledge the courage each of us is demonstrating in sharing our initial efforts to teach these lessons. Please be assured that our analyses of the videos will focus on the strategies, the science content, and most importantly, how students are making sense of the lessons. We're not going to focus on rough spots or management problems. We're here to support one another and to learn and grow as science teachers."

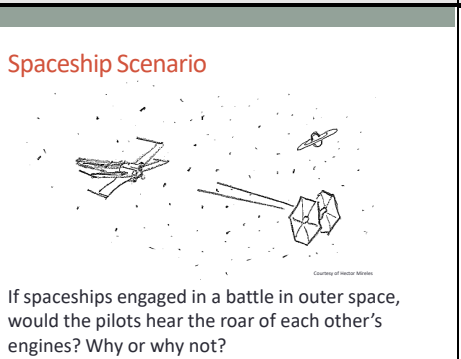
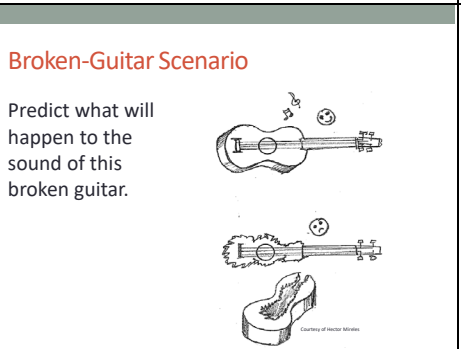
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
	assessments. **What Participants Do** • Review the plans for school-year study groups. • Listen to the PD leaders describe the lesson plans for the study groups and how they should be used/adapted. • Present a summary of an assigned lesson plan to help their peers understand the lesson. • Raise questions and concerns about the lesson plans and make suggestions. **Supplies** • Chart paper and markers **PD Resources** • RESPeCT lesson plans binder	  	**Display Slide 21.** The RESPeCT Lesson Plans as a Study Tool: Part 1 (2 min) a. Read through the information on this slide. b. Elicit and respond to any comments or questions from participants. **Display Slide 22.** The RESPeCT Lesson Plans as a Study Tool: Part 2 (2 min) a. Read through the information on this slide. b. Elicit and respond to any comments or questions from participants. **Display Slide 23.** Lesson Plan Conversation (60 min in conjunction with next slide). a. For step 1 on the slide, have participants describe the main learning goal for their assigned two-part lesson (parts A and B) and how it connects to the lessons that precede and follow it. (5 min) b. For steps 2 and 3, have participants report on their assigned two-part lesson. **Note:** Rather than walking through every step in the lesson plan, participants should present the *big picture* using the questions in step 2 on the slide. They should bring up details only when they

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			have some concern, question, or suggestion about a modification. c. As participants give their reports, mark on a chart the Student Thinking Lens strategies that are highlighted in each lesson. (Use the chart on the next slide as a model.) **Note:** Encourage participants to pick just one or two Student Thinking Lens strategies that are highlighted in the lesson. (Several strategies may be used in a lesson.) d. Highlight the following ideal pattern and how the STL strategies work together across lessons: • Elicit and probe strategies are very important in lesson 1. • Probe and challenge strategies are used throughout all the lessons. • Strategies 4 and 5 are highlighted in the middle lessons. • Strategy 6 is highlighted toward the end of a lesson, after students encounter new science ideas but before final unit assessments. **Timing note: Make sure you limit the time allotted for each lesson** so you can get through them all. If you have 6 two-part lessons, you'll have approximately 8 minutes for each lesson (4 minutes for part A, and 4 minutes for part B). If your lesson series has more than 6 two-part lessons, you'll have to decrease the time for each lesson.

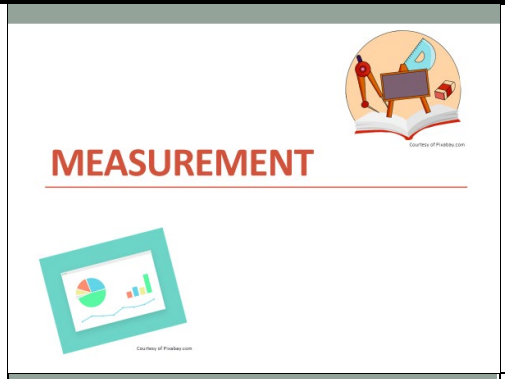
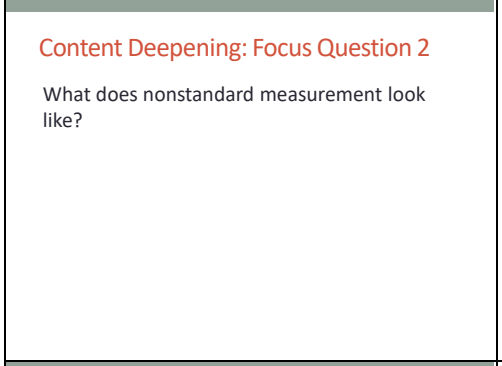
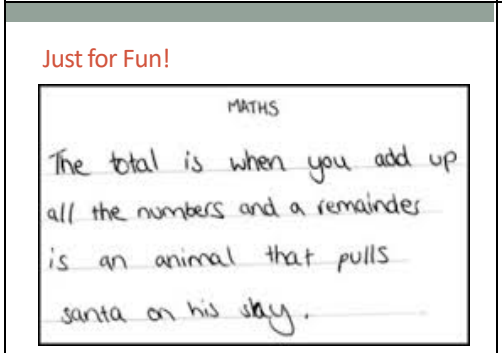
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 24.** STL Strategies Highlighted in Sound Lessons a. Use this slide in conjunction with the previous slide.
12:00–12:45 45 min	**LUNCH**		
12:45–3:15 150 min (Includes 10-min break) **Science and Math Content Deepening: Sound** Slides 25–60	**Purpose** • Reinforce participants' science-content understandings of sound by engaging in use-and-apply activities. • Develop participants' understandings of Common Core math standards as they relate to standard and nonstandard measurement. **Content** • Soundmakers must vibrate to produce sounds we can hear. • When objects vibrate, they cause the air around them to vibrate. These vibrations move as sound waves through the air (matter) in all directions. • Vibrating air can make other objects vibrate. When vibrating air makes our eardrums vibrate, we hear sound. • Nonstandard measurement can be used to help students develop		**Display Slide 25.** Science and Math Content Deepening: Sound (Less than 1 min) a. "Our content deepening work for this session will focus using and applying ideas about sound and exploring the concept of nonstandard measurement as it relates to Common Core math standards." **Note:** Refer to the Sound Content Background Document and Common Student Ideas about Sound as needed throughout this phase.
			**Display Slide 26.** Content Deepening: Focus Question 1 (Less than 1 min) a. Read the focus question on the slide. b. Ask participants to write this question in their science notebooks and draw a box around it. This reinforces the practice they'll follow with students. c. "To help us answer this question, we'll use everything we've learned about sound this week to explain what happens to sound in various

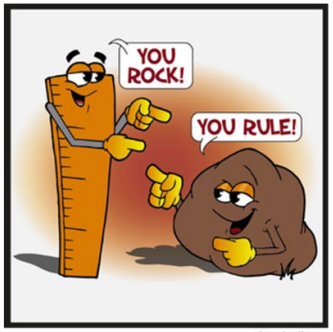
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
	conceptual understandings of measurement that reflect the Common Core math standards. **What Participants Do** • Use and apply key science ideas about sound to explain and/or predict what happens in various scenarios. • Practice using nonstandard units of measurement in different scenarios. • Complete a worksheet in which they measure distances using nonstandard units of measurement. • Consider when to use standard or nonstandard units of measurement. • Discuss measurement challenges and propose solutions. • Determine how to apply the practice standard of attending to precision in measurement. • Reflect on how to support students in developing measurement sense. **Handouts in PD Binder** • 4.7 Falling-Tree Scenario • 4.8 Baseball Scenario • 4.9 Spaceship Scenario • 4.10 Broken-Guitar Scenario • 4.11 Ladybug Tape • 4.12 Measuring Distance **Supplies** • Science notebooks • Chart paper and markers • Large paper clips **PD Resources** • RESPeCT lesson plans binder		scenarios." **Display Slide 27.** Falling-Tree Scenario (8 min) a. "First, let's consider some use-and-apply scenarios to review what we've learned so far about sound." b. Distribute handout 4.7 (Falling-Tree Scenario). Then ask participants, "If a tree falls in the forest and nobody is there to hear it, is there a sound?" c. **Individuals:** "Answer this question on your handouts using the science ideas we've learned about this week. Include evidence from our investigations to support your ideas. You may refer to what you've written in your science notebooks, as well as other available resources. As you consider this question, think about the key ingredients of sound we've talked about. Which of these ingredients are present in this scenario?" d. **Pairs:** "Now I'd like you to share your ideas and evidence with an elbow partner." e. **Whole group:** Invite a few participants to share their answers with the group. Record key ideas and evidence on chart paper. **Note:** The answer to this question depends on how you define *sound*. This is an interesting question that will likely generate rich discussion. **Key ideas:** • Sound requires specific ingredients, such as a vibrating object (such as cracking wood), air surrounding the object through which the sound waves or vibrations can travel, ears that can receive the sound waves, eardrums that can vibrate, and a brain that can interpret the vibrations as sound. Healthy ears can register pressure waves as sound with the help of the brain. • It would seem that there is no perfect answer to this question. We know that humans and animals

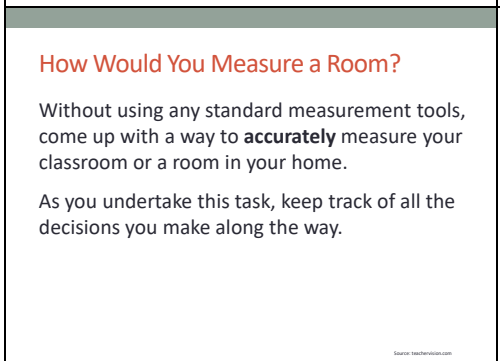
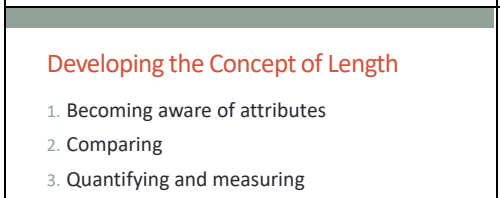
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
	Resources in Lesson Plans Binder *Resources section:* • Content background document • Common Student Ideas		*perceive* pressure waves or vibrations as sound, and to hear sound, a brain has to process it as such. Without eardrums and a brain, the only ingredients of sound in this scenario are the vibrations or pressure waves created when the tree falls, and vibrating air that carries the sound waves away from the source. When the sound waves reach the neighboring trees, however, they are unable to perceive these vibrations as sound because they lack eardrums and brains.
			**Display Slide 28.** Baseball Scenario (8 min) a. Distribute handout 4.8 (Baseball Scenario). b. "When a batter hits a baseball, who hears the sound? Which person in this scenario receives more sound energy? Can you illustrate why?" c. **Individuals:** "Answer these questions on your handouts and include evidence from our investigations to support your ideas. Think about what happens to the sound waves as they move away from the source." d. **Pairs:** "Now share your ideas and evidence with an elbow partner." e. **Whole group:** Invite a few participants to share their answers with the group. Record key ideas and evidence on chart paper.

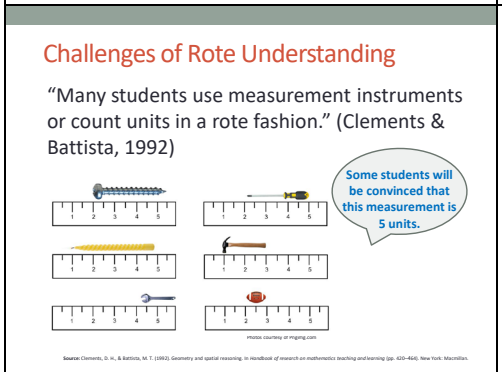
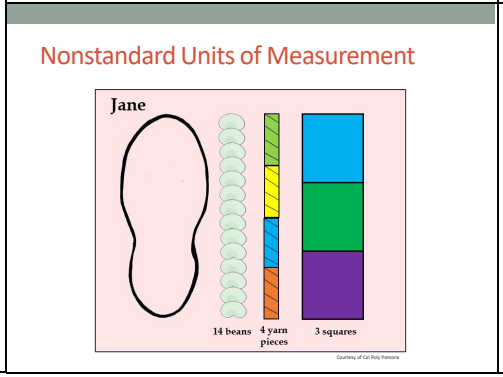
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 29.** Spaceship Scenario (8 min) a. Distribute handout 4.9 (Spaceship Scenario). b. "If spaceships engaged in a battle in outer space, do you think the pilots would hear the roar of each other's engines? Why or why not?" c. **Individuals:** "Answer these questions on your handouts and include evidence from our investigations to support your ideas. Think about the key ingredients of sound again." d. **Pairs:** "Now share your ideas and evidence with an elbow partner." e. **Whole group:** Invite a few participants to share their answers with the group. Record key ideas and evidence on chart paper. **Ideal response:** • Outer space doesn't have an atmosphere, and there is no way for pressure waves to travel through a space without air. So even if there were vibrations (oscillations) and humans with ears and brains inside the spaceships, sound can't travel through outer space. So the pilots wouldn't hear the roar of each other's engines.
			**Display Slide 30.** Broken-Guitar Scenario (8 min) a. Distribute handout 4.10 (Broken-Guitar Scenario). b. "A beautiful guitar is ripped open in such a way that the entire top portion containing the strings, frets, tuner, and bridge is separated from the body of the guitar. What do you think will happen to the sound of this broken guitar?" c. **Individuals:** "Write your predictions on your handouts and try to include evidence from our investigations to support your ideas."

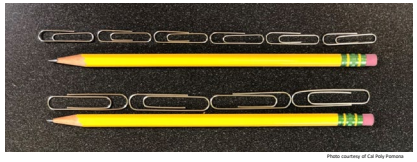
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			d. **Pairs:** "Now share your ideas and evidence with an elbow partner." e. **Whole group:** Invite a few participants to share their answers with the group. Record key ideas and evidence on chart paper. **Ideal response:** • Since the soundmaker (oscillator) no longer has a resonator, the sound of the strings would be much softer (muted). Resonators amplify sound, making it louder. Without a resonator, any sound the guitar makes won't be amplified. The sound would still be somewhat musical, like plucking a stretched rubber band, but it wouldn't be very pleasant.
		Reflect: Content Deepening Focus Question 1 Why do we hear sound?	**Display Slide 31.** Reflect: Content Deepening Focus Question 1 (5 min) a. Review the focus question on the slide. b. **Individuals:** Have participants answer the question in their science notebooks using what they've learned about sound this week. c. **Whole group:** Invite a few participants to share their responses. Record key ideas and evidence on chart paper.
	10-MINUTE BREAK		

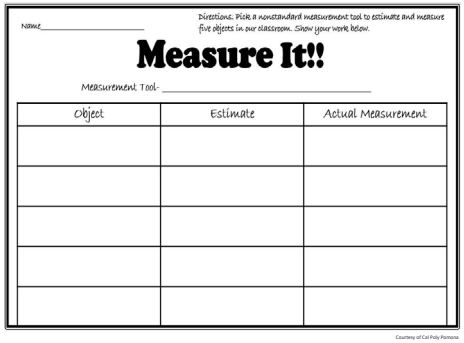
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 32.** Measurement (Less than 1 min) a. "Next, our content deepening work will focus on measurement as it relates to the Common Core math standards."
			**Display Slide 33.** Content Deepening: Focus Question 2 (Less than 1 min) a. Read the focus question on the slide. b. Ask participants to write this question in their science notebooks.
			**Display Slide 34.** Just for Fun (Less than 1 min) a. Begin this new focus with a smile by reading the student explanation on the slide.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		Common Core Math Standards **Measurement and Data** CCSS.Math.Content.1.MD.A.2 Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. *Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.*	**Display Slide 35.** Common Core Math Standards (Less than 1 min) a. Ask a volunteer to read aloud the 1st-grade Common Core math standard for measurement and data. b. "The activities we engage in throughout this session will help us deepen and develop our understandings of this standard."
			**Display Slide 36.** You Rock! You Rule! (Less than 1 min) a. "Rulers are the standard tools of measurement that 1st graders use, but in this session, we'll develop the idea of measurement using nonstandard measuring tools."
		Your Ideas about Measurement 1. Why do we measure? 2. What types of tools do we use to measure? 3. What are some units we use? 4. How is measurement learned? 5. How is measurement taught? 6. Would you be able to more accurately mark off 10 yards or 10 meters? 	**Display Slide 37.** Your Ideas about Measurement (8 min) a. Read the first three questions on the slide. b. Invite participants to share their ideas for answering these questions and record them on chart paper. c. **Think-Pair-Share:** "Now I'd like you to pair up with an elbow partner and talk about the last three questions on the slide. Be prepared to share your ideas with the group." d. **Whole group:** Invite participants to share their

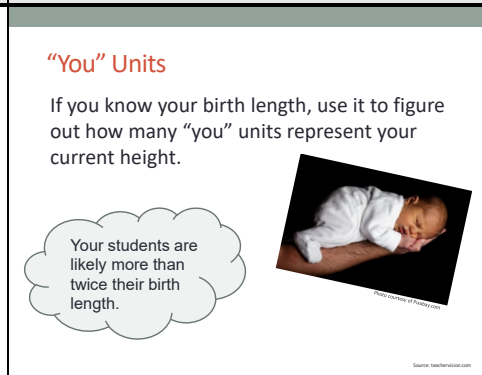
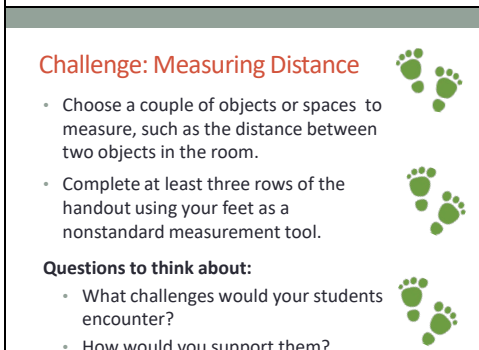
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			answers for the last three questions. Record key ideas on chart paper.
			**Display Slide 38.** How Would You Measure a Room? (10 min) a. Introduce the task on the slide to get participants thinking about nonstandard measurement and the decisions they would have to make to accurately measure a room. b. **Individuals:** Ask participants to jot down their ideas in their science notebooks and list all of the decisions they would need to make to accomplish the task. c. **Pairs:** Have participants share their ideas with an elbow partner and compare their lists of decisions. d. **Whole group:** Invite a few participants to share how they would measure a room without using any standard measurement tools. Ask these questions: • Does the number of decisions involved in this relatively simple task surprise you? • Did anyone consider measuring the volume or surface area of the room? • Did anyone consider the angles of the room?
			**Display Slide 39.** Developing the Concept of Length (8 min) a. "Students go through three stages as they develop the concept of length: (1) becoming aware of attributes, (2) comparing, and (3) quantifying and measuring." b. **Think-Pair-Share:** "Think about what each of these stages looks like and consider which stage your students are currently in. Then share your thoughts with an elbow partner."

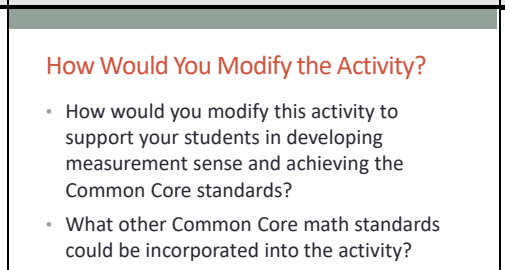
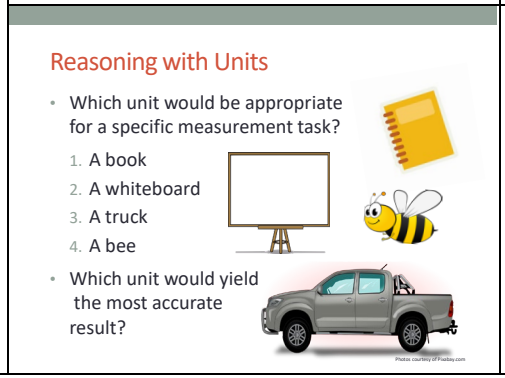
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			c. **Whole group:** Discuss participants' ideas about what each stage of development looks like and ask them what stage their own students are in. **Key ideas:** • **Stage 1:** Students are aware that some things are long, short, wide, close, near, far, deep, and so on. They might be aware that a pencil is the same length even if they move it to another location. • **Stage 2:** Student can compare the same attribute in different objects, such as the lengths of two pencils. • **Stage 3:** Students can quantify the length, height, size, or other attribute of an object using standard or nonstandard measurement.
			**Display Slide 40.** Challenges of Rote Understanding (4 min) a. **Individuals:** Ask participants to think about how some students might respond to the task on the slide. What misconception needs to be overcome? b. **Whole group:** Discuss some of the challenges associated with rote understanding of measurement.
			**Display Slide 41.** Nonstandard Units of Measurement (4 min) a. Discuss the nonstandard units of measurement on the slide. b. Ask participants, "What other nonstandard units of measurement have you used in your class?"

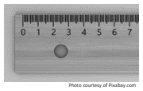
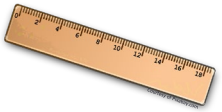
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		Nonstandard Units of Measurement How would you quantify the lengths of these pencils? 	**Display Slide 42.** Nonstandard Units of Measurement (5 min) a. "How would quantify the lengths of these pencils?" b. Record participants' ideas on chart paper. **Note:** Participants should observe that the length of one pencil is four large paper clips, and the length of the other pencils is six small paper clips. c. "Working with nonstandard units of measurement can be challenging, but why?" d. Consider the value of standard units of measurement.
		What about These Units of Measurement? 	**Display Slide 43.** What about These Units of Measurement? (4 min) a. "How would you support the student who measured the yellow footprint using two different units of measurement?" b. Elicit participants' ideas about what a unit is and record them on chart paper. c. Note that identifying a unit is one of the challenges of using nonstandard measurement.
		What Does Measurement Mean? According to the National Council of Teachers of Mathematics (2000), "Measurement is the assignment of a numerical value to an attribute of an object, such as the length of a pencil. At more-sophisticated levels, measurement involves assigning a number to a characteristic of a situation, as is done by the consumer price index." Students begin to develop understandings of measurement by making simple comparisons, such as comparing two objects to figure out which is longer and which is shorter.	**Display Slide 44.** What Does Measurement Mean? (4 min) a. Read the basic and advanced definitions of *measurement* on the slide. b. Ask participants how they might support students' in developing early understandings of measurement in the science lessons.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		Teaching Students to Measure • For students to assign a numerical value to a specific attribute of an object, they must first be able to identify the attribute and then compare the attribute against some kind of unit. • To develop measurement sense in students, teachers should present problems that involve estimating and then measuring lengths.	**Display Slide 45.** Teaching Students to Measure (Less than 1 min) a. Walk participants through information on the slide.
			**Display Slide 46.** Sample Measurement Worksheet (2 min) a. Ask participants to examine and evaluate the sample measurement worksheet on the slide. b. Invite participants to share their observations and comments. Ask specifically what they think about including an estimate column on the data chart. c. Note that early in the year, teachers can include pictures for each of the objects to help students identify them more easily.
		Using Nonstandard Units of Measurement 1. Work **silently** with your partner to estimate the length and width of a sheet of paper in **nonstandard units**. How many paper clips or ladybugs long and wide is the paper? Record this estimate in your notebook. 2. Then work **silently** using one of the nonstandard measuring tools (the paper clips or the ladybug tape) to measure the length and width of the paper. Record these measurements in your notebook. 	**Display Slide 47.** Using Nonstandard Units of Measurement (6 min) a. "To deepen our understandings of nonstandard measurement, let's practice using nonstandard units to measure a standard piece of notebook paper. To measure the paper, you and a partner will use large paperclips or ladybug tape." b. **Pairs:** Have participants pair up with an elbow partner. Then give each pair several large paper clips and a few strips of ladybug tape (from handout 4.11). c. "First, estimate the length and width of the paper in

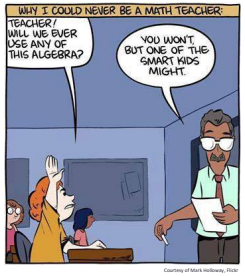
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			nonstandard units and write your estimate in your notebooks. Then use one of the nonstandard measuring tools to measure the length and width of the paper. Record your measurements in your notebooks."
		Using Nonstandard Units of Measurement • Compare your measurements with another team's measurements. • Was your estimate **exactly** right? • Did your team's measurements match the measurements of the other team **exactly**? • Why do you think the measurements might not be exactly the same? What are the challenges in measuring accurately? 	**Display Slide 48.** Using Nonstandard Units of Measurement (6 min) a. **Pairs:** Have participants share their results with another team. b. **Whole group:** Ask participants the questions on the slide.
		Standard or Nonstandard Units? • We often use **standard units** of measurement. These units are standard because they're always the same size, and they're universally available. • Sometimes we use **nonstandard units** of measurement. These units are nonstandard because we invent them, and they're unknown outside our local context. • It's acceptable to use standard or nonstandard units of measurement in the classroom depending on your immediate objectives.	**Display Slide 49.** Standard or Nonstandard Units? (3 min) a. Read the information about standard and nonstandard units of measurement on the slide b. "When do you think it's appropriate to use standard units of measurement? What about nonstandard units?" c. As participants share their ideas, record them on chart paper.

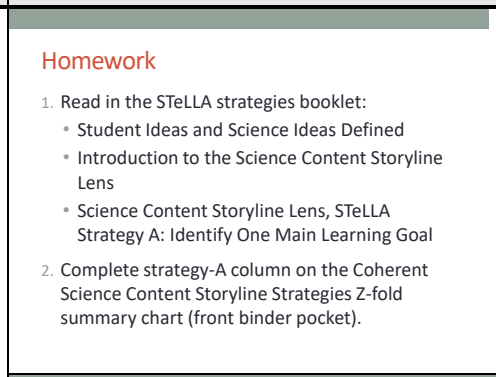
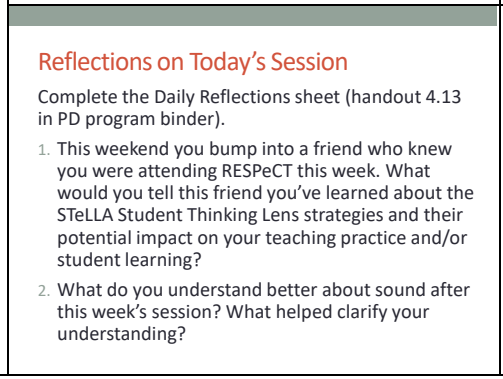
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 50.** "You" Units (2 min) a. "How many of you know your birth length? If so, here's a challenge for you: Calculate your current height in original 'you' units." b. Give participants a minute or two to consider how to use their birth length to figure out how many "you" units (including fractional units) represent their current height. c. Invite participants to share their results. Then ask them whether this would be a valuable activity for their students.
			**Display Slide 51.** Challenge: Measuring Distance (10 min) a. "Next, we'll measure the distance between objects or spaces in the room using nonstandard units of measurement." b. Distribute handout 4.12 (Measuring Distance) and walk participants through the instructions. c. **Pairs:** Have participants pair up with an elbow partner to complete the handout. d. Direct participants to use their own feet as a nonstandard measurement tool for at least three measurements. e. "As you're working on this activity, think about the challenges your students might encounter and how you would support them." f. **Whole group:** Following the activity, invite pairs to share their results. Then discuss the challenges students might encounter with the activity and how participants would support students.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 52.** How Would You Modify the Activity? (3 min) a. Introduce the questions on the slide and ask participants to consider how they would modify the activity and/or the handout to better support their students in developing measurement sense and achieving the Common Core standards. b. Elicit ideas from participants and record them on chart paper. **Key ideas to highlight:** • To work independently, younger students usually need picture cues for the objects they're going to measure. They could draw pictures of these objects on their handouts. • After record their feet measurements, students should share the results with the class. • It's appropriate for 1st- and 2nd-grade students to use tally marks or materials, such as markers, to record the number of units used. • Other math standards that could be incorporated into the activity are adding and comparing. • The handout might also need to be modified.
			**Display Slide 53.** Reasoning with Units (6 min) a. Read the questions on the slide. b. **Think-Pair-Share:** Have participants take a moment of think time to consider how they would use each unit of measurement. Then ask them to share their ideas with an elbow partner. c. **Whole group:** Invite participants to share their ideas with the group. Record key ideas on chart paper.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		Measurement Challenges • Whether to use standard or nonstandard measurement units for a specific task • Using the same unit(s) throughout a task • For repeated measurements, a major challenges is placing the measurement tool (such as a ruler) in the exact spot where the previous measurement ended. Even slight placement errors are multiplied as the task progresses. For example, when measuring a 20-foot wall, even a small overlap or gap of a quarter inch multiplied by the 20 times the ruler is moved turns into a rather substantial error of five inches by the time the measurements are completed.	**Display Slide 54.** Measurement Challenges (4 min) a. Read through the measurement challenges on the slide. b. **Pairs:** Have participants pair up and discuss how they might solve each challenge. c. **Whole group:** Invite participants to share their ideas for solving the challenges associated with implementing the measurement standard.
		Attending to Precision • Which mark on the ruler is **closest** to the right edge of the battery? • Is a measurement of 2 inches close enough, or should the answer be more precise, such as $1\frac{7}{8}$ inches or **exactly** $1\frac{14}{16}$ inches? 	**Display Slide 55.** Attending to Precision (2 min) a. "One important Common Core practice standard is attending to precision. How can we achieve this standard in our teaching and support our students in attending to precision as well?" b. Present the scenario on the slide and elicit participants' ideas about how they would attend to precision using nonstandard measurement tools in this scenario and support their students in this practice.
		Working with Measurement Tools • The markings on some wooden or plastic rulers begin at the very edge of the ruler. But that isn't always the case. • It's essential that students learn to examine their rulers to determine where the markings begin and then measure accordingly.  	**Display Slide 56.** Working with Measurement Tools (2 min) a. Read the information on the slide. b. Elicit ideas from participants about how they can support students in learning to work with measurement tools. Also discuss how this relates to the practice standard of attending to precision.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		Reflect: Supporting Students When working with measurements, students encounter many issues at once: recognizing the attribute, identifying the unit, deciding on the level of precision, and making mental calculations. • How can you best support your students in developing measurement sense? • Jot down your ideas in a quick write. 	**Display Slide 57.** Reflect: Supporting Students (3 min) a. Present the quick-write challenge and question on the slide. b. **Individuals:** Ask participants to reflect on the question for a moment and then jot down their ideas in a quick write. c. **Whole group:** Invite participants to share their ideas with the group. Record key ideas on chart paper.
		Where Does Measurement Fit? Research shows that students need experiences that help them understand why measurement is necessary and helpful. • How does measurement relate to science content? Where does it fit? • How can we incorporate this math standard into our science lessons?	**Display Slide 58.** Where Does Measurement Fit? (1 min) a. "How does measurement relate to science content? Where does it fit? How can we incorporate this math standard into our science lessons?" b. Relate the Common Core measurement standard to the science content and elicit ideas of how participants could incorporate it into the lessons.
		Reflect: Content Deepening Focus Question 2 What does nonstandard measurement look like?	**Display Slide 59.** Reflect: Content Deepening Focus Question 2 (5 min) a. Review the focus question on the slide. b. **Individuals:** Have participants answer the question in their science notebooks using what they've learned about sound this week. c. **Whole group:** Invite a few participants to share their responses. Record key ideas and evidence on chart paper.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		End with a Smile!  	**Display Slide 60.** End with a Smile! (Less than 1 min) a. "Since we started our content deepening session with a smile, let's wrap it up the same way!"
3:15–3:30 15 min **Wrap-Up: Summary, Homework, and Reflections** Slides 61–64	**Purpose** • Summarize and reflect on key ideas from today's learning and preview the transition to the Science Content Storyline Lens (SCSL) strategies. **What Participants Do** • Review today's focus questions. • Share key ideas from the lesson analysis (strategy 6), lesson plan review, and content deepening work. • Copy down the homework assignment. • Write their reflections on today's learning. **Handouts in PD Binder** • 4.13 Daily Reflections—Day 4 **Supplies** • Science notebooks	Today's Focus Questions 1. Why is it necessary to engage students in using and applying new science ideas in a variety of ways and contexts? 2. How will the Student Thinking Lens strategies help you teach the Sound lessons? 3. Why do we heart sound? 4. What does nonstandard measurement look like?	**Display Slide 61.** Today's Focus Questions (2 min) a. Review today's focus questions. b. **Individual think time (1 min):** Ask participants to reflect on these questions and think about how they might revise their answers.
		Let's Summarize! **Lesson Analysis Strategy 6** • What new understandings did you develop? • What do you still have questions about? **Lesson Plans Review** • What new insight(s) did you gain? • What do you still have questions about? **Content Deepening** • What did you learn? • What do you still have questions about?	**Display Slide 62.** Let's Summarize! (5 min) a. **Individual think time (1 min):** Give participants a minute to think about the questions on the slide and consider questions they still have. Challenge them to formulate a statement summarizing what they learned in each area. b. **Whole-group share-out:** Have participants share at least two different statements about each of the areas on the slide. Elicit more if time allows.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 63.** Homework (3 min) a. "Next week we'll focus on the Science Content Storyline Lens strategies and explore a new content area: variations in plants and animals. To prepare, complete the homework tasks on the slide." b. Make sure participants copy the assignment into their science notebooks.
			**Display Slide 64.** Reflections on Today's Session (5 min) a. Give participants time to reflect on today's session and write their responses to the questions on the Daily Reflections sheet (handout 4.13 in PD program binder).