## SSUP: Summer Institute PD Leader Guide Day 1 Sun’s Effect on Climate and Seasons

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| Grade Level | 5 | Day | 1 | STeLLA Strategies Focus | STL 4 | Subject Matter Focus | Sun’s Effect on Climate and Seasons |
| Teacher Learning Goals | * The goals of the STeLLA PL program are to deepen knowledge of teaching and learning, increase ability to analyze and reflect on teaching and learning, increase ability to use content knowledge and knowledge of teaching and learning to transform classroom practice, deepen teacher content knowledge, and increase student learning in science. * The understanding and application of research on teacher and student learning has shown that the STeLLA Student Thinking and Science Content Storyline Lenses are important to improve science teaching and students’ learning. * Average temperatures are higher in the northern US than the southern US in December and in June. Average temperatures are higher near the equator than near the poles in January and July. The highest average temperatures seem to be a little above the equator in July and a little below the equator in January. * Based on Communicating in Scientific Ways, teachers can distinguish observation and inference; data and evidence; claim, evidence, and reasoning; reasoning with data/evidence, ideas, and models; and eventually, explanation and argumentation. | | | | | | |
| Focus Questions | * What patterns in temperature can you find on Earth at different times of the year? * How can students be empowered to reveal their thinking and to listen to and interact with each other during classroom conversations? | | | | | | |
| Ideal Teacher Response | What patterns in temperature can you find on Earth at different times of the year?  Average temperatures are lower in the northern US than the northern US in December and in June. Average temperatures are higher near the equator than near the poles in January and July. The highest average temperatures seem to be a little above the equator in July and a little below the equator in January.  lens.  How can students be empowered to reveal their thinking and to listen to and interact with each other during classroom conversations?  Strategy 4 of the Student Thinking Lens, engage students in communicating in scientific ways, provides sentence stems that help students engage in scientific discourse and make their thinking visible to each other and the teacher. This classroom practice promotes a classroom culture of student thinking. | | | | | | |

| Preparation | Materials | Videos and Transcripts |
| --- | --- | --- |
| **Planning/Preparation Tasks:**   * Study PDLG, PPTs, video clips, and handouts. Make changes to PPTs, if needed. * Link clips * Content Deepening Prep (none)   **Daily Set Up Tasks:**   * Check that video clips are correctly linked to PPT * Set up PowerPoint and speakers * Check video & sound * Arrange furniture, food (include social distancing protocols in set up) * Arrange posters/charts   **Day 1 Set Up Task:**  Arrange teacher materials on tables:   * Tabletop name cards * Table boxes (small red, green, yellow dots; black permanent fine-tipped markers)   **Daily Follow-up Tasks:**   * Archive final PPT * Collect and turn in daily feedback * Disinfect common materials, tables and common areas per protocol | **Posters/Charts:**   * STeLLA Conceptual Framework poster. * Communicating in Scientific Ways poster * Program Goals chart * Day 1 Agenda chart * Norms chart * Day 1 Focus Questions chart * Effective Science Teaching chart (sections cut up for initial charting) * Parking Lot chart   **Handouts in PD binder front pocket or in Pre-Tab:**   * Z-fold chart: Student Thinking Lens Strategies * Program Goals * Week-at-a-Glance   **Handouts in SSUP PD binder, Tab 1:**   * STeLLA Norms * CSW Transcript Charles Clip 1 * CSW Transcript Charles Clip 2 * Day 1 Reflection * Cut sheet: Sun’s Effect on Climate and Seasons * Map of average temperatures in US in Jun-Aug * Map of average temperatures in US in Dec-Feb * Data table of average temps in different cities in the N and S hemispheres in July and January * Map of world with cities (avg temps added in July and January) * Graphs of latitude matched to cities (avg temps in July and January)   **Supplies:**   * None   **Resources:**   * STeLLA Strategies booklet * BSCS Journal (norms pasted into the journal) * Content Deepening Notebook | * CSW Clip 1: Charles Clip 1 * CSW Clip 2: Charles Clip 2 |

**DAY 1 SESSION OUTLINE: 8:30 a.m. - 4:30 p.m.**

| **Time** | **Purpose** | **Content** | **Activities** |
| --- | --- | --- | --- |
| 10:00 – 10:40  40 min  Slides 1-7  **Whole Group** | **Purpose:** Continue to build community and set the stage for learning throughout the week and into the academic year. | **Content:** Share focus questions for the day:   * What patterns in temperature can you find on Earth at different times of the year? * How can students be empowered to reveal their thinking and to listen to and interact with each other during classroom conversations? | **Opening**   * Welcome & introductions * Goals, Agenda, and Norms * Focus Questions * Revisit Effective Science Teaching Chart |
| 10:40 – 10:50  10 min | Transition to Study Groups | | |
| 10:50 – 12:00  70 min  Slides 8-22  **Study Group Teams** | **Purpose:** Model effective STeLLA-based science teaching and learning through a common experience that is grounded in a 3D, phenomena/problem driven unit and designed for adult learners. The Teacher Set-up and Follow-up are reflective of STeLLA Strategy F (Activity Set-up, Activity, and Activity Follow-up) with an eye toward teachers as science learners. PDLs use the teacher follow-up to uncover T ideas about their experience and then leverage those ideas throughout analysis of practice. | **Content:** STeLLA model lessons/units attend to the characteristics of effective science teaching and learning (e.g., 3D, phenomenon/problem-driven, student-centered, make student thinking visible and support sense-making, coherent, and access/engage PK and develop metacognitive abilities).  Average temperatures are higher in the northern US than the southern US in December and in June. Average temperatures are higher near the equator than near the poles in January and July. The highest average temperatures seem to be a little above the equator in July and a little below the equator in January. | **Content Deepening: Anchor Lesson 1**   * Teacher Set-up * Anchor Experience for Adult Science Learners |
| 12:00 – 12:30  30 min | **Lunch (served between 11:45 a.m. and 12:45 p.m. for maximum flexibility)** | | |
| 12:30 – 2:20  110 min  Slides 8-22  **Study Group Teams** | **Purpose:** Model effective STeLLA-based science teaching and learning through a common experience that is grounded in a 3D, phenomena/problem driven unit and designed for adult learners. The Teacher Set-up and Follow-up are reflective of STeLLA Strategy F (Activity Set-up, Activity, and Activity Follow-up) with an eye toward teachers as science learners. PDLs use the teacher follow-up to uncover T ideas about their experience and then leverage those ideas throughout analysis of practice. | **Content:** STeLLA model lessons/units attend to the characteristics of effective science teaching and learning (e.g., 3D, phenomenon/problem-driven, student-centered, make student thinking visible and support sense-making, coherent, and access/engage PK and develop metacognitive abilities).  Average temperatures are higher in the northern US than the southern US in December and in June. Average temperatures are higher near the equator than near the poles in January and July. The highest average temperatures seem to be a little above the equator in July and a little below the equator in January. | **Content Deepening: Anchor Lesson 1**   * Anchor Experience for Adult Science Learners (continued) * Teacher Follow-up |
| 2:20 – 2:30  10 min | **Break** | | |
| 2:30 - 4:20  110 min  Slides  **Study Group Teams** | **Purpose:** Develop a shared understanding of STeLLA Strategy 4: Communicating in Scientific Ways and how it plays out in the classroom from the introduction of CSW to improving students’ use of the sentence stems. | **Content:** Engaging students in CSW helps students reveal their thinking and supports listening and responding to one another’s ideas. CSW helps establish a classroom culture of revising ideas and moves away from a culture of right answers. Teachers have an important role to play in supporting student discourse (student-to-student talk). | **Lesson Analysis: STL Strategy 4**   * Set up Charting * Video Analysis x2 * Follow-up |
| 4:20 - 4:30  10 min  Slides  **Study Group Teams** | **Purpose:** Reflect on the day’s experiences and learning and prepare for Day 2. | **Content:**Focus Questions:   * What patterns in temperature can you find on Earth at different times of the year? * What are the STeLLA Lenses and Strategies, and why do we think they will make a difference in your science teaching and students’ learning? * How can students be empowered to reveal their thinking and to listen to and interact with each other during classroom conversations? | **Closing**   * Revisit Focus Questions * Day 1 Reflections * Homework: Read STL overview and Z-fold STL 1, 2, and 3 |

### DAY 1

| **Time and Focus** | **Purpose and Content &**  **What Participants Do** | **Slides** | **Process** |
| --- | --- | --- | --- |
| 9:30 – 10:00 | **Coffee & Conversation** |  | Need several hands-on deck to manage logistics and to help participants complete paperwork and pick up materials. |
| 10:00 – 10:40  40 min  Slides 1-7  **Whole Group** | **Opening**  **Purpose:** The purpose of the opening session is to continue to build community and set the stage for learning throughout the week and into the academic year.  **Content:** The STeLLA program is designed with the following goals in mind:   * Deepen knowledge of teaching and learning * Increase ability to analyze and reflect on teaching and learning * Increase ability to use content knowledge of teaching and learning to transform classroom practice * Deepen teacher content knowledge * Increase student learning in science   To achieve these goals, it is important to develop a strong community of learners to create a safe and respectful environment to make teacher thinking and practice visible.  **What Participants Do:** Participants introduce themselves and orient to the day’s activities and focus questions. They review the goals of the program and revisit their Effective Teaching and Learning charts.  **Resources**   * Journal * PD Binder   + Week-at-a-Glance   + Norms * STeLLA Strategies Booklet * STeLLA Conceptual Framework poster * Charts   + Program Goals   + Day 1 Agenda   + Day 1 Focus Questions   + Norms   + Parking Lot   + Effective Science T&L |  | 1. **SSUP Program Day 1 (0 min)** 2. Greet participants as they enter the room. Help them find their small group. |
|  | 1. **Welcome and Introduction (10 min)** 2. Welcome the team to the summer institute. 3. Frame much of this opening session as part of continuing to get to know one another and building community. Provide instructions for the introductions task. 4. Provide instructions for introductions to be done in their table groups as directed on the slide. Give table groups about 6 min to complete introductions. Remind them to listen for patterns/similarities. 5. Ask tables to share a few examples of things people are looking forward to for the week. |
|  | 1. **Program Goals (5 min)** 2. Briefly share the program goals (p. \_\_). 3. Forecast that we will work toward these goals together throughout the week and academic year. Note that one of the sessions later today will help us think together about why we think this program will “work”. 4. Ask participants to consider how these goals resonate with their expectations for the week. Invite participants to record some ideas in their notebook.   **PDL Note:** Be sure to link what we will do during the summer institute to work toward these goals. |
|  | 1. **Week-at-a-Glance (5 min)** 2. Refer participants to p.\_\_ in the PD binder. 3. Provide an overview of the week. 4. Point to the Day 1 agenda chart. 5. Remind participants how we will work.    1. Parking lot    2. Breaks/take care of your own needs    3. Safety protocols |
|  | 1. **Norms (5 min)** 2. Refer participants to p.\_\_ in the PD binder and in their BSCS Journal. 3. Begin by asking participants what kinds of norms they have used in the past. Whip around and gather some ideas. Follow-up responses with a question about why that norm or the use of norms in general was important. 4. Highlight the purpose of norms in collaboration (i.e., learning together) and link to their ideas as possible. Note that we’ve found these particular norms to be especially helpful in the work of a STeLLA Study group. 5. Ask for any clarifying questions and then to note which norms they think are really important to promote collaboration. 6. Share that we’ll revisit the norms periodically and take some time tomorrow morning to customize them for our work together in our study groups. |
|  | 1. **Focus Questions (5 min)**    1. Note that focus questions are a hallmark of this program.    2. Share the focus questions for Day 1. Link back to the program goals.   **Transition:** *This program is all about improving our science teaching so we can improve students’ learning. To get us started, we’ll revisit our ideas of effective science teaching.* |
|  | 1. **Effective Science Teaching & Learning (10 min)**    1. Share the questions on the slide and remind teachers of their work during the virtual kick-off session. Link to the program goals of improving our science teaching so we can improve our students’ learning.    2. Briefly provide an overview of the task/process. Divide rooms into study groups and have each group discuss ideas on their Google document from the Zoom kickoff and translate the ideas onto chart paper.   **Transition:** *We’ll revisit these ideas later as we learn more about the STeLLA Lenses and Strategies (point to focus questions) and the research about science teaching and learning that serves as the foundation for the Conceptual Framework (point to the Conceptual Framework cover page/poster).*  *As you know, one opportunity offered by this program is to deepen our content knowledge—to learn some science together. We’ll do that through experiences grounded in a common unit of instruction that you’ll use with your students next fall. For our team, that unit will focus on Sun’s effect on climate and seasons.* |
| 10:40-10:50  10 min | **Transition to Study Groups**  **Quick Break** | | |
| 10:50 – 12:00  70 min  Slides 8 – 17 (pick up w/ 17 after lunch as needed)  **Study Group Teams** | **Content Deepening: Lesson 1**  **Purpose:** The purpose of this session is to model effective STeLLA-based science teaching and learning through a common experience that is grounded in a 3D, phenomena/ problem driven unit and designed for adult learners. The Teacher Set-up and Follow-up are reflective of STeLLA Strategy F (Activity Set-up, Activity, and Activity Follow-up) with an eye toward teachers as science learners. PDLs use the teacher follow-up to uncover T ideas about their experience and then leverage those ideas throughout analysis of practice.  **Content:**  STeLLA model lessons/units attend to the characteristics of effective science teaching and learning (e.g., 3D, phenomenon/problem-driven, student-centered, make student thinking visible and support sense-making, coherent, and access/engage PK and develop metacognitive abilities).  Average temperatures are higher in the northern US than average temperatures in the southern US at different times of the year. The pattern does not apply to the whole Earth. Average temperatures near the equator tend to be higher throughout the entire year when compared to average temperatures near the poles (at higher latitudes both north and south).  Identifying patterns in nature or the designed world help us ask questions about phenomena [or define problems]. Making observations, identifying trends, determining high or low points, or identifying repeating events help us to make generalizable statements that represent patterns.  Analyzing and interpreting data in organized in tables or represented on maps or graphs can help us identify patterns in nature that need to be explained.  Based on Communicating in Scientific Ways, teachers can distinguish observation and inference; data and evidence; claim, evidence, and reasoning; reasoning with data/evidence, ideas, and models; and eventually, explanation and argumentation.  **What Participants Do**  Participants make observations and identify patterns of average temperatures at different times of the year and different places in the US and on Earth. They get clear about the natural phenomenon (temperature patterns) they will explore. Participants also consider how the different representations helped them think about the patterns they identified. Thus, the content representations serve as models used by students.  This experience involves six lessons from a unit on Sun’s effect on climate and seasons. As such it represents learning at the intersection of the DCIs, CCCs, and SEPs. It also surfaces and challenges common misconceptions.  **Resources**   * Journals * Science Notebook * STeLLA Conceptual Framework Poster * CSW poster * PD Binder   + Science Ideas/Common Student Ideas (Mash up) * Charts   + Parking Lot Chart   + Day 1 Focus Questions Chart   **Handouts**   * Data table of average temps in different cities in the N and S hemispheres in July and January * Map of world with cities (temps added in July and Feb) * Graphs of latitude matched to cities (temps in July and Feb)   **Additional HOs**   * Map of average temperatures in US in Jun-Aug   Map of average temperatures in US in Dec-Feb |  | 1. **Focus Questions (0 Min)**    1. Highlight the SEC-specific focus question. |
|  | 1. **Content Deepening: Teacher Set-up (5 min)**   **PDL Note:** The purpose of the Teacher Set-up is to set the stage for teacher learning through the content deepening experience. This part of the session should engage teachers as learners and elicit their prior knowledge and experience. Be cautious about how much time you spend here.   * 1. Note the “teacher hat” in the upper right-hand corner of the slide and that we’ll begin with some time to think and write about how you usually teach climate and seasons including “what” they teach and how they sequence the learning.   2. Provide time for individual journaling based on the prompts.   3. Whip around and gather ideas.   **Transition:** *One of the things you shared was the science that you intend students to learn. Let’s consider our own understanding of the science.* |
|  | 1. **Content Deepening: Teacher Set-up (5 min)**    1. Invite teachers to turn to PD binder p. \_\_\_ and consider the ideas and science practices on the page. Note any ideas that are similar to those they shared in their previous conversation.    2. Provide instructions and time for the task.    3. Note that they’ll have periodic opportunities to revisit and discuss these ideas throughout the week.   **Transition:** *Over the next hour or so, we’ll experience lesson 1 of a unit focused on the Sun’s Effect on Climate and Seasons. While this first experience is grounded in lesson 1, we’ve designed the experience for you as adult learners—as science learners. You’ll see a ball cap in the upper right-hand corner of the slide to signify the new “science learner hat”.*  *To make the most of this time, set aside your teacher hat and thoughts/questions about how you’ll do this in your classroom with your kids. Give yourself and our whole team the gift of immersing yourself in the experience as a science learner. When the inevitable wonderings about teaching come up, capture them on a sticky note or in your BSCS journal so you can re-focus as a learner on our shared experience.*  *Don’t worry, just as we are in the teacher set-up right now, there will be a teacher follow-up immediately after this science learner experience where we will address any teacher thoughts. Give yourself a moment to get organized. As you are doing that, consider what you’ll do to stay in the learner experience.*  **PDL Note: Be sure to refer to the common experience as learner hat and not student hat**. We want participants to engage in the activities as adult science learners not as one of their students. |
|  | 1. **Anchor Lesson Common Experience (5 min)**   **PDL Note:** Point teachers to their science learner journals. Engaging in lesson as a learner may be a new experience for some participants. They may find it difficult to remain in learner hat. If you notice participants talking in teacher hat, gently encourage them to capture their teacher idea on a sticky note or in their BSCS journal to return to after the common learner experience. If a participant asks the whole group a teacher-focused question, you have a couple of options:  1) you can acknowledge that we will return to their great teacher question in the debrief and invite them to remain in learner hat for now, or  2) you can turn it into a learner hat question.  Example:  Teacher question: *How do I help kids ask questions for the DQB?*  PDL follow-up: *So are you asking how we could work together to develop better questions for the DQB?*  *Or*  *Great question. Let’s think together about how we could ask better questions for the DQB.*  Note that you can acknowledge that it’s a conversation you would also have with students.  Example:  Teacher statement: *Kids will really struggle with this.*  PDL follow-up: *We can all struggle with this. Let’s pause and talk about OUR struggles...just like we’d do with our kids in class. Let’s talk about it as learners.*  Example:  Teacher statement: *These content representations are really important. I think we need to pause and talk about the purpose of each in kids’ learning.*  PDL follow-up: *Exactly and this is something I’d want to do with kids in the classroom, so let’s us do this as learners, too. What role did content representation 1 play in your learning? In our learning?* |
|  | 1. SEC (5 min)    1. Provide an opportunity for a private quick-write in their science notebooks. *Do not* share in the large group. |
|  | 1. CSW (5 min)    1. Orient participants to the CSW poster and highlight the categories of CSW and the sentence stems.    2. Ask the question about their use of these types of sentence starters and why/how they could be important/helpful AS LEARNERS!    3. Plan to use these sentence starters over the next hour or so.   **PDL Note:** During the Anchor Lesson, PDLs will prompt for participant use of CSW and model the use of elicit, probe, and challenge questions.  Example of challenge questions include:   * How does your idea connect to X’s idea? * What did you observe during the Anchor Lesson (NOT activity) that helped you ask that question? * How does \_\_\_\_\_\_\_\_\_\_\_\_ relate to your past experiences? * What are you observing that prompts you to make that claim? |
|  | 1. Patterns (US Dec) (10 min)    1. Identify the phenomenon (and pattern) to investigate by analyzing and interpreting data.   **PDL NOTE:** The purpose of identifying these patterns is to test the patterns in the US against patterns on Earth, so keep patterns to the US based on the data they have, NOT couched in the hemispheres.   * 1. Invite participants to study the map. For now, just identify “something” they see—keep it simple for now. Use the sentence stems: I see…or I noticed. Note that we are pattern-seekers and that will come. For now, just simple observations.   2. Invite a few participants to come up to the map and point to their observation.   3. Model how to add “WIS” (what I see) statement and draw arrows. Highlight that **adding the arrows will help us all learn**! Encourage participants to make 3 such statements with accompanying arrows.   **PDL Note:** Periodically remind participants to use their CSW sentence starters. |
|  | 1. Patterns (US July) (5 min)    1. Identify the phenomenon (and pattern) to investigate by analyzing and interpreting data.    2. Invite participants to study the map. For now, just identify “something” they see—keep it simple for now. Use the sentence stems: I see…or I noticed. Provide a non-example (e.g., inference), such as, It’s summer in the US.    3. Chart observations. Use probe questions to increase clarity. Ask participants to point to their observation. Listen for an opportunity to highlight the idea that **observations can be high points, low points, or trends that you can point to. Observations are not inferences about what the observation “means”.** |
|  | 1. Patterns (Both) (15 min)    1. Invite participants to identify patterns. Use sentence stems such as: When I compare…Similarities are…Differences are….    2. Chart patterns. Continue to probe for clarity and challenge inferences.   **PDL NOTE:** The purpose of identifying these patterns is to test the patterns in the US against patterns on Earth, so keep patterns to the US based on the data they have, NOT couched in the hemispheres.   * 1. Identify the phenomenon (and pattern) to investigate by analyzing and interpreting data. Anomalies provide a source for questions, so capture these as well.   2. Possible patterns/phenomena statements:      + **Average temperatures in the northern US are lower than those in the southern US in both July and December**.      + See Content section for other examples.   **Transition:** *These patterns exist in the US, but what about patterns in the average temperature on the whole planet? In the next part of this activity, we’ll take a look at some data sets from different places on Earth and see what patterns we can identify*. |
|  | 1. Patterns (World) (5 min)    1. Refer to HO (p. \_\_).    2. Ask if the pattern we saw in the US hold when we look at average temperatures on Earth. Follow up with what is your evidence?   **Transition:** *Highlight that HOW we represent data matters. Some representations are more expressive than others. Share that now we’ll take a look at this data in bar graphs*. |
|  | 1. Patterns (World Graph) (20 min)    1. Refer to HO (p. \_\_\_). Someone will likely hold the bar graph handouts stacked and up to the light, call this out to the group. If no one tries is, model it so they can identify the pattern of highest average temperatures just above and below the equator in July and January.    2. Ask: *What patterns can you identify across the three representations?*    3. Now think about all three representations we have used. *Which representation best helped you answer the question—gave you the clearest indication of the patterns of temperature on Earth? Why do you suppose we used all three representations? How do the different representations influence your thinking?* (Meta) |
| 12:00 – 12:30 | Lunch | | |
|  |  |  | 1. CSW (5 min)    1. Remind participants to the CSW poster and highlight the categories of CSW and the sentence stems.    2. Ask the question about their use of these types of sentence starters and why/how they were/are important/helpful AS LEARNERS (or not)! (Meta)   **PDL Note:** Ensure teachers can answer this question by including more explicit use of the CSW sentence stems in the anchor. |
|  | 1. **Driving Question Board (15 min)**    1. Note that we have generated a lot of individual and group questions so far; it will be useful to organize them so we can begin to answer them. Invite participants to write their questions in complete sentences on sticky notes, one question per sticky note.    2. Invite participants to bring their sticky notes and stand around the Driving Question Board (DQB) chart. Invite participants to take turns reading one of their questions aloud and then sticking it on the chart. After each question is read and placed on the chart, have others with similar or related questions to read them and place them near that sticky note to begin spatially organizing clusters of questions.   **PDL Note:** Invite participants with fewer sticky notes to share first to ensure the greatest number of participants have the opportunity to read their question aloud.   1. As questions are organized into clusters, help the group identify category names for each cluster. Add category names to the top of each cluster. Invite participants to return to their tables and open their science notebooks. 2. Return to the focus question for the anchor lesson and provide time for participants to revise their ideas from the beginning of the lesson and capture any new ideas. Encourage them to use a different color so they can see how their ideas have changed and grown. 3. Invite students to share their thinking using sentence stems from row 13 of the CSW chart.   **Transition:** *We have generated a lot of really good questions today. Throughout this unit we will have opportunities to reflect back on these questions to take stock of what we have figured out as well as add new questions.* |
|  | 1. **UCQ (5 min)**    1. Review the questions on the DQB and identify a “group” of Qs related to the UCQ. Use their questions to introduce the UCQ.   ***Transition:*** *Our Driving Question Board captures what we have been thinking about. Now let’s pause and think about how we have been thinking.*  **Transition:** *Thank you for engaging in the lesson as a learner. We will now return to our teacher hats to think through our experiences. Set your science notebook aside and open your BSCS journal.* |
|  | 1. **Content Deepening: Teacher Follow-up (20 min)**   **PDL NOTE:** Keep in mind that everything up to the next curriculum immersion experience is part of the teacher follow-up It is all part of the storyline and should be closely linked.  The purpose of the Teacher Follow-up is to continue teacher learning from the content deepening experience. This part of the session should engage teachers as learners and support them in explaining and reflecting on their experience.   * 1. Provide time for teachers to consider this question and capture ideas in their BSCS Journal. While participants are writing in their journals post 4 chart papers side by side on a large wall. Using a partner or small group Walk-n-Talk strategy to share ideas here can help renew energy.   **PDL Note:** These four charts will ultimately be titled: DCIs, SEPs, CCCs, and Misc. (i.e., teaching strategies, pedagogy, classroom culture). To begin, the charts will be blank. Sort and chart ideas onto the appropriate chart as participants share. After the charts are populated with participants’ ideas, you will ask for the titles for each chart.   * 1. Begin a “Wall Debrief.” Invite participants to share their ideas with the whole group. As participants share ideas, record them on the appropriate untitled chart. If the idea isn’t easy to sort, probe for clarity: * How did that contribute to your learning? * How do you think it could impact students’ learning? * Why is that important? * What is the critical teacher move or strategy there?   It is important to listen and chart participants’ ideas and NOT your ideas. You need to avoid getting trapped into thinking only about where the statement goes.   1. Provide time to address any teacher-focused questions that participants recorded while they were in learner hat.   **PDL Note: The idea here is attended to in Day 3. This note is an FYI.** Questions may arise about the relationship between the questions on the DQB and the focus question. A lesson focus question is bigger than a particular phenomenon or problem and attends to the main learning goal of the lesson. Phenomena or problem-specific questions make terrific elicit questions. The main learning goal is a big idea in science, NOT a phenomenon or problem. Just as a phenomenon or problem is NOT a concept, but rather an observable event (among other things).   1. Driving questions AND focus questions are not the same thing. They may fulfill a similar purpose. Therefore, sometimes a driving question can be a focus question, but driving questions are not always focus questions. |
|  | 1. **Meta Moment (5 min)** 2. Invite participants to respond individually to the prompts on the slide in their journals. Mark that we will revise our charts later today.   **PDL Note:** Keep in mind that every session up to the next Content Deepening session is part of the Teacher Debrief. These sessions are part of the Teacher debrief storyline and should be closely linked. |
| 2:20 – 2:30  10 min | **Break** | | |
| 2:30 - 4:20  110 min  Slides 36-49    **Study Group Teams** | **Lesson Analysis: STL Strategy 4**  **Purpose**: The purpose of this session is to develop a shared understanding of STeLLA Strategy 4: Communicating in Scientific Ways and how it plays out in the classroom from the introduction of CSW to improving students’ use of the sentence stems.  **Content:** Engaging students in CSW helps students reveal their thinking and supports listening and responding to one another’s ideas. CSW helps establish a classroom culture of revising ideas and moves away from a culture of right answers. Teachers have an important role to play in supporting student discourse (student-to-student talk).  **What participants do**  Participants read the summary document for STL 4: Communicating in Scientific Ways, complete their Z-fold, and chart the purpose and key features. After an introduction to the STeLLA process for analyzing video, they apply what they learn about CSW to the analysis of classroom video.  **Resources**   * Journals * STeLLA Strategies Booklet * PD Binder   + STL Z-fold   + CSW Transcript Charles Clip 1   + CSW & Anchor Lesson * Video   + CSW Duin Clip 1   + CSW Duin Clip 2 * Charts   + CSW Purpose/Key Features Chart |  | 1. **Norms (5 min)**    1. Remind participants of the STeLLA norms from this morning and emphasize that we will be working together throughout the summer institute and academic year.    2. Invite participants to consider their use of the Norms so far. Let them know that they’ll revisit these norms in the morning with a chance to revise them. Encourage them to add notes in their journal or add sticky notes near where the norms are inserted about       * norms they’ve done well with,       * norms that could be improved, and       * thoughts about revisions.    3. Note that this afternoon we will start our analysis of other teachers’ classroom videos. In the fall, we will be analyzing classroom videos from each other’s classrooms. For this work to be meaningful, we need to push and challenge each other, but we need to do this with a common understanding of our goals. |
|  | 1. **STeLLA Conceptual Framework (0 min)**  PDL Note: This is an animated slide.Direct attention to the focus questions on the slide. Mark that we have completed a dive into the research that underpins the STeLLA Lenses.Point to the strategies highlighted on the slide – we will begin a deep dive into the Student Thinking Lens Strategy: Communicating in Scientific Ways (ADVANCE SLIDE to highlight the strategy) that we experienced in our content deepening session.Invite participants to pull out their Z-fold and Strategies Booklet |
|  | 1. **STL Strategy 4 (10 min)**  Refer to the STeLLA Strategy booklet and orecast that we will come back to the Strategies booklet time and time again to ensure that we consistently use ideas, meaning, and language that matches the STeLLA framework.Invite participants to individually review the CSW strategy (Strategy Booklet p. 19) and the purpose and key features on their Z-fold for this strategy.Have participants share ideas from their Z-fold with an elbow partner. Encourage participants to provide evidence from the readings to support their ideas and ask each other questions consistent with our norms such as, “Where did your find that?” or “I interpreted that differently.” |
|  | 1. **STL Strategy 4 (10 min)**    1. As a whole group, discuss the purpose and key features of the CSW Strategy, writing their ideas on chart paper. Hang the chart where it can be referenced later.    2. Invite the group to share the main ideas they recorded for purpose and key features.   **PDL Note:** Key ideas about CSW include:   * CSW reveals students thinking more clearly as they communicate using scientific norms of discourse. * Students use scientific discourse to propose new ideas or explanations, to support ideas with evidence, and to agree/disagree with classmates’ ideas. * CSW must be explicitly taught. * As students learn to communicate using CSW, the role of the teacher shifts from intermediary in student conversations to listening, noting progress, diagnosing problems in student understanding, and planning for instruction. * CSW and sentence starters help students engage productively in the NGSS SEPs. |
|  | 1. **Lesson Analysis (5 min)**    1. Direct participant attention to the Viewing Basics (Strategy Booklet p. 1). Ask: Why is each Viewing Basic important? Which will be hardest for you?    2. Direct attention to the Analysis Basics (Strategy Booklet p. 2). Share that both the Viewing and Analysis Basics will help us dig deeper and learn more from our analyses while keeping us focused on the ultimate goal – improved student learning. Mark that this process is NOT about critiquing teachers but improving student learning.    3. Highlight that the videos we will analyze are not necessarily exemplars. You might say, *The videos we’ll be viewing throughout the program are not necessarily exemplars, but rather they show teachers working to implement the STeLLA Strategies. “Real world” examples deepen our thinking because we can see the sometimes unintended results of a teacher’s decisions and consider missed opportunities.*    4. Honor the videocase teachers. You might say: *All of these teachers are courageous teachers who are not only working hard to improve their practice but are willing to make their practice public so that others can learn from it. None of them would claim to be exemplary science teachers.*    5. Tell participants they can find additional information about both the Viewing and Analysis Basics in their Strategy booklet. |
|  | 1. **Preparing for Video Analysis: The Process (5 min)**     1. Note that we want to be explicit about our video analysis structure. As we move into the fall we will rely heavily on this structure.    2. Share that framing our analysis in this way will help us focus more holistically on BOTH teaching strategies and the impact of those strategies on student thinking and learning, and the storyline that students are constructing (e.g. the two lenses). |
|  | 1. **The Context (5 min)**    1. Provide instructions for watching the video clip and using the transcript to identify places where students are using CSW sentence stems.    2. Invite participants to read the context for this clip at the top of the transcript. |
|  | 1. **Video Analysis: Identify (10 min)**  Note: Emphasize that the purpose of this first analysis is to see the whole process and that in future analyses, we’ll take much more time to go deeply into each step of the process.  * 1. Show the video clip.   2. Individually: Give time for teachers to review the transcript and mark any time students used a CSW sentence stems (or close to the sentence stem) or “way” of communicating like scientists.   3. Whole group: Discuss what they observed in the video. Encourage teachers to use point to the timestamp from the transcript and justify their identification using their poster, Z-Fold, or the STeLLA strategy booklet. Begin by asking for a clear example of students using a CSW stem. After discussing clear examples, take some time to work through a more challenging example or two. Make sure to keep in mind that it’s about the justification…not the “right” answer.   **PDL Note:** Clear examples of students using CSW stems include:   * T: “Today I just want you to focus on...” (and this whole section where the teacher is introducing the chart) * A student comes to the board to point out what he notices about the map. Teacher reiterates that he noticed a pattern, emphasizing CSW sentence stem language (Rows 2 and 3). * A student “added on” to the first student. The teacher reiterates the language of “noticing” (Row 2) * A student begins her sentence with “I noticed” (Row 2) |
|  | 1. **Video Analysis: Analyze (10 min)** 2. Have participants consider the analysis question individually. 3. Invite participants to share their ideas with the whole group. 4. If time permits, ask if there were any sentence stems that students used more frequently, or sentence stems that students didn’t use. What does the pattern indicate about where students might need more support or encouragement in their communication? 5. Possible Responses  * The teacher introduces the chart and has students identify which rows are easier and harder. * The teacher modeled using language from the sentence stems. |
|  | 1. **Video Analysis: Reflect and Apply (10 min)** 2. Invite participants to respond to the prompt in their journals. 3. Have several participants share their ideas with the whole group. |
|  | 1. **CSW and the Anchor Lesson (15 min)** 2. Direct participants to the reading of their PD binder (p. \_\_). Invite participants to silently read with the questions on the slide in mind. 3. As participants finish reading, they should make eye contact with others at their table and discuss the questions on the slide. 4. If time permits, invite several groups to share highlights from their discussion with the whole group. |
| 4:20 - 4:30  10 min  Slides 50-53    **Study Group Teams** | **Closing: Reflection & Homework**  **Purpose:** Reflect on the day’s experiences and learning and prepare for Day 2.  **Content:**  Focus Questions:   * What patterns in temperature can you find on Earth at different times of the year? * How can students be empowered to reveal their thinking and to listen, probe, and challenge each other during classroom conversations?   **What participants do**  Participants reflect on their learning experiences through the day.  **Resources**   * STeLLA Strategies Booklet * PD Binder   + STL Z-fold   + Day 1 Reflection Sheet |  | 1. **Focus Questions (0 min)**    1. Remind participants of our focus questions for today. Invite participants to consider how, in the spirit of CSW, their ideas about these questions have grown and changed throughout the day. |
|  | 1. **Reflection (5 min)**    1. Direct participants to the daily reflections sheet (PD Binder p.\_\_\_). Completed sheets can be left in the center of each table. Names are optional!    2. Remind participants that the parking lot is available for any concerns or questions. |
|  | 1. **Homework (5 min)**    1. Provide instructions for the homework and ask for any clarifying questions about the homework.    2. Remind participants that our goal is to develop a shared understanding of these important strategies so that we can enact them in our classrooms to improve student learning.    3. Remind participants to bring their personal and school calendars on Friday so we can do some scheduling for our study group meetings and lesson videotaping in the fall. |
|  | 1. **BSCS (0 min)** 2. Thank participants for a great first day! |