RESPeCT Summer Institute Professional Development Leader Guide (PDLG)

Grade Level	2	Day	7	STeLLA Strategy	SCSL Strategy D: Select Content Representations and Models	Subject Matter Focus	Earth's Changing Surface (ECS)

Focus Questions	• How do you know when a content representation is appropriate and matched to the main learning goal? • How can we engage students in using content representations and models in meaningful ways? • How quickly or slowly do landforms change over time? How do we know? • Can we explain how landforms change in our area?
Main Learning Goals	Participants will understand the following: • Content representations can be helpful tools if they're matched to the learning goal of a lesson, are scientifically accurate, and address common student misconceptions. In addition, they must be comprehensible to students without reinforcing or introducing misconceptions and without distracting students with too many details or new terms. • To ensure meaningful learning from content representations, students need to be engaged in modifying or creating the representations, in analyzing their meaning, and in critiquing them. • Earth's surface is always changing. Some changes happen very slowly over a long period of time, and other changes happen quickly. • The surface of Earth has many types of landforms, including bodies of water, that are always changing. Some changes happen quickly, and some happen very slowly. Flowing water is one process that can change landforms quickly or slowly over time.

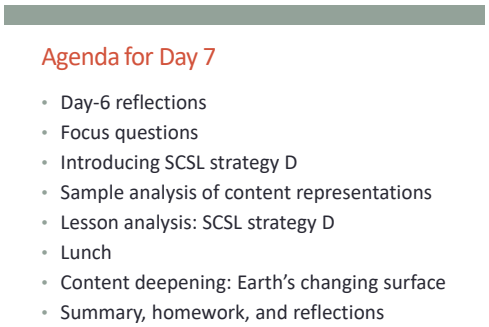
Preparation	Materials	Videos
Daily Setup Tasks • Check that video clips are correctly linked to PowerPoint (PPT) slides. • Set up PowerPoint. • Make sure video clips play correctly with good sound. • Arrange furniture and food. • Arrange participant materials. • Put up posters and charts. **Planning and Preparation Tasks** • Study the PDLG, PowerPoint slides (PPTs), video clips, and handouts. Make changes to PPTs if needed. • Review the reflections from day 6 and create a summary slide.	**Posters and Charts** • STeLLA Framework and Strategies poster • Day-7 Agenda (chart) • Norms for Working Together (chart) • Day-7 Focus Questions (chart) • Strategy charts from days 1–6 (STL strategies 1–7 and SCSL strategies A, B, C, and I) • Parking Lot poster **Handouts in RESPeCT PD Binder Front Pocket** • Z-fold summary chart: Science Content Storyline Lens Strategies **Handouts in RESPeCT PD Binder, Day 7** • 7.1 Analysis Guide D: Selecting and Using	• Video Clip 7.1: Poulsen classroom (strategy D); 7.1_mspcp_gr.2_ecs_poulsen_L2_c5 • Video Clip 7.2: Poulsen classroom (strategy D); 7.2_mspcp_gr.2_ecs_poulsen_L5_c5

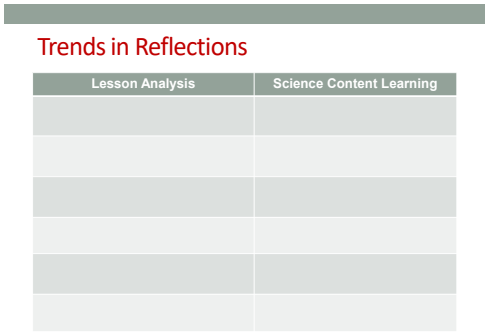
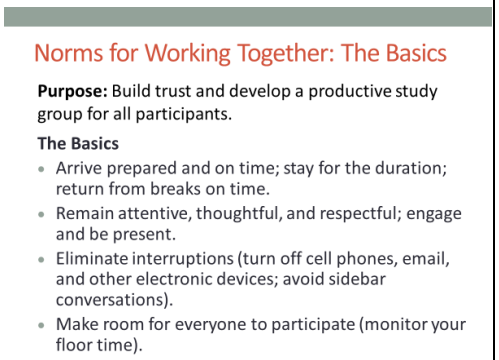
• Watch the video clips and anticipate participant responses. • Prepare charts for the day's agenda and focus questions. • Review the activities for ECS lessons 5a/b and 6a/b in the lesson plans binder.	Content Representations (3 copies) • 7.2 Transcript for Video Clip 7.1 • 7.3 Transcript for Video Clip 7.2 • 7.4 Daily Reflections—Day 7 **Handouts in RESPeCT Lesson Plans Binder** • 5.1 The Grand Canyon (from ECS lesson 5a) • 5.2 Deltas (from lesson 5a) • 5.3 Landslides (from lesson 5b) **Supplies** • Science notebooks • Chart paper and markers **PD Resources** • STeLLA strategies booklet • RESPeCT PD program binder • RESPeCT lesson plans binder **Resources in Lesson Plans Binder** *Resources section:* • Earth's Changing Surface Content Background Document • Common Student Ideas about Earth's Changing Surface	

DAY 7 SESSION OUTLINE

Time	Activities	Purpose
8:00–8:25 25 min	**Getting Started: Housekeeping, Agenda, Day-6 Reflections, Norms, Focus Questions**	• Build community by sharing participants' reflections from day 6. • Set the stage for a day of learning.
8:25–9:00 35 min	**Introducing SCSL Strategy D**	• Deepen participants' knowledge of the purpose and key features of SCSL strategy D.
9:00–10:20 80 min (Includes 10-min break)	**Sample Analysis of Content Representations**	• Develop participants' ability to analyze content representations to determine how well they match the main learning goal. • Deepen participants' science-content knowledge as it emerges from analyzing content representations.
10:20–12:00 100 min	**Lesson Analysis: SCSL Strategy D**	• Develop participants' ability to analyze content representations to determine how well engaged students are in their use. • Use lesson analysis of classroom videos to better understand STeLLA strategy D. • Deepen participants' science-content knowledge of Earth's changing surface through lesson analysis.
12:00–12:45 45 min	**LUNCH**	
12:45–3:15 150 min (Includes 10-min break)	**Content Deepening: Earth's Changing Surface**	• Deepen participants' understandings of the science content that is part of the Earth's Changing Surface lesson series. • Deepen participants' science-content knowledge of Earth's changing surface by conducting investigations from ECS lessons 5 and 6.
3:15–3:30 15 min	**Wrap-Up: Summary, Homework, and Reflections**	• Summarize and reflect on key ideas about SCSL strategies A, B, C, D, and I and the ECS science content, lesson plans, and lesson analysis work.

DAY 7

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
8:00–8:25 25 min **Getting Started** Slides 1–7	**Purpose** • Build community by sharing participants' reflections from day 6. • Set the stage for a day of learning. **What Participants Do** • Review the day's agenda. • Discuss reflections from day 6. • Review and discuss progress on the RESPeCT program norms. • Read today's focus questions. **Posters and Charts** • STeLLA Framework and Strategies poster • Day-7 Agenda (chart) • Norms for Working Together (chart) • Day-7 Focus Questions (chart)		**Display Slide 1.** RESPeCT PD Program (5 min) a. Take care of any housekeeping issues.
			**Display Slide 2.** Agenda for Day 7 (5 min) a. Talk through the agenda for the day.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 3.** Trends in Reflections (5 min) a. Give participants time to review your feedback on their reflections from day 6 and offer reactions, comments, or follow-up questions.
			**Display Slide 4.** Norms for Working Together: The Basics (2 min) a. Review the norms and ask participants to think about areas where they could improve individually or as a group. b. "How do you think we're doing individually and as a group applying these norms? Do you have any comments or suggestions about areas where we could improve?"

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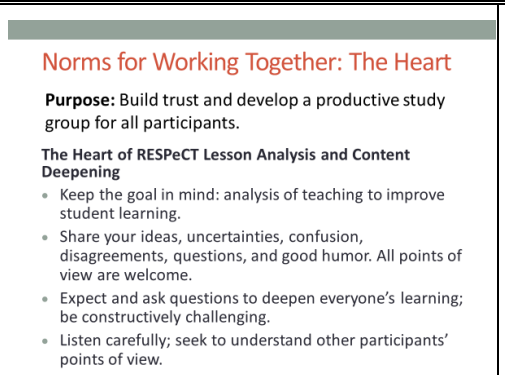	**Display Slide 5.** Norms for Working Together: The Heart (5 min) a. Review the norms that are at the heart of the RESPeCT program and ask participants to think about areas where they could improve individually or as a group. b. **Emphasize:** "We're doing quite well with our norms, but as we approach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

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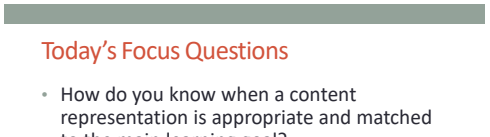
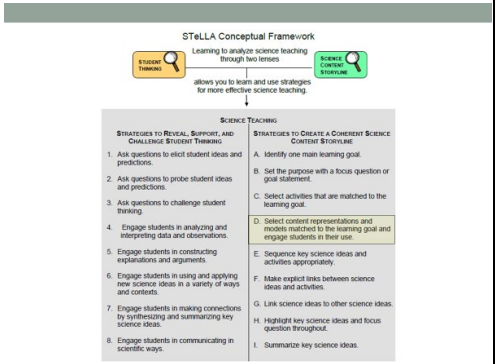
			**Display Slide 6.** Today's Focus Questions (1 min) a. Introduce the focus questions on the slide.
			**Display Slide 7.** STeLLA Conceptual Framework (2 min) a. "We'll be focusing on STeLLA strategy D today. Notice that this SCSL strategy has two parts. The first part—select content representations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

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

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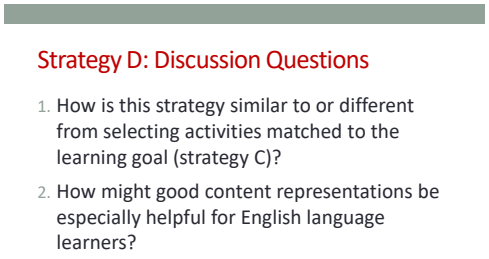
	PD Resources • STeLLA strategies booklet • SCSL Z-fold summary chart (front pocket of PD binder)		closely matched to the main learning goal, they can be especially useful in helping students see how the science content storyline fits together. • There are many different types of content representations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

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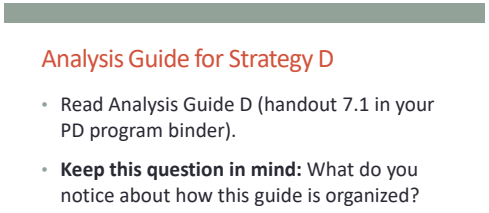
			in addition to words.
9:00–10:20 80 min (Includes 10-min break) **Sample Analysis of Content Representations** Slides 11–20	**Purpose** • Develop participants' ability to analyze content representations to determine how well they match the main learning goal. • Deepen participants' science-content knowledge as it emerges from analyzing content representations. **Content** • Six criteria are used in analyzing and selecting a content representation that is matched to the main learning goal. • There are distinct names for landforms, but landforms aren't separate from one another in the real world; they're always connected. The land is contiguous from one landform to another. Mountains give way to valleys and rivers, and canyons are sometimes carved into mountains. When using images or models of landforms, it's important to understand that multiple landforms will always be present, and students may see and/or emphasize different landforms. • Water typically changes the land very slowly over time. Stream-table models are intended to		**Display Slide 11.** Analysis Guide for Strategy D (6 min) a. Have participants locate Analysis Guide D in their PD program binders (handout 7.1). b. **Individuals:** "As you read the analysis guide, keep in mind the discussion question on the slide." c. **Whole group:** Discuss the question on the slide. **Key ideas:** • This analysis guide focuses on the main learning goal by having participants write that down first. • The guide is divided into three parts. Part 1 focuses on how well matched the content representation is to the main learning goal. Part 2 focuses on how well engaged students are in using the content representation. • The guide ends with identifying ways to improve the content representation and its use in a lesson (part 3).

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	replicate the processes of erosion and deposition in a faster time frame, but they can't accurately represent the varying degrees in which materials break down or the different forces needed to move those materials over long distances and periods of time. **What Participants Do** • Study how Analysis Guide D is organized. • Use the analysis guide to analyze three examples of ECS content representations (drawn from content deepening sessions or ECS lessons). **Handouts in PD Binder** • 7.1 Analysis Guide D (3 copies) **PD Resources** • STeLLA strategies booklet • RESPeCT lesson plans binder	Content Representation 1: Photograph of Valley Landscape Read the main learning goal and the description of the content representation in **Analysis Guide D1** (page 1 of handout 7.1).	**Display Slide 12.** Content Representation 1: Photograph of Valley Landscape (2 min) a. **Set the context:** "Now we're going to analyze a content representation to see how well it's matched to the stated learning goal." b. Have participants read the main learning goal and the description of the content representation in **Analysis Guide D1** (page 1 of handout 7.1).
		Content Representation 1: Photograph of Valley Landscape 	**Display Slide 13.** Content Representation 1: Photograph of Valley Landscape (8 min) a. **Individuals:** Have participants work independently on part 1 of Analysis Guide D1. b. **Pairs:** "Now pair up and discuss your answers to the analysis questions."

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		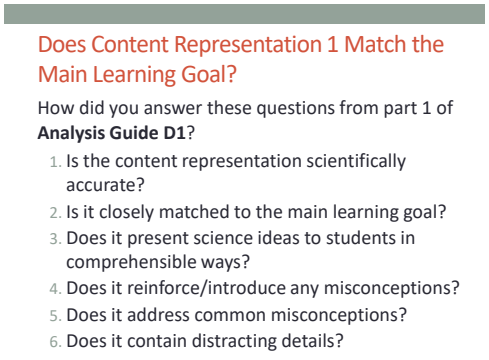	**Display Slide 14.** Does Content Representation 1 Match the Main Learning Goal? (10 min) a. **Whole group:** Discuss participants' responses to the questions in part 1 of Analysis Guide D1. (See ideal responses below.) b. **Ask:** "How might this content representation be improved? Would you use it with your students?" **Ideal responses for Analysis Guide D1 (part 1):** • **Question 1:** This photograph accurately shows landforms on Earth. • **Question 2:** This content representation is closely matched to the learning goal. The picture shows different types of landforms (valley, hills, cliffs, mountains) and a body of water (lake or ocean). A river may also run through the valley. • **Question 3:** Although the picture is comprehensible, it could confuse students because it illustrates other landforms and bodies of water in addition to the valley landscape (e.g., mountains or hills, an ocean, and possibly a river or canyon at the lowest part of the valley). • **Question 4:** This content representation is unlikely to introduce misconceptions, but it might reinforce the idea that all valleys look like the one in the photo and are always located away from cities and towns. The teacher could emphasize that valleys can be much broader than the one in the photo and can be located in urban

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			areas (e.g., the San Fernando Valley). • **Question 5:** This representation could be used to address the common student misconception that trees, plants, and grass are landforms. • **Question 6:** This image was purposefully chosen to reduce distracting details (such as urban features) so that students will focus on the shape of the land. **Key idea:** While landforms have specific or distinct names, they aren't separate from one another in the real world. Landforms are always connected, and the land is contiguous from one landform to another. Mountains give way to valleys and rivers, and canyons are sometimes carved into mountains. When using images or models of landforms, it's important to understand that multiple landforms will always be present, so the teacher will need to highlight the landform(s) in focus. **Take-home message:** Trying to address all six criteria in the analysis guide is a balancing act or trade-off. To make complex science ideas meaningful and comprehensible to students, the content representation needs to be simplified, but simplifications can sometimes be misleading in terms of scientific accuracy. The important thing is for teachers to be aware of such problems so they can be addressed.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		Content Representation 2: Raised Relief Map Read the main learning goal and the description of the content representation in **Analysis Guide D2** (page 2 of handout 7.1).	**Display Slide 15.** Content Representation 2: Raised Relief Map (5 min) a. Set the context for analyzing another content representation. b. Have participants turn to **Analysis Guide D2** (page 2 of handout 7.1) and read the main learning goal and description of the content representation.
		Content Representation 2: Raised Relief Map 	**Display Slide 16.** Content Representation 2: Raised Relief Map (7 min) a. **Individuals:** Have participants work independently on part 1 of Analysis Guide D2. **Note:** If time is short, just do partner work. b. **Pairs:** "Now pair up and discuss your answers to the analysis questions."

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		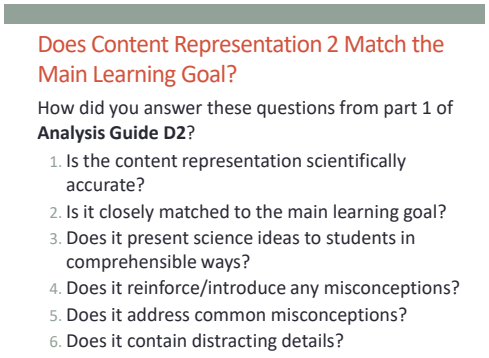	**Display Slide 17.** Does Content Representation 2 Match the Main Learning Goal? (10 min) a. **Whole group:** Discuss participants' responses to the questions in part 1 of Analysis Guide D2. (See ideal responses below.) b. **Ask:** "How might this content representation be improved? Would you use it with your students?" **Ideal responses for Analysis Guide D2 (part 1):** • **Question 1:** Raised relief maps aren't scientifically accurate because they use exaggerated vertical scaling to illustrate changes in the terrain more effectively. Consequently, mountains on a relief map don't accurately reflect the scale or elevation of real mountains. • **Question 2:** This content representation is closely matched to the main learning goal and is a good choice for illustrating how the land is different in different places. • **Question 3:** Most 2nd graders are familiar with maps but may never have used a raised relief map, so they'll need some support in understanding what the map is showing and perhaps some assistance identifying the types of landforms from a different perspective. So far, students have seen pictures of landforms and built models out of sand, but now they're observing landforms from a bird's-eye view. Some students do well transitioning

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			from a portrait view (looking at a picture from eye level) to a bird's-eye view (looking at a picture from above), but some students will need help. • **Question 4:** This map isn't likely to reinforce any student misconceptions. Even though it exaggerates the vertical scale of landforms, the rest of the map is highly accurate, and the variety of landforms is very close to what people see in the real world from one place to another. • **Question 5:** Using a relief map can help students with limited firsthand experience of landforms in other locations understand how landforms can vary from one place to another. It can also help them distinguish between the shape of the land itself and structures that humans have built on the land. • **Question 6:** This map was purposefully chosen to help students focus on the shape of the land (physical features). To avoid distracting details, the map excludes most human-made structures (small towns, roads), with the exception of some major cities. **Take-home message:** Trying to address all six criteria in the analysis guide is a balancing act or trade-off. To make complex science ideas meaningful and comprehensible to students, the content representation needs to be simplified, but simplifications can sometimes be misleading in terms of scientific accuracy. The important thing is for teachers to be aware of such problems so they can be addressed.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		Content Representation 3: Stream-Table Model Read the main learning goal and the description of the content representation in **Analysis Guide D3** (page 3 of handout 7.1).	**Display Slide 18.** Content Representation 3: Stream-Table Model (5 min) **Note**: If time is running short, this content representation can be skipped. a. Set the context for analyzing one more content representation. b. Have participants turn to **Analysis Guide D3** (page 3 of handout 7.1) and read the main learning goal and description of the content representation.
		Content Representation 3: Stream-Table Model  	**Display Slide 19.** Content Representation 3: Stream-Table Model (7 min) a. **Individuals:** Have participants work independently on part 1 of Analysis Guide D3. **Note:** If time is short, just do partner work. b. **Pairs:** "Now pair up and discuss your answers to the analysis questions."

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		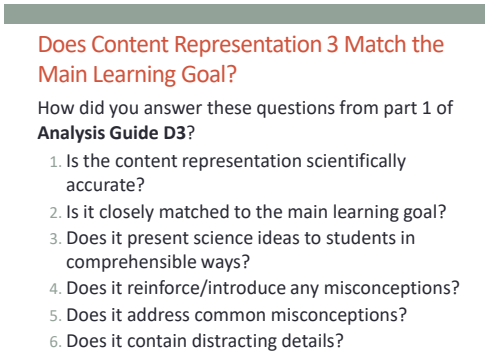	**Display Slide 20.** Does Content Representation 3 Match the Main Learning Goal? (10 min) a. **Whole group:** Discuss participants' responses to the questions in part 1 of Analysis Guide D3. (See ideal responses below.) b. **Ask:** "How might this content representation be improved? Would you use it with your students?" **Ideal responses for Analysis Guide D3 (part 1):** • **Question 1:** This content representation isn't very accurate from a scientific standpoint. Stream tables model erosion and deposition at much quicker rates than in nature and don't account for how long different materials take to break down or the force necessary to move them. A stream table also depicts only a small, simple snapshot of a much larger, more complicated system. However, they do a good job illustrating how water can move soil and rock from one place to another. • **Question 2:** The stream-table model closely matches the main learning goal by showing how water can carry soil and rock from one place to another. But it's a highly simplified version of the real-world process. • **Question 3:** The model is comprehensible to students, since they're able to observe the flow of water and the movement of soil and rock. The difficult part for students is translating what

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			happens in the model to what happens in the real world. • **Question 4:** Stream tables can sometimes reinforce the student misconception that land only changes during floods (i.e., if water is flowing quickly). Using such a small-scale model can also make it difficult for students to wrap their heads around the large scale at which erosion happens or imagine how water can carve out an enormous landform like the Grand Canyon. • **Question 5:** Stream-table models address and challenge the common student idea that the land essentially stays the same. By showing how water is powerful enough to carry dirt and rock from one place to another, stream tables help students understand how the land can change. • **Question 6:** Creating rain with the spray bottles might distract students from focusing on the river as the primary mechanism for carving out the Grand Canyon. Although rain is one source of the water that flows through the canyon and is therefore a contributing factor in forming the canyon, the Colorado River is the primary mechanism. **Take-home message:** Trying to address all six criteria in the analysis guide is a balancing act or trade-off. To make complex science ideas meaningful and comprehensible to students, the content representation needs to be simplified, but simplifications can sometimes be misleading in terms of scientific accuracy. The important thing is for teachers to be aware of such

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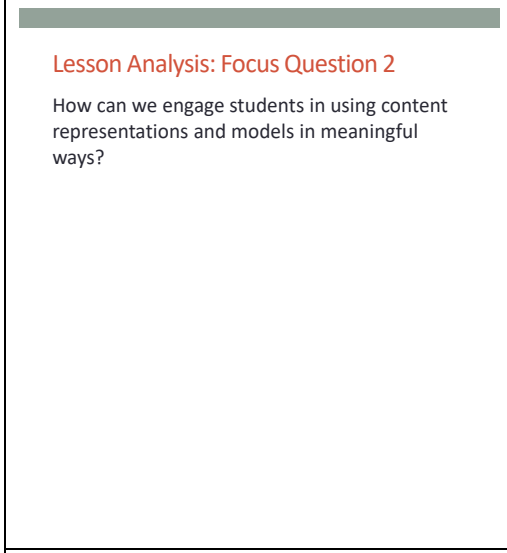
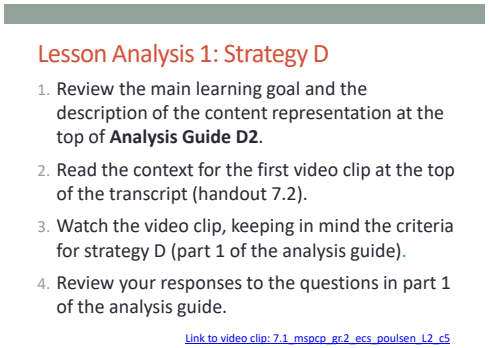
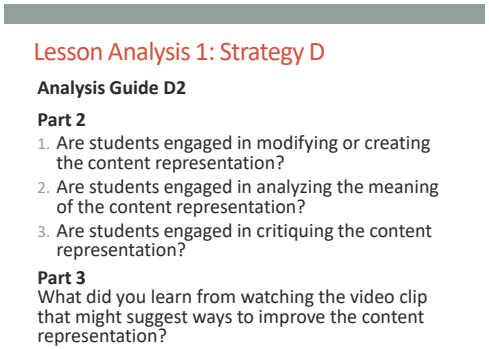
			problems so they can be addressed.
10:10–10:20 10 min	**BREAK**		
10:20–12:00 100 min **Lesson Analysis: SCSL Strategy D** Slides 21–26	**Purpose** • Develop participants' ability to analyze content representations to determine how well engaged students are in their use. • Use lesson analysis of classroom videos to better understand STeLLA strategy D. • Deepen participants' science-content knowledge of Earth's changing surface through lesson analysis. **Content** • Six criteria are used in analyzing and selecting a content representation that is well matched to the main learning goal. • Three criteria are used in analyzing how well teachers engage students in using content representations. **What Participants Do** • Use Analysis Guide D to analyze student engagement with content representations in three video clips. • Use the analysis guide to analyze how well the content	 	**Display Slide 21.** Lesson Analysis: Focus Question 2 (Less than 1 min) a. **Transition slide:** "Next we'll watch two video clips of strategy D in use during an ECS lesson. For this analysis, we'll focus on parts 2 and 3 of the analysis guide: *How well engaged are students in using the content representation? And what suggestions do you have for improving the content representation and its use with students?"* **Note:** Participants have already analyzed the content representations in these clips (relief map and stream-table model) using part 1 of Analysis Guide D. **Display Slide 22.** Lesson Analysis 1: Strategy D (10 min) a. Have participants take out **Analysis Guide D2** and review the main learning goal and description of the content representation. b. Then ask participants to read the context for the first video clip at the top of the transcript (handout 7.2 in PD binder). c. Show the video clip. d. Have participants' review their responses

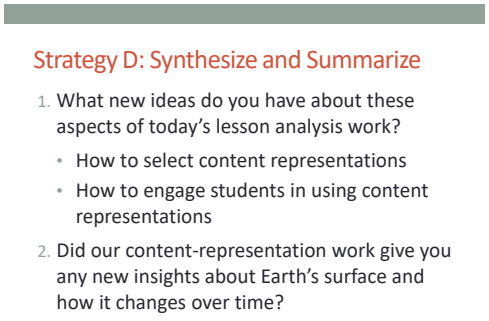
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
	representation matches the main learning goal in the third video clip. • Identify key ideas participants have learned about strategy D and the science content from the lesson analysis work. **Videos** • Video Clip 7.1, Poulsen classroom • Video Clip 7.2, Poulsen classroom **Handouts in PD Binder** • 7.1 Analysis Guide D • 7.3 Transcript for Video Clip 7.1 • 7.4 Transcript for Video Clip 7.2 • 7.5 Transcript for Video Clip 7.3 **PD Resources** • STeLLA strategies booklet • RESPeCT lesson plans binder • SCSL Z-fold summary chart (front pocket of PD binder) **Resources in Lesson Plans Binder** *Resources section:* • Content background document		to the questions in part 1 of the analysis guide before moving on to parts 2 and 3. **Display Slide 23.** Lesson Analysis 1: Strategy D (35 min) a. "Now let's turn our attention to part 2 of strategy D, which engages students in using content representations. We'll also consider ways the content representation could be improved." b. **Individuals:** "Study the video transcript and think about parts 2 and 3 of **Analysis Guide D2**. Be ready to share evidence that supports your conclusions." c. **Pairs:** "Now pair up with an elbow partner and compare your conclusions about student engagement with the content representation." d. **Whole group:** Review participants' responses to parts 2 and 3 of the analysis guide. Challenge participants to support their answers with evidence from the video transcript. e. If it didn't come up in the discussion, ask participants, "How might the teacher have engaged these students in analyzing or critiquing the representation?" **Ideal responses for Analysis Guide D2:** **Part 2:** • In this video clip, students focus on analyzing the meaning of the content representation rather than creating, modifying, or critiquing it. Students are engaged in trying to understand what the

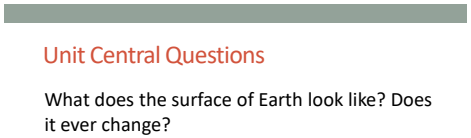
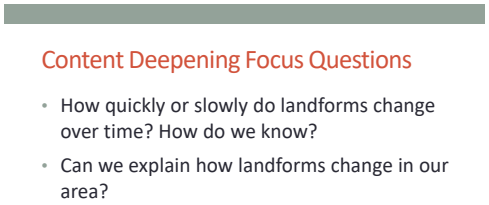


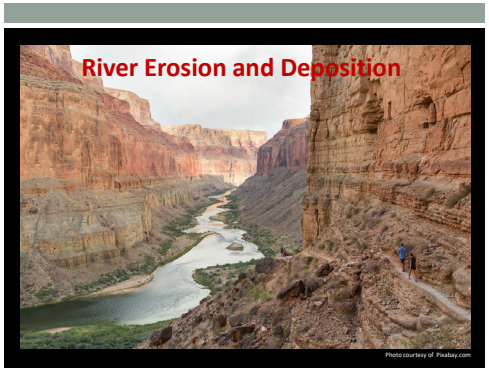
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			relief map is showing them and where landforms are located on the map. **Part 3:** • As students engage with this content representation, they mostly describe what they see on the relief map. Some students connect the bumpy or rough features of the map to landforms. • There is a missed opportunity to probe student thinking about why they said the map looks "real." For example, the teacher could have asked students, "What do you mean by "real"? and "How is this map different from the real world?" [*Answer:* The landforms on the map are much, much smaller than real landforms, but they can help us student the shape of the land.] • The teacher could improve her introduction by having students point out specific features on the relief map (e.g., "Where do you see mountains?" "What about this flat area? What would we call this?" "Where are we located on the map?" "What do you see around our area?").

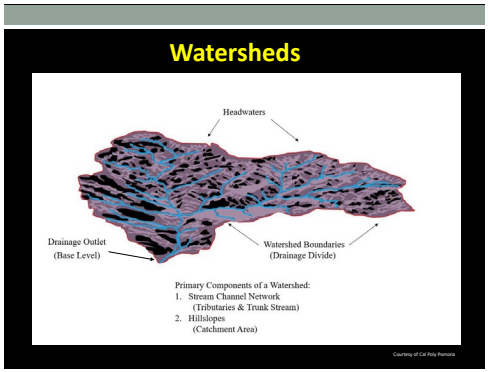
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		Lesson Analysis 2: Strategy D 1. Review the main learning goal and the description of the content representation at the top of **Analysis Guide D3**. 2. Read the context for the first video clip at the top of the transcript (handout 7.3). 3. Watch the video clip, keeping in mind the criteria for strategy D (part 1 of the analysis guide). 4. **Pairs:** Review your responses to the questions in part 1 of the analysis guide. Then complete parts 2 and 3. Link to video clip: 7.2_mspcp_gr.2_ecs_poulsen_L5_c5	**Display Slide 24.** Lesson Analysis 2: Strategy D (25 min) a. Have participants take out **Analysis Guide D3** and review the main learning goal and description of the content representation. b. Then ask participants to read the context for the second video clip at the top of the transcript (handout 7.3 in PD binder). c. "Next, we'll watch a new classroom video and examine how students are (or are not) engaged in using the content representation. Like our last analysis, we'll focus only on parts 2 and 3 of the analysis guide." d. Show the video clip. e. **Pairs:** Have participants pair up and review their responses to the questions in part 1 of the analysis guide before completing parts 2 and 3.
		Lesson Analysis 2: Strategy D **Analysis Guide D3** **Part 2** 1. Are students engaged in modifying or creating the content representation? 2. Are students engaged in analyzing the meaning of the content representation? 3. Are students engaged in critiquing the content representation? **Part 3** What did you learn from watching the video clip that might suggest ways to improve the content representation?	**Display Slide 25.** Lesson Analysis 2: Strategy D (20 min) a. **Whole group:** Discuss participants' responses to parts 2 and 3 of **Analysis Guide D3**. Challenge participants to support their answers with evidence from the video transcript. b. If it didn't already come up in the discussion, ask participants, "How might the teacher have engaged these students in analyzing or critiquing the

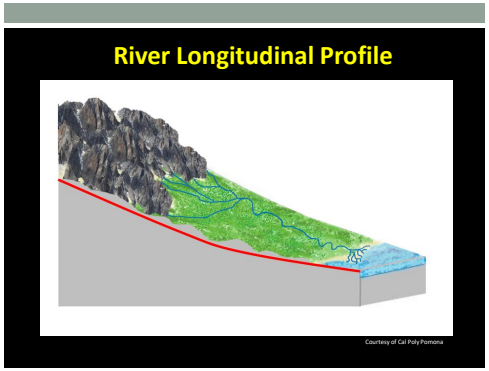
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			representation?" **Ideal responses for Analysis Guide D3:** **Part 2:** • In this video clip, students focus on analyzing the meaning of the content representation rather than creating, modifying, or critiquing it. Students are engaged in making observations about the stream-table model before the demonstration begins. The teacher uses questioning strategies to help students understand what different parts of the model represent in the real world and connect the model to what they're learning about the Grand Canyon. **Part 3:** • There are missed opportunities to probe students' observations of the model to find out what they see (e.g., grass, mountains, Grand Canyon). It's hard to tell what students see, since the model starts off as a flat surface (a plain). One solution might be to ask students to point out specific landforms on the model before and after the demonstration. • Students seem to think they're observing a model of the Grand Canyon because it's been discussed in previous lessons. The teacher could challenge students to describe the Grand Canyon and compare that description to the model. Students should realize that since the model has a flat surface before the demonstration, it doesn't represent the Grand Canyon. The demonstration shows how canyons, like the Grand Canyon, are formed.

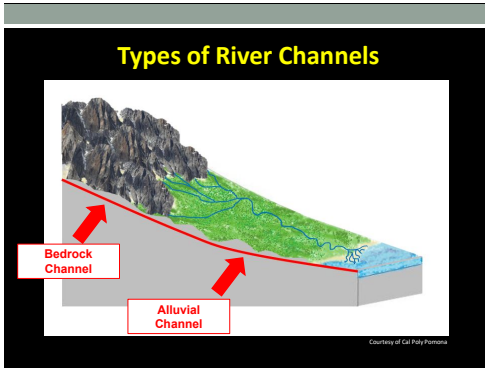
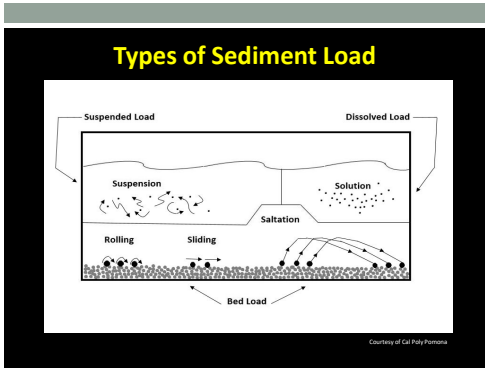
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 26.** Strategy D: Synthesize and Summarize (10 min) a. **Individuals (5 min):** Have participants work on the slide questions. Encourage them to use their resources (e.g., the strategies booklet, their Z-fold summary charts, the content background document, notes they've taken). b. **Whole group (5 min):** Have participants share their new ideas for each question in a round-robin format, if time allows. Otherwise, have a couple of volunteers share their ideas for each question.
12:00–12:45 45 min	**LUNCH**		
12:45–3:15 150 min (Includes 10-min break) **Content Deepening: Earth's Changing Surface** Slides 27–66	**Purpose** • Deepen participants' understandings of the science content that is part of the Earth's Changing Surface lesson series. • Deepen participants' science-content knowledge of Earth's changing surface by conducting investigations from ECS lessons 5 and 6. **Content** • Earth's surface has many types of landforms, including bodies of water, that are always changing.		**Display Slide 27.** Content Deepening: Earth's Changing Surface (Less than 1 min) a. **Transition:** This slide marks the transition to the content deepening phase of the session. **Note:** Throughout this content deepening phase, refer as needed to the content background document and Common Student Ideas about Earth's Changing Surface.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
	Some changes happen quickly, and some changes happen very slowly over a long period of time. Flowing water is one process that can change landforms quickly or slowly over time. **What Participants Do** • Explore and discuss key science ideas about erosion and deposition. • Define a delta and a landslide. • Investigate three different landforms in the United States and decide whether these landforms are changing quickly or slowly. • Review what they've learned about landforms. • Brainstorm examples of landform changes around Pomona. • Work on a use-and-apply challenge, using key ideas about landforms to determine whether cliffs along a coastline are changing. **Handouts in Lesson Plans Binder** • 5.1 The Grand Canyon (from ECS lesson 5a) • 5.2 Deltas (from lesson 5a) • 5.3 Landslides (from lesson 5b) **Supplies** • Science notebooks • Chart paper and markers		**Display Slide 28.** Unit Central Questions (Less than 1 min) a. Review the unit central questions on the slide. b. Remind participants that these questions will guide student learning throughout the entire ECS unit.
			**Display Slide 29.** Content Deepening Focus Questions (Less than 1 min) a. Review the content deepening focus questions on the slide.

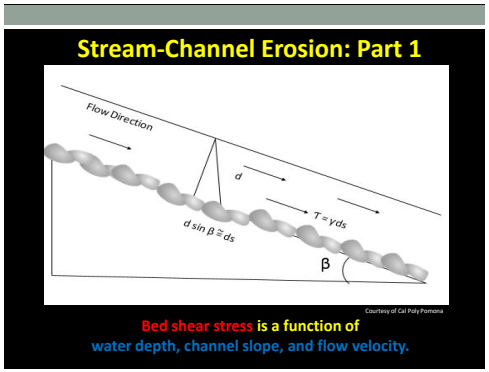
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
	PD Resources • RESPeCT lesson plans binder **Resources in Lesson Plans Binder** *Resources section:* • Content background document • Common Student Ideas		**Display Slide 30.** Earth's Changing Surface: Content Deepening (Less than 1 min) a. "Today's content deepening work will focus on science ideas about Earth's changing surface from ECS lessons 5 and 6."
			**Display Slide 31.** River Erosion and Deposition (Less than 1 min) a. "Let's review some key science ideas about erosion and deposition." b. "This slide shows the Colorado River flowing through the Grand Canyon. It's a familiar example of a river eroding its bed and cutting through hard rock to carve out a canyon. The flowing water erodes the rock and carries sediment away to be deposited somewhere else downstream, such as behind a dam or in the Colorado River delta at the Gulf of California."

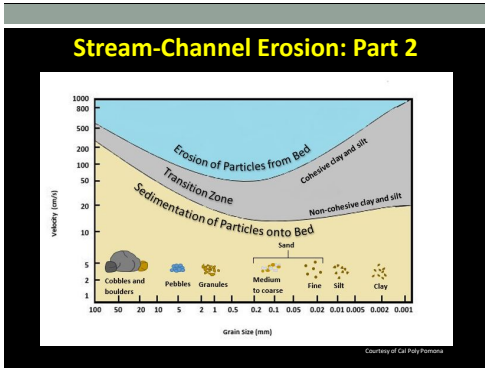
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 32.** Watersheds (3 min) a. "To understand river erosion and deposition, we must first understand the concept of a watershed, sometimes called a *drainage basin*." b. "A *watershed* is an area of Earth's surface drained by a particular river. *Drainage divides*, like those on the slide, are boundaries that separate a watershed from neighboring watersheds. These divides are high points, like ridgelines, that surround a watershed." c. "*Headwaters* mark the upper end of a watershed, and the lower end is called a *drainage outlet* or *base level*. The outlet is the lowest elevation point in the watershed where the main river or stream flows out of the basin." d. "The main river or stream in the watershed is called the *trunk river* or *trunk stream*. Smaller streams or rivers that feed into the trunk stream are called *tributaries*. Together, a trunk stream and its tributaries make up a *stream channel network* that funnels rain runoff and sediment from the landscape into the trunk stream." e. "*Hill slopes* are located between stream channels. In this area of land, precipitation either infiltrates or soaks into the ground or flows downhill into a stream channel as runoff." f. "A *watershed* is a natural system that

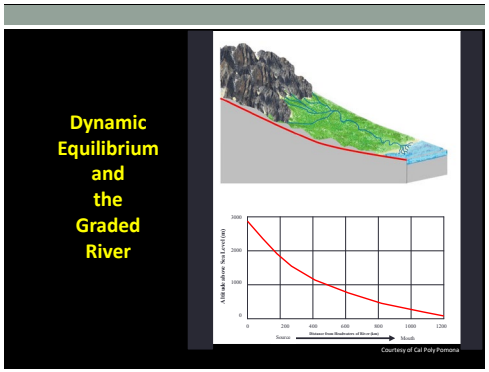
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			transports rainwater runoff and eroded sediment into the trunk stream and out of the basin at the drainage outlet for deposition elsewhere."
			**Display Slide 33.** River Longitudinal Profile (1 min) a. "This slide shows a longitudinal profile of a river." b. "Natural rivers typically develop a profile along their length that curves upward like a dish. This is called a *concave-up longitudinal profile* because the concavity in the curve faces upward. This curve is steepest at its upper end near the headwaters and flattest at its lower end near the drainage outlet." c. "This concave shape forms because of the interaction between gravity and the mass of flowing water and sediment. It reflects the fact that the small headwater tributaries carry less water and sediment and thus require a steeper slope to move that small mass downhill. On the other hand, a large trunk stream carries much more water and sediment in the lower basin and thus only requires a gentle slope to move that greater mass downhill toward the outlet."

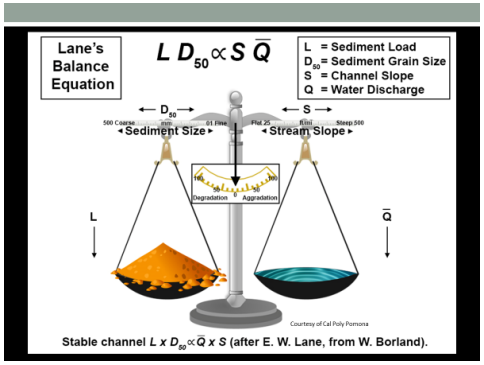
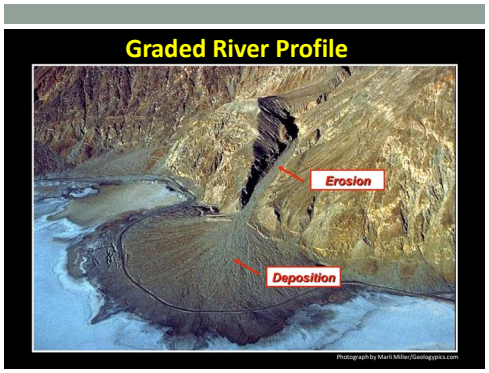
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 34.** Types of River Channels (1 min) a. "Most rivers begin their journey in the mountainous headwaters area of a watershed and flow downward into a valley that leads to a drainage outlet at an ocean, a lake, or another bigger river." b. "As rivers erode their profile, they may either cut their beds downward into hard rock or build their beds upward by depositing sediment. This results in two different types of river channels: a *bedrock channel,* where a river cuts a canyon in the hard rock of a mountain, or an *alluvial channel*, where a river builds up its bed by depositing sediment across a floodplain."
			**Display Slide 35.** Types of Sediment Load (3 min) a. "This slide shows various types of sediment load." b. "River channels carry both water and sediment. The sediment consists of broken particles of weathered rock that have eroded from the surface of the watershed. Fast-flowing river water carries the sediment down a channel and deposits it in another location where the water flow is slower." c. "The *sediment load* of a river is defined as 'the volume or mass of material a river

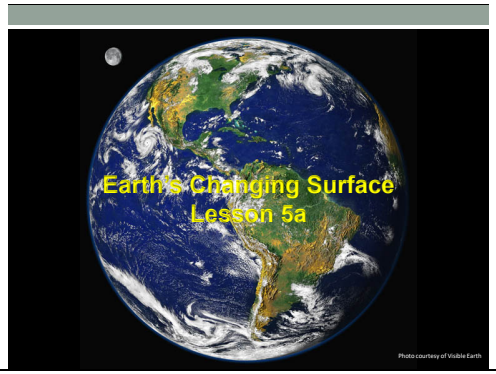
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			transports in a given amount of time.'" d. "There are three different types of sediment load in a river: (1) suspended load, (2) bed load, and (3) dissolved load." e. "A *suspended load* consists of small grains that are carried aloft by turbulence in the flowing water. These small silt or sand grains turn river water brown during a flood." f. "A *bed load* consists of larger, heavier grains that roll, slide, or bounce along the bed as the flowing water carries them along. These are the pebbles and boulders we see on the bottom of a streambed when it's dry." g. "A *dissolved load* consists of ions that dissolve in the flowing water. The chemical weathering of rocks and minerals upstream produce these ions." h. "The physical particles of rock in suspended and bed loads are visible, but the chemical ions of a dissolved load are part of the flowing water and can't be seen with the naked eye."

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 36.** Stream-Channel Erosion: Part 1 (2 min) a. "The equation on this slide illustrates stream-channel erosion." b. "Rivers erode their beds by either removing sediment grains that have accumulated on the bed or by cutting directly into the hard bedrock beneath the sediment. Both of these processes require sufficient sideways force or *shear stress* exerted by the column of flowing water. This *bed shear stress* is proportional to the water depth, or *mass*, and the steepness, or *slope*, of the stream channel." c. "With greater water flow, water depth increases, which means that more mass is pressing down on the streambed. With a steeper stream channel, more of that mass is directed downhill, increasing the sideways force or shear stress on the streambed. So more water and/or a steeper streambed increase erosion." d. "We'll test these ideas later using a stream-table model. This type of model can show us how increasing or decreasing water flow and/or changing the tilt of the stream table affect erosion and deposition."

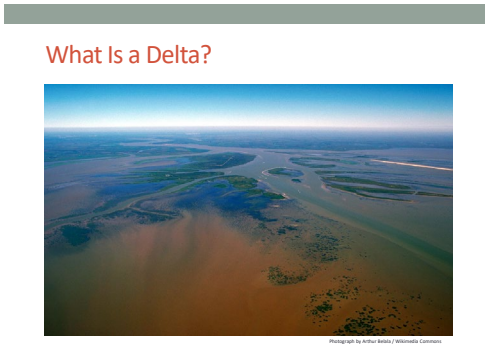
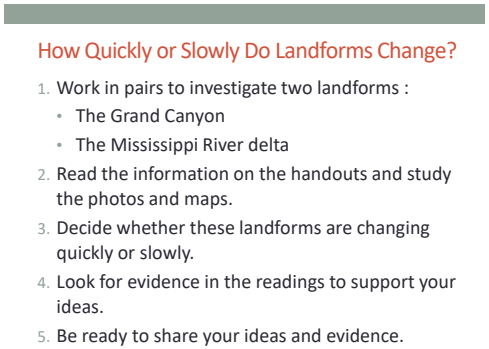
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 37.** Stream-Channel Erosion: Part 2 (2 min) a. "Water depth and channel steepness determine the speed at which river water flows. So flow velocity is also related to a river's ability to erode its bed." b. "The graph on this slide plots water velocity versus the size of sediment grains that can be lifted off the bed." c. "On the left side of the graph, faster water flow, with deeper water and a steeper channel, is required to move large sediment grains like cobbles and boulders. In the middle, smaller grains, such as grains of sand, can be moved with slower velocities of water, shallower water, and a gentler slope. But on the right side, faster velocities of water are required to move the smallest grains of silt and clay because those grains are sticky or cohesive." d. "So it's hardest for a stream to erode big boulders and sticky clay from its bed, and it's easiest to move small, loose grains of sand."

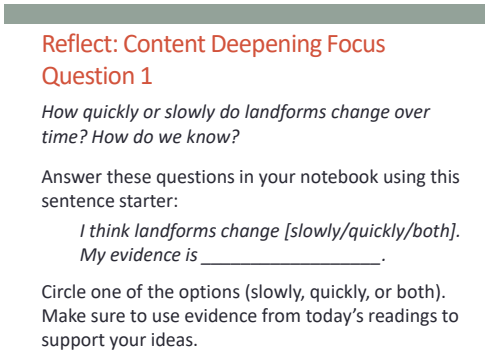
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 38.** Dynamic Equilibrium and the Graded River (2 min) a. "To better understand river erosion and deposition, we need to understand the important concept of *dynamic equilibrium*." b. "According to this concept, rivers are dynamic systems that respond to changing conditions within the watershed. As plate tectonics build up Earth's surface and erosion wears it down, rivers respond by adjusting their profile to achieve a balance between opposing forces. If any characteristic of a river changes, such as its channel shape or the flow of water and sediment, other characteristics will adjust to achieve a new balance or equilibrium. The dish-shaped profile we discussed earlier is an expression of dynamic equilibrium." c. "Geomorphologists refer to this balanced form as a *graded river profile*. A graded river is a river in equilibrium or balance with the prevailing conditions in the watershed."

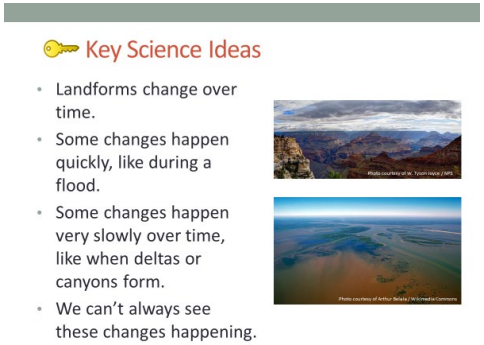
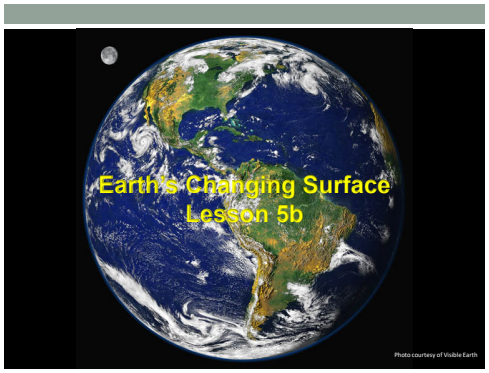
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 39.** Stream-Channel Equilibrium (1 min) a. "Four basic parameters control river equilibrium: (1) sediment load (L), (2) average sediment grain size (D_{50}), (3) channel slope (S), and (4) water flow or discharge (Q)." b. "The equation on the slide, called *Lane's balance*, is a mathematical relationship that expresses this equilibrium. L x D_{50} is proportional to S x Q." c. "If any of these four parameters is altered, the other three will adjust to achieve a new balance or equilibrium."
			**Display Slide 40.** Graded River Profile (1 min) a. "This photo of Death Valley, California, is an excellent example of a graded stream. The stream channel follows a concave-up graded profile from its head on the mountainside to its base on the alluvial fan." b. "Scarps, or steep slopes, are visible at the base of the hill, and with repeated earthquakes on the mountain-front fault, the mountain block rises and the valley bottom drops down. To maintain an equilibrium-graded profile, the stream erodes its bed upstream, cutting a deeper canyon into the rock, and deposits sediment downstream, building up its bed

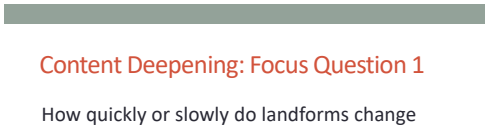
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			on the alluvial fan." c. "Think about how this relates to your observations during our stream-table investigation in yesterday's content deepening session."
			**Display Slide 41.** Graded River Profile (1 min) a. "This photo of the Grand Canyon, which we saw earlier, shows a segment of the Colorado River following a graded profile through the canyon." b. "The river has cut downward into the solid rock on the sides of the canyon to maintain a gradual concave up-graded profile extending from its headwaters in the Rocky Mountains to the river mouth at the Gulf of California." c. "Again, think about how this shape relates to your observations during our stream-table investigation last time."
			**Display Slide 42.** Earth's Changing Surface: Lesson 5a (Less than 1 min) a. "Next, we'll explore ideas about Earth's changing surface from lesson 5a."

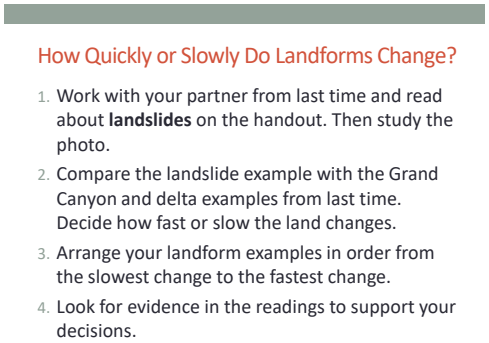
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		Content Deepening: Focus Question 1 How quickly or slowly do landforms change over time? How do we know?	**Display Slide 43.** Content Deepening: Focus Question 1 (Less than 1 min) a. Read the two-part focus question on the slide. b. Emphasize that these questions will guide student learning throughout ECS lesson 5a. c. Have participants write the questions in their science notebooks and draw a box around them.
		Can We See Landforms Change? Do you think someone could watch the Grand Canyon change? How long would it take? 	**Display Slide 44.** Can We See Landforms Change? (7 min) a. Read the questions on the slide. b. **Pairs:** "Discuss these questions with an elbow partner and work together to come up with answers." c. **Whole group:** Invite pairs to share their answers and reasoning with the group. Record key ideas on chart paper. d. Elicit differing points of view during this discussion and probe participants' responses (e.g., "Can you say more about that?"). Encourage participants to agree, disagree, ask questions, or add to the ideas others share. Work toward a consensus.

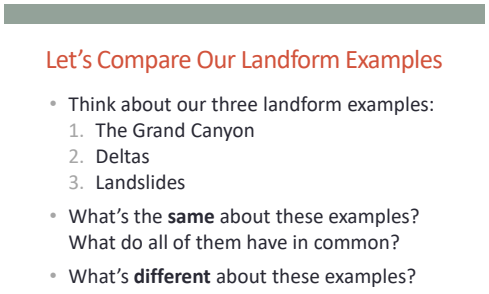
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 45.** What Is a Delta? (8 min) a. Read the question on the slide. b. Elicit ideas from the group and record them on chart paper. c. Ask participants the following questions: • Have you ever seen a delta? • Where would you have to go to see one? • Do deltas form only at the mouth of a big river like the Mississippi River, or can they appear in other locations? d. During this discussion, encourage participants to ask any questions they may have about deltas. e. Work together to develop a definition of a delta. When the group reaches a consensus, record the definition on chart paper and have participants write it in their science notebooks.
			**Display Slide 46.** How Quickly or Slowly Do Landforms Change? (10 min) a. "In our first investigation, we'll learn about deltas and the Grand Canyon and use this information to consider how quickly these landforms change over time." b. Have participants locate handouts 5.1 (The Grand Canyon) and 5.2 (Deltas) in their lesson plans binders. c. **Pairs:** "Pair up with an elbow partner and work together to complete the tasks on

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			the slide." d. **Whole-group share-out:** "So what did you decide about each landform based on the information and maps you studied? Do you think these landforms are changing quickly or slowly? What's your evidence?" e. As participants share their ideas and evidence, record them on chart paper.
			**Display Slide 47.** Reflect: Content Deepening Focus Question 1 (7 min) a. Review the two-part focus question on the slide. b. **Individuals:** Ask participants to write their initial ideas in their science notebooks using the sentence starters on the slide. c. **Whole-group share-out:** Invite participants to share their ideas and evidence with the group. Challenge them to respond in complete sentences using science ideas from the handouts to support their answers. As participants share their ideas, record them on chart paper and probe participants' thinking. d. Following the share-out, review the key ideas you recorded on chart paper and ask participants, "Do you have anything you'd like to add or correct?"

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 48.** Key Science Ideas (Less than 1 min) a. Review the key science ideas on the slide.
	10-MINUTE BREAK		
			**Display Slide 49.** Earth's Changing Surface: Lesson 5b (Less than 1 min) a. "Next, let's explore ideas about Earth's changing surface from lesson 5b."

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 50.** Content Deepening: Focus Question 1 (Less than 1 min) a. Review the two-part focus question on the slide. b. Emphasize that these questions from ECS lesson 5a will guide student learning throughout lesson 5b as well.
			**Display Slide 51.** What Is a Landslide? (7 min) a. Read the question on the slide. b. Elicit ideas from the group and record them on chart paper. c. Ask participants, "What questions and misconceptions might your students have about landslides?" d. Work together to develop a definition of a landslide. When the group reaches a consensus, record the definition on chart paper and have participants write it in their science notebooks.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 52.** How Quickly or Slowly Do Landforms Change? (10 min) a. "Next, we'll learn about landslides and consider whether these changes happen quickly or slowly. Then we'll compare our landslide example with our other landform examples and arrange them in order of slowest to fastest change." b. Have participants locate handout 5.3 (Landslides) in their lesson plans binders. They'll also need handouts 5.1 (The Grand Canyon) and 5.2 (Deltas) from the previous investigation. c. **Pairs:** "Work with the same partner to complete the tasks on the slide." d. **Whole-group share-out:** "So based on the information and maps you studied, do you think landslides happen quickly or slowly? In what order did you arrange the three landforms, and what evidence did you use to reach these decisions?" e. As participants share their decisions and evidence, record them on chart paper. f. Ask participants, "What challenges did this sequencing task pose for you? What challenges might it pose for your students?"

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 53.** Let's Compare Our Landform Examples (10 min) a. Read the statement and questions on the slide. b. **Turn and Talk (3 min):** "Share your ideas with an elbow partner and work together to develop an answer for these questions." c. While pairs are working on the task, create a two-column data table on chart paper. For the first column, write the heading "What's the Same?" and for the second column, write the heading "What's Different?" d. **Whole-group discussion (2 min):** Invite pairs to share their answers to the questions. Record key similarities and differences on the data table. e. **Follow-up question:** "In a previous session, we talk about processes that build up and wear down Earth's surface. Tectonics is a process that builds up the surface, and erosion is a process that wears it down. Which process or processes do you think are involved in our three landform examples? **Expected response:** Both processes are involved in all three landform examples. The land is worn down in one place as dirt and rock are carried away, and the land is built up in another place where the dirt and rock are deposited.

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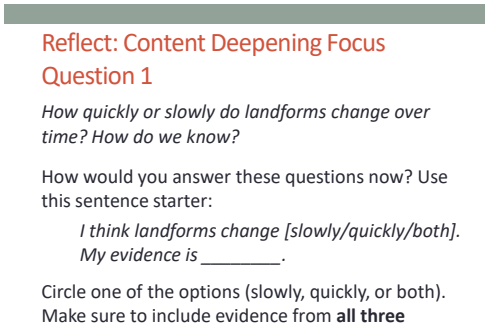
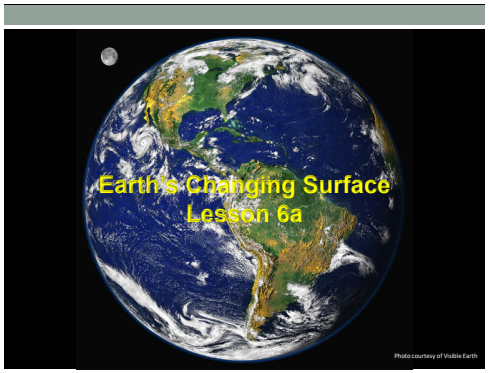
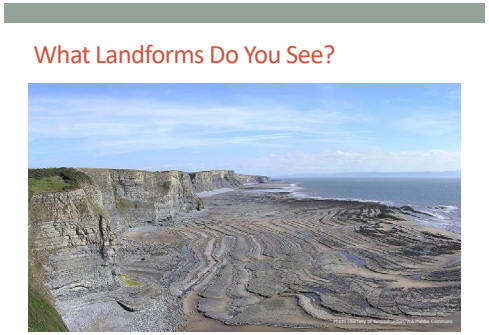
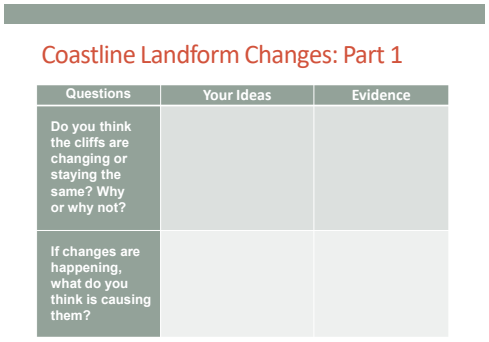
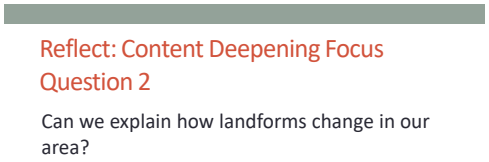
			**Display Slide 54.** Reflect: Content Deepening Focus Question 1 (7 min) a. Review the two-part focus question on the slide. b. **Individuals:** "How would you answer these questions now, based on what we learned about our three landform examples? Write your ideas and evidence in your science notebooks, using the sentence starter on the slide." c. **Whole-group share-out:** Invite participants to share their ideas and evidence with the group. Record key ideas on chart paper and challenge any incorrect or inaccurate statements. d. During this discussion, encourage participants to give one another feedback (agree/disagree, ask questions, add on).
			**Display Slide 55.** Key Science Ideas (Less than 1 min) a. Review the key science idea on the slide.

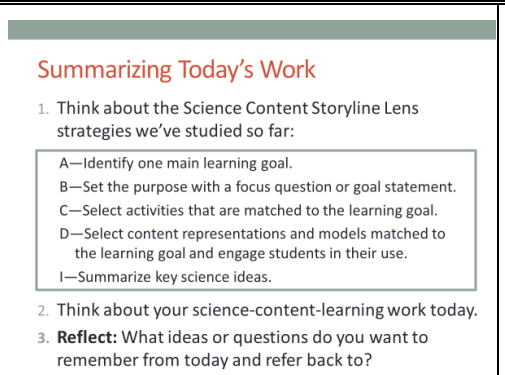
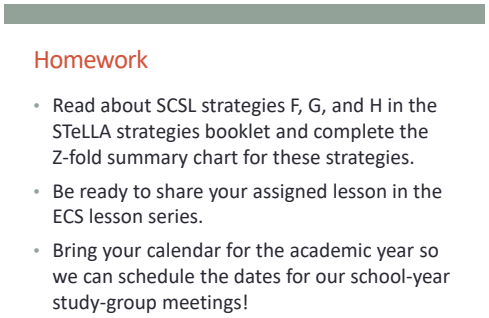
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 56.** Earth's Changing Surface: Lesson 6a (Less than 1 min) a. "Next, we'll explore ideas about Earth's changing surface from lesson 6a."
			**Display Slide 57.** Let's Review What We've Learned! (5 min) a. "Let's begin this segment of our content deepening work with a quick review of what we've learned about landforms so far." b. "During this review, think about what you ideally want your students to say in response to each of the questions and what might cause confusion for them." c. Read the key science idea and question on the slide. d. Ask participants to brainstorm ideal student responses to this question and share possible difficulties or confusion students might experience related to this content.

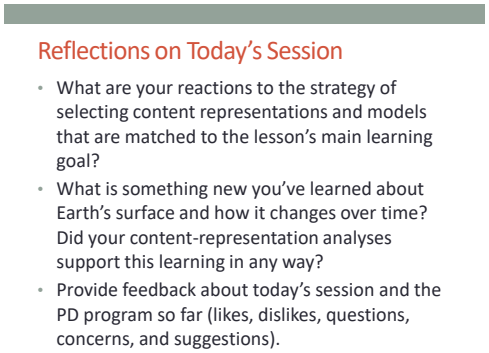
PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 58.** Let's Review What We've Learned (5 min) a. Read the key science idea and question on the slide. b. Ask participants to brainstorm ideal student responses to this question and share possible difficulties or confusion students might experience related to this content.
			**Display Slide 59.** Let's Review What We've Learned! (5 min) a. Read the key science ideas and question on the slide. b. Ask participants to brainstorm ideal student responses to this question and share possible difficulties or confusion students might experience related to this content.
			**Display Slide 60.** Let's Review What We've Learned! (5 min) a. Read the key science ideas and question on the slide. b. Ask participants to brainstorm ideal student responses to this question and share possible difficulties or confusion students might experience related to this content.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
		Content Deepening: Focus Question 2 Can we explain how landforms change in our area?	**Display Slide 61.** Content Deepening: Focus Question 2 (Less than 1 min) a. Read the focus question on the slide. b. Emphasize that this question will guide student learning throughout ECS lesson 6a. c. Have participants write the question in their science notebooks and draw a box around it.
		Landform Changes around Pomona What are some examples of landform changes around Pomona? 	**Display Slide 62.** Landform Changes around Pomona (8 min) a. Read the question on the slide. b. **Pairs:** "Discuss this question with an elbow partner and develop an answer using descriptive terminology. Focus on the processes that caused the landform." c. **Whole group:** Invite pairs to share their landform examples with the group. Record the landforms on chart paper and include the processes involved in forming each one. d. Ask participants, "What examples do you think your students might come up with?"

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 63.** What Landforms Do You See? (5 min) a. Read the question on the slide. b. Elicit ideas from participants and record them on chart paper. Work toward a consensus. c. Ask participants, "Do we have landforms like this near Pomona?"
			**Display Slide 64.** A Coastline Landform Challenge (5 min) a. "Next, we'll engage in a use-and-apply challenge using everything we've learned about landforms to help us determine whether the cliffs in this photo are changing." b. **Pairs:** Have participants pair up with an elbow partner and follow the instructions on the slide.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 65.** Coastline Landform Changes (10 min) a. Create a data table on chart paper like the one on this slide. **Note:** Alternatively, you could display the data table on a document reader. b. Read the questions on the data table and invite participants to share their ideas and evidence. Records participants' responses in the appropriate boxes on the table. c. During this discussion, elicit differing points of view and probe participants' responses (e.g., "Can you say more about that?"). Encourage participants to agree, disagree, ask questions, or add to the ideas others share. Work toward a consensus.
			**Display Slide 66.** Reflect: Content Deepening Focus Question 2 (6 min) a. Review the focus question on the slide. b. **Individuals:** Have participants answer the question in their science notebooks. c. **Whole group:** Invite participants to share their ideas with the group. Record key ideas and evidence on chart paper.

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
3:15–3:30 15 min **Wrap-Up: Summary, Homework, and Reflections** Slides 67–69	**Purpose** • Summarize and reflect on key ideas about SCSL strategies A, B, C, D, and I and the ECS science content, lesson plans, and lesson analysis work. **What Participants Do** • Write about and share key ideas from SCSL strategies A, B, C, D, and I. • Write about and share key ideas about today's content deepening work. • Copy down the homework assignment for day 8. • Write reflections on today's learning. **Handouts in PD Binder** • 7.4 Daily Reflections—Day 7 **Supplies** • Science notebooks		**Display Slide 67.** Summarizing Today's Work (6 min) a. **Individuals (4 min):** Ask participants to think about the first two tasks on the slide and respond to the reflection question in their notebooks. b. **Whole group (2 min):** Ask for volunteers to share an idea or question from their responses to the reflection question.
			**Display Slide 68.** Homework (3 min) a. Review the homework assignment and have participants write it in their notebooks. b. Make sure participants understand the assignment. c. "We won't address strategy E about sequencing science ideas and activities until the school year, since you'll learn a lot about sequencing from teaching the RESPeCT lesson plans."

PD Model: Time/Phase	Purpose, Content, and What Participants Do	Slides	Process
			**Display Slide 69.** Reflections on Today's Session (6 min) a. Allow **at least 5 minutes** for participants to think about today's session and write their reflections and feedback on the Daily Reflections sheet (handout 7.4 in PD program binder).