Achieve

Using

Primary Evaluation of Essential Criteria (PEEC) for Next Generation Science Standards Instructional Materials

Professional Learning Facilitator's Guide

NEXT GENERATION SCIENCE STANDARDS For States, By States

About This Professional Learning Facilitator's Guide

Primary Evaluation of Essential Criteria (PEEC) for Next Generation Science Standards (NGSS) Instructional Materials is a process that provides tools and criteria that can be used to 1) help educators determine how well instructional materials under consideration have been designed for *A Framework for K-12 Science Education* and the NGSS, and to 2) help curriculum developers construct and write science instructional materials that are designed for the *Framework* and NGSS. Completing this professional learning will provide educators with an understanding of the processes necessary to use PEEC to evaluate instructional materials programs.

The guide is not intended to be a self-paced learning guide for PEEC, rather it is intended to support districts, school educators, and/or states to design and deliver professional learning that can help support the:

- Review and/or selection of entire school science instructional materials programs—school science textbooks, textbook series, kit-based and other instructional materials and support materials for teachers—that are designed for the NGSS
- Evaluation of current science instructional materials programs to identify adaptations and modifications to support NGSS implementation.

Structure of the Guide

This Professional Learning Facilitator's Guide is divided into six sections:

- **Structure of the Professional Learning**
  - Explains how the professional learning is organized.
- **Considerations**
  - Provides answers to seven common questions that need to be addressed before beginning the professional learning.
- **Leadership Team Planning Session**
  - Focuses on providing information about how to begin the PEEC process, builds the leadership team's understanding of the NGSS Innovations, and includes detailed information about applying the PEEC Prescreening process.
- **Session 1: Immersion**
  - Builds participants' understanding of the NGSS and its Innovations.
- **Session 2: Unit Evaluation**
  - Provides detailed information about how Phase 2 of the PEEC process can be used to review and select instructional materials programs.
- **Session 3: Program Evaluation**
  - Provides detailed information about how Phase 3 of the PEEC process can be used to review and select instructional materials programs.

Sessions 1, 2, and 3 are designed to sequentially build upon each other and build participants' understanding of the NGSS, its innovations, and the process of PEEC.

The Leadership Team Planning Session and Sessions 1, 2, and 3 sections each contain a professional learning PowerPoint with talking points for each slide. The slides and talking points are included in this document and are also available as separate PowerPoint files. When appropriate, facilitator notes are included to set up and support the discussion of a slide, to provide instructions for tasks, to highlight key takeaway messages, or to provide an explanation for slides. Each section also contains details about the materials needed and any considerations that need to be addressed when planning for that session of the professional learning. Any handouts needed by the participants are identified in the facilitator notes for that slide and are available as separate files.

Structure of the Professional Learning

This guide is intended to help professional learning providers with a solid understanding of PEEC design professional learning for a review team that will be evaluating instructional materials programs. The PEEC process consists of three phases: 1) Prescreen, 2) Unit Evaluation, and 3) Program Evaluation. The recommendation is for a small leadership group, with prior knowledge of the *Framework* and the NGSS, to apply the prescreen and narrow down the list of instructional materials programs. Then, once a smaller set of programs have been identified, a larger review team can be involved in the remaining two phases of PEEC. The professional learning is designed to support this recommendation.

As a facilitator, your roll is to take charge of planning and delivering the professional learning sessions. Reading through the "Considerations" section of this guide will help you make decisions about your goals for the professional learning, who the reviewers should be, and how the instructional materials review and reporting should be structured. To help you prepare for the professional learning sessions, you will need to bring together leaders of the NGSS in your community. The leadership team should ideally consist of educators who have a strong knowledge of the NGSS and its Innovations, and who have been a part of NGSS implementation.

The leadership team will assemble at the Leadership Team Planning Session to start the review of instructional materials programs. They will participate in an immersion activity to build a common understanding of the NGSS Innovations that are an integral part of the PEEC process. After this level-setting activity, the team will apply the PEEC Phase 1 Prescreen tools to narrow down the list of instructional materials programs. This resulting list of programs will then need a more in-depth review to determine if they truly are designed for the NGSS.

Assembling a larger review team to complete the in-depth portion of the review will significantly help decrease the amount of time needed for instructional materials review and selection. The three professional learning sessions in this guide (Session One, Session Two, and Session Three), are designed to build reviewers' understanding of the NGSS Innovations and the PEEC process so they can use the second and third phases of the PEEC process to complete full reviews of instructional materials programs. The goals for each session are listed below:

Session One (Day 1)
- Build a common understanding of the NGSS and its Innovations

Session Two (Days 2 & 3)
- Build a common understanding of the EQuIP Rubric for Science
- Use the PEEC Unit Evaluation process to evaluate the NGSS design of units in instructional materials programs
- Select the programs that will move on to the final evaluation phase

Session Three (Days 4 & 5)
- Use the PEEC Program Evaluation process to evaluate the NGSS design of instructional materials programs
- Generate final recommendations to support the selection of instructional materials programs designed for the NGSS

As mentioned earlier in the guide, all three of these professional learning sessions contain PowerPoint slide decks, notes, and handouts. These materials are designed to support the recommended professional learning structure, but they can be edited and modified to fit your needs.

A number of symbols are used throughout this guide to signal specific features of the professional learning:

The clock signals a timed task.

The exclamation mark signals a very important point that needs to be emphasized.

The video camera signals a video clip.

The double arrow signals an opportunity to differentiate to meet the needs of your audience.

A number of symbols are used throughout the PowerPoint slides to help participants identify what they are doing:

The thought bubble indicates when participants should have time to quietly think.

The conversation bubbles indicate when participants should discuss their thoughts.

The handout icon indicates when participants should reference a handout.

The pencil identifies when participants should record their ideas.

Considerations Before Planning the Professional Learning

Before beginning the review of science instructional materials programs, there are several important considerations. Having a smooth review and selection process that really zeroes in on selecting materials and that will advance instruction requires thoughtful planning. This review process will likely ask reviewers to dig into materials in deeper ways than they are used to and to do this takes time, creativity, and patience as a facilitator. Preparing for an instructional materials review and selection is time and resource intensive and preparations should start well ahead of the review and selection. This process varies greatly from district to district and this guide has been developed as an example of how PEEC can be used in the process, with some examples and recommendations about how the process can be modified depending on your needs and constraints. This section outlines general considerations for the PEEC process, while considerations more specific to each phase can be found in their respective sections. As was mentioned earlier, this guide is not a self-guided set of modules to teach yourself how to use PEEC. It is intended to help professional learning providers with a solid understanding of PEEC to design professional learning for a review team.

The questions that will be addressed in this section are:

- What are your goals for the review?
- How much time do you have for the review?
- Who will be conducting the review?
- How much knowledge do reviewers already have of the NGSS and the *Framework for K-12 Science Education*?
- What are the state and district level requirements for reviewing instructional materials programs?
- What are the state and district level requirements for reporting?
- Which components of the instructional materials program will you review?

What are your goals for the review?

As you begin planning the professional learning, first set your goals for the review, as they will impact many of the decisions you make. Use the following questions to help you decide your goals:

- Do you need to select science instructional materials programs that are designed for the NGSS?
- Do you want to deepen participants' understanding of the NGSS?
- Do you want to evaluate current science instructional materials programs to identify adaptations and modifications to support NGSS implementation?

If you answered yes to multiple questions above, decide whether all of your goals will have an equal emphasis or if one will be the main focus. This professional learning guide is designed with the focus on helping reviewers select instructional materials programs that are designed for the NGSS, and but it also works on deepening participants' understanding of the NGSS. For reviewers to understand the PEEC criteria, they need a solid understanding of the NGSS Innovations. Thus, guide helps deepen reviewers' understanding of the Innovations, but assumes reviewers are coming in with prior basic knowledge of the NGSS and does not provide NGSS 101 training. If one of your primary goals is to build participants' understanding of the NGSS from a basic level, you will need to modify the immersion activity in Session One to help meet your goal. If one of your goals is to evaluate current science instructional materials programs to identify adaptations and modifications to support NGSS implementation, you will need to modify the review and reporting process to meet your goal. For example, in this guide, the second phase of PEEC does not include completing the "suggestions for improvement" in the EQuIP Rubric. To help meet your goal, include this part of the EQuIP rubric in your review process and add a similar section to the program evaluation tools.

How much time do you have for the review?

One of the biggest constraints for this process will be the amount of time that you have available. This guide is designed for the professional learning sessions to take five days – one day for immersion, two days for the unit level evaluation, and two days for the program level evaluation. While these do not have to be five consecutive dates, it is highly recommended that at least the days needed to complete each session be consecutive. Also, it is possible that if the dates are spread over several months, reviewers may need additional time to refamiliarize themselves with the programs, innovations, and evaluation criteria each time they come back for the review. Before the professional learning sessions take place, the leadership team will need to convene to plan for the sessions and to complete the PEEC Prescreening process. The amount of time needed for the leadership team meeting will vary depending on the number of people on the time and the number of programs submitted for review. Information about the planning and prescreening process is included in this guide as the Leadership Team Planning Session.

You will need to consider the time that you have available and the time that it takes to do a full review of the instructional materials programs with any other constraints that you have. For example, if every submitted program needs to go through all of the evaluation phases, you will need to consider the amount of time it will take to complete a unit evaluation and program level evaluation for every program. If you estimate that it will take each review group approximately four hours to complete one program's review in Phase 2, and you have two days to complete Phase 2, you will only be able to review a total of four programs in this phase. If you have more than four programs to review, you can divide the reviewers into groups and each group can review a different set of programs. If this is not possible (e.g., all reviewers must review all programs), you may consider using the NGSS Lesson Screener instead of the EQuIP Rubric for Science, for the unit evaluation in Phase 2. This will limit how deep you look into the sample unit which will save you time, but may also mean that you do not evaluate the materials at sufficient depth to make the right decision.

Who will be conducting the review?

Some of the first steps you need to consider before beginning the PEEC process are what instructional materials you will use for the review and who will be reviewing the materials. This guide is not a detailed guide for how to go through the process of gathering instructional materials for review or assembling an instructional materials review team. As many of these processes are governed by state or local processes. However, even after assembling a team to conduct a review, it is important to decide if the whole team will be participating in all three phases of the PEEC process or if there will be a smaller leadership group within the larger team. Here are two options of how the three phases can be structured in terms of who carries out the review for each phase:

Option A: The leadership group experiences an immersion activity that highlights NGSS Innovations 1 and 2 to build a common understanding, and then they prescreen the instructional materials programs. After narrowing down the list of instructional materials program in the prescreen, the leadership group leads the full group through the same immersion activity to build common understanding, and then leads the full group through phases 2 and 3.

Phase 1 – Prescreen: small leadership group (or just the facilitation team)
Phase 2 – Unit Level Evaluation: full group
Phase 3 – Program Level Evaluation: full group

Option B: The full group participates in all three phases of the PEEC process. If there is a leadership group, the leadership group can be spread out among the groups to help support discussions.

Phase 1 – Prescreen: full group
Phase 2 – Unit Level Evaluation: full group
Phase 3 – Program Level Evaluation: full group

The recommendation is for a small leadership group, with prior knowledge of the *Framework* and the NGSS, to apply the prescreen and narrow down the list of instructional materials programs. Then, once a smaller set of programs have been identified, a larger group of educators can be involved in the remaining two phases of PEEC. This is outlined as Option A above.

However, depending on state and/or district protocols and if there are is a small number of instructional materials programs to be reviewed, it may make more sense to everyone participate in the prescreening process. This is outlined as Option B above.

For either Option A or B, you will need to decide how many reviewers you will need and how to group reviewers for each phase. While it is possible for the prescreen and subsequent phases of the PEEC review to be applied by an individual, the quality review process works best with a team of reviewers as a collaborative process. As more people get involved, the likelihood for better evidence and understanding increases as the additional perspectives can deepen the review process. However, adding more review team members will increase the complexity and costs of a review effort. Working as a group will not only result in a better-informed decision, but the conversations can also bring the group to a common, deeper understanding of what instructional materials designed for the NGSS look like.

It's also important to think of this group as leadership for the implementation of the materials in the classroom. The professional learning that goes along with the PEEC process will better prepare these individuals to implement the materials in the classroom. By selecting individuals who are knowledgeable and well-respected in their buildings, you will be setting the stage for a better implementation.

Regardless of the number of people involved, the same process works to collect input from individuals to make a collective decision. Just as when using the EQuIP Rubric for Science, users should follow the sequence of steps below for each instructional materials program under consideration:

1. Individually record criterion-based evidence.
2. Individually use this evidence to make a recommendation about whether to continue review.
3. With team members, discuss evidence, recommendations, and reasoning.
4. Reach a consensus decision about conducting deeper analysis for this instructional materials program in subsequent PEEC phases.

How much knowledge do reviewers already have of the NGSS and the *Framework for K-12 Science Education?*

All reviewers need a thorough understanding of the National Research Council's *A Framework for K–12 Science Education*, the NGSS, and the NGSS Innovations. They also need to be comfortable applying the EQuIP Rubric for Science 3.0. If reviewers are not familiar with the NGSS, its Innovations, or have not received formal professional learning to support using the EQuIP Rubric for Science, that will need to be included in the process. The professional learning sessions build in some review of the NGSS and the innovations, and Session Two also includes a quick training on the EQuIP rubric, but these are more for level-setting to make sure that all reviewers have the same base understanding than an NGSS 101. The professional learning sessions also offer suggestions where differentiation can occur if reviewers need less or additional support. If participants are knowledgeable about the NGSS and its Innovations, then sections identified by a split arrow can most likely be modified or skipped. While the immersion activity in Session One may seem like a section to skip for a knowledgeable group, it is highly recommended that groups of all knowledge levels participate in the activity, because participants will receive an opportunity to experience three-dimensional learning and the discussions that emerge from this activity are a great level-setting opportunity.

Additional resources that can help build reviewers' understanding of the NGSS are:

- NGSS Parent Guides – The parent guides provide a basic overview of the NGSS, and are available for Grades K-2, Grade 3-5, Grades 6-8, and Grades 9-12. This resource could be a helpful introduction for team members who are parents or who have not been exposed much to the NGSS before.

- Video: NGSS – Crosscutting Concepts - This video highlights NGSS Crosscutting Concepts in a teacher professional development setting.
- Video: NGSS – Disciplinary Core Ideas - This video highlights NGSS Disciplinary Core Ideas in a teacher professional development setting.
- Video: NGSS – Science & Engineering Practices - This video highlights NGSS Science and Engineering Practices in a teacher professional development setting.
- EQuIP Rubric for Science Professional Facilitator's Guide – This facilitator's guide consists of ten models that are designed to increase educator proficiency in applying the EQuIP Rubric for Science v3.0 while also deepening their understanding of the NGSS. If participants do not have a basic understanding of the NGSS, then some of these modules may be helpful in building their understanding. For example, Module 2 walks through the structure of performance expectations.
- NGSS Lesson Screener – The NGSS Lesson Screener provides criteria for a quick look into the degree to which lessons and units are designed for the NGSS.
- NGSS Appendices – The appendices provide background and details about the standards.
- Quality Examples of Science Lessons and Units - Instructional materials that have been submitted to the EQuIP Peer Review Panel and evaluated as Examples of High Quality NGSS Design, Examples of High Quality NGSS Design if Improved, or Quality Works in Progress.

What are the state and district level requirements for reviewing instructional materials programs?

States and districts usually have specific requirements for reviewing instructional materials programs under consideration. These requirements differ by state and district, and you should spend time becoming familiar with the ones that apply for your review. Below are several general questions that you should ask and find answers to before beginning the PEEC review process:

- *Do all submitted programs need to go through the entire evaluation process?*

  Some districts or states may have standing processes or even statutes that require full review of all instructional materials programs that are submitted in response to a request for materials. This will affect how you use the PEEC process and you will have to adjust based on your available time. If full review of all programs is not required, then use PEEC as described in the guide.
  If full review of all programs is required then consider the following:
  1. Include criteria from the prescreen as part of your request for materials (See the Appendix for an example of a Biology Textbook Request) so that you only have to consider materials that provide evidence that they meet the prescreen criteria; and/or
  2. Modify the professional learning to free up more time for reviewing materials.
     a) Remove the prescreen from the PEEC process, and remove the prescreen components from the overall scoring
     b) have a smaller leadership team do all of the prescreens first and then use them as examples of quality feedback to support the other two phases of the evaluation
     c) devise a creative way to divide and conquer the large group of materials for review that still meets district and state guidelines and, more importantly, makes sure that there are enough people reviewing each set of materials to ensure a quality review.

- *Do all the reviewers need to evaluate every program that has been submitted?*

Some districts or states may require that all programs receive feedback from all reviewers, but others may allow more of a divide and conquer approach. If there is a large number of programs to be reviewed, participants can be divided into groups, with each group reviewing a different set of programs. It is important in this scenario to make sure that enough people review each program. A rule of thumb would be for at least two, but preferably at least three people review each program and to make sure that the review groups shift to increase inter-rater reliability. For example, if you are reviewing high school biology materials and have 12 participants reviewing and 6 programs to review, if you assign three programs to review as shown in the table on the right, each person only has to review 3 programs (saving time), but you still get six sets of eyes on each set of materials and the groups for each material change. Of course, if all programs have to be evaluated by all reviewers, this division will not be possible, and you will need to make sure there is enough time for all programs to be reviewed.

Reviewer #	Materials for Review (each represented with a letter)
1	abc
2	def
3	bcd
4	efa
5	cde
6	eab
7	def
8	abc
9	efa
10	bcd
11	fab
12	cde

What are the state and district level requirements for reporting?

Many districts and states have specific requirements for the reports used during the review and evaluation of instructional materials programs under consideration. These requirements differ by state and district, and you should spend time becoming familiar with the ones that apply in your case. Below are several general questions that you should ask and find answers to before beginning the PEEC review process:

- *Are there specific forms that are required for reporting?*

  Many districts and states require a certain form or format for reporting reviews of instructional materials programs. These forms may have to be completed and even signed by individual reviewers, and other rubrics or forms cannot be used in place of these. If this is the case, you can still use PEEC and the PEEC review process to collect the evidence about how well the materials are designed for the NGSS. Just go through the required reporting policies before beginning to plan the instructional materials review process and look at the similarities and differences between the required reports and the forms and criteria in the PEEC process. Check to see where there are overlaps and what the required reports have that are not found in the PEEC forms. You may need to modify the PEEC reporting tools to include these additional criteria and meet state and/or district requirements.

- *Do reports need to be submitted by each individual?*

  Some districts and states may require that all programs are evaluated by all reviewers, and that each reviewer has to submit an individual report for each program. There is time built into the phases for groups to discuss their individual findings and reach a consensus about whether the evaluation criteria in each phase have been met. If all reviewers need to submit reports, you might decide that they will not need to generate a consensus report for all reviews, though they should do this with the first examples to increase inter-rater reliability. If you change this process, those talking points and slides in the phases can be altered to reflect this modification. However, the time that individuals spend discussing their findings in their groups can still be valuable as it will allow participants a chance to reflect on their findings and deepen their understanding of the criteria and process.

- *Do reports need to be handwritten or electronic?*

  Some districts and states may require that all submitted reports be either handwritten or electronic. If the requirement is for handwritten reports, the documents for each of the tools in PEEC may need to be modified to allow participants more space to handwrite their comments. It may also be useful to provide reviewers with pre-printed stickers that include their name, the name of the program that they are evaluating, and any other pertinent information, that they can place on each of tools. If the requirement is for electronic reports, all reviewers will need access to computers for the entire duration of the professional learning and will need to know how to submit their electronic reports (e.g. by email or google drive).

Which components of the instructional materials program will you review?

The NGSS Innovations should be present in the materials that are in the hands of all students and teachers—not just in optional or ancillary materials. The components of the instructional materials program chosen to review need to be selected in advance and consistent across programs and the phases. It is important to review only what will be available to all teachers and to all students. Though the prescreen is intended to be a quick read-through of materials, it is important—for all the materials reviewed and for each of the criteria—to evaluate both the overall organization of the materials and their content.

Leadership Team Planning Session: Immersion & PEEC Prescreen

The first purpose of this session is to engage the leadership team in an immersion activity to build a common understanding of the NGSS and its Innovations. These Innovations are the lens that PEEC uses to help educators evaluate instructional materials, so it is important that before evaluating instructional materials, all reviewers understand the Innovations.

The second purpose of this session is to narrow the list of instructional materials programs under consideration to prepare for the rest of the evaluation process by a larger review group in Session 1-3. The leadership team will use the PEEC prescreen to do a relatively quick survey of the instructional materials programs to see if they warrant further review. The prescreen offers users a process to determine if a given set of instructional materials appears to be designed for the NGSS. If the evidence for the criteria in the prescreen is not clear and compelling, the materials are likely not worth the time and capacity necessary to fully evaluate the degree to which the programs are designed for the NGSS. By applying the prescreen to all the instructional materials programs under consideration, the leadership team will help narrow the list of programs that require a full review.

Logistics & Materials

- If reviewers have access to computers, they will be to type up their evidence for each tool in the PEEC process. This is highly recommended, as it will allow them to capture more of their ideas and group discussions. A fillable PDF version and a Microsoft Word version of PEEC can be found at https://www.nextgenscience.org/peec. A fillable PDF version a Microsoft Word version of EQuIP Rubric for Science v.3 can be found at https://www.nextgenscience.org/resources/equip-rubric-lessons-units-science.
- Reviewers will need to be able to look up the standards and NGSS appendices, either digitally or in print format.
- The number of PEEC Tool handouts that will be needed will depend on the number of instructional materials programs that need to be reviewed for the prescreen phase.
- The presentation requires a computer, projector, and speaker system.

Handouts needed:

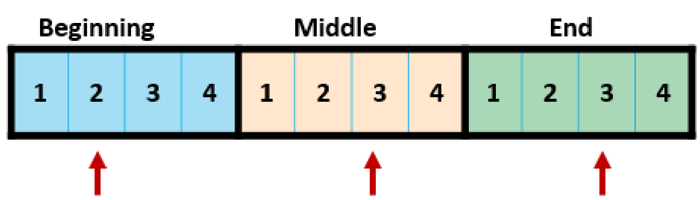
- Handout 1 – NGSS Innovations
- Handout 2 – Immersion Student Packet
- Handout 3 – Immersion Teacher Packet
- Handout 4 – NSTA DCIs Matrix
- Handout 5 – NGSS Appendix F
- Handout 6 – NGSS Appendix G
- Handout 7 – Immersion Evidence Organizer
- Handout 8 – What Are Phenomena?
- Handout 9 – Tool 1A – PEEC Prescreen
- Handout 10 – Tool 1B – PEEC Prescreen
- Handout 11 – Tool 1C – PEEC Prescreen
- Handout 12 – Tool 2 – PEEC Prescreen
- Handout 13 – Innovation One
- Handout 14 – Innovation Two

Considerations

How will you scan the materials for evidence?

The prescreen criteria allow users to take a quick look at an instructional materials program to determine whether the program shows promise of NGSS design. The prescreen process involves the use of three tools, each for a criterion that should be readily apparent in a program that has been designed for the NGSS. Reviewers will need to scan each program to find evidence for the criteria, and the materials that they will scan and the way that they will scan the materials should be determined before beginning the prescreen. Here is a recommended sampling plan that can be modified to better fit your needs:

1. Find a total of six-nine pieces of evidence for each of the three tools.
    i. Each tool asks for evidence that an instructional materials program does not meet the criteria and for evidence that it does meet the criteria. The evidence should not be required for each column or to be split across the “does not meet” or “does meet” columns (as this may skew the results). Instead, reviewers should look for evidence for the presence and absence of the criteria in general, and record their findings in the appropriate column.
2. Search for evidence from different areas of the program.
    i. Reviewers should find and record two-three pieces of evidence each from the beginning, the middle, and the end of the program, for a total of six-nine pieces of evidence for each tool.
    ii. Divide the program into three imaginary sections to represent the beginning, middle, and end of the program. To find the evidence from the beginning of the program, divide that section into four smaller sections and choose one to look through evidence. Repeat this process for the middle and the end sections. The figure below provides a visual for this process.

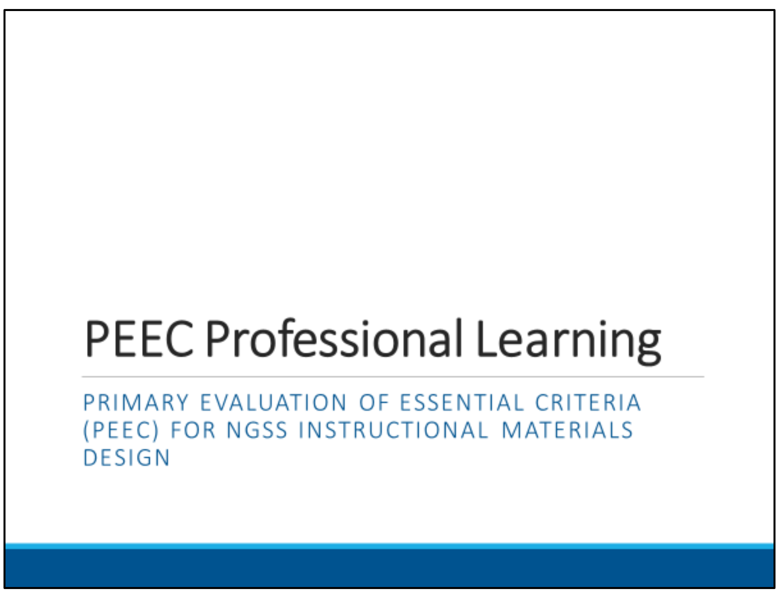


    The actual number of pages that are reviewed in each section that is sampled will depend on the length of the program, but it might be something equivalent to a chapter length in a textbook.
    iii. During this stage of work, it is important to remember that this is a prescreen and not the full evaluation. It is not necessary to find every piece of evidence in the program and reviewers do not need to evaluate every single page or even every lesson. Instead, they need to scan through the sections that they have selected in the program for the evidence.
3. Identify the type and number of materials that will be reviewed for each program.
    i. Reviewers should have a list of the programs that they will be evaluating and the type and number of materials that were submitted with each program. They should also be informed if they will be evaluating all of the supplemental materials or only a portion of them. For example, if a program comes with optional supplemental CD activities that you already know you will not be able to purchase and use, they should not be a part of the evaluation.

Slides

Facilitator Notes:

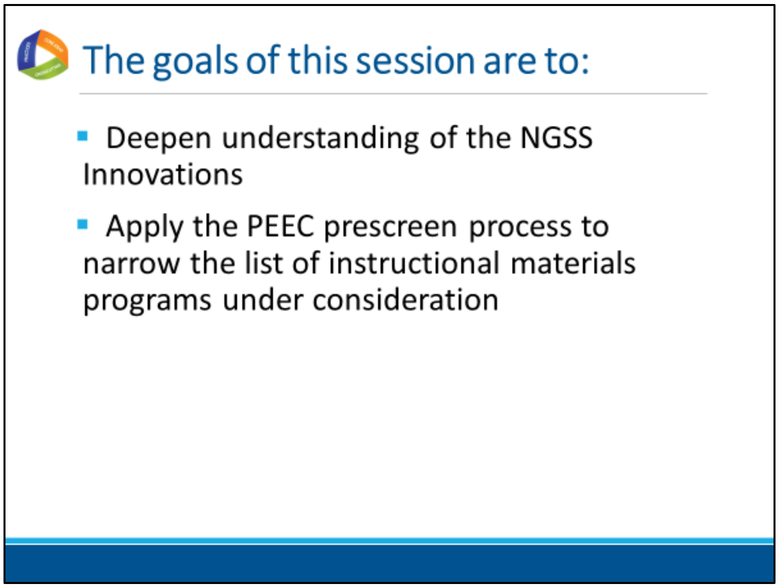
- The purpose of this session is to bring together leaders of the NGSS in your community to help you prepare for the professional learning sessions that will equip a group of reviewers to evaluate whether instructional materials programs are designed for the NGSS. The leadership team should ideally consist of educators who have a strong knowledge of the NGSS and its Innovations, and who have been a part of NGSS implementation, whether it is through teaching, training, developing materials, etc.
- The first part of this planning session will act as a level-setter. Even though, ideally, all team members have a strong understanding of the NGSS, it is important that they have a common understanding and that there are no misconceptions heading into the professional learning sessions. All members will participate in an immersion activity as students, and then will look for evidence of three-dimensional learning in the activity as teachers. The discussions that emerge from this activity will be a great level-setting opportunity.
- In the second part of this planning session, members will learn the basics about the PEEC process and will learn how to use the PEEC Prescreen tools to evaluate and narrow the list of instructional materials programs that warrant a full and complete review by the larger review group in the professional learning Sessions 1-3. The prescreen criteria allow users to take a quick look at an instructional materials program to determine whether the program shows promise of NGSS design.
- There are several considerations before beginning the prescreening process in the second half of this session. These considerations are addressed in the facilitator's notes section of the prescreening slides, beginning on Slide 61.
- Before you begin the session, it will be important to think about how you want to group participants. Ideally, participants will be in teams of four to six members, as this size gives everyone an opportunity to be part of the team discussion. You may wish to group participants with varying levels of knowledge (i.e. spread out educators who have an understanding of the NGSS into separate groups), to allow for a rich discussion with multiple perspectives.



Slide 1

Slide 2

Talking Points:
[Note to facilitator: Create talking points for a welcome and introductions. If people in the room do not know each other, include an ice breaker activity and establish norms to get the day started.]



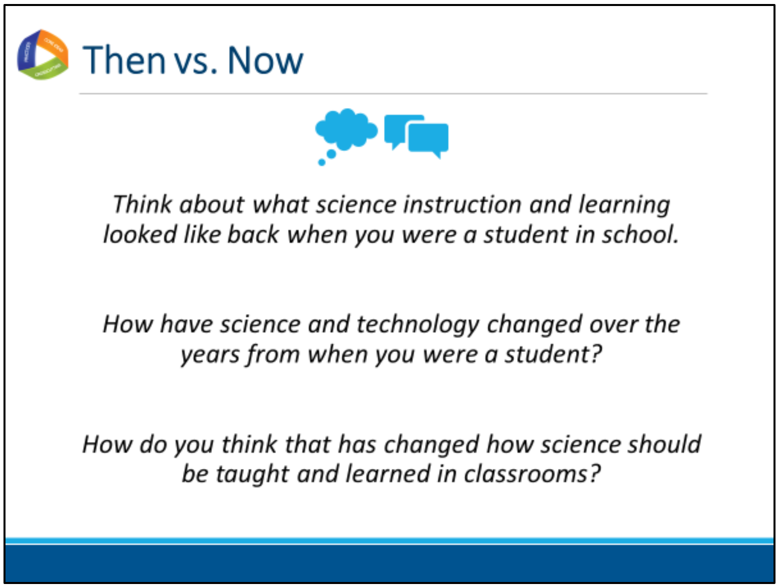
Slide 3

Facilitator Notes:

- This slide will explain the goals of the session to participants. It will help show them how they are setting the stage for a more in-depth review of the instructional materials programs by a larger group of reviewers in the professional learning Sessions 1-3.

Talking Points:

- There are two main goals for this session.
- First, we want to deepen your understanding of the five NGSS Innovations. These innovations are the lens that PEEC uses to help educators evaluate instructional materials, so it is important that the people evaluating instructional materials understand the innovations.
- Second, we want to apply the PEEC Phase 1, Prescreening process to narrow the list of instructional materials programs under consideration. We have a lot of instructional materials programs that have been submitted in response to our materials request. We need to review all of these programs to find the ones that show evidence of being designed for the NGSS, so that we can select our new materials. We will be using the PEEC process (that you will learn a lot more about today) to help us evaluate and select the materials. The PEEC process consists of three phases, and the second and third phase dig deeply into the programs and are time intensive. To help maximize your use of time and resources, your task is to learn about the first phase in PEEC, the prescreen, and apply the prescreen process to narrow the list of programs under consideration. This resulting list of programs will then be reviewed by our larger group of reviewers in Sessions 1-3.
- Before we dive into the PEEC process, let’s discuss some of the changes that have happened in science education over the past few decades and build our understanding of the NGSS Innovations.



Slide 4

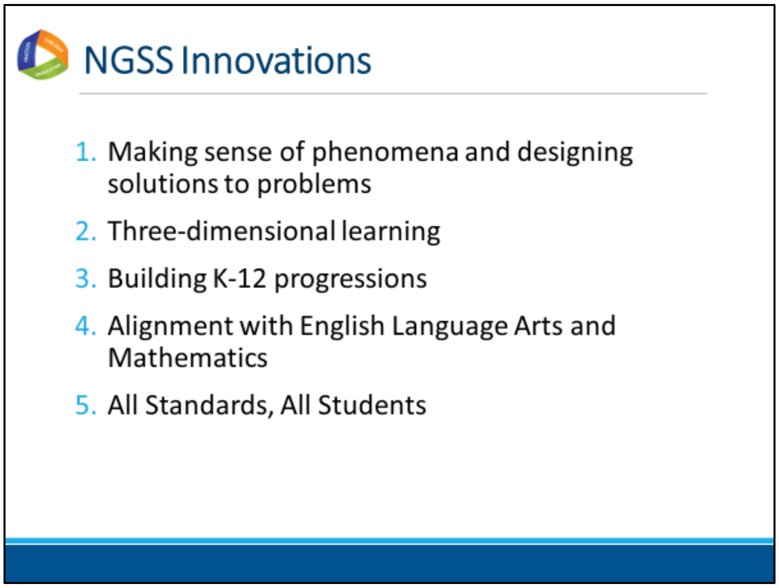
Facilitator Notes:

- Participants' knowledge about the shift in science standards and the NGSS may vary greatly, and not all participants may understand how or why science education is changing, and in turn, how instructional materials will look different from when they were students. This slide is structured to allow participants time to personally reflect on their science education experiences and includes opportunities for them to discuss their experiences and their thoughts about how instruction and learning should be changing in the science classroom to match the evolution of science and technology. This slide will help participants understand the need to update instructional materials.
- If the participants in the leadership group consist of people who have a solid understanding of the NGSS and have been through robust professional learning about NGSS implementation (e.g. an EQuIP Rubric for Science training), then this reflection may not be necessary, and you could remove or modify this slide to better fit your needs. It is important, however, to center your team on their vision for science education. This will be particularly helpful if you suspect that some of that participants in the room are not readily embracing the expectations of the standards.
  (The split arrow icon on the left-hand side reappears throughout the professional learning sessions, and it identifies slides where there are opportunities to differentiate to meet the needs of participants. These slides are included to help build a common understanding of the NGSS, its innovations, and the PEEC process, but they can be altered or removed. If you feel that your participants already have an understanding of a slide coming in, then you can remove the slide. If there is a mix of understanding, it is recommended to include the slide in your session.)
- The thought bubble and conversation bubble icons indicate that the statement/questions listed on the slide are for participants to think about and then discuss with their group. These icons will reappear throughout the professional learning slides to help support the facilitator's talking points in a visual manner for participants. The talking points below provide a recommended structure for this conversation.
- Each group will need chart paper and markers for this activity.

Talking Points:

- What makes the Next Generation Science Standards (NGSS) new and different from past science standards? *[Note to facilitator: Click for animation.]* Take a few minutes to think about what science instruction and learning looked like back when you were a student in middle/high school or college. What did instruction look like? What was the role of the student vs. the teacher? *[Note to facilitator: Give participants a minute for personal reflection.]* Discuss your thoughts with your group. *[Note to facilitator: Give participants 5 minutes for their group discussions.]*

- Now think about how science and technology have changed over the years from when you were a student? *[Note to facilitator: Click for animation.]* How do you think that has changed how science should be taught and learned in the classroom? *[Note to facilitator: Click for animation.]* Discuss your thoughts with your group. *[Facilitator Note: Give participants 5 minutes for their group discussions.]*
- On the chart paper provided for you, create a T-chart and list your big ideas about what science education and standards used to look like when you were a student, and what science education and standards are shifting toward now. *[Note to facilitator: Give participants 5 minutes for this activity. After groups are finished creating their T-chart, have them post their chart where everyone can see it.]*
- Let's have each group share their chart. *[Note to facilitator: Have each group present their chart to the room.]*



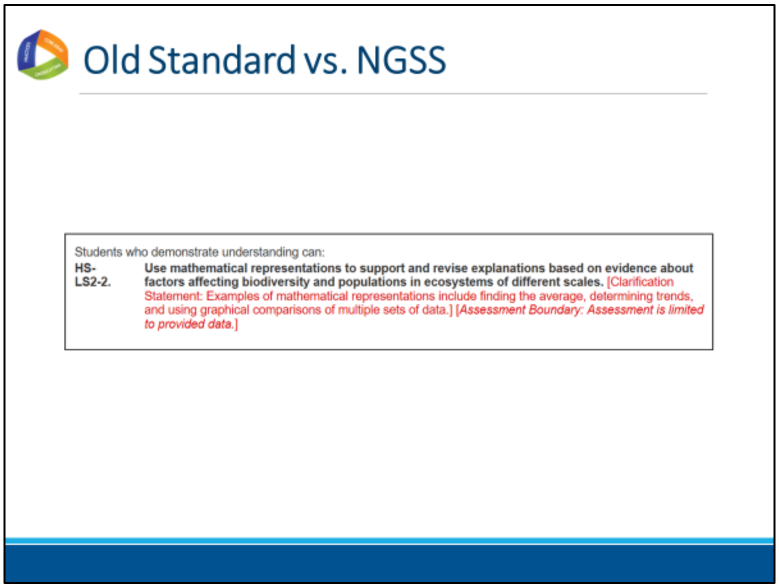
Slide 5

Facilitator Notes:

- The NGSS Innovations will be briefly introduced here to tie into the discussion from the previous slide. Each innovation will be presented further in depth later on in the professional learning sessions as needed for participants to understand the three PEEC phases. The handout that participants will begin to fill out in this slide, *Handout 1 – NGSS Innovations,* will help track how participants' understanding of the NGSS innovations changes throughout the professional learning sessions.
- Tailor the talking points to build on any ideas that may have surfaced in the previous discussion when groups shared their ideas in the form of their T-chart.
- Participants will need a copy of *Handout 1 - NGSS Innovations*.

Talking Points:

- We just discussed the shifts that we have seen in general for science education. Let's now talk specifically about the innovations of the NGSS.
- The vision of the NGSS is based on scientific advances and educational research about how students best learn science. The NGSS are new and different from past science standards in that there are five innovations.
- The five NGSS innovations are: making sense of phenomenon and designing solutions to problem; three-dimensional learning; building K-12 progressions; alignment with English Language Arts and Mathematics; and all standards, all students.
- What do each of these innovations mean to you right now? Please take out your *NGSS Innovations* handout. In the chart on the first page, take a few minutes to write down your description for each innovation and how you would expect each one to appear in instructional materials. *[Note to facilitator: Give participants about five minutes to write down their initial thoughts.]*
- Take a few minutes to discuss your thoughts with your group. *[Note to facilitator: Walk around and listen to the group discussion to get an understanding of what participants already know (or do not know) about the innovations. Participants will be building their understanding of the innovations throughout the professional learning.]*
- We will discuss each innovation more in depth over the next few days.



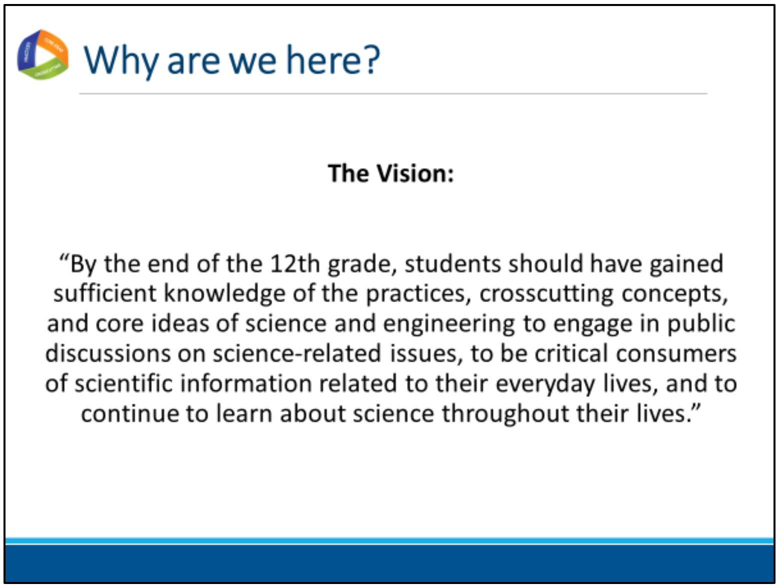
Slide 6

Facilitator Notes:

- This slide can help clarify and emphasize the innovations of the NGSS and the change from old to new standards. This slide will not be needed if participants are already well versed in the NGSS, but could be a helpful visual for any participants who do not know how the performance expectations are different from old standards or how they are structured.
- ! The key takeaway for participants is that the NGSS performance expectations are three-dimensional. Depending on the background of participants, they may need additional explanations and support as to what performance expectations are (that they are what students should be able to do by the end of a certain grade, etc.).
- Insert in an example of one of your old state standards and a comparable performance expectation from the NGSS.

Talking Points:

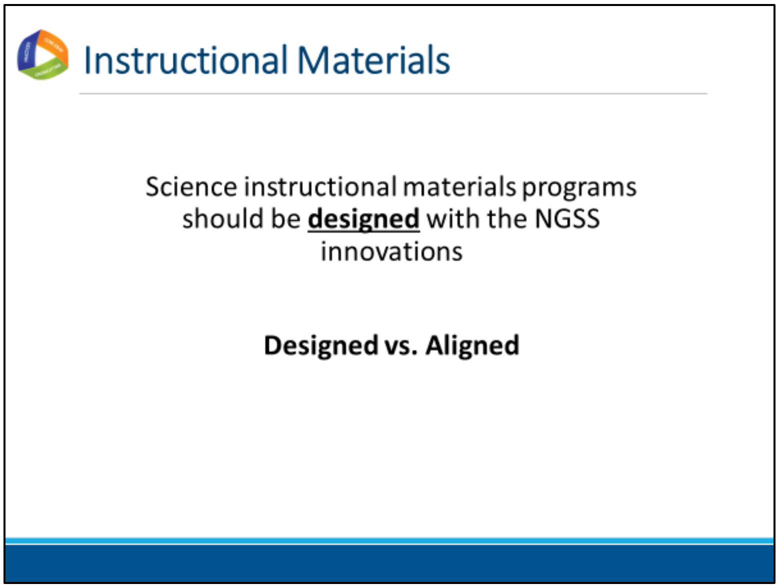
- So what does the difference actually look like for the standards and themselves?
- Let's take a look at a performance expectation from the NGSS and a similar standard from the old state standards. What is similar? What is different? What are the new standards really asking students to do? *[Note to facilitator: Engage participants in a discussion about the differences between the standards.]*



Slide 7

Talking Points:

- The NGSS do not shy away from the complexity of effectively teaching and learning science. They challenge us to better support teachers as they create learning environments that support all students to make sense of the world around them and design solutions to problems. This vision is summarized in the following excerpt from the *Framework*. *[Note to facilitator: Pause to give time to participants to read the quote.]*
- The research and resulting vision for science education have implications for instructional materials.
- The old versions of textbooks and instructional materials do not support the innovations and vision of the NGSS, and there need to be shifts in instructional materials to fully support both teachers and students as schools transition to the NGSS.



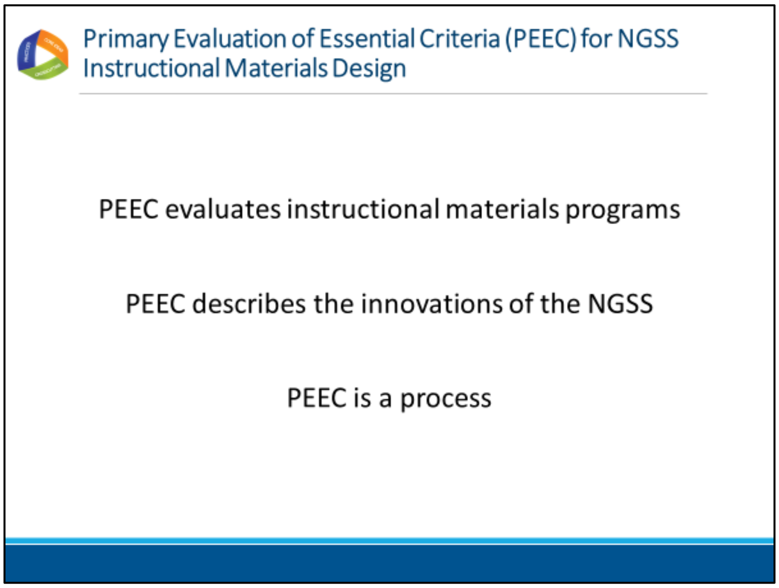
Slide 8

Facilitator Notes:

- Many of the new resources for the NGSS use the word “designed” instead of “aligned” when referring to programs for the NGSS. There is a reason behind this shift, and the talking points below walk participants through the reasoning behind the use of the word “designed,” as it appears throughout PEEC and this professional learning.

Talking Points:

- The research and resulting vision for science education have implications for instructional materials that reach far beyond minor adjustments to lessons, adding callout boxes to margins, crafting a few new activities, or adding supplements to curriculum units.
- The advances in the NGSS will be more successfully supported if entire science instructional materials programs are designed with the NGSS innovations and if states, districts, and schools use a tool and process to ensure that the materials they choose really measure up.
- The word “designed” is intentionally and deliberately used here instead of “aligned.” This choice was made because alignment has come to represent a practice that is insufficient to address the innovations in these standards.
- When new standards are released, educators traditionally create a checklist or map in order to tally how well their instructional materials match up with the standards. If enough of the pieces of the standards match up with the pieces in the lessons or units or chapters, the instructional materials are said to be “aligned.” In this sense, “alignment” is primarily correlational and, if the correlation is not high enough, the only shift that is needed is to add additional materials or re-move particular pieces. This traditional approach to alignment assumes that (1) matching content between the language of the standards and the instructional materials is sufficient for ensuring that students meet the standards, and (2) that all approaches to the way instructional experiences are designed in materials are created equally as long as the content described by the standards appears.
- However, the innovations of the *Framework* and NGSS cannot be supported by instructional materials that simply have the same pieces and words as the standards. In the NGSS, academic goals for students are stated as performance expectations that combine disciplinary core ideas, cross-cutting concepts, and science and engineering practices. The nature of this multidimensional combination is as important as the presence of the constituent components, and has implications for how students build the knowledge and skill needed to be able to meet multidimensional standards. Thus, the word “designed” was chosen because it reflects the degree to which the innovations represented by the standards are a foundational aspect of both the design and content of the instructional materials.



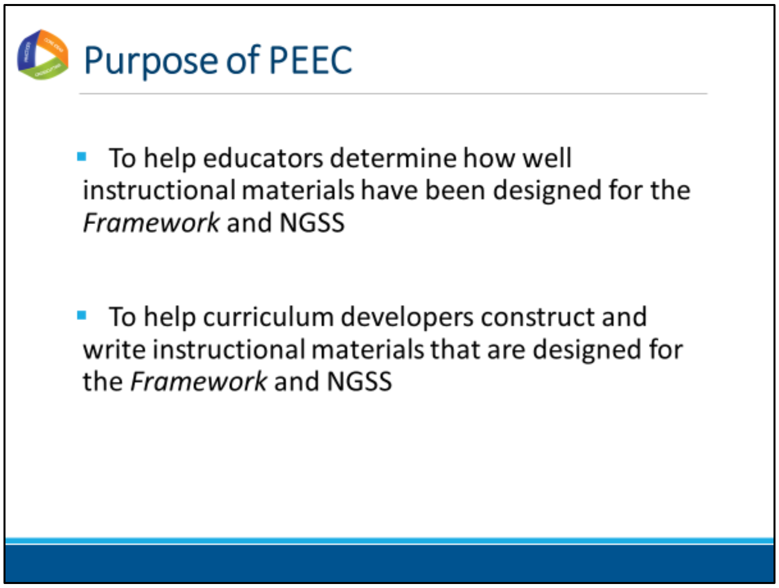
Slide 9

Facilitator Notes:

- The next few slides (slides 9-12) walk participants through the basics of what PEEC is and how they will be using PEEC.

Talking Points:

- How can we evaluate whether instructional materials programs are designed for the NGSS and truly reflect the innovations?
- One of the resources available to us is PEEC which is short for Primary Evaluation of Essential Criteria for NGSS Instructional Materials Design.
- PEEC is a process that can be used by educators to evaluate the NGSS design of instructional materials programs. The programs being evaluated can be of a variety of digital and print formats. They can include textbooks as well as comprehensive science instructional materials programs designed to include different units, kits, modules, textbooks, textbook series, or web-based instructional materials, including open educational resources.
- By using a process that focuses on the innovations of the NGSS, we are avoiding the “We are already doing NGSS; we’ll just put a new label on the textbook” problem.



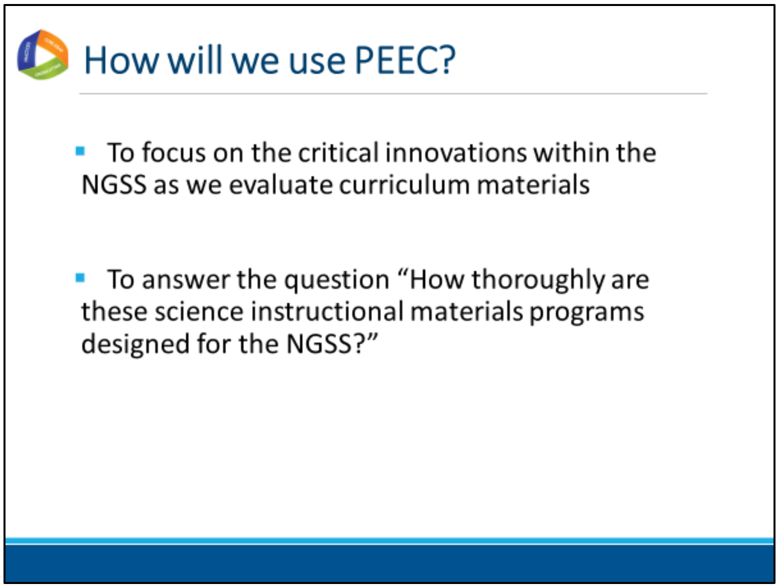
Slide 10

Facilitator Notes:

- The next few slides (slides 9-12) walk participants through the basics of what PEEC is and how they will be using PEEC.

Talking Points:

- The main goal of PEEC is twofold. Curriculum developers can use PEEC to more easily create and refine instructional materials for the NGSS, and to do so knowing that their efforts are focused on the same innovations that schools, districts, and states will be using to select instructional materials for use.
- PEEC can also help educators determine how well the instructional materials under consideration for adoption have been designed for the NGSS.



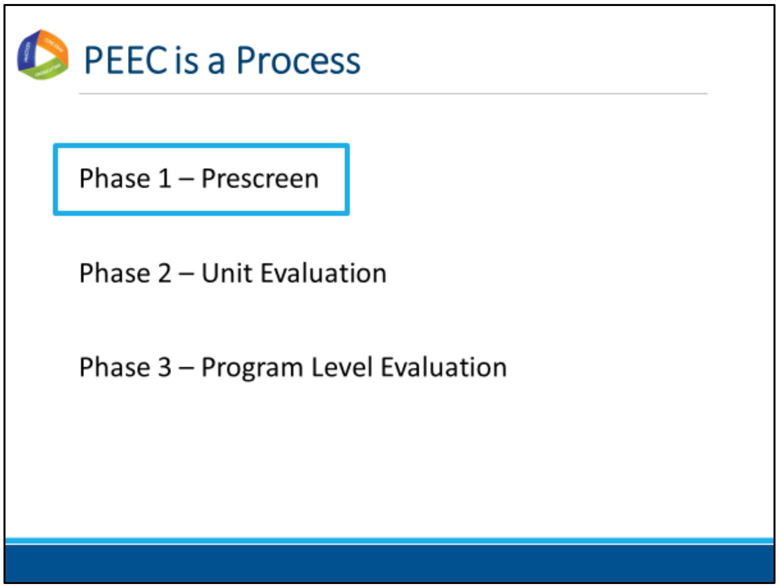
Slide 11

Facilitator Notes:

- The purpose of the professional learning and which of the three phases of the PEEC process you include will vary depending on the steps that you need to follow for instructional materials selection and adoption that are specific for your district. The points provided are the general points of what PEEC is designed to do and the talking points and slide points should be altered to specifically reflect the goals of your professional learning.

Talking Points:

- We will use PEEC to guide the selection of high quality NGSS instructional materials. The criteria in PEEC will help us focus on the innovations within the NGSS as we evaluate the submitted instructional materials.
- Ultimately, we want to be able to answer the question "How thoroughly are these science instructional materials programs designed for the NGSS?"



Slide 12

Facilitator Notes:

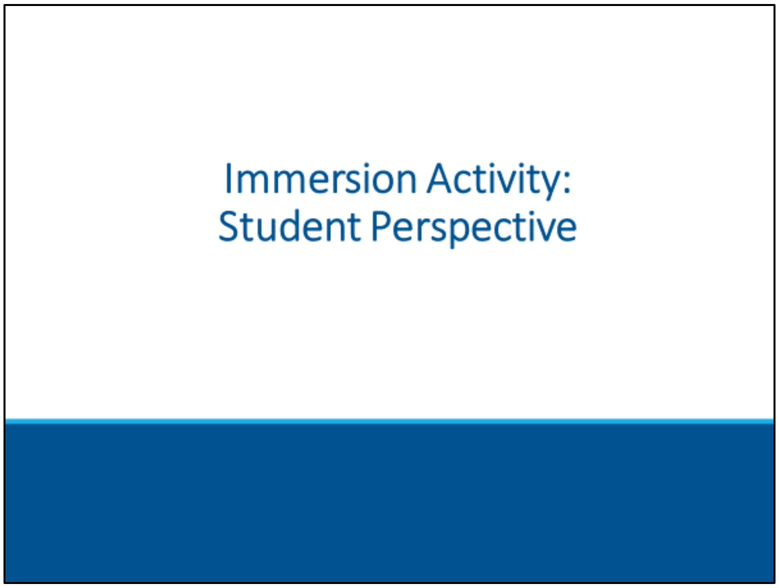
- The purpose of the professional learning and which of the three phases of the PEEC process you include will vary depending on the steps that you follow for instructional materials selection and adoption in your district. It is recommended that the leadership team complete the prescreen before the entire group convenes to complete the unit evaluation and program level evaluation. This guide is structured to represent this recommended option. However, for information about other ways to structure the professional learning, please see the *Considerations Section* of the *PEEC Professional Learning Facilitator's Guide* document.
- This slide is an opportunity to introduce participants to the entire PEEC process, to provide brief descriptions of each phase, and to inform them what phases they will be participating in and over which days. Your talking points should be modified to reflect these points.
- It is recommended that these participants, the leadership team, lead and/or support the immersion activity (that they themselves will be engaged in today) for the whole group in Session One of the professional learning. It is extremely helpful to have people who have been through the immersion take the role as table or group facilitators as they can help provide support for the participants. This will also help the leadership team strengthen their understanding of the NGSS. If the leadership team will be able to provide this support for Session One, it is recommended that you explain this to them before you begin the immersion, so that they understand their role for the entirety of the professional learning.

Talking Points:

- PEEC is a process that can be used by educators to evaluate the NGSS design of instructional materials programs. The PEEC evaluation process involves three successive phases: first the prescreen, then the unit evaluation, and lastly the program level evaluation.
- The first phase, the prescreen, focuses on a small number of criteria that should be readily-apparent in instructional materials designed for the NGSS. This allows those selecting materials to take a relatively quick look at a wide range of materials and narrow the number of programs worthy of a closer look.
- If the prescreen of the materials indicates that there is at least the potential they are designed for the NGSS, they are put through the second phase of the PEEC process. The second phase uses the EQuIP Rubric for Science as a sampling tool to evaluate a unit of instruction for evidence it is designed for the NGSS.
- For materials that successfully complete the second phase, the third and final phase of the PEEC process evaluates the evidence that the NGSS innovations are embedded across the entire instructional materials program.
- As the leadership team, you will be participating in all three phases of the PEEC process. *[Note to facilitator: Click for animation.]* We will begin with the first phase, the prescreen, today, to narrow the list of materials worth a

closer look. We will then complete the second and third phases with a larger group. *[Note to facilitator: Depending on the amount of time you have allocated for the prescreen, you may finish prescreening today, or you may need additional time. Make sure to inform participants of the days/times they will be dedicating to the prescreen and planning.]*

- *[Note to facilitator: It is recommended that these participants, the leadership team, lead and/or support the immersion activity (that they themselves will be engaged in today) for the whole group in Session One of the professional learning. It is extremely helpful to have people who have been through the immersion take the role as table or group facilitators as they can help provide more support to the participants. This will also help the leadership team strengthen their understanding of the NGSS. If the leadership team will be able to provide this support for Session One, it is recommended that you explain this to them before you begin the immersion, so that they understand their role for the entirety of the professional learning.]*



Slide 13

Facilitator Notes:

- Before participants begin to dig into the evaluation of instructional materials program using the PEEC criteria, it is important that they understand the criteria and what the criteria are based on – the NGSS Innovations. Instead of frontloading information about all five of the NGSS Innovations and overwhelming participants with a lot of information, this professional learning introduces and builds understanding of each Innovation as it is needed for the PEEC process. This part of the professional learning (Leadership Team Planning Session) along with Session One, focus on making sure participants understand the first two Innovations: three-dimensional learning, and explaining phenomena or designing solutions. Session Two of the professional learning introduces and explains the remaining three Innovations and reinforces understanding of Innovations 1 and 2.
- Participants will build an understanding of Innovations 1 and 2 by first engaging in an immersion activity as students and then by dissecting the activity for evidence of the Innovations as a teacher. By experiencing an activity both as a student and a teacher, participants will be able to see how three-dimensional learning looks like from both sides of the classroom, resulting in a stronger understanding than just reading an activity.
- If the leadership team already has a strong understanding of the NGSS and its participants have participated in trainings designed especially for the NGSS before (i.e., EQuIP Rubric for Science trainings), then you can modify, replace, or skip the immersion activity. However, if the leadership team will be leading the immersion activity for the entire review group in Session One of the professional learning, it is strongly recommended that they participate in the immersion activity before they lead it.
- If participants are already not sitting in groups (preferably of four to six), then they should rearrange into groups for the immersion activity.

Talking Points:

- Before we begin prescreening materials, we will need to ensure that we all have the same understanding of the NGSS Innovations, because they are critical pieces of the criteria found in PEEC.
- We will begin to build our understanding by digging into three-dimensional learning. You will take part in an immersion activity as students to experience three-dimensional learning.
- Our goal is for you to be able to explain what three-dimensional learning is and what evidence for it looks like in an activity.

Slide 14

Facilitator Notes:

- The goals for this activity:
  - participants will build a common understanding of NGSS Innovation 1 (phenomena/problems)
  - participants will build a common understanding of NGSS Innovation 2 (three-dimensional learning)
  - participants will be able to explain what three-dimensional learning looks like in a classroom
  - participants will be able to explain what evidence for three-dimensional learning looks like in an activity
- This activity is adapted from the Ambitious Science Teaching's Sound Energy Unit for Grade 4. Parts of some lessons from this Unit have been used and modified for this professional learning. The original files for this unit can be found at the Ambitious Science Teaching's website: https://ambitiousscienceteaching.org/one-curriculum-sound-energy-grade-4/

Talking Points:

- Let's experience *figuring out* by engaging in 3-dimensional learning together.
- In this immersion experience into the 3 dimensions, you will be wearing two hats.
- First, we will wear our student hat as we productively struggle with a phenomenon.
- Second, we will put on our teacher hat, and look for evidence of student thinking and learning in student products.
- Examining the three dimensions from both the creation and evaluation perspective will deepen our understanding of how students build an understanding that they can use to explain the world.

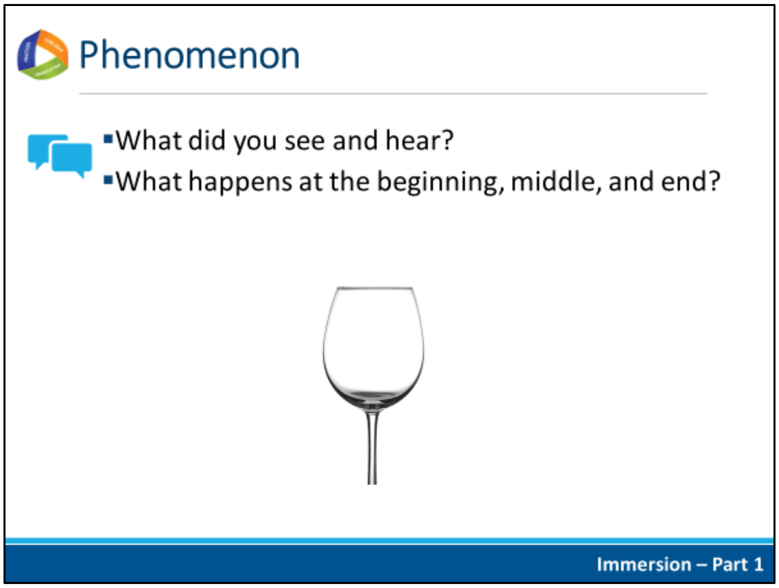
Slide 15

Facilitator Notes:

- This slide will give participants a common experience for the phenomenon that anchors the immersion activity.
- After participants watch the video alone, they then turn and talk with a neighbor and the video is replayed.
- The video URLs hyperlinked in this video are:
  - Singer Shattering Glass: https://www.youtube.com/watch?v=10lWpHyN0Ok
  - Slow motion view of a glass shattering: https://www.youtube.com/watch?v=dU0OqVDl7kc

Talking Points:

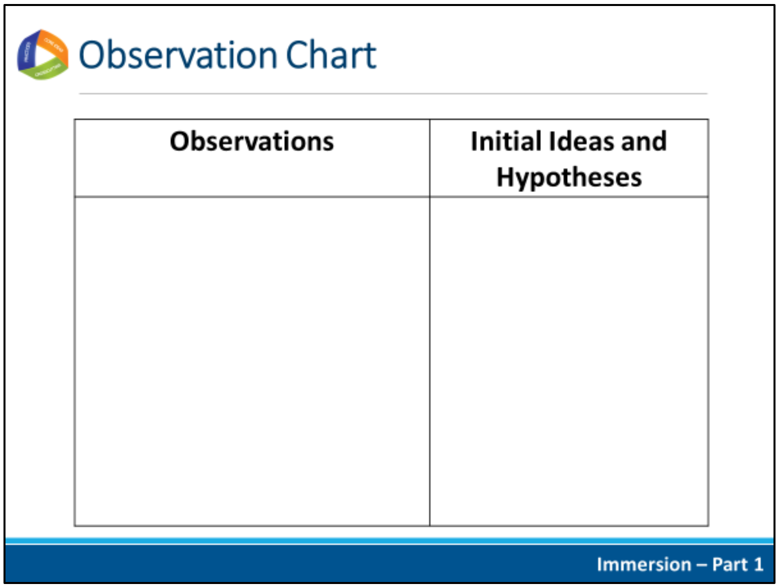
- Let’s put on our fourth-grade student hats as we all experience this phenomenon.
- Do not write anything down. At this point, just focus on making detailed observations in your head.
- After you watch the video clips, you will have time to turn and talk with a neighbor about your observations, and then I will replay the video during that time. *[Note to facilitator: Play the videos once. Then allow time for participants to discuss their observations with a neighbor. Play the videos a second time. The next slide has questions that the groups can discuss after watching the videos a second time.]*



Slide 16

Talking Points:

- Think about what you saw and heard in the video. Think about what happened at the beginning, the middle, and the end.
- In your group, discuss your answers to the two questions posted on the slide. Remember to think about this from the perspective of a fourth-grader! *[Note to facilitator: Give groups a few minutes to discuss their observations.]*



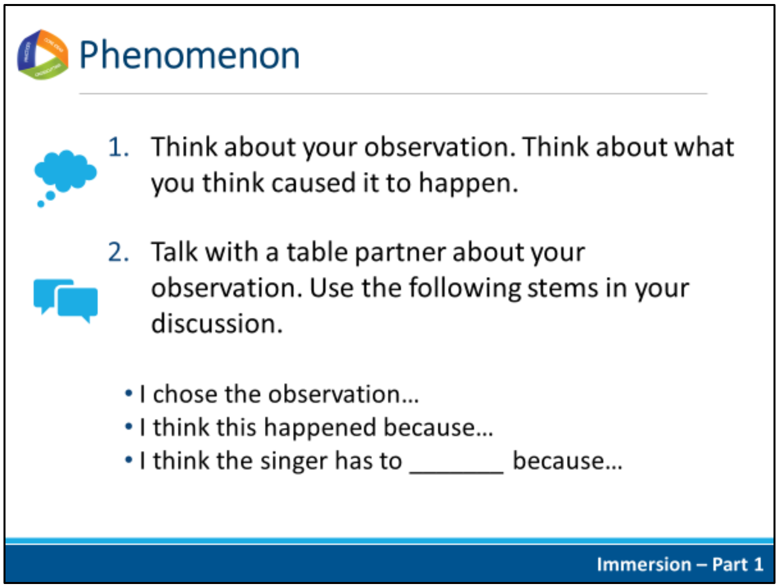
Slide 17

Facilitator Notes:

- As groups share their observations with the whole room, record their observations in the first column in the chart on this slide so that everyone can see it. If the groups have internet access, you can set up a google document where everyone can type in their observations. If it is not convenient to type into this table, you can record their observations on chart paper or a white board.
- Participants will need blank paper and pens.

Talking Points:

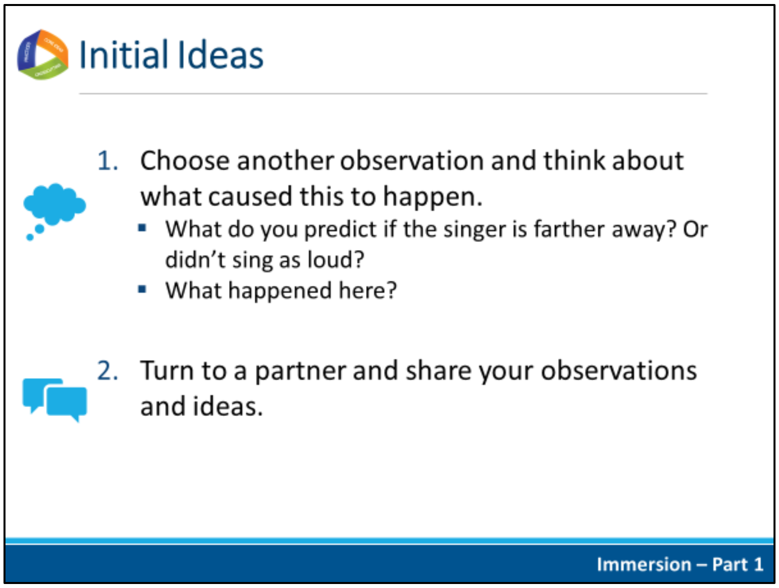
- Let's have each group share some of their observations. *[Note to facilitator: Go around to each group and ask each one to share 2-3 observations. Make sure to ask every group, and depending on the number of groups you have, you may go back around again to ask for additional observations. Record observations on this slide (in the first column titled "observations" or on chart paper as participants share them.]*
- Take a blank piece of paper and create a two-column chart like the one on this slide. With one column labeled "observations" and the other column labeled "initial ideas and hypotheses."
- Pick one of the initial observations that we recorded on the list. Write it down in the observations column on your piece of paper.



Slide 18

Talking Points:

- Think about the observation that you just recorded on your paper. Take a few minutes to think about what caused it to happen and record your thoughts on the second column titled “initial ideas and hypotheses” in your paper. *[Note to facilitator: Give students a few minutes to quietly think about this on their own.]*
- Talk to a neighbor about the observation and what you think caused it to happen. Use the sentence stems in your discussion with your neighbor.



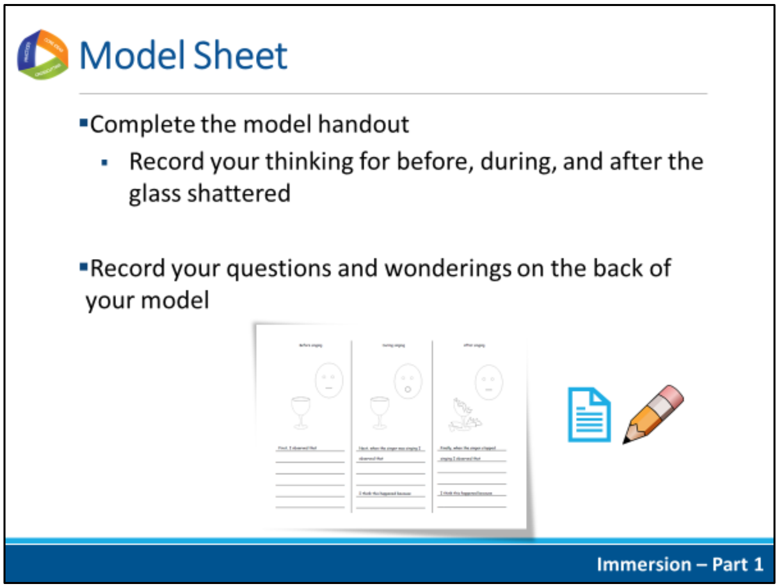
Slide 19

Facilitator Notes:

- You will need to go back to slide 17 so that students can see the list of observations and choose another observation.

Talking Points:

- *[Note to facilitator: If you recorded the class observations on the slide, go back to slide 19 so that students can see the list of observations and choose another observation. Then, come back to this slide.]*
- Choose another observation from the list and think about what caused that to happen. Record your observation and thoughts on your paper. Also think about and record your thoughts about the following questions: What do you predict if the singer is farther away? Or didn't sing as loud? What happened here? *[Note to facilitator: Give students a few minutes to quietly think about this on their own.]*
- Share your thoughts with a partner. *[Note to facilitator: Give everyone a few minutes to discuss their ideas.]*
- *[Note to facilitator: Go back to slide 17 as students are discussing their thoughts with a partner. You will be asking participants to share out and will record their initial ideas and hypotheses in the second column in slide 17.]* Let's go back to our observation chart and record some of your initial thoughts and hypotheses. *[Note to facilitator: Ask for volunteers to share their ideas or pick on pairs.]*



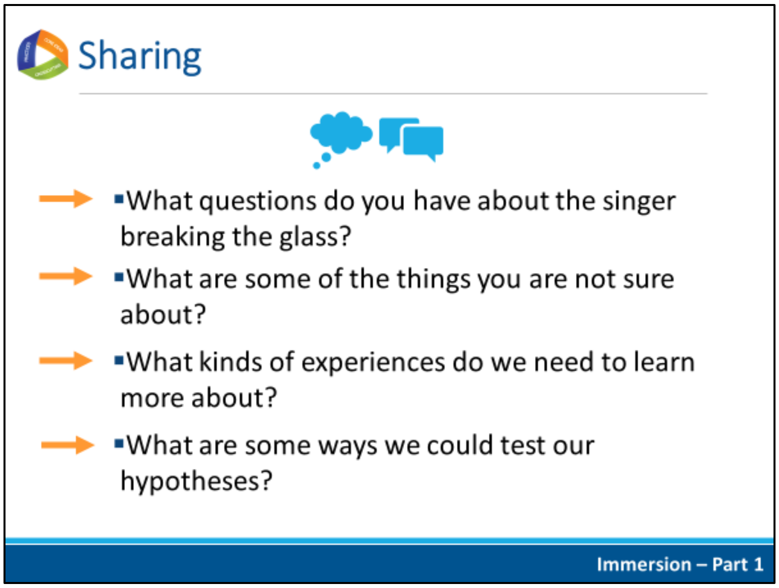
Slide 20

Facilitator Notes:

- Participants will need a copy of Handout 2 – Immersion Student Packet. Participants will be working on the first page of this handout. This page will be referred to as the "Initial Model" and it has three columns: "before singing," "during singing," and "after singing."
- Direct participants to use their *Initial Model* handout to record (both by writing and drawing) the things that they think are happening that they can't see. Students can talk to their partners about their ideas, but each participant should complete a model sheet to show their own thinking.
- Circulate to help struggling participants.
- After participants have time to record their observations, collect the handouts as you will be sharing a few examples. Select a variety of different models to share with the group, and be sure to select a model to share that has vibrations as this will lead into the next lesson. The idea is not to correct flaws at this point, but just to have the "students" share out their ideas.
- The purpose of this handout is not to evaluate or correct student ideas, but is rather to see what students' initial ideas are and how they are approaching the phenomenon.
- The paper icon seen on this slide, will be used throughout the professional learning to indicate when participants will be using a handout.
- The pencil icon seen on this slide, will be used throughout the professional learning to indicate when participants should be recording their ideas.

Talking Points:

- Take out your copy of the *Immersion Student Packet*. We will be working on the first page of this packet. The page will be referred to as the "Initial Model" and it has three columns: "before singing," "during singing," and "after singing." A screenshot of the page is on the slide
- For each stage, write down and draw what you think is happening that you cannot see. If you have any questions, write those down on the back of the paper. *[Note to facilitator: Give participants 5-10 minutes to work on their handout. After participants have had time to record their observations, collect and share a few examples.]*
- Let's look at a few examples of the handout that you just filled out. What do you notice about the different models we observed? What are some of the similarities and differences? *[Note to facilitator: Ask some participants to share their drawings and questions with the entire class. As participants share their models, keep an eye out for any models that show drawings for or questions about vibrations, as you will be using those models in the next part of the activity during slide 22.]*



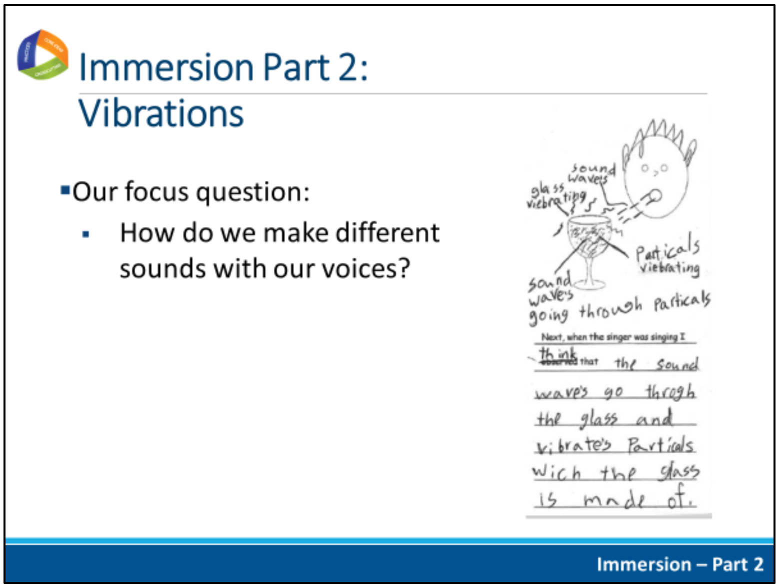
Slide 21

Facilitator Notes:

- Use the questions on this slide to begin and guide a whole group discussion that will wrap up this section of the activity. (This immersion activity is adapted from lessons by the Ambitious Science Teaching Framework. In their storyline, this is the end of the first lesson for students.)
- Allow participants time to think about the listed questions quietly and then provide some time for them share out to the class.
- It may be easier to guide the discussion by having participants share out their answers by each question. To help guide this discussion, animated arrows that point to each question and that are advanced by clicking the mouse button, are included in this slide. The first click makes an arrow appear for the first question, and the second click makes the first arrow disappear. This is repeated for the remaining three questions.
- For the class discussion, it may be helpful to write down participants' ideas on chart paper.
- In this discussion, challenge participants to be honest about things that they are still not sure about. Remind participants to think as fourth-graders!

Talking Points:

- After sharing ideas with your peers and completing your initial model sheet, what questions do you have about the singer breaking the glass? What are some of the things you are not sure about? What kinds of experiences do we need to learn more about? What are some ways we could test our hypotheses?
- *[Note to facilitator: Read out all questions on the slide. Provide a few minutes for participants to quietly and individually reflect on these questions and then lead a whole group discussion.]*
- Take a few minutes to re-read the questions on the slide and think about your answers. Then we will share out as a whole group. *[Note to facilitator: It may be easier to guide the discussion by having participants share out their answers by each question. To help guide this discussion, animated arrows that point to each question and that are advanced by clicking the mouse button, are included in this slide. It may also be helpful to write down participants' answers on chart paper.]*



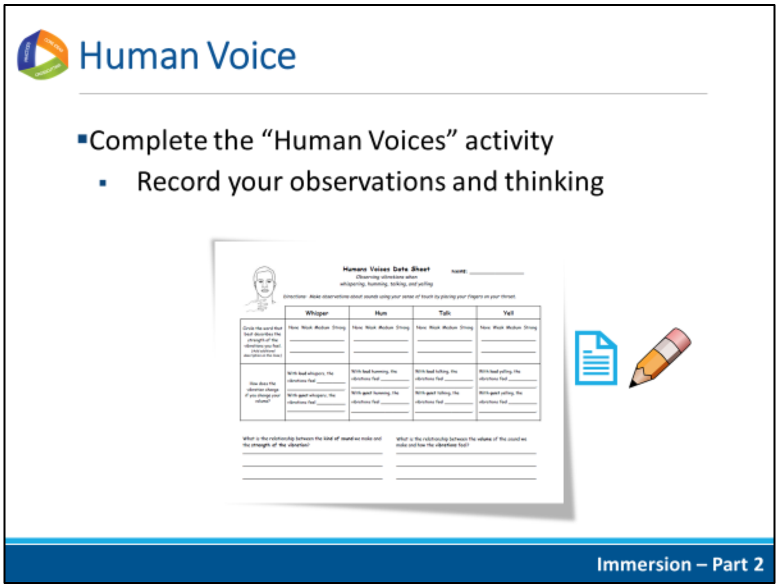
Slide 22

Facilitator Notes:

- This immersion activity is adapted from lessons by the Ambitious Science Teaching Framework. In their storyline, this begins the second lesson and their student objectives for this lesson are:
  - Describe and discuss patterns in the vibrations they observed.
  - Draw conclusions about the relationship between vibrations and volume.
- Pick out some of the student work for the *Initial Model* handout that showed drawings for or questions about vibrations.

Talking Points:

- We now are going to move into the second lesson of this unit. You will continue to play the role of a fourth-grade student.
- In the previous activity, you created models to show what was going on before, during, and after the singing. Here are some of the models that you created. *[Note to facilitator: Share the student models that include vibrations. Either project them or pass them around. An example of student work that shows vibrations is shown as an image on this slide and can be used as an example to anchor the focus question if participants' models are difficult to project/display.]*
- Some of your models showed that there were vibrations during the singing. We use vibrations to make sounds when we talk, sing, whisper, etc.
- We are going to explore vibrations and our focus question for today is "how do we make different sounds with our voices?"



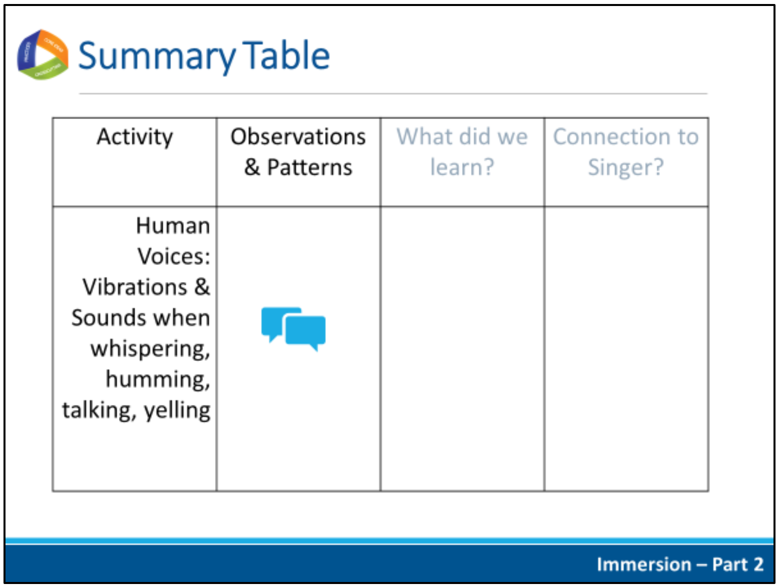
Slide 23

Facilitator Notes:

- Participants will need *Handout 2 – Immersion Student Packet.* Participants will be working on the second worksheet of this packet. The worksheet is titled *Human Voices Data Sheet.*
- Participants will complete the worksheet by following the directions in the handout.
- After participants complete the worksheet, have a class discussion about the patterns that they noticed.

Talking Points:

- Turn to the second page of your Immersion packet. This page is titled *Human Voices Data Sheet* and a screen shot of the page is on the slide.
- You will work with your group to complete the worksheet. You will follow the directions that are provided on the worksheet.
- Take a minute to read through the directions on the worksheet. What observations will you be making for this activity? How will you measure or record these observations?
- Remember to think as a fourth grader! *[Note to facilitator: Give participants 10 minutes to complete this activity.]*
- Once you have collected your data, in your groups, discuss the patterns you noticed in your data. *[Note to facilitator: Give participants a few minutes to discuss the patterns in their groups. Groups will share out in a whole class discussion in the next slide.]*



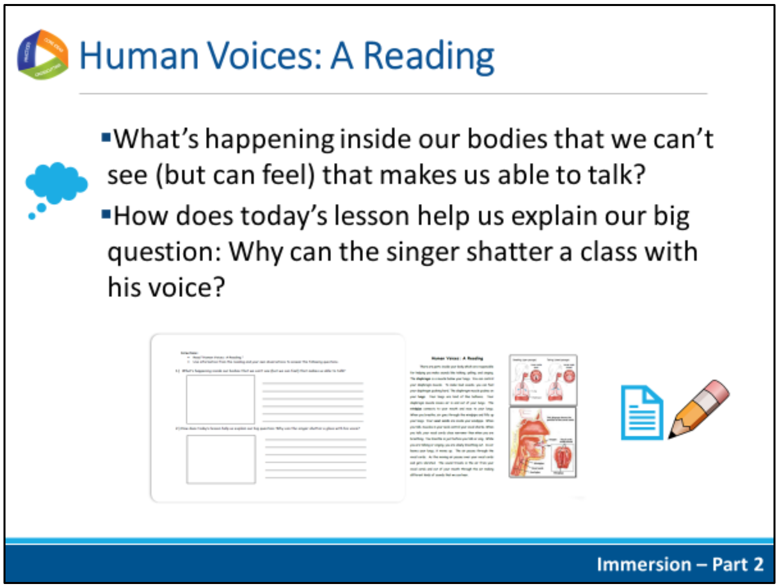
Slide 24

Facilitator Notes:

- This summary table will help guide the next few whole group discussions to help wrap up the immersion activity.
- The conversation bubble icon indicates that the participants will only be discussing the first column at this time. The grayed-out columns will be discussed in the next few slides.

Talking Points:

- Let's share out your observations and the patterns you noticed in the data from the human voice activity. *[Note to facilitator: Ask participants to share what they observed when they were in the process of collecting their data and what patterns they noticed in the data. You can write down their contributions on this slide or on chart paper.]*



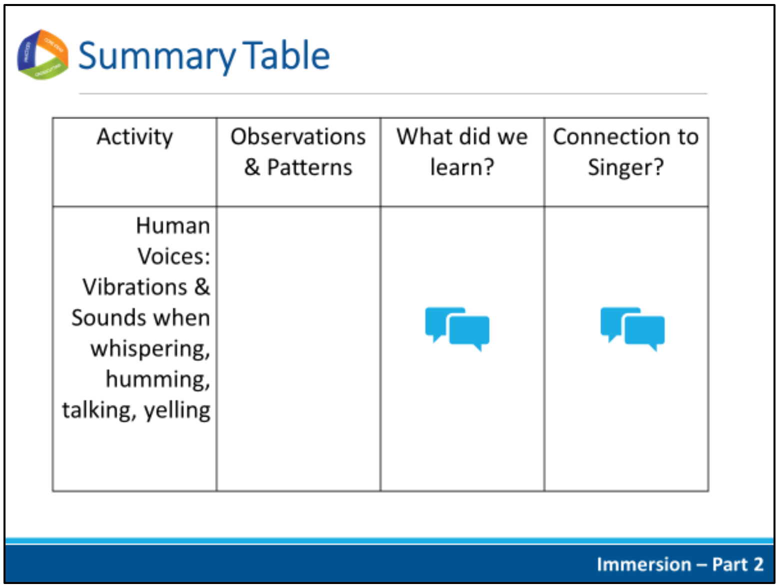
Slide 25

Facilitator Notes:

- Participants will need *Handout 2 – Immersion Student Packet.* They will be using the third and fourth pages in this packet titled *Human Voices: A Reading.*

Talking Points:

- We will begin to answer some of the questions you may have by reading a bit about how our bodies make sound.
- Turn to page 3 in your *Immersion Student Packet.* This page is titled *Human Voices: A Reading*. A screenshot of the handout is on the slide.
- Read through this handout. As you read, look for information to help make sense of what we felt and experienced during the Human Voice Investigation. Think about the two questions that are listed on this slide as you read: What is happening inside our bodies that we can't see (but can feel) that makes us able to talk? How does today's lesson help us explain our big question: Why can the singer shatter a class with his voice? Then, record your answers to these questions in the space provided on the page after your reading. You should use a combination of drawing and writing to represent your thoughts. *[Note to facilitator: Give participants ~5 minutes to complete this activity. Students can work in their groups to discuss the reading and their thoughts, but each student should record their own answers to the questions.]*



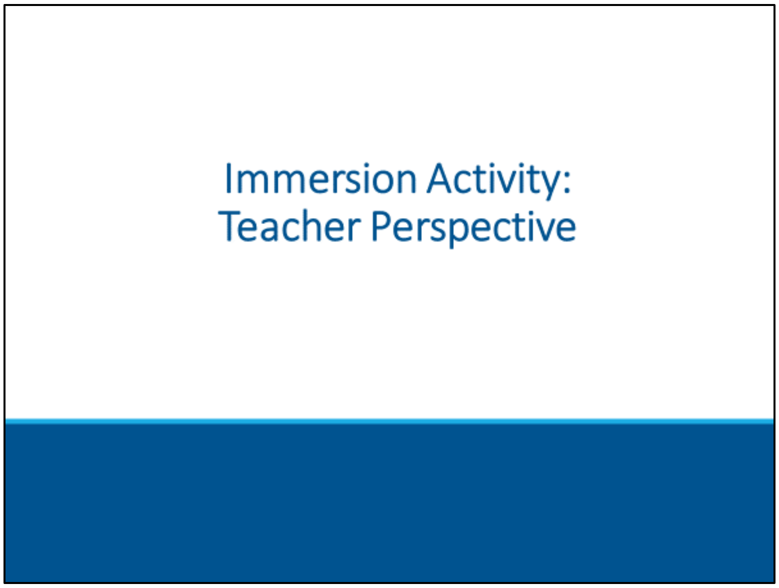
Slide 26

Facilitator Notes:

- This summary table will help guide a whole group discussion to wrap up the immersion activity. Remind participants to keep their student hats on for this discussion!
- The conversation bubble icon indicates that the participants will be discussing the second and third columns at this time. The first column was discussed in slide 26.

Talking Points:

- Now that you have read a little about how your bodies make sound, let's discuss what you learned. What have you learned about the focus question for this lesson? Our focus question was: "How do we make different sounds with our voices?" *[Note to facilitator: Ask participants to share what they have learned so far about the focus question. You can write down their contributions on this slide or on chart paper.]*
- How did what you learned about help us explain the phenomenon? How can we connect what we have learned back to the singer and what happened in the video? *[Note to facilitator: You can write down their contributions on this slide or on chart paper.]*



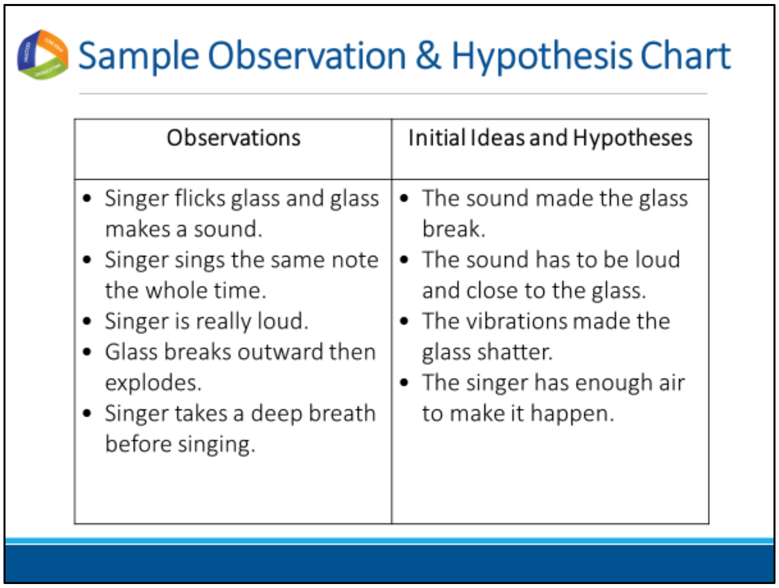
Slide 27

Facilitator Notes:

- The participants will now switch over and wear the teacher hat for the immersion debrief from a teacher's perspective. Participants will receive a packet that provides them with additional information about the unit and examples of completed student work by real fourth grade students. Participants only engaged in a portion of the unit (and that was also slightly modified), so they will receive basic information about the unit storyline to see what comes before and after the activities they did. Using their experience as students and the additional teacher information provided, participants will look for evidence for the three dimensions, and in doing so, will learn how to use the NGSS Appendices to look for evidence at the element level for all three dimensions.

Talking Points:

- You participated in an immersion activity as fourth-grade students. Because of our time constraints, you were not able to go through the entire unit, and instead, we focused on a few activities from the unit. Before we go back through the activities and look for evidence for three-dimensional learning, it will be helpful to see more information about the unit.
- Let's put our teacher hat on now and look at the entire unit from an educator's point of view.
- We will look at a few examples of student work and get some more details about the overall unit, so that you have more sources in which to find evidence.



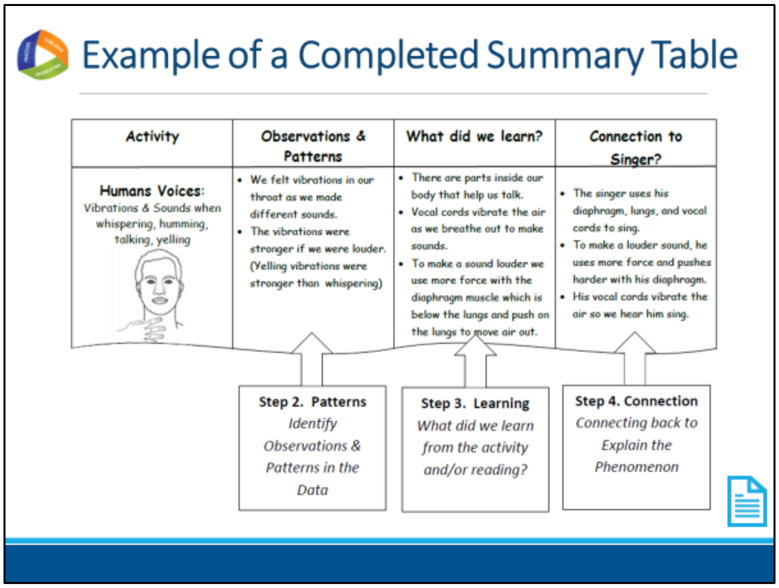
Slide 28

Facilitator Notes:

- In Slide 17, you filled out a chart during a class share-out of participants' observations and initial ideas and hypotheses. The chart on this slide is a sample of what the chart would look like if it was filled out by observations and ideas from fourth grade students. It is included to help participants see what type of observations and ideas actual fourth grade students may have.

Talking Points:

- In the immersion activity, you shared your observations, ideas, and hypotheses during a class discussion and we recorded them on a chart. The chart on this slide is an example of what some observations and ideas from fourth grade students may look like.
- *[Note to facilitator: Give participants a few minutes to look over this chart.]*



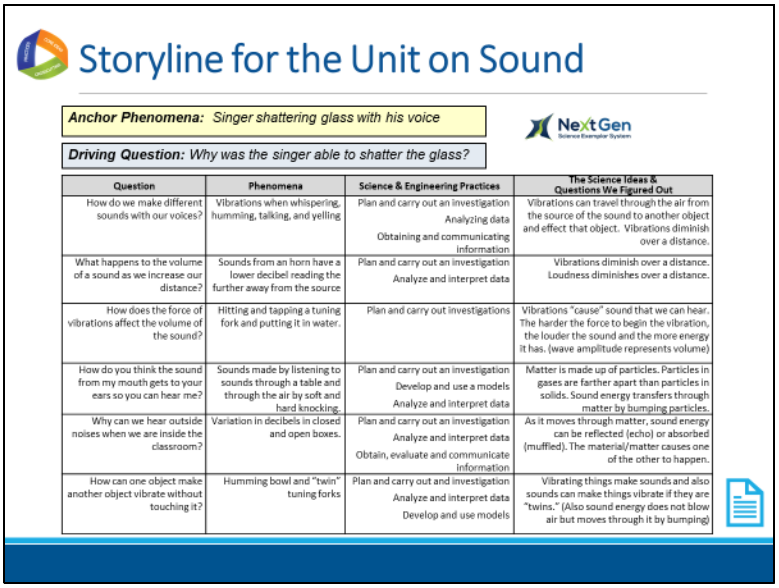
Slide 29

Facilitator Notes:

- Participants will need a copy of *Handout 3 – Immersion Teacher Packet.* They will be looking at page 1 in the packet.
- In the second part of the immersion activity, you filled out a summary table with the participants. The table on this slide is an example of a completed summary table that has examples from fourth grade students. In the actual fourth grade unit, this chart is revised as the students work through the unit and they continue to add evidence to their models of how the singer broke the glass.

Talking Points:

- Please pull out your copy of the *Immersion Teacher Packet.*
- One the first page, there is an example of a completed summary table that we filled out during the second part of the immersion activity. This has examples from fourth grade students. As students work through the actual unit, this chart is revised and they continue to add evidence to their models of how the singer broke the glass.
- *[Note to facilitator: Give participants a few minutes to look over this table.]*



Question	Phenomena	Science & Engineering Practices	The Science Ideas & Questions We Figured Out
How do we make different sounds with our voices?	Vibrations when whispering, humming, talking, and yelling	Plan and carry out an investigation Analyzing data Obtaining and communicating information	Vibrations can travel through the air from the source of the sound to another object and effect that object. Vibrations diminish over a distance.
What happens to the volume of a sound as we increase our distance?	Sounds from an horn have a lower decibel reading the further away from the source	Plan and carry out an investigation Analyze and interpret data	Vibrations diminish over a distance. Loudness diminishes over a distance.
How does the force of vibrations affect the volume of the sound?	Hitting and tapping a tuning fork and putting it in water.	Plan and carry out investigations	Vibrations "cause" sound that we can hear. The harder the force to begin the vibration, the louder the sound and the more energy it has. (wave amplitude represents volume)
How do you think the sound from my mouth gets to your ears so you can hear me?	Sounds made by listening to sounds through a table and through the air by soft and hard knocking.	Plan and carry out an investigation Develop and use a models Analyze and interpret data	Matter is made up of particles. Particles in gases are farther apart than particles in solids. Sound energy transfers through matter by bumping particles.
Why can we hear outside noises when we are inside the classroom?	Variation in decibels in closed and open boxes.	Plan and carry out an investigation Analyze and interpret data Obtain, evaluate and communicate information	As it moves through matter, sound energy can be reflected (echo) or absorbed (muffled). The material/matter causes one of the other to happen.
How can one object make another object vibrate without touching it?	Humming bowl and "twin" tuning forks	Plan and carry out and investigation Analyze and interpret data Develop and use models	Vibrating things make sounds and also sounds can make things vibrate if they are "twins." (Also sound energy does not blow air but moves through it by bumping)

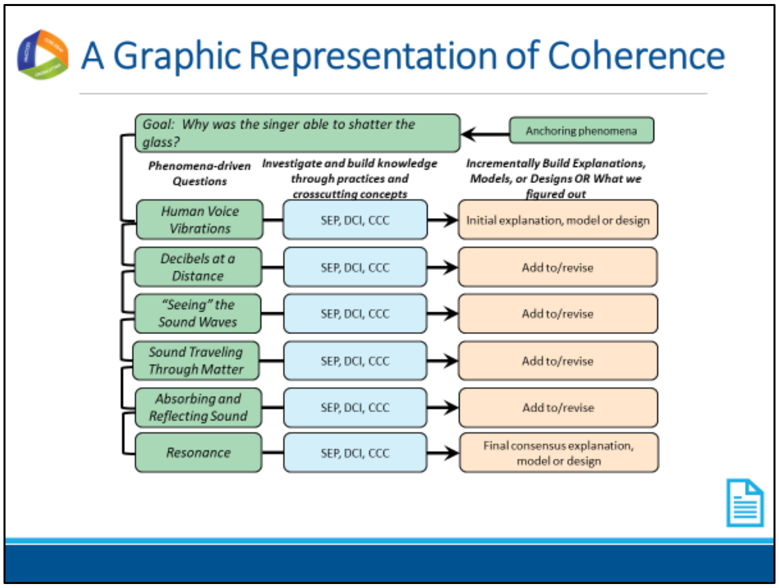
Slide 30

Facilitator Notes:

- Participants will need a copy of *Handout 3 – Immersion Teacher Packet.* They will be looking at page 2 in the packet.
- This is a basic storyline that shows the lesson-level questions and phenomena for the entire unit.

Talking Points:

- On the second page of the *Immersion Teacher Packet,* you will find the storyline table for the entire unit as seen on the slide. We just participated in the first section of the unit, but the unit continues to provide opportunities for students to build their explanations of the phenomenon.
- There are many ways to represent a storyline for a unit, and this table shows you one way it can be done.
- This storyline provides you with the anchor phenomenon and the driving question for the entire unit. It also lists the questions and investigative phenomena for the individual lessons of the unit. It provides information about the practices that students will be engaged in for each lesson, along with the science ideas and questions that students figure out in each lesson.
- Take a few minutes to read through the storyline. *[Note to facilitator: Give participants a few minutes to look over the storyline.]*



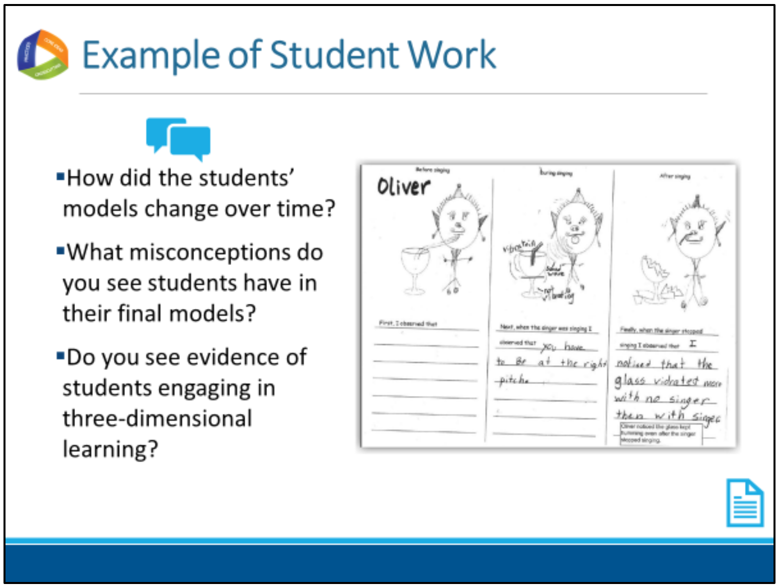
Slide 31

Facilitator Notes:

- Participants will need a copy of *Handout 3 – Immersion Teacher Packet.* They will be looking at page 3 in the packet.

Talking Points:

- On this slide and on the third page of the *Immersion Teacher Packet,* you will find another way to represent the unit storyline: a coherence map for the unit.
- The coherence map shows that the unit begins with the anchoring phenomenon and the driving question of "why was the singer able to shatter the glass?" Each line in this graphic represents a lesson, and requires students to integrate all three dimensions to build and revise their models and explanations of the overall anchor phenomenon. As students proceed through the unit, they revise their explanations and model in each lesson based on what they have learned in that lesson. This then leads them to the next lesson, where they repeat the process, until they create their final explanation and model at the end of the unit. The coherence map shows that each activity serves an explicit purpose in the unit, and contributes toward students understanding and explaining the anchor phenomenon.
- *[Note to facilitator: Give participants a few minutes to look over the coherence map.]*



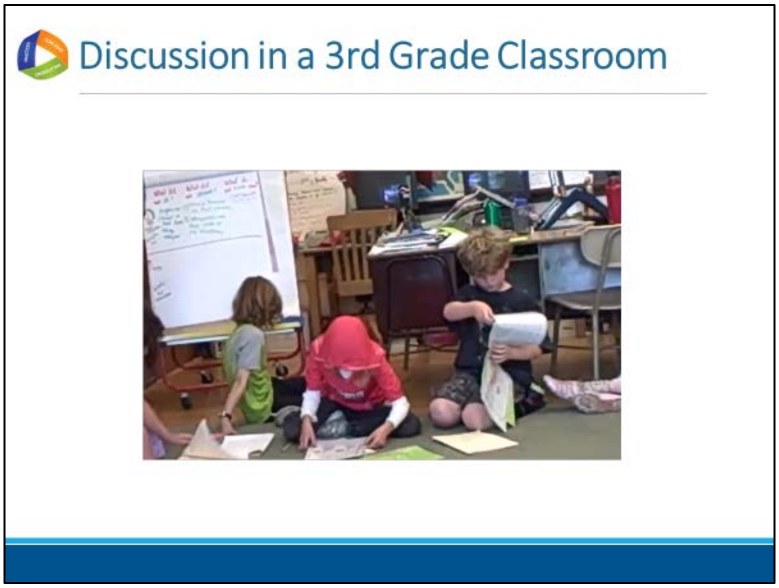
Slide 32

Facilitator Notes:

- Participants will need a copy of *Handout 3 – Immersion Teacher Packet.* They will be looking at pages 4-6 in the packet.
- Pages 4-6 in the *Immersion Teacher Packet* represent student models. Page 4 has two students' initial models that they created toward the beginning of the unit (similar to how the participants' created their initial models). Pages 5-6 show the final models for the same students. Participants will be able to see how students' thinking changed over the course of the unit by comparing the initial and final models.
- Participants will be asked if they see evidence of students engaging in three-dimensional learning in this slide and the next slide. This is an opportunity for you to walk around and listen to participants' discussions to see what they think three-dimensional is and what misconceptions they may have. Take a mental note of what they are saying, because in a few slides (slide 34) you will begin the three-dimensional learning section and where you can clear up any misconceptions.

Talking Points:

- Let's also look at some student examples of initial and final models.
- In pages 4 through 6 of your packet, will find the initial and final models created by Marianna and Oliver. The initial models for both are on page 4 and the final models are on pages 5-6. Take a few minutes to look over the student work samples.
- As a table discuss the following questions:
    - How did the students' models change over time?
    - What misconceptions do you see students have in their final models?
    - Do you see evidence of students engaging in three-dimensional learning (SEPs, CCCs, & DCIs)? *[Note to facilitator: This is an opportunity for you to walk around and listen to participants' discussions to see what they think three-dimensional is and what misconceptions they may have. Take a mental note of what they are saying, because in a few slides (slide 34) you will begin the three-dimensional learning section and where you can clear up any misconceptions.]*



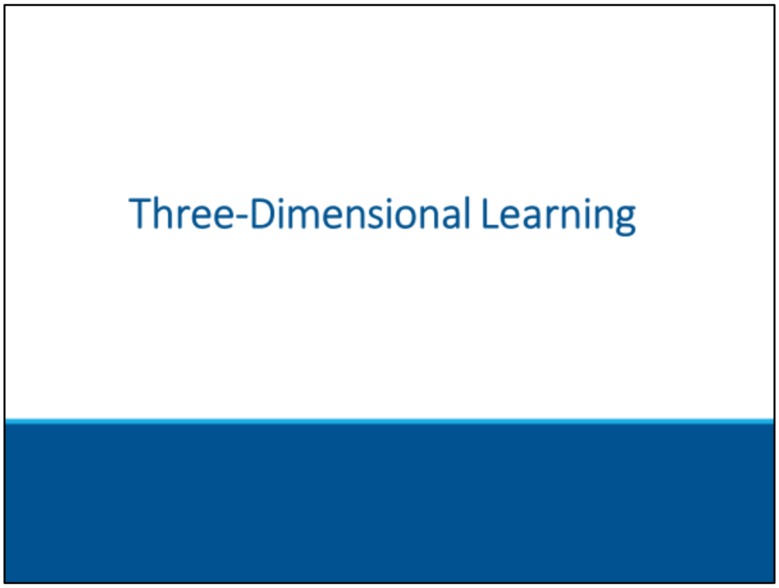
Slide 33

Facilitator Notes:

- The hyperlink for the video in this slide is: https://vimeo.com/126093889
- Note: The sound in the video is low. Be sure to turn the volume up
- This video shows third grade students engaging in the same activities that the participants were engaged in during the immersion.
- Participants will be asked if they see evidence of students engaging in three-dimensional learning in this slide. This is an opportunity for you to walk around and listen to participants' discussions to see what they think three-dimensional is and what misconceptions they may have. Take a mental note of what they are saying, because in the next slide, you will begin the three-dimensional learning section and where you can clear up any misconceptions.

Talking Points:

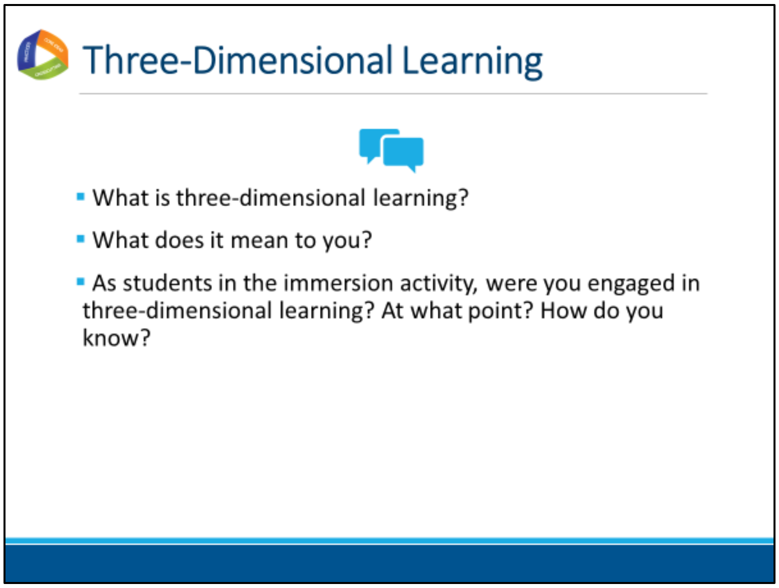
- Finally, let's watch a video of third grade students engaging in the same activities that we did.
- As you watch the video think about three-dimensional learning. What evidence do you see of students engaging with each of the three dimensions: the SEPs, CCCs, & DCIs? *[Note to facilitator: This is an opportunity for you to walk around and listen to participants' discussions to see what they think three-dimensional is and what misconceptions they may have. Take a mental note of what they are saying, because in a few slides (slide 34) you will begin the three-dimensional learning section and where you can clear up any misconceptions.]*



Slide 34

Facilitator Notes:

- Three-dimensional learning is an important concept for participants to understand, as it is one of the NGSS Innovations, and participants will be looking for evidence that it is occurring in the materials they will be evaluating in the prescreen process. This section helps build participants' understanding of three-dimensional learning by discussing what it means, and the next section (Looking for Evidence of the Three Dimensions) will guide participants through finding evidence for each of the three dimensions. By the time participants are ready to look at the PEEC Prescreen tools later in this presentation, they will already have begun to build an understanding of the criteria that the tools use. Participants' will continue to build their understanding of three-dimensional learning when the related prescreen tools are introduced.
- Since participants are expected to have a basic understanding of the NGSS, this section may seem to not be necessary for your group if they are well-versed in the NGSS. However, it can help bring all participants to the same level of understanding and the group discussions can ensure that participants are thinking about three-dimensional learning in the same way. This leveling is important as three-dimensional learning criteria will appear in all three phases of the PEEC process.



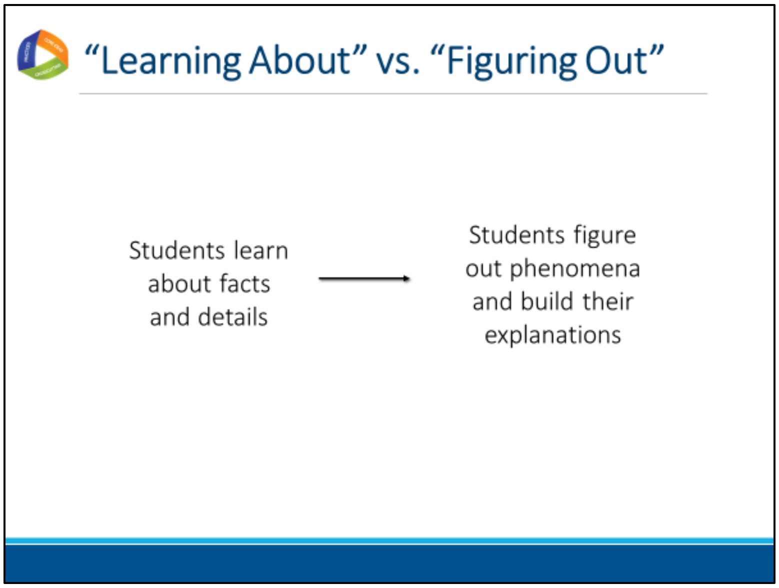
Slide 35

Facilitator Notes:

- As participants have a discussion with the partners about the questions posted on the slide, walk around the room and listen to their thoughts. If participants are struggling to answer the questions, this will help you understand what misconceptions you need to clear, or on the other hand if participants are demonstrating a solid understanding, you can proceed through this section relatively quickly. You will be using the ideas that participants share during the discussion to transition to the next slide.

Talking Points:

- We have tossed around the words "three-dimensional learning" a few times. Think about the following questions and share your thoughts with a partner:
    - What is three-dimensional learning?
    - What does it mean to you?
    - As students in the immersion activity, were you engaged in three-dimensional learning? At what point? How do you know?
    - Take a few minutes to discuss these questions with a partner at your table. *[Note to facilitator: Give participants a few minutes to discuss their thoughts.]*
- Who would like to share their ideas with the whole group? *[Note to facilitator: Ask a few participants to share their thoughts about what three-dimensional learning is with the entire group.]*



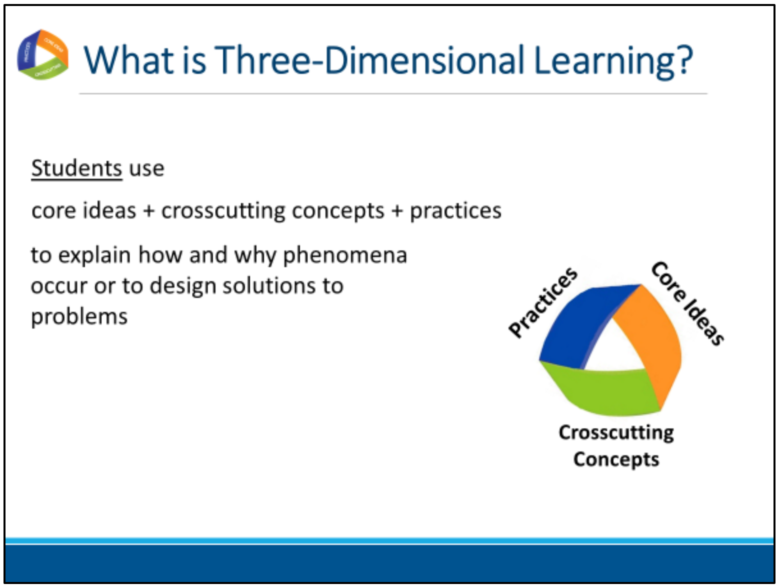
Slide 36

Facilitator Notes:

- Use the ideas that participants shared in the previous slide to transition into talking about learning about vs figuring out. Alter the talking points in this slide to build upon the conversation that began with your group in the last slide.

Talking Points:

- An important idea that was shared about three-dimensional learning was that students are building explanations.
- In an NGSS classroom, the focus shifts from simply *learning about* science ideas that students often have difficulty applying to real-world contexts to *figuring out* or making sense of phenomena in the world and designing solutions to problems.
- Students are not just *learning about* a topic, but they are now *figuring out* why or how something happens in the world.
- Students can then use these explanations to make sense of new contexts and transfer this working knowledge to new situations.
- If students are not being fed the information, how are they gathering information and building their explanations or designing solutions to problems? What should they be engaged in during the lesson? *[Note to facilitator: You want the participants to say that students need to be engaged in the three dimensions during the lesson – the practices, disciplinary core ideas, and crosscutting concepts. If participants are not getting to that idea, ask them what the rest of three-dimensional learning is and strongly hint them toward the three dimensions.]*
- Yes! Students build this working knowledge by engaging through the practices, by using the crosscutting concepts to organize and connect thinking, and by using the disciplinary core ideas to explain their world and develop solutions to problems.
- Figuring out or making sense of phenomena supports three-dimensional learning.



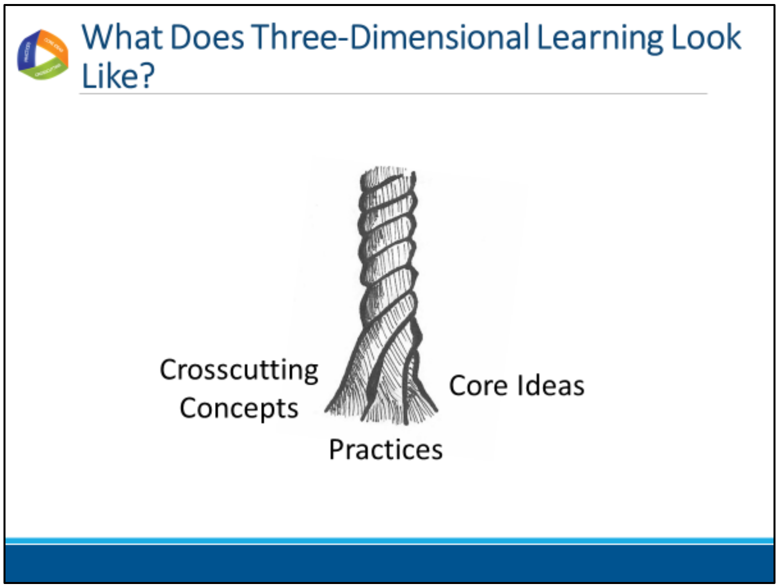
Slide 37

Facilitator Notes:

- The important take-away in this slide is that participants should understand that in three-dimensional learning *students* are the ones that should be developing and using the three dimensions to explain a phenomenon or to design a solution to a problem. Often, a lesson or activity will show evidence that a teacher is using the three dimensions, but that does not ensure that *students* will develop or use the dimensions. The emphasis on students and finding evidence in lessons that *students* are the ones developing and using elements of dimensions can be found throughout the professional learning sessions.

Talking Points:

- If we take our discussion about three-dimensional learning and create a definition for three-dimensional learning we can sum it up by saying: students use core ideas, crosscutting concepts, and practices to explain how and why phenomena occur or to design solutions to problems.
- Notice the emphasis on the word “students.” It is important to remember that students and not teachers should be the ones developing and using the three dimensions to explain a phenomenon or to design a solution to a problem. Remember that three-dimensional learning shifts the focus of the science classroom to students.



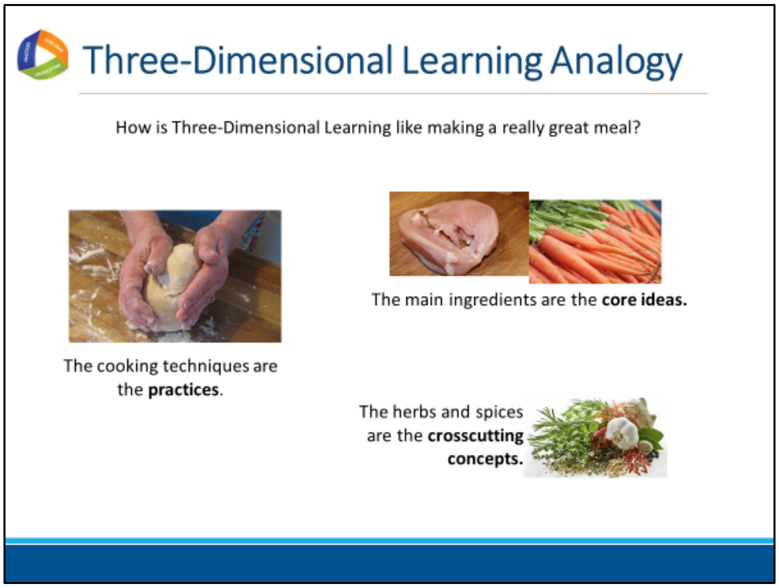
Slide 38

Facilitator Notes:

- Some participants may think that as long as the three-dimensions are present in a lesson, that the lesson is three-dimensional. However, it is important for them to understand that the three dimensions need to work together and that student performances need to show students engaged in all three at the same time to explain a phenomenon or design a solution to a problem. The analogies in the next few slides will help to reinforce this idea.

Talking Points:

- So, what does three-dimensional learning look like in the classroom?
- The key with three-dimensional learning is that engagement in the dimensions cannot occur in isolation of each other. The three dimensions need to work together and students need to be engaged in all three at the same time. For example, students should not only be engaged in practices at the beginning of the lesson, disciplinary core ideas in the middle, and then crosscutting concepts at the end.
- Think of the three components of three-dimensional learning as three intertwining stands of a rope. While the rope can be separated into its three different strands, the strength of the rope is determined by the strands working together; separating the strands weakens the rope so that it is no longer effective for our intended use.
- While in the past we may have separated out the knowledge and skills students need in the study of science, knowing and doing cannot be separated if our goal is the kind of usable, conceptual understanding students need to think, act, and learn like scientists.
- Three-dimensional learning—practices, core ideas, and crosscutting concepts working together—is therefore a non-negotiable for NGSS lessons and units.



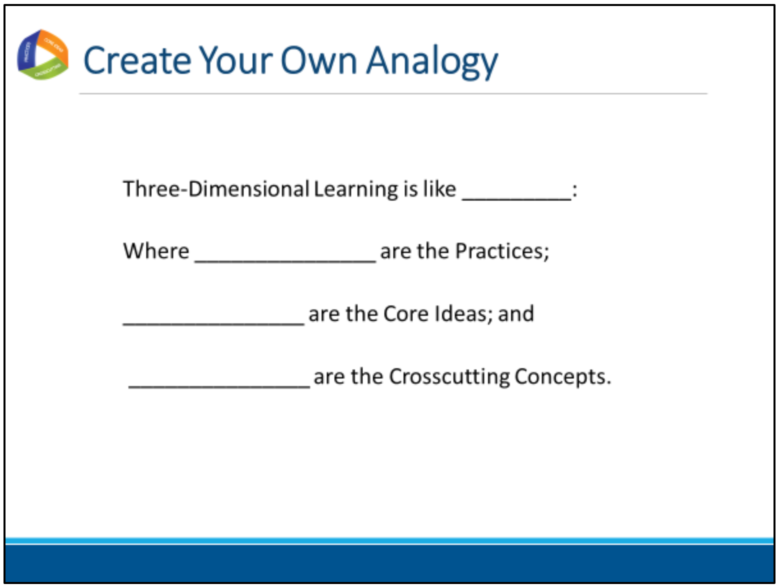
Slide 39

Facilitator Notes:

- Participants often find hearing and creating an analogy helpful in strengthening their understanding of three-dimensional learning. They will receive an opportunity to create their own analogy in the next slide.

Talking Points:

- Borrowing an idea from Ted Willard at NSTA, Joe often compares three-dimensional learning to making a really good meal.
- As Joe says so well, “Think of knowing how to do various techniques in the kitchen like kneading bread, cutting tomatoes, beating an egg, frying or roasting, and so forth as the practices. You could know how to do all of these things and still not be able to prepare a really good meal.”
- “Now think of picking out really good ingredients for the meal. You want to pick out a high-quality piece of fish or poultry or excellent pasta for the meal. These are your core ideas. A disciplinary core idea is essential to explaining a variety of phenomena. Your main ingredient is essential to the meal. But just as the [disciplinary core idea] works with practices to make sense of phenomena and design solutions, you need to know how to cook that main ingredient. But something is still missing. The meal tastes bland. What is missing? To make a really good meal, we need to use spices and herbs to enhance the flavor of the main ingredients.”
- “Crosscutting concepts are like these spices and herbs—they enhance learning by providing a familiar lens to use to examine and understand phenomena. Because the same spices and herbs are used in many different dishes, we recognize them even when we have them in a new or unfamiliar dish. Consequently, we can use our familiarity with a spice or herb to examine a new meal and understand what was used to make it. Likewise, crosscutting concepts can be found in all scientific disciplines, and we can use our familiarity with crosscutting concepts in one discipline of science to examine phenomena and enhance understanding and learning in other disciplines of science.”
- “To make a really wonderful meal, good main ingredients are necessary, but you need to know how to use various techniques to prepare them, and you must have the spices and herbs to enhance the flavors. All three work and blend together to make a great meal. Similarly, to foster three-dimensional learning where all learners can make sense of phenomena and design solutions, all three dimensions need to work and blend together” (http://nstacommunities.org/blog/2014/04/25/equip/).



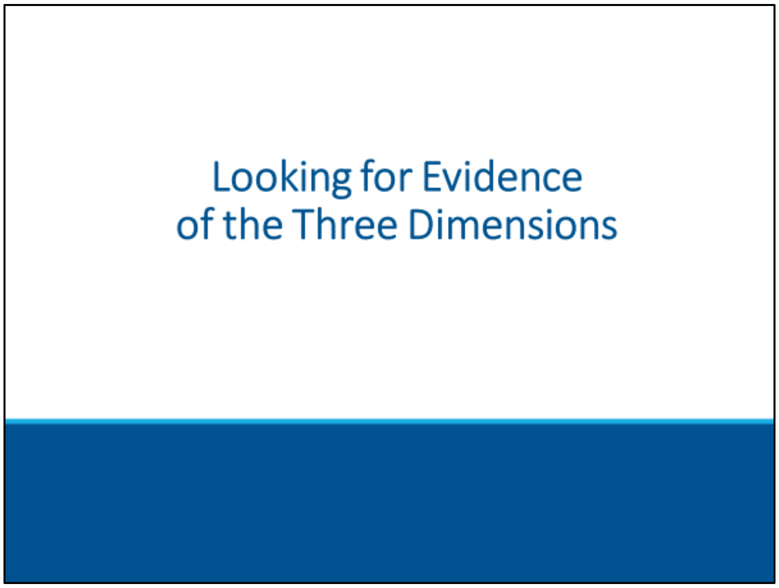
Slide 40

Facilitator Notes:

- Participants often find hearing and creating an analogy helpful in strengthening their understanding of three-dimensional learning.
- If you find that the participants already have a strong understanding of three-dimensional learning and do not need to create their own analogies, feel free to skip this slide.

Talking Points:

- Now, take a few minutes and create your own analogy for three-dimensional learning.
- *[Note to facilitator: Ask participants to share their analogies and explanations with their table group or the whole group.]*
- Does anyone have any questions about three-dimensional learning? *[Note to facilitator: The next section moves on to talking about how to look for evidence of the dimensions, so this would be a good place to address any lingering questions about three-dimensional learning.]*



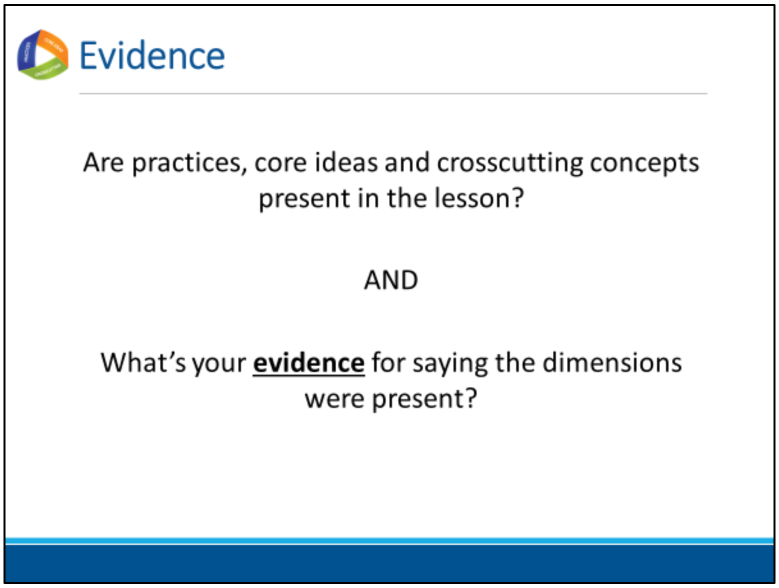
Slide 41

Facilitator Notes:

- Using their experience as students and the additional teacher information provided, participants will look for evidence for the three dimensions in the immersion activity, and in doing so, will learn how to use the NGSS Appendices to look for evidence at the element level for all three dimensions.

Talking Points:

- Now that we have experienced the immersion activity as a student, have received more information about it from the teacher perspective, and have discussed what three-dimensional learning is, let's look for evidence of three-dimensional learning.
- When we look for evidence of three-dimensional learning, it is easier to break it down slightly and to first look for the evidence that each of the three dimensions are present, and then look for evidence to see if those dimensions are integrated and working together.
- For the immersion activity, we will look for evidence that each of the three dimensions are present.



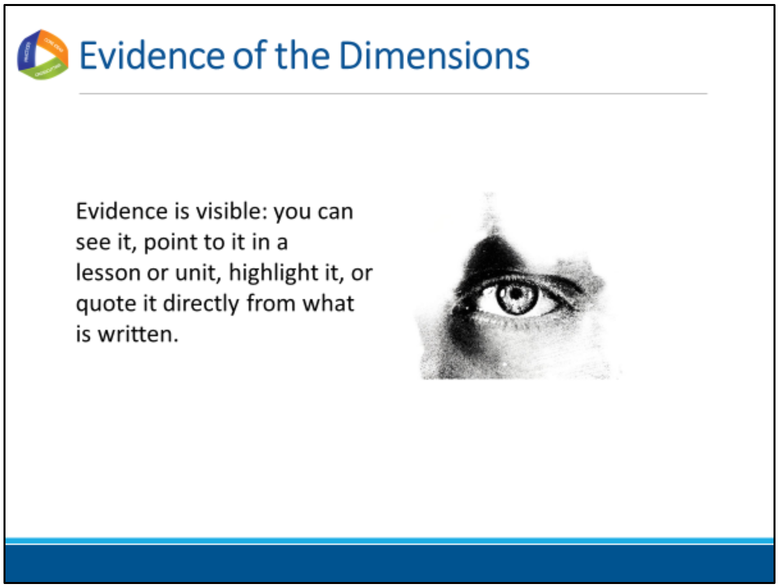
Slide 42

Facilitator Notes:

- This slide is meant to elicit what the participants' think evidence is. The explicitness of evidence required in the PEEC process will be discussed in a few slides.

Talking Points:

- When we look to see if the three dimensions are present in the immersion activity, we are looking to answer three separate questions: Are science and engineering practices present? Are disciplinary core ideas present? Are crosscutting concepts present?
- If you say that a particular dimension is present in the lesson, you need evidence to support your "yes."
- If you are asked to look for evidence of the three dimensions in a lesson, what would you look for? What would your evidence be? Take a few minutes to discuss this with your group. *[Note to facilitator: Give participants a few minutes to discuss how they would look for evidence of the three dimensions in a lesson.]*



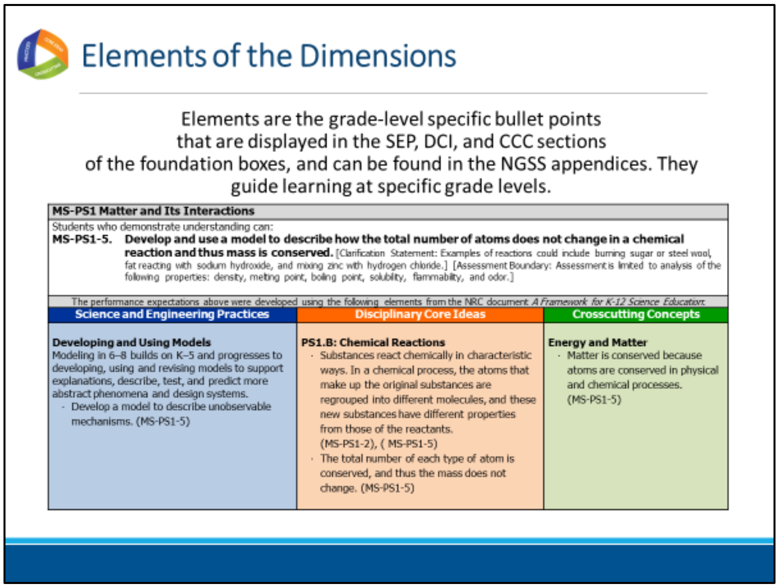
Slide 43

Facilitator Notes:

- It is extremely important that participants understand that evidence needs to be explicit and visible. It is often easy to think about the lessons as an educator, see the potential in a lesson, and then assume that there is evidence there because there is potential for students to do something. However, directions need to be explicitly written that show that all students will be engaged in a particular dimension. If directions are vague, then the assumptions of what students will do can vary by the person reading the directions. If you are reading the lesson and find yourself thinking there is a chance students "could do…" or "are probably…" or "if they added in this step, *then* they could…" that is not explicit evidence, it is *implicit* and cannot be used as evidence that something is definitely present.
- While participants may show understanding of explicit evidence at this time, it is important to keep reinforcing this idea throughout the professional learning.

Talking Points:

- When we discuss finding "evidence," we need to make sure that the evidence we are using to back up our claim of whether something is present or not in a lesson is extremely explicit.
- We need to be able to see the evidence, point to it, highlight it, or quote it directly from what is written.
- As educators, it is extremely easy to fill in the gaps in instructions and lessons and think about what we would be able to do with a particular activity, discussion, etc. based upon just a few instructions. However, it is important to remember that not every educator will interpret general instructions in the same way, and educators will have different ways of filling in the gaps based upon their own thoughts and experiences. Therefore, if instructions are not explicitly in the lesson that show, for example, all students will be engaged in going through the detailed steps of claim, evidence, and reasoning for constructing an explanation, it is not guaranteed that all students will be engaged in constructing an explanation as called for in the NGSS practice. If at any point you think, "well this is a great place where my students *could* bring in looking at cause and effect," but there are no detailed instructions in the lesson itself of students engaged in a specific cause and effect element, then that is not explicit evidence.
- In general, if you read a lesson and think that students "could do…" or "are probably…" or "if this step was added in, then students will be…" then there is no explicit evidence that ALL students will be engaged in that particular step and *explicit* evidence is not present.
- We will look back over the immersion activity and see if there is evidence of each of the three dimensions.
- We did not have time to look through the rest of the lessons in the unit, so we will look for evidence of each of the three dimensions in the activities you engaged in, the unit overview, the student work, and the classroom video.



Slide 44

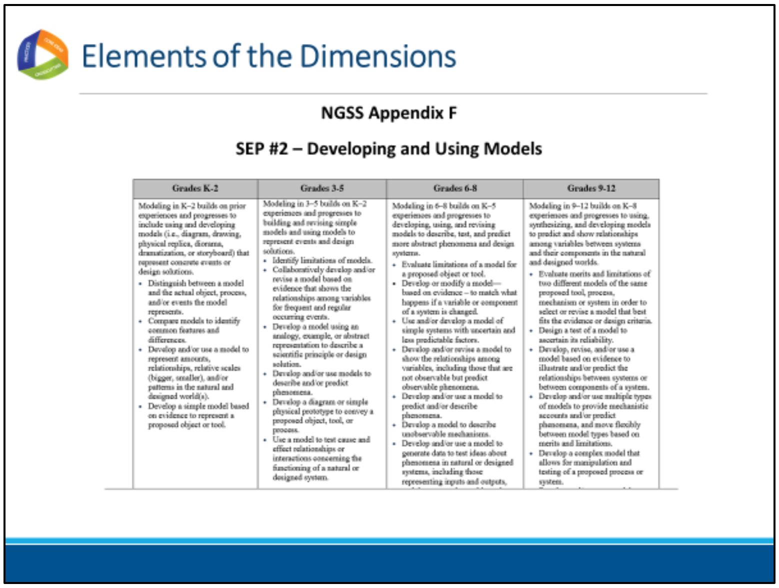
Facilitator Notes:

- When participants are asked to look for evidence of the dimensions, it is critical that they are looking for evidence at the element level. For example, if participants are looking for evidence of the practice “developing and using models” in a middle school lesson, they may see those words and look in the lesson to see if there is any evidence that students are either developing a model or are using a model. This would not be an appropriate way to look for evidence that practices are present in a lesson. Someone may find a step where participants are developing a model, but this general search is not sufficient to know whether students are using the elements of the developing/using models practice at a *grade-appropriate* level. Finding general evidence that students are developing a model may only show students using the practice at a K-2 grade-band level. Each practice has specific components, or elements, that students are expected to master at the end of each grade band, and these elements increase in complexity through the grade-bands. To see if the students are truly using the developing and using models practice in a middle school lesson, you need to look for evidence of the specific elements of this practice in the 6-8 grade-band. For example, you could look for evidence that students are “developing a model to describe unobservable mechanisms.”
- The following copies are provided as *Handout 04 – NSTA DCIs Matrix; Handout 05 – NGSS Appendix F; Handout 06 – NGSS Appendix G.*
    - Participants will need copies of or digital access to NGSS Appendices F and G.
    - Participants will need a copy of or digital access to the *NSTA DCIs Matrix* (http://nstahosted.org/pdfs/ngss/20130509/MatrixOfDisciplinaryCoreIdeasInNGSS-May2013.pdf)

Talking Points:

- When we look for evidence of the three dimensions we need to look for evidence at the **element** level. Let’s take a minute to define what we mean by the elements of the dimensions.
- Please take a minute to read the definition of an element of dimensions that is displayed in this slide.
- Every performance expectation is composed of elements from all three dimensions and the language for these elements can be found in a performance expectation’s foundation boxes. The blue box has the element for the science and engineering practices. The orange box has the elements for the disciplinary core ideas. The green box has the elements for the crosscutting concepts.
- As you can see in this example, the science and engineering practice included in this performance expectation is developing and using models. This is the overall practice, and is not at the element level. So, when you look for evidence, you cannot just look for general evidence that students are developing and using models. You must specifically look for evidence that students are “developing a model to describe unobservable mechanisms.”

- It is important that all of our evidence be recorded at the element level.
- We can find the elements of all eight science and engineering practices in NGSS Appendix F, and the elements of all seven crosscutting concepts in NGSS Appendix G.
- The elements for the DCIs are organized by grade-band in the *NSTA DCIs Matrix*.



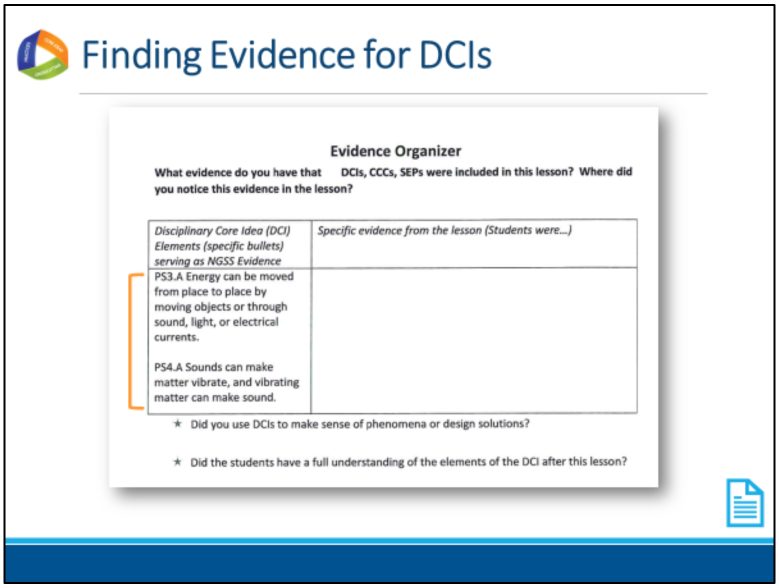
Slide 45

Facilitator Notes:

- It is important to emphasize that elements are organized by grade-band, as participants should be looking for evidence that students are engaged in grade-appropriate elements in a lesson. Sometimes, a lesson will state that it is targeting a grade-appropriate element, but the evidence will show that students are actually building an understanding of an element at a lower or at a higher grade-level.
- The following copies are provided as *Handout 04 – NSTA DCIs Matrix; Handout 05 – NGSS Appendix F; Handout 06 – NGSS Appendix G.*
    - Participants will need copies of or digital access to NGSS Appendices F and G.
    - Participants will need a copy of or digital access to the *NSTA DCIs Matrix* (http://nstahosted.org/pdfs/ngss/20130509/MatrixOfDisciplinaryCoreIdeasInNGSS-May2013.pdf)

Talking Points:

- Here is a chart from NGSS Appendix F that shows the elements for the science and engineering practice of developing and using models.
- As you can see here, the elements are all grade-banded. There is a set of elements for K-2, a set for 3-5, a set for 6-8, and a set for 9-12.
- This organization by grade-band can be seen for the practices, the crosscutting concepts, and the disciplinary core ideas.
- When looking for evidence in a lesson for a particular element, you need to make sure that you know what grade band the element falls under and what grade level the lesson targets. It is possible that there is no evidence of the element at the targeted grade band, because students are engaging in the element at a higher or lower grade level.



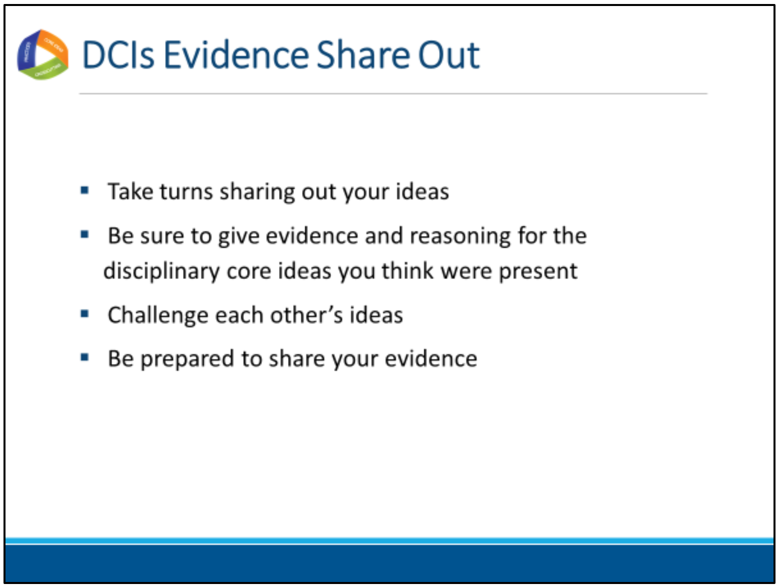
Slide 46

Facilitator Notes:

- Participants will focus on finding evidence of the target DCIs. Participants should look for evidence in the immersion activity they engaged in, the unit overview, the student work, and the classroom video.
- Participants will need a copy of *Handout 07 – Immersion Evidence Organizer*.
- Participants may need 8 to 10 minutes to fill out evidence for the disciplinary core ideas.

Talking Points:

- Please pull out your copy of the *Evidence Organizer* handout.
- Think back to the activity you just experienced. The designers of this unit were intentionally targeting the disciplinary core idea elements listed here on the slide and in your handout. *[Note to facilitator: Click for animation.]* You will look for evidence that students are using and developing these particular DCI elements in the lesson.
- Look through the materials you used for the immersion activity, the student work, and the video and individually look for evidence that these DCI elements are being used and developed by students. You will have 10 minutes to individually work and then we will discuss your findings as a whole group.



Slide 47

Facilitator Notes:

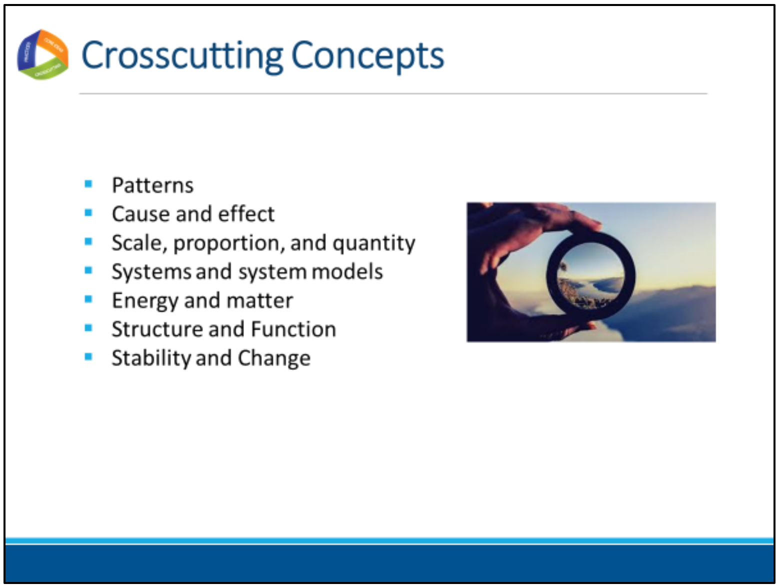
- Have people share out the evidence that they recorded in the evidence organizer. The goal of this conversation is to start bringing up issues that they are likely to encounter when reviewing materials.
- Possible issues that participants may encounter (the respective talking points are listed in the section below):
    - Expect participants to identify the fact that energy isn't really addressed in the unit. This helps participants learn to be critical and to know that the evidence needs to be explicit.
    - Participants may also identify pieces of evidence that are not truly evidence and are only implied in the materials.
    - Participants may identify that some grade-inappropriate DCI elements are identified.

Talking Points:

- Let's discuss the evidence that you found. This slide has the guidelines for our share out. Please take a minute to read over them.
- *[Note to facilitator: Lead a group discussion.]* How well did this lesson address the target disciplinary core ideas? Did you find evidence for DCI element PS3.A? Did you find evidence for DCI element PS4.A?

Depending on what participants bring up during the discussion, here are some specific talking points:

- *It's great to think about how you could use some these materials and then modify them in your classroom, but the focus is making sure that there is explicit evidence in the materials*
- *We may run into situations where the DCIs are out of the target grade band for the lesson. For example, PS4.A is addressed, but only at a level that matches the expectations of the K-2 grade band.*
- *We may run into materials that are claiming to address DCIs, but that only address part of what is expected. Whether that is "okay" depends on whether or not the other portions are addressed elsewhere in the materials.*



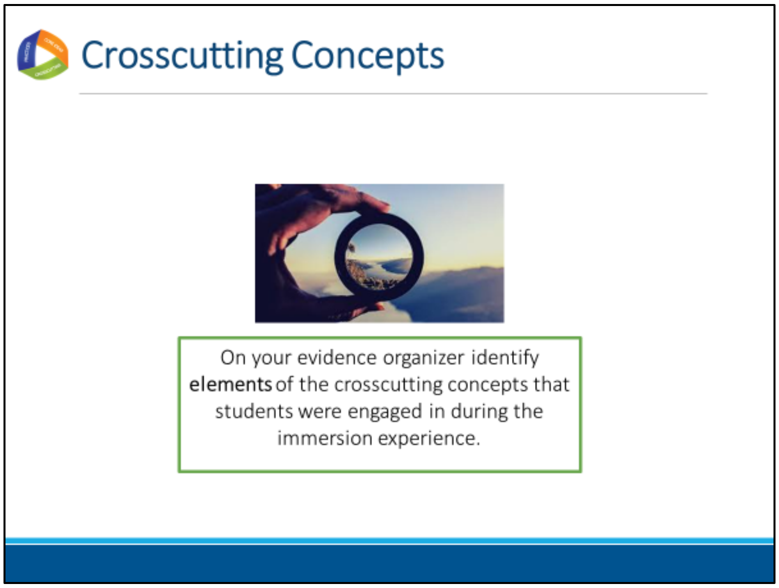
Slide 48

Facilitator Notes:

- Participants will focus on finding evidence of the target crosscutting concepts. Participants should look for evidence in the immersion activity they engaged in, the unit overview, the student work, and the classroom video.
- See the facilitator note in the fourth talking point for important points to cover in your crosscutting concepts discussion.
- Participants will need a copy of or digital access to NGSS Appendix G. A copy for it is provided as *Handout 06 – NGSS Appendix G.*

Talking Points:

- The crosscutting concepts are a lens we want students to look through as they are making sense of the world around them.
- We want students to not only be able to use each lens, but to be aware enough that they can change the lens for the situation—microscope; magnifying glass; glasses; binoculars; telescope.
- There are seven overall crosscutting concepts, but each CCC has specific elements that can be found organized by grade band in NGSS Appendix G. Take a minute to look through some of the elements in NGSS Appendix G. *[Note to facilitator: Give participants a few minutes to look through the elements in NGSS Appendix G.]*
- Turn and talk with a neighbor, what might evidence of the crosscutting concepts look like in instructional materials? *[Note to facilitator: Give participants a few minutes to discuss the question with their partners. Then, have some participants share out their ideas. Finding evidence for crosscutting concepts can be tricky sometimes and this will be an important conversation. A lesson developer may include a vague statement such as "ask the students to look for patterns." However, without more details such as the type of questions students are asking about patterns or the types of statements they are making, just including the word "patterns" is in most situations not evidence enough that students are using a grade-appropriate element of the crosscutting concept. It is important that participants understand that simply including the words for a crosscutting concept does not mean the students are using that crosscutting concept. You need to read the steps that come before and after those words are used and really think if from what is written, it is guaranteed that all students will use that crosscutting concept. Also, think about it from the shoes of a student. Would a student in that situation understand that they were using a crosscutting concept? Finding evidence for crosscutting concepts often requires a little more digging than finding evidence for the other two DCIs.]*



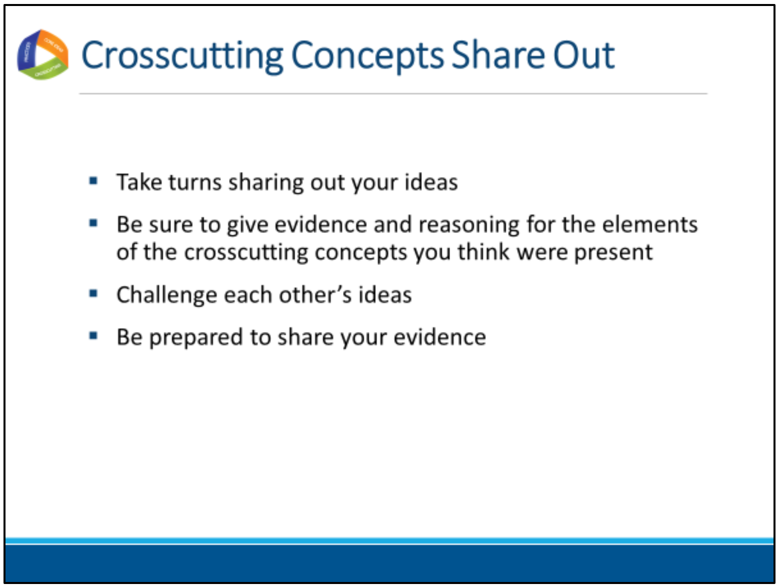
Slide 49

Facilitator Notes:

- Participants will need a copy of or digital access to NGSS Appendix G. A copy for it is provided as *Handout 06 – NGSS Appendix G.*
- Though 10 minutes may be short for a group that is not very familiar with the appendices, it's important not to dwell too long with this activity. The expectation here is for them to get their thoughts down and then spend time justifying their evidence claims with their group.

Talking Points:

- Start with the crosscutting concepts that are provided in the handout and identify whether there is evidence of these in the lesson. After recording the evidence, look through Appendix G and determine if there are other CCCs that are a part of the lesson.
- Remember Where is the evidence that students are engaged in the *elements* of the CCCs? It is particularly important to go to the element level in evaluating the CCCs, because there will be many connections at the larger grain-size.
- You will have 10 minutes to individually work and then we will discuss your findings as a group.



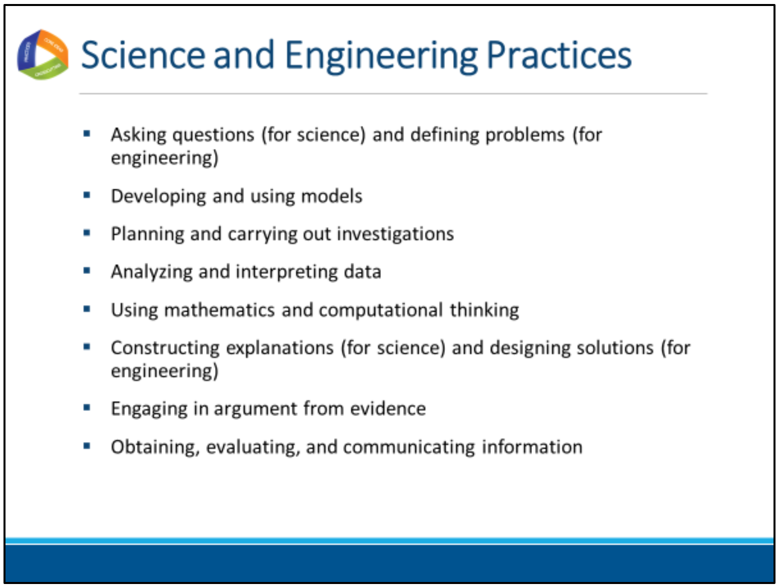
Slide 50

Facilitator Notes:

- Participants will need a copy of or digital access to NGSS Appendix G. A copy for it is provided as *Handout 06 – NGSS Appendix G.*

Talking Points:

- *[Note to facilitator: Lead a group discussion by asking participants to share the evidence they found.]* Let's share some of the evidence you found for the crosscutting concepts listed on the evidence organizer.
- What are some additional CCC elements that might fit well with this unit? *[Note to facilitator: Participants might respond that all crosscutting concepts connect with the unit. If this happens, discuss with the group the importance of knowing which CCC to emphasize when working with students. Students need time to develop each "lens". This happens through questions and modeling the CCCs. If all CCCs are included in a unit, it will become harder for the students to develop deeper understanding for any CCC.]*



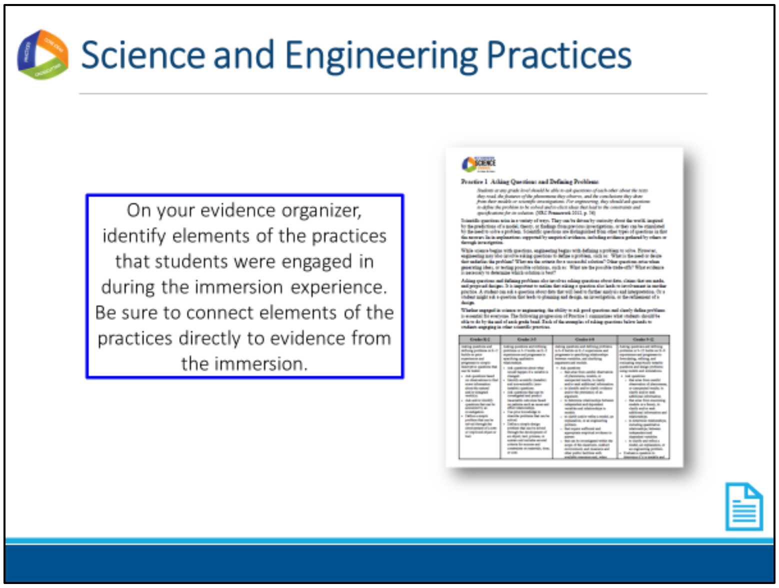
Slide 51

Facilitator Notes:

- Participants will need a copy of or digital access to NGSS Appendix F. A copy for it is provided as *Handout 05 – NGSS Appendix F.*

Talking Points:

- There are eight overall science and engineering practices (SEPs), but each SEP has specific elements that can be found organized by grade band in NGSS Appendix F. Take a minute to look through some of the elements in NGSS Appendix F. *[Note to facilitator: Give participants a few minutes to look through the elements in NGSS Appendix F.]*



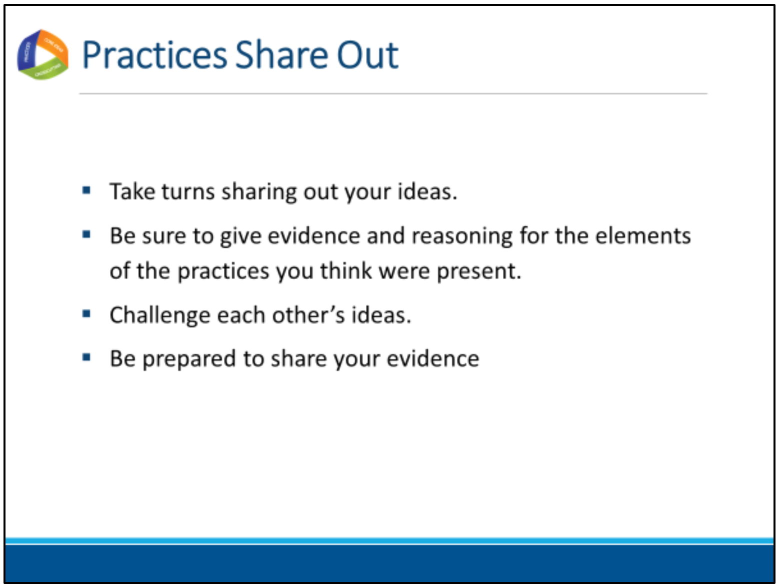
Slide 52

Facilitator Notes:

- Participants will need a copy of or digital access to NGSS Appendix F. A copy for it is provided as *Handout 05 – NGSS Appendix F.*
- As participants look for and discuss their findings, keep an ear out for anyone saying the overall practice names, instead of the specific elements. If you hear participants saying, "I found evidence that students are developing and using models in step 7 when they…" ask them which element of that practice they found evidence for.
- Again, though 10 minutes may be short and you may need to lengthen time based on participant's familiarity with the appendices, the focus here is on the group discussion.

Talking Points:

- Use NGSS Appendix F and look through the lesson to identify whether there is evidence for any SEP *element*. It is particularly important to go to the element level in evaluating the SEPs because there will be many connections at the larger grain-size.
- You will have 10 minutes to individually work and then we will discuss your findings as a group.



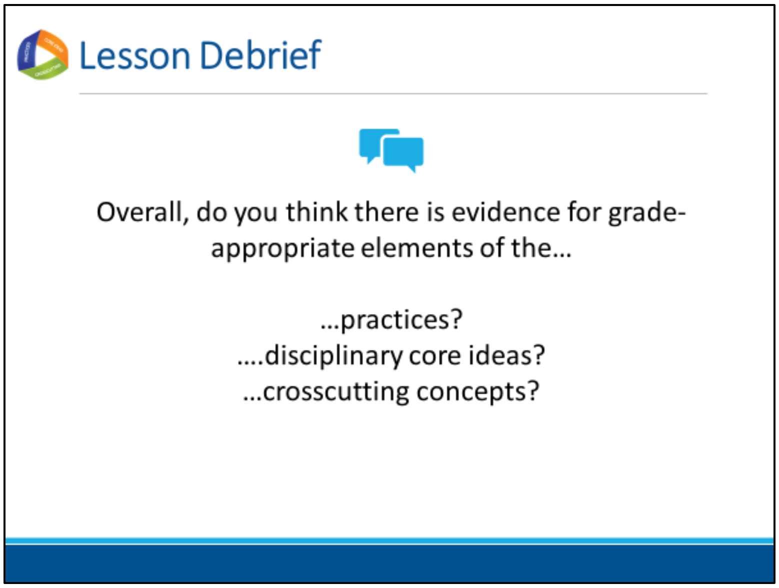
Slide 53

Facilitator Notes:

- Participants will need a copy of or digital access to NGSS Appendix F. A copy for it is provided as *Handout 05 – NGSS Appendix F.*

Talking Points:

- Let's share some of the evidence you found for the science and engineering practices. *[Note to facilitator: Select 4-7 people to share an element of a practice and the evidence from the unit. When participants share, have them say the page of Appendix F they found the element, the practice, and then the element of the practice. This will support participants as they move on to looking for elements and evidence in curriculum materials.]*



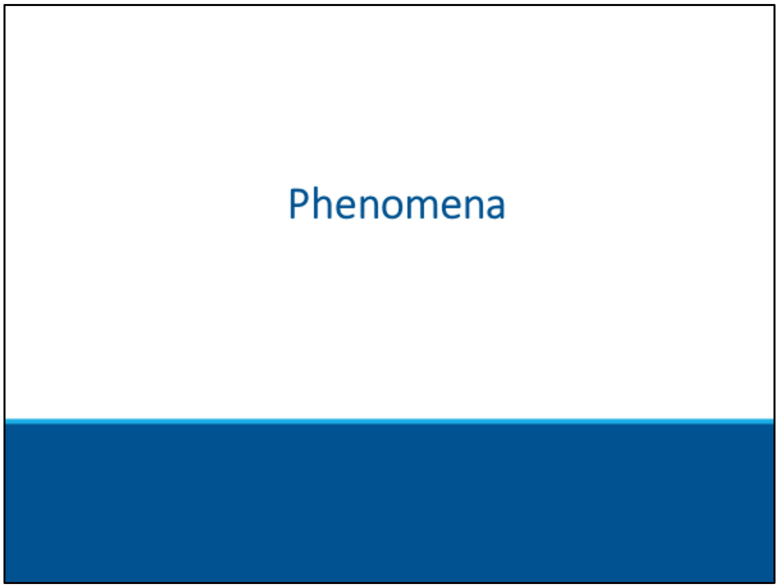
Slide 54

Facilitator Notes:

- Before moving on to the next section, check in with the participants to see if they have any questions about finding evidence for the three dimensions.
- It may be appropriate to chart out responses so that participants can see what the evidence is across the groups.

Talking Points:

- We just discussed the evidence you found for the practices, the disciplinary core ideas, and the crosscutting concepts.
- Overall, do you think there is evidence for grade-appropriate elements of the practices?
- Overall, do you think there is evidence for grade-appropriate elements of the disciplinary core ideas?
- Overall, do you think there is evidence for grade-appropriate elements of the crosscutting concepts?
- Do you have any questions about finding evidence for the three dimensions?



Slide 55

Facilitator Notes:

- This section builds participants' understanding of NGSS Innovation One: Phenomena or Problems. It walks participants through coming up with a definition for phenomena and with the characteristics of an instructionally productive phenomenon. Important points that need to be made about phenomena are included as facilitator notes in the next few slides. Participants will continue to build their understanding of Innovation One throughout the professional learning sessions.

Talking Points:

- The NGSS focus on the innovation of three-dimensional learning is critical in supporting another NGSS innovation: phenomena.
- Three-dimensional learning supports students in figuring out phenomena or developing solutions to problems.
- In the immersion activity that you participated in, were you focused on trying to explain something or develop a solution to a problem? What were you trying to explain as you engaged in the three dimensions? What was the phenomenon?

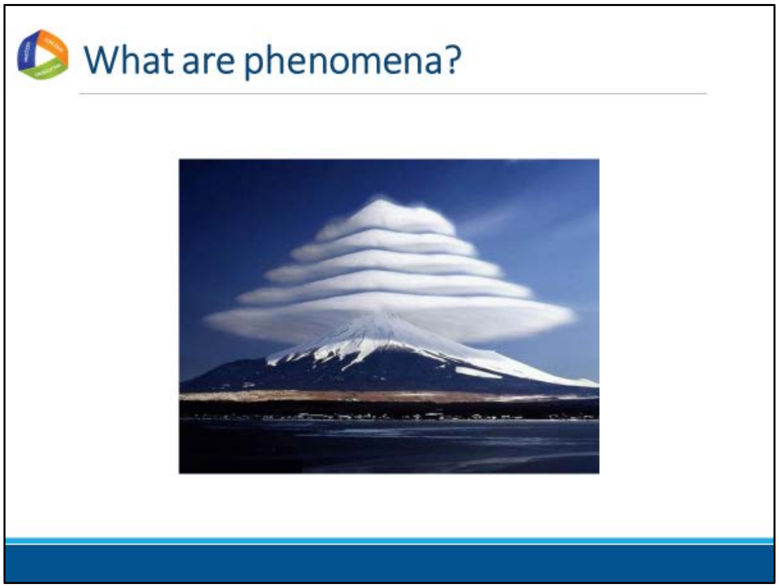
Slide 56

Facilitator Notes:

- This slide references the phenomenon from the immersion activity.

Talking Points:

- Yes, you were trying to explain why a singer was able to shatter a glass with his voice. This was the phenomena that anchored the activity and drove student learning.



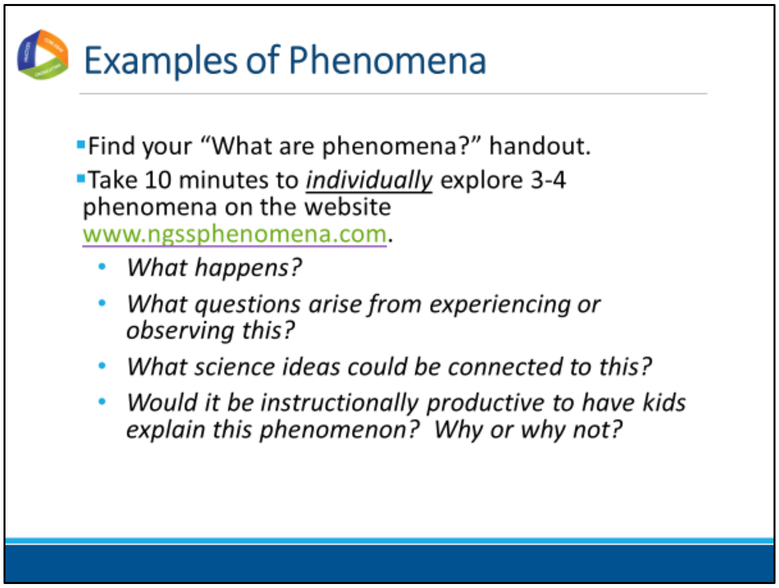
Slide 57

Facilitator Notes:

- It is important that these points are raised in the discussion:
    - Natural phenomena are observable events that occur in the universe and that we can use our science knowledge to explain or predict. The goal of building knowledge in science is to develop general ideas, based on evidence, that can explain and predict phenomena.
    - Learning to explain phenomena and solve problems is the central reason students engage in the three dimensions of the NGSS. Students explain phenomena by developing and applying the Disciplinary Core Ideas (DCIs) and Crosscutting Concepts (CCCs) through use of the Science and Engineering Practices (SEPs).
    - By centering science education on phenomena that students are motivated to explain, the focus of learning shifts from learning about a topic to figuring out why or how something happens.
    - **these points are from "Using Phenomena in NGSS-Designed Lessons and Units." Participants will receive this handout later in the session.*
- Every point about a phenomenon does not need to be raised in this discussion. The next few slides will ask participants to think about characteristics of instructionally productive phenomena, and the goal is for participants to slowly build their understanding of phenomena throughout this session.

Talking Points:

- So, what are phenomena? How would you define a phenomenon? *[Note to facilitator: Lead a whole group discussion about what participants think phenomena are. If the points listed above in the facilitator notes are not brought up by participants, then help prompt them towards those ideas. If you find it helpful, you can chart participants' ideas during the discussion.]*



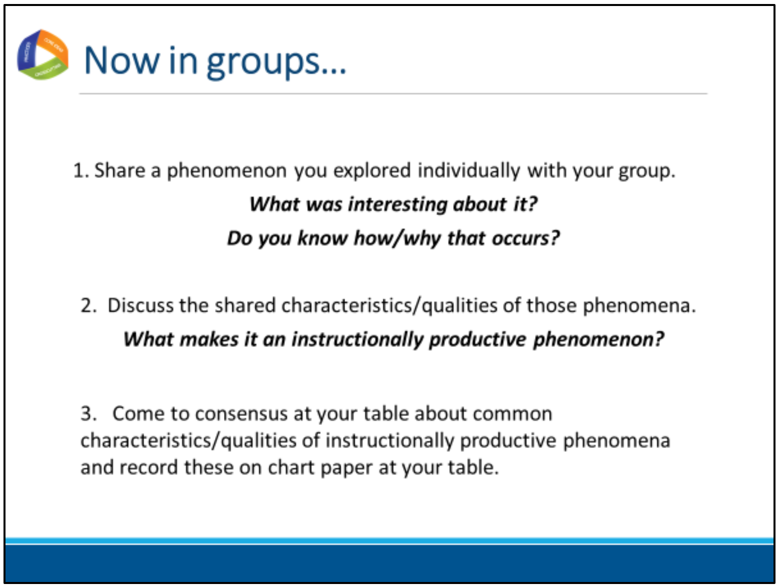
Slide 58

Facilitator Notes:

- In this short activity, participants will explore different phenomena on a website and answer questions about the phenomena. The website www.ngssphenomena.com has may different photos and videos that are phenomena. While a phenomenon may be very cool or interesting, it may not be the best phenomenon to use to anchor a lesson and drive student learning. Participants will be introduced to this idea through this activity as they answer the questions listed on the slide for each phenomenon that they explore.
- Participants will need a copy of *Handout 08 – What Are Phenomena.*
- Participants will need access to a computer and the internet.

Talking Points:

- Let’s look at some examples of phenomena.
- Pull out your copy of the *What Are Phenomena* handout. Take 10 minutes to individually explore 3-4 additional phenomena on the website www.ngssphenomena.com and fill out the questions listed in the columns for each phenomenon:
  - What happens?
  - What questions arise from experiencing or observing this?
  - What science ideas could be connected to this?
  - Would it be instructionally productive to have students explain this phenomenon? Why or why not?



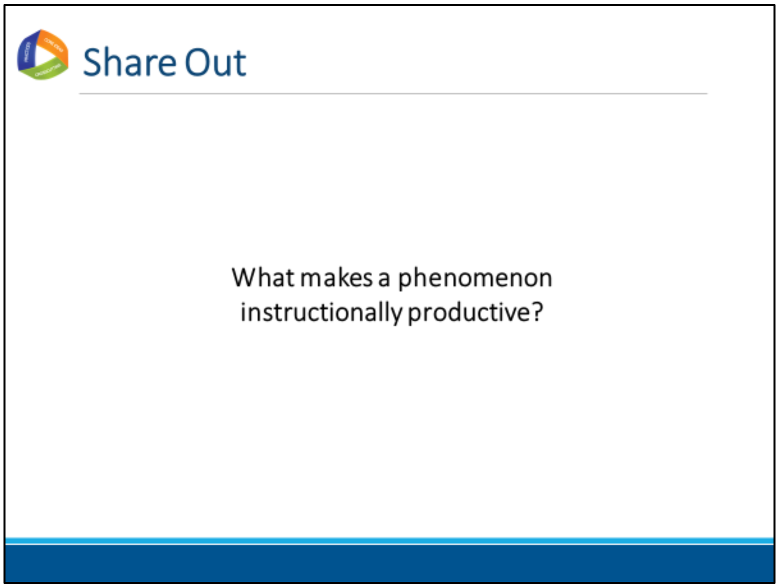
Slide 59

Facilitator Notes:

- Participants will have a group discussion about what characteristics/qualities are for an instructionally productive phenomena. Groups will share their ideas in the next slide.

Talking Points:

- Share a phenomenon you explored individually with your group. Discuss what you found interesting about it. Do you know how and why the phenomenon occurs? *[Note to facilitator: Give groups 5 minutes for their discussion].*
- Then, discuss the shared characteristics and qualities of the phenomena that members of your group explored. What do you think makes them instructionally productive phenomena? Come to a consensus at your table about the common characteristics/qualities of instructionally productive phenomena and record these on chart paper at your table. You will share your characteristics/qualities with all participants after you are done. *[Note to facilitator: Give the groups 10 minutes to come to a consensus and record the characteristics on the chart paper].*



Slide 60

Facilitator Notes:

- One of the biggest characteristics that you need to make sure is emphasized is that a phenomenon is not just a “hook” that is introduced at the beginning of the lesson to grab the attention of the students and then never referred to again in the lesson. Sometimes, people will see evidence of a “hook” in a lesson and say that there is evidence for a phenomenon. For a phenomenon to be a true phenomenon, and for it to be instructionally productive, it needs to drive the lesson and student learning. The focus of what students do in the lesson should be to help them build an explanation for the phenomenon, they should explicitly refer back to the phenomenon throughout their learning and be able to build an explanation for it by the end.
- These are some of the characteristics that you want participants to point out during their share out:
    - Culturally or personally relevant or consequential to students
    - Engages all students in working toward the learning goals
    - Should advance students’ understandings when they develop an explanation
    - Takes some investigation (use of practices) to figure out how and why the phenomena work
    - Does not <u>need</u> to be flashy or unexpected! Instead, it simply needs to create the opportunity for learning
    - **these characteristics are from “Using Phenomena in NGSS-Designed Lessons and Units.” Participants will receive this handout later in the session.*

Talking Points:

- Have each group share the characteristics and qualities that they think make phenomena instructionally productive. *[Note to facilitator: Ask groups to post their chart paper on the walls and to use it as they share their ideas. Encourage other groups to add on to points made the presenting group.]*

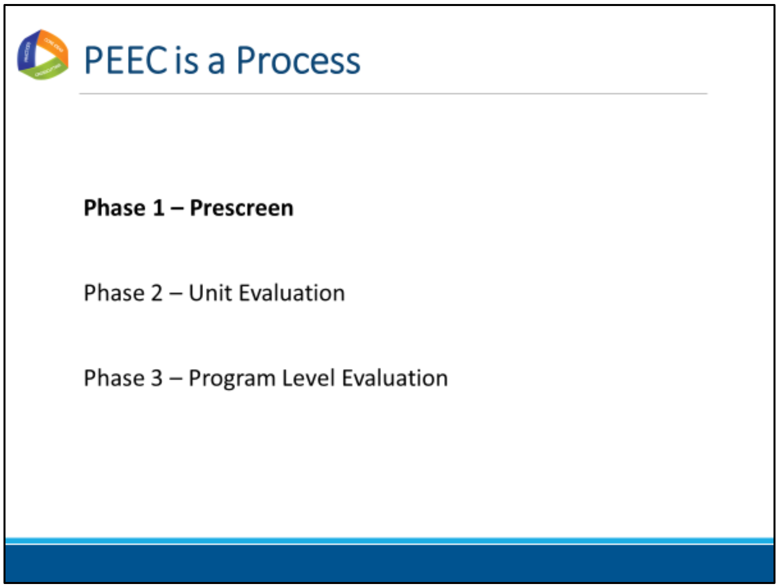
Slide 61

Facilitator Notes:

- The prescreen criteria allow users to take a quick look at an instructional materials program to determine whether the program shows promise of NGSS design. The prescreen process involves the use of three tools, each for a criterion that should be readily apparent in a program that has been designed for the NGSS. Participants will need to scan each program to find evidence for the criteria. Which materials they will scan and the sampling methodology for scanning the materials should be determined before beginning the prescreen (see [How will you scan the materials for evidence?](#)). Recommendations for how participants can scan for evidence can be found in slides 70 and 73.
- Each instructional materials program may come with a variety of materials (e.g., student edition, teacher edition, lab manual) and the types of materials may not be consistent across the programs. When the prescreening begins, participants should have a list of the programs that they will be evaluating and the type and number of materials that were submitted with each program. They should also be informed if they will be evaluating all of the supplemental materials or only a portion of them. For example, if a program comes with optional supplemental CD activities that you already know you will not be able to purchase and use, they should not be a part of the evaluation.
- At this point, you may want to consider regrouping the participants, based upon their knowledge and the number and type of instructional materials you have to prescreen. For example, if you are selecting high school materials based on discipline, you may want one (or more depending on the number of participants) groups of participants with life sciences experience, groups with physical sciences experience, etc. The screening and evaluation processes will be easier if participants have background knowledge of the discipline they are evaluating programs for.
- When grouping people, consider the amount of time you have for the prescreen, the number of people who will be prescreening, and the number of instructional materials that need to be prescreened.

Talking Points:

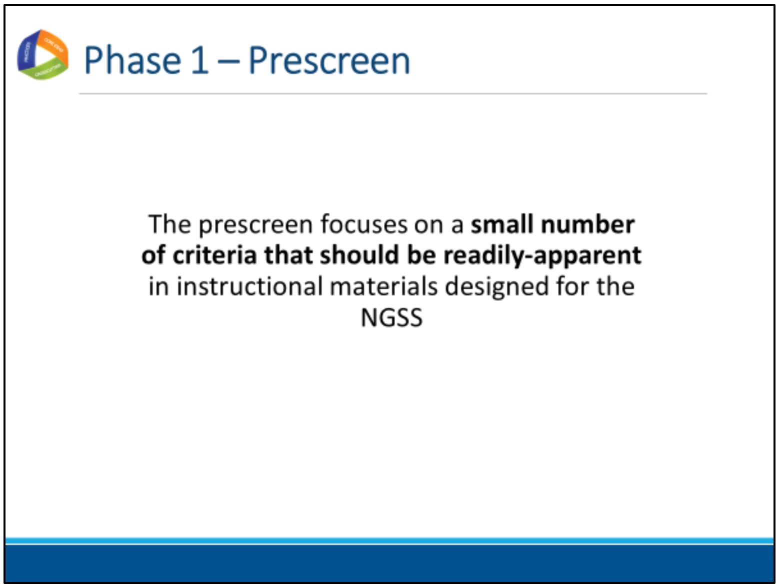
- Now that we all have experienced what three-dimensional learning and phenomena look like, let's begin the process of prescreening instructional materials and determining which materials show potential that they are designed for the NGSS.
- *[Note to facilitator: Provide participants with the list of instructional materials programs that they will be evaluating that identifies any supplemental materials that they will need to include in their evaluation.]*



Slide 62

Talking Points:

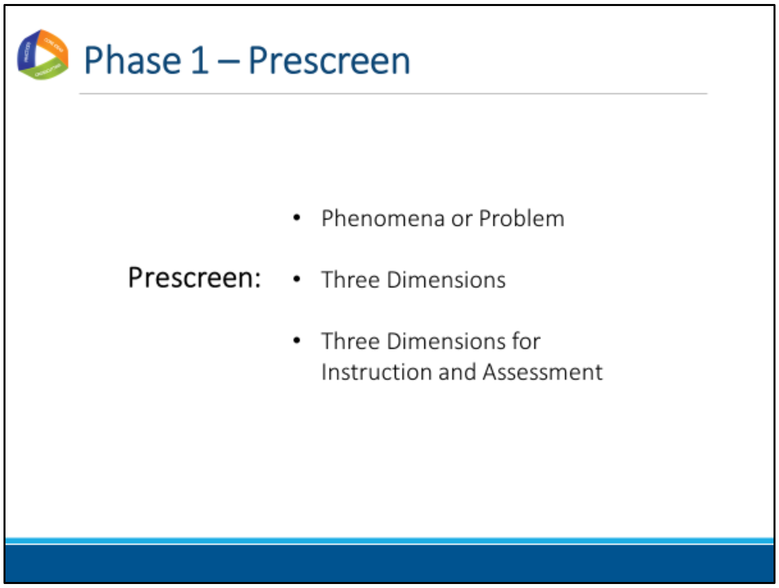
- As we discussed earlier, PEEC consists of three phases, the first of which is the prescreen. We will only be focusing on the first phase in this session.
- Your task is to use the prescreen process to evaluate the instructional materials programs that have been submitted and try to narrow down the list to the ones that show promise of NGSS design and warrant a more in-depth evaluation.



Slide 63

Talking Points:

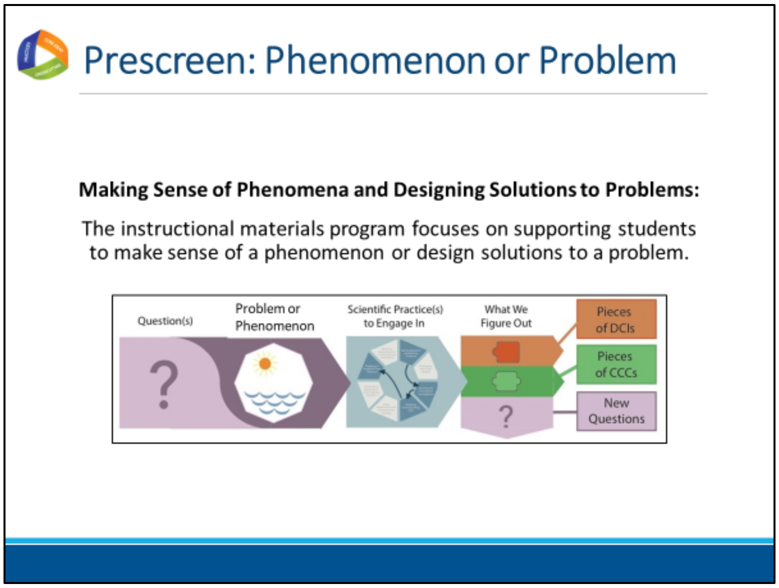
- The prescreen focuses on a small number of criteria that should be readily-apparent in instructional materials designed for the NGSS.
- This allows those selecting materials to take a relatively quick look at a wide range of materials and narrow the number of programs worthy of a closer look.



Slide 64

Talking Points:

- The three criteria for the prescreen are: phenomena, three dimensions, and three dimensions for instruction and assessment.
- In the immersion activity, we focused on looking for evidence for the three dimensions and we also discussed phenomenon, because an understanding of these two Innovations also builds an understanding of the prescreen criteria.
- Let's continue to build our understanding of the first prescreen criteria: phenomena or problem.



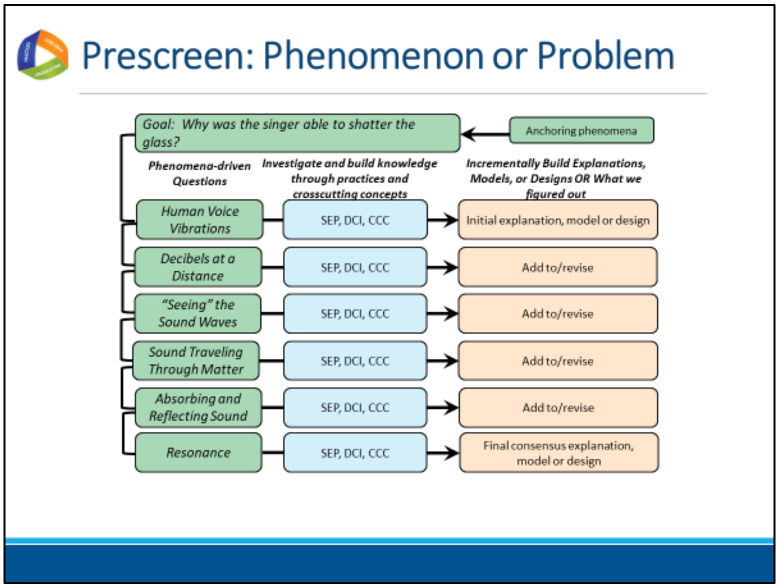
Slide 65

Facilitator Notes:

- This slide explains the first prescreen criteria.
- Build on the conversations that you had earlier this session about phenomena.

Talking Points:

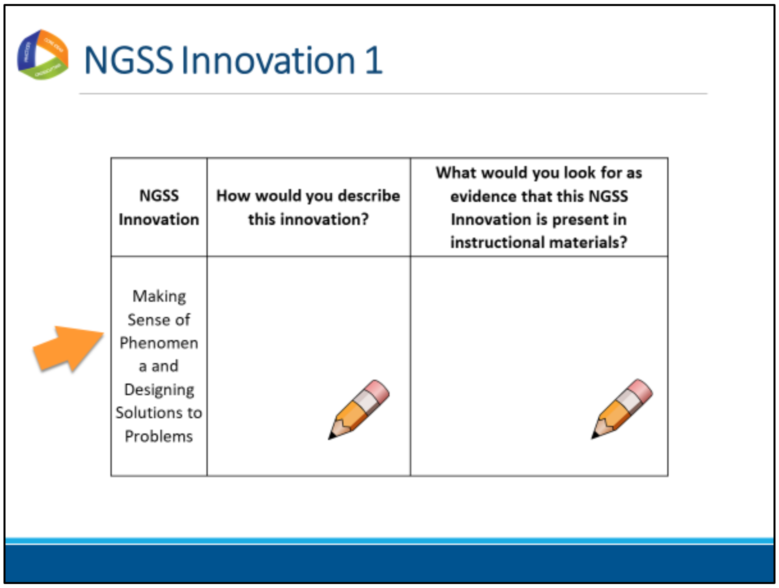
- The first criteria in the Phase 1 Prescreen process is that the instructional materials program **focuses** on supporting students to make sense of a phenomenon or design solutions to a problem.
- There needs to be explicit evidence in the materials that the purpose and focus of the learning sequences in the materials is to support students in making sense of phenomena and/or designing solutions to problems.
- Students should be engaged in all three dimensions throughout the learning sequences to build their explanations for a phenomenon or to help design a solution to a problem.
- As students engage in all three dimensions to build a piece of their explanation or solution, they will generate new questions that will lead them to the next learning sequence and there they will re-engage in the three dimensions to continue building their explanations or solutions. Ultimately, all student learning should be linked back to the original anchoring phenomenon or problem.



Slide 66

Talking Points:

- Let's look back at the entire learning sequence for the activity that you participated in earlier.
- The goal of this entire learning sequence is for students to make sense of why the singer was able to shatter the glass—which is the phenomenon. Students engage in practices, core ideas, and crosscutting concepts to incrementally build their explanations. They generate new questions that lead them to the next step of the learning sequence, and this process continues until students are able to explain the phenomenon.



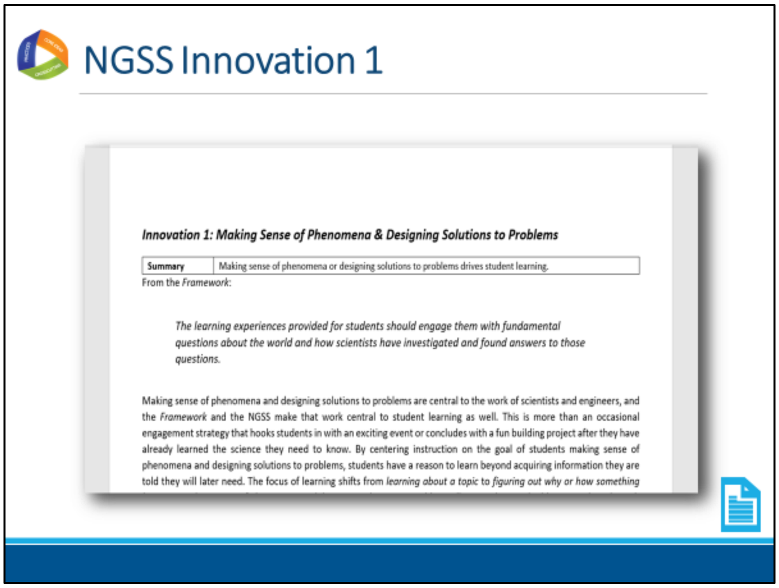
Slide 67

Facilitator Notes:

- Participants will need their copy of *Handout 1 – NGSS Innovations* that they began to fill out earlier in the session.

Talking Points:

- Let's go back to our *NGSS Innovations* handout.
- Turn to page 2 in the handout.
- How has your description of the first NGSS Innovation changed? Take a few minutes to talk to your group and come up with a working group description for making sense of phenomena and designing solutions to problems. Write your new description of this innovation in the second row, second column of the table. *[Note to facilitator: Click for animation.]*
- Based on what you have learned about phenomena and problems in the immersion activity and through our discussion, what would you look for as evidence that this NGSS innovation is present in instructional materials? Discuss your thoughts with your group and then write your thoughts down in the second row, third column. *[Note to facilitator: Click for animation.]*



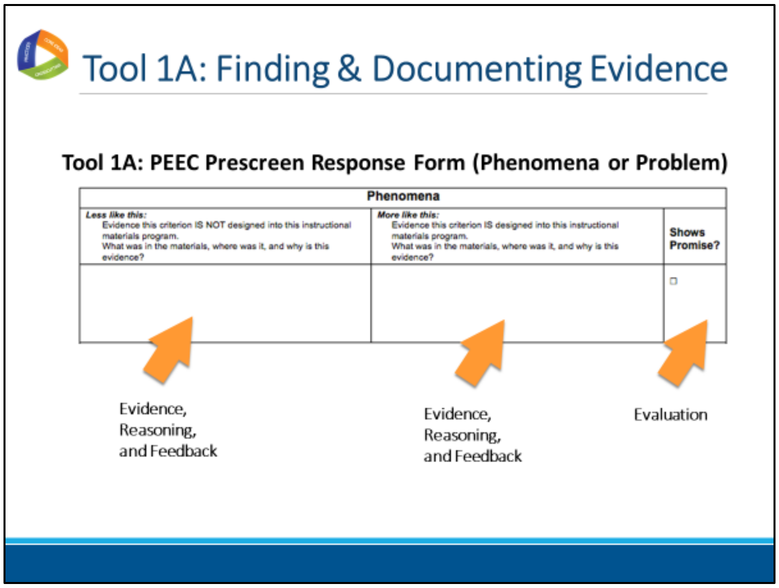
Slide 68

Facilitator Notes:

- Participants will need their copy of *Handout 1 – NGSS Innovations* that they began to fill out earlier in the session.
- Participants will need a copy of *Handout 13 – Innovation 1.*

Talking Points:

- Let's look at some more information of what NGSS designed programs should look less like and what they should look more like when considering the phenomena criterion.
- Pull out your copy of the *Innovation One* handout.
- Take a few minutes to read over this handout.
- Turn to the Explaining Phenomena or Designing Solutions chart in the handout.
- You probably see many the points from the left-hand side in the textbooks you have in your classroom right now.
- As you dig through your assigned instructional materials program, you will be searching for evidence of the points on the right-hand side.
- These are the things we are looking for in the instructional materials programs we will prescreen. So, if you see a lot of the ideas from the right column appear in the instructional materials, there is at least some evidence of NGSS design.
- If you see a lot of the ideas from the left column appear in the instructional materials, there is some evidence of the materials not being completely designed for the NGSS.
- Take a few minutes to go back to your *NGSS Innovations* handout and add in any additional thoughts in the second row of page two in the handout. Discuss your thoughts with your group. Especially focus on any new ideas about what you would look for as evidence that this NGSS Innovation is present in instructional materials.
- *[Note to facilitator: It may be helpful to have a whole group share out after individual teams have completed their discussions.]*
- Now, let's take a look at how we will record the evidence.



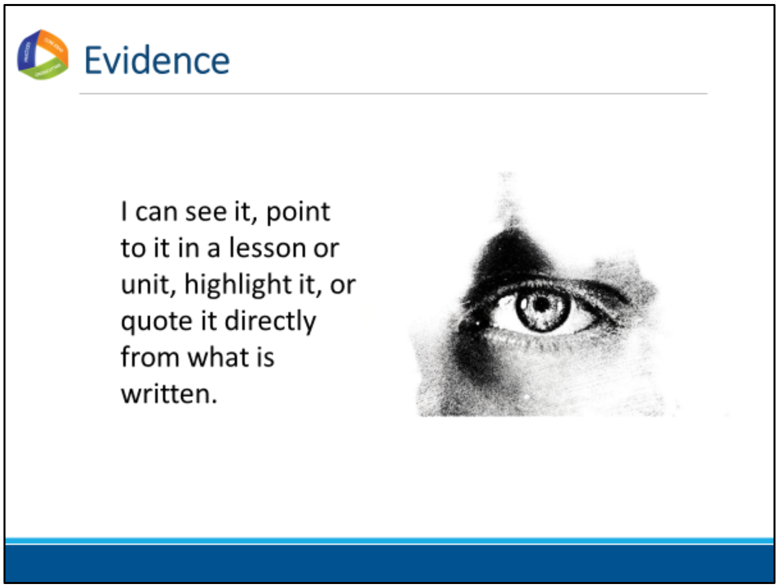
Slide 69

Facilitator Notes:

- This slide walks participants through how they should fill out the PEEC Prescreen Response Form.
- Participants will need a copy of *Handout 9 – Tool 1A PEEC Prescreen.*

Talking Points:

- Let's begin with the first prescreening tool in the PEEC Document. Please take out your copy of the *Prescreen Tool A* response form.
- Tool 1A: The PEEC Prescreen Response Form, has three columns.
- *[Note to facilitator: Click for animation.]* The first column is where you will record evidence that the phenomena criterion is NOT designed into the instructional materials program. For example, if a phenomenon is brought into the learning sequence at the very end after students have already developed the science ideas (which was in the "less like this column"), then that is evidence that you will record in the left column.
- *[Note to facilitator: Click for animation.]* The second column is where you will record evidence that the phenomena criterion IS designed into the instructional materials program. So, if the phenomenon is introduced at the beginning of the learning sequence, and everything that the students do goes back towards makings sense of and explaining this phenomenon, then that is evidence that this criterion was designed into the materials.
- *[Note to facilitator: Click for animation.]* The third column is where you evaluate the evidence you found and indicate whether this instructional materials program warrants further evaluation with the rest of the PEEC process. We will discuss this more in depth after you are done collecting evidence.
- First, let's talk about what the evidence should look like and how you fill out the chart.



Slide 70

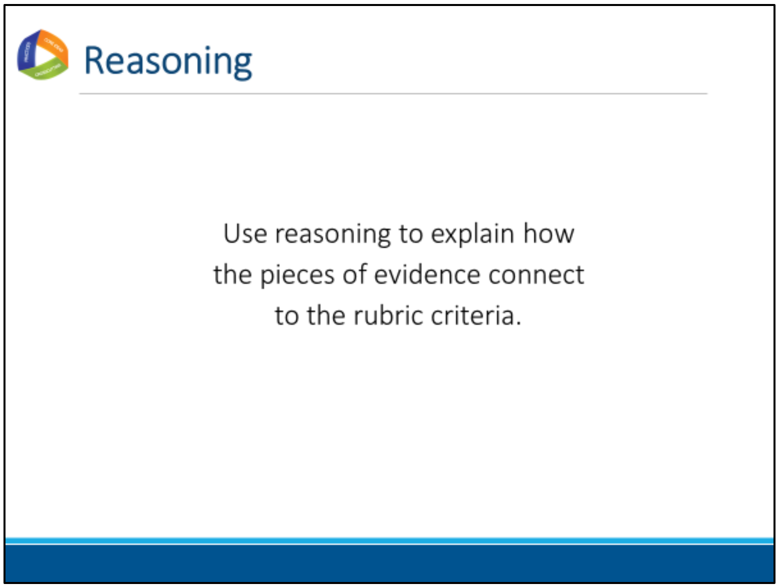
Facilitator Notes:
These notes are included in slide 73 and are also included in that slide as talking points. The notes are also included in this slide in case this conversation seems to naturally come up at this time.

- You will need to figure out how much time you have for the prescreen and how much evidence you would like to see in both columns for each material. There are three tools in the prescreen that require reviewers to find and record evidence. Each tool asks for evidence that an instructional materials program does not meet the criteria and for evidence that it does meet the criteria. It is recommended that you require that reviewers find and record two-three pieces of evidence each from the beginning, the middle, and the end of the program, for a total of six-nine pieces of evidence for each tool. The evidence should not be required for each column or to be split across the does not meet or does meet columns (as this may skew the results). Instead, reviewers should look for evidence for the presence and absence of the criteria in general, and record their findings in the appropriate column. Depending on the time that you have allotted for the prescreening process, you can increase or decrease the pieces of evidence that you require. However, it is important that participants review a portion toward the beginning of the program, a portion from the middle, and a portion toward the end.
- To help you look for evidence, divide your program into three imaginary sections to represent the beginning, middle, and end of the program. To find the evidence from the beginning of the program, divide that section into four smaller sections and choose one to look through evidence. Repeat this process for the middle and the end sections. During this stage of work, it is important to remember that this is a prescreen and not the full evaluation. It is not necessary to find every piece of evidence in the program and participants do not need to evaluate every single page or even every lesson. Instead, they need to scan through the sections that they have selected in your program for the evidence. For the first criteria, looking for phenomena and problems, participants should focus on the beginning of the lesson to see if phenomenon or problem is introduced, and then check through the lesson to see if it connects back. In materials that at least show promise for being designed for the NGSS, it should not be difficult to see evidence of at least an attempt to address these innovations.
- When participants scan for evidence, they will be looking to see if the program is designed to engage all students in making sense of phenomena and/or designing solutions to problems through student performances that integrate the three dimensions of the NGSS. To find evidence for this, participants should scan both student and teacher materials and start off by looking the organization of both resources. Is the content organized in a way that would help demonstrate the inclusion of the criteria and innovations? Is it divided into sections that are labeled by terms such as “periodic table of elements” or “cell structures,” or is it divided into sections that labeled by driving questions, problems, or phenomena? Are there explicit sections where the integration of

phenomena or problems are called out or student performances are highlighted? Or do the materials read like a traditional textbook with information but no student performance integration?

Talking Points:

- What should we be recording when we're looking for evidence?
- Evidence is what is stated or described explicitly in a lesson or unit. If it is evidence, you can see it, point directly to it, highlight it, cite it, or quote it directly from what is written.
- On a cautionary note, it is very common to want to "fill in the blanks" in a lesson or unit and add what we think the developer intended or what we would do if teaching and call it evidence; but to be very clear, we can only examine what we can see. If it's not there, we cannot add it in and call it evidence. Think, for example, of asking a student to evaluate an argument. Students should only evaluate the argument as it exists and not "fill in the blanks" about what they think the person who made the argument intended. It is tempting for students to want to apply their own experiences and understanding to fill in the blanks, but the application of their expertise is better suited for making suggestions about how to improve the argument. Likewise, you cannot make assumptions about a lesson or unit developer's intentions. Evidence must be explicitly stated in the materials you are examining. Later in the process, you will use professional judgment to decide whether the evidence is sufficient to say the criteria have been met and to make criterion-based suggestions for improvement. But for the purpose of finding evidence, it is essential to consider only what is explicit in the lesson or unit.
- In addition, it's also common to skip right over the evidence and move directly to making judgments about whether a lesson or unit meets the rubric criteria or to offering suggestions on how to improve the lesson. We need to be careful to avoid this pitfall.



Slide 71

Talking Points:

- Once we've located evidence of the criteria we're looking for, we then use reasoning to explain how that evidence connects to the criteria in the rubric.
- Again, at this point we're not yet evaluating whether the evidence is sufficient to say that the materials align to the NGSS in terms of three-dimensional learning or other criteria. We're just stating that "x is an example of modeling *at the element level*"; "this element is part of the modeling science and engineering practice at the appropriate grade level"; "so, therefore, this lesson/unit includes a science and engineering practice."
- It's important to reason through these connections because it's not at all uncommon for different people to see the same exact thing in a lesson or unit without making the exact same connections to the rubric criteria.
- We use reasoning to put the different pieces of evidence we find together and then to connect that evidence to the rubric criteria so that we can, ultimately, work collaboratively to evaluate the program.

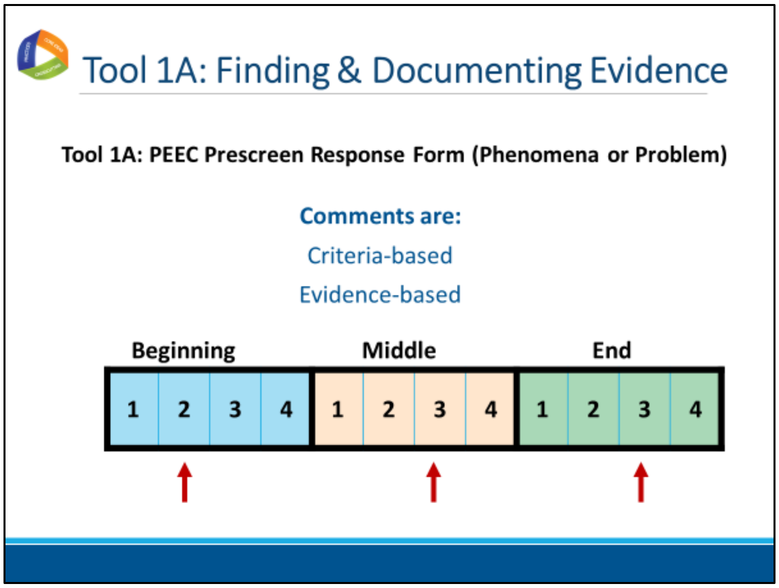
Feedback

Statements made to teachers, lesson developers, and/or other educators about what evidence is or is not explicit in a lesson or unit.

Slide 72

Talking Points:

- In essence, *feedback* refers to statements made to educators or developers about what evidence is or is not explicit in a lesson or unit. Feedback is always criterion-based.
- Feedback may also include reasoning that explains *how* the evidence we see connects to one or more criteria in the rubric itself. For example, we might say something like, “Having the students develop a representation that presents a causal account to show that plants have similar life cycles is an example of X element of the modeling practice, therefore this lesson does include practices.” We may have similar evidence and reasoning for core ideas and crosscutting concepts.
- For now, if we want to provide good feedback, we need to locate evidence, determine how that evidence connects to the criteria on the rubric, and share this with the developer.



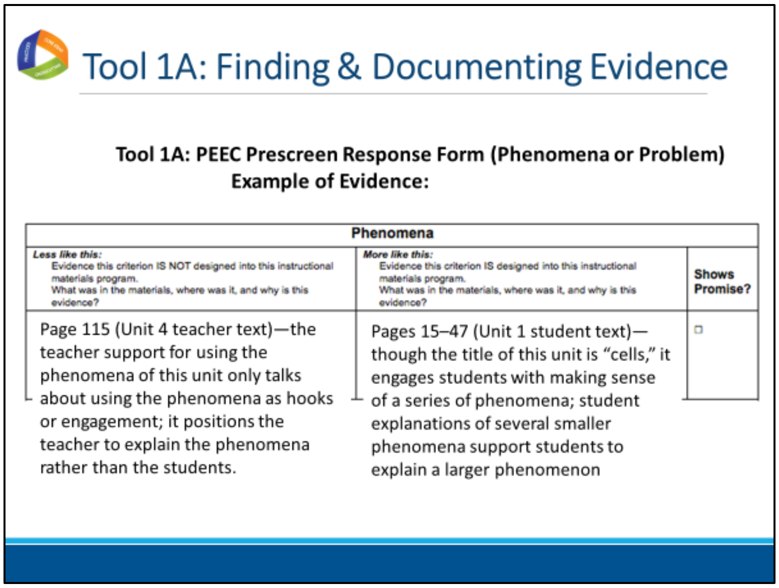
Slide 73

Facilitator Notes:

- You will need to figure out how much time you have for the prescreen and how much evidence you would like to see in both columns for each material. There are three tools in the prescreen that require reviewers to find and record evidence. Each tool asks for evidence that an instructional materials program does not meet the criteria and for evidence that it does meet the criteria. It is recommended that you require that reviewers find and record two-three pieces of evidence each from the beginning, the middle, and the end of the program, for a total of six-nine pieces of evidence for each tool. The evidence should not be required for each column or to be split across the does not meet or does meet columns (as this may skew the results). Instead, reviewers should look for evidence for the presence and absence of the criteria in general, and record their findings in the appropriate column. Depending on the time that you have allotted for the prescreening process, you can increase or decrease the pieces of evidence that you require. However, it is important that participants review a portion toward the beginning of the program, a portion from the middle, and a portion toward the end.
- To help you look for evidence, divide your program into three imaginary sections to represent the beginning, middle, and end of the program. To find the evidence from the beginning of the program, divide that section into four smaller sections and choose one to look through evidence. Repeat this process for the middle and the end sections. During this stage of work, it is important to remember that this is a prescreen and not the full evaluation. It is not necessary to find every piece of evidence in the program and participants do not need to evaluate every single page or even every lesson. Instead, they need to scan through the sections that they have selected in your program for the evidence. For the first criteria, looking for phenomena and problems, participants should focus on the beginning of the lesson to see if phenomenon or problem is introduced, and then check through the lesson to see if it connects back. In materials that at least show promise for being designed for the NGSS, it should not be difficult to see evidence of at least an attempt to address these innovations.
- When participants scan for evidence, they will be looking to see if the program is designed to engage all students in making sense of phenomena and/or designing solutions to problems through student performances that integrate the three dimensions of the NGSS. To find evidence for this, participants should scan both student and teacher materials and start off by looking the organization of both resources. Is the content organized in a way that would help demonstrate the inclusion of the criteria and innovations? Is it divided into sections that are labeled by terms such as “periodic table of elements” or “cell structures,” or is it divided into sections that labeled by driving questions, problems, or phenomena? Are there explicit sections where the integration of phenomena or problems are called out or student performances are highlighted? Or do the materials read like a traditional textbook with information but no student performance integration?

Talking Points:

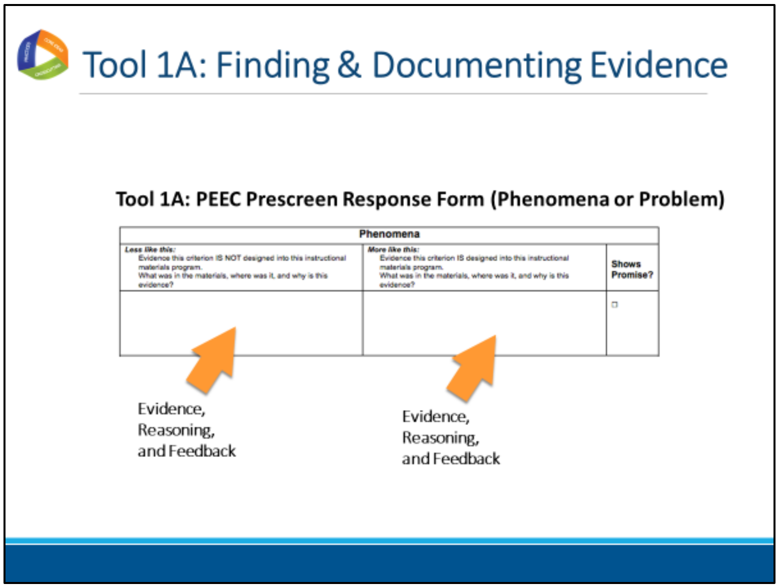
- All written comments should be based on the criteria that is currently being used for evaluation. For example, do not include comments in Tool 1A about whether crosscutting concepts are developed or not, because that criterion is found in Tool 1B and it is not a part of the phenomena Tool 1A.
- The comments should include where in the materials the evidence was found and how the criteria are met or not. The location should be specific and include, if possible, a page number and section or lesson header.
- No extraneous or personal comments should be included.
- You will need to find and record two-three pieces of evidence each from the beginning, the middle, and the end of the program, for a total of six-nine pieces of evidence for each tool. The evidence is not required for each column and is not required to be split across the does not meet or does meet columns (as this may skew the results). Instead, you should look for evidence for the presence and absence of the criteria in general, and record your findings in the appropriate column.
- It is important that you review a portion toward the beginning of the program, a portion from the middle, and a portion toward the end. To help you look for evidence, divide your program into three imaginary sections to represent the beginning, middle, and end of the program. *[Note to facilitator: Click for animation.]* To find the evidence from the beginning of the program, divide that section into four smaller sections *[Note to facilitator: Click for animation.]* and choose one to look through evidence. *[Note to facilitator: Click for animation.]* Repeat this process for the middle and the end sections. *[Note to facilitator: Click for animation.]*
- During this stage of work, it is important to remember that this is a prescreen and not the full evaluation. It is not necessary to find every piece of evidence in the program and you do not need to evaluate every single page or even every lesson. Instead, scan through the sections that you have selected in your program for the evidence. For the first criteria, looking for phenomena and problems, especially focus on the beginning of the lesson to see if phenomenon or problem is introduced, and then check through the lesson to see if it connects back. In materials that at least show promise for being designed for the NGSS, it should not be difficult to see evidence of at least an attempt to address these innovations.



Slide 74

Talking Points:

- Here is an example of what written comments should look like in each column. Take a few minutes to read the examples.
- Do you have any questions?



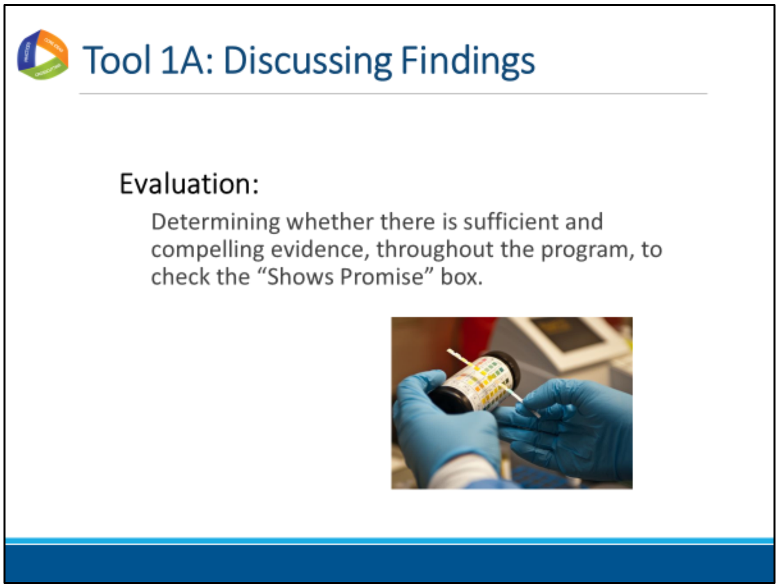
Slide 75

Facilitator Notes:

- For the prescreening process, you will need to allocate enough time for everyone to individually look through the materials for a program and record evidence before the group discusses the evidence for a certain instructional materials program and comes to a consensus about if it shows promise for the next phase. Guidance for time is included in the talking points for each tool (criteria).
- Pass out the first instructional materials program to each group for them to prescreen, or give them instructions on how to access the materials online.
- Walk around the room and check-in with each group periodically to see if they have any questions about the process.
- Posting a timer that is visible to all participants can help everyone keep track of their time and stay on task.

Talking Points:

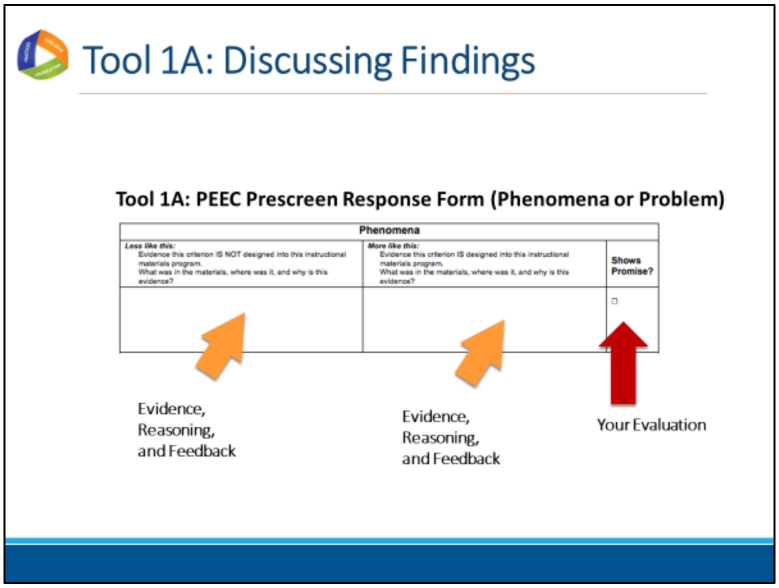
- Now, we will get started with the prescreen. You will spend the next 40 minutes working to fill out Tool 1A for the first instructional materials program assigned to your group.
- You will first need to individually scan the materials and look for evidence that phenomena is not designed into the materials and for evidence that it is designed into the materials. You will receive 20 minutes to individually record evidence before you come together as a group to discuss the evidence that everyone found.
- Remember to be as explicit and clear as possible when writing your statements.
- *[Note to facilitator: Set a timer for 20 minutes. Posting a timer that is visible to all participants can help everyone keep track of their time and stay on task.]*



Slide 76

Talking Points:

- After individually gathering evidence and completing the first two columns, the next step is to discuss your individual findings in your groups and come to a consensus about if the program shows promise to move on to the next phase of PEEC.
- You will now work as a group to discuss and evaluate the evidence you have gathered and determine whether there is sufficient and compelling evidence of phenomena throughout the program to check the "shows promise" box.



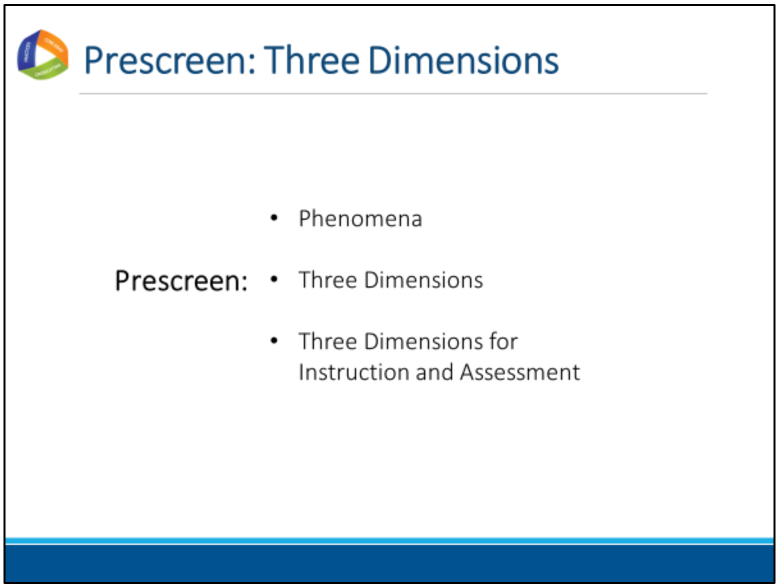
Slide 77

Facilitator Notes:

- Depending on your policies and process, you may need each individual to submit a completed and filled out version of the PEEC Prescreen Tool charts for your records, or you may need a team consensus report. If you need a combined team report, assign a lead in each group and have them complete a digital or paper version of Tool 1A that is a consensus report of the individual evidence found in the group.
- It will be important as you walk around to focus reviewers on providing criterion-based feedback. It is not whether the materials are “good” or “bad,” but to what degree there is evidence that they have potential to meet the criterion.
- It is also important to remind the participants that this is not the final evaluation. This is a quick read through to determine if the materials show promise and are worth the time for a deeper review.
- Posting a timer that is visible to all participants can help everyone keep track of their time and stay on task.

Talking Points:

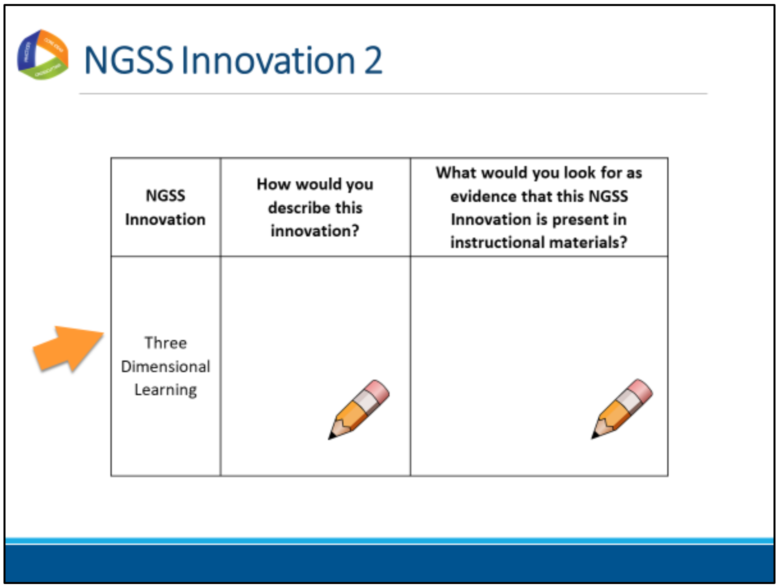
- Take 20 minutes to discuss your individual findings in your group and to come to a consensus about if the program shows promise for NGSS design for the phenomena criterion.
    - Now that you have recorded evidence for the criterion, it is time to determine if there is enough evidence to check the “shows promise?” box for the criterion.
    - To answer this question, weigh the “More Like This” evidence with the “Less Like This” evidence. This first phase is meant to be a quick glance that sorts out instructional materials programs that are not designed for the NGSS.
    - Checking the “shows promise” box in the prescreen phase does not mean that the criterion is thoroughly and appropriately designed into the instructional materials program, but it does mean the program shows promise and it is worth the time to dig deeper. If you find that a program is close, it warrants further review.
- As you discuss your individual evidence as a group and come to a consensus, fill out a group consensus version of Tool 1A digitally. This version will be submitted at the end of the prescreen.
- *Note to facilitator: Set a timer for 20 minutes. Posting a timer that is visible to all participants can help everyone keep track of their time and stay on task.*



Slide 78

Talking Points:

- We will repeat the process you followed for looking for evidence for the first criterion of phenomena with the remaining two criteria of the prescreen.
- The second criterion in the prescreen looks for the presence of the three dimensions and the third looks for the integration of the three dimensions for instruction and for assessment.
- Both of these criteria fall under the second innovation of the NGSS – three-dimensional learning.



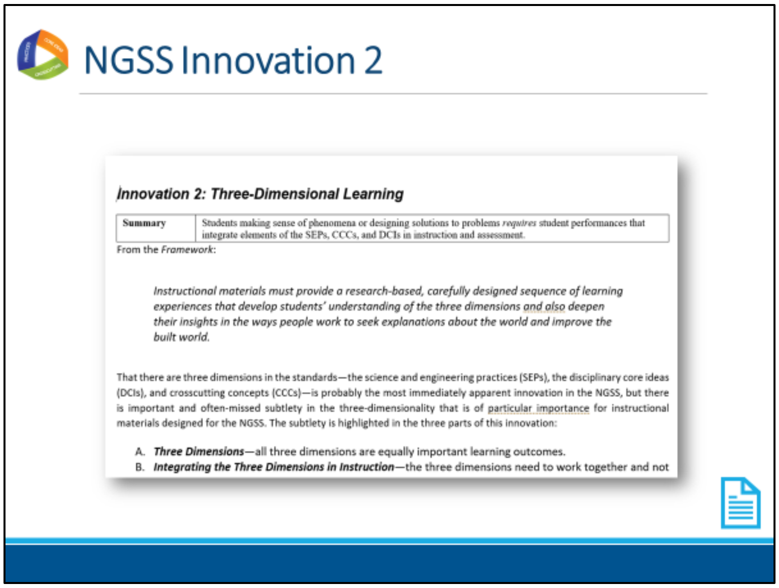
Slide 79

Facilitator Notes:

- Participants will need their copy of *Handout 1 – NGSS Innovations* that they began to fill out earlier in the session.

Talking Points:

- Let's go back to our *NGSS Innovations* handout.
- Turn to page 2 in the handout.
- How has your description of the second NGSS Innovation changed? Take a few minutes to talk to your group and come up with a working group description for three-dimensional learning. Write your new description of this innovation in the table. *[Note to facilitator: Click for animation.]*
- Based on what you have learned about three-dimensional learning in the immersion activity and through our discussion, what would look for as evidence that this NGSS innovation is present in instructional materials? Discuss your thoughts with your group and then write your thoughts down in the table. *[Note to facilitator: Click for animation.]*



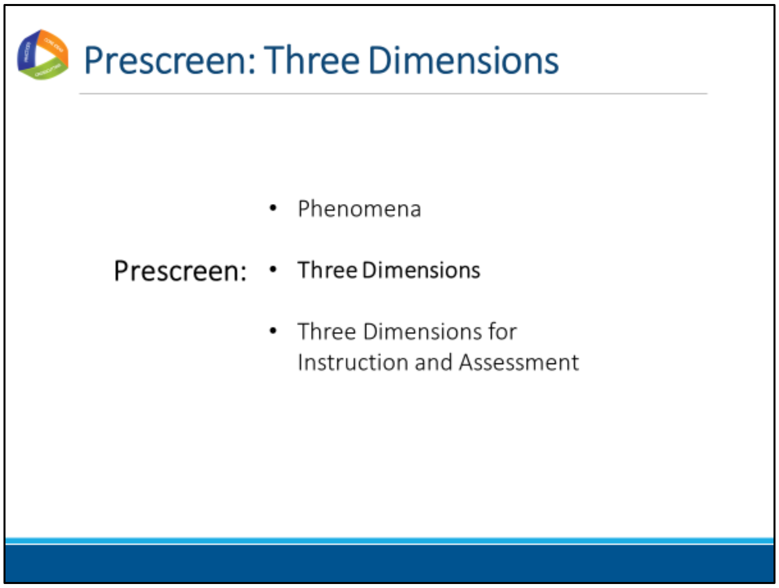
Slide 80

Facilitator Notes:

- Participants will need a copy of *Handout 14 – Innovation Two*.

Talking Points:

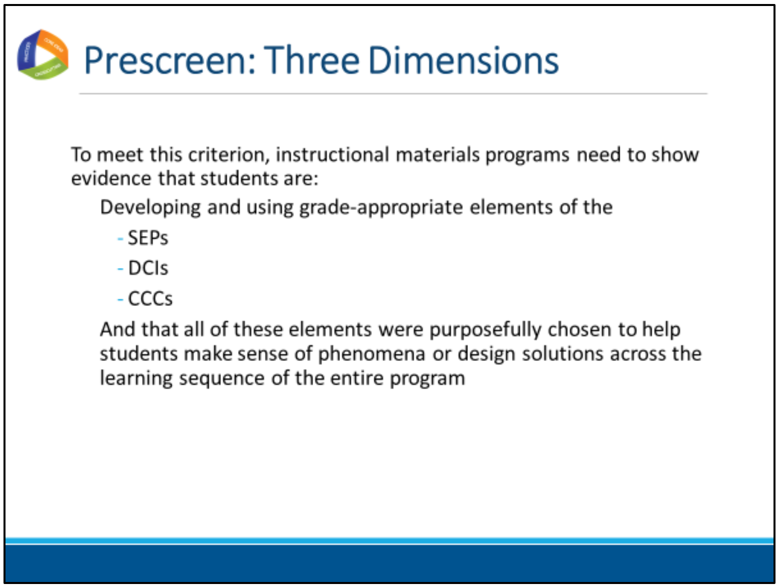
- Let's look at some statements of what NGSS designed programs should look less like and what they should look more like when considering the two three-dimensional learning criteria.
- Pull out your copy of the copy of the *Innovation Two* handout.
- Take a few minutes to read over this handout.
- Turn to the Three-Dimensional Learning table in the handout.
- As you dig through your assigned instructional materials program, you will be searching for evidence of the points on the right-hand side.
- These are all of the things we are looking for in the instructional materials programs we will prescreen. So if you see a lot of the ideas from the right column appear in the instructional materials, there is at least some evidence of NGSS design.
- If you see a lot of the ideas from the left column appear in the instructional materials, there is some evidence of the materials not being completely designed for the NGSS.
- Take a few minutes to go back to your *NGSS Innovations* handout and add in any additional thoughts in the third row of page two in the handout. Discuss your thoughts with your group. Especially focus on any new ideas about what you would look for as evidence that this NGSS Innovation is present in instructional materials.
- *Note to facilitator: It may be helpful to have a whole group share out after individual teams have completed their discussions.*



Slide 81

Talking Points:

- We will repeat the process you followed for looking for evidence for the first criterion of phenomena with the second prescreen criterion.
- While both the second and third criteria focus on three-dimensional learning, the second criterion specifically and only focuses on whether each of the three dimensions are present in the materials. This criterion was covered in section A of the innovation handout that you just read.



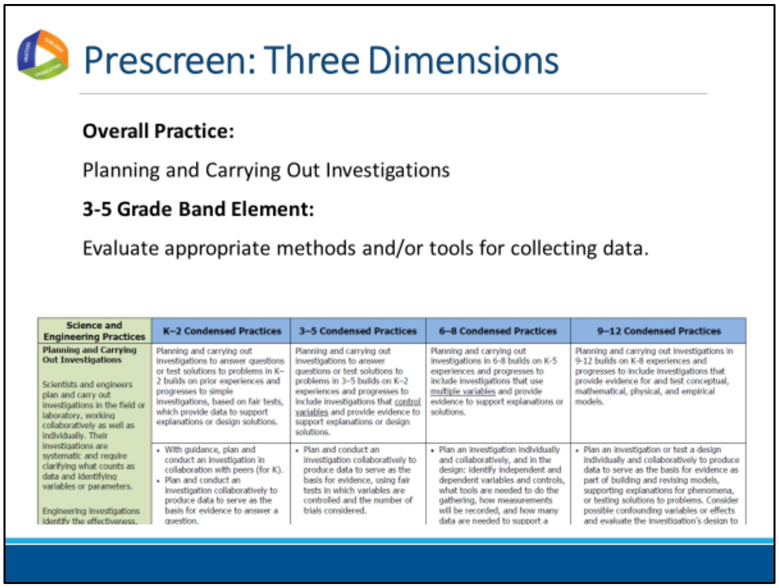
Slide 82

Talking Points:

- Earlier in the day, you participated in an activity and then looked for the presence of the three dimensions.
- You will be following a similar process to look for evidence of the second criterion of the prescreen.
- To meet this criterion, instructional materials programs need to show evidence that students are:
    - Developing and using grade-appropriate elements of the SEPs
    - Developing and using grade-appropriate elements of the DCIs
    - Developing and using grade-appropriate elements of the CCCs

In particular, your search for evidence should focus on the elements that were purposefully chosen to help students make sense of phenomena or design solutions across the learning sequence.

- In the NGSS, all three strands of learning are valued and equally important learning outcomes, and therefore, there needs to be explicit evidence of student learning for all three of the dimensions.



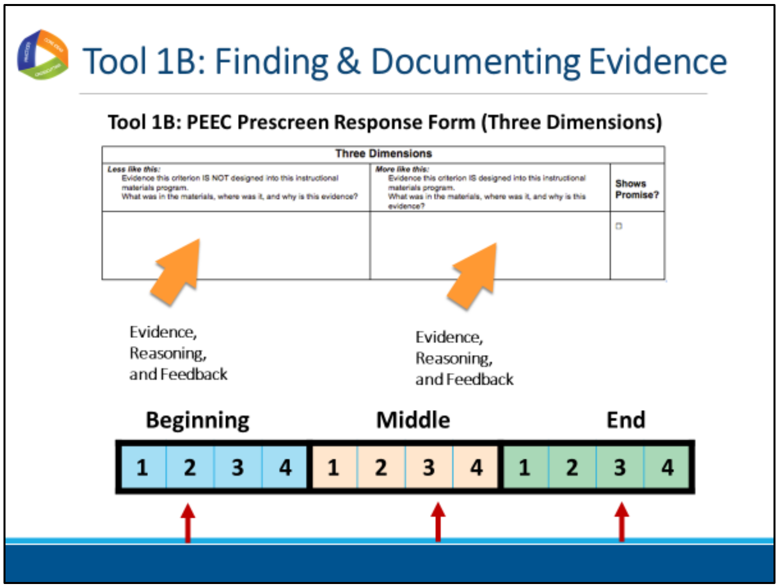
Slide 83

Facilitator Notes:

- The following copies are provided as *Handout 04 – NSTA DCIs Matrix; Handout 05 – NGSS Appendix F; Handout 06 – NGSS Appendix G.*
    - Participants will need a copy of or digital access to NGSS Appendices F and G.
    - Participants will need a copy of or digital access to the *NSTA DCIs Matrix* (http://nstahosted.org/pdfs/ngss/20130509/MatrixOfDisciplinaryCoreIdeasInNGSS-May2013.pdf)

Talking Points:

- As you scan the materials to look for evidence of the each of the three dimensions, remember that evidence for each dimension must be present at the element level. For example, you are not looking for evidence in general if students are planning and carrying out investigations. You are looking to see if there is any evidence that students are developing and/or using a specific, *grade-appropriate* element of planning and carrying out investigations.
- Remember to refer to NGSS Appendix F to see what the grade-appropriate elements for practices are and to refer to NGSS Appendix G to see what the grade-appropriate elements for crosscutting concepts are.
- The grade-appropriate elements for DCIs are categorized by grade-band in the *NSTA DCIs Matrix* handout.



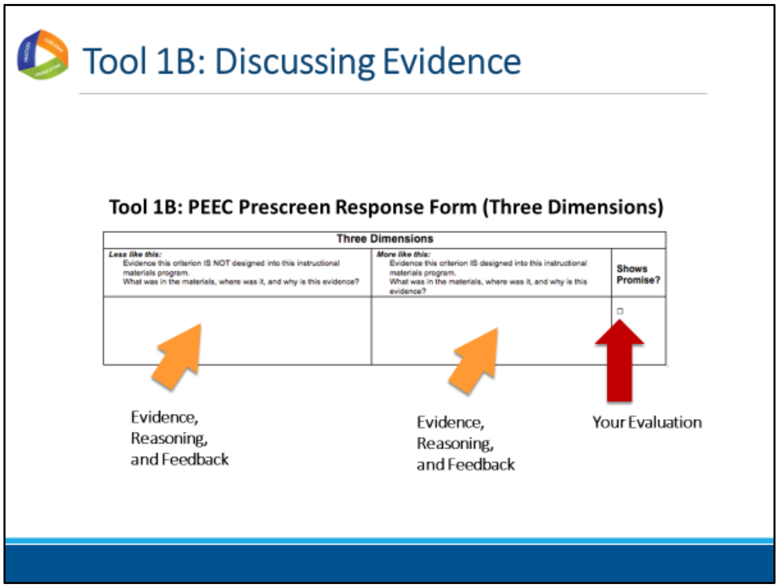
Slide 84

Facilitator Notes:

- Posting a timer that is visible to all participants can help everyone keep track of their time and stay on task.
- You may need to refer back to the facilitator notes and talking points from slide 73 if participants need to refresh their memories about how to search for evidence.

Talking Points:

- Individually scan the materials and look for evidence that the three dimensions are not designed into the materials and for evidence that they are designed into the materials. Record your findings in Tool 1B. You will receive 30 minutes to individually record evidence before you come together as a group to discuss the evidence that everyone found.
- Remember to be as explicit and clear as possible when writing your statements.
- Remember to divide up the program and look for the evidence the same way that we discussed for Tool1A.
- *Note to facilitator: Set a timer for 30 minutes.*



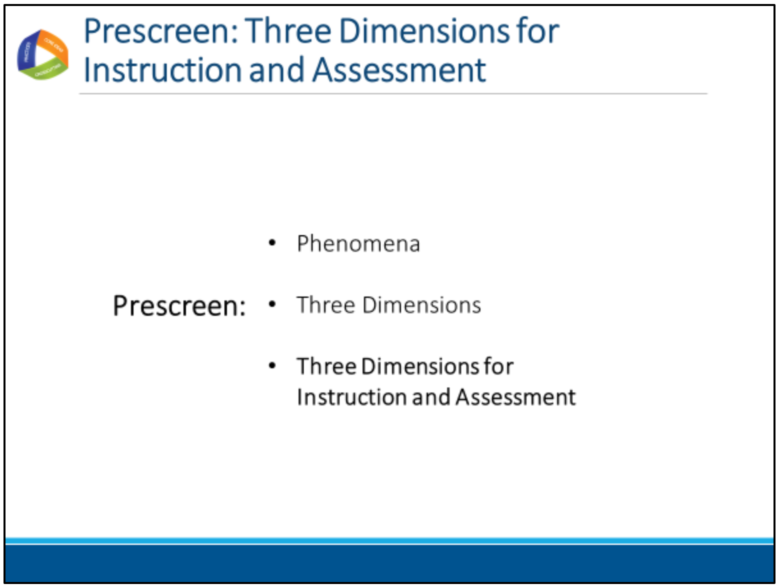
Slide 85

Facilitator Notes:

- Posting a timer that is visible to all participants can help everyone keep track of their time and stay on task.

Talking Points:

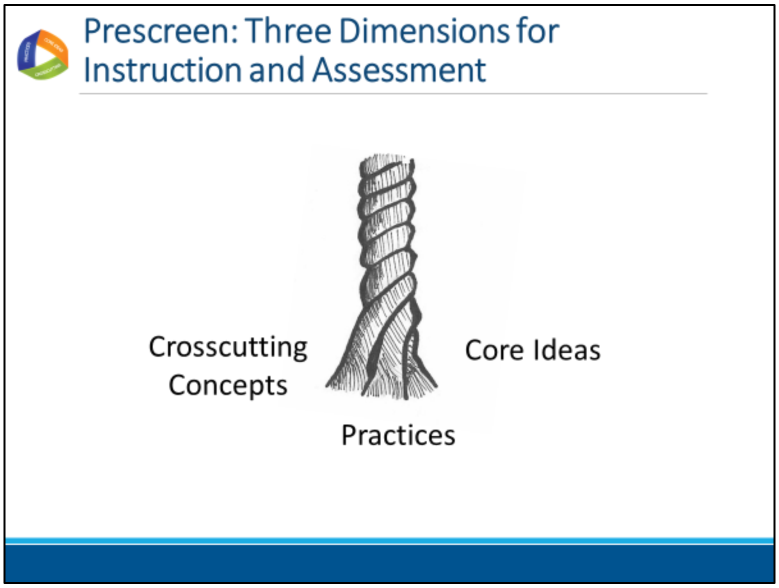
- Take 20 minutes to discuss your individual findings in your group and to come to a consensus about if the program shows promise for NGSS design for the three dimensions criterion.
    - Now that you have recorded evidence for the criterion, it is time to determine if there is enough evidence to check the “shows promise?” box for the criterion. Remember that checking this box is not a final approval, it just means that there is potential here that is worth further review.
    - To answer this question, weigh the “More Like This” evidence with the “Less Like This” evidence. This first phase is meant to be a quick glance that sorts out instructional materials programs that are not designed for the NGSS.
    - Checking the “shows promise” box in the prescreen phase does not mean that the criterion is thoroughly and appropriately designed into the instructional materials program, but it does mean the program shows promise and it is worth the time to dig deeper. If you find that a program is close, it warrants further review.
- As you discuss your individual evidence as a group and come to a consensus, fill out a group consensus version of Tool 1B digitally. This version will be submitted at the end of the prescreen.
- *Note to facilitator: Set a timer for 20 minutes.*



Slide 86

Talking Points:

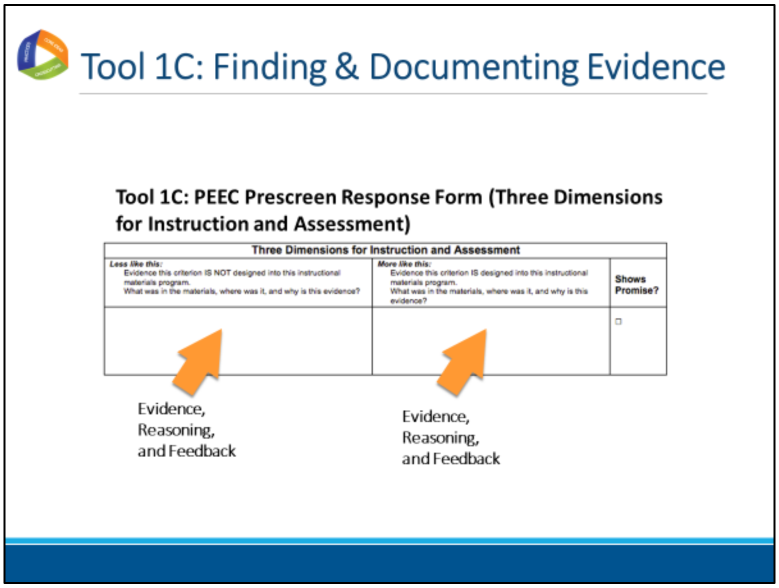
- We will now look for evidence for the last criterion of the prescreen: three dimensions for instruction and assessment.
- This criterion was explained in sections B and C of the Innovation Two handout that we read and discussed.



Slide 87

Talking Points:

- The previous criterion looked for evidence to see if the three dimensions were present.
- However, the three dimensions need to work together, and they should not be taught in isolation. In instruction and assessment, when students make sense of phenomena or design solutions to problems, their performances should integrate elements of all three dimensions.
- The standards are written as three-dimensional performance expectations and this was both intentional and significant, as it signals that three-dimensional performances should be reflected in the learning experiences in instructional materials.
- Therefore, it is not enough to see just the presence of the practices, or crosscutting concepts, or core ideas in instructional materials. There needs to be evidence that all three of these are purposefully integrated in student performances for both instruction and assessment.



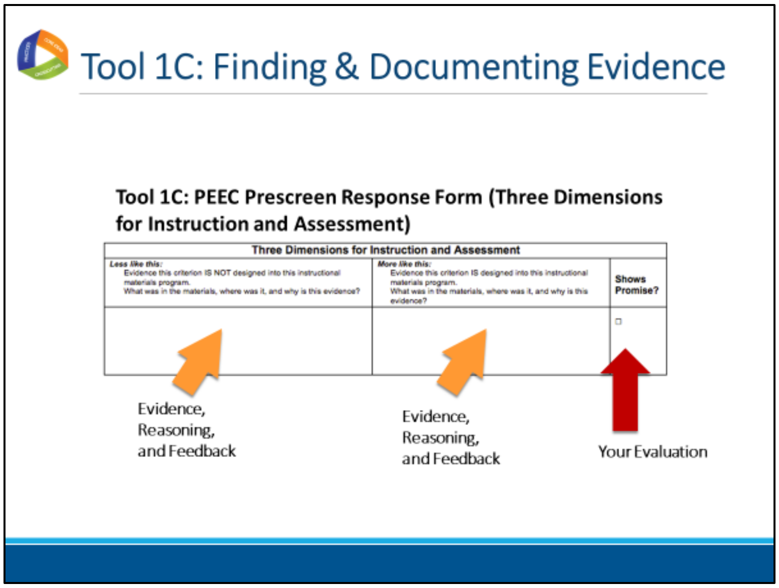
Slide 88

Facilitator Notes:

- Posting a timer that is visible to all participants can help everyone keep track of their time and stay on task.

Talking Points:

- Individually scan the materials and look for evidence that the three dimensions are not designed into the materials and for evidence that they are designed into the materials. Record your findings in Tool 1C. You will receive 20 minutes to individually record evidence before you come together as a group to discuss the evidence that everyone found.
- Remember to be as explicit and clear as possible when writing your statements.
- Remember to divide up the program and look for the evidence the same way that we discussed for Tool 1A.
- *Note to facilitator: Set a timer for 20 minutes.*



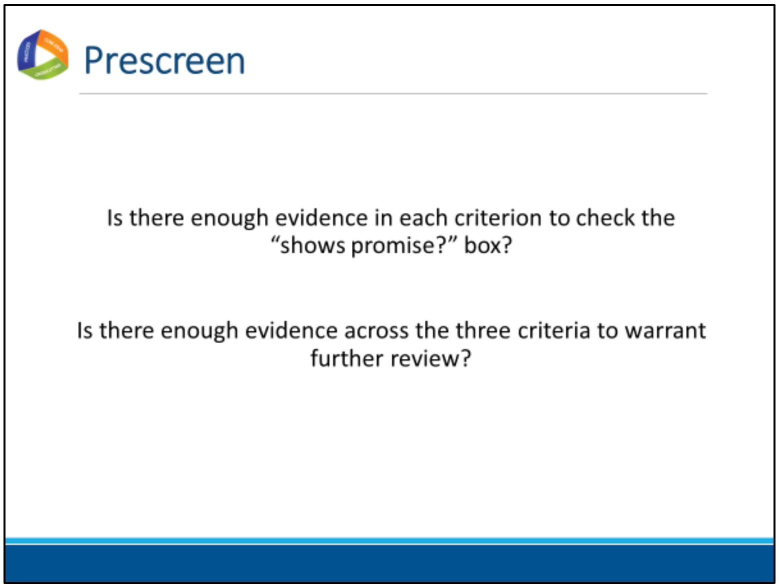
Slide 89

Facilitator Notes:

- Posting a timer that is visible to all participants can help everyone keep track of their time and stay on task.

Talking Points:

- Take 20 minutes to discuss your individual findings in your group and to come to a consensus about if the program shows promise for NGSS design for the three dimensions criterion.
    - Now that you have recorded evidence for the criterion, it is time to determine if there is enough evidence to check the “shows promise?” box for the criterion.
    - To answer this question, weigh the “More Like This” evidence with the “Less Like This” evidence. This first phase is meant to be a quick glance that sorts out instructional materials programs that are not designed for the NGSS.
    - Checking the “shows promise” box in the prescreen phase does not mean that the criterion is thoroughly and appropriately designed into the instructional materials program, but it does mean the program shows promise and it is worth the time to dig deeper. If you find that a program is close, it warrants further review.
- As you discuss your individual evidence as a group and come to a consensus, fill out a group consensus version of Tool 1C digitally. This version will be submitted at the end of the prescreen.
- *Note to facilitator: Set a timer for 20 minutes.*



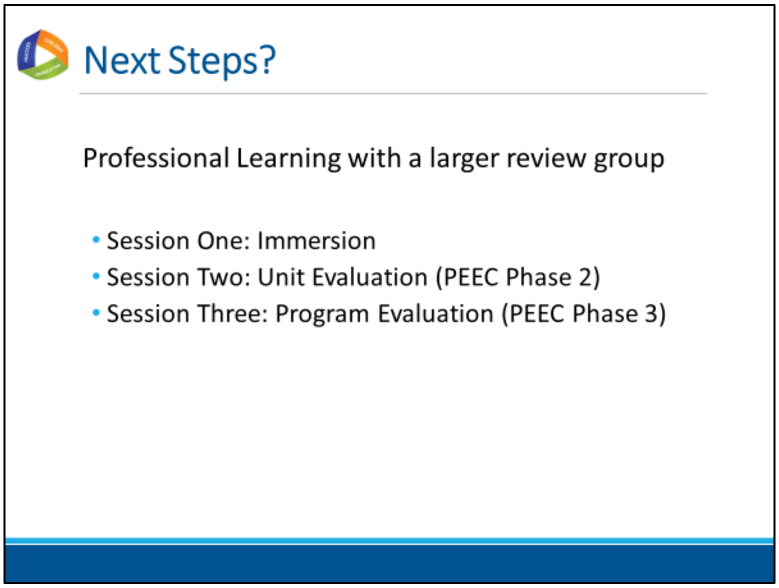
Slide 90

Facilitator Notes:

- The prescreen process (Tools 1A, 1B, and 1C) will need to be applied to all instructional materials programs that are being considered. As participants become more comfortable with the prescreen process and the tools, they may need less time to find evidence for each criterion and for their group discussions. The timer should then be adjusted for each tool.
- After applying the prescreen across the instructional materials programs that are being considered, those that don't meet the fundamental criteria of the prescreen should be set aside. They can always be analyzed later if none of the initial materials measures up, but the remaining analyses are more time- and resource-intensive, so focus on the programs that have the clearest prescreen evidence of NGSS-design.
- The programs that do meet the criteria of the prescreen and show promise, should move on to the next phase – the unit evaluation. The unit evaluation process will be described in detail in Session Two of the professional learning.
- Participants will need a copy of *Handout 12 – Tool 2 PEEC Prescreen.*

Talking Points:

- Now that you have recorded evidence for all three criteria and discussed whether the criteria show promise or not, it is time to decide if there is enough evidence across the three criteria to warrant a further review.
- If all three criteria have their "shows promise" box checked, that indicates that there is sufficient *initial* evidence that the program is designed to address these first two key innovations. There is enough evidence to warrant further review and continue the PEEC process for this program.
- Each group needs to discuss their findings from the three Tool 1 forms and needs to complete *Tool 2: PEEC Prescreen: Recommendation for Review?* This will be the official and final recommendation of whether the program warrants further review.



Slide 91

Facilitator Notes:

- Before ending the Leadership Team Planning Session, all members should understand their role for the three professional learning sessions and what will happen in each session.

Talking Points:

- Now that you have helped narrow the list of instructional materials programs that warrant further review, we will convene a larger review group to help complete the reviews.
- In this session, you engaged in an immersion activity to deepen your understanding of the NGSS and its Innovations. You will help lead this same immersion activity for the larger review group in Session One of the professional learning. After the review group has a common understanding of the Innovations through the immersion activity, they will use the unit evaluation and then the program evaluation processes to select instructional materials programs designed for the NGSS. You all will also be reviewers for both processes. In Sessions Two and Three, you will serve as table or group facilitators who will help support the review process.
- Do you have any questions?

Professional Learning Session One: Immersion (Day 1)

In this one-day session, the leadership team will engage the reviewers in an immersion activity to build a common understanding of the NGSS and its Innovations. These Innovations are the lens that PEEC uses to help educators evaluate instructional materials, so it is important that before evaluating instructional materials, all reviewers understand the Innovations.

This session is essentially the same is the leadership session, but now the leadership team works as table facilitators to support the discussion of the broader review group. If you modified the slides that were used in the leadership session to fit your presentation style, use those same slides for the beginning of this session.

Based on your experiences with the leadership team and knowing how this audience may have a wider range of knowledge and understanding of the NGSS, you should be prepared to allow for more time for discussions with the broader group. Pay attention to the crossroads icons in the facilitator notes as places where you may need to do things a little differently this time.

If you know the whole team has a deep and common understanding of the NGSS Innovations, or if they have all been trained to use the EQuIP Rubric for Science, this day can be shortened, or even potentially skipped and you can jump into Phase II of PEEC. It is recommended, however, that you at least do the immersion activity to verify that the understanding is as deep and common as expected (use it like a formative assessment) before skipping to Session Two.

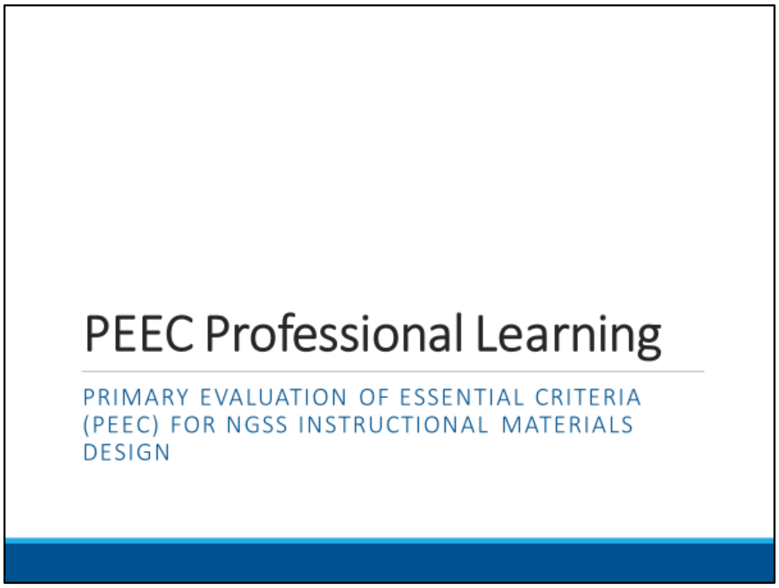
Logistics & Materials

- If reviewers have access to computers, they will be to type up their evidence for each tool in the PEEC process. This is highly recommended, as it will allow them to capture more of their ideas and group discussions. A fillable PDF version and a Microsoft Word version of PEEC can be found at https://www.nextgenscience.org/peec. A fillable PDF version a Microsoft Word version of EQuIP Rubric for Science v.3 can be found at https://www.nextgenscience.org/resources/equip-rubric-lessons-units-science.
- Reviewers will need to be able to look up the standards and NGSS appendices, either digitally or in print format.
- The presentation requires a computer, projector, and speaker system.

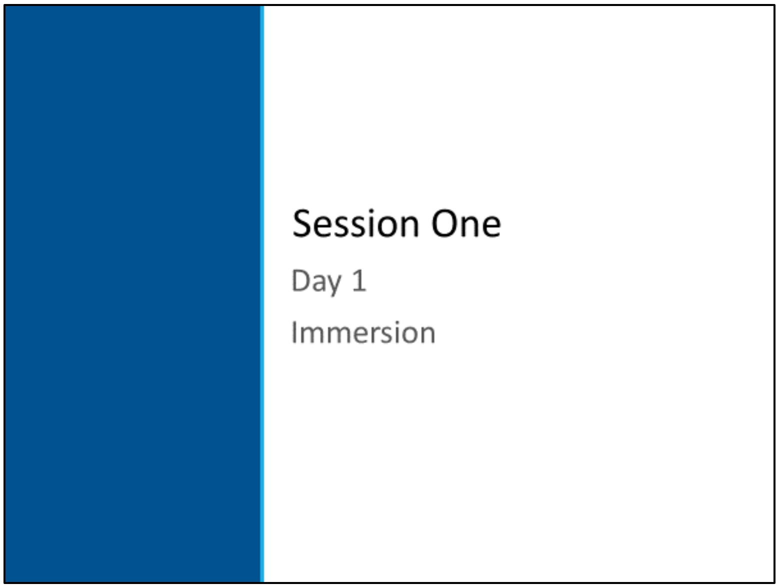
Handouts needed:

- Handout 1 – NGSS Innovations
- Handout 2 – Immersion Student Packet
- Handout 3 – Immersion Teacher Packet
- Handout 4 – NSTA DCIs Matrix
- Handout 5 – NGSS Appendix F
- Handout 6 – NGSS Appendix G
- Handout 7 – Immersion Evidence Organizer
- Handout 8 – What Are Phenomena?
- Handout 13 – Innovation One
- Handout 14 – Innovation Two

Slides



Slide 1



Slide 2

Facilitator Notes:

- The purpose of this session is to bring together a large group of reviewers to evaluate whether instructional materials programs are designed for the NGSS.
- Even though, ideally, all participants will have a basic understanding of the NGSS, it is important that they have a common understanding and that there are no misconceptions before they dive into evaluating instructional materials programs. All participants will participate in an immersion activity as students, and then will look for evidence of three-dimensional learning in the activity as teachers. The discussions that emerge from this activity will be a great level-setting opportunity.
- The leadership team has engaged in this session’s immersion activity during their Leadership Team Planning Session. The team members should help lead the immersion activity and serve as table/group facilitators.

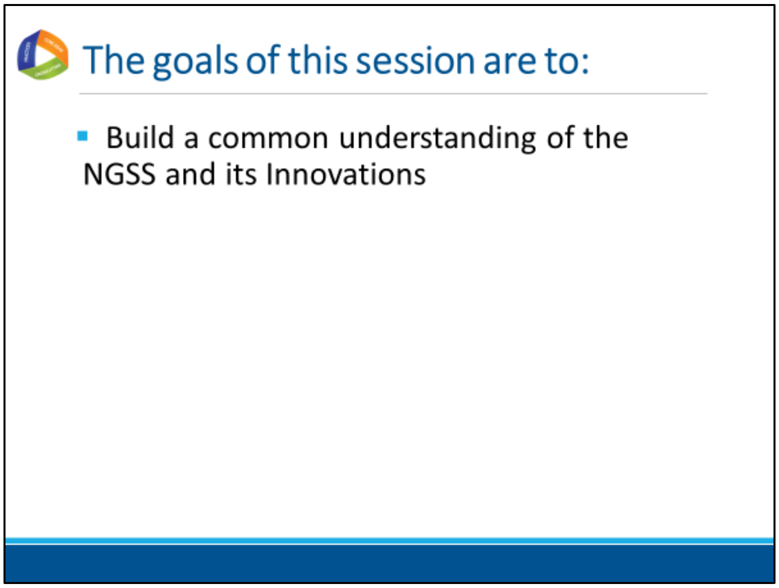
Slide 3

Facilitator Notes:

- Before you begin the session, it will be important to think about how you want to group participants. Ideally, participants will be in teams of four to six members, as this size gives everyone an opportunity to be part of the team discussion. You may wish to group participants with varying levels of knowledge (i.e. spread out educators who have an understanding of the NGSS into separate groups), to allow for a rich discussion with multiple perspectives.

Talking Points:

[Note to facilitator: Create talking points for a welcome and introductions. If people in the room do not know each other, include an ice breaker activity to get the day started.]



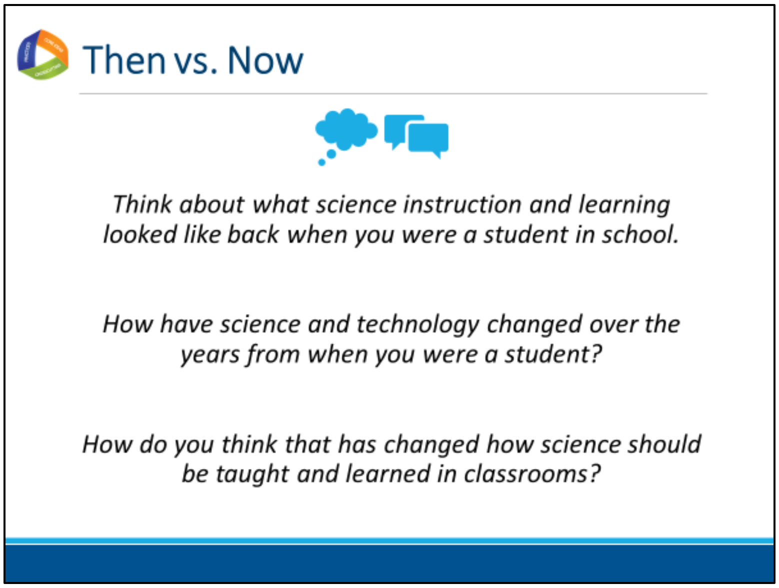
Slide 4

Facilitator Notes:

- This slide will explain the goal of the session to participants.

Talking Points:

- The goal of this session is to build a common understanding of the NGSS and its Innovations
- Today, you will take part in an immersion activity as a student and a teacher to build your understanding of the NGSS Innovations. These innovations are the lens that PEEC uses to help educators evaluate instructional materials, so it is important that before you begin to evaluate instructional materials in Sessions Two and Three you understand the innovations.



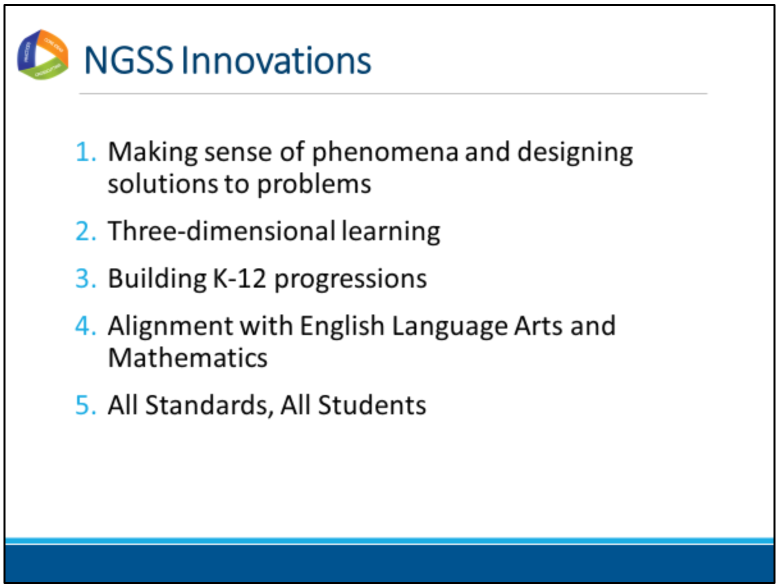
Slide 5

Facilitator Notes:

- The participants in the session may be a mix of educators, administrators, and/or parents. Their knowledge about the shift in science standards and the NGSS may vary greatly, and not all participants may understand how or why science education is changing, and in turn, how instructional materials will look different from when they were students. This slide is structured to allow participants time to personally reflect on their experiences and with opportunities to discuss their experiences and their thoughts about how instruction and learning should be changing in the science classroom to match the evolution of science and technology. This will help participants understand the need to update instructional materials.
- The thought bubble and conversation bubble icons indicate that the statement/questions listed on the slide are for participants to think about and then discuss with their group. These icons will reappear throughout the professional learning slides to help support the facilitator's talking points in a visual manner for participants. The talking points below provide a recommended structure for this conversation.
- Each group will need chart paper and markers for this activity.

Talking Points:

- What makes the Next Generation Science Standards (NGSS) new and different from past science standards? *[Note to facilitator: Click for animation.]* Take a few minutes to think about what science instruction and learning looked like back when you were a student in middle/high school or college. What did instruction look like? What was the role of the student vs. the teacher? *[Note to facilitator: Give participants a minute for personal reflection.]* Discuss your thoughts with your group. *[Note to facilitator: Give participants 5 minutes for their group discussions.]*
- Now think about how science and technology have changed over the years from when you were a student? *[Note to facilitator: Click for animation.]* How do you think that has changed how science should be taught and learned in the classroom? *[Note to facilitator: Click for animation.]* Discuss your thoughts with your group. *[Facilitator Note: Give participants 5 minutes for their group discussions.]*
- On the chart paper provided for you, create a T-chart and list your big ideas about what science education and standards used to look like when you were a student, and what science education and standards are shifting toward now. *[Note to facilitator: Give participants 5 minutes for this activity. After groups are finished creating their T-chart, have them post their chart where everyone can see it.]*
- Let’s have each group share their chart. *[Note to facilitator: Have each group present their chart to the room.]*



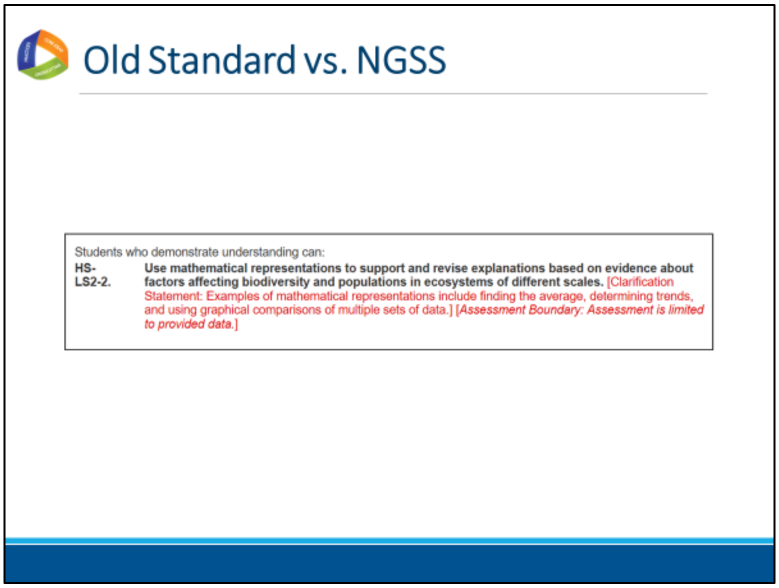
Slide 6

Facilitator Notes:

- The NGSS innovations will be briefly introduced here to tie into the discussion from the previous slide. Each innovation will be presented further in depth later in the professional learning sessions as needed for participants to understand the three PEEC phases. The handout that participants will begin to fill out in this slide, *Handout 1 – NGSS Innovations,* will help track how participants' understanding of the NGSS innovations changes throughout the professional learning sessions.
- Tailor the talking points to build on any ideas that may have surfaced in the previous discussion when groups shared their ideas in the form of their T-chart.
- Participants will need a copy of *Handout 1 - NGSS Innovations*.

Talking Points:

- We just discussed the shifts that we have seen in general for science education. Let's now talk specifically about the innovations of the NGSS.
- The vision of the NGSS is based on scientific advances and educational research about how students best learn science. The NGSS are new and different from past science standards in that there are five innovations.
- The five NGSS innovations are: making sense of phenomenon and designing solutions to problem; three-dimensional learning; building K-12 progressions; alignment with English Language Arts and Mathematics; and all standards, all students.
- What do each of these innovations mean to you right now? Please take out your *NGSS Innovations* handout. In the chart on the first page, take a few minutes to write down your description for each innovation and how you would expect each one to appear in instructional materials. *[Note to facilitator: Give participants about five minutes to write down their initial thoughts.]*
- Take a few minutes to discuss your thoughts with your group. *[Note to facilitator: Walk around and listen to the group discussion to get an understanding of what participants already know (or do not know) about the innovations. Participants will be building their understanding of the innovations throughout the professional learning.]*
- We will discuss each innovation more in depth over the next few days.



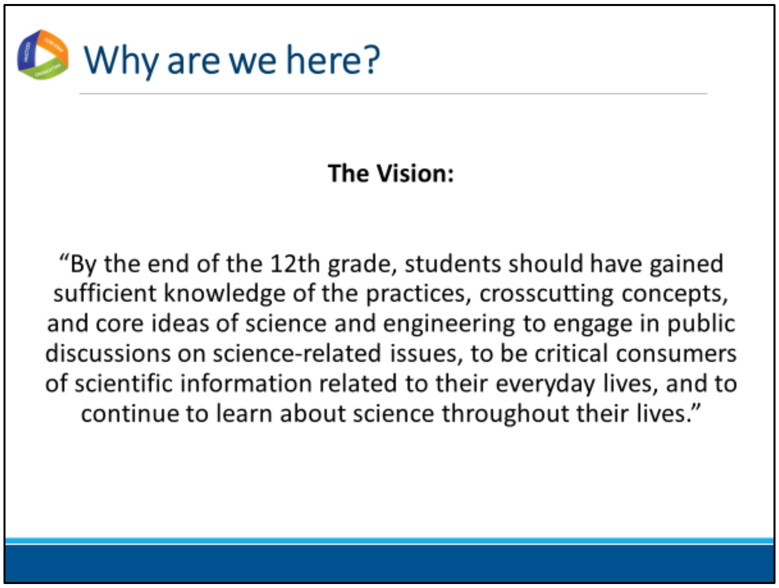
Slide 7

Facilitator Notes:

- This slide can help clarify and emphasize the innovations of the NGSS and the change from old to new standards. This slide will not be needed if participants are already well versed in the NGSS, but could be a helpful visual for any participants who do not know how the performance expectations are different from old standards or how they are structured.
- The key takeaway for participants is that the NGSS performance expectations are three-dimensional. Depending on the background of participants, they may need additional explanations and support as to what performance expectations are (that they are what students should be able to do by the end of a certain grade, etc.).
- Insert in an example of one of your old state standards and a comparable performance expectation from the NGSS.

Talking Points:

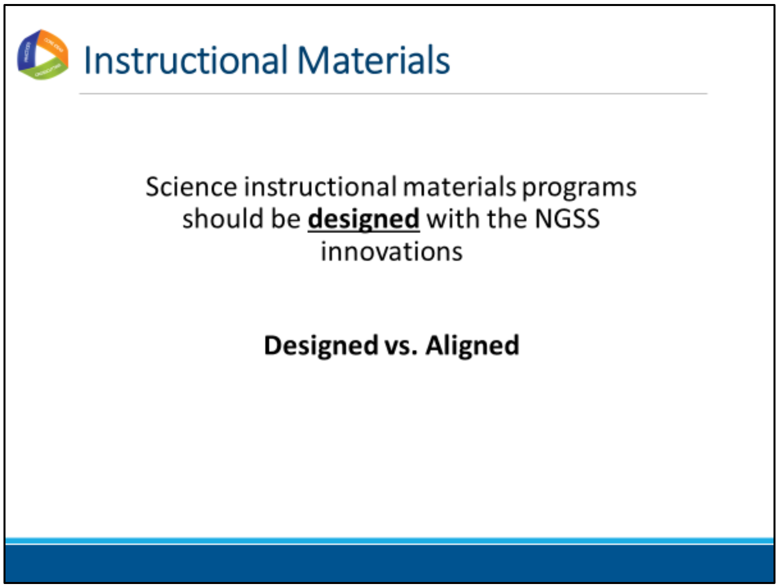
- So, what does the difference actually look like for the standards and themselves?
- Let's look at a performance expectation from the NGSS and a similar standard from the old state standards. What is similar? What is different? What are the new standards really asking students to do? *[Note to facilitator: Engage participants in a discussion about the differences between the standards.]*



Slide 8

Talking Points:

- The NGSS do not shy away from the complexity of effectively teaching and learning science. They challenge us to better support teachers as they create learning environments that support all students to make sense of the world around them and design solutions to problems. This vision is summarized in the following excerpt from the *Framework*. *[Note to facilitator: Pause to give time to participants to read the quote.]*
- The research and resulting vision for science education have implications for instructional materials.
- The old versions of textbooks and instructional materials do not support the innovations and vision of the NGSS, and there need to be shifts in instructional materials to fully support both teachers and students as schools transition to the NGSS.



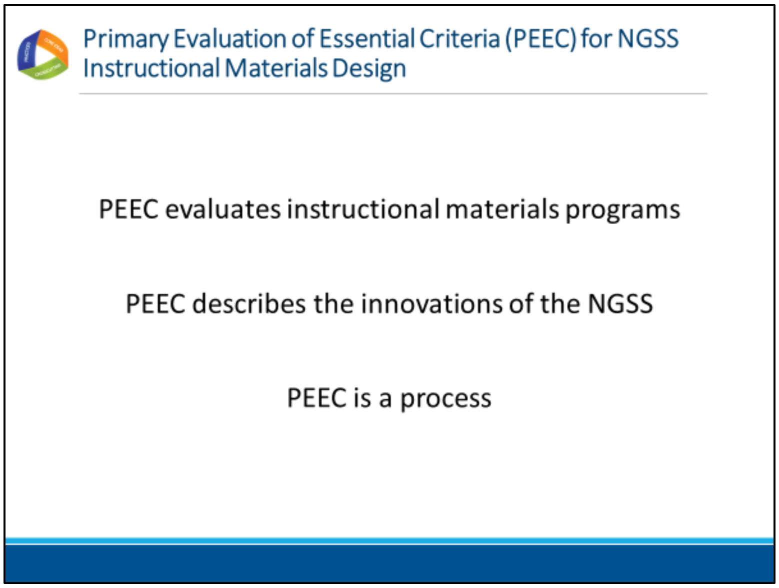
Slide 9

Facilitator Notes:

- Many of the new resources for the NGSS use the word “designed” instead of “aligned” when referring to programs for the NGSS. There is a reason behind this shift, and the talking points below walk participants through the reasoning behind the use of the word “designed,” as it appears throughout PEEC and this professional learning.

Talking Points:

- The research and resulting vision for science education have implications for instructional materials that reach far beyond minor adjustments to lessons, adding callout boxes to margins, crafting a few new activities, or adding supplements to curriculum units.
- The advances in the NGSS will be more successfully supported if entire science instructional materials programs are designed with the NGSS innovations and if states, districts, and schools use a tool and process to ensure that the materials they choose really measure up.
- The word “designed” is intentionally and deliberately used here instead of “aligned.” “Alignment” has come to represent a practice that is insufficient to address the innovations in these standards.
- When new standards are released, educators traditionally create a checklist or map in order to tally how well their instructional materials match up with the standards. If enough of the pieces of the standards match up with the pieces in the lessons or units or chapters, the instructional materials are said to be “aligned.” In this sense, “alignment” is primarily correlational and, if the correlation is not high enough, the only shift that is needed is to add additional materials or re-move particular pieces. This traditional approach to alignment assumes that (1) matching content between the language of the standards and the instructional materials is sufficient for ensuring that students meet the standards, and (2) that all approaches to the way instructional experiences are designed are created equally as long as the content described by the standards appears.
- However, the innovations of the *Framework* and NGSS cannot be supported by instructional materials that simply have the same pieces and words as the standards. In the NGSS, academic goals for students are stated as performance expectations that combine disciplinary core ideas, cross-cutting concepts, and science and engineering practices. The nature of this multidimensional combination is as important as the presence of the constituent components, and has implications for how students build the knowledge and skill needed to be able to meet multidimensional standards. Thus, the word “designed” was chosen because it reflects the degree to which the innovations represented by the standards are a foundational aspect of both the design and content of the instructional materials.



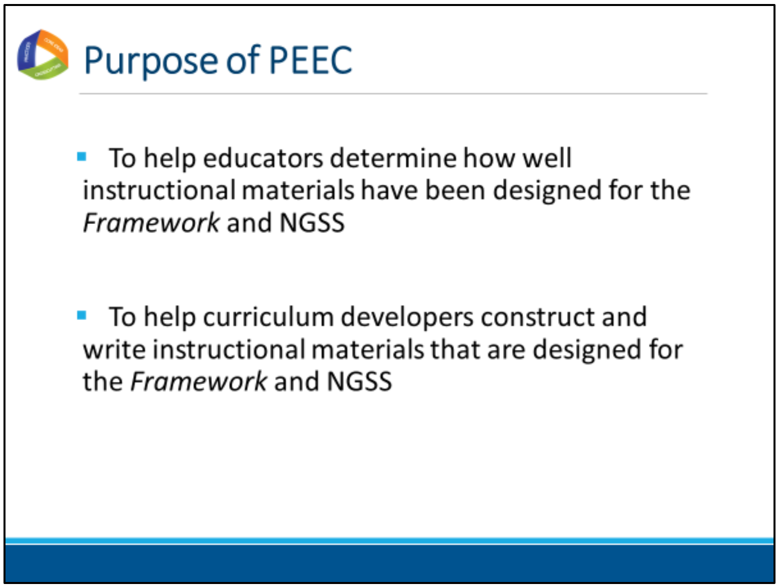
Slide 10

Facilitator Notes:

- The next few slides (slides 9-12) walk participants through the basics of what PEEC is and how they will be using PEEC.

Talking Points:

- How can we evaluate whether instructional materials programs are designed for the NGSS and truly reflect the innovations?
- One of the resources available to us is PEEC which is short for Primary Evaluation of Essential Criteria for NGSS Instructional Materials Design.
- PEEC is a process that can be used by educators to evaluate the NGSS design of instructional materials programs. The programs being evaluated can be of a variety of digital and print formats. They can include textbooks as well as comprehensive science instructional materials programs designed to include different units, kits, modules, textbooks, textbook series, or web-based instructional materials, including open educational resources.
- By using a process that describes the innovations of the NGSS, we are avoiding the “We are already doing NGSS; we’ll just put a new label on the textbook” problem.



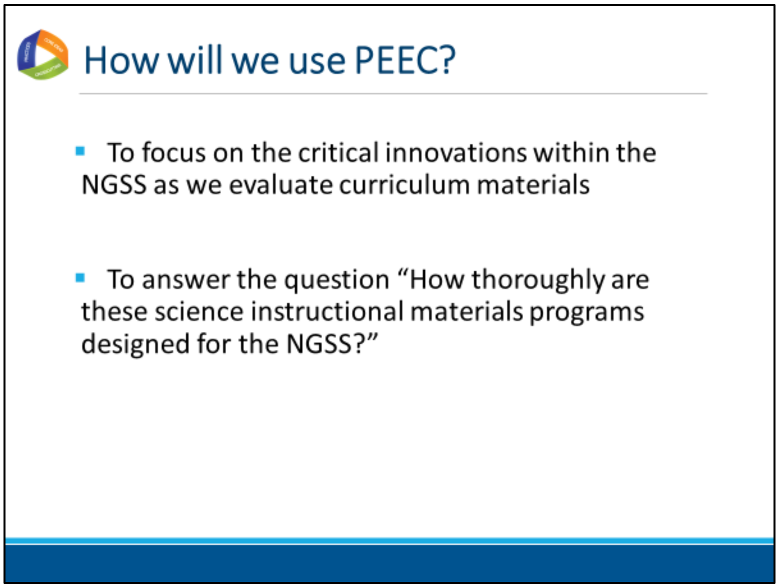
Slide 11

Facilitator Notes:

- The next few slides (slides 9-12) walk participants through the basics of what PEEC is and how they will be using PEEC.

Talking Points:

- The main goal of PEEC is twofold. Curriculum developers can use PEEC to more easily create and refine instructional materials for the NGSS, and to do so knowing that their efforts are focused on the same innovations that schools, districts, and states will be using to select instructional materials for use.
- PEEC can also help educators determine how well the instructional materials under consideration for adoption have been designed for the NGSS.



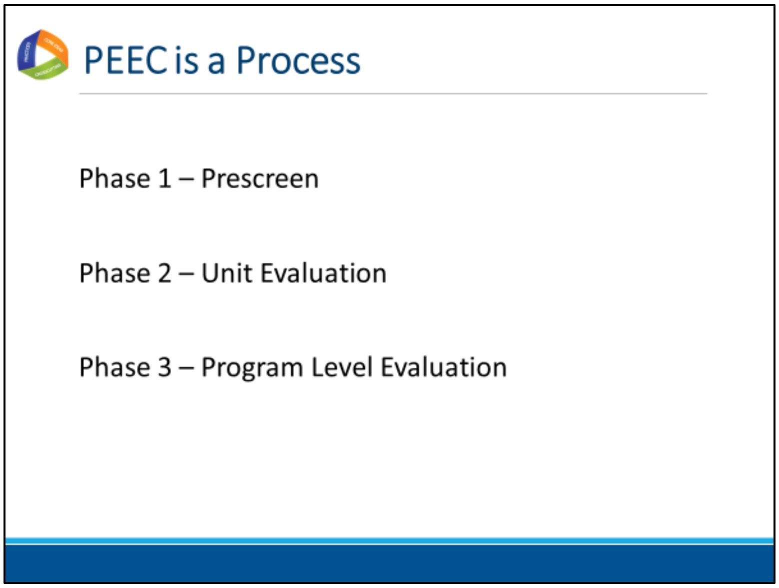
Slide 12

Facilitator Notes:

- The purpose of the professional learning and which of the three phases of the PEEC process you include will vary depending on the steps that you need to follow for instructional materials selection and adoption in your district. The points provided are the general points of what PEEC is designed to do and the talking points and slide points should be altered to specifically reflect the goals of your professional learning.

Talking Points:

- We will use PEEC to guide the selection of high quality NGSS instructional materials. The criteria in PEEC will help us focus on the innovations within the NGSS as we evaluate the submitted instructional materials.
- Ultimately, we want to be able to answer the question "How thoroughly are these science instructional materials programs designed for the NGSS?"



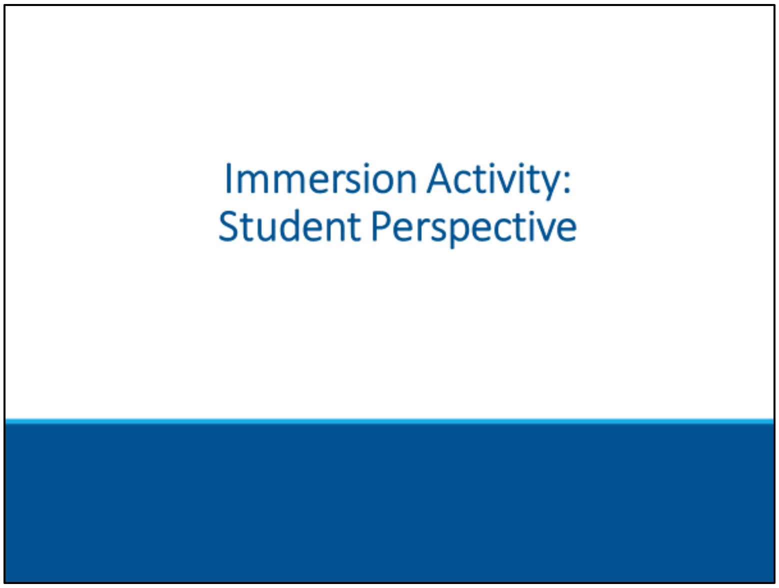
Slide 13

Facilitator Notes:

- The purpose of the professional learning and which of the three phases of the PEEC process you include will vary depending on the steps that you need to follow for instructional materials selection and adoption in your district. It is recommended that the leadership team complete the prescreen before the entire group convenes to complete the unit evaluation and program level evaluation. This guide is structured to represent this recommended option. However, for information about other ways to structure the professional learning, please see the *Considerations Section* of the *PEEC Professional Learning Facilitator's Guide* document.
- This slide is an opportunity to introduce participants to the entire PEEC process, to provide brief descriptions of each phase, and to inform them what phases they will be participating in and over which days. Your talking points should be modified to reflect these points.

Talking Points:

- PEEC is a process that can be used by educators to evaluate the NGSS design of instructional materials programs. The PEEC evaluation process involves three successive phases: first the prescreen, then the unit evaluation, and lastly the program level evaluation.
- The first phase, the prescreen, focuses on a small number of criteria that should be readily-apparent in instructional materials designed for the NGSS. This allows those selecting materials to take a relatively quick look at a wide range of materials and narrow the number of programs worthy of a closer look.
- If the prescreen of the materials indicates that there is at least the potential they are designed for the NGSS, they are put through the second phase of the PEEC process. The second phase uses the EQuIP Rubric for Science as a sampling tool to evaluate a unit of instruction for evidence it is designed for the NGSS.
- For materials that successfully complete the second phase, the third and final phase of the PEEC process evaluates the evidence that the NGSS innovations are embedded across the entire instructional materials program.
- The leadership team has already applied the PEEC Prescreen process to the instructional materials programs and has narrowed the list of materials that will be evaluated in Phase 2. In Sessions 2 and 3, you will be using Phase 2 and 3 of the PEEC process to determine whether the programs show evidence of NGSS design.



Slide 14

Facilitator Notes:

- Before participants begin to dig into the evaluation of instructional materials program using the PEEC criteria, it is important that they understand the criteria and what the criteria are based on – the NGSS Innovations. Instead of frontloading information about all five of the NGSS Innovations and overwhelming participants with a lot of information, this professional learning introduces and builds understanding of each Innovation as it is needed for the PEEC process. This part of the professional learning (Leadership Team Planning Session) along with Session One, focus on making sure participants understand the first two Innovations: three-dimensional learning, and explaining phenomena or designing solutions. Session Two of the professional learning introduces and explains the remaining three Innovations and reinforces understanding of Innovations 1 and 2.
- Participants will build an understanding of Innovations 1 and 2 by first engaging in an immersion activity as students and then by dissecting the activity for evidence of the Innovations as a teacher. By experiencing an activity both as a student and a teacher, participants will be able to see how three-dimensional learning looks like from both sides of the classroom, resulting in a stronger understanding than just reading an activity.
- If participants are already not sitting in groups (preferably of four to six), then they should rearrange into groups for the immersion activity.

Talking Points:

- Before we begin prescreening materials, we will need to ensure that we all have the same understanding of the NGSS Innovations, because they are critical pieces of the criteria found in PEEC.
- We will begin to build our understanding by digging into three-dimensional learning. You will take part in an immersion activity as students to experience three-dimensional learning.
- Our goal is for you to be able to explain what three-dimensional learning is and what evidence for it looks like in an activity.

Slide 15

Facilitator Notes:

- The goals for this activity:
  - participants will build a common understanding of NGSS Innovation 1 (phenomena/problems)
  - participants will build a common understanding of NGSS Innovation 2 (three-dimensional learning)
  - participants will be able to explain what three-dimensional learning looks like in a classroom
  - participants will be able to explain what evidence for three-dimensional learning looks like in an activity
- This activity is adapted from the Ambitious Science Teaching's Sound Energy Unit for Grade 4. Parts of some lessons from this Unit have been used and modified for this professional learning. The original files for this unit can be found at the Ambitious Science Teaching's website: https://ambitiousscienceteaching.org/one-curriculum-sound-energy-grade-4/

Talking Points:

- Let's experience *figuring out* by engaging in 3-dimensional learning together.
- In this immersion experience into the 3 dimensions, you will be wearing two hats.
- First, we will wear our student hat as we productively struggle with a phenomenon.
- Second, we will put on our teacher hat, and look for evidence of student thinking and learning in student products.
- Examining the three dimensions from both the creation and evaluation perspective will deepen our understanding of how students build an understanding that they can use to explain the world.

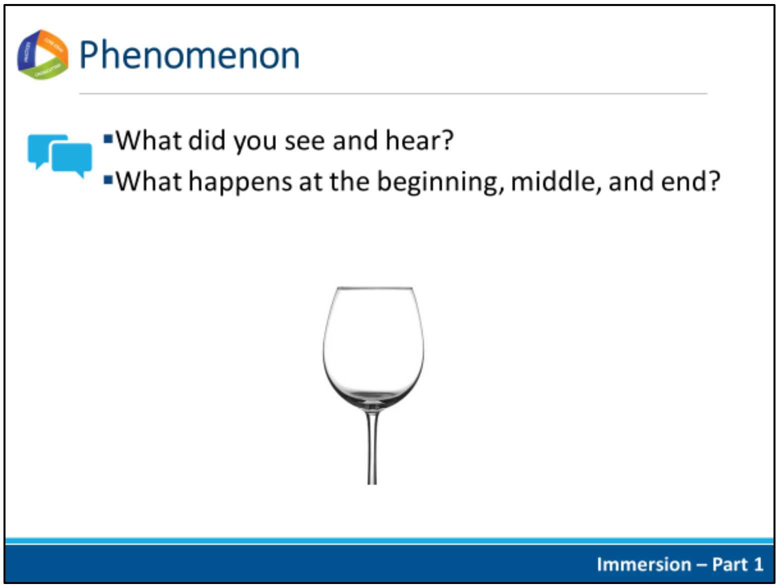
Slide 16

Facilitator Notes:

- This slide will give participants a common experience for the phenomenon that anchors the immersion activity.
- After participants watch the video alone, they then turn and talk with a neighbor and the video is replayed.
- The video URLs hyperlinked in this video are:
    - Singer Shattering Glass: https://www.youtube.com/watch?v=10lWpHyN0Ok
    - Slow motion view of a glass shattering: https://www.youtube.com/watch?v=dU0OqVDl7kc

Talking Points:

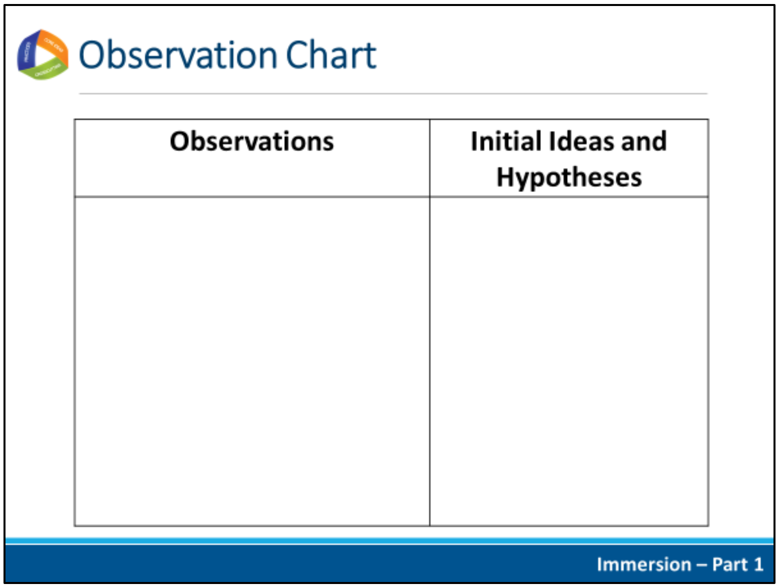
- Let's put on our fourth-grade student hats as we all experience this phenomenon.
- Do not write anything down. At this point, just focus on making detailed observations in your head.
- After you watch the video clips, you will have time to turn and talk with a neighbor about your observations, and then I will replay the video during that time. *[Note to facilitator: Play the videos once. Then allow time for participants to discuss their observations with a neighbor. Play the videos a second time. The next slide has questions that the groups can discuss after watching the videos a second time.]*



Slide 17

Talking Points:

- Think about what you saw and heard in the video. Think about what happened at the beginning, the middle, and the end.
- In your group, discuss your answers to the two questions posted on the slide. Remember to think about this from the perspective of a fourth-grader! *[Note to facilitator: Give groups a few minutes to discuss their observations.]*



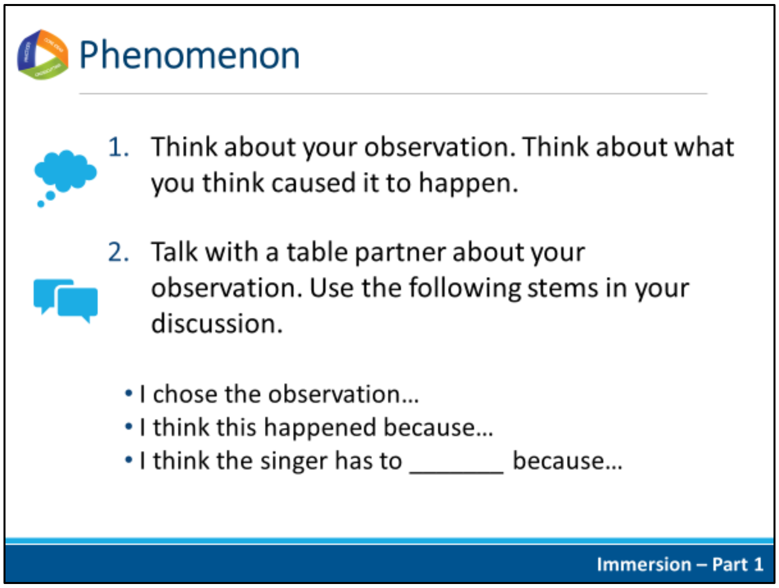
Slide 18

Facilitator Notes:

- As groups share their observations with the whole room, record their observations in the first column in the chart on this slide so that everyone can see it. If the groups have internet access, you can set up a google document where everyone can type in their observations. If it is not convenient to type into this table, you can record their observations on chart paper or a white board.
- Participants will need blank paper and pens.

Talking Points:

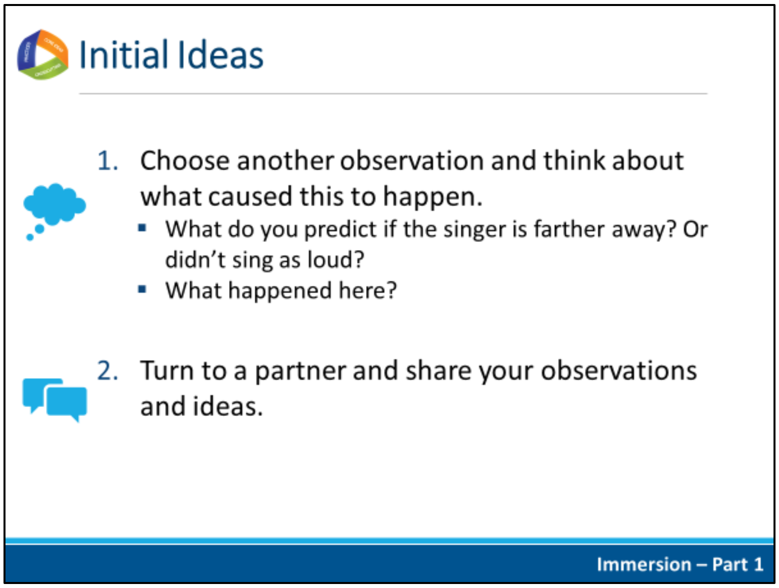
- Let's have each group share some of their observations. *[Note to facilitator: Go around to each group and ask each one to share 2-3 observations. Make sure to ask every group, and depending on the number of groups you have, you may go back around again to ask for additional observations. Record observations on this slide (in the first column titled "observations" or on chart paper as participants share them.]*
- Take a blank piece of paper and create a two-column chart like the one on this slide. With one column labeled "observations" and the other column labeled "initial ideas and hypotheses."
- Pick one of the initial observations that we recorded on the list. Write it down in the observations column on your piece of paper.



Slide 19

Talking Points:

- Think about the observation that you just recorded on your paper. Take a few minutes to think about what caused it to happen and record your thoughts on the second column titled "initial ideas and hypotheses" in your paper. *[Note to facilitator: Give students a few minutes to quietly think about this on their own.]*
- Talk to a neighbor about the observation and what you think caused it to happen. Use the sentence stems in your discussion with your neighbor.



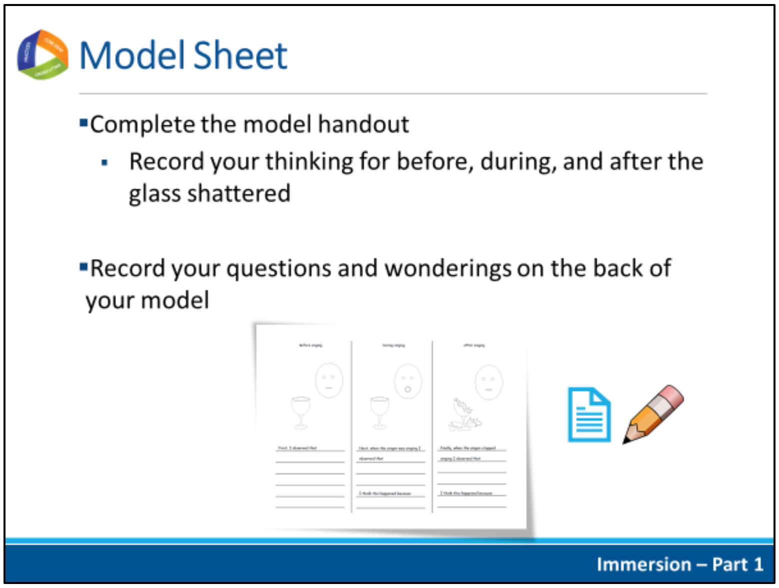
Slide 20

Facilitator Notes:

- You will need to go back to slide 17 so that students can see the list of observations and choose another observation.

Talking Points:

- *[Note to facilitator: If you recorded the class observations on the slide, go back to slide 19 so that students can see the list of observations and choose another observation. Then, come back to this slide.]*
- Choose another observation from the list and think about what caused that to happen. Record your observation and thoughts on your paper. Also think about and record your thoughts about the following questions: What do you predict if the singer is farther away? Or didn't sing as loud? What happened here? *[Note to facilitator: Give students a few minutes to quietly think about this on their own.]*
- Share your thoughts with a partner. *[Note to facilitator: Give everyone a few minutes to discuss their ideas.]*
- *[Note to facilitator: Go back to slide 17 as students are discussing their thoughts with a partner. You will be asking participants to share out and will record their initial ideas and hypotheses in the second column in slide 17.]* Let's go back to our observation chart and record some of your initial thoughts and hypotheses. *[Note to facilitator: Ask for volunteers to share their ideas or pick on pairs.]*



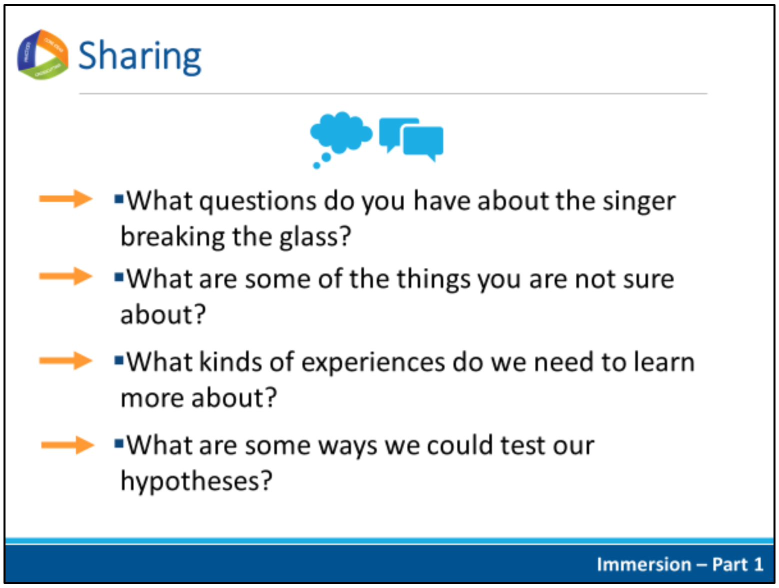
Slide 21

Facilitator Notes:

- Participants will need a copy of *Handout 2 – Immersion Student Packet.* Participants will be working on the first page of this handout. This page will be referred to as the "Initial Model" and it has three columns: "before singing," "during singing," and "after singing."
- Direct participants to use their *Initial Model* handout to record (both by writing and drawing) the things that they think are happening that they can't see. Students can talk to their partners about their ideas, but each participant should complete a model sheet to show their own thinking.
- Circulate to help struggling participants.
- After participants have time to record their observations, collect the handouts as you will be sharing a few examples. Select a variety of different models to share with the group, and be sure to select a model to share that has vibrations as this will lead into the next lesson. The idea is not to correct flaws at this point, but just to have the "students" share out their ideas.
- The purpose of this handout is not to evaluate or correct student ideas, but is rather to see what students' initial ideas are and how they are approaching the phenomenon.
- The paper icon seen on this slide, will be used throughout the professional learning to indicate when participants will be using a handout.
- The pencil icon seen on this slide, will be used throughout the professional learning to indicate when participants should be recording their ideas.

Talking Points:

- Take out your copy of the *Immersion Student Packet*. We will be working on the first page of this packet. The page will be referred to as the "Initial Model" and it has three columns: "before singing," "during singing," and "after singing." A screenshot of the page is on the slide
- For each stage, write down and draw what you think is happening that you cannot see. If you have any questions, write those down on the back of the paper. *[Note to facilitator: Give participants 5-10 minutes to work on their handout. After participants record their observations, collect and share a few examples.]*
- Let's look at a few examples of the handout that you just filled out. What do you notice about the different models we observed? What are some of the similarities and differences? *[Note to facilitator: Ask some participants to share their drawings and questions with the entire class. As participants share their models, keep an eye out for any models that show drawings for or questions about vibrations, as you will be using those models in the next part of the activity during slide 22.]*



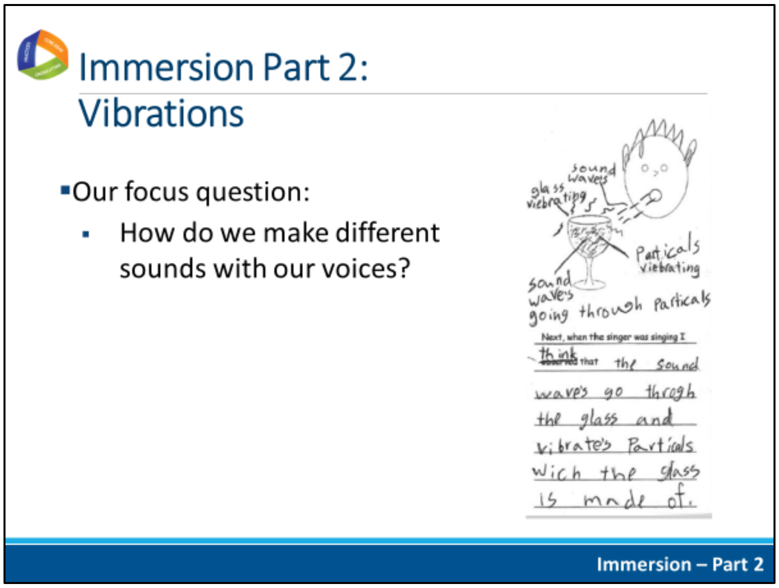
Slide 22

Facilitator Notes:

- Use the questions on this slide to begin and guide a whole group discussion that will wrap up this section of the activity. (This immersion activity is adapted from lessons by the Ambitious Science Teaching Framework. In their storyline, this is the end of the first lesson for students.)
- Allow participants time to think about the listed questions quietly and then provide some time for them share out to the class.
- It may be easier to guide the discussion by having participants share out their answers by each question. To help guide this discussion, animated arrows that point to each question and that are advanced by clicking the mouse button, are included in this slide. The first click makes an arrow appear for the first question, and the second click makes the first arrow disappear. This is repeated for the remaining three questions.
- For the class discussion, it may be helpful to write down participants' ideas on chart paper.
- In this discussion, challenge participants to be honest about things that they are still not sure about. Remind participants to think as fourth graders!

Talking Points:

- After sharing ideas with your peers and completing your initial model sheet, what questions do you have about the singer breaking the glass? What are some of the things you are not sure about? What kinds of experiences do we need to learn more about? What are some ways we could test our hypotheses?
- *[Note to facilitator: Read all the questions on the slide out loud. Provide a few minutes for participants to quietly and individually reflect on these questions and then lead a whole group discussion.]*
- Take a few minutes to re-read the questions on the slide and think about your answers. Then we will share out as a whole group. *[Note to facilitator: It may be easier to guide the discussion by having participants share out their answers by each question. To help guide this discussion, animated arrows that point to each question and that are advanced by clicking the mouse button, are included in this slide. It may also be helpful to write down participants' answers on chart paper.]*



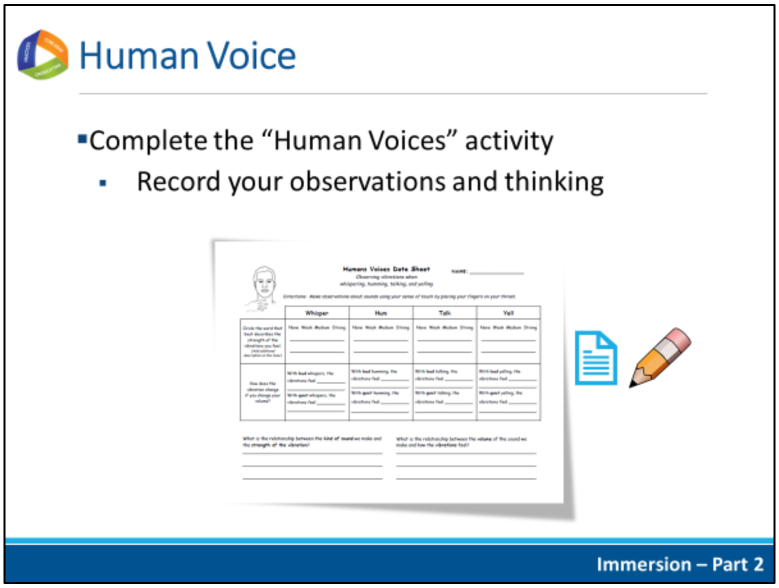
Slide 23

Facilitator Notes:

- This immersion activity is adapted from lessons by the Ambitious Science Teaching Framework. In their storyline, this begins the second lesson and their student objectives for this lesson are:
    - Describe and discuss patterns in the vibrations they observed.
    - Draw conclusions about the relationship between vibrations and volume.
- Pick out some of the student work for the *Initial Model* handout that showed drawings for or questions about vibrations.

Talking Points:

- We now are going to move into the second lesson of this unit. You will continue to play the role of a fourth-grade student.
- In the previous activity, you created models to show what was going on before, during, and after the singing. Here are some of the models that you created. *[Note to facilitator: Share the student models that include vibrations. Either project them or pass them around. An example of student work that shows vibrations is shown as an image on this slide and can be used as an example to anchor the focus question if participants' models are difficult to project/display.]*
- Some of your models showed that there were vibrations during the singing. We use vibrations to make sounds when we talk, sing, whisper, etc.
- We are going to explore vibrations and our focus question for today is "how do we make different sounds with our voices?"



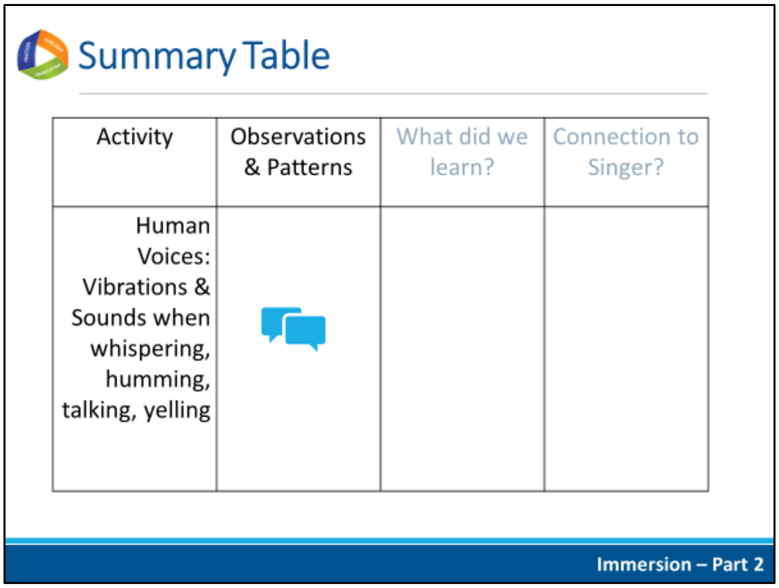
Slide 24

Facilitator Notes:

- Participants will need *Handout 2 – Immersion Student Packet.* Participants will be working on the second worksheet of this packet. The worksheet is titled *Human Voices Data Sheet.*
- Participants will complete the worksheet by following the directions in the handout.
- After participants complete the worksheet, have a class discussion about the patterns that they noticed.

Talking Points:

- Turn to the second page of your Immersion packet. This page is titled *Human Voices Data Sheet* and a screen shot of the page is on the slide.
- You will work with your group to complete the worksheet. You will follow the directions that are provided on the worksheet.
- Take a minute to read through the directions on the worksheet. What observations will you be making for this activity? How will you measure or record these observations?
- Remember to think as a fourth grader! *[Note to facilitator: Give participants 10 minutes to complete this activity.]*
- Once you have collected your data, in your groups, discuss the patterns you noticed in your data. *[Note to facilitator: Give participants a few minutes to discuss the patterns in their groups. Groups will share out in a whole class discussion in the next slide.]*



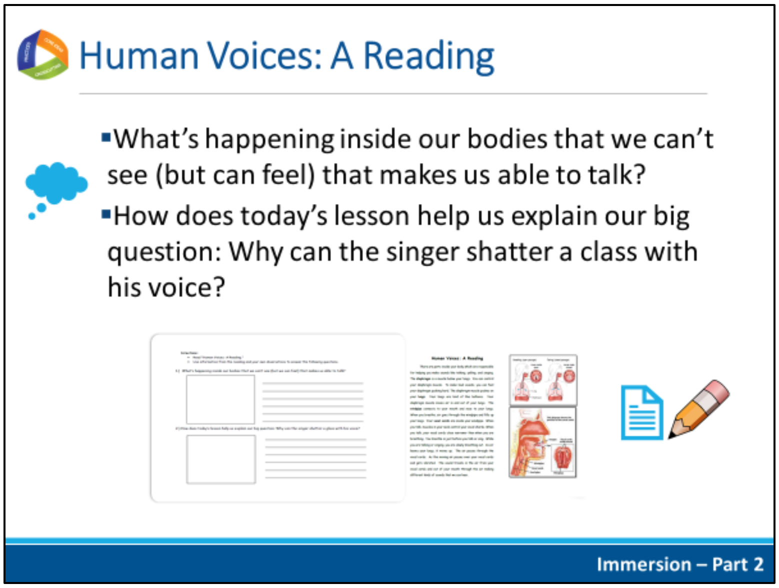
Slide 25

Facilitator Notes:

- This summary table will help guide the next few whole group discussions to help wrap up the immersion activity.
- The conversation bubble icon indicates that the participants will only be discussing the first column at this time. The grayed-out columns will be discussed in the next few slides.

Talking Points:

- Let's share out your observations and the patterns you noticed in the data from the human voice activity. *[Note to facilitator: Ask participants to share what they observed when they were in the process of collecting their data and what patterns they noticed in the data. You can write down their contributions on this slide or on chart paper.]*



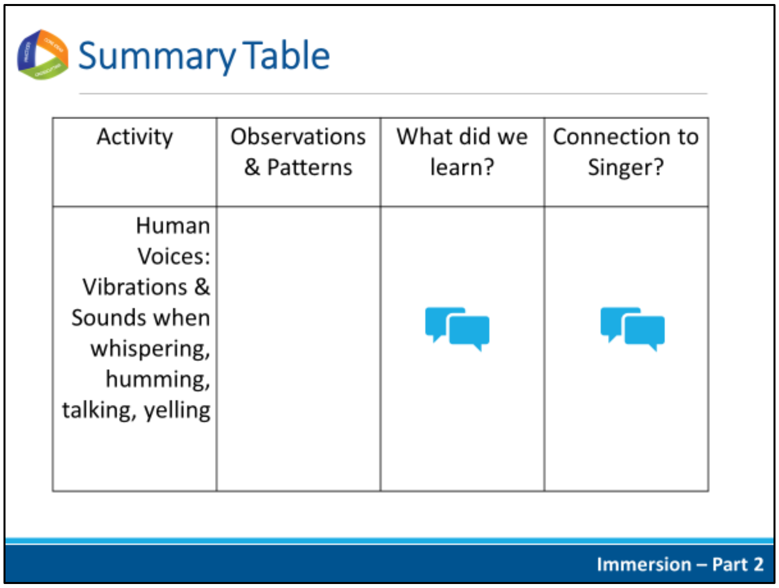
Slide 26

Facilitator Notes:

- Participants will need *Handout 2 – Immersion Student Packet.* They will be using the third and fourth pages in this packet titled *Human Voices: A Reading.*

Talking Points:

- We will begin to answer some of the questions you may have by reading a bit about how our bodies make sound.
- Turn to page 3 in your *Immersion Student Packet.* This page is titled *Human Voices: A Reading*. A screenshot of the handout is on the slide.
- Read through this handout. As you read, look for information to help make sense of what we felt and experienced during the Human Voice Investigation. Think about the two questions that are listed on this slide as you read: What is happening inside our bodies that we can't see (but can feel) that makes us able to talk? How does today's lesson help us explain our big question: Why can the singer shatter a class with his voice? Then, record your answers to these questions in the space provided on the page after your reading. You should use a combination of drawing and writing to represent your thoughts. *[Note to facilitator: Give participants ~5 minutes to complete this activity. Students can work in their groups to discuss the reading and their thoughts, but each student should record their own answers to the questions.]*



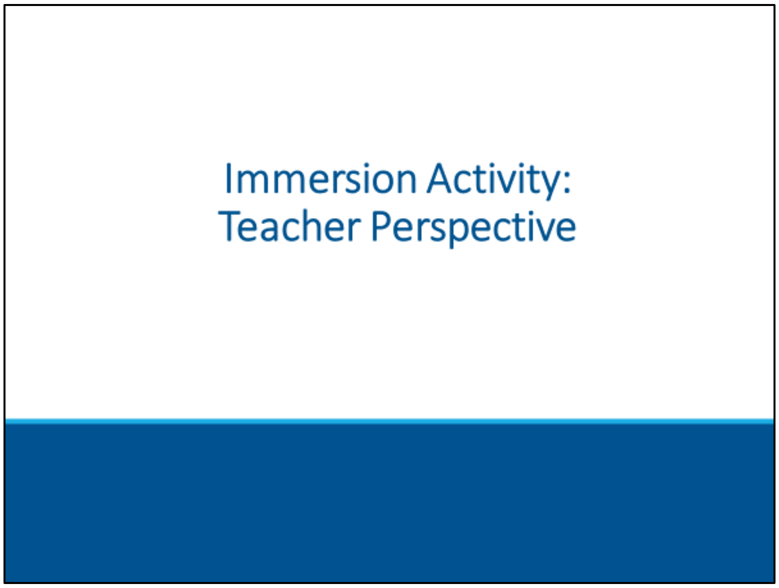
Slide 27

Facilitator Notes:

- This summary table will help guide a whole group discussion to wrap up the immersion activity. Remind participants to keep their student hats on for this discussion!
- The conversation bubble icon indicates that the participants will be discussing the second and third columns. The first column was discussed in slide 26.

Talking Points:

- Now that you have read a little about how your bodies make sound, let's discuss what you learned. What have you learned about the focus question for this lesson? Our focus question was: "How do we make different sounds with our voices?" *[Note to facilitator: Ask participants to share what they have learned so far about the focus question. You can write down their contributions on this slide or on chart paper.]*
- How did what you learned about help us explain the phenomenon? How can we connect what we have learned back to the singer and what happened in the video? *[Note to facilitator: You can write down their contributions on this slide or on chart paper.]*



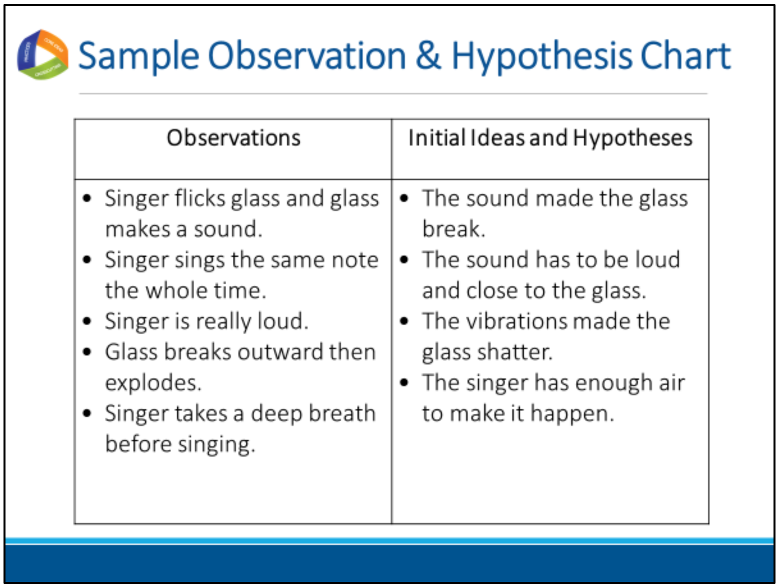
Slide 28

Facilitator Notes:

- The participants will now switch over and wear the teacher hat for the immersion debrief from a teacher's perspective. Participants will receive a packet that provides them with additional information about the unit and examples of completed student work by real fourth grade students. Participants only engaged in a portion of the unit (and that was also slightly modified), so they will receive basic information about the unit storyline to see what comes before and after the activities they did. Using their experience as students and the additional teacher information provided, participants will look for evidence for the three dimensions, and in doing so, will learn how to use the NGSS Appendices to look for evidence at the element level for all three dimensions.

Talking Points:

- You participated in an immersion activity as fourth grade students. Because of our time constraints, you were not able to go through the entire unit, and instead, we focused on a few activities from the unit. Before we go back through the activities and look for evidence for three-dimensional learning, it will be helpful to see more information about the unit.
- Let's put our teacher hat on now and look at the entire unit from an educator's point of view.
- We will look at a few examples of student work and get some more details about the overall unit, so that you have more sources in which to find evidence.



Observations	Initial Ideas and Hypotheses
• Singer flicks glass and glass makes a sound. • Singer sings the same note the whole time. • Singer is really loud. • Glass breaks outward then explodes. • Singer takes a deep breath before singing.	• The sound made the glass break. • The sound has to be loud and close to the glass. • The vibrations made the glass shatter. • The singer has enough air to make it happen.

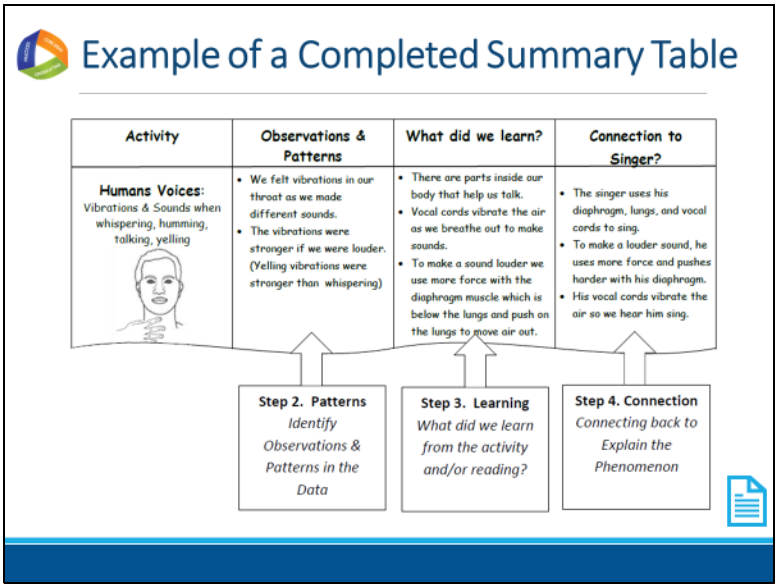
Slide 29

Facilitator Notes:

- In Slide 17, you filled out a chart during a class share-out of participants' observations and initial ideas and hypotheses. The chart on this slide is a sample of what the chart would look like if it was filled out by observations and ideas from fourth grade students. It is included to help participants see what type of observations and ideas actual fourth grade students may have.

Talking Points:

- In the immersion activity, you shared your observations, ideas, and hypotheses during a class discussion and we recorded them on a chart. The chart on this slide is an example of what some observations and ideas from fourth grade students may look like.
- *[Note to facilitator: Give participants a few minutes to look over this chart.]*



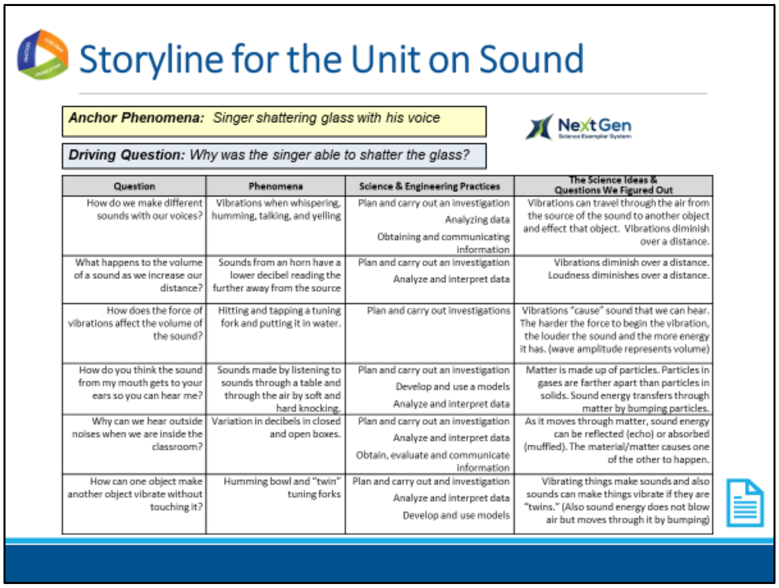
Slide 30

Facilitator Notes:

- Participants will need a copy of *Handout 3 – Immersion Teacher Packet.* They will be looking at page 1 in the packet.
- In the second part of the immersion activity, you filled out a summary table with the participants. The table on this slide is an example of a completed summary table that has examples from fourth grade students. In the actual fourth grade unit, this chart is revised as the students progress through the unit and they continue to add evidence to their models of how the singer broke the glass.

Talking Points:

- Please pull out your copy of the *Immersion Teacher Packet.*
- One the first page, there is an example of a completed summary table that we filled out during the second part of the immersion activity. This has examples from fourth grade students. As students progress through the actual unit, this chart is revised and they continue to add evidence to their models of how the singer broke the glass.
- *[Note to facilitator: Give participants a few minutes to look over this table.]*



Question	Phenomena	Science & Engineering Practices	The Science Ideas & Questions We Figured Out
How do we make different sounds with our voices?	Vibrations when whispering, humming, talking, and yelling	Plan and carry out an investigation Analyzing data Obtaining and communicating information	Vibrations can travel through the air from the source of the sound to another object and effect that object. Vibrations diminish over a distance.
What happens to the volume of a sound as we increase our distance?	Sounds from an horn have a lower decibel reading the further away from the source	Plan and carry out an investigation Analyze and interpret data	Vibrations diminish over a distance. Loudness diminishes over a distance.
How does the force of vibrations affect the volume of the sound?	Hitting and tapping a tuning fork and putting it in water.	Plan and carry out investigations	Vibrations "cause" sound that we can hear. The harder the force to begin the vibration, the louder the sound and the more energy it has. (wave amplitude represents volume)
How do you think the sound from my mouth gets to your ears so you can hear me?	Sounds made by listening to sounds through a table and through the air by soft and hard knocking.	Plan and carry out an investigation Develop and use a models Analyze and interpret data	Matter is made up of particles. Particles in gases are farther apart than particles in solids. Sound energy transfers through matter by bumping particles.
Why can we hear outside noises when we are inside the classroom?	Variation in decibels in closed and open boxes.	Plan and carry out an investigation Analyze and interpret data Obtain, evaluate and communicate information	As it moves through matter, sound energy can be reflected (echo) or absorbed (muffled). The material/matter causes one of the other to happen.
How can one object make another object vibrate without touching it?	Humming bowl and "twin" tuning forks	Plan and carry out and investigation Analyze and interpret data Develop and use models	Vibrating things make sounds and also sounds can make things vibrate if they are "twins." (Also sound energy does not blow air but moves through it by bumping)

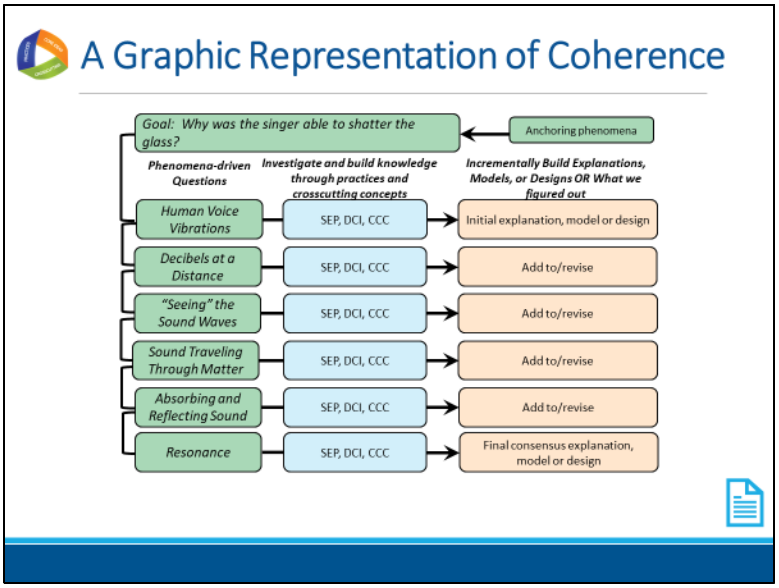
Slide 31

Facilitator Notes:

- Participants will need a copy of *Handout 3 – Immersion Teacher Packet.* They will be looking at page 2 in the packet.
- This is a basic storyline that shows the lesson-level questions and phenomena for the entire unit.

Talking Points:

- On the second page of the *Immersion Teacher Packet,* you will find the storyline table for the entire unit as seen on the slide. We just participated in the first section of the unit, but the unit continues to provide opportunities for students to build their explanations of the phenomenon.
- There are many ways to represent a storyline for a unit, and this table shows you one way it can be done.
- This storyline provides you with the anchor phenomenon and the driving question for the entire unit. It also lists the questions and investigative phenomena for the individual lessons of the unit. It provides information about the practices that students will be engaged in for each lesson, along with the science ideas and questions that students figure out in each lesson.
- Take a few minutes to read through the storyline. *[Note to facilitator: Give participants a few minutes to look over the storyline.]*



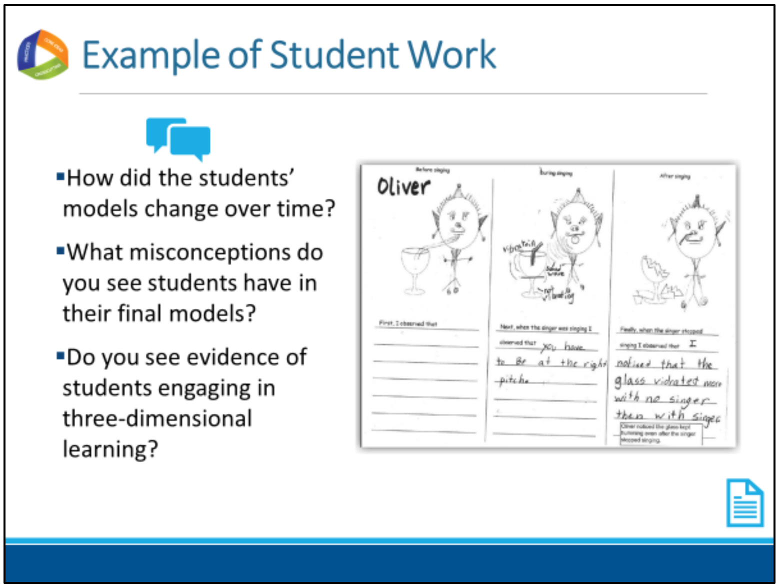
Slide 32

Facilitator Notes:

- Participants will need a copy of *Handout 3 – Immersion Teacher Packet.* They will be looking at page 3 in the packet.

Talking Points:

- On this slide and on the third page of the *Immersion Teacher Packet,* you will find the another way to represent the unit storyline: a coherence map for the unit.
- The coherence map shows that the unit begins with the anchoring phenomenon and the driving question of "why was the singer able to shatter the glass?" Each line in this graphic represents a lesson, and requires students to integrate all three dimensions to build and revise their models and explanations of the overall anchor phenomenon. As students proceed through the unit, they revise their explanations and model in each lesson based on what they have learned in that lesson. This then leads them to the next lesson, where they repeat the process, until they create their final explanation and model at the end of the unit. The coherence map shows that each activity serves an explicit purpose in the unit, and contributes toward students understanding and explaining the anchor phenomenon.
- *[Note to facilitator: Give participants a few minutes to look over the coherence map.]*



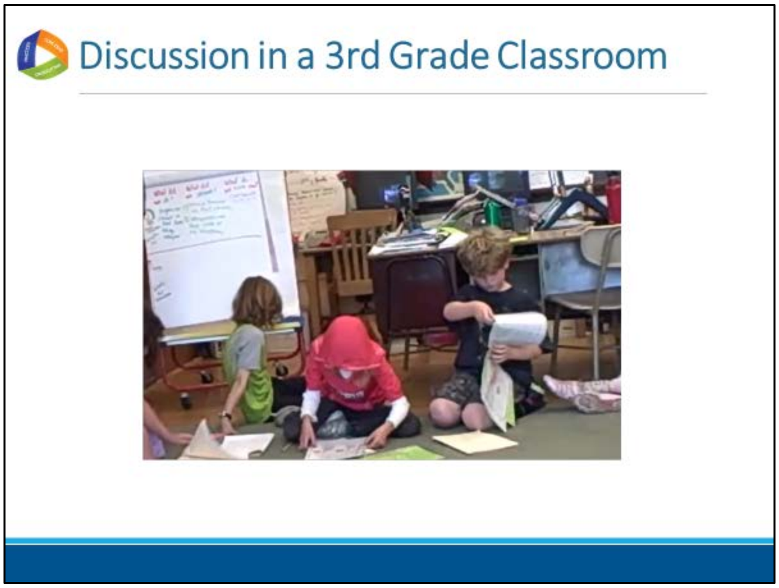
Slide 33

Facilitator Notes:

- Participants will need a copy of *Handout 3 – Immersion Teacher Packet.* They will be looking at pages 4-6 in the packet.
- Pages 4-6 in the *Immersion Teacher Packet* represent student models. Page 4 has two students' initial models that they created toward the beginning of the unit (similar to how the participants' created their initial models). Pages 5-6 show the final models for the same students. Participants will be able to see how students' thinking changed over the course of the unit by comparing the initial and final models.
- Participants will be asked if they see evidence of students engaging in three-dimensional learning in this slide and the next slide. This is an opportunity for you to walk around and listen to participants' discussions to see what they think three-dimensional is and what misconceptions they may have. Take a mental note of what they are saying, because in a few slides (slide 34) you will begin the three-dimensional learning section and where you can clear up any misconceptions.

Talking Points:

- Let's also look at some student examples of initial and final models.
- In pages 4 through 6 of your packet, will find the initial and final models created by Marianna and Oliver. The initial models for both are on page 4 and the final models are on pages 5-6. Take a few minutes to look over the student work samples.
- As a table discuss the following questions:
    - How did the students' models change over time?
    - What misconceptions do you see students have in their final models?
    - Do you see evidence of students engaging in three dimensional learning (SEPs, CCCs, & DCIs)? *[Note to facilitator: This is an opportunity for you to walk around and listen to participants' discussions to see what they think three-dimensional is and what misconceptions they may have. Take a mental note of what they are saying, because in a few slides (slide 34) you will begin the three-dimensional learning section and where you can clear up any misconceptions.]*



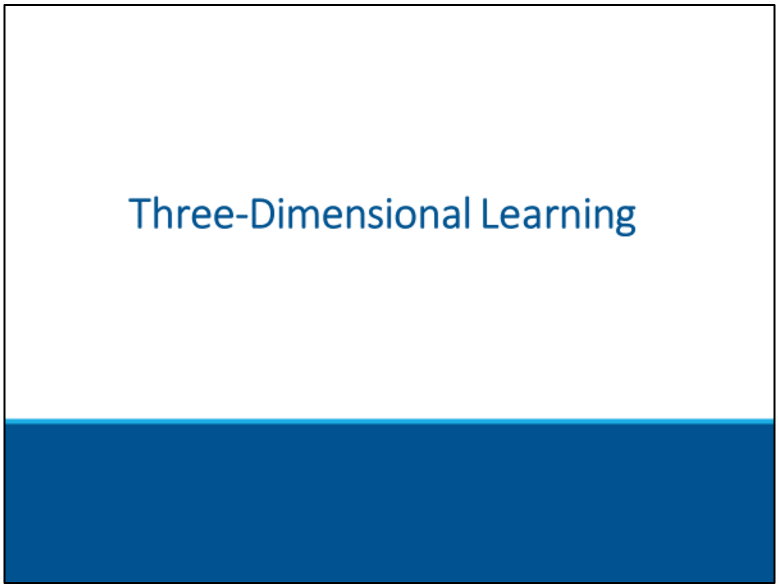
Slide 34

Facilitator Notes:

- The hyperlink for the video in this slide is: https://vimeo.com/126093889
- Note: The sound in the video is low. Be sure to turn the volume up
- This video shows third grade students engaging in the same activities that the participants were engaged in during the immersion.
- Participants will be asked if they see evidence of students engaging in three-dimensional learning in this slide. This is an opportunity for you to walk around and listen to participants' discussions to see what they think three-dimensional is and what misconceptions they may have. Take a mental note of what they are saying, because in the next slide, you will begin the three-dimensional learning section and where you can clear up any misconceptions.

Talking Points:

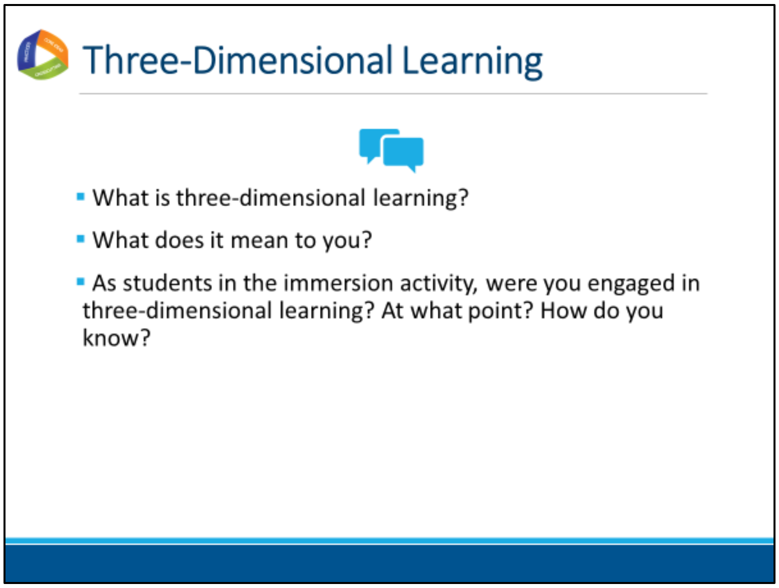
- Finally, let's watch a video of third grade students engaging in the same activities that we did.
- As you watch the video think about three-dimensional learning. What evidence do you see of students engaging with each of the three dimensions: the SEPs, CCCs, & DCIs? *[Note to facilitator: This is an opportunity for you to walk around and listen to participants' discussions to see what they think three-dimensional is and what misconceptions they may have. Take a mental note of what they are saying, because in a few slides (slide 34) you will begin the three-dimensional learning section and where you can clear up any misconceptions.]*



Slide 35

Facilitator Notes:

- Three-dimensional learning is an important concept for participants to understand, as it is one of the NGSS Innovations, and participants will be looking for evidence that it is occurring in the materials they will be evaluating in the prescreen process. This section helps build participants' understanding of three-dimensional learning by discussing what it means, and the next section (Looking for Evidence of the Three Dimensions) will guide participants through finding evidence for each of the three dimensions. By the time participants are ready to look at the PEEC Prescreen tools later on in this presentation, they will already have begun to build an understanding of the criteria that the tools use. Participants' will continue to build their understanding of three-dimensional learning when the related prescreen tools are introduced.
- Since participants are expected to have a basic understanding of the NGSS, this section may seem to not be necessary for your group if they are well-versed in the NGSS. However, it can help bring all participants to the same level of understanding and the group discussions can ensure that participants are thinking about three-dimensional learning in the same way. This leveling is important as three-dimensional learning criteria will appear in all three phases of the PEEC process.



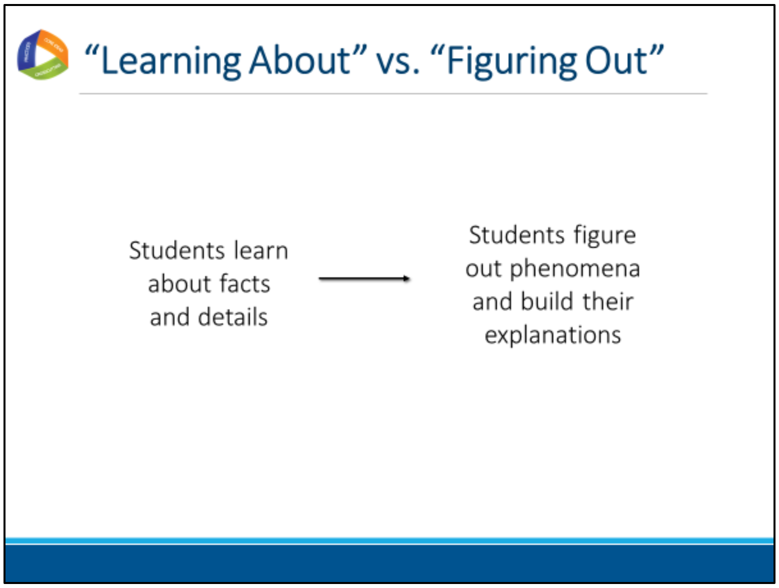
Slide 36

Facilitator Notes:

- As participants have a discussion with the partners about the questions posted on the slide, walk around the room and listen to their thoughts. If participants are struggling to answer the questions, this will help you understand what misconceptions you need to clear, or on the other hand if participants are demonstrating a solid understanding, you can proceed through this section relatively quickly. You will be using the ideas that participants share during the discussion to transition to the next slide.

Talking Points:

- We have tossed around the words "three-dimensional learning" a few times. Think about the following questions and share your thoughts with a partner:
  - What is three-dimensional learning?
  - What does it mean to you?
  - As students in the immersion activity, were you engaged in three-dimensional learning? At what point? How do you know?
  - Take a few minutes to discuss these questions with a partner at your table. *[Note to facilitator: Give participants a few minutes to discuss their thoughts.]*
- Who would like to share their ideas with the whole group? *[Note to facilitator: Ask a few participants to share their thoughts about what three-dimensional learning is with the entire group.]*



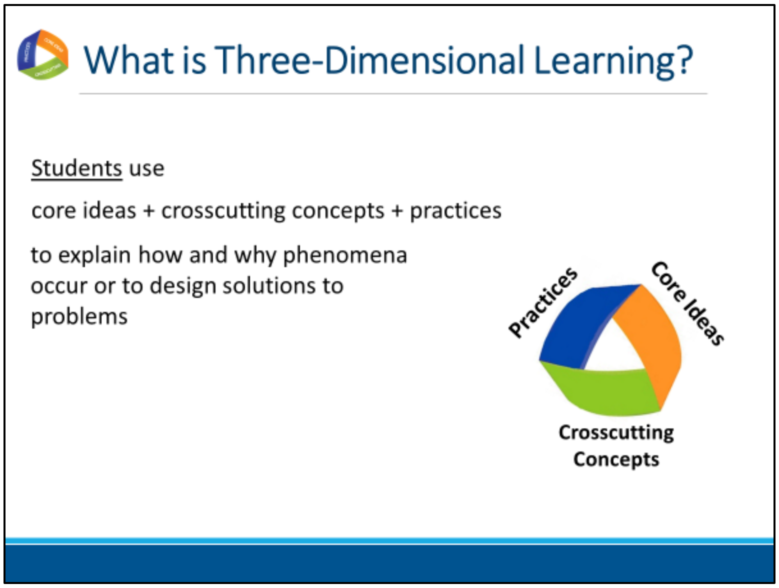
Slide 37

Facilitator Notes:

- Use the ideas that participants shared in the previous slide to transition into talking about learning about vs figuring out. Alter the talking points in this slide to build upon the conversation that began with your group in the last slide.

Talking Points:

- An important idea that was shared about three-dimensional learning was that students are building explanations.
- In an NGSS classroom, the focus shifts from simply *learning about* science ideas that students often have difficulty applying to real-world contexts to *figuring out* or making sense of phenomena in the world that students are motivated to explain.
- Students are not just *learning about* a topic, but they are now *figuring out* why or how something happens in the world.
- Students can then use these explanations to make sense of new contexts and transfer this working knowledge to new situations.
- If students are not being fed the information, how are they gathering information and building their explanations or designing solutions to problems? What should they be engaged in during the lesson? *[Note to facilitator: You want the participants to say that students need to be engaged in the three dimensions during the lesson – the practices, disciplinary core ideas, and crosscutting concepts. If participants are not getting to that idea, ask them what the rest of three-dimensional learning is and strongly hint them toward the three dimensions.]*
- Yes! Students build this working knowledge by engaging through the practices, by using the crosscutting concepts to organize and connect thinking, and by using the disciplinary core ideas to explain their world and develop solutions to problems.
- Figuring out or making sense of phenomena supports three-dimensional learning.



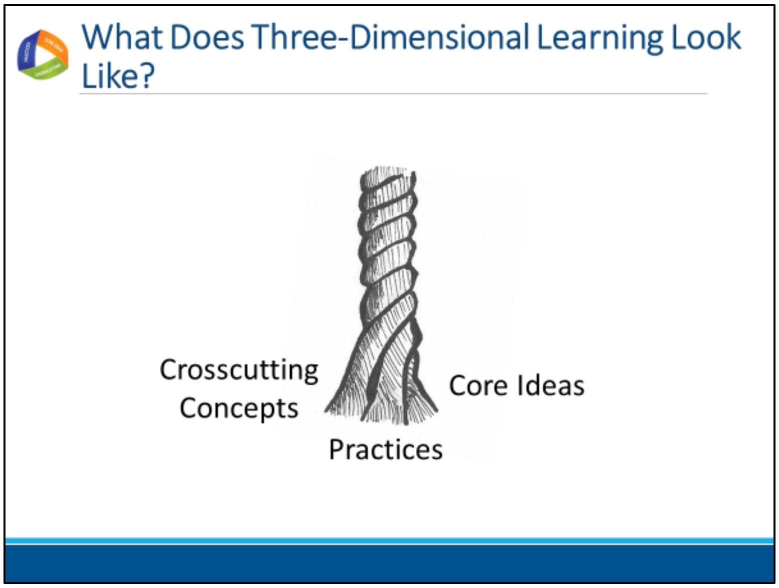
Slide 38

Facilitator Notes:

- The important take-away in this slide is that participants should understand that in three-dimensional learning *students* are the ones that should be developing and using the three dimensions to explain a phenomenon or to design a solution to a problem. Often, a lesson or activity will show evidence that a teacher is using the three dimensions, but that does not ensure that *students* will develop or use the dimensions. The emphasis on students and finding evidence in lessons that *students* are the ones developing and using elements of dimensions can be found throughout the professional learning sessions.

Talking Points:

- If we take our discussion about three-dimensional learning and create a definition for three-dimensional learning we can sum it up by saying: students use core ideas, crosscutting concepts, and practices to explain how and why phenomena occur or to design solutions to problems.
- Notice the emphasis on the word "students." It is important to remember that students and not teachers should be the ones developing and using the three dimensions to explain a phenomenon or to design a solution to a problem. Remember that three-dimensional learning shifts the focus of the science classroom to students.



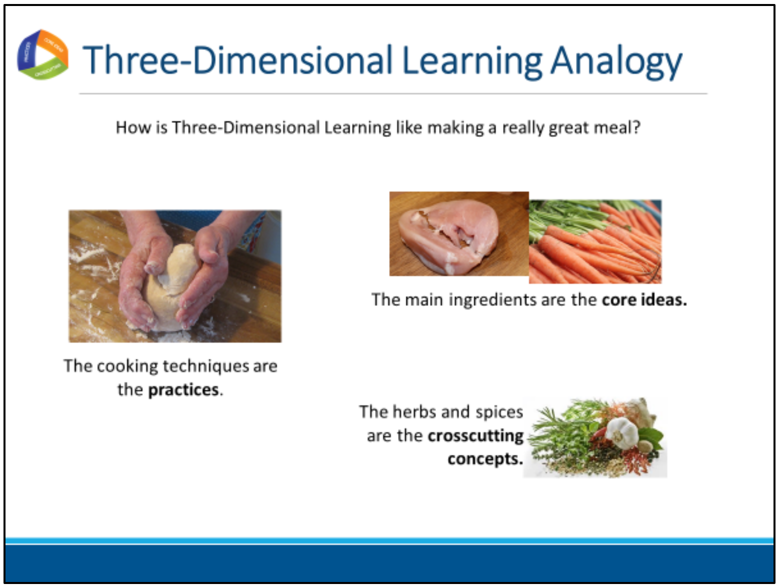
Slide 39

Facilitator Notes:

- Some participants may think that as long as the three-dimensions are present in a lesson, that the lesson is three-dimensional. However, it is important for them to understand that the three dimensions need to work together and that student performances need to show students engaged in all three at the same time to explain a phenomenon or design a solution to a problem. The analogies in the next few slides will help to reinforce this idea.

Talking Points:

- So, what does three-dimensional learning look like in the classroom?
- The key with three-dimensional learning is that engagement in the dimensions cannot occur in isolation of each other. The three dimensions need to work together and students need to be engaged in all three at the same time. For example, students should not only be engaged in practices at the beginning of the lesson, disciplinary core ideas in the middle, and then crosscutting concepts at the end.
- Think of the three components of three-dimensional learning as three intertwining stands of a rope. While the rope can be separated into its three different strands, the strength of the rope is determined by the strands working together; separating the strands weakens the rope so that it is no longer effective for our intended use.
- While in the past we may have separated out the knowledge and skills students need in the study of science, knowing and doing cannot be separated if our goal is the kind of usable, conceptual understanding students need to think, act, and learn like scientists.
- Three-dimensional learning—practices, core ideas, and crosscutting concepts working together—is therefore a non-negotiable for NGSS lessons and units.



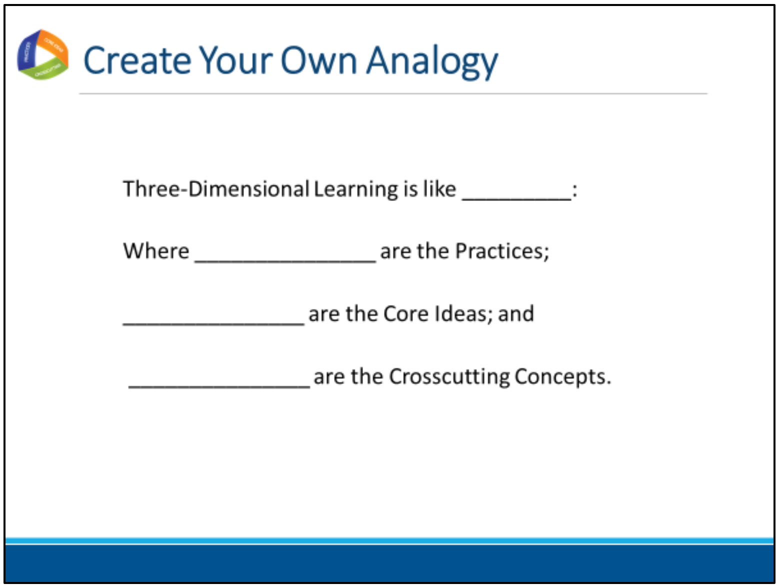
Slide 40

Facilitator Notes:

- Participants often find hearing and creating an analogy helpful in strengthening their understanding of three-dimensional learning. They will receive an opportunity to create their own analogy in the next slide.

Talking Points:

- Borrowing an idea from Ted Willard at NSTA, Joe often compares three-dimensional learning to making a really good meal.
- As Joe says so well, “Think of knowing how to do various techniques in the kitchen like kneading bread, cutting tomatoes, beating an egg, frying or roasting, and so forth as the practices. You could know how to do all of these things and still not be able to prepare a really good meal.”
- “Now think of picking out really good ingredients for the meal. You want to pick out a high-quality piece of fish or poultry or excellent pasta for the meal. These are your core ideas. A disciplinary core idea is essential to explaining a variety of phenomena. Your main ingredient is essential to the meal. But just as the [disciplinary core idea] works with practices to make sense of phenomena and design solutions, you need to know how to cook that main ingredient. But something is still missing. The meal tastes bland. What is missing? To make a really good meal, we need to use spices and herbs to enhance the flavor of the main ingredients.”
- “Crosscutting concepts are like these spices and herbs—they enhance learning by providing a familiar lens to use to examine and understand phenomena. Because the same spices and herbs are used in many different dishes, we recognize them even when we have them in a new or unfamiliar dish. Consequently, we can use our familiarity with a spice or herb to examine a new meal and understand what was used to make it. Likewise, crosscutting concepts can be found in all scientific disciplines, and we can use our familiarity with crosscutting concepts in one discipline of science to examine phenomena and enhance understanding and learning in other disciplines of science.”
- “To make a really wonderful meal, good main ingredients are necessary, but you need to know how to use various techniques to prepare them, and you must have the spices and herbs to enhance the flavors. All three work and blend together to make a great meal. Similarly, to foster three-dimensional learning where all learners can make sense of phenomena and design solutions, all three dimensions need to work and blend together” (http://nstacommunities.org/blog/2014/04/25/equip/).



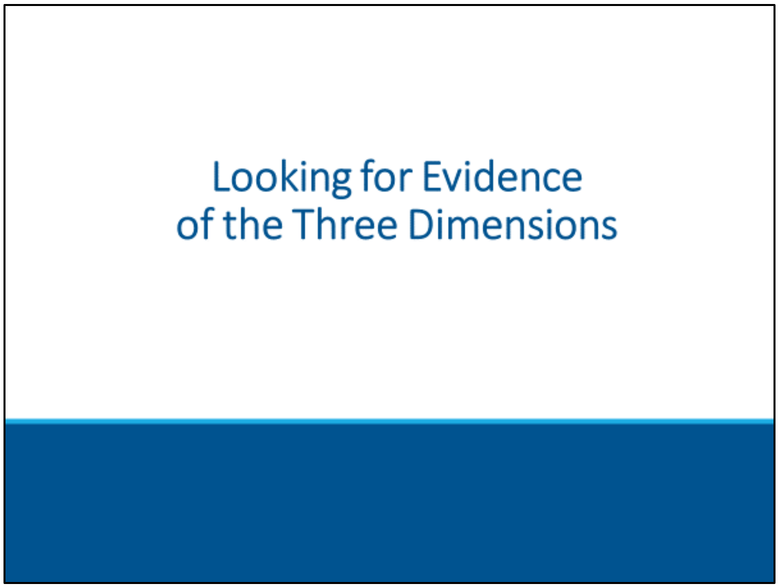
Slide 41

Facilitator Notes:

- Participants often find hearing and creating an analogy helpful in strengthening their understanding of three-dimensional learning.
- If you find that the participants already have a strong understanding of three-dimensional learning and do not need to create their own analogies, feel free to skip this slide.

Talking Points:

- Now, take a few minutes and create your own analogy for three-dimensional learning.
- *[Note to facilitator: Ask participants to share their analogies and explanations with their table group or the whole group.]*
- Does anyone have any questions about three-dimensional learning? *[Note to facilitator: The next section moves on to talking about how to look for evidence of the dimensions, so this would be a good place to address any lingering questions about three-dimensional learning.]*



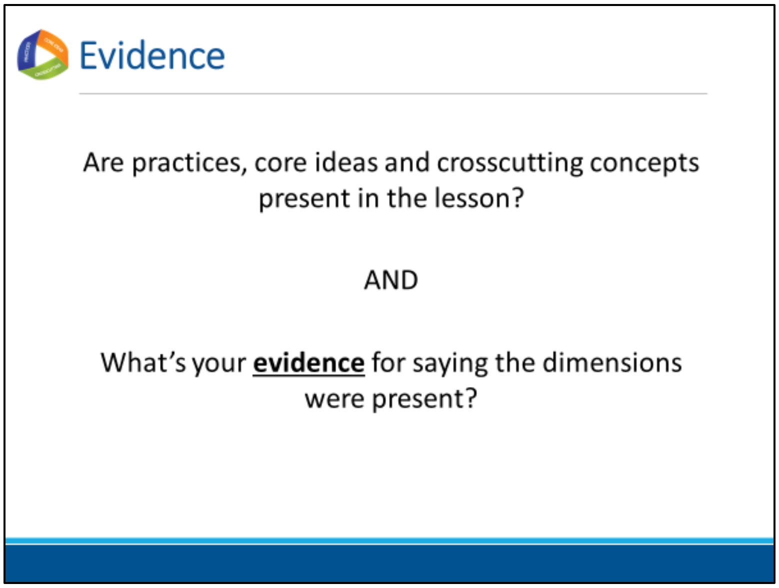
Slide 42

Facilitator Notes:

- Using their experience as students and the additional teacher information provided, participants will look for evidence for the three dimensions in the immersion activity, and in doing so, will learn how to use the NGSS Appendices to look for evidence at the element level for all three dimensions.

Talking Points:

- Now that we have experienced the immersion activity as a student, have received more information about it from the teacher perspective, and have discussed what three-dimensional learning is, let's look for evidence of three-dimensional learning.
- When we look for evidence of three-dimensional learning, it is easier to break it down slightly and to first look for the evidence that each of the three dimensions are present, and then look for evidence to see if those dimensions are integrated and working together.
- For the immersion activity, we will look for evidence that each of the three dimensions are present.



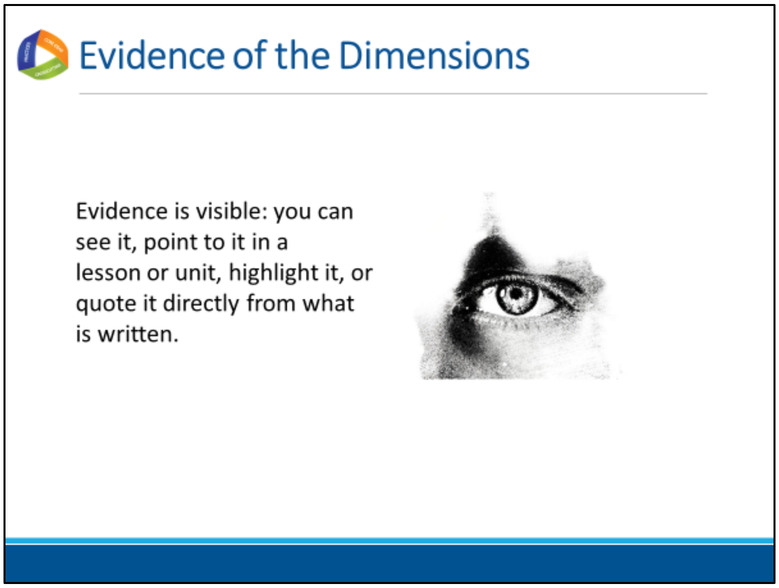
Slide 43

Facilitator Notes:

- This slide is meant to elicit what the participants' think evidence is. The explicitness of evidence required in the PEEC process will be discussed in a few slides.

Talking Points:

- When we look to see if the three dimensions are present in the immersion activity, we are looking to answer three separate questions: Are science and engineering practices present? Are disciplinary core ideas present? Are crosscutting concepts present?
- If you say that a particular dimension is present in the lesson, you need evidence to support your "yes."
- If you are asked to look for evidence of the three dimensions in a lesson, what would you look for? What would your evidence be? Take a few minutes to discuss this with your group. *[Note to facilitator: Give participants a few minutes to discuss how they would look for evidence of the three dimensions in a lesson.]*



Slide 44

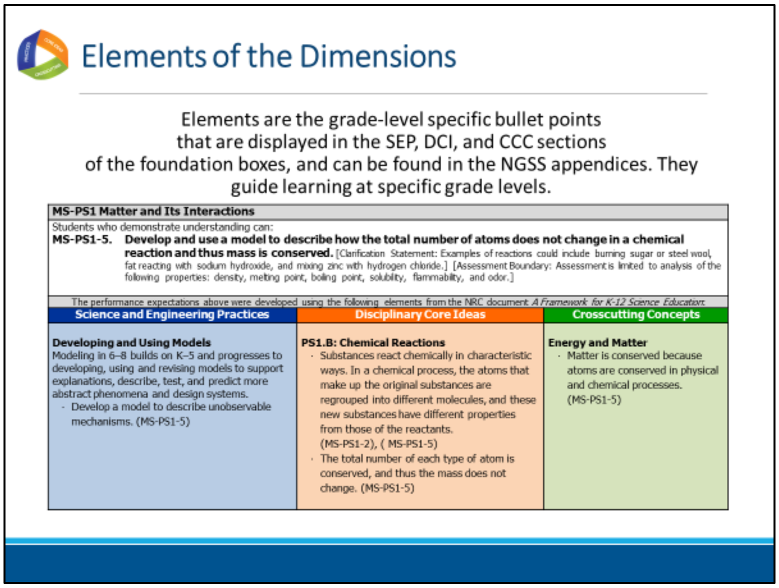
Facilitator Notes:

- It is extremely important that participants understand that evidence needs to be explicit and visible. It is often easy to think about the lessons as an educator, see the potential in a lesson, and then assume that there is evidence there because there is potential for students to do something. However, directions need to be explicitly written that show that all students will be engaged in a particular dimension. If directions are vague, then the assumptions of what students will do can vary by the person reading the directions. If you are reading the lesson and saying that there is a chance students "could do…" or "are probably…" or "if they added in this step, *then* they could…" that is not explicit evidence, it is *implicit* and cannot be used as evidence that something is definitely present.
- While participants may show understanding of explicit evidence at this time, it is important to keep reinforcing this idea throughout the professional learning.

Talking Points:

- When we discuss finding "evidence," we need to make sure that the evidence we are using to back up our claim of whether something is present or not in a lesson is extremely explicit.
- We need to be able to see the evidence, point to it, highlight it, or quote it directly from what is written.
- As educators, it is extremely easy to fill in the gaps in instructions and lessons and think about what we would be able to do with a particular activity, discussion, etc. based upon just a few instructions. However, it is important to remember that not every educator will interpret general instructions in the same way, and educators will have different ways of filling in the gaps based upon their own thoughts and experiences. Therefore, if instructions are not explicitly in the lesson that show, for example, all students will be engaged in going through the detailed steps of claim, evidence, and reasoning for constructing an explanation, it is not guaranteed that all students will be engaged in constructing an explanation as called for in the NGSS practice. If at any point you think, "well this is a great place where my students *could* bring in looking at cause and effect," but there are no detailed instructions in the lesson itself of students engaged in a specific cause and effect element, then that is not explicit evidence.
- In general, if you read a lesson and think that students "could do…" or "are probably…" or "if this step was added in, then students will be…" then there is no explicit evidence that ALL students will be engaged in that particular step and *explicit* evidence is not present.
- We will look back over the immersion activity and see if there is evidence of each of the three dimensions.

- We did not have time to look through the rest of the lessons in the unit, so we will look for evidence of each of the three dimensions in the activities you engaged in, the unit overview, the student work, and the classroom video.



Slide 45

Facilitator Notes:

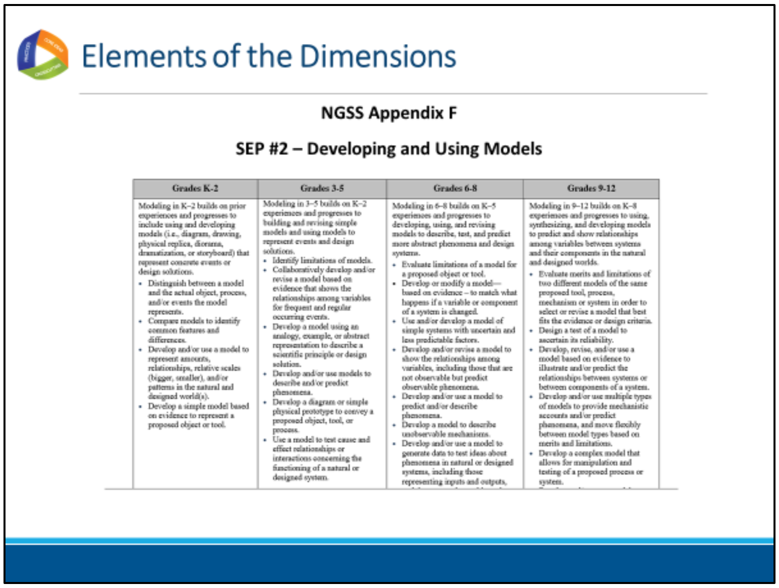
- When participants are asked to look for evidence of the dimensions, it is critical that they are looking for evidence at the element level. For example, if participants are looking for evidence of the practice "developing and using models" in a middle school lesson, they may see those words and look in the lesson to see if there is any evidence that students are either developing a model or are using a model. This would not be an appropriate way to look for evidence that practices are present in a lesson. Someone may find a step where participants are developing a model, but this general search is not sufficient to know whether students are using the elements of the developing/using models practice at a *grade-appropriate* level. Finding general evidence that students are developing a model may only show students using the practice at a K-2 grade-band level. Each practice has specific components, or elements, that students are expected to master at the end of each grade band, and these elements increase in complexity through the grade-bands. To see if the students are truly using the developing and using models practice in a middle school lesson, you need to look for evidence of the specific elements of this practice in the 6-8 grade-band. For example, you could look for evidence that students are "developing a model to describe unobservable mechanisms."
- The following copies are provided as *Handout 04 – NSTA DCIs Matrix; Handout 05 – NGSS Appendix F; Handout 06 – NGSS Appendix G.*
    - Participants will need copies of or digital access to NGSS Appendices F and G.
    - Participants will need a copy of or digital access to the *NSTA DCIs Matrix* (http://nstahosted.org/pdfs/ngss/20130509/MatrixOfDisciplinaryCoreIdeasInNGSS-May2013.pdf)

Talking Points:

- When we look for evidence of the three dimensions we need to look for evidence at the **element** level. Let's take a minute to define what we mean by the elements of the dimensions.
- Please take a minute to read the definition of an element of dimensions that is displayed in this slide.
- Every performance expectation is composed of elements from all three dimensions and the language for these elements can be found in a performance expectation's foundation boxes. The blue box has the element for the science and engineering practices. The orange box has the elements for the disciplinary core ideas. The green box has the elements for the crosscutting concepts.
- As you can see in this example, the science and engineering practice included in this performance expectation is developing and using models. This is the overall practice, and is not at the element level. So when you look for

evidence, you cannot just look for general evidence that students are developing and using models. You specifically must look for evidence that students are “developing a model to describe unobservable mechanisms.”

- It is important that all evidence for the three dimensions be recorded at the element level.
- We can find the elements of all eight science and engineering practices in NGSS Appendix F, and the elements of all seven crosscutting concepts in NGSS Appendix G.
- The elements for the DCIs are organized by grade-band in the *NSTA DCIs Matrix*.



Grades K-2	Grades 3-5	Grades 6-8	Grades 9-12
Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions. • Distinguish between a model and the actual object, process, and/or events the model represents. • Compare models to identify common features and differences. • Develop and/or use a model to represent amounts, relationships, relative scales (bigger, smaller), and/or patterns in the natural and designed world(s). • Develop a simple model based on evidence to represent a proposed object or tool.	Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions. • Identify limitations of models. • Collaboratively develop and/or revise a model based on evidence that shows the relationships among variables for frequent and regular occurring events. • Develop a model using an analogy, example, or abstract representation to describe a scientific principle or design solution. • Develop and/or use models to describe and/or predict phenomena. • Develop a diagram or simple physical prototype to convey a proposed object, tool, or process. • Use a model to test cause and effect relationships or interactions concerning the functioning of a natural or designed system.	Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems. • Evaluate limitations of a model for a proposed object or tool. • Develop or modify a model— based on evidence – to match what happens if a variable or component of a system is changed. • Use and/or develop a model of simple systems with uncertain and less predictable factors. • Develop and/or revise a model to show the relationships among variables, including those that are not observable but predict observable phenomena. • Develop and/or use a model to predict and/or describe phenomena. • Develop a model to describe unobservable mechanisms. • Develop and/or use a model to generate data to test ideas about phenomena in natural or designed systems, including those representing inputs and outputs,	Modeling in 9–12 builds on K–8 experiences and progresses to using, synthesizing, and developing models to predict and show relationships among variables between systems and their components in the natural and designed worlds. • Evaluate merits and limitations of two different models of the same proposed tool, process, mechanism or system in order to select or revise a model that best fits the evidence or design criteria. • Design a test of a model to ascertain its reliability. • Develop, revise, and/or use a model based on evidence to illustrate and/or predict the relationships between systems or between components of a system. • Develop and/or use multiple types of models to provide mechanistic accounts and/or predict phenomena, and move flexibly between model types based on merits and limitations. • Develop a complex model that allows for manipulation and testing of a proposed process or system.

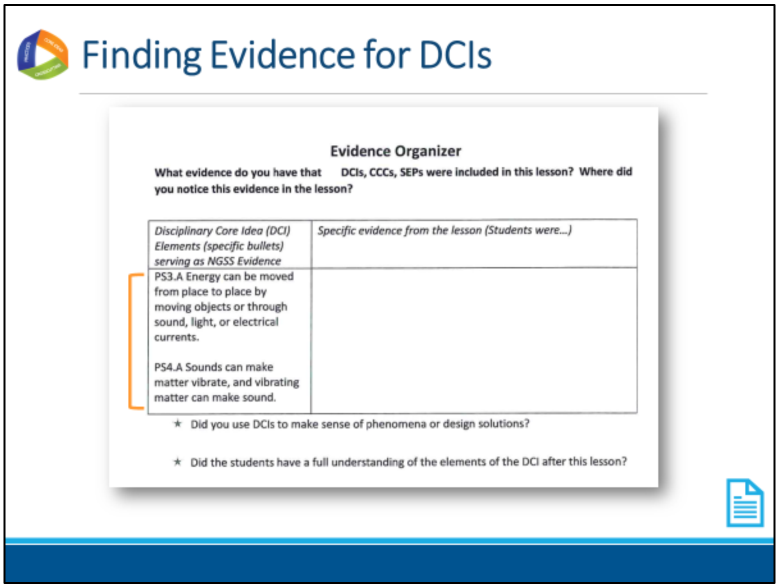
Slide 46

Facilitator Notes:

- It is important to emphasize that elements are organized by grade-band, as participants should be looking for evidence that students are engaged in grade-appropriate elements in a lesson. Sometimes, a lesson will state that it is targeting a grade-appropriate element, but the evidence will show that students are actually building an understanding of an element at a lower or at a higher grade-level.
- The following copies are provided as *Handout 04 – NSTA DCIs Matrix; Handout 05 – NGSS Appendix F; Handout 06 – NGSS Appendix G.*
    - Participants will need copies of or digital access to NGSS Appendices F and G.
    - Participants will need a copy of or digital access to the *NSTA DCIs Matrix* (http://nstahosted.org/pdfs/ngss/20130509/MatrixOfDisciplinaryCoreIdeasInNGSS-May2013.pdf)

Talking Points:

- Here is a chart from NGSS Appendix F that shows the elements for the science and engineering practice of developing and using models.
- As you can see here, the elements are all grade-banded. There is a set of elements for K-2, a set for 3-5, a set for 6-8, and a set for 9-12.
- This organization by grade-band can be seen for the practices, the crosscutting concepts, and the disciplinary core ideas.
- When looking for evidence in a lesson for a particular element, you need to make sure that you know what grade band the element falls under and what grade level the lesson targets. It is possible that there is no evidence of the element at the targeted grade band, because students are engaging in the element at a higher or lower grade level.



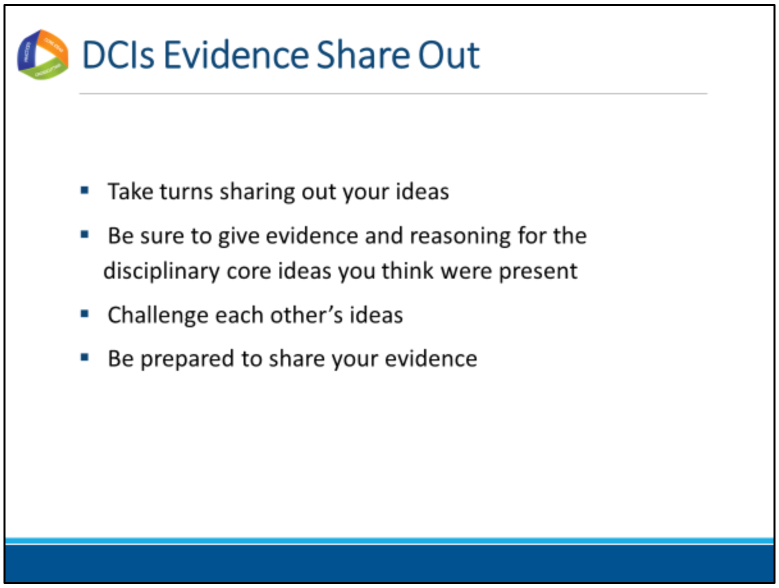
Slide 47

Facilitator Notes:

- Participants will focus on finding evidence of the target DCIs. Participants should look for evidence in the immersion activity they engaged in, the unit overview, the student work, and the classroom video.
- Participants will need a copy of *Handout 07 – Immersion Evidence Organizer*.
- Participants may need 8 to 10 minutes to fill out evidence for the disciplinary core ideas.

Talking Points:

- Please pull out your copy of the *Evidence Organizer* handout.
- Think back to the activity you just experienced. The designers of this unit were intentionally targeting the disciplinary core idea elements listed here on the slide and in your handout. *[Note to facilitator: Click for animation.]* You will look for evidence that students are using and developing these particular DCI elements in the lesson.
- Look through the materials you used for the immersion activity, the student work, and the video and individually look for evidence that these DCI elements are being used and developed by students. You will have 10 minutes to individually work and then we will discuss your findings as a whole group.



Slide 48

Facilitator Notes:

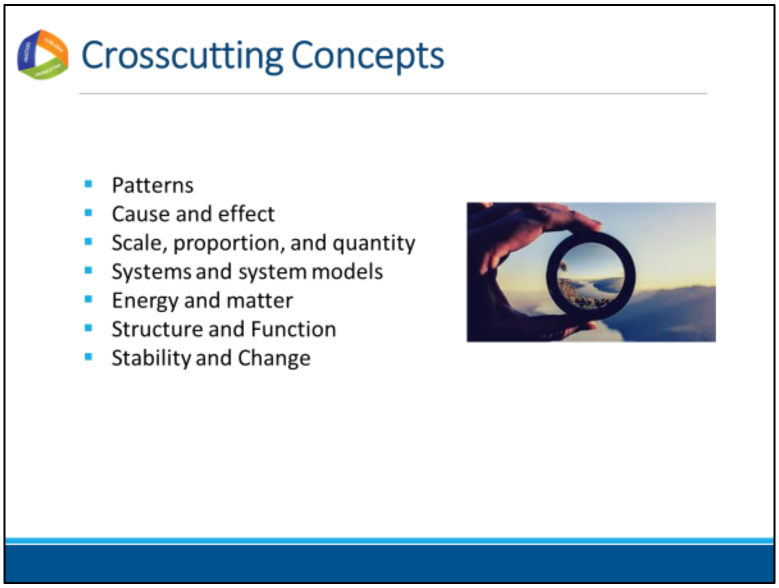
- Have people share out the evidence that they recorded in the evidence organizer. The goal of this conversation is to start bringing up issues that they are likely to encounter when reviewing materials.
- Possible issues that participants may encounter (the respective talking points are listed in the section below):
  - Expect participants to identify the fact that energy isn't really addressed in the unit. This helps participants learn to be critical and to know that the evidence needs to be explicit.
  - Participants may also identify pieces of evidence that are not truly evidence and are only implied in the materials.
  - Participants may identify that some grade-inappropriate DCI elements are identified.

Talking Points:

- Let's discuss the evidence that you found. This slide has the guidelines for our share out. Please take a minute to read over them.
- *[Note to facilitator: Lead a group discussion.]* How well did this lesson address the target disciplinary core ideas? Did you find evidence for DCI element PS3.A? Did you find evidence for DCI element PS4.A?

Depending on what participants bring up during the discussion, here are some specific talking points:

- *It's great to think about how you could use some these materials and then modify them in your classroom, but the focus is making sure that there is explicit evidence in the materials*
- *We may run into situations where the DCIs are out of the target grade band for the lesson. For example, PS4.A may be addressed, but only at the level that is represented in the K-2 grade band.*
- *We may run into materials that are claiming to address DCIs, but that only address part of what is expected. Whether that is "okay" depends on whether the other portions are addressed elsewhere in the materials.*



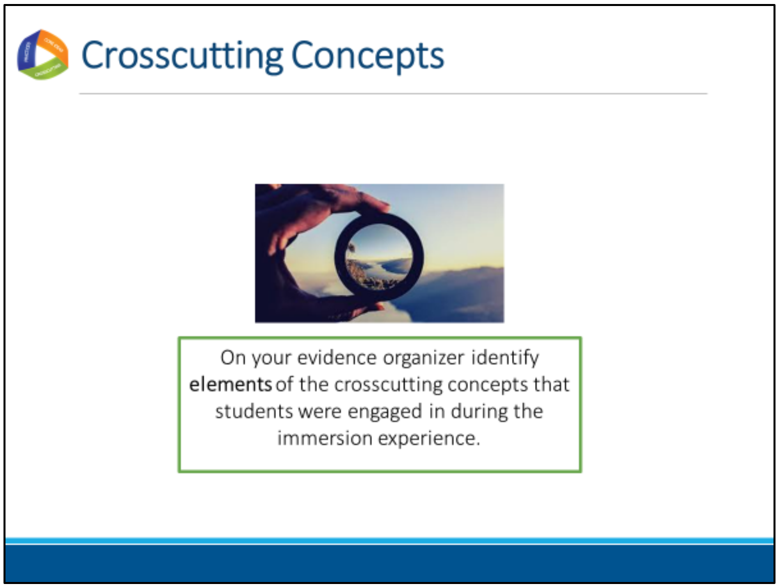
Slide 49

Facilitator Notes:

- Participants will focus on finding evidence of the target crosscutting concepts. Participants should look for evidence in the immersion activity they engaged in, the unit overview, the student work, and the classroom video.
- See the facilitator note in the fourth talking point for important points to cover in your crosscutting concepts discussion.
- Participants will need a copy of or digital access to NGSS Appendix G. A copy for it is provided as *Handout 06 – NGSS Appendix G.*

Talking Points:

- The crosscutting concepts are a lens we want students to look through as they are making sense of the world around them.
- We want students to not only be able to use each lens, but to be aware enough that they can change the lens for the situation—microscope; magnifying glass; glasses; binoculars; telescope.
- There are seven overall crosscutting concepts, but each CCC has specific elements that can be found organized by grade band in NGSS Appendix G. Take a minute to look through some of the elements in NGSS Appendix G. *[Note to facilitator: Give participants a few minutes to look through the elements in NGSS Appendix G.]*
- Turn and talk with a neighbor, what might evidence of the crosscutting concepts look like in instructional materials? *[Note to facilitator: Give participants a few minutes to discuss the question with their partners. Then, have some participants share out their ideas. Finding evidence for crosscutting concepts can be tricky sometimes and this will be an important conversation. A lesson developer might include a vague statement such as "ask the students to look for patterns." However, without more details such as the type of questions students are asking about patterns or the types of statements they are making, just including the word "patterns" is in most situations not evidence enough that students are using a grade-appropriate element of the crosscutting concept. It is important that participants understand that simply including the words for a crosscutting concept does not mean the students are using that crosscutting concept. You need to read the steps that come before and after those words are used and really think if from what is written, it is guaranteed that all students will use that crosscutting concept. Also, think about it from the shoes of a student. Would a student in that situation understand that they were using a crosscutting concept? Finding evidence for crosscutting concepts often requires a little more digging than finding evidence for the other two DCIs.]*



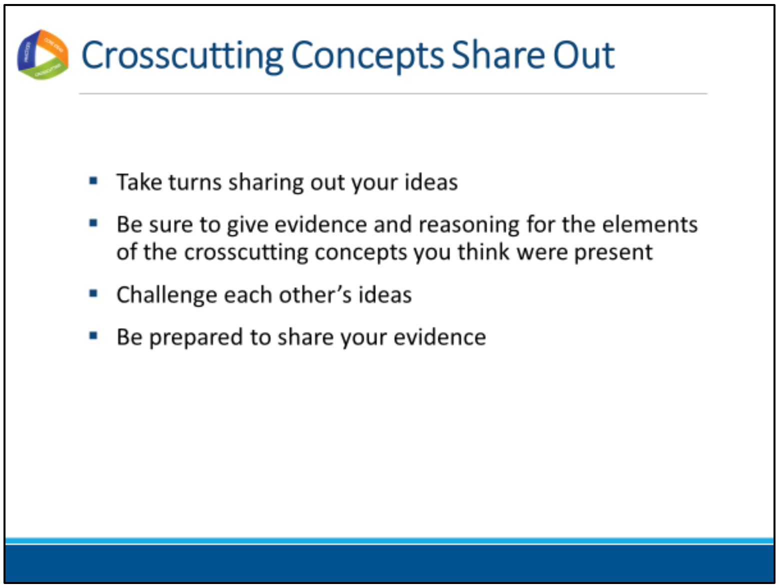
Slide 50

Facilitator Notes:

- Participants will need a copy of or digital access to NGSS Appendix G. A copy for it is provided as *Handout 06 – NGSS Appendix G.*

Talking Points:

- Start with the crosscutting concepts that are provided in the handout and identify whether there is evidence of these in the lesson. After recording the evidence, look through Appendix G and determine if there are other CCCs that are a part of the lesson.
- Remember Where is the evidence that students are engaged in the *elements* of the CCCs? It is particularly important to go to the element level in evaluating the CCCs, because there will be many connections at the larger grain-size.
- You will have 10 minutes to individually work and then we will discuss your findings as a group.



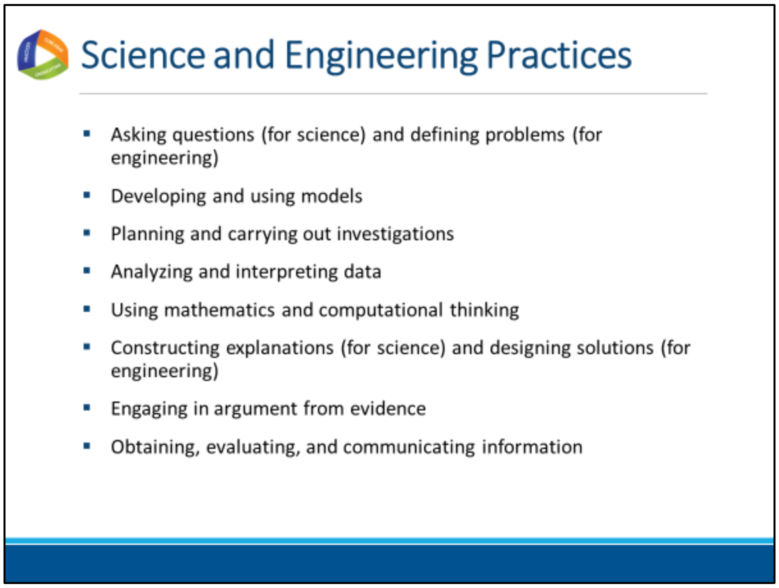
Slide 51

Facilitator Notes:

- Participants will need a copy of or digital access to NGSS Appendix G. A copy for it is provided as *Handout 06 – NGSS Appendix G.*

Talking Points:

- *[Note to facilitator: Lead a group discussion by asking participants to share the evidence they found.]* Let's share some of the evidence you found for the crosscutting concepts listed on the evidence organizer.
- What are some additional CCC elements that might fit well with this unit? *[Note to facilitator: Participants might respond that all crosscutting concepts connect with the unit. If this happens, discuss with the group the importance of knowing which CCC to emphasize when working with students. Students need time to develop each "lens". This happens through questions and modeling the CCCs. If all CCCs are included in a unit, it will become harder for the students to develop deeper understanding for any CCC.]*



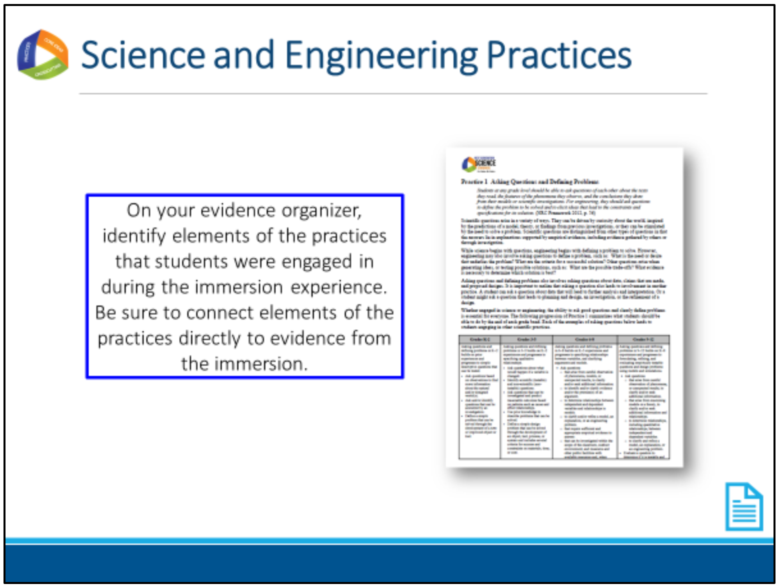
Slide 52

Facilitator Notes:

- Participants will need a copy of or digital access to NGSS Appendix F. A copy for it is provided as *Handout 05 – NGSS Appendix F.*

Talking Points:

- There are eight overall science and engineering practices (SEPs), but each SEP has specific elements that can be found organized by grade band in NGSS Appendix F. Take a minute to look through some of the elements in NGSS Appendix F. *[Note to facilitator: Give participants a few minutes to look through the elements in NGSS Appendix F.]*



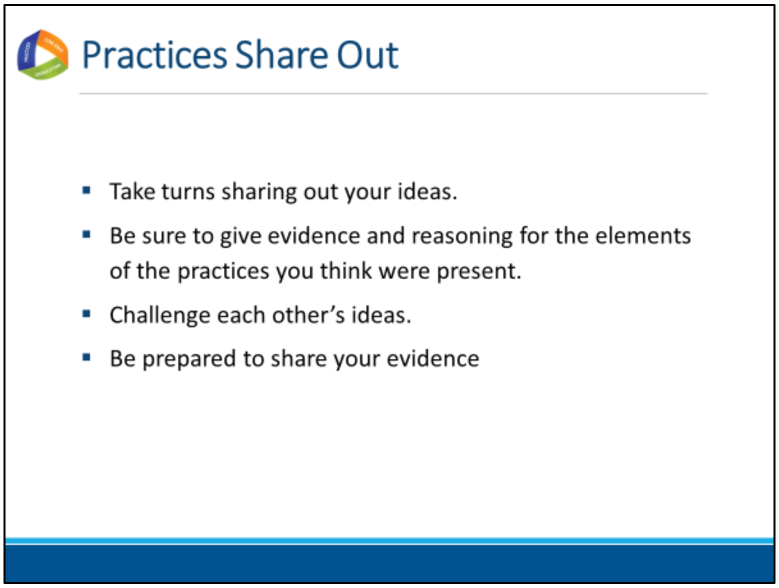
Slide 53

Facilitator Notes:

- Participants will need a copy of or digital access to NGSS Appendix F. A copy for it is provided as *Handout 05 – NGSS Appendix F.*
- As participants look for and discuss their findings, keep an ear out for anyone saying the overall practice names, instead of the specific elements. If you hear participants saying, “I found evidence that students are developing and using models in step 7 when they…” ask them which element of that practice they found evidence for.

Talking Points:

- Use NGSS Appendix F and look through the lesson to identify whether there is evidence for any SEP *element*. It is particularly important to go to the element level in evaluating the SEPs because there will be many connections at the larger grain-size.
- You will have 10 minutes to individually work and then we will discuss your findings as a group.



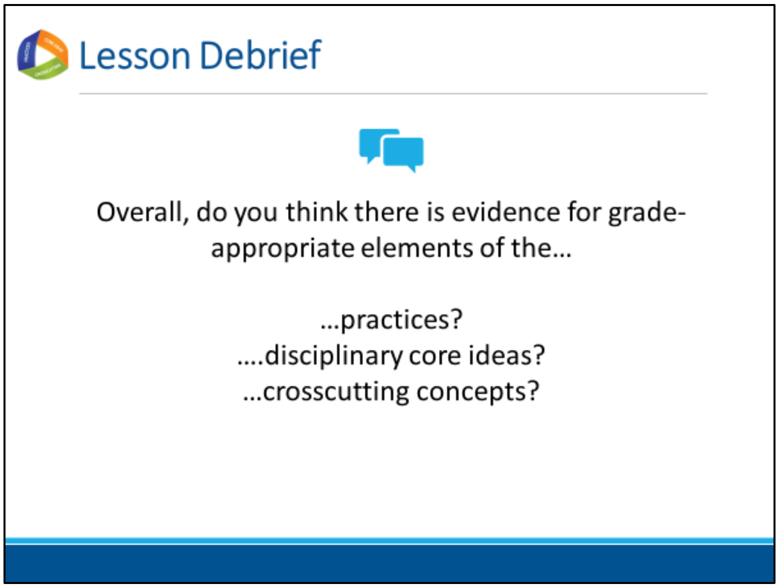
Slide 54

Facilitator Notes:

- Participants will need a copy of or digital access to NGSS Appendix F. A copy for it is provided as *Handout 05 – NGSS Appendix F.*

Talking Points:

- Let's share some of the evidence you found for the science and engineering practices. *[Note to facilitator: Select 4-7 people to share an element of a practice and the evidence from the unit. When participants share, have them say the page of Appendix F they found the element, the practice, and then the element of the practice. This will support participants as they move on to looking for elements and evidence in curriculum materials.]*



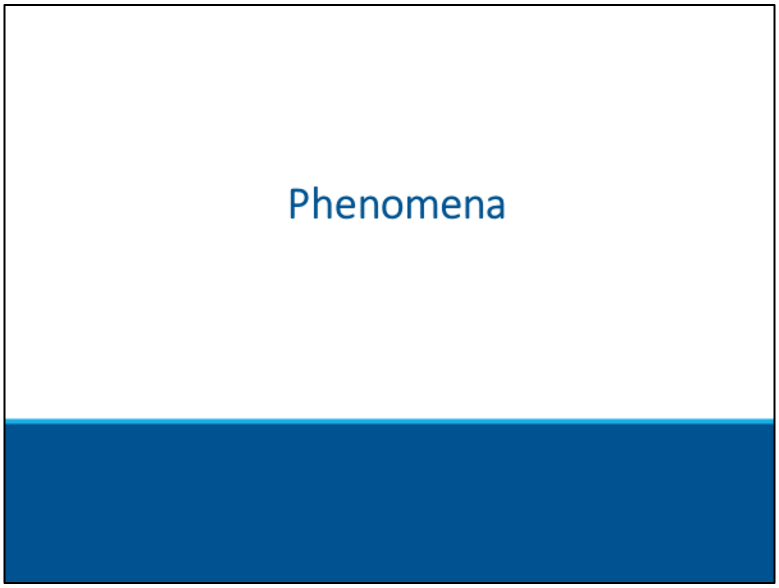
Slide 55

Facilitator Notes:

- Before moving on to the next section, check in with the participants to see if they have any questions about finding evidence for the three dimensions.

Talking Points:

- We just discussed the evidence you found for the practices, the disciplinary core ideas, and the crosscutting concepts.
- Overall, do you think there is evidence for grade-appropriate elements of the practices?
- Overall, do you think there is evidence for grade-appropriate elements of the disciplinary core ideas?
- Overall, do you think there is evidence for grade-appropriate elements of the crosscutting concepts?
- Do you have any questions about finding evidence for the three dimensions?



Slide 56

Facilitator Notes:

- This section builds participants' understanding of NGSS Innovation One: Phenomena or Problems. It walks participants through coming up with a definition for phenomena and with the characteristics of an instructionally productive phenomenon. Important points that need to be made about phenomena are included as facilitator notes in the next few slides. Participants will continue to build their understanding of Innovation One throughout the professional learning sessions.

Talking Points:

- The NGSS focus on the innovation of three-dimensional learning is critical in supporting another NGSS innovation: phenomena.
- Three-dimensional learning supports students in figuring out phenomena or developing solutions to problems.
- In the immersion activity that you participated in, were you focused on trying to explain something or develop a solution to a problem? What were you trying to explain as you engaged in the three dimensions? What was the phenomenon?

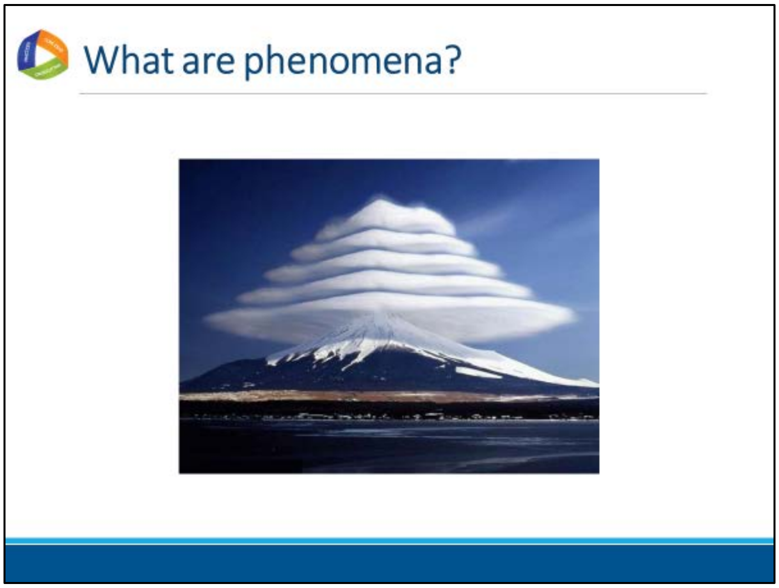
Slide 57

Facilitator Notes:

- This slide references the phenomenon from the immersion activity.

Talking Points:

- Yes, you were trying to explain why a singer could shatter a glass with his voice. This was the phenomena that anchored the activity and drove student learning.



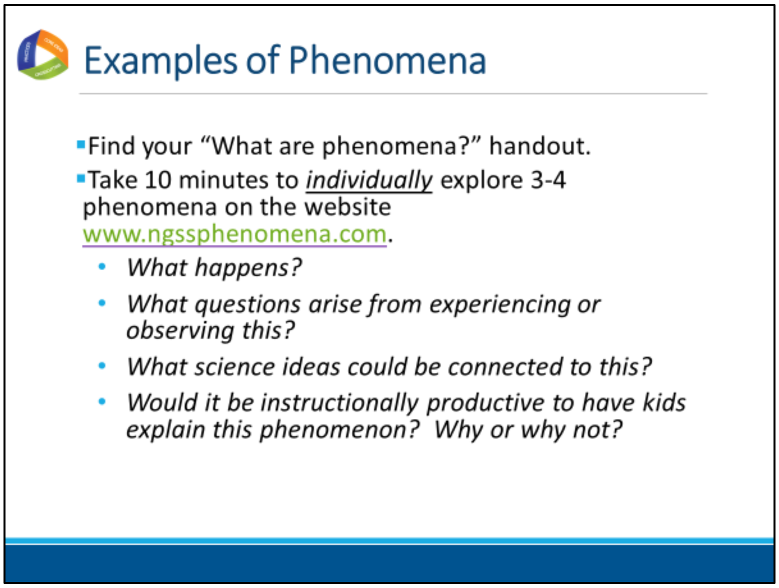
Slide 58

Facilitator Notes:

- It is important that these points are raised in the discussion:
  - Natural phenomena are observable events that occur in the universe and that we can use our science knowledge to explain or predict. The goal of building knowledge in science is to develop general ideas, based on evidence, that can explain and predict phenomena.
  - Learning to explain phenomena and solve problems is the central reason students engage in the three dimensions of the NGSS. Students explain phenomena by developing and applying the Disciplinary Core Ideas (DCIs) and Crosscutting Concepts (CCCs) through use of the Science and Engineering Practices (SEPs).
  - By centering science education on phenomena that students are motivated to explain, the focus of learning shifts from learning about a topic to figuring out why or how something happens.
  - **these points are from "Using Phenomena in NGSS-Designed Lessons and Units." Participants will receive this handout later in the session.*
- Every point about a phenomenon does not need to be raised in this discussion. The next few slides will ask participants to think about characteristics of instructionally productive phenomena, and the goal is for participants to slowly build their understanding of phenomena throughout this session. The next slide will help

Talking Points:

- So, what are phenomena? How would you define a phenomenon? *[Note to facilitator: Lead a whole group discussion about what participants think phenomena are. If the points listed above in the facilitator notes are not brought up by participants, then help prompt them towards those ideas. If you find it helpful, you can chart participants' ideas during the discussion.]*



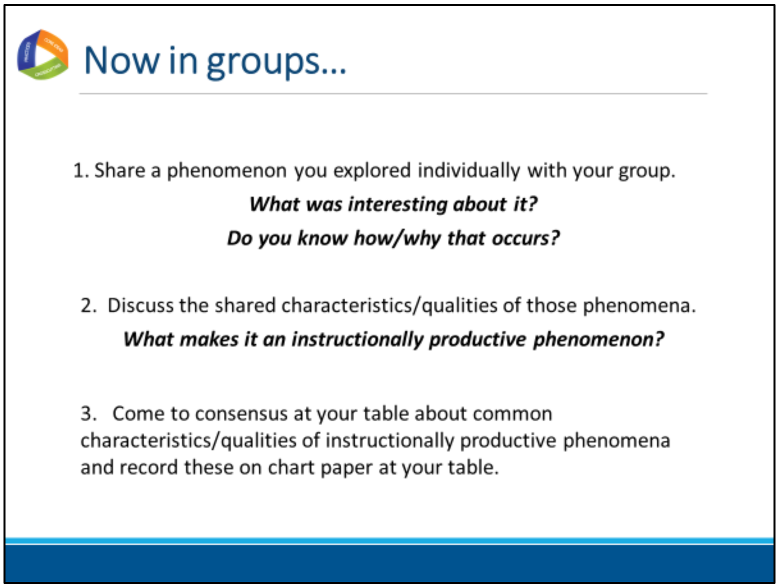
Slide 59

Facilitator Notes:

- In this short activity, participants will explore different phenomena on a website and answer questions about the phenomena. The website www.ngssphenomena.com has may different photos and videos that are phenomena. While a phenomenon may be very cool or interesting, it may not be the best phenomenon to use to anchor a lesson and drive student learning. Participants will be introduced to this idea through this activity as they answer the questions listed on the slide for each phenomenon that they explore.
- Participants will need a copy of *Handout 08 – What Are Phenomena.*
- Participants will need access to a computer and the internet.

Talking Points:

- Let's look at some examples of phenomena.
- Pull out your copy of the *What Are Phenomena* handout. Take 10 minutes to individually explore 3-4 additional phenomena on the website www.ngssphenomena.com and fill out the questions listed in the columns for each phenomenon:
  - What happens?
  - What questions arise from experiencing or observing this?
  - What science ideas could be connected to this?
  - Would it be instructionally productive to have kids explain this phenomenon? Why or why not?



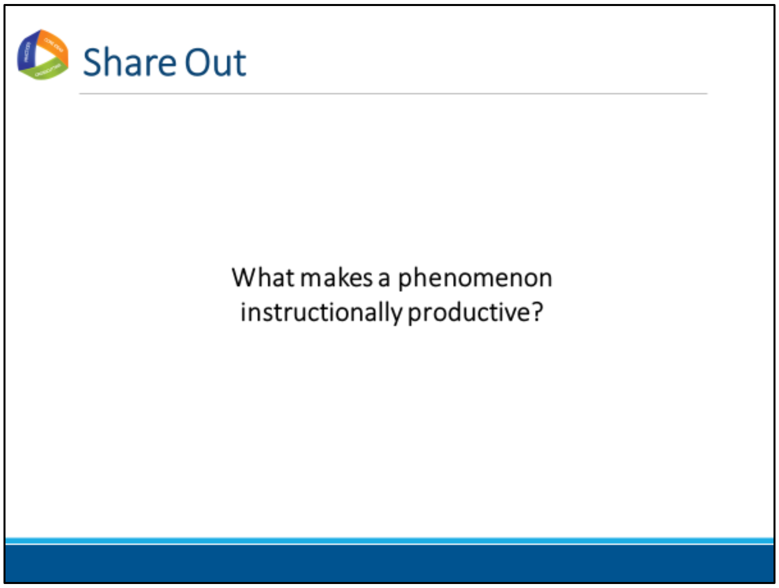
Slide 60

Facilitator Notes:

- Participants will have a group discussion about what characteristics/qualities an instructionally productive phenomena has. Groups will share their ideas in the next slide.

Talking Points:

- Share a phenomenon you explored individually with your group. Discuss what you found interesting about it. Do you know how and why the phenomenon occurs? *[Note to facilitator: Give groups 5 minutes for their discussion].*
- Then, discuss the shared characteristics and qualities of the phenomena that members of your group explored. What do you think makes them instructionally productive phenomena? Come to a consensus at your table about the common characteristics/qualities of instructionally productive phenomena and record these on chart paper at your table. You will share your characteristics/qualities with all participants after you are done. *[Note to facilitator: Give the groups 10 minutes to come to a consensus and record the characteristics on the chart paper].*



Slide 61

Facilitator Notes:

- One of the biggest characteristics that you need to make sure is emphasized is that a phenomenon is not just a “hook” that is introduced at the beginning of the lesson to grab the attention of the students and then never referred to again in the lesson. Sometimes, people will see evidence of a “hook” in a lesson and say that there is evidence for a phenomenon. For a phenomenon to be a true phenomenon, and for it to be instructionally productive, it needs to drive the lesson and student learning. Everything that students do in the lesson should be to help them build an explanation for the phenomenon, they should explicitly refer to the phenomenon throughout the lesson, and be able to build an explanation for it by the end.
- These are some of the characteristics that you want participants to point out during their share out:
    - Culturally or personally relevant or consequential to students
    - Engages all students in working toward the learning goals
    - Should advance students’ understandings when they develop an explanation
    - Takes some investigation (use of practices) to figure out how and why the phenomena work
    - Does not <u>need</u> to be flashy or unexpected! Instead, it simply needs to create the opportunity for learning
    - **these characteristics are from “Using Phenomena in NGSS-Designed Lessons and Units.” Participants will receive this handout later in the session.*

Talking Points:

- Have each group share the characteristics and qualities that they think make phenomena instructionally productive. *[Note to facilitator: Ask groups to post their chart paper on the walls and to use it as they share their ideas. Encourage other groups to add on to points made the presenting group.]*

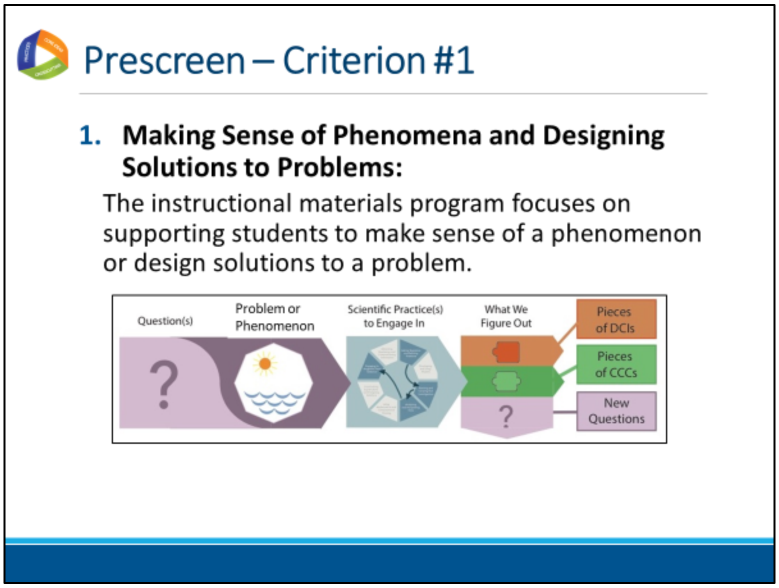
Slide 62

Facilitator Notes:

- Participants will learn about the three prescreen criteria that the leadership team used to determine whether the instructional materials programs showed promise of the NGSS design. Even though they did not participate in the prescreen, participants should understand what criteria the prescreen used to narrow the list of programs. Learning about the criteria will also help them continue to build their understanding of the NGSS Innovations.

Talking Points:

- Now that we all have experienced what three-dimensional learning and phenomena look like, let's take a look at the PEEC Phase 1 Prescreen criteria that the leadership team used to determine whether the instructional materials programs showed promise of the NGSS design.
- The prescreen process involves the use of three tools, each for a criterion that should be readily apparent in a program that has been designed for the NGSS.



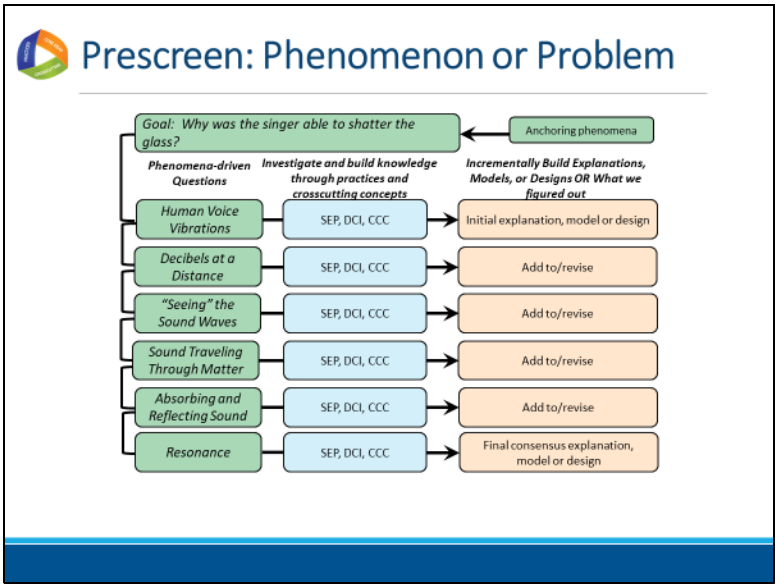
Slide 63

Facilitator Notes:

- This slide explains the first prescreen criteria.
- Build on the conversations that you had earlier this session about phenomena.

Talking Points:

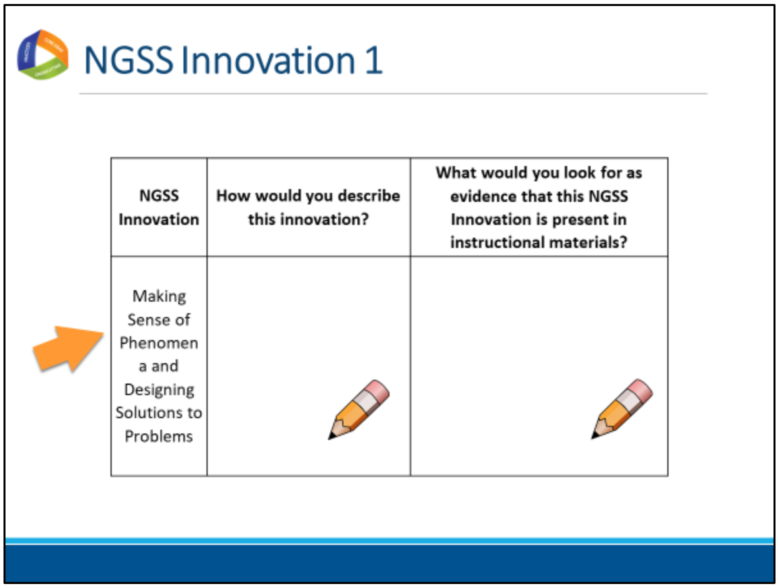
- The first criteria in the Phase 1 Prescreen process is that the instructional materials program **focuses** on supporting students to make sense of a phenomenon or design solutions to a problem.
- There needs to be explicit evidence in the materials that the purpose and focus of the learning sequences in the materials is to support students in making sense of phenomena and/or designing solutions to problems.
- Students should be engaged in all three dimensions throughout the learning sequences to build their explanations for a phenomenon or to help design a solution to a problem.
- As students engage in all three dimensions to build a piece of their explanation or solution, they will generate new questions that will lead them to the next learning sequence and there they will re-engage in the three dimensions to continue building their explanations or solutions. Ultimately, all student learning should be linked back to the original anchoring phenomenon or problem.



Slide 64

Talking Points:

- Let's look back at the entire learning sequence for the activity that you participated in earlier.
- The goal of this entire learning sequence is for students to make sense of why the singer could shatter the glass which is the phenomenon. Students engage in practices, core ideas, and crosscutting concepts to incrementally build their explanations. They generate new questions that lead them to the next step of the learning sequence, and this process continues until students can explain the phenomenon.



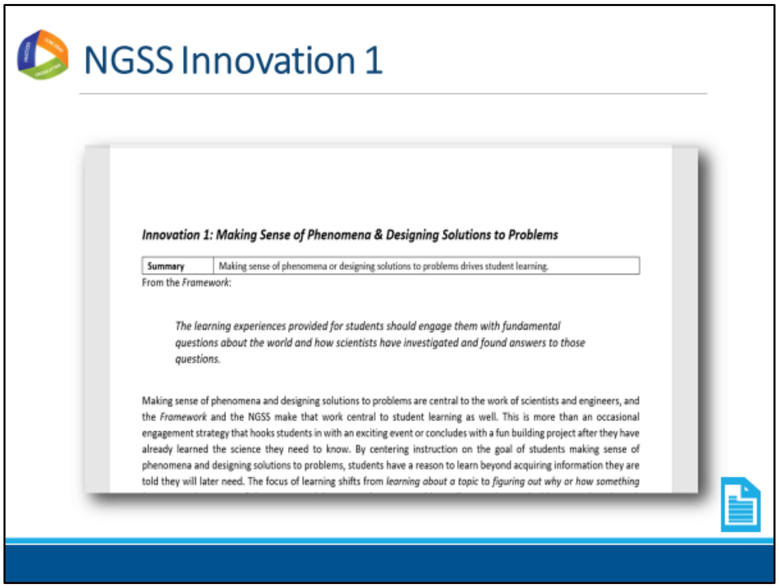
Slide 65

Facilitator Notes:

- Participants will need their copy of *Handout 1 – NGSS Innovations* that they began to fill out earlier in the session.

Talking Points:

- Let's go back to our *NGSS Innovations* handout.
- Turn to page 2 in the handout.
- How has your description of the first NGSS Innovation changed? Take a few minutes to talk to your group and come up with a working group description for making sense of phenomena and designing solutions to problems. Write your new description of this innovation in the second row, second column of the table. *[Note to facilitator: Click for animation.]*
- Based on what you have learned about phenomena and problems in the immersion activity and through our discussion, what would you look for as evidence that this NGSS innovation is present in instructional materials? Discuss your thoughts with your group and then write your thoughts down in the second row, third column. *[Note to facilitator: Click for animation.]*



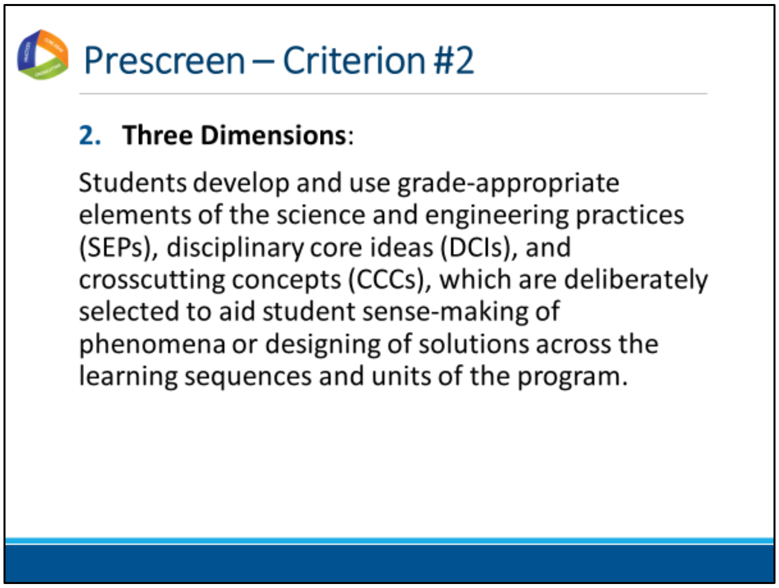
Slide 66

Facilitator Notes:

- Participants will need their copy of *Handout 1 – NGSS Innovations* that they began to fill out earlier in the session.
- Participants will need a copy of *Handout 13 – Innovation 1.*

Talking Points:

- Let's look at some more information of what NGSS designed programs should look less like and what they should look more like when considering the phenomena criterion.
- Pull out your copy of the *Innovation One* handout.
- Take a few minutes to read over this handout.
- Turn to the Explaining Phenomena or Designing Solutions chart in the handout.
- You probably see many the points from the left-hand side in the textbooks you have in your classroom right now.
- As you dig through instructional materials programs in the next two sessions, you will be searching for evidence of the points on the right-hand side. These are all the things we are looked for in the instructional materials programs in the prescreen. If a lot of the ideas from the right column appeared in the instructional materials, there was at least some evidence of NGSS design.
- If a lot of the ideas from the left column appear in the instructional materials, there is some evidence of the materials not being completely designed for the NGSS.
- Take a few minutes to go back to your *NGSS Innovations* handout and add in any additional thoughts in the second row of page two in the handout. Discuss your thoughts with your group. Especially focus on any new ideas about what you would look for as evidence that this NGSS Innovation is present in instructional materials.
- *[Note to facilitator: It may be helpful to have a whole group share out after individual teams have completed their discussions.]*



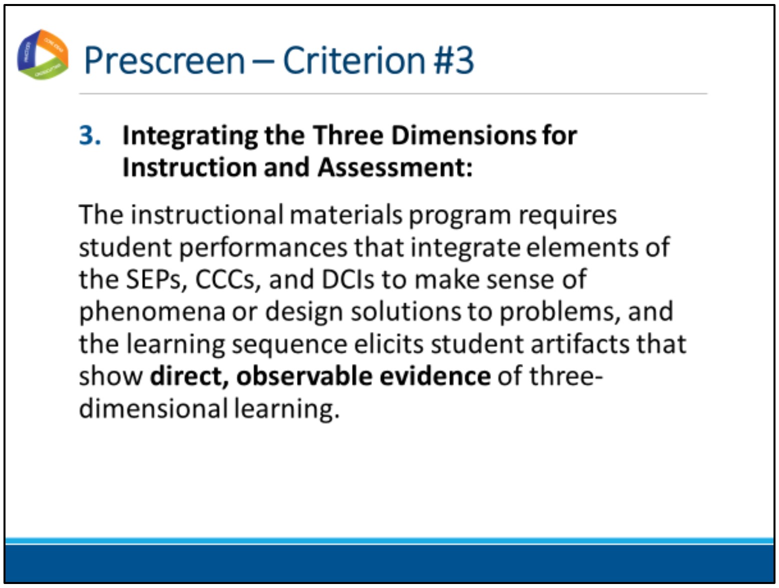
Slide 67

Facilitator Notes:

- This slide explains the second prescreen criteria.
- Build on the conversations that you had earlier this session about the three dimensions.

Talking Points:

- The second criterion specifically and only focuses on whether each of the three dimensions are present in the materials. This is extremely similar to the evidence you looked in the immersion activity.
- Take a minute to read the criterion on the slide.
- Note that the second half of the criterion where it says that the elements for all three dimensions should be “deliberately selected to aid sense-making of phenomena or designing solutions.” It is extremely important that the elements that chosen for a lesson are selected for a purpose and are not random. The elements should always help students make sense of the phenomenon or to design a solution to a problem for the entire learning sequence.



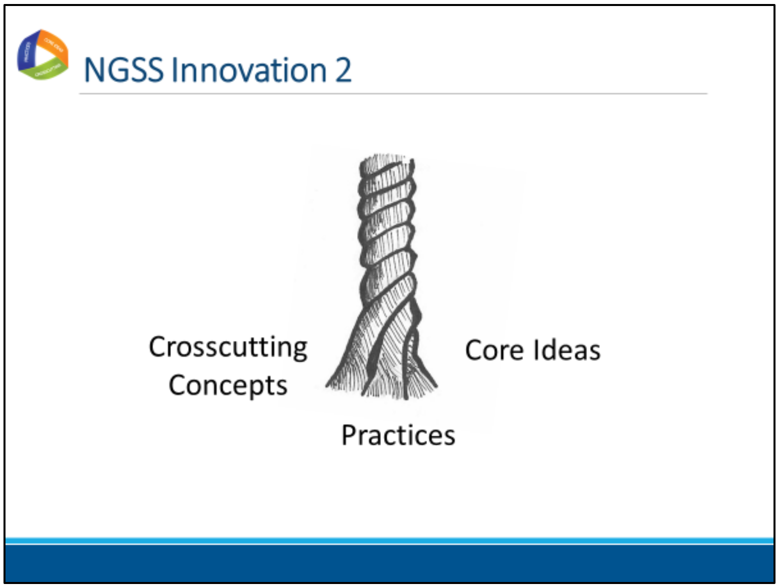
Slide 68

Facilitator Notes:

- This slide explains the third prescreen criteria.
- Build on the conversations that you had earlier this session about the three dimensions.

Talking Points:

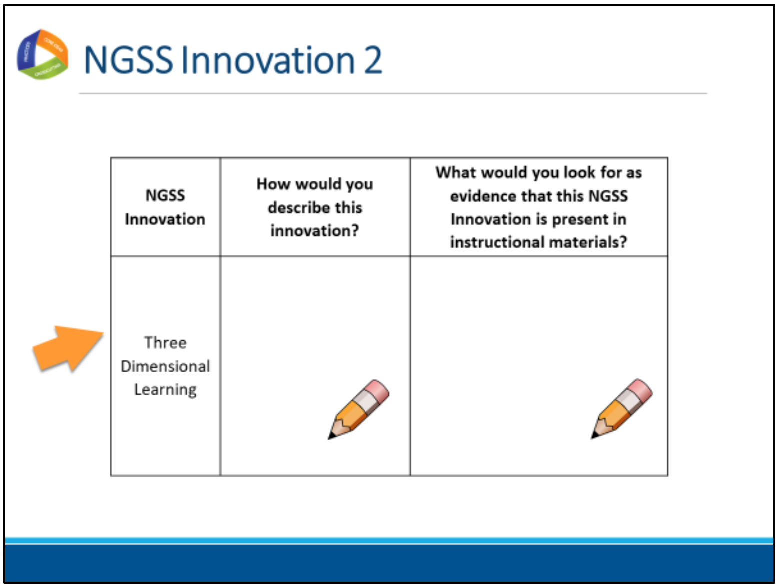
- The second criterion specifically and only focuses on whether each of the three dimensions are present in the materials. The third criterion focuses on whether the three dimensions are integrated for instruction and assessment.
- Take a minute to read the criterion on the slide.



Slide 69

Talking Points:

- The previous criterion looked for evidence to see if the three dimensions were present.
- However, the three dimensions need to work together, and they should not be taught in isolation. In instruction and assessment, when students makes sense of phenomena or design solutions to problems, their performances should integrate elements of all three dimensions.
- The standards are written as three-dimensional performance expectations and this was both intentional and significant, as it signals that three-dimensional performances should be reflected in the learning experiences in instructional materials.
- Therefore, it is not enough to see just the presence of the practices, or crosscutting concepts, or core ideas in instructional materials. There needs to be evidence that all three of these are purposefully integrated in student performances for both instruction and assessment.



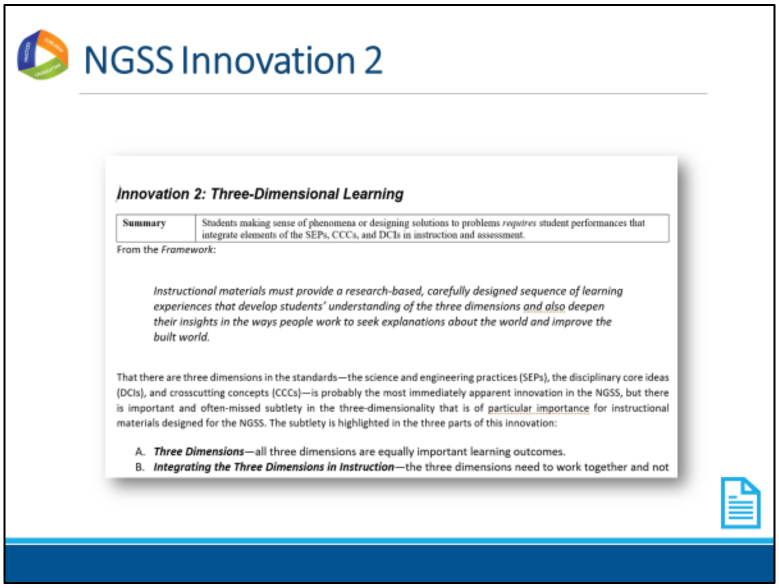
Slide 70

Facilitator Notes:

- Participants will need their copy of *Handout 1 – NGSS Innovations* that they began to fill out earlier in the session.

Talking Points:

- Let’s go back to our *NGSS Innovations* handout.
- Turn to page 2 in the handout.
- How has your description of the second NGSS Innovation changed? Take a few minutes to talk to your group and come up with a working group description for three-dimensional learning. Write your new description of this innovation in the table. *[Note to facilitator: Click for animation.]*
- Based on what you have learned about three-dimensional learning in the immersion activity and through our discussion, what would look for as evidence that this NGSS innovation is present in instructional materials? Discuss your thoughts with your group and then write your thoughts down in the table. *[Note to facilitator: Click for animation.]*



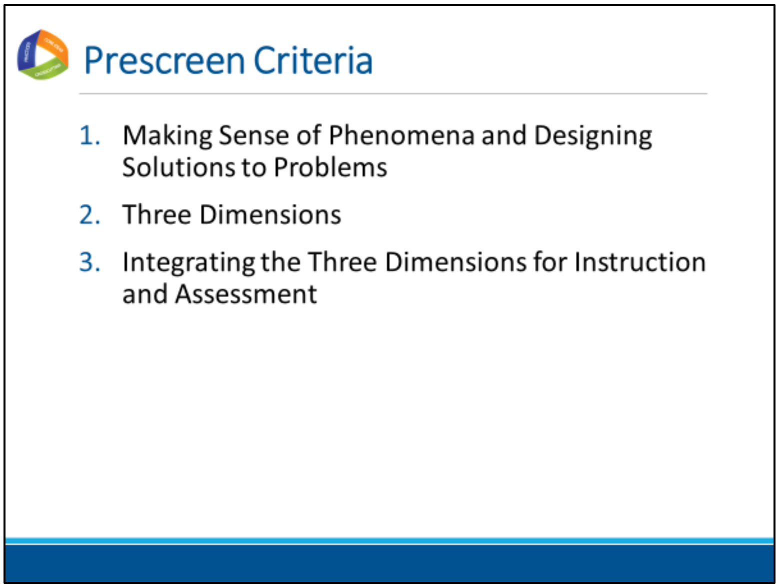
Slide 71

Facilitator Notes:

- Participants will need a copy of *Handout 14 – Innovation Two*.

Talking Points:

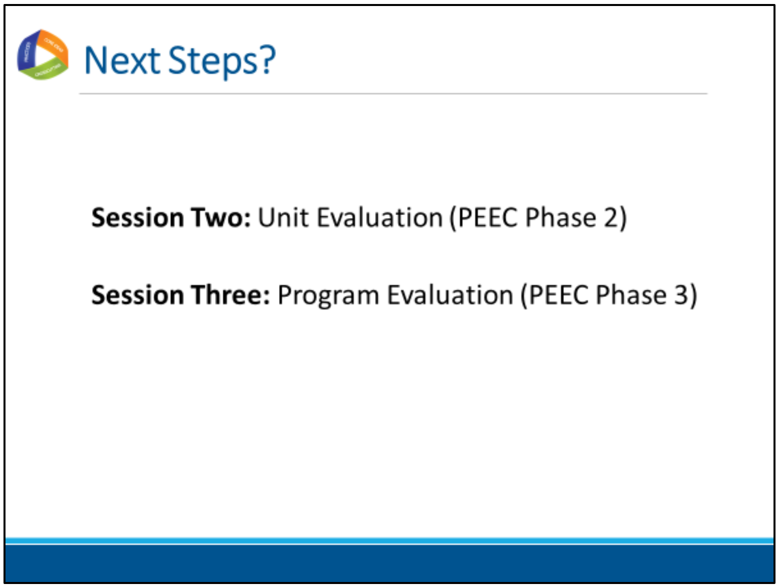
- Let's look at some statements of what NGSS designed programs should look less like and what they should look more like when considering the two three-dimensional learning criteria.
- Pull out your copy of the copy of the *Innovation Two* handout.
- Take a few minutes to read over this handout.
- Turn to the Three-Dimensional Learning table in the handout.
- As you dig through instructional materials programs in the next two sessions, you will be searching for evidence of the points on the right-hand side. These are all the things we are looked for in the instructional materials programs in the prescreen. If a lot of the ideas from the right column appeared in the instructional materials, there was at least some evidence of NGSS design.
- If a lot of the ideas from the left column appear in the instructional materials, there is some evidence of the materials not being completely designed for the NGSS.
- Take a few minutes to go back to your *NGSS Innovations* handout and add in any additional thoughts in the third row of page two in the handout. Discuss your thoughts with your group. Especially focus on any new ideas about what you would look for as evidence that this NGSS Innovation is present in instructional materials.
- *Note to facilitator: It may be helpful to have a whole group share out after individual teams have completed their discussions.*



Slide 72

Talking Points:

- The leadership team used the tool associated with each of the three prescreen criteria to look for evidence of that criteria in all the instructional materials programs that were submitted.
- The programs that showed evidence for this criteria in the tools, show that there is some promise of NGSS design. These programs will be further evaluated to see if there is NGSS design at the unit level and at the entire program level.



Slide 73

Facilitator Notes:

- Make sure participants understand what they will be doing in the next two sessions.

Talking Points:

- You will learn about and apply the unit evaluation process from the second phase of PEEC during our next session. The programs that pass that evaluation phase will go through to the final evaluation round. In Session 3, you will learn about and use the program evaluation process, which is the final part of the PEEC process.
- Do you have any questions about the prescreen criteria, what the leadership team did during the prescreen, or what you will be doing in the next two sessions?

Professional Learning Session Two: PEEC Unit Evaluation (Days 2 & 3)

The purpose of this session is to build participants' understanding of the Educators Evaluating the Quality of Instructional Products (EQuIP) Rubric for Science, use the PEEC Unit Evaluation process to evaluate the NGSS design of units in instructional materials programs, and select the programs that will move on to the final evaluation process. Once instructional materials programs have been established by the PEEC Prescreen to at least have the appearance of being designed for the NGSS, the next step is to look at a full unit to evaluate evidence for the rest of the NGSS Innovations. The EQuIP Rubric for Science provides criteria by which to measure the alignment and overall quality of units with respect to the NGSS, and is used as the tool for unit evaluation in this phase. The unit evaluation will help select the programs that will move on to the final evaluation phase.

It should be noted that the facilitator notes and talking points for this session assume that the broader group went through Session One of this professional learning path. If you skipped or modified what was done in Session One, you will need to pay close attention in revising this session to flow from the professional learning experiences the team has already experienced.

Logistics & Materials

- If reviewers have access to computers, they will be to type up their evidence for each tool in the PEEC process. This is highly recommended, as it will allow them to capture more of their ideas and group discussions. A fillable PDF version and a Microsoft Word version of PEEC can be found at https://www.nextgenscience.org/peec. A fillable PDF version a Microsoft Word version of EQuIP Rubric for Science v.3 can be found at https://www.nextgenscience.org/resources/equip-rubric-lessons-units-science.
- Reviewers will need to be able to look up the standards and NGSS appendices, either digitally or in print format.
- The number of PEEC Tool handouts that will be needed will depend on the number of instructional materials programs that need to be reviewed for the unit evaluation phase.
- The presentation requires a computer, projector, and speaker system.

Handouts needed:

- Handout 1 – NGSS Innovations
- Handout 4 – NSTA DCIs Matrix
- Handout 5 – NGSS Appendix F
- Handout 6 – NGSS Appendix G
- Handout 13 – Innovation One
- Handout 14 – Innovation Two
- Handout 15 – Innovation Three
- Handout 16 – Innovation Four
- Handout 17 – Innovation Five
- Handout 18 – EQuIP Rubric for Science
- Handout 19 – Using Phenomena in NGSS-Designed Lessons and Units
- Handout 20 – Graphic Example of Coherence
- Handout 21 – STEM Teaching Tool Equity Overview
- Handout 22 – Formative Assessment Vignettes
- Handout 23 – Tool 3 – Unit Selection Table
- Handout 24 – Tool 4 – EQuIP Rubric Data Summary

Considerations

How will you select the unit for evaluation?

Before beginning the second phase of the PEEC process, you will need to decide what unit you will choose to evaluate in the instructional materials programs. Depending on the amount of time that you have and the structure of your evaluation, you can either have the leadership team choose the unit you will evaluate before the session begins, or you can let the teams go through the process of selecting one during the session. Whether you select the units or allow the teams to select them, you can follow the same recommended process:

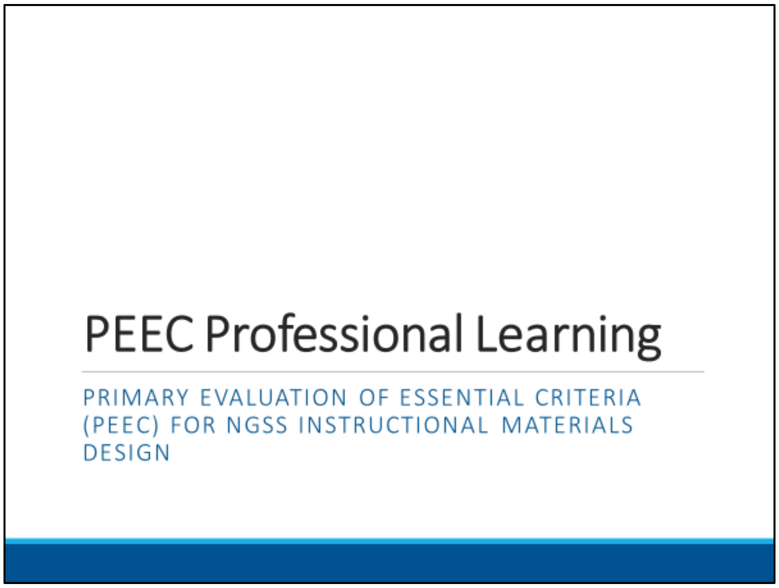
1. Define the size of a "unit." Since it will need to be consistent across programs, the word "unit" will be used loosely. It is possible that what is considered a "unit" in one program is considered several units in another program, so reviewers will need to agree on what exactly defines a "unit" for the purposes of this evaluation and that works across the programs that are being reviewed. The following should be considered when developing the definition:
    a. For the purposes of EQuIP and PEEC, a unit is defined as, "a coherent set of lessons that extend over a longer period of time."
    b. The "unit" should include sufficient length for students to explain at least one phenomenon and/or design a solution to at least one problem.
    c. Students should also be engaged in at least one three-dimensional student performance, and have their learning measured across the three dimensions of the standards.
    d. Try to find a chunk of material that consists of several different types of lessons or activities.
    e. It is possible that what is packaged as a unit in one program is split across several different areas of another program because of the way the different programs are organized. This is okay, and you will have to be careful to make sure you cover the same concepts across the different programs. For example, if you choose "energy" as your unit in the life sciences discipline, it is possible that one program has an energy unit that includes energy transfer in an ecosystem and energy flow in organisms (covering photosynthesis and cellular respiration) together, but that another program has different sections for photosynthesis, cellular respiration, and energy in the ecosystem, and they are in different "units" for this second program. Even though they are in different units for the second program, you would still lump them together for your evaluation as they make up your chosen "energy" unit.
2. Select the unit that you will receive across the instructional materials programs. Consider the following when selecting a unit:
    a. The unit will need to be consistent across all the instructional materials programs that will be reviewed (in a particular grade band and/or discipline). For example, if you are evaluating programs for high school by discipline, all the life sciences programs will need to have the same unit evaluated.
    b. Think about what unit might be the most "telling" or descriptive of the overall quality of alignment of the instructional materials program. Is there a particular unit in your discipline that you know program developers have struggled with in the past or have included only the bare minimum for? Is there a unit that you feel would require extra thoughtful integration of the dimensions?
    c. Think about what concepts connect to standards that are required in the course the program will be used and what concepts do not have official standards and are optional. Choose a unit with concepts that connects to required standards.
    d. Check to see if the concepts in the unit you select exist in all the programs that will be reviewed. Remember, as instructional materials programs are being designed for the NGSS, it is possible that some programs are completely reorganizing units to better reflect three-dimensional

learning. Not containing a unit title does not necessarily mean that the unit's concepts are not located elsewhere in the program. However, if any of the programs in fact do not contain the concepts in a unit, then switch to another unit. Make a note that the programs do not contain these topics (especially if they are required student learning expectations for your district, as you may not be able to ultimately recommend materials that do not contain learning for all standards).

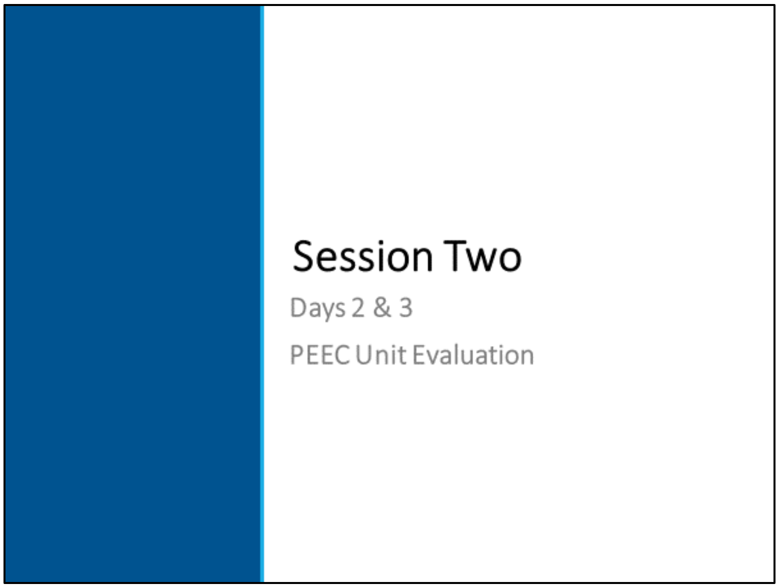
   e. Consider the expertise of the review team. Will the review team members be comfortable understanding and finding evidence for the DCIs that are the focus of student learning in the selected unit?

3. Identify what sections of a program your selected unit includes for each program. Write down the page numbers and sections from each program that makeup the "unit" you have selected, in the *Unit Selection Table Handout.* The unit evaluation should also include the support materials that correspond with the unit of instruction. The only caveat to this would be if these materials will not be available to the teachers who will be implementing the program.

Slides



Slide 1

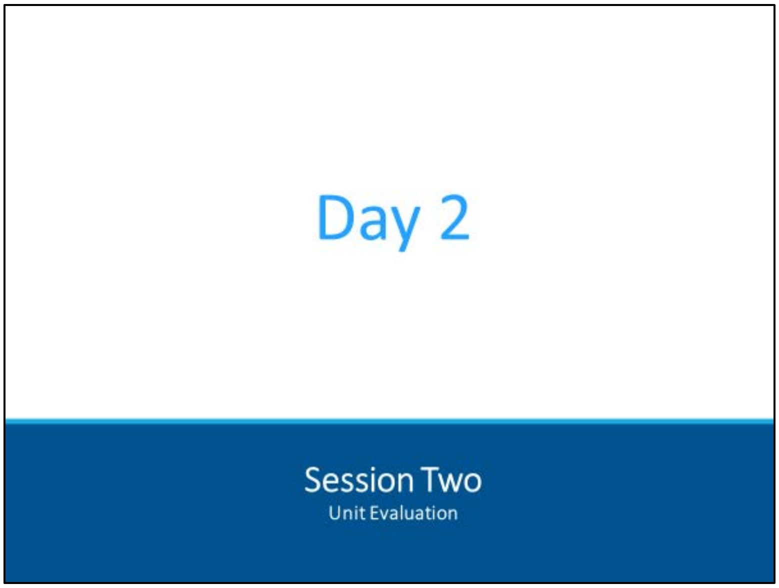


Slide 2

Facilitator Notes:

- Once instructional materials programs have been established by the PEEC Phase 1: Prescreen to at least have the appearance of being designed for the NGSS, the next step is to look at a full unit in each program to evaluate evidence for the rest of the NGSS Innovations. The Leadership Team has already applied the Prescreen (in the Leadership Team Planning Session) and narrowed down the list of instructional materials programs for the second phase of PEEC. The entire review group will now look at the narrowed list of programs and apply the Unit Evaluation from Phase 2 of PEEC. This second phase uses the *Educators Evaluating the Quality of Instructional Products (EQuIP) Rubric for Science* to measure the alignment and overall quality of units with respect to the NGSS.

- If all participants are proficient in using the EQuIP Rubric for Science, then you can skip (or at least modify) the slides in this section designated by the diverging arrow.
- If participants are familiar with the rubric but have not been through at least a 2-day professional learning session to learn how to use the rubric, it is recommended to go through all the slides to make sure everyone has the same understanding of the criteria before they begin the second phase evaluation.



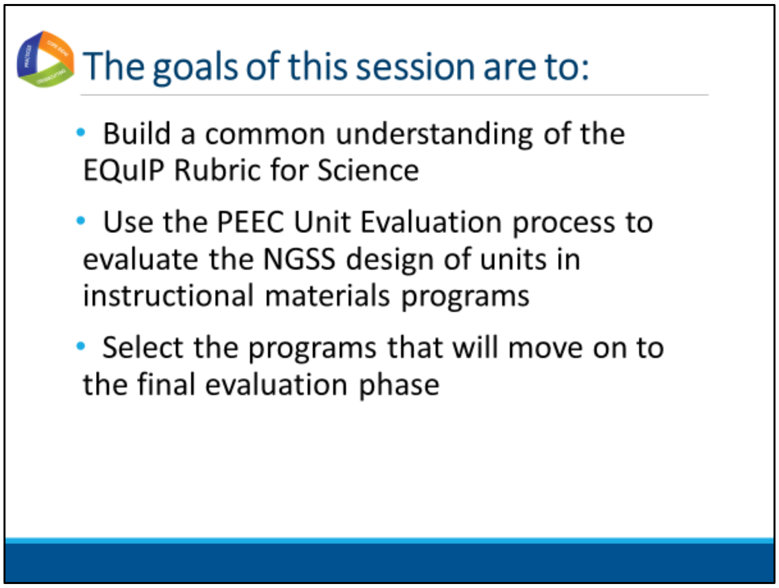
Slide 3

Facilitator Notes:

- Participants will learn about the PEEC Phase 2 Unit Evaluation by using the process to evaluate an instructional materials program. Participants will then apply the process to the remaining instructional materials programs.
- Participants should be seated in groups. The type of groups and number of people in each group will vary by the type of review that you are doing.
    - For example, if this session is part of a review and selection process for a single grade's instructional materials program, such as a 3rd grade program, then the participants do not need to be separated by grade or discipline. You can divide the participants up into groups of four-six and all participants can evaluate all the programs that passed the prescreen (if you have adequate time). You may wish to group participants with varying levels of knowledge (i.e. spread out educators who have an understanding of the NGSS into separate groups), to allow for a rich discussion with multiple perspectives. The leadership team can be split across the groups, with one person from the leadership team serving as the table facilitator for each group.
    - If this session is part of a middle school review and selection process, and programs need to be selected per discipline, then you can create three groups: one that will review life sciences programs; one that will review earth and space sciences programs, and one that will review physical sciences programs. Or, if you need to be even more specific, then the groups could be: Biology, Chemistry, Physics, and Earth Science. You can assign participants to a group based on their expertise. If any particular group has a lot of members, you can split that large discipline group into smaller groups.

Talking Points:

[Note to facilitator: Create talking points for a welcome and introductions. If people in the room do not know each other, include an ice breaker activity to get the day started.]



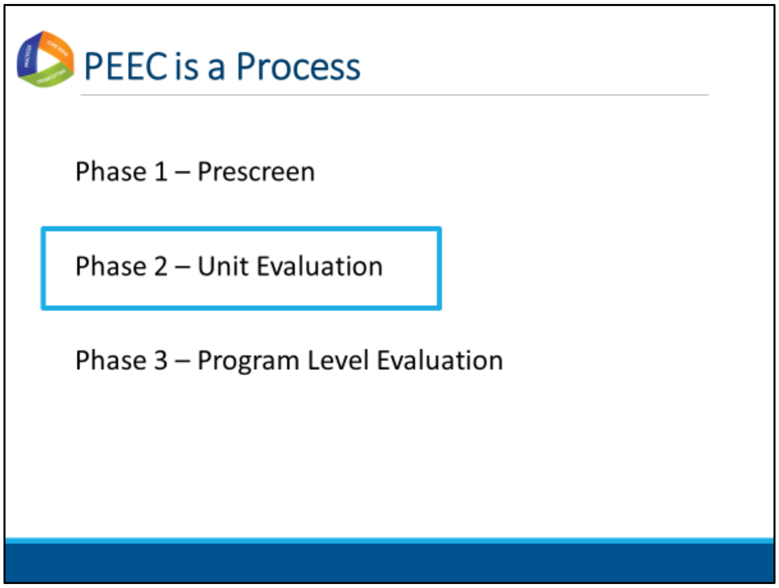
Slide 4

Facilitator Notes:

- Once instructional materials programs have been established by the PEEC Phase 1: Prescreen to at least have the appearance of being designed for the NGSS, the next step is to look at a full unit in each program to evaluate evidence for the rest of the NGSS Innovations. The Leadership Team has already applied the Prescreen (in the Leadership Team Planning Session) and narrowed down the list of instructional materials programs for the second phase of PEEC. The entire review group will now look at the narrowed list of programs and apply the Unit Evaluation from Phase 2 of PEEC. This second phase uses the *Educators Evaluating the Quality of Instructional Products (EQuIP) Rubric for Science* to measure the alignment and overall quality of units with respect to the NGSS.

Talking Points:

- The first goal of this session is to build a common understanding of the EQuIP Rubric for Science. Since the second phase of PEEC uses the EQuIP Rubric for Science to dig deep into a program's unit to look for evidence of NGSS design, you will learn how to use the EQuIP rubric.
- Since the ultimate goal of the session is to narrow the list of instructional materials programs that will move on to the final evaluation phase, you will use the PEEC Unit Evaluation process to evaluate the NGSS design of units in the programs to help select the programs that will move on.



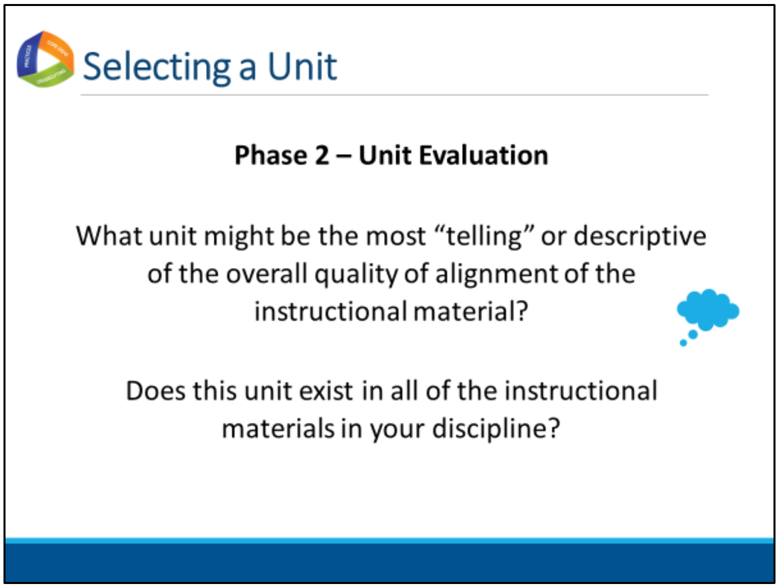
Slide 5

Facilitator Notes:

- Participants have already learned about the basics of PEEC process in Session One. This slide is an opportunity to refresh participants knowledge of the PEEC process, to provide brief descriptions of each phase, and to inform them what phases they will be participating in and over which days. Your talking points should be modified to reflect these points.

Talking Points:

- In the last session you learned a little about PEEC which is short for Primary Evaluation of Essential Criteria for NGSS Instructional Materials Design. Remember that PEEC is a process that can be used by educators to evaluate the NGSS design of instructional materials programs. The PEEC evaluation process involves three successive phases: first the prescreen, then the unit evaluation, and lastly the program level evaluation.
    - The first phase, the prescreen, focuses on a small number of criteria that should be readily-apparent in instructional materials designed for the NGSS. This allows those selecting materials to take a relatively quick look at a wide range of materials and narrow the number of programs worthy of a closer look.
    - If the prescreen of the materials indicates that there is at least the potential they are designed for the NGSS, they are put through the second phase of the PEEC process. The second phase uses the EQuIP Rubric for Science as a sampling tool to evaluate a unit of instruction for evidence it is designed for the NGSS.
    - For materials that successfully complete the second phase, the third and final phase of the PEEC process evaluates the evidence that the NGSS innovations are embedded across the entire instructional materials program.
- The leadership team has already applied the prescreen and has narrowed the list of instructional materials programs for consideration. The next step is for these programs to undergo the PEEC Unit Evaluation, which uses the EQuIP Rubric for Science to dig deep into a unit of an instructional materials program that has passed the prescreen. Over the next two days, you will be learning about and applying the PEEC Unit Evaluation to narrow the list of programs even further for the last evaluation phase.



Slide 6

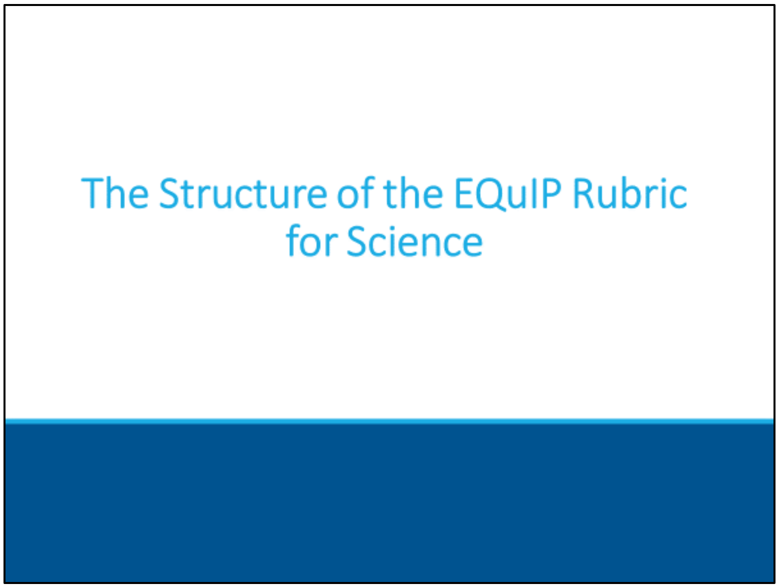
Facilitator Notes:

- Before beginning the second phase of the PEEC process, you will need to decide what unit you will choose to evaluate in the instructional materials programs. Depending on the amount of time that you have and the structure of your evaluation, you can either choose the unit you will evaluate before this session begins, or you can let the teams go through the process of selecting one. Whether you select the units or allow the teams to select them, you will follow the same process:
  - The unit will need to be consistent across all the instructional materials programs that will be reviewed (in a particular grade band and/or discipline). For example, if you are evaluating programs for high school by discipline, all the Life Sciences programs will need to have the same unit evaluated.
  - The size of a "unit" will need to be defined and clarified. Since it will need to be consistent across programs, the word "unit" will be used loosely. It is possible that what is considered a "unit" in one program is considered several units in another program. For the purposes of EQuIP and PEEC, a unit is defined as, "a coherent set of lessons that extend over a longer period of time." The "unit" should include sufficient length for students to explain at least one phenomenon and/or design a solution to at least one problem. Students should also be engaged in at least one three-dimensional student performance, and have their learning measured across the three dimensions of the standards. Try to find a chunk of material that consists of several different types of lessons or activities. It is possible that what is packaged as a unit in one program is split across several different areas of another program because of the way the different programs are organized. This is okay, and you will have to be careful to make sure you cover the same concepts across the different programs. For example, if you choose "energy" as your unit in the life sciences discipline, it is possible that one program has an energy unit that includes energy transfer in an ecosystem and energy flow in organisms (covering photosynthesis and cellular respiration) together, but that another program has different sections for photosynthesis, cellular respiration, and energy in the ecosystem, and they are in different "units" for this second program. Even though they are in different units for the second program, you would still lump them together for your evaluation as they make up your chosen "energy" unit.
  - Think about what unit might be the most "telling" or descriptive of the overall quality of alignment of the instructional materials program. Is there a particular unit in your discipline that you know program developers have struggled with in the past or have included only the bare minimum for? Is there a unit that you feel would require extra thoughtful integration of the dimensions?
  - Check to see if the concepts in the unit you select exist in all of the programs in your discipline.
  - Consider the expertise of the review team. Will the review team members understand and be able to find evidence for the DCIs in the unit selected?

- The general talking points below will help guide the conversation, if the teams will be choosing what unit they will review. If you have already chosen the units, you should inform the teams what units have been selected for each grade level and discipline and should inform them of the reasoning behind why you chose those units.
- Participants will need a copy of *Handout 23 – Tool 3 – Unit Selection Table.*

Talking Points:

- To begin work on this phase, we will need to decide what unit we will be evaluating. The unit that you choose will need to be consistent across all the instructional materials programs that you will be reviewing. Since it will need to be consistent across the programs, the word "unit" will be used loosely. It is possible that what is considered a "unit" in one program is considered several units in another program. For the purposes of EQuIP and PEEC, a unit is defined as, "a coherent set of lessons that extend over a longer period of time." The "unit" should include sufficient length for students to explain at least one phenomenon and/or design a solution to at least one problem. Students should also be engaged in at least one three-dimensional student performance, and have their learning measured across the three dimensions of the standards. *[Note to facilitator: If you are doing an instructional materials review for middle school or high school and need separate programs for each discipline, you can choose a different unit for each discipline. For example, you can choose "Energy" for biology and "sustainability" for earth and space sciences.]*
- To help you think about what unit to choose, think through the following questions:
    - What unit might be the most "telling" or descriptive of the overall quality of alignment of the instructional material?
    - Does this unit exist in all the instructional materials in your discipline? *[Note to facilitator: It may be helpful to discuss the idea that as instructional materials programs are being designed for the NGSS and focusing more on students using the three dimensions to make sense of phenomena and design solutions to problems, it is quite possible that the units may not be as easily comparable in topic and organization as they once were. For example, most current high school biology texts have a single Biology unit focused on photosynthesis. However, as instructional materials programs designed with the NGSS Innovations in mind are developed, the DCI information related to photosynthesis may be spread out through both Chemistry and Biology courses, and the concepts might be developed through several different instructional units.]*
- Take fifteen minutes to look through the programs, and as a group, choose a unit that you will review for all of the programs. Keep the two questions on the screen in mind as you choose a unit. Use *Tool 3 – Unit Selection Table* to help keep track of the units from the different programs. It is possible that what is packaged as a unit in one program is split across several different areas of another program because of the way the different programs are organized. This is okay, and you will have to be careful to make sure you cover the same concepts across the different programs. Write down the page numbers and sections from each program that makeup the "unit" you have selected, in the *Unit Selection Table Handout. [Note to facilitator: Depending on the number of programs that need to be evaluated, it may take participants slightly longer to select a unit.]*



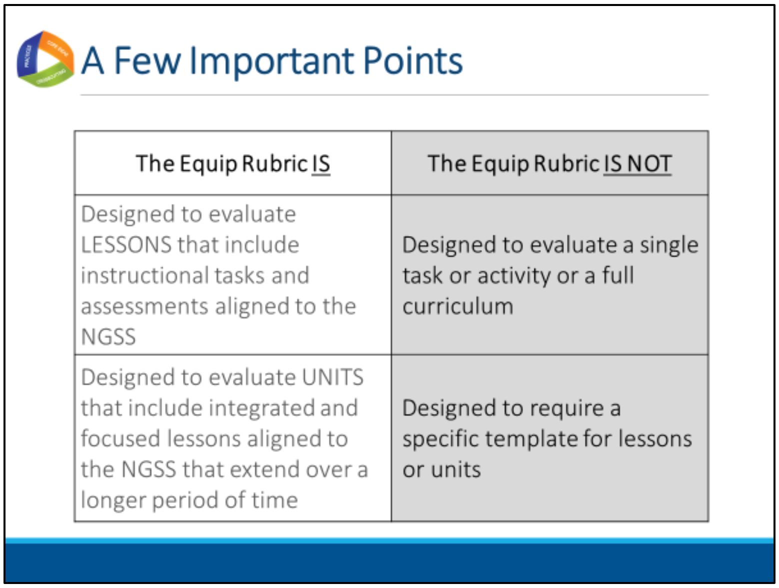
Slide 7

Facilitator Notes:

- This section teaches participants how the EQuIP Rubric is structured. It is important for participants to have a general understanding of how the criteria are organized in the rubric before they use the rubric to evaluate instructional materials programs. The goal is not for them to understand the individual criteria, but rather how the criteria are organized.

Talking Points:

- Now that you have a selected a unit to review, let’s learn about the EQuIP Rubric and how you can use it to evaluate units.



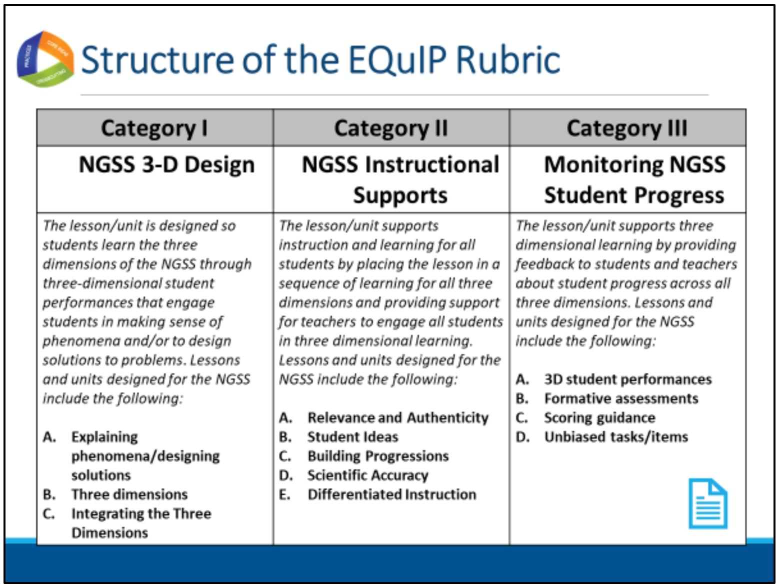
Slide 8

Facilitator Notes:

- This slide covers the main points about what the EQuIP Rubric is designed for and what it is not designed for.

Talking Points:

- The unit chosen from each instructional materials program will be evaluated by the full EQuIP Rubric for Science.
- The EQuIP Rubric for Science provides criteria by which to measure the alignment and overall quality of lessons and units with respect to the NGSS.
- As defined by the EQuIP Rubric:
    - A lesson is a coherent set of instructional activities and assessments that may extend over a few to several class periods or days; and
    - A unit is a coherent set of lessons that extend over a longer period of time.
- With these definitions in mind, it is important to note that the lessons the EQuIP Rubric is designed to evaluate may extend over a few class periods or days.
- Any single task, activity, or mini-lesson would not be suitable for use with the EQuIP Rubric as it would likely not include instructional supports and assessments, two of the categories of the rubric. Likewise, the EQuIP Rubric is not appropriate for reviewing a full curriculum; however, the rubric could be used to review specific lessons or units within the curriculum, and this is how we will be using the rubric.
- Finally, the EQuIP Rubric does not require that lessons or units be put into a specific format in order to be evaluated against the rubric criteria.



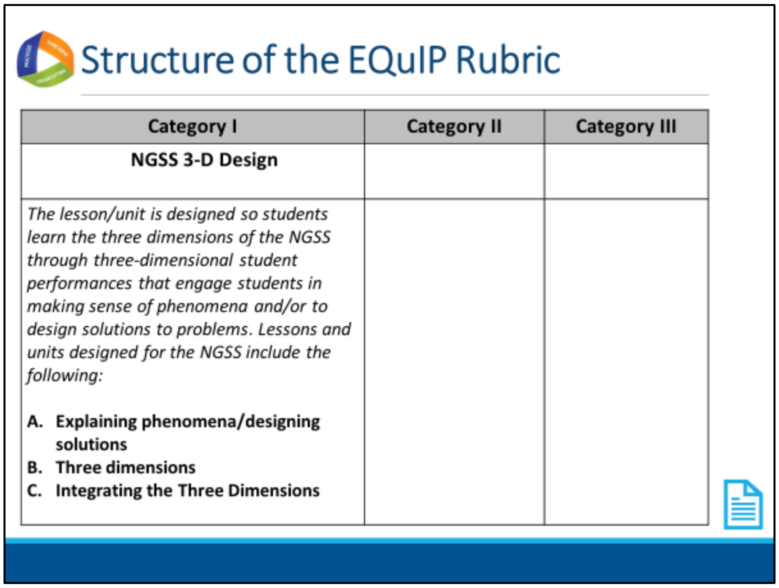
Slide 9

Facilitator Notes:

- The next few slides discuss how the EQuIP Rubric organizes criteria. It is important for participants to have a general understanding of how the criteria are organized in the rubric before they use the rubric to evaluate instructional materials programs.
- Participants will need a copy of *Handout 18 – EQuIP Rubric for Science.* Encourage participants to look at their copy of the EQuIP Rubric as you talk about its structure. It will be easier for them to read the charts in the paper copies in front of them than on the screen.

Talking Points:

- Please get out your copy of the EQuIP Rubric for Science.
- Before we dig into the structure of the EQuIP Rubric, turn to page two of the rubric—the back of the first page—and take a few minutes to circle important terms that jump out at you as you read through the page. *[Note to facilitator: Allow three to five minutes for participants to circle terms then ask several to share. Keep this sharing non-evaluative and avoid responding to participants with words such as “good” or “great,” which tend to signify right or wrong answers.]*
- Now let’s dive deeper into the rubric.
- The rubric organizes criteria into three categories: NGSS 3-D Design, NGSS Instructional Supports, and Monitoring NGSS Student Progress.
- Instructional materials will be examined against the criteria in each category.
- As you can see, each category is structured with criteria for a lesson or unit at the top and additional criteria for a unit or longer lesson at the bottom. Since we are evaluating units, we will be using both the lesson and unit criteria.
- Within each category, specific criteria and sub-criteria are delineated, with uppercase Arabic letters (A, B, C, etc.) representing the main criteria and lowercase Roman numerals (i, ii, iii, etc.) representing the sub-criteria.
- Working collaboratively, educators can use common standards for quality and to generate evidence-based commentary on the quality and alignment of materials.
- A rating scale is found for each category as well as category ratings and a total score for the entire rubric.



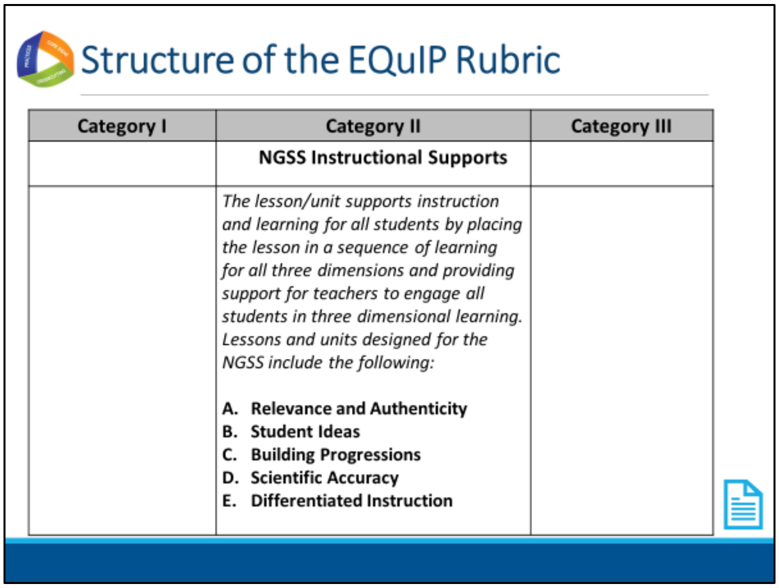
Slide 10

Facilitator Notes:

- The next few slides discuss how the EQuIP Rubric organizes criteria. It is important for participants to have a general understanding of how the criteria are organized in the rubric before they use the rubric to evaluate instructional materials programs.
- Participants will need a copy of *Handout 18 – EQuIP Rubric for Science.* Encourage participants to look at their copy of the EQuIP Rubric as you talk about its structure. It will be easier for them to read the charts in the paper copies in front of them than on the screen.

Talking Points:

- The first category is NGSS 3D Design. This includes supporting students in three-dimensional learning to explain phenomena or design solutions *and* ensuring lessons fit together coherently and develop connections. These criteria are very similar to the criteria that we discussed for the PEEC Phase 1 Prescreen.
- Examining a lesson or unit against the criteria in Category I: NGSS 3D Design, may reveal evidence related to Category II: NGSS Instructional Supports and/or Category III: Monitoring NGSS Student Progress; however, the EQuIP process involves examining a lesson or unit against only the criteria for Category I before moving on to Category II and finally to Category III.



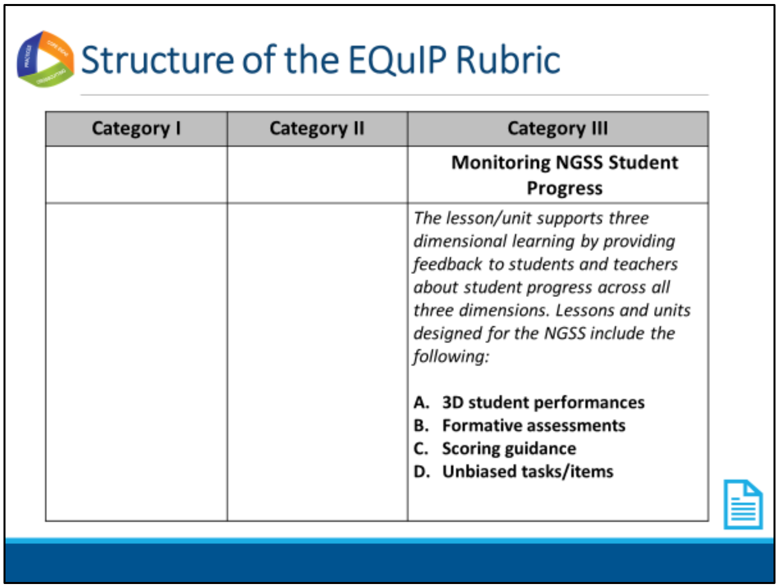
Slide 11

Facilitator Notes:

- The next few slides discuss how the EQuIP Rubric organizes criteria. It is important for participants to have a general understanding of how the criteria are organized in the rubric before they use the rubric to evaluate instructional materials programs.
- Participants will need a copy of *Handout 18 – EQuIP Rubric for Science.* Encourage participants to look at their copy of the EQuIP Rubric as you talk about its structure. It will be easier for them to read the charts in the paper copies in front of them than on the screen.

Talking Points:

- Now let's look more closely at Category II: NGSS Instructional Supports. Category II focuses on supporting three-dimensional teaching and learning for all students by placing the lesson/unit in a sequence of learning for all three dimensions and providing support for teachers to engage all students.
- Criteria and sub-criteria focus on engaging students in three-dimensional learning that is relevant, authentic, and connected to students' experiences.
- In addition, this category includes criteria related to providing guidance to help teachers build coherence and to provide and adjust supports for students to make students increasingly responsible for their learning.



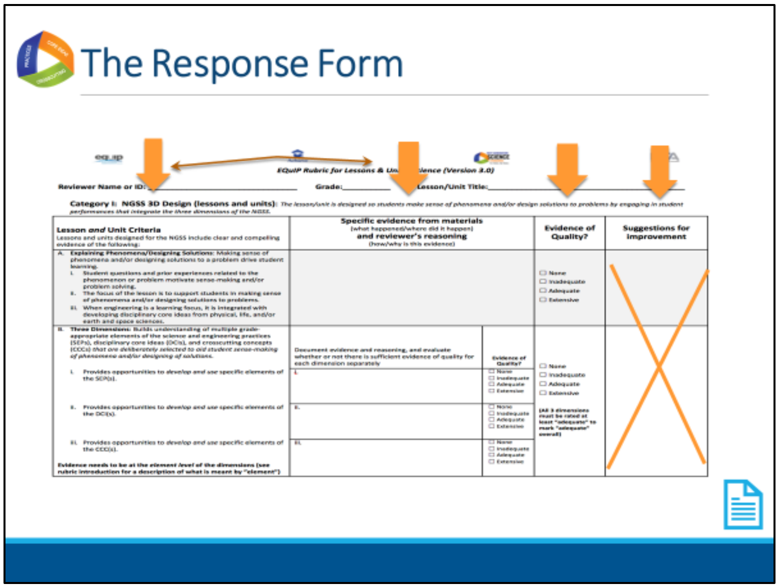
Slide 12

Facilitator Notes:

- The next few slides discuss how the EQuIP Rubric organizes criteria. It is important for participants to have a general understanding of how the criteria are organized in the rubric before they use the rubric to evaluate instructional materials programs.
- Participants will need a copy of *Handout 18 – EQuIP Rubric for Science.* Encourage participants to look at their copy of the EQuIP Rubric as you talk about its structure. It will be easier for them to read the charts in the paper copies in front of them than on the screen.

Talking Points:

- The third category, Monitoring NGSS Student Progress, ensures that assessments elicit observable evidence of three-dimensional learning, include formative assessments, and are accessible and unbiased.
- It also ensures that all assessments—pre-, formative, and summative—are aligned to three-dimensional learning.
- We've just had a brief overview of the criteria in the EQuIP Rubric by examining how it's structured. Each of these three categories and their criteria will be discussed in greater detail as we begin to use the rubric.



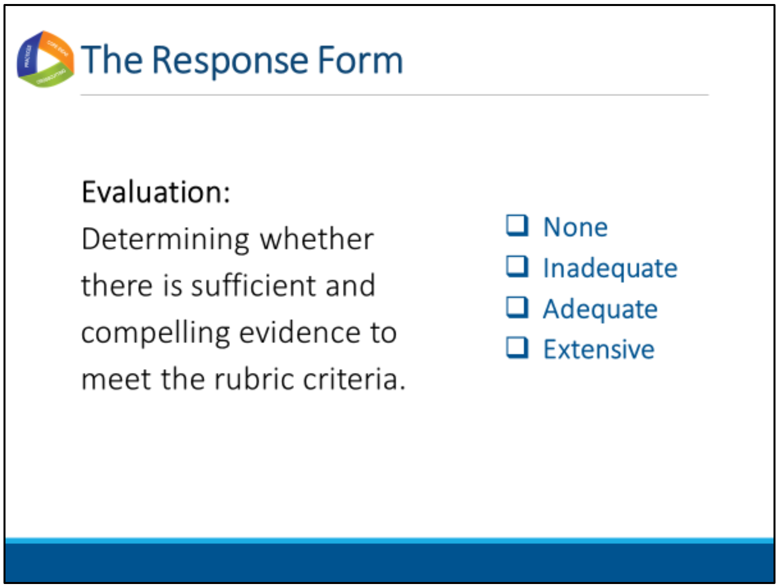
Slide 13

Facilitator Notes:

- The next few slides discuss how the EQuIP Rubric organizes criteria. It is important for participants to have a general understanding of how the criteria are organized in the rubric before they use the rubric to evaluate instructional materials programs.
- Participants will need a copy of *Handout 18 – EQuIP Rubric for Science.* Encourage participants to look at their copy of the EQuIP Rubric as you talk about its structure. It will be easier for them to read the charts in the paper copies in front of them than on the screen.

Talking Points:

- Let's take a look at the response form section of the rubric and how you will fill it out. This begins on page six of the rubric document.
- When using the response form, you will first record your name as the reviewer, the title of the program and the unit, and the grade level for which the unit is intended for at the top of the form. *[Note to facilitator: Click for animation.]*
- The first column of the response form lists the category and the criteria to which you are responding. *[Note to facilitator: Click for animation.]* The example on this slide shows Category I. Subsequent pages of the response form have Categories II and III.
- As you examine instructional materials, the second column of the response form is used to record evidence and reasoning. *[Note to facilitator: Click for animation.]*
- After examining the instructional materials and recording evidence from the unit as well as why or how this evidence is an indicator of the rubric criterion being met (the reasoning), the third column *[Note to facilitator: Click for animation.]* is for recording the degree to which the evidence could be identified. Finally, the last column of the form is used to record suggestions for improvement. *[Note to facilitator: Click for animation.]* Because we are using the EQuIP rubric as part of the PEEC process, and are not giving suggestions for improvement back to the developers, we will not be filling out this column. *[Note to facilitator: Click for animation.]*



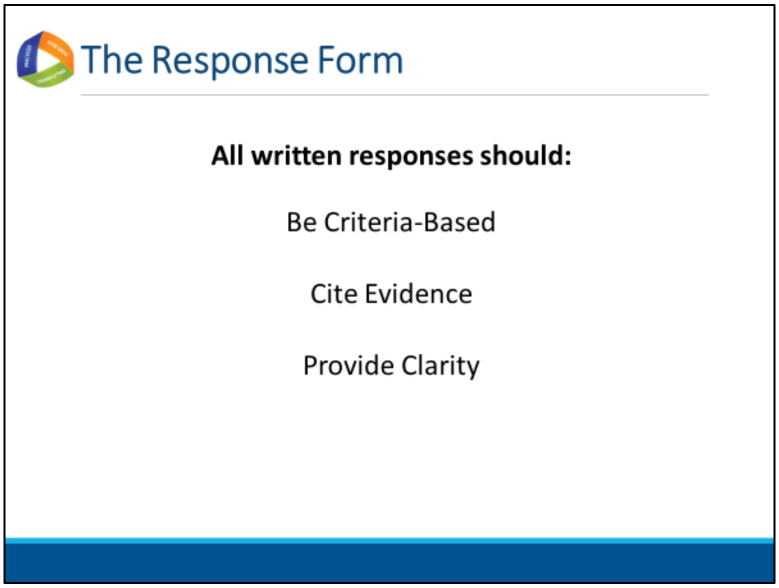
Slide 14

Facilitator Notes:

- Evaluation will be one of the most important conversations that groups will have, because they will be determining whether there is sufficient and compelling evidence to meet the rubric criteria. In order to have productive conversation about evaluation, participants will need to understand the quality of evidence they will be looking for. The type and quality of evidence was discussed in Session One, is reiterated in this slide, and will be reinforced later in this session as well.

Talking Points:

- Finding evidence to meet the rubric criteria is both an individual and collaborative process.
- The rules for finding evidence that we discussed in Session One are the same for the EQuIP Rubric as well.
- Remember, when we discuss finding “evidence,” we need to make sure that the evidence we are using to back up our claim of whether something is present or not in a lesson is extremely explicit. We need to be able to see the evidence, point to it, highlight it, or quote it directly from what is written.
- Your evidence and reasoning statements that will go in the second column of the EQuIP rubric will need to be detailed and clear because after you individually receive time to look for and record evidence, you will work with your group to discuss the evidence and collaboratively determine whether there is sufficient and compelling evidence to say that the unit meets the rubric criteria and to evaluate the degree to which the rubric criteria are met.
- *[Note to facilitator: Click for animation.]* These evaluations can range from none, to inadequate, to adequate, and finally extensive. As a team, you will discuss the criteria and determine the degree to which clear and substantial evidence was found that the criteria have been met. Then, the group will enter a 0–3 rating for the category.
- Note that evaluation differs from reasoning as we defined it previously. Reasoning just makes the connection between the explicit evidence and what that evidence represents—for example, practices, disciplinary core ideas, or crosscutting concepts. In this step, we evaluate whether the evidence is sufficient and compelling enough to say, for example, that the practices, disciplinary core ideas, and crosscutting concepts work together to support students in three-dimensional learning to make sense of phenomena or design solutions to problems—in other words, sufficient and compelling enough to meet the stated rubric criteria.



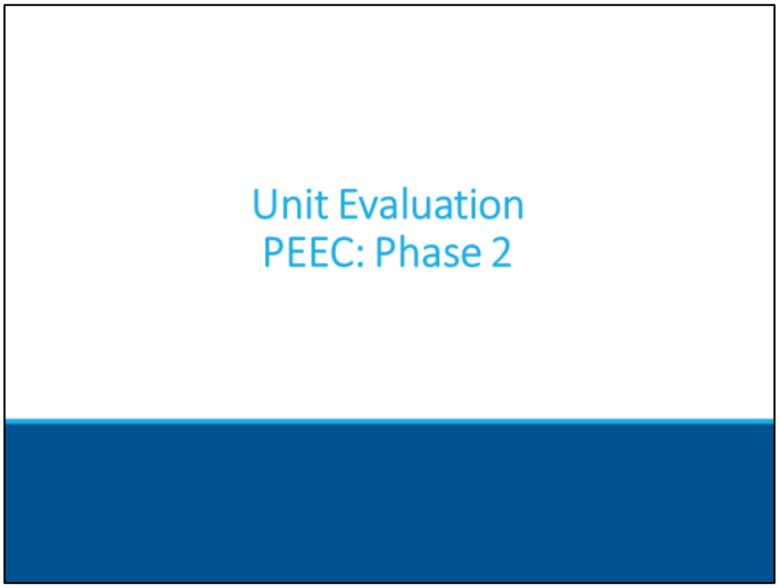
Slide 15

Facilitator Notes:

- Participants should understand that all the comments they write in the EQuIP Rubric should not contain any opinions or personal comments. All comments should focus on the criteria in the rubric, should include specific evidence for whether each criterion was met or not. The comments should be easy to read and understand, constructed in a manner keeping with basic grammar, spelling, and sentence structure conventions.

Talking Points:

- Regardless of whether the comments provided on the response sheet are feedback, evaluation, or guidance, all comments should adhere to the following guidelines:
  - Be Criteria-Based:
    - Written comments should be based on the criteria used for review.
    - No extraneous or personal comments should be included.
    - The comment for a particular criterion should only be focused on finding evidence for that criterion, and should not include evidence for other criteria in the rubric.
  - Cite Evidence:
    - Written comments should show that the reviewer looked for evidence in the lesson or unit for each criterion.
    - Examples are provided that cite where and how the criteria are met or not met.
    - When citing evidence, the specific location of the evidence in the instructional materials should be identified. For example, include a page number or activity number, and identify what resource the evidence is from (student edition, teacher manual, etc.).
  - Provide Clarity:
    - Comments should be easy to read and understand, and should be in complete sentences.
    - Comments should be constructed in a manner keeping with basic grammar, spelling, and sentence structure conventions.
- Do you have any questions about how the EQuIP Rubric is organized or how to write comments in the rubric?



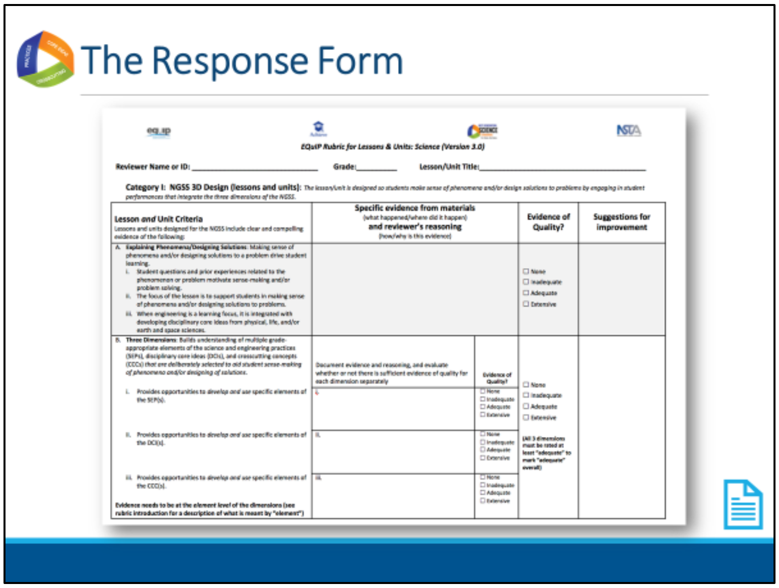
Slide 16

Facilitator Notes:

- Participants should be given all materials for the first instructional materials program that they will be evaluating. The leadership team that completed the prescreen and narrowed down the list of instructional materials program to review for the unit evaluation should have an idea of what programs may show the most promise of being designed for the NGSS. The team should choose one of those programs for each group's first unit evaluation. All groups will be guided through the first unit evaluation together to make sure they understand the criteria and what type of evidence they need to look for. As a lot of the criteria are introduced, there will be discussions about the criteria to build this understanding. If all groups are completing a unit evaluation on a program that shows some substantial promise, the discussions and hunt for evidence will be more fruitful and will help all the different groups stay on the timer schedule for each criterion. If a group begins an evaluation on a program that clearly has not much evidence of NGSS design, they will not be able to find evidence for the criteria, so they may sit around a lot longer waiting for the timer to signal the end of a criterion, and may not have as much to contribute toward discussion. Participants will be given a general overview of how they will complete the first evaluation in the next slide.
- Participants should receive all the support materials for the program such as student lab manuals, online activities, teacher manuals, etc. The only caveat to this would be if these materials will not be available to the teachers who will be implementing the program. In this case, only student materials that can be purchased for use should be evaluated.

Talking Points:

- *[Note to facilitator: Pass out the materials for the first instructional materials program to all of the groups. Participants should receive all of the support materials for the program such as student lab manuals, online activities, teacher manuals, etc. The only caveat to this would be if these materials will not be available to the teachers who will be implementing the program. In this case, only student materials that can be purchased for use should be evaluated.]*
- Let's begin the unit evaluation for our first instructional materials program.
- Take five minutes as a group to identify what parts of the program will be evaluated for the chosen unit. Refer back to the notes that you took in the *Tool 3 – Unit Selection Table* handout. Do you have any teacher manuals, student lab manuals, online activities, etc. for this program? Find the sections in each resource that you will be evaluating as part of the unit. It may be helpful to mark the pages with post-it notes and to write down the page numbers so that all group members are aware of what sections to evaluate. *[Note to facilitator: If participants have access to student lab manuals, electronic investigations, etc., then they should identify what parts of those resources will be evaluated as well as the textbook or the "main" body of the program.]*



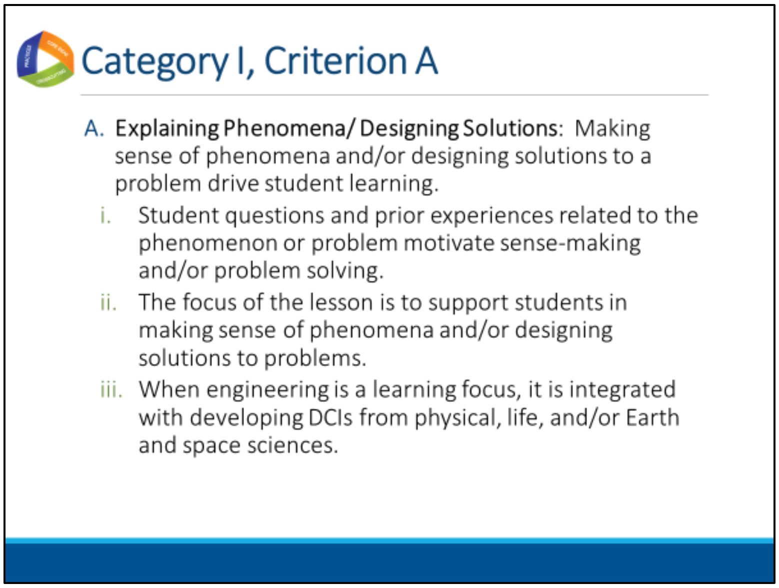
Slide 17

Facilitator Notes:

- This slide will provide participants with an overview of how they will complete their first unit evaluation.

Talking Points:

- Let's begin the unit evaluation for our first instructional materials program. Even though some groups may be evaluating different sets of programs, we will walk through the first evaluation as a whole group. We will go through each criterion in the rubric to make sure you understand what that criterion means and what type of evidence you will look for. You will find that we have already discussed some of the criteria in the immersion activity in Session One. For each criterion, you will receive time to look individually and quietly for evidence, and then will have time to discuss the evidence that you found in your group and decide whether there is enough evidence to meet the criterion. Remember that for our purposes, we will only be filling out the second and third columns of the EQuIP Rubric, and will not be filling out the "suggestions for improvement" column.
- After we walk through one-unit evaluation as a group and show you how to structure the evaluation, you will work in your groups to complete the rest of the evaluations.
- If you have questions at any point, feel free to ask!



Slide 18

Facilitator Notes:

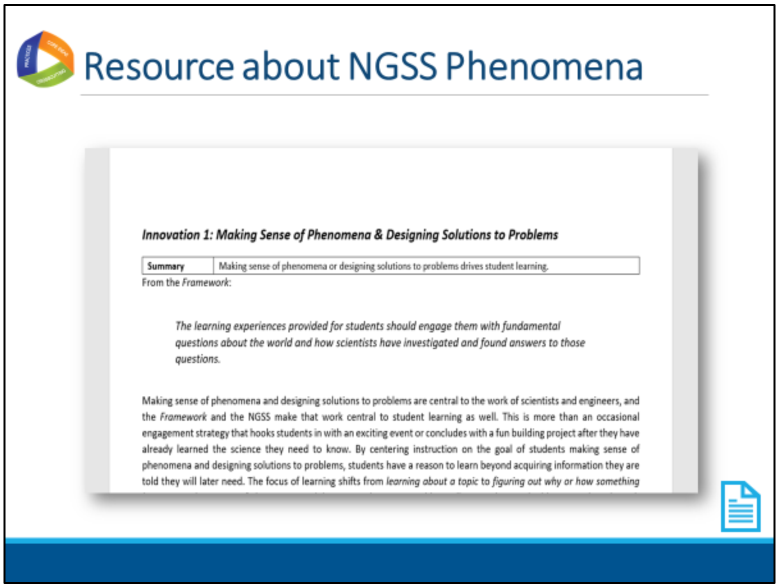
- For Category I, Criterion A, build on what participants learned in Session One. Participants spent some time learning about phenomena after the immersion activity in Session One, and you should build from that understanding, instead of trying to teach phenomena as a brand-new concept.
- Session One also focused heavily on understanding phenomena and did not spend as much time on designing solutions to problems. This is because participants often struggle with understanding what phenomena are and how they should be integrated in lessons designed for the NGSS, but often readily understand what designing a solution to problem means and should look like. The next two slides are included to reinforce participants' understanding of phenomenon. However, with all the emphasize on phenomena, it is important that participants read and understand the language in this criterion. The criterion states that "making sense of phenomena **and/or** designing solutions to a problem drive student learning." This means that for the purposes of the rubric, a phenomenon is not required for this criterion to be met. A common misconception is that a lesson needs a phenomenon even if the focus of the lesson is already on students designing a solution to a problem. If there is no phenomenon for a particular lesson, but there is sufficient evidence that designing a solution to a problem is *driving* student learning in the lesson, then the criterion can be met even without evidence for a phenomenon. A lesson does not need to have both a phenomenon and a problem. It just needs one of them. The *key* is that whether it is a phenomenon or a problem, it should be *driving* student learning. Students should not hear about the problem or the phenomenon for the first time at the end of the lesson. That means it did not drive their entire learning and was not the focus of the lesson.

Talking Points:

- Let's begin our evaluation by looking at the first criterion: Criterion A of Category 1, Explaining Phenomena and Designing Solutions.
- This criterion focuses on how making sense of phenomena or designing solutions to problems drives student three-dimensional learning. Take a few minutes to read through this criterion. *[Note to facilitator: Give participants a minute to read through the criterion.]*
- What are some key points that jump out at you? *[Note to facilitator: Ask a few participants to share. The goal is to begin a conversation about the second point in the facilitator notes above. It is very important that participants understand the points raised in that note, and if those points are not raised by participants, you should contribute them in the discussion. The key is that you want to clear the common misconception that a lesson needs a phenomenon even if the focus of the lesson is already on students designing a solution to a problem. If there is no phenomenon for a particular lesson, but there is sufficient evidence that designing a solution to a problem is driving student learning in the lesson, then the criterion can be met even without*

*evidence for a phenomenon. A lesson does not need to have both a phenomenon and a problem. It just needs one of them. The key is that whether it is a phenomenon or a problem, it should be driving student learning. Make sure to point out the **"and/or**" language in the criterion.]*

- During the immersion activity in Session One, we established some common language and understanding about phenomena and how they are important to NGSS design.
- Let's continue to build on that language and understanding by looking at a few resources that can help you as you look for evidence of this criterion.



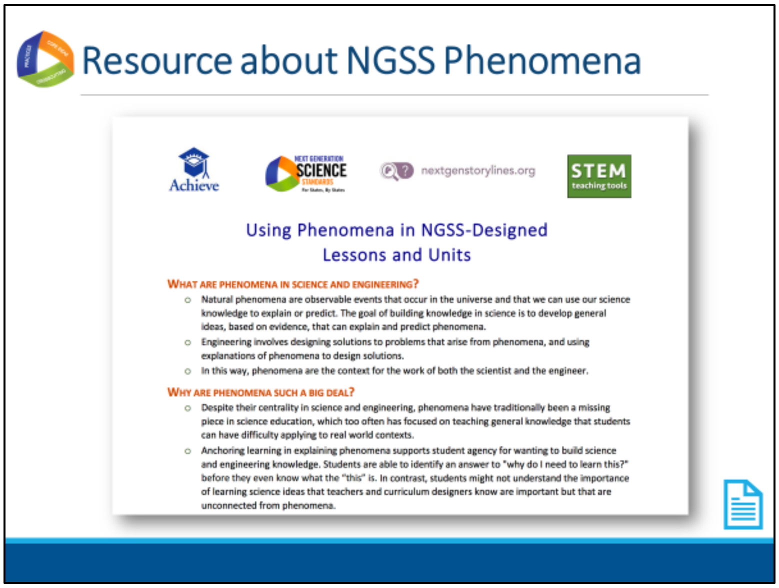
Slide 19

Facilitator Notes:

- Participants will need a copy of *Handout 13 – Innovation One*. Participants have already read through and discussed this Innovation 1 handout in Session One. They will be focusing on revisiting the table on page 2 of this handout to refresh their understanding of what instructional materials programs designed for the NGSS should look like. This table will help participants when they search for evidence if the criterion for phenomena is met or not. They can look back at this chart and see if the evidence falls into the left column or the right column. If it falls into the left column, then it is not evidence for meeting this criterion.

Talking Points:

- Pull out your copy of the copy of the *Innovation One* handout and turn to the Explaining Phenomena or Designing Solutions table.
- Take a minute to look over this table. This is the same table that we discussed in Session One. *[Note to facilitator: Give participants a few minutes to read through the table.]*
- You probably see many the points from the left-hand side in the textbooks you have in your classroom right now.
- As you dig through your assigned instructional materials program, you will be searching for evidence of the points on the right-hand side.
- Some of these materials may have a small section or header at the beginning of the unit that is titled "phenomenon" or "problem." However, that is not enough evidence that the phenomenon or the problem is anchoring the entire learning sequence and that everything the students do drives them toward making sense of this phenomenon or designing a solution to the problem. There may be something engaging in the beginning, but it students are not coming back to it to explain it and it is not present throughout the entire unit, then it is the "hook" and is not a truly developed phenomenon.
- When you find evidence for a phenomenon or a problem, look back at this chart and see if the evidence falls into the left column or the right column. If it falls into the left column, then it is not evidence for meeting this criterion.



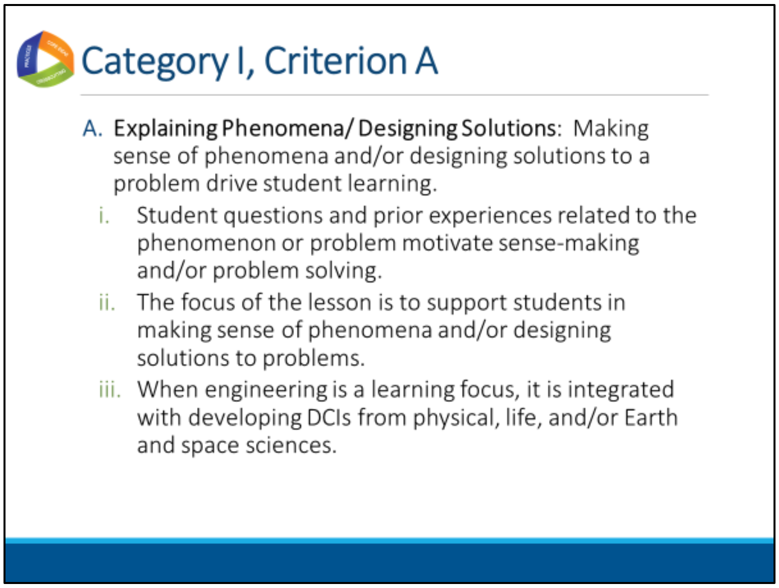
Slide 20

Facilitator Notes:

- Participants will need a copy of *Handout 19 – Using Phenomena in NGSS-Designed Lessons and Units*.
- Depending on how comfortable your participants are with what phenomena are and they should be used in lessons designed for the NGSS, the time you spend on this resource will vary. If you see that participants are still struggling, increase your discussion time and provide time for participants to talk with their groups and for the groups to share out with the entire room. If participants show a strong understanding of phenomena, you can provide them with a few minutes to read over this resource and remind them this is available if they have questions during their hunt for evidence.

Talking Points:

- Let's take a look at another resource that we can use to build our understanding of phenomenon.
- Pull out your copy of the *Using Phenomena in NGSS-Designed Lessons and Units* handout.
- Take a few minutes to quietly read through this resource. *[Note to facilitator: Give participants a few minutes to read through the handout.]*
- What points really stood out to you? Take a few minutes to discuss this with your group. *[Note to facilitator: Depending on how comfortable your participants are with what phenomena are and they should be used in lessons designed for the NGSS, the time you spend on this resource will vary. If you see that participants are still struggling, increase your discussion time and provide time for participants to talk with their groups and for the groups to share out with the entire room. If participants show a strong understanding of phenomena, you can provide them with a few minutes to read over this resource and remind them this is available if they have questions during their hunt for evidence.]*



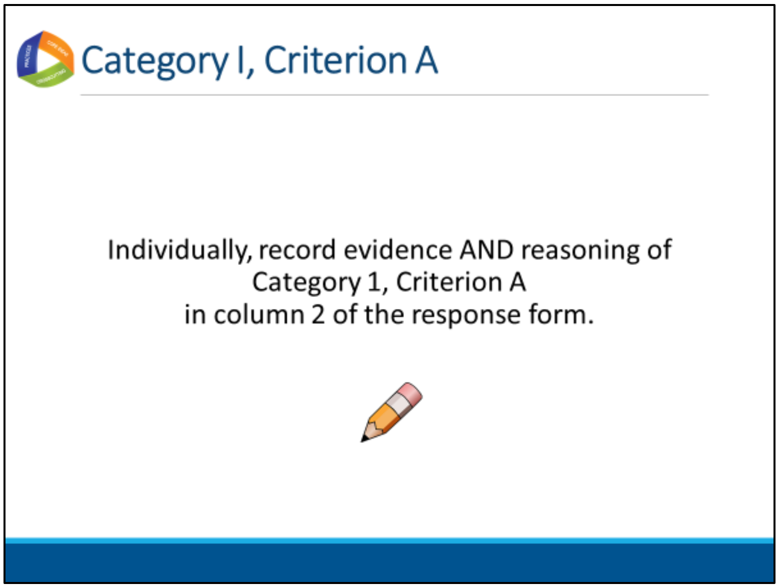
Slide 21

Facilitator Notes:

- Depending on your district policies about the type of reports you have to fill out and submit, you may wish to provide participants with digital copies of the EQuIP Rubric and they can use computers to fill out the response forms. If that is not possible, provide participants with printed out copies (*Handout 18 – EQuIP Rubric for Science)* that they can fill out by hand.
- If you have not already, it may be helpful to assign a team leader/facilitator for each group. The team facilitator will be responsible for keeping an eye on time for the assigned tasks and for keeping group discussion on task.

Talking Points:

- Now that we have a better understanding of phenomena and how they can be used in NGSS-Designed instruction, let’s look for evidence for Category 1, Criterion A.
- Criterion A has three sub-criteria which will help guide your search for evidence.
- To have adequate evidence to meet this criterion, a unit must show evidence that
    - Student questions and prior experiences related to the phenomenon or problem motivate sense-making and/or problem solving;
    - The focus of the lesson is to support students in making sense of phenomena and/or designing solutions to problems; and
    - When engineering is a learning focus, it is integrated with developing DCIs from physical, life, and/or Earth and space sciences.



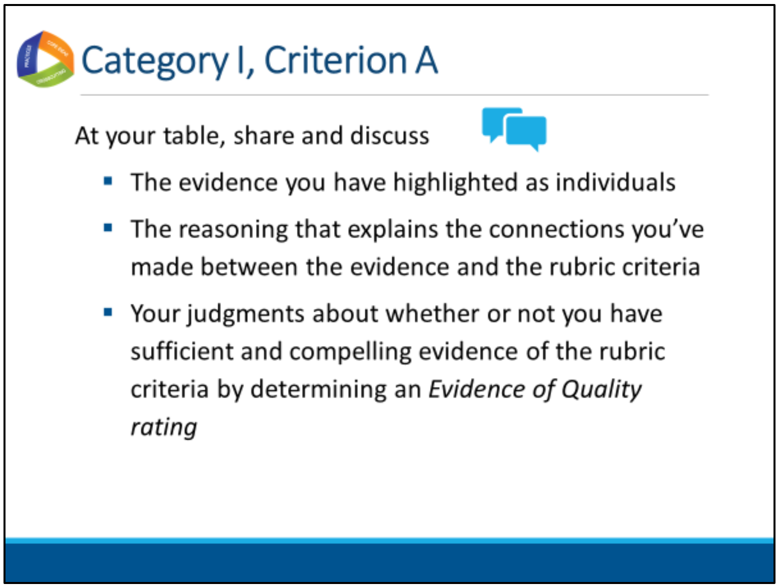
Slide 22

Facilitator Notes:

- Posting a timer that is visible to all participants can help everyone keep track of their time and stay on task.
- Some individuals may breeze through their individual time and want to talk to their group members about the criterion before the timer is up. It is important that all participants receive quiet, individual time to look for evidence and process their thoughts. Remind participants to respect this quiet time until the timer signals it is time to switch to the group discussion.

Talking Points:

- You will have 15 minutes to individually look for evidence and to record your evidence and reasoning in column two of the EQuIP Rubric response form. This time should be used to evaluate the lesson individually without any discussion between or among group members. Even if you complete this part before other tables are finished, do not discuss your findings before being instructed to do so, to ensure that everyone has the individual time to gather their evidence
- As you locate evidence, use the Arabic and Roman numerals associated with the rubric criteria 1A to code the evidence you locate from the lesson.
- Remember, evidence is what you can see explicitly in the lesson or unit.
- You will use the second column of the response form to summarize your evidence and your reasoning of HOW/WHY this evidence connects to the rubric criteria and sub-criteria for Category 1A.
- Reasoning is the bridge connecting the evidence to the rubric criteria and to how the practices, core ideas, and crosscutting concepts work together.
- You have 15 minutes to work individually. Once, the timer signals an end to individual time, we will switch to group time so that you can discuss the evidence you found. *[Note to facilitator: Set the timer for 15 minutes but monitor the table groups and provide more or less time as needed to complete this.]*



Slide 23

Facilitator Notes:

- Posting a timer that is visible to all participants can help everyone keep track of their time and stay on task.

Talking Points:

- Now it's time to share and compare.
- The table facilitators will begin the group discussion and make sure that everyone contributes his/her findings. You will need to share and discuss:
  - *[Note to facilitator: Click for animation.]* The evidence you highlighted;
  - *[Note to facilitator: Click for animation.]* The reasoning that explains the connections you made between the evidence and the rubric criteria; and then
  - *[Note to facilitator: Click for animation.]* Collaboratively evaluate whether this lesson or unit includes sufficient and compelling evidence of three-dimensional learning and whether or you see evidence of Explaining Phenomena or Designing Solutions according to Criterion A.
- Attempt to reach consensus as a table group and determine an evidence of quality rating for Criterion A. Be prepared to share your evaluation and support them with evidence and reasoning. *[Note to facilitator: Depending on your reporting requirements, you may be required to submit individual reviews for each program. If this is the case, individuals do not need to reach consensus and can record their individual evaluations. However, this discussion time and an attempt to reach consensus is still valuable as it will allow participants a chance to reflect on their findings and deepen their understanding of the criteria and process. If you are required to submit one group consensus report, then groups may need additional time to reach consensus.]*
- You have 15 minutes for this discussion. *[Note to facilitator: Set the timer for 15 minutes but monitor the table groups and provide more or less time as needed to complete this.]*

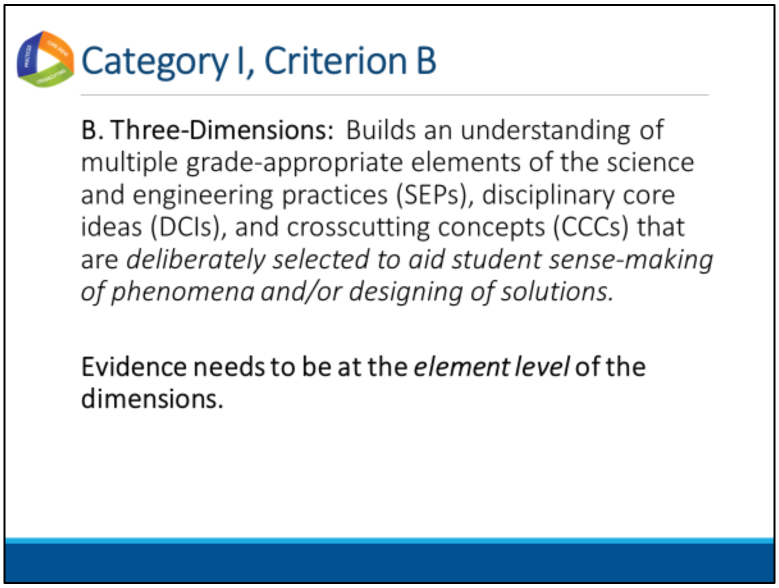
Slide 24

Facilitator Notes:

- The video in this slide can be found at the following link: http://www.nextgenscience.org/resources/ngss-equip-rubric-3-dimensional-learning
- You will need internet access and a speaker system for the video.

Talking Points:

- Let's move on to the other criteria in Category 1. Criteria B and C focus on finding evidence of the three dimensions.
- This video highlights Category 1, Criteria B and C of the EQuIP rubric.
- Let's view this video together to help us determine whether the three dimensions are present and if they work together to support students in making sense of phenomena or designing solutions to problems.
- *[Note to facilitator: After the video* Ask participants: "What kinds of changes do you think three-dimensional classrooms will require for teachers?" *Have a brief discussion (1–2 minutes).*
- *[Note to facilitator: After discussion about the first question, ask* "What are some major *look-fors* in a lesson to determine if it is three-dimensional? *Have a brief discussion (1–2 minutes).*



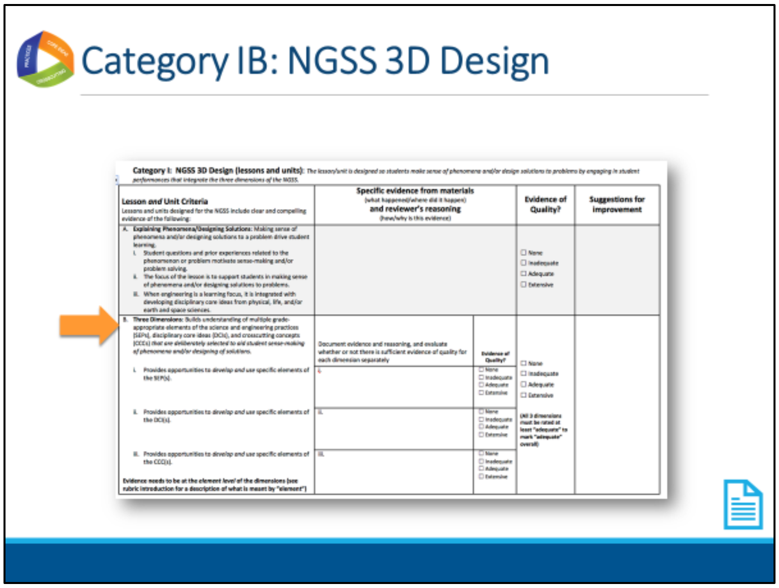
Slide 25

Facilitator Notes:

- The following copies are provided as *Handout 04 – NSTA DCIs Matrix; Handout 05 – NGSS Appendix F; Handout 06 – NGSS Appendix G.*
    - Participants will need copies of or digital access to NGSS Appendices F and G.
    - Participants will need a copy of or digital access to the *NSTA DCIs Matrix* (http://nstahosted.org/pdfs/ngss/20130509/MatrixOfDisciplinaryCoreIdeasInNGSS-May2013.pdf)
- Participants learned about the elements of the dimensions and practiced finding evidence of the elements for the Immersion Activity in Session One. If you noticed participants still struggling with this at the end of Session One, make sure they are comfortable before they begin to find evidence for this criterion (as the process for it is extremely similar to what they did). You can walk them through how elements are organized in the NGSS Appendices

Talking Points:

- Category 1, Criterion B states "Builds an understanding of multiple grade-appropriate elements of the science and engineering practices (SEPs), disciplinary core ideas (DCIs), and crosscutting concepts (CCCs) that are deliberately selected to aid student sense-making of phenomena and/or designing of solutions."
- Let's break this down:
    - First, we want to make sure that there is evidence that students are engaged in elements of each of the three dimensions.
    - Here the term "elements" is used to represent the relevant, bulleted practices, disciplinary core ideas, and crosscutting concepts that are articulated in the foundations boxes of the standards, as well as in the NGSS appendices on each dimension.
    - Second, we want to make sure that the elements for each dimension are **grade-appropriate.** Looking at the dimensions at the element level helps to ensure that each dimension is grade or grade-band appropriate.
    - Lastly, the elements that are developed in the unit, should fit in and should help students make sense of the phenomenon or design a solution to a problem.
- It is important to note that evidence recorded in the rubric needs to be at the element level of each dimension: practices, core ideas, and crosscutting concepts.



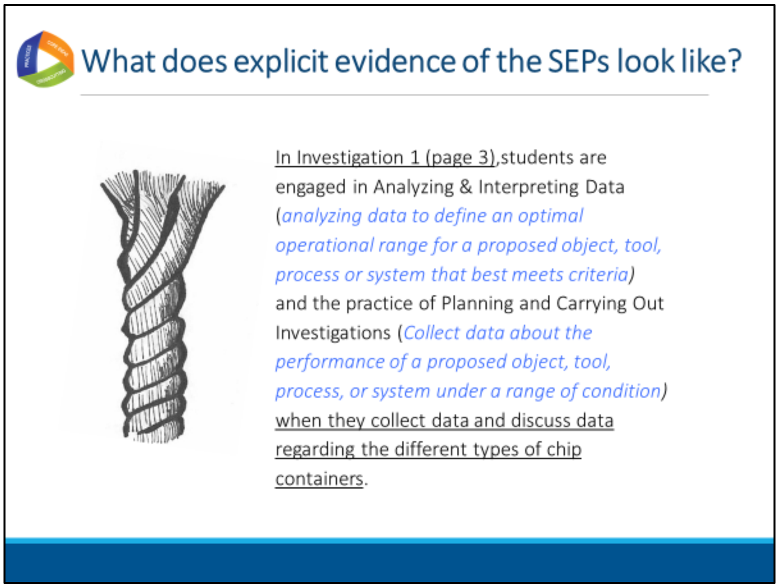
Slide 26

Facilitator Notes:

- Have participants follow along on their paper copies of the EQuIP Rubric.

Talking Points:

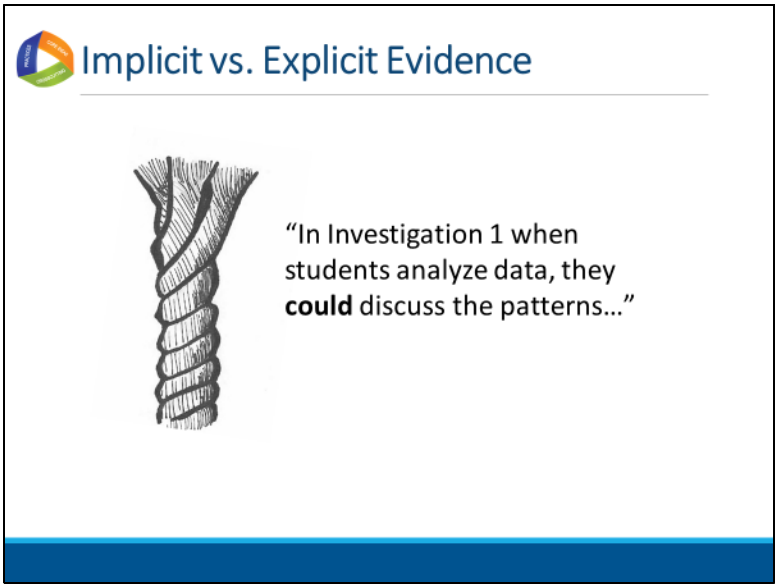
- To help organize evidence for Criterion B, the response form divides the box for the criterion into three sub-criteria.
- The first sub-criterion focuses on finding evidence that the unit provides opportunities for students to develop and use specific elements of the science and engineering practices.
- The second sub-criterion focuses on evidence for disciplinary core ideas, and the third on crosscutting concepts.
- As you can see on the response form, you will be recording evidence for each dimension in a separate box.



Slide 27

Talking Points:

- Let's look at some examples of how we can record evidence in column 2 of the EQuIP response form.
- This feedback should include evidence from the lesson, evidence from the NGSS for this dimension at the element level, and your reasoning of WHY or HOW this evidence connects to the rubric criteria.
- The Category 1B sub criterion I focuses on the SEPs and states "Provides opportunities to develop and use specific elements of the SEPs."
- When we look at this slide, we see that the reviewer cites specific details about where the evidence of the SEPs was found in the lesson by indicating "In Investigation 1 (page 3)" and "when they collect data and discuss data regarding the different types of chip containers", which are both underlined on this slide.
- In addition, the reviewer cites evidence of the SEPs by indicating the name of the practices (analyzing and interpreting data, and planning and carrying out investigations) as well as the **elements** of the practices that this lesson addresses. For analyzing and interpreting data, the element identified is *analyzing data to define an optimal operational range for a proposed object, tool, process or system that best meets criteria* and the element of the practice of planning and carrying out investigations is *collect data about the performance of a proposed object, tool, process, or system under a range of condition.*
- It is important when providing feedback that both lesson evidence and element level NGSS evidence from the appendices be connected in column 2 when giving feedback about this sub-criterion.



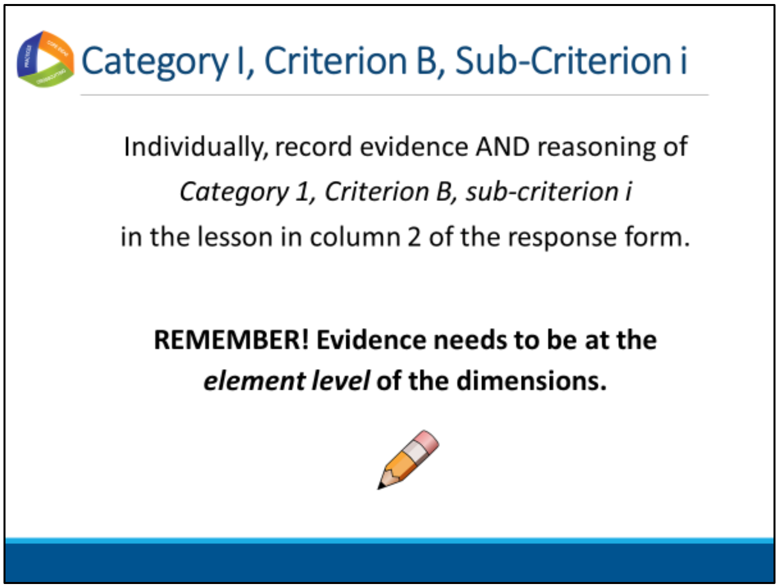
Slide 28

Facilitator Notes:

- Participants first discussed the difference between implicit and explicit evidence in Session One. While participants may already show understanding of explicit evidence before this slide, it is important to keep reinforcing this idea throughout the professional learning.

Talking Points:

- When looking for and recording evidence, it is important to make sure that you are recording only explicit evidence in support of meeting a criterion.
- Remember, for the purposes of PEEC and the EQuIP Rubric, evidence is what is stated or described explicitly in a lesson or unit. If it is evidence, you can see it, point directly to it in the lesson or unit, highlight it, cite it, or quote it directly from what is written.
- If you find a piece of evidence and record it in the response form with your reasoning by saying “In Investigation 1 when students analyze data, they **could** discuss the patterns…” that is not explicit evidence. Unless the lesson or unit specifically states that students **are** discussing the patterns at a **grade-appropriate** element level, the idea that they **could** is implicit, is not guaranteed, and therefore, is not explicit evidence you can record.
- As you look for evidence, make sure you keep in mind that you are looking not only the presence of each dimensions, but also if **students** are the ones developing and using the elements in each dimension. It can be helpful to ask yourself – are the students doing it or is the teacher doing it?



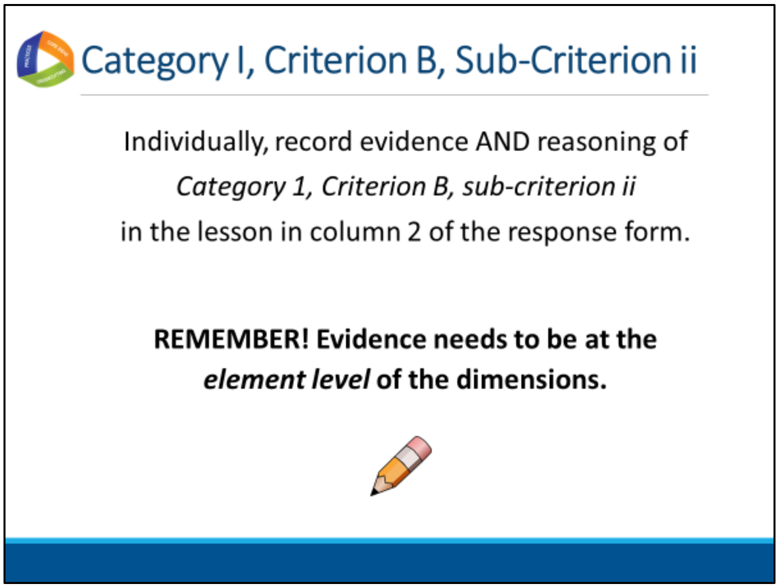
Slide 29

Facilitator Notes:

- Posting a timer that is visible to all participants can help everyone keep track of their time and stay on task.

Talking Points:

- You will have 10 minutes to individually look for evidence and to record your evidence and reasoning in column two of the EQuIP Rubric response form. We will only be focusing on sub-criterion i at this time.
- Remember, this time should be used to evaluate the lesson individually without any discussion between or among group members. Even if you complete this part before other tables are finished, do not discuss your findings before being instructed to do so, to ensure that everyone has the individual time to gather their evidence.
- *[Note to facilitator: Set the timer for 10 minutes but monitor the table groups and provide more or less time as needed to complete this.]*



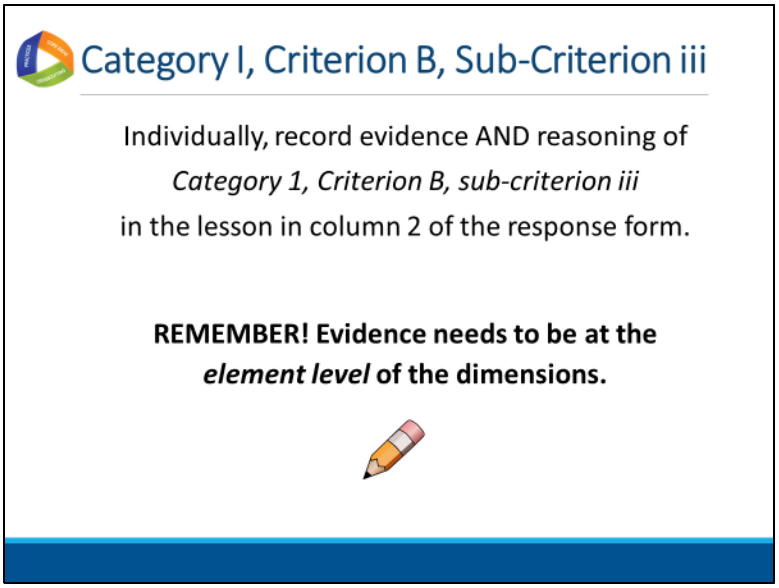
Slide 30

Facilitator Notes:

- Posting a timer that is visible to all participants can help everyone keep track of their time and stay on task.

Talking Points:

- You will have 10 minutes to individually look for evidence and to record your evidence and reasoning in column two of the EQuIP Rubric response form. We will only be focusing on sub-criterion ii at this time.
- *[Note to facilitator: Set the timer for 10 minutes but monitor the table groups and provide more or less time as needed to complete this.]*



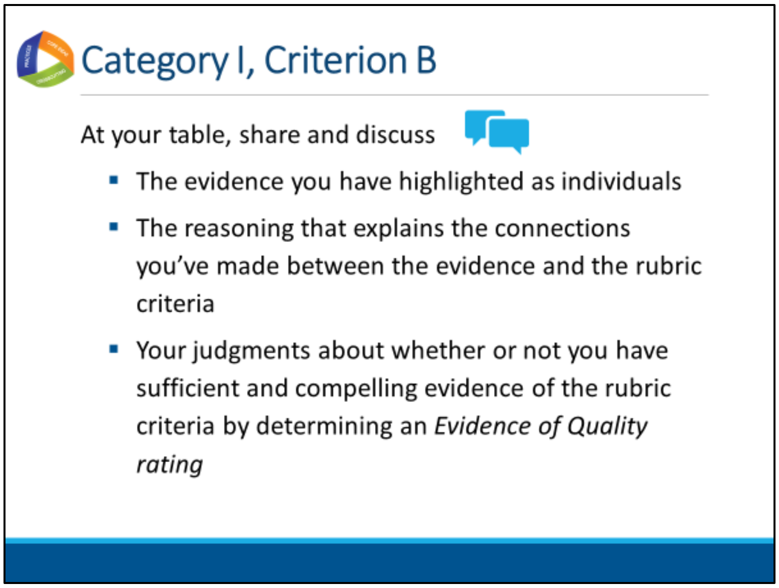
Slide 31

Facilitator Notes:

- Posting a timer that is visible to all participants can help everyone keep track of their time and stay on task.

Talking Points:

- You will have 10 minutes to individually look for evidence and to record your evidence and reasoning in column two of the EQuIP Rubric response form. We will only be focusing on sub-criterion iii at this time.
- *[Note to facilitator: Set the timer for 10 minutes but monitor the table groups and provide more or less time as needed to complete this.]*



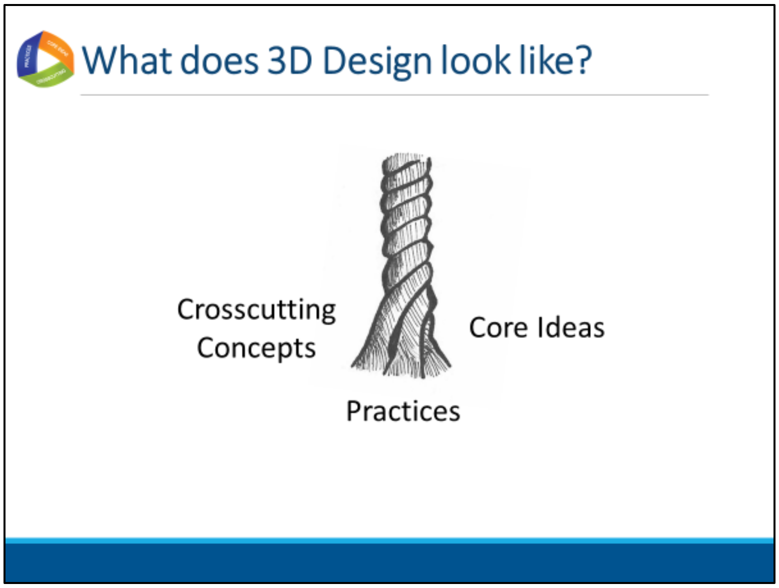
Slide 32

Facilitator Notes:

- Posting a timer that is visible to all participants can help everyone keep track of their time and stay on task.

Talking Points:

- Now it's time to share and compare.
- The table facilitators will begin the group discussion and make sure that everyone contributes his/her findings. You will need to share and discuss:
  - *[Note to facilitator: Click for animation.]* The evidence you highlighted;
  - *[Note to facilitator: Click for animation.]* The reasoning that explains the connections you made between the evidence and the rubric criteria; and then
  - *[Note to facilitator: Click for animation.]* Collaboratively evaluate whether this lesson or unit includes sufficient and compelling evidence of three-dimensional learning and whether or you see evidence of the three dimensions according to Criterion B.
- Attempt to reach consensus as a table group and determine an evidence of quality rating for Criterion B. Be prepared to share your evaluation and support them with evidence and reasoning.
- You have 20 minutes for this discussion. *[Note to facilitator: Set the timer for 20 minutes but monitor the table groups and provide more or less time as needed to complete this.]*



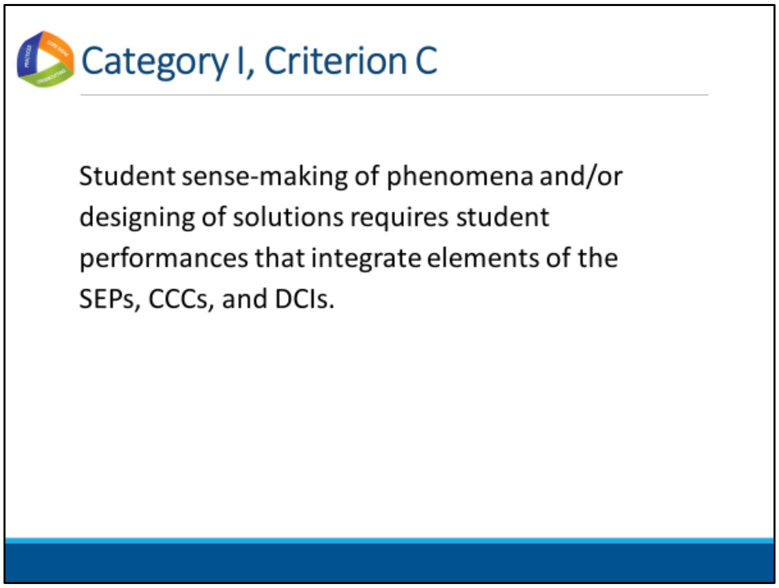
Slide 33

Facilitator Notes:

- Participants discussed three-dimensional learning in Session One. This should be a review for them and you can check for understanding.

Talking Points:

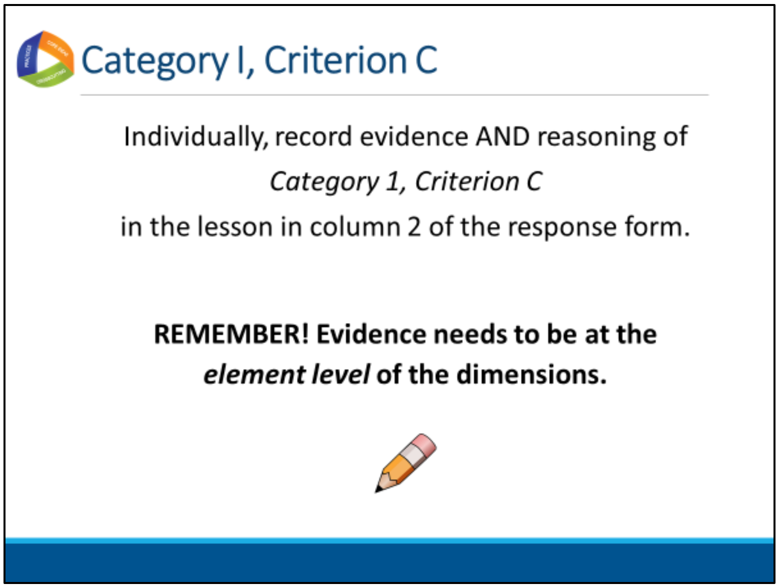
- After we look for evidence of each of the three dimensions separately, we look for evidence of integration of the three dimensions for Category 1 Criterion C.
- For a lesson or unit to be truly three-dimensional, it is not enough for the dimensions to just be present in isolation. The rope on the screen is made of up many intertwined fibers, and for its full strength and functionality, it needs all of these fibers to be tightly wound together. Like the fibers in a rope, the dimensions should work together and students should be engaged in all three of them to make sense of a phenomenon or design a solution.



Slide 34

Talking Points:

- Criterion C states “student sense-making of phenomena and/or designing of solutions requires student performances that integrate elements of the SEPs, CCCs, and DCIs.”
- For the dimensions to work together, student performances that integrate the elements of the SEPs, DCIs and CCCs are required. Students should also be engaging in these elements to ultimately help them build an explanation of a phenomenon or to help them design a solution to a problem.
- As you consider evidence for this criterion, ask yourself “Do the students have an opportunity to engage in three-dimensional learning to help them make sense of phenomena or design solutions, OR Do the three dimensions occur in isolation?”
- You will generally not find these three-dimensional student performances in the text. Look for areas in a textbook where students are doing some type of activity, or look at any supplemental materials such as lab manuals or review sections.



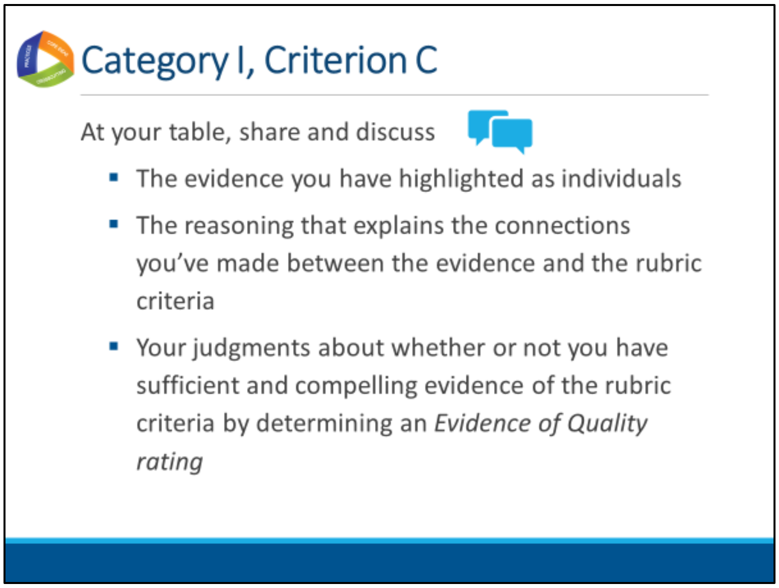
Slide 35

Facilitator Notes:

- Posting a timer that is visible to all participants can help everyone keep track of their time and stay on task.

Talking Points:

- You will have 15 minutes to individually look for evidence and to record your evidence and reasoning for Criterion C in column two of the EQuIP Rubric response form.
- *[Note to facilitator: Set the timer for 15 minutes but monitor the table groups and provide more or less time as needed to complete this.]*



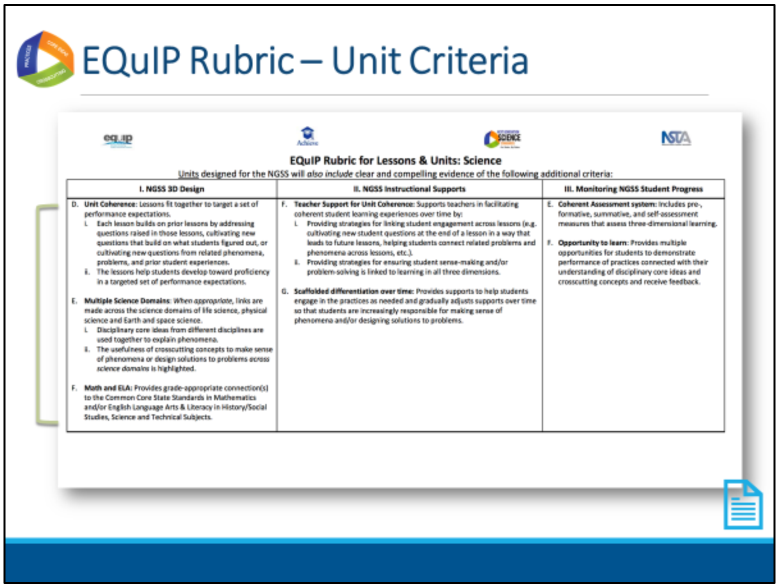
Slide 36

Facilitator Notes:

- Posting a timer that is visible to all participants can help everyone keep track of their time and stay on task.

Talking Points:

- Now it's time to share and compare.
- The table facilitators will begin the group discussion and make sure that everyone contributes his/her findings. You will need to share and discuss:
  - *[Note to facilitator: Click for animation.]* The evidence you highlighted;
  - *[Note to facilitator: Click for animation.]* The reasoning that explains the connections you made between the evidence and the rubric criteria; and then
  - *[Note to facilitator: Click for animation.]* Collaboratively evaluate whether this lesson or unit includes sufficient and compelling evidence of three-dimensional learning and whether or you see evidence of NGSS design according to Criterion C.
- Attempt to reach consensus as a table group and determine an evidence of quality rating for Criterion C. Be prepared to share your evaluation and support them with evidence and reasoning.
- You have 10 minutes for this discussion. *[Note to facilitator: Set the timer for 10 minutes but monitor the table groups and provide more or less time as needed to complete this.]*



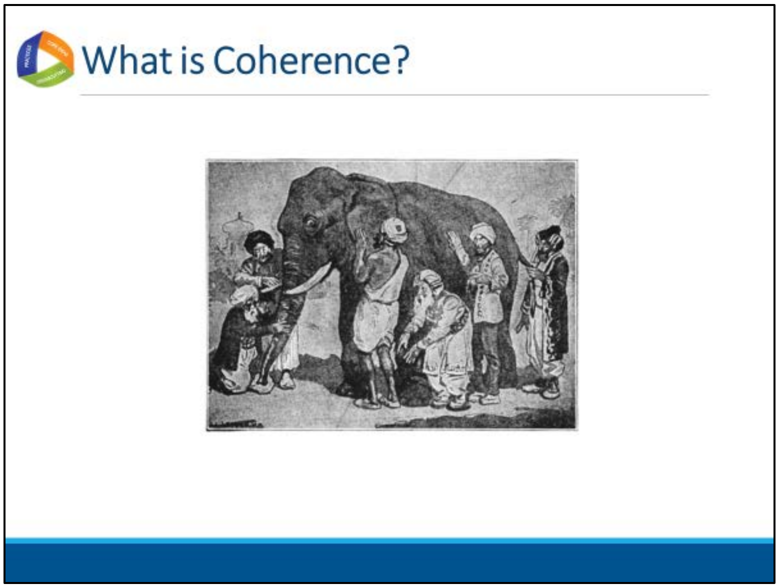
Slide 37

Facilitator Notes:

- This slide introduces the Category I unit criteria, and the next few slides explain the criteria.

Talking Points:

- The rest of the criteria in Category I are for units and they focus on coherence and connections.
- Since we are evaluating a unit, we will continue on to criteria D, E, and F.
- These criteria will help us answer the question "How can we determine whether NGSS lessons and units demonstrate coherence and include relevant connections?"
- Locate Criteria D-F in Category I on page 3 of your rubric.
- Take a few minutes to read over the criteria before we discuss each one more in depth. *[Note to facilitator: Give participants a few minutes to read through the criteria.]*



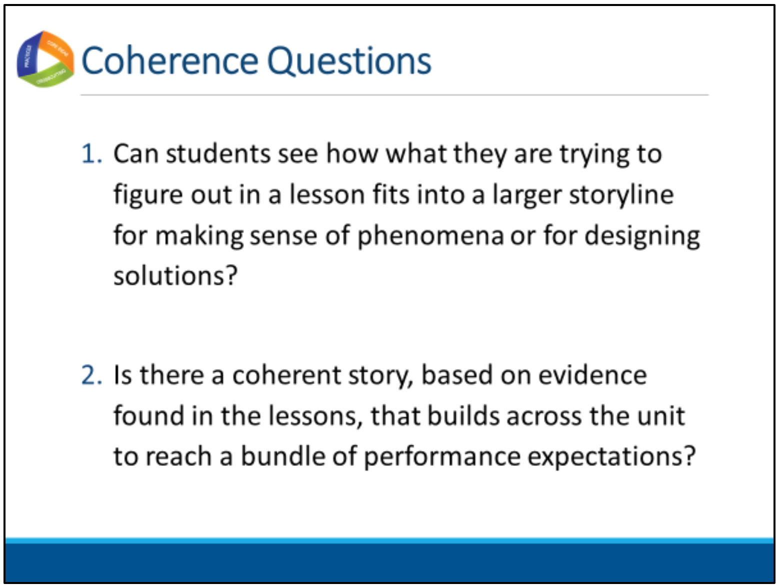
Slide 38

Facilitator Notes:

- The story of the blind men and the elephant can be found at: https://en.wikipedia.org/wiki/Blind_men_and_an_elephant

Talking Points:

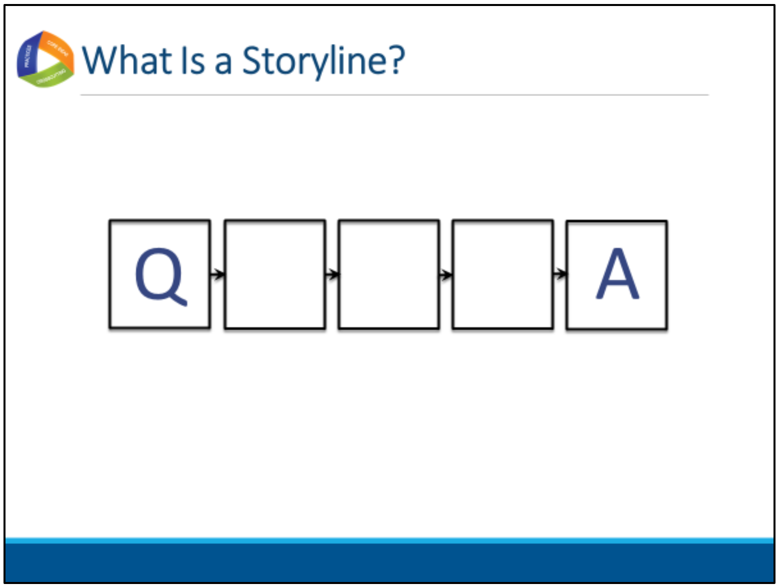
- Who knows the story of the blind men and the elephant? *[Note to facilitator: Have someone share the story with the whole group. If no one volunteers, the facilitator should retell the story.]*
- Although the men in this story certainly examined the parts of the elephant, their individual explanations did not depict a coherent representation of the elephant. Their various descriptions of the parts of an elephant did not fit together to create a picture of an entire elephant that made sense. Their individual descriptions, when examined as a whole, lacked coherence.
- So, what is coherence? Take a few minutes to talk about what you think coherence might look like in a longer lesson, a series of lessons, or a unit in science. *[Note to facilitator: Allow approximately five minutes before asking for volunteers to share. Allow several people to share. Facilitator should guide this discussion to ensure that s/he brings everything together to define coherence as intended in the EQuIP Rubric.]*



Slide 39

Talking Points:

- As you examine lessons and units to determine whether they meet the rubric criteria for coherence, keep these two questions in mind:
    - Can students see how what they are trying to figure out in a lesson fits into a larger storyline for making sense of phenomena or for designing solutions to problems?
    - Is there a coherent story that, based on explicit evidence found in the lessons, builds across the unit to reach a bundle—a set of more than one—of performance expectations?
- So, what exactly do we mean by a storyline or a coherent story?
- Think of your favorite episode of *Law and Order* or another TV mystery series you watch regularly. The episode begins with a question: “Who committed the crime?” From here the plot proceeds logically as evidence is collected, suspects are questioned, and a case is built. The show ends when everything comes together, the question we began with is answered, and the perpetrator of the crime is revealed.
- This exemplifies a coherent storyline.
- Now think back to a TV show or movie you’ve watched where you’ve reached the end only to discover that the answer to the question of who committed the crime comes straight out of left field. There was no way you could have figured out the ending because either it wasn’t logical or the crime ended up being committed by someone who wasn’t even present in the earlier portion of the show. You feel as if you’ve wasted your time because the storyline wasn’t coherent; one thing did not follow from another.



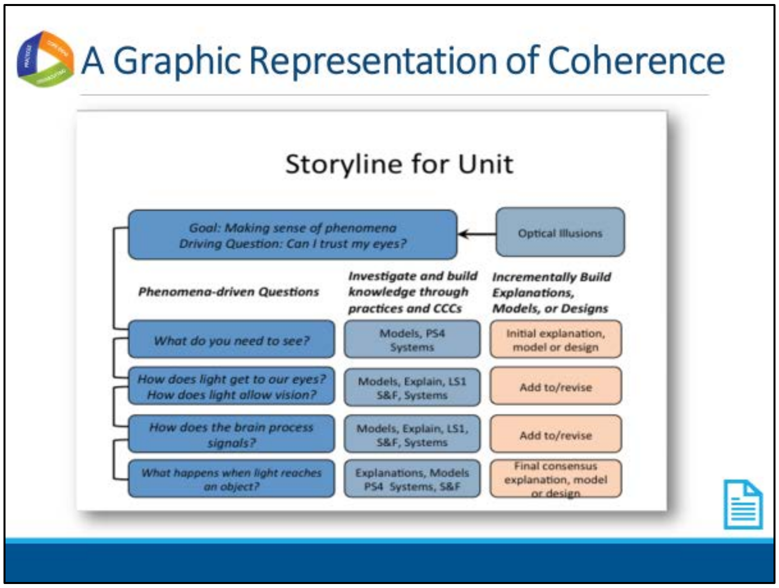
Slide 40

Facilitator Notes:

- Preparations: Print out one copy of Facilitator Resource - Storyline Cards per group. For each group, cut out the individual cards for a total of seven cards and place them an envelope.
- Make sure each table group has an envelope with the Storyline Cards for this task.
- Each envelope has seven slips of paper inside of it. On each paper there is a written question. Participants will need to arrange the seven questions in an order they believe is the most coherent storyline.

Talking Points:

- In the center of your table you'll find an envelope. Inside are seven slips of paper, each with a question on it.
- As a group, read through these questions and then put them in the order that you believe to be the most coherent storyline.
- As you work to make a coherent storyline from these cards, think about what this process would look like in a classroom where students are trying to make sense of phenomena and/or design solutions to problems.
- As you arrange the cards, ask yourself the following questions:
    - Can students see how what they are trying to figure out in a lesson fits into a larger storyline for making sense of phenomena and/or for designing solutions to problems?
    - Is there a coherent story that, based on explicit evidence found in the lessons, builds across the unit to reach a bundle of performance expectations?
- Can you arrange the questions so that students see how what they are trying to figure out in a lesson fits into a larger storyline for making sense of phenomena and/or for designing solutions?
- Can the questions be organized to build a series of lessons or a unit to reach a bundle of performance expectations? *[Note to facilitator: Allow five minutes for the groups to work and then have two to three tables share.]*
- Before we resume with our rubric evaluation, let's look at the role questions play in the organization of a unit with a graphic organizer and think about how it connects to our storyline cards table discussions.



Slide 41

Facilitator Notes:

- Participants will each need a copy of *Handout 20 – Graphic Example of Coherence*.

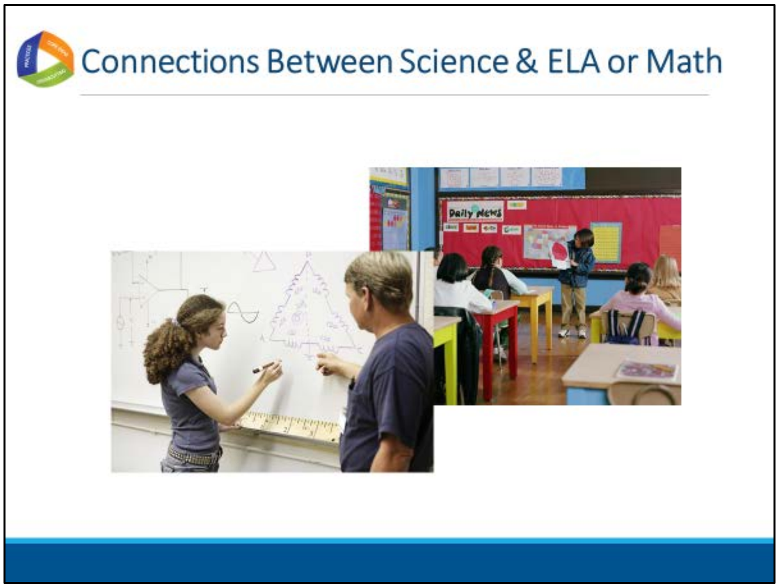
Talking Points:

- Please refer to the handout titled *Graphic Example of Coherence* which provides a larger version of this slide.
- Notice the “making sense question” at the top—the anchoring phenomenon.
- Now look at the order of the phenomena-driven questions—the questions at the beginning of each row.
- In this example, we can see coherence just by virtue of the fact that each subsequent phenomena-driven question relates directly back to our attempt to answer the making sense question or driving question.
- In other words, if we assume that each phenomena-driven question relates to one lesson in a series of lessons, all of which are designed to address the making sense question, then each lesson connects and builds onto the previous one as students work to answer the making sense question.
- Here, students engage in all three of the dimensions to answer each of the phenomena-driven questions.
- And, since the phenomena-driven questions logically and sequentially build on one another, what the students figure out—the meaning they make—logically and sequentially builds as well. In other words, their learning is coherent because the students can see how what they are trying to figure out in one lesson fits into a larger storyline for making sense of phenomena.

Slide 42

Talking Points:

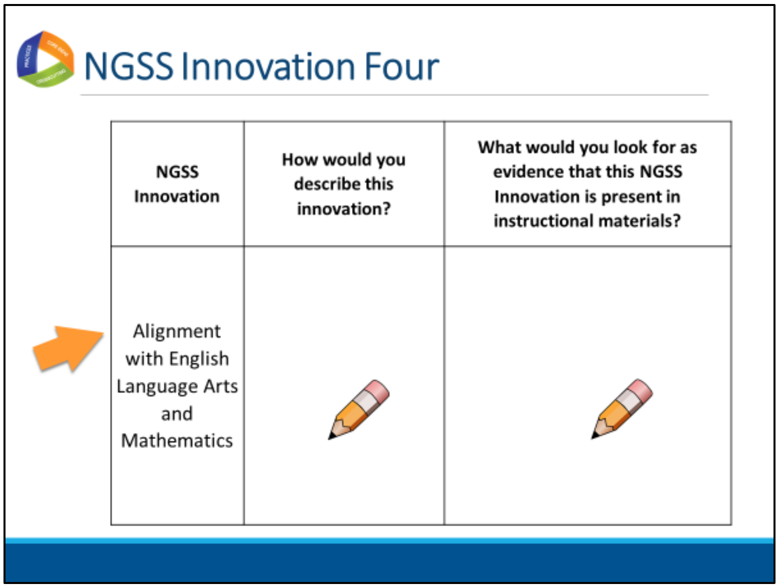
- Just as coherence occurs in a series of lessons, where appropriate, disciplinary core ideas from different science disciplines can be used together to explain phenomena.
- Likewise, where appropriate, crosscutting concepts can be used in the explanation of phenomena from a variety of science disciplines.
- Again, here we're looking for connections that enable students to see the bigger picture or see how different science disciplines relate to form a larger storyline for making sense of the natural world or the human-designed world.
- As you look for this evidence, ask yourself the following questions:
    - Are students using what they have figured out in other disciplines of science to make sense of the phenomena and/or to design solutions to problems in current lessons and units?
    - Are students using crosscutting concepts to make sense of phenomena or design solutions across science domains?



Slide 43

Talking Points:

- Finally, connections can occur between science and ELA/literacy and science and mathematics.
- Why is it important for students to be able to make connections between science and ELA and math? Take five minutes to discuss this question with your group.
- How could instructional materials show these connections? How can they be made explicit for both the student and the teacher? Take five minutes to discuss these questions with your group.
- Let’s have each group share some of their ideas. *[Note to facilitator: As each group to share their two-three thoughts from the questions that they discussed. If the groups need some support in reaching the points you want them to understand the following are examples of how you can contribute to / guide the discussion:*
    - *For example, students could create mathematical models to explain science phenomena, or write arguments to show how they reason from evidence to reach a logical conclusion in science.*
    - *As before, we’re looking for connections that enable students to see the bigger picture or see how different areas of study relate to form a larger storyline for making sense of the natural world or the human-designed world.]*



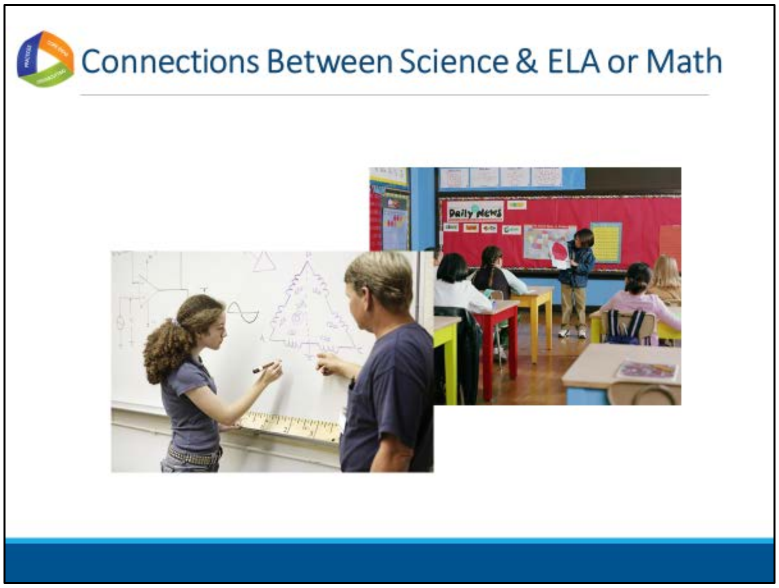
Slide 44

Facilitator Notes:

- Participants will need their copy of *Handout 1 – NGSS Innovations*.

Talking Points:

- Let's go back to our *NGSS Innovations* handout that you worked on in Session One.
- Turn to page 3 in the handout.
- How has your description of the fourth NGSS Innovation changed? Take a few minutes to talk to your group and come up with a working group description for Alignment with English Language Arts and Mathematics. Write your new description of this innovation in the table. *[Note to facilitator: Click for animation.]*
- Based on what you have learned so far, what would look for as evidence that this NGSS innovation is present in instructional materials? Discuss your thoughts with your group and then write your thoughts down in the table. *[Note to facilitator: Click for animation.]*



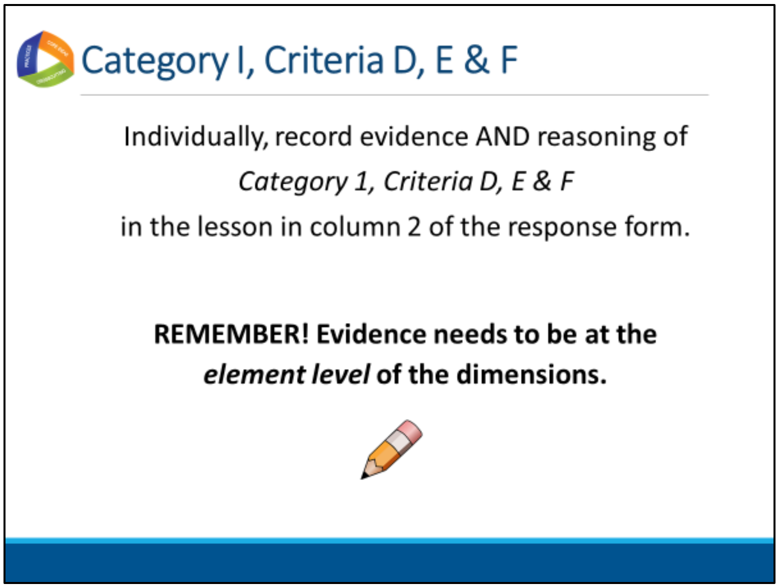
Slide 45

Facilitator Notes:

- Participants will need a copy of *Handout 16 – Innovation Four*.

Talking Points:

- Please take out your copy of the *Innovation Four* handout. Take a few minutes to individually read through Innovation Four.
- Take a few minutes to discuss any new points that jump out for you with your group.
- Take a few minutes to go back to your *NGSS Innovations* handout and add in any additional thoughts in the table. Discuss your thoughts with your group. Especially focus on any new ideas about what you would look for as evidence that this NGSS Innovation is present in instructional materials.
- *[Note to facilitator: It may be helpful to have a whole group share out after individual teams have completed their discussions.]*
- As you look for evidence of connections between science and mathematics and/or ELA/literacy, ask yourself the following questions:
  - Are students using what they have learned or are learning in ELA/literacy or mathematics as a tool to make sense of new phenomena or design solutions to problems? To express or convey the sense they make of phenomena or the solutions they design?
  - Are the students reflecting on the ELA/literacy and mathematics skills they are using and thus improving their skills in these areas?



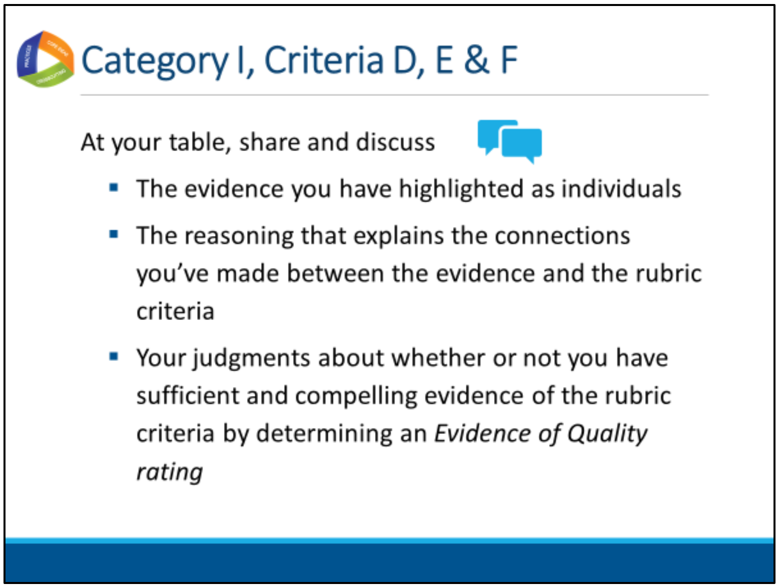
Slide 46

Facilitator Notes:

- Posting a timer that is visible to all participants can help everyone keep track of their time and stay on task.

Talking Points:

- You will have 30 minutes to individually look for evidence and to record your evidence and reasoning in column two of the EQuIP Rubric response form. We will only be focusing on all of the unit level criteria in Category I at this time – Criteria D, E, & F.
- *[Note to facilitator: Set the timer for 30 minutes but monitor the table groups and provide more or less time as needed to complete this.]*



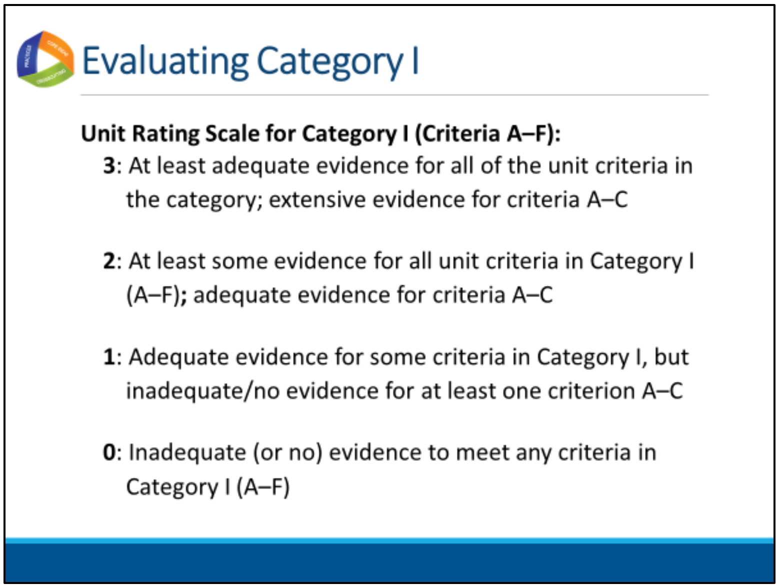
Slide 47

Facilitator Notes:

- Posting a timer that is visible to all participants can help everyone keep track of their time and stay on task.

Talking Points:

- Now it's time to share and compare.
- The table facilitators will begin the group discussion and make sure that everyone contributes his/her findings. You will need to share and discuss:
  - *[Note to facilitator: Click for animation.]* The evidence you highlighted;
  - *[Note to facilitator: Click for animation.]* The reasoning that explains the connections you made between the evidence and the rubric criteria; and then
  - *[Note to facilitator: Click for animation.]* Collaboratively evaluate whether this lesson or unit includes sufficient and compelling evidence of three-dimensional learning and whether or you see evidence of NGSS design according to Criteria D, E, and F.
- Attempt to reach consensus as a table group and determine an evidence of quality rating for Criteria D, E, and F. Be prepared to share your evaluation and support them with evidence and reasoning.
- You have 15 minutes for this discussion. *[Note to facilitator: Set the timer for 15 minutes but monitor the table groups and provide more or less time as needed to complete this.]*



Slide 48

Facilitator Notes:

- While it is important to gather specific evidence of each criterion within the unit, it is not necessary for participants to use the scoring guide portion of the EQuIP Rubric to score each Category, because of how the information from EQuIP is incorporated into PEEC. However, this slide and the scoring can be included, as the discussions that arise from participants scoring a category can help a team reach consensus about a particular program.

Talking Points:

- Let's rate the degree to which the criteria were met in Category I.
- Since we are examining a unit, we will be considering all the Criteria in Category 1.
- At each table, let's review the evidence of quality for Criteria A through F. Then, as a group, determine a rating for Category I using the language on page 8 of the rubric. Note that the possible ratings fall across a 0–3 scale.
- *[Note to Facilitator: Give groups about 5-8 minutes to discuss evidence of quality for each criterion and to determine a Category rating.]*

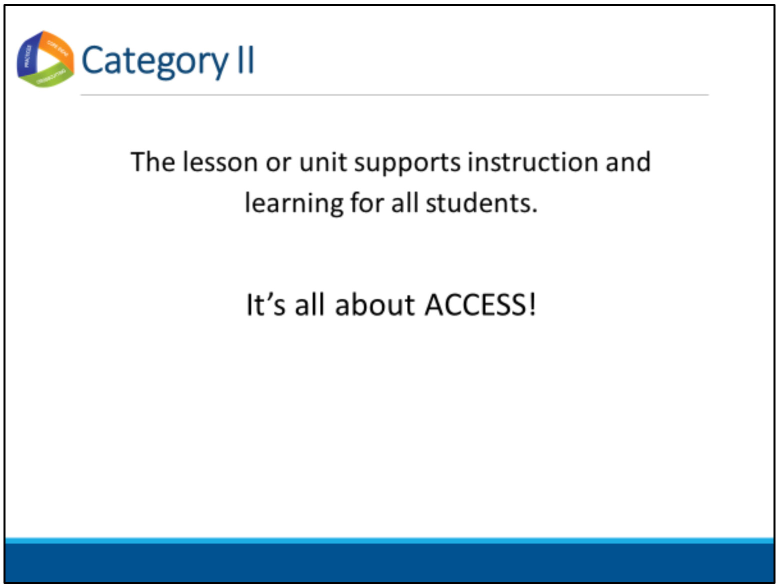
Category II

Category I	Category II	Category III
	NGSS Instructional Supports	
	The lesson/unit supports instruction and learning for all students by placing the lesson in a sequence of learning for all three dimensions and providing support for teachers to engage all students in three dimensional learning. Lessons and units designed for the NGSS include the following: **A. Relevance and Authenticity** **B. Student Ideas** **C. Building Progressions** **D. Scientific Accuracy** **E. Differentiated Instruction**	

Slide 49

Talking Points:

- Now, let's move on to Category II: NGSS Instructional Supports.



Slide 50

Facilitator Notes:

- The next few slides will help explain the criteria in Category 2.

Talking Points:

- Category 2 focuses on examining lessons and units to determine whether they include the kinds of instructional practices and supports necessary to allow all students to access the NGSS successfully.
- Take a few minutes to read through all of Category II quickly. *[Note to facilitator: Allow three to five minutes.]*
- Category II focuses on supporting three-dimensional teaching and learning for all students by placing the lesson in a sequence of learning for all three dimensions and providing support for teachers to engage all students. Criteria and sub-criteria focus on engaging students in three-dimensional learning that is relevant, authentic, and connected to students' experiences.
- In addition, this category includes criteria related to providing guidance to help teachers build coherence and to provide and adjust supports for students in order to make students increasingly responsible for their learning.
- The idea that the three-dimensional teaching and learning is for **all** students can be clearly in the criteria in Category II (and will also be seen in Category III as well).
- This brings in the fifth NGSS Innovation, which is All Standards, All Students.

Slide 51

Talking Points:

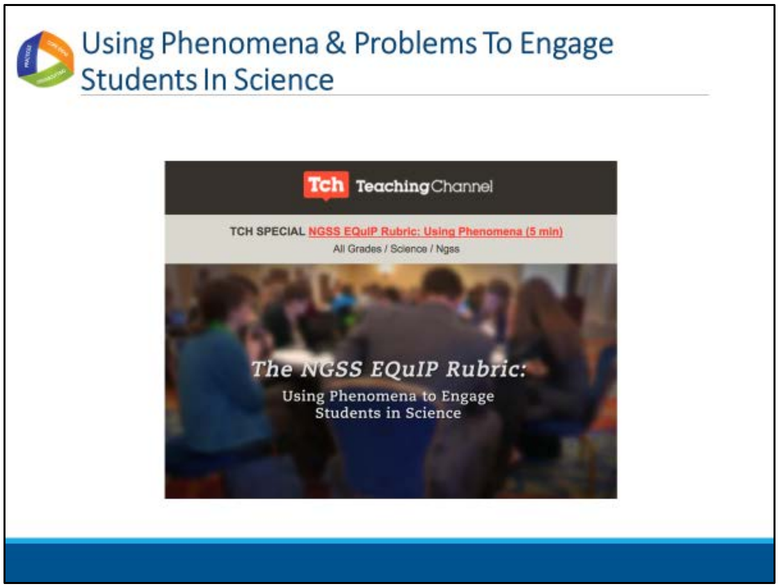
- The NGSS and the *Framework* are about science for *all* students.
- In today's world, science, engineering, and technology are not a luxury to be experienced by only *some* students.
- A strong science education equips students with skills necessary for all careers. Science develops students' abilities to think critically and to innovate. All students need strong foundational knowledge in science to tackle difficult and/or long-term issues that face both our generation and future generations.
- Science, engineering, and technology:

  Serve as cultural achievements and a common good across societies;

  Permeate modern life and as such are essential at the individual level;

  Are critical to participation in public policy and good decision-making; and

  Are essential for ensuring that future generations will live in a society that is economically viable, sustainable, and free.



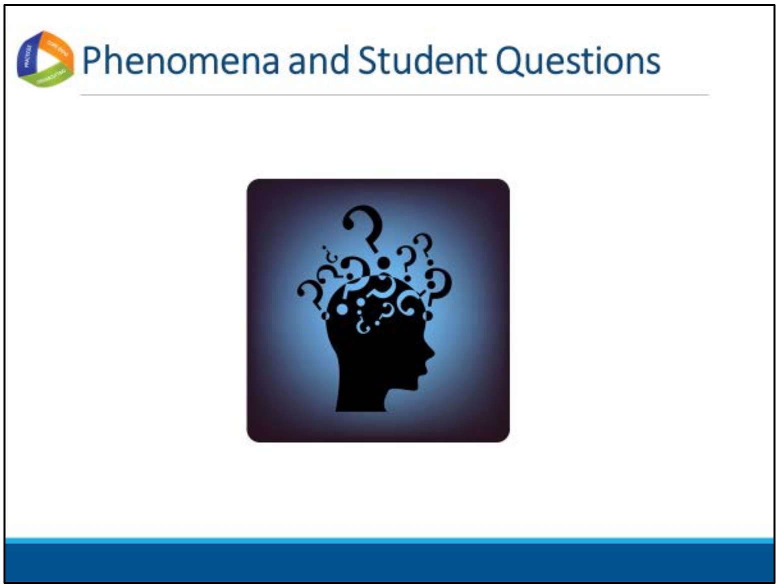
Slide 52

Facilitator Notes:

- The video can be found at the following link http://www.nextgenscience.org/resources/ngss-equip-rubric-using-phenomena

Talking Points:

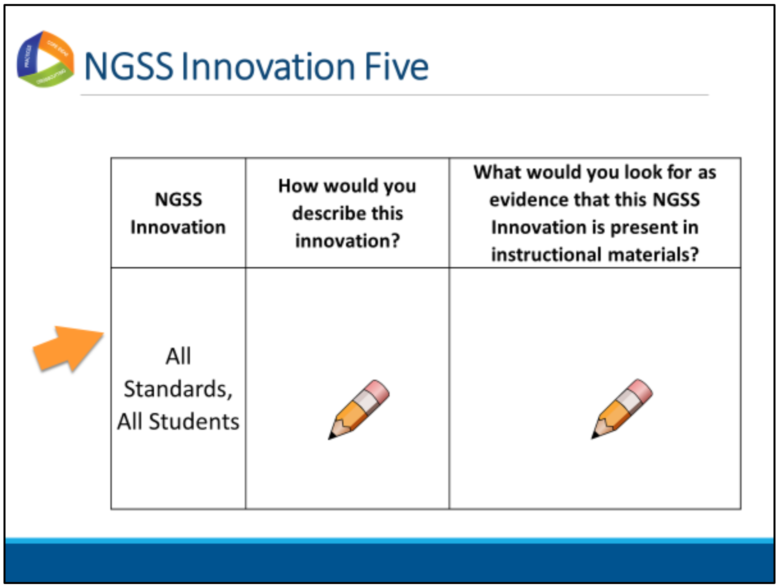
- One way to check if the instructional materials are indeed targeting all students, is to dig a little deeper into the phenomena and problems to see if they are accessible and meaningful to all students.
- The first criterion in Category II focuses on the relevance and authenticity of the phenomena or problems and learning experiences for students. It is important that students engage in scenarios that are authentic and meaningful for them, that allow them to draw upon their own experiences, that can easily be connected to their local context, and that generate student curiosity and questions that drive the learning even further.
- We have discussed phenomena and problems before with the criteria in Category 1, and now we will continue to build our understanding of it in terms of relevance and authenticity.
- This video highlights the role of phenomena in multiple criteria of the EQuIP rubric, using phenomena to engage students in science.
- Let’s view this video together to help us determine how phenomena and problems can support student engagement and drive instruction.
- *[Note to facilitator: Play the video.]*
- *[Note to Facilitator: After the video ask participants:* “How is a phenomenon or problem engaging? How can it be instructionally productive or drive a lesson?” *Have a brief discussion (3-5 minutes). If helpful, you can have each group create write their ideas on a chart paper. The chart paper can then be displayed around the room as a gallery walk.]*
- *[Note to Facilitator: After discussion about the first series of questions, ask* “How can you leverage an engaging phenomenon or problem to provide access points for all students? *Have a brief discussion (3-5 minutes). If helpful, you can have each group create write their ideas on a chart paper. The chart paper can then be displayed around the room as a gallery walk.]*



Slide 53

Talking Points:

- As we saw in the video, the point of using phenomena to drive instruction is to help students engage in the practices to develop the knowledge necessary to explain and predict phenomena. Therefore, the focus is on both the phenomena and the student-generated questions about the phenomena that drive instruction.



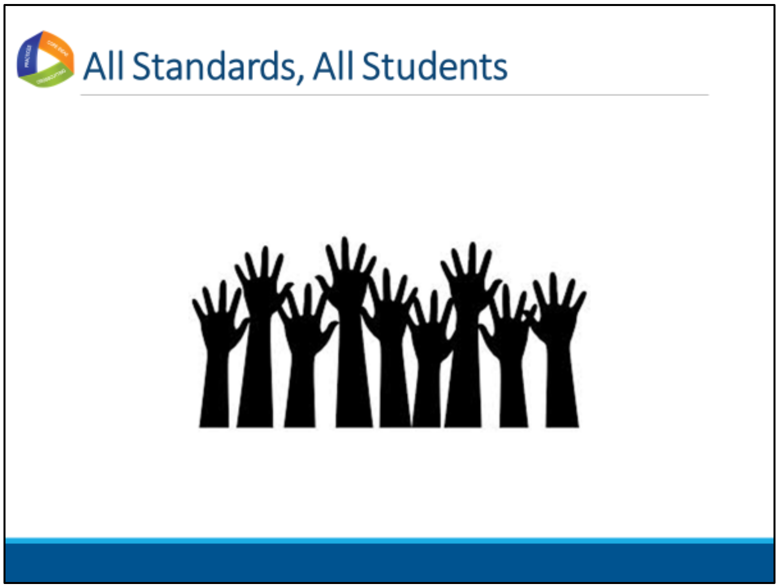
Slide 54

Facilitator Notes:

- Participants will need their copy of *Handout 1 – NGSS Innovations*.

Talking Points:

- Let's go back to our *NGSS Innovations* handout.
- Turn to page 3 in the handout.
- How has your description of the fifth NGSS Innovation changed? Take a few minutes to talk to your group and come up with a working group description for All Standards, All Students. Write your new description of this innovation in the table. *[Note to facilitator: Click for animation.]*
- Based on what you have learned so far, what would look for as evidence that this NGSS innovation is present in instructional materials? Discuss your thoughts with your group and then write your thoughts down in the table. *[Note to facilitator: Click for animation.]*



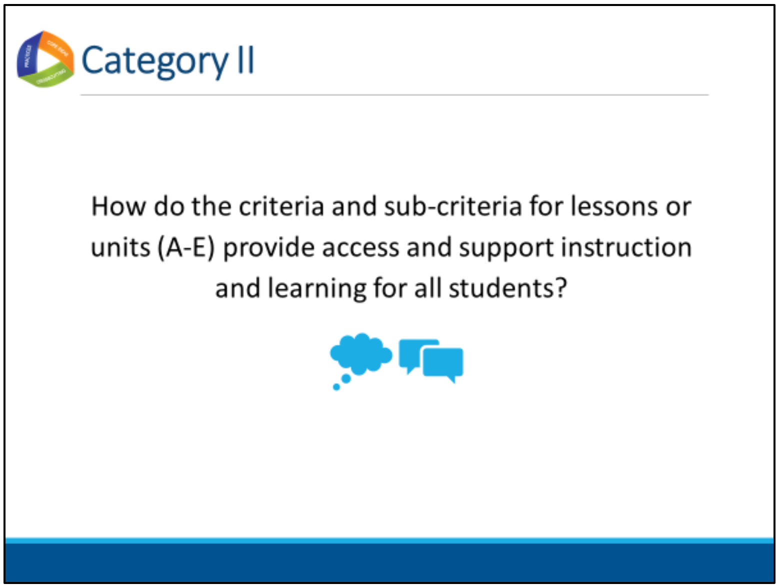
Slide 55

Facilitator Notes:

- Participants will need a copy of *Handout 17 – Innovation Five*.
- Participants will need a copy of *Handout 21 – STEM Teaching Tool Equity Overview*
    - http://stemteachingtools.org/brief/15

Talking Points:

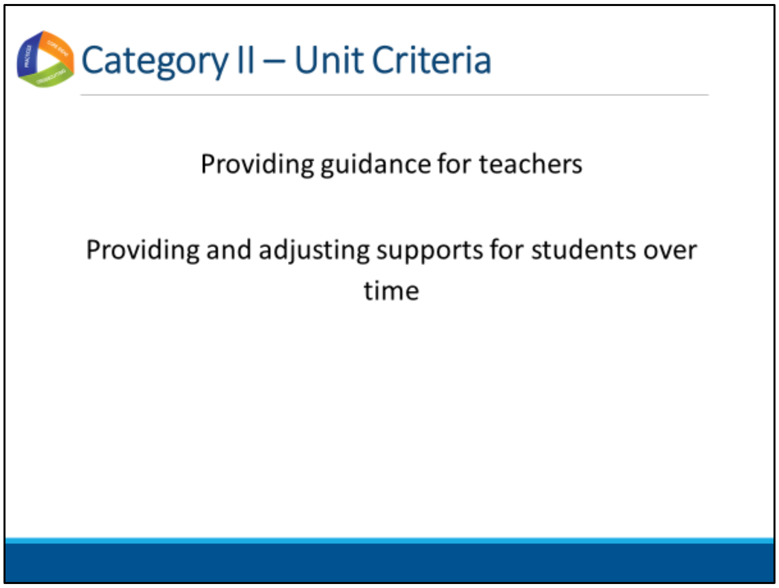
- Please take out your copy of the *Innovation Five* handout and the *STEM Teaching Tool Equity Overview*.
- Take a few minutes to read through both handouts. Highlight or underline any points that will help you look for evidence of Category II criteria in the instructional materials. Especially focus on the chart at the end of the handout.
- Take a few minutes to discuss your findings with your group.
- Take a few minutes to go back to your *NGSS Innovations* handout and add in any additional thoughts in the table. Discuss your thoughts with your group. Especially focus on any new ideas about what you would look for as evidence that this NGSS Innovation is present in instructional materials.
- *[Note to facilitator: It may be helpful to have a whole group share out after individual teams have completed their discussions.]*



Slide 56

Talking Points:

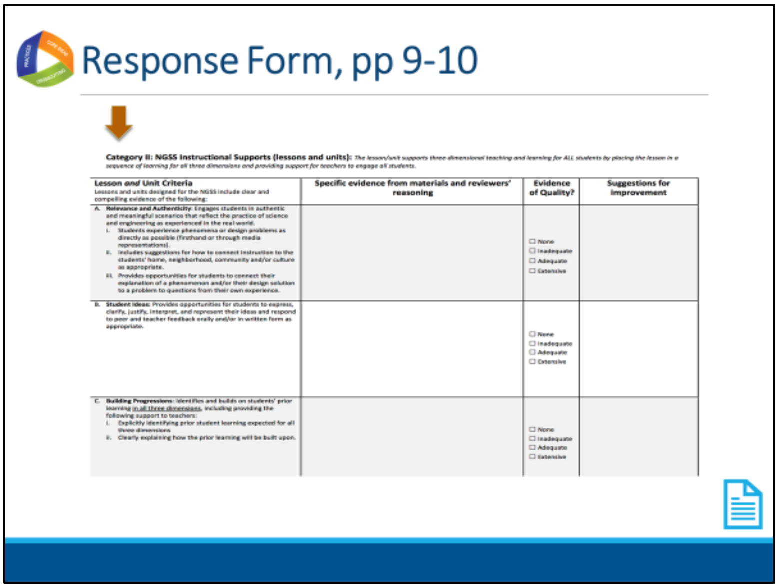
- Read back through the Category II's first four criteria: A, B, C and, D, along with their sub-criteria, and circle key words. You have three minutes to do this.
- Noting what you've circled and what we have discussed about the evidence of the innovations, what might evidence of criteria A through D look like in a lesson or unit? *[Note to facilitator: Allow a few participants to share.]*
- All of the EQuIP Rubric criteria are important, but in Category II, Criterion E, along with its sub-criteria, is particularly deep.
- So, take a few minutes at your tables just to discuss Criterion E and its sub-criteria. *[Note to facilitator: Allow five minutes.]*
- What are some of the points you discussed regarding Criterion E? And, based on what you see in Criterion E, what might evidence of Criterion E, along with its sub-criteria, look like in a lesson or unit? *[Note to facilitator: Allow a few groups to share.]*



Slide 57

Talking Points:

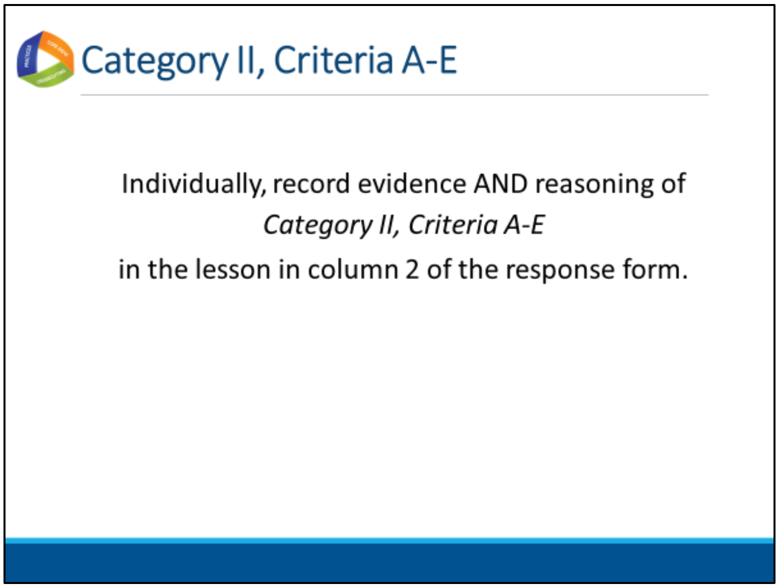
- In Category I the focus for a unit or longer lessons is on the coherence of the lessons—whether they were designed in a coherent way.
- In Category II, the first criterion for a unit focuses on whether there is built-in support for the teachers to ensure that students see the coherence and that this deepens their understanding. Consequently, some of the evidence you identified when looking for coherence in Category I may also provide evidence here.
- The second criterion for longer lessons and units focuses on providing and then gradually adjusting supports for students over time so that the students become increasingly responsible for making sense of phenomena and designing solutions to problems.



Slide 58

Talking Points:

- The response form for Category II, Criteria A-E is located on pages 9 and 10 of your rubric document.



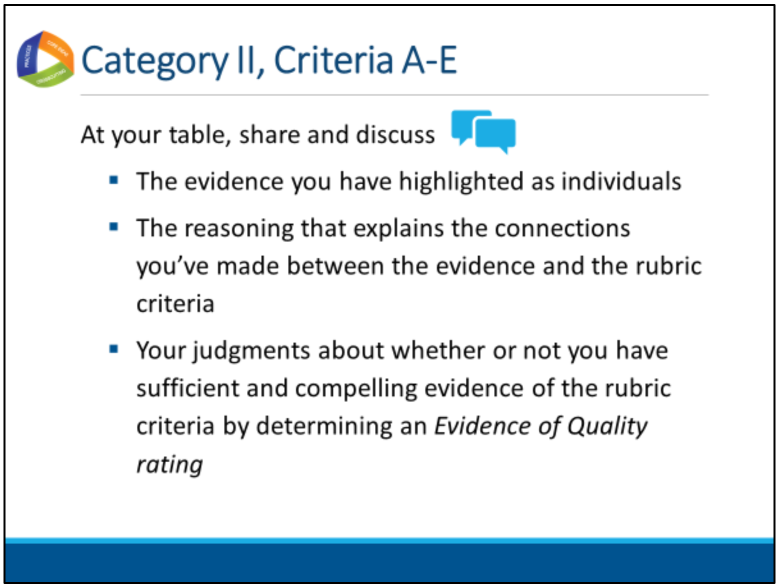
Slide 59

Facilitator Notes:

- Posting a timer that is visible to all participants can help everyone keep track of their time and stay on task.

Talking Points:

- You will have 30 minutes to individually look for evidence and to record your evidence and reasoning in column two of the EQuIP Rubric response form. We will only be focusing on all of the lesson level criteria in Category II at this time – Criteria A, B, C, D, and E.
- *[Note to facilitator: Set the timer for 30 minutes but monitor the table groups and provide more or less time as needed to complete this.]*



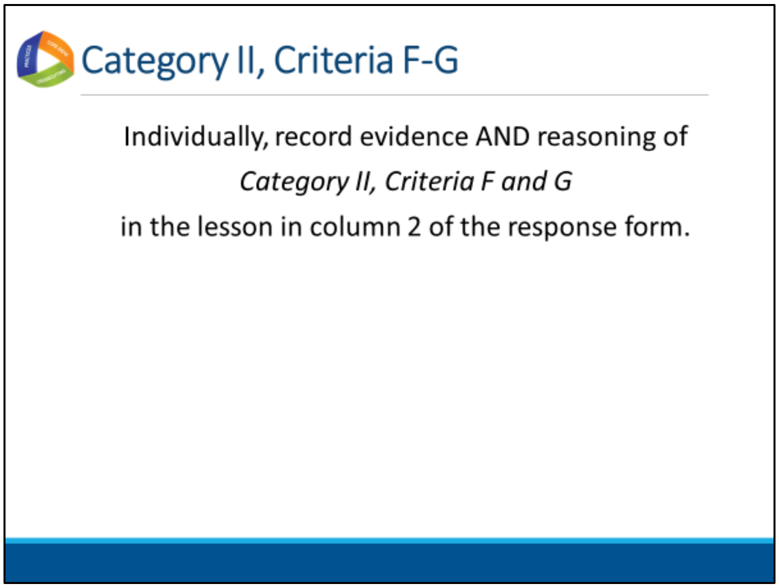
Slide 60

Facilitator Notes:

- Posting a timer that is visible to all participants can help everyone keep track of their time and stay on task.

Talking Points:

- Now it's time to share and compare.
- The table facilitators will begin the group discussion and make sure that everyone contributes his/her findings. You will need to share and discuss:
    - *[Note to facilitator: Click for animation.]* The evidence you highlighted;
    - *[Note to facilitator: Click for animation.]* The reasoning that explains the connections you made between the evidence and the rubric criteria; and then
    - *[Note to facilitator: Click for animation.]* Collaboratively evaluate whether this lesson or unit includes sufficient and compelling evidence of three-dimensional learning and whether or you see evidence of NGSS design according to Criteria A, B, C, D, and E.
- Attempt to reach consensus as a table group and determine an evidence of quality rating for Criteria A, B, C, D, and E. Be prepared to share your evaluation and support them with evidence and reasoning.
- You have 20 minutes for this discussion. *[Note to facilitator: Set the timer for 20 minutes but monitor the table groups and provide more or less time as needed to complete this.]*



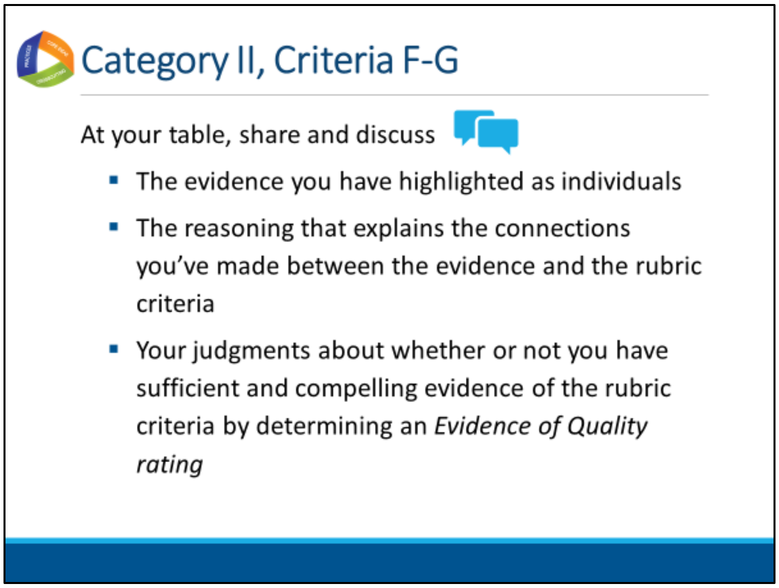
Slide 61

Facilitator Notes:

- Posting a timer that is visible to all participants can help everyone keep track of their time and stay on task.

Talking Points:

- We will now focus on the unit level criteria in Category II at this time – Criteria F and G. You will have 10 minutes to individually look for evidence and to record your evidence and reasoning in column two of the EQuIP Rubric response form.
- *[Note to facilitator: Set the timer for 10 minutes but monitor the table groups and provide more or less time as needed to complete this.]*



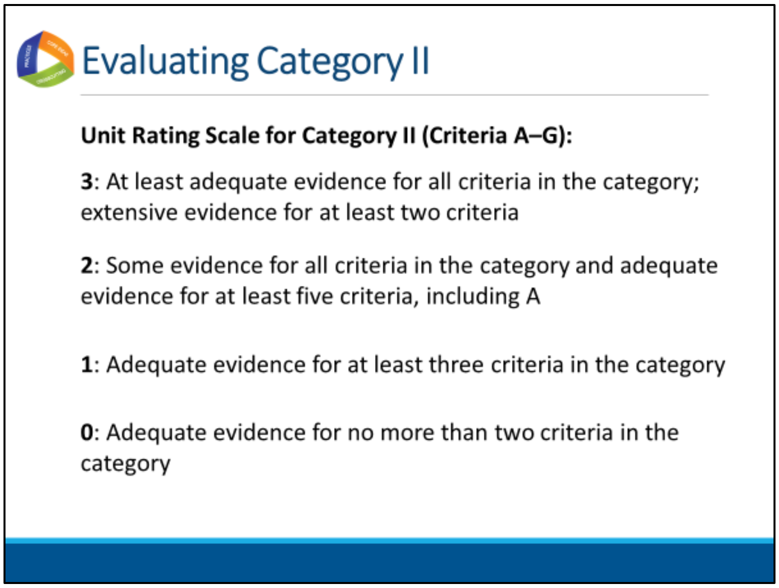
Slide 62

Facilitator Notes:

- Posting a timer that is visible to all participants can help everyone keep track of their time and stay on task.

Talking Points:

- Now it's time to share and compare.
- The table facilitators will begin the group discussion and make sure that everyone contributes his/her findings. You will need to share and discuss:
    - *[Note to facilitator: Click for animation.]* The evidence you highlighted;
    - *[Note to facilitator: Click for animation.]* The reasoning that explains the connections you made between the evidence and the rubric criteria; and then
    - *[Note to facilitator: Click for animation.]* Collaboratively evaluate whether this lesson or unit includes sufficient and compelling evidence of three-dimensional learning and whether or you see evidence of NGSS design according to Criteria F and G.
- Attempt to reach consensus as a table group and determine an evidence of quality rating for Criteria F and G. Be prepared to share your evaluation and support them with evidence and reasoning.
- You have 10 minutes for this discussion. *[Note to facilitator: Set the timer for 10 minutes but monitor the table groups and provide more or less time as needed to complete this.]*



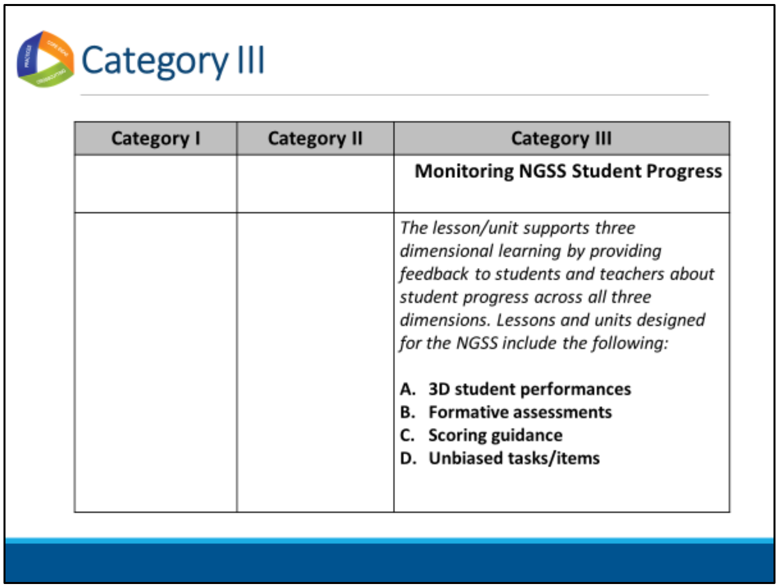
Slide 63

Facilitator Notes:

- While it is important to gather specific evidence of each criterion within the unit, it is not necessary for participants to use the scoring guide portion of the EQuIP Rubric to score each Category, because of how the information from EQuIP is incorporated into PEEC. However, this slide and the scoring can be included, as the discussions that arise from participants scoring a category can help a team reach consensus about a particular program.

Talking Points:

- Let’s rate the degree to which the criteria were met in Category I.
- Since we are examining a unit, we will be considering all the Criteria in Category 1.
- At each table, let’s review the evidence of quality for Criteria A through F. Then, as a group, determine a rating for Category I using the language on page 11 of the rubric. Note that the possible ratings fall across a 0–3 scale.
- *[Note to Facilitator: Give groups about 5-8 minutes to discuss evidence of quality for each criterion and to determine a Category rating.]*



Category I	Category II	Category III
		Monitoring NGSS Student Progress
		The lesson/unit supports three dimensional learning by providing feedback to students and teachers about student progress across all three dimensions. Lessons and units designed for the NGSS include the following: **A. 3D student performances** **B. Formative assessments** **C. Scoring guidance** **D. Unbiased tasks/items**

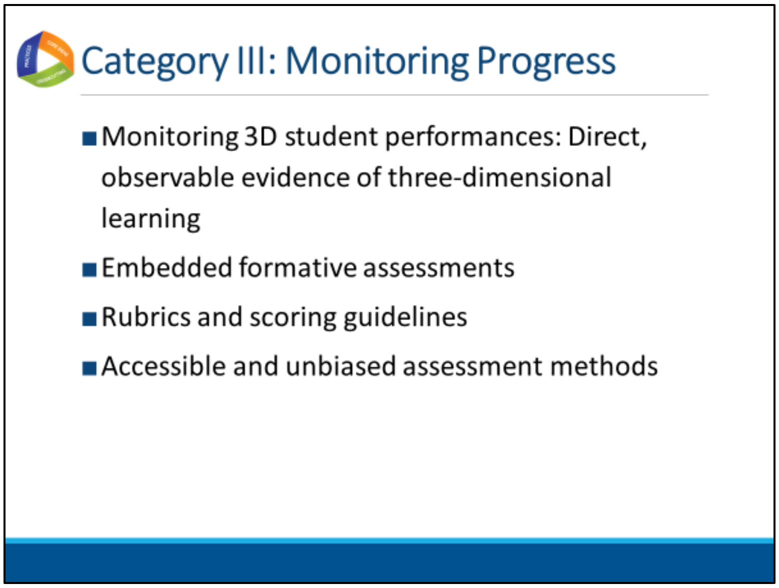
Slide 64

Facilitator Notes:

- The next few slides will help explain the criteria in Category 3.

Talking Points:

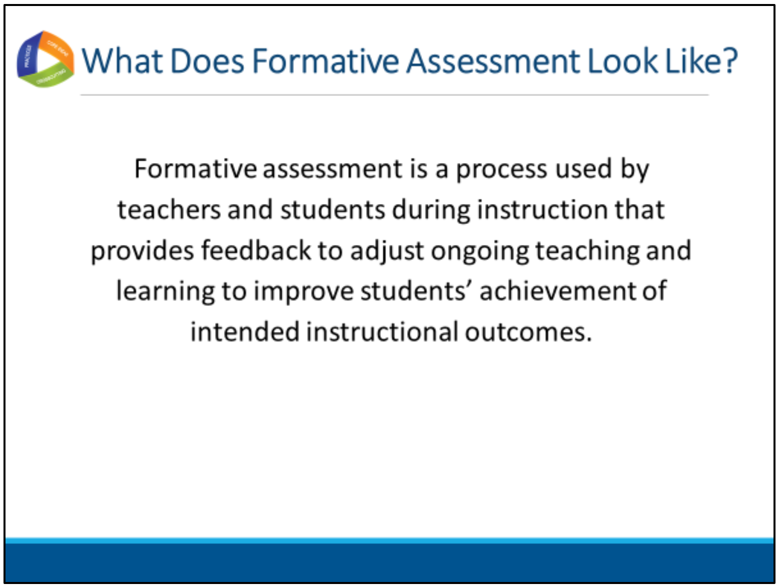
- The last Category in the rubric helps us figure out if the unit has been designed to monitor student progress.
- Category III focuses on examining lessons and units to determine whether they include the kinds of assessments necessary to assess student mastery of the NGSS accurately.
- Take a few minutes to read through Category III. *[Note to facilitator: Allow three to five minutes.]*



Slide 65

Talking Points:

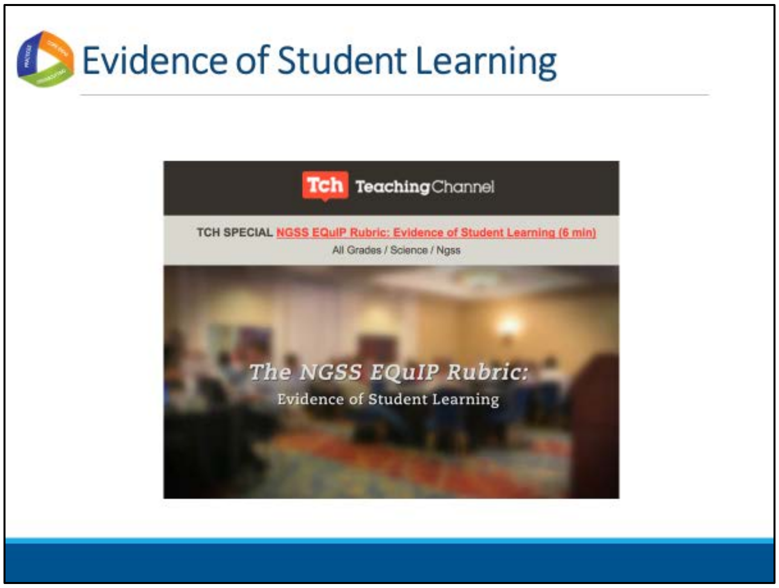
- The first four criteria of Category III focus on monitoring student NGSS progress in a lesson or a unit. The first criterion focuses on finding direct, observable evidence of 3D student performances. The second criterion focuses on finding evidence for embedded formative assessments. The third criterion focuses on finding evidence for guidance for interpreting 3D student performances through rubrics and scoring guidelines. The fourth criterion focuses on finding evidence for accessible and unbiased assessment methods.
- Take a few minutes and read through the Category III Criteria A-D on your rubric.
- Do you have any questions about the criteria? *[Note to facilitator: If participants have questions about formative assessment, that criteria will be discussed in the next few slides. You can choose to hold off on answering those until you hit those slides, or you can answer their questions and let them know they will be learning more about formative assessment in just a few minutes.]*
- We've focused extensively on direct, observable evidence of three-dimensional learning; but before we can examine units to look for evidence of embedded formative assessments, we need to determine just what that looks like.



Slide 66

Talking Points:

- According to a paper initiated by the Council of Chief State School Officers (CCSSO) in 2008 entitled, "Formative Assessment: Examples of Practice," formative assessment is:
    - A process used by teachers and students during instruction that provides feedback to adjust ongoing teaching and learning to improve students' achievement of intended instructional outcomes.
- Dylan Wiliam, who you may recall co-authored "Inside the Black Box," the groundbreaking research report on the impact of formative assessment on student learning, says this about formative assessment in his 2011 book, "Embedded Formative Assessment":
    - "An assessment functions formatively to the extent that evidence about student achievement is elicited, interpreted, and used by teachers, learners, or their peers to make decisions about the next steps in instruction that are likely to be better, or better founded, than the decisions they would have made in absence of that evidence." (43)



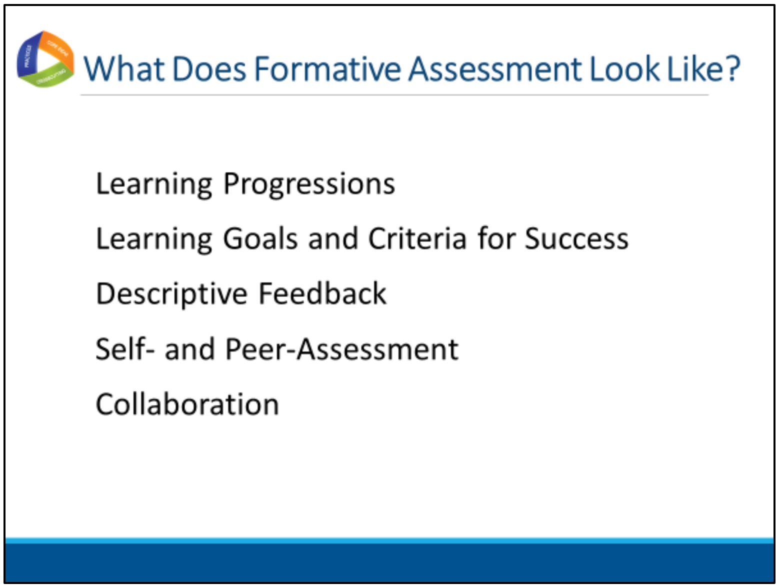
Slide 67

Facilitator Notes:

- This video can be found at http://www.nextgenscience.org/resources/ngss-equip-rubric-evidence-student-learning

Talking Points:

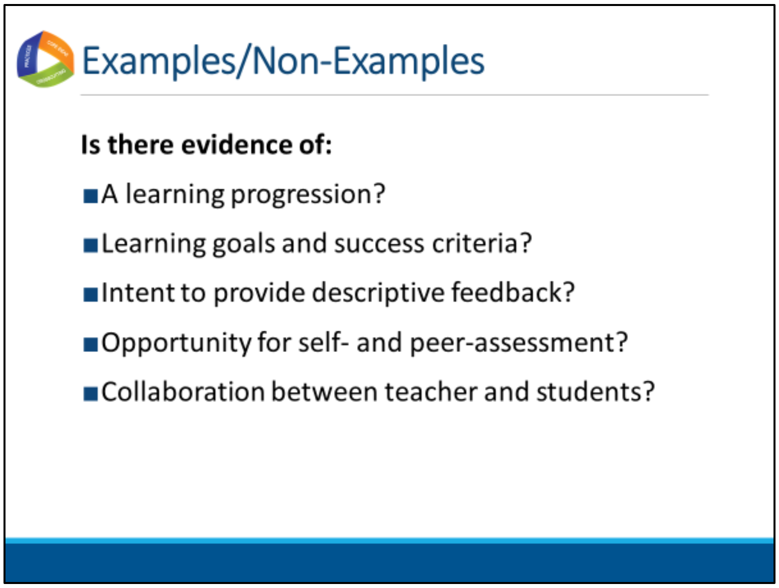
- This video highlights Category 3 of the EQuIP rubric.
- Let’s watch this video to better understand how we may approach looking for direct observable evidence of 3D student learning in a lesson.
- *[Note to Facilitator: After the video* Ask participants: “How can the features of the NGSS offer ways to make student thinking visible?” *Have a brief discussion (1–2 minutes).]*



Slide 68

Talking Points:

- According to the CCSSO paper, five attributes are associated with effective formative assessment:
    - *[Note to facilitator: Click for animation.]* **Learning Progressions** that clearly articulate the sub-goals of the ultimate learning goal [for a lesson or unit];
    - *[Note to facilitator: Click for animation.]* **Learning Goals and Success Criteria** that are clearly identified and communicated to students;
    - *[Note to facilitator: Click for animation.]* **Descriptive Feedback** provided to students that is evidence-based and linked to the intended instructional outcomes and criteria for success;
    - *[Note to facilitator: Click for animation.]* **Self- and Peer-Assessment** that provide students with opportunities to think meta-cognitively about their learning; and
    - *[Note to facilitator: Click for animation.]* **Collaboration** exemplified by a classroom culture in which teachers and students are partners in learning.



Slide 69

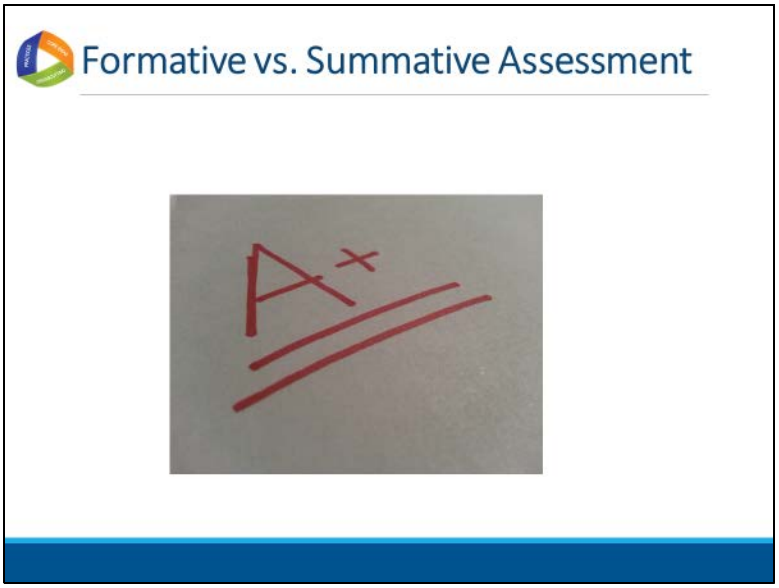
Facilitator Notes:

- Participants will need a copy of *Handout 22 – Formative Assessment Vignettes*.
- In this task, participants will read through the different vignettes to determine what evidence they see of the five attributes delineated by CCSSO or evidence they see that supports Wiliam's definition of formative assessment. (Note that the examples presented in the vignettes are not necessarily three-dimensional.) Directions for the task are included in the talking points below.

Talking Points:

- Please pull out your copy of the *Formative Assessment Vignettes* handout.
- Read through the different vignettes to determine what evidence you see of the five attributes delineated by CCSSO or evidence you see that supports Wiliam's definition of formative assessment. Please note that the examples presented in the vignettes are not necessarily three-dimensional.
- Once you've read through the vignettes individually, discuss your findings as a group to determine which vignettes are examples of formative assessment and which are non-examples. *[Note to facilitator: These vignettes, as well as additional information about formative assessment, are available in the* paper from the Council of State School Officers*. Allow seven to ten minutes.]*
- Now let's take a look at these examples and non-examples.
- The first vignette is "Thumbs Up and Thumbs Down." What do you think? Let's see your thumbs up if you think this example provides evidence of formative assessment or thumbs down if you do not.
- What's your reasoning? *[Note to facilitator: Allow one or two people to share.]*
- Here's what the experts say about this first vignette: "This teacher is using a formative assessment approach to collect evidence to adjust instruction. This is, therefore, an instance of formative assessment."
- Moving on to the second vignette, "Structured Pair Work," again, let's see your thumbs up if you think this example provides evidence of formative assessment or thumbs down if you do not.
- What's your reasoning for this one? *[Note to facilitator: Allow one or two people to share.]*
- Here's what the experts say about this second vignette: "This is an example of formative assessment where the posed questions and the peer conversations are used to elicit evidence of the students' understandings. In this context, the formative assessment process is embedded into the learning activity itself due to the teacher's careful engineering of the activity. The students are able to self-reflect and get feedback from their peers. The teacher is able to listen to the conversations between students to note the current level of understanding for the class and for individual students. The teacher uses the information immediately to assist students in their learning by redirecting thinking, reinforcing ideas or providing cues."

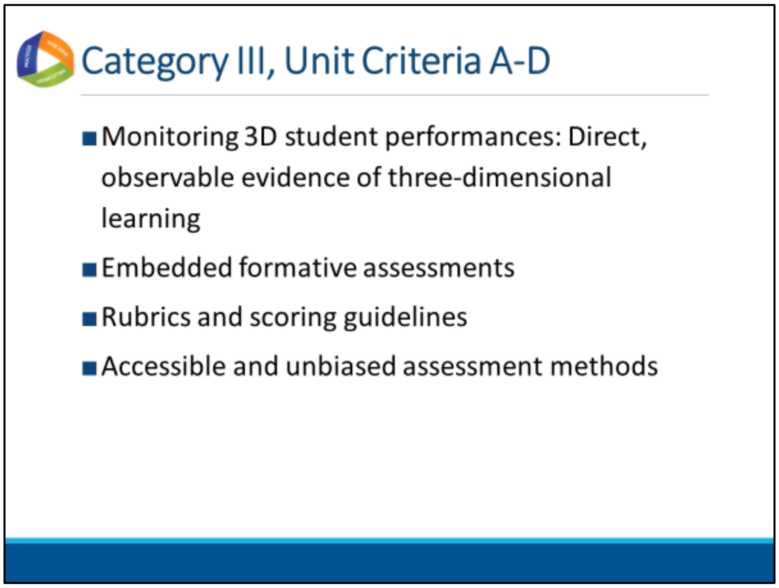
- Now for the third vignette, “Classroom Quizzes,” again, let’s see your thumbs up if you think this example provides evidence of formative assessment or thumbs down if you do not.
- What’s your reasoning for this one? *[Note to facilitator: Allow one or two people to share*.*]*
- Here’s what the experts say about this third vignette: “This is not an example of formative assessment because the teacher does not use the evidence from the quizzes to adjust instruction, nor does the teacher provide direction to students for them to think meta-cognitively about their own learning. The only information the students receive is a score for the number of correct answers. This is an example of ongoing summative assessment, not formative assessment.”
- Continuing on to the fourth vignette, “Shared Thinking,” again, let’s see your thumbs up if you think this example provides evidence of formative assessment or thumbs down if you do not.
- What’s your reasoning for this one? *[Note to facilitator: Allow one or two people to share*.*]*
- Here’s what the experts say about this fourth vignette: “In this example of formative assessment the teacher is provided with information about student learning, and the process used to gather that information also requires students to reflect on their own learning. This activity provides the teacher with information about how well the students understand the concept and how best to demonstrate that understanding. To fully participate in the activity, students must reflect on their own level of understanding as they analyze the work of others and provide reasons why they think there are gaps in understanding.”
- Finally, for vignette number five, “District-Developed Assessments,” let’s see your thumbs up if you think this example provides evidence of formative assessment or thumbs down if you do not.
- What’s your reasoning for this one? *[Note to facilitator: Allow one or two people to share*.*]*
- Here’s what the experts say about this fifth vignette: “In this example, we see neither teachers’ adjustment of their instruction nor students’ adjustment of their learning tactics. Thus, this probably well-intentioned distribution of the monthly exams’ results to parents would constitute a counter-example of formative assessment.”
- So, determining whether evidence of embedded formative assessment is present in a lesson or unit is not easy. Misconceptions regarding what is and what is not formative assessment are common. Hopefully these examples and non-examples from the CCSSO document, along with the expert commentary, help identify some of the more common misconceptions and clarify what we’re looking for in terms of evidence of embedded formative assessment.



Slide 70

Talking Points:

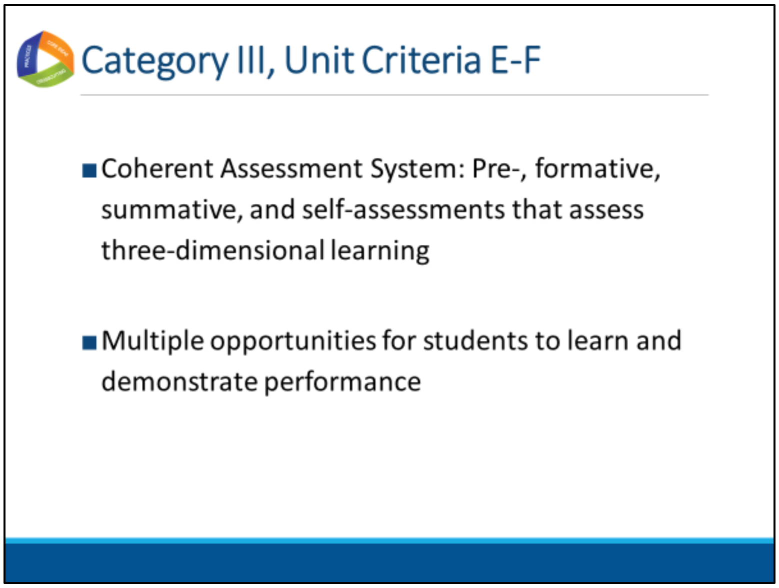
- Overall, whether an assessment is formative or summative depends on the purpose for which that assessment is being used.
- As William states, “An assessment functions formatively to the extent that evidence about student achievement is elicited, interpreted and used by teachers, learners or their peers to make decisions about the next steps in instruction.”
- Summative assessments, on the other hand, are those whose purpose is evaluation. Summative assessments provide grades or scores denoting overall mastery of the material.



Slide 71

Talking Points:

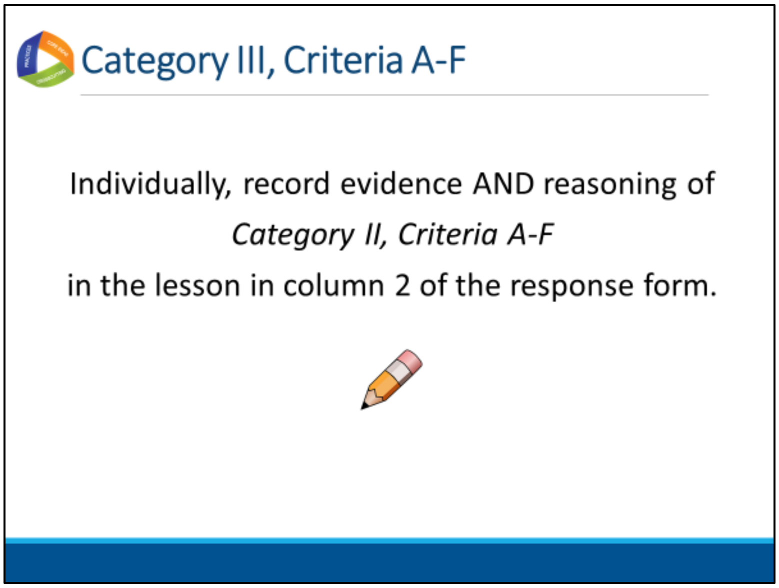
- As we prepare to look for evidence of the Category III criteria in an actual lesson, let's quickly review criteria A through D for Category III. *[Note to facilitator: Repeat the key points represented by the bullets for each criterion.)*
- Keep in mind that you'll be looking for direct, observable evidence of these criteria. This evidence must be explicitly stated in the lesson.



Slide 72

Talking Points:

- Criteria E and F of Category III focus on monitoring student progress in longer lessons or in a unit of instruction.
- Note that these criteria require multiple forms of assessment as well as multiple opportunities for students to demonstrate performance.
- Again, keep in mind that you're always looking for direct, observable evidence of these criteria.



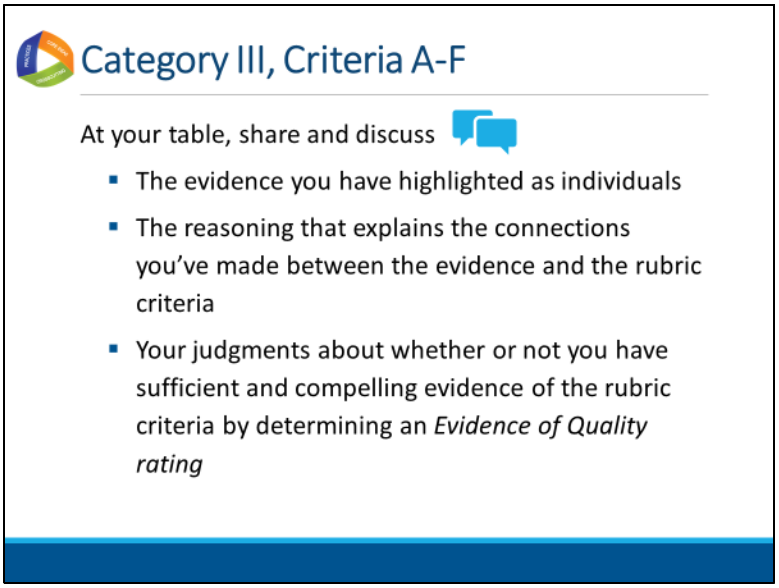
Slide 73

Facilitator Notes:

- Posting a timer that is visible to all participants can help everyone keep track of their time and stay on task.

Talking Points:

- You will have 30 minutes to individually look for evidence and to record your evidence and reasoning in column two of the EQuIP Rubric response form. We will only be focusing on the unit level criteria in Category II at this time – Criteria F and G.
- *[Note to facilitator: Set the timer for 30 minutes but monitor the table groups and provide more or less time as needed to complete this.]*



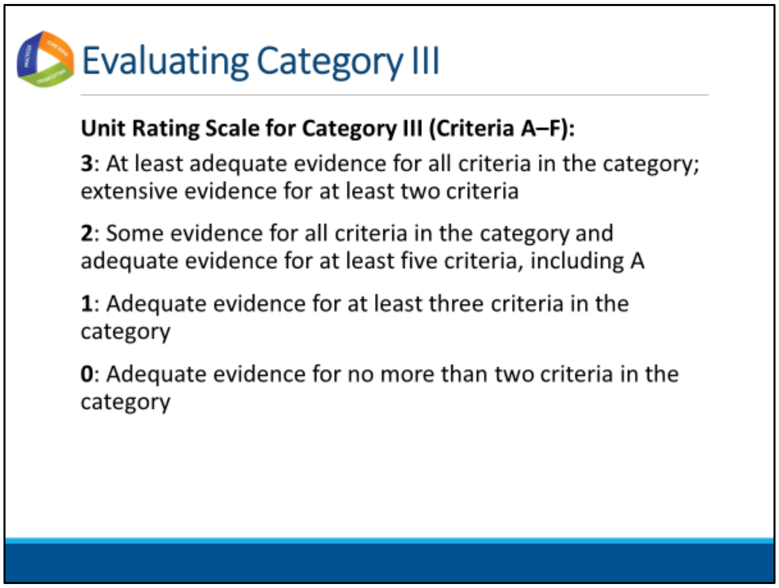
Slide 74

Facilitator Notes:

- Posting a timer that is visible to all participants can help everyone keep track of their time and stay on task.

Talking Points:

- Now it's time to share and compare.
- The table facilitators will begin the group discussion and make sure that everyone contributes his/her findings. You will need to share and discuss:
    - *[Note to facilitator: Click for animation.]* The evidence you highlighted;
    - *[Note to facilitator: Click for animation.]* The reasoning that explains the connections you made between the evidence and the rubric criteria; and then
    - *[Note to facilitator: Click for animation.]* Collaboratively evaluate whether this lesson or unit includes sufficient and compelling evidence of three-dimensional learning and whether or you see evidence of NGSS design according to Criteria A, B, C, D, E, and F.
- Attempt to reach consensus as a table group and determine an evidence of quality rating for Criteria A, B, C, D, E, and F. Be prepared to share your evaluation and support them with evidence and reasoning.
- You have 15 minutes for this discussion. *[Note to facilitator: Set the timer for 10 minutes but monitor the table groups and provide more or less time as needed to complete this.]*



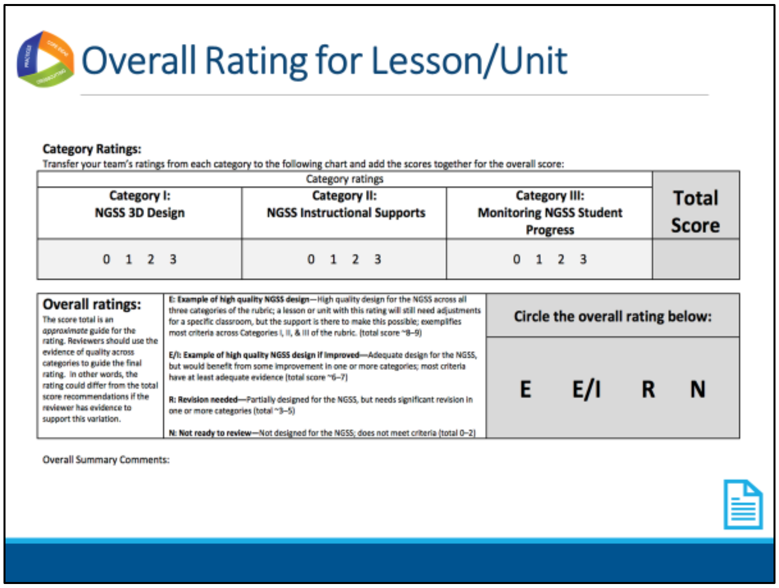
Slide 75

Facilitator Notes:

- While it is important to gather specific evidence of each criterion within the unit, it is not necessary for participants to use the scoring guide portion of the EQuIP Rubric to score each Category, because of how the information from EQuIP is incorporated into PEEC. However, this slide and the scoring can be included, as the discussions that arise from participants scoring a category can help a team reach consensus about a particular program.

Talking Points:

- Let’s rate the degree to which the criteria were met in Category III.
- Since we are examining a unit, we will be considering all the Criteria in Category III.
- At each table, let’s review the evidence of quality for Criteria A through F. Then, as a group, determine a rating for Category III using the language on page 13 of the rubric. Note that the possible ratings fall across a 0–3 scale.
- *[Note to Facilitator: Give groups about 5-8 minutes to discuss evidence of quality for each criterion and to determine a Category rating.]*



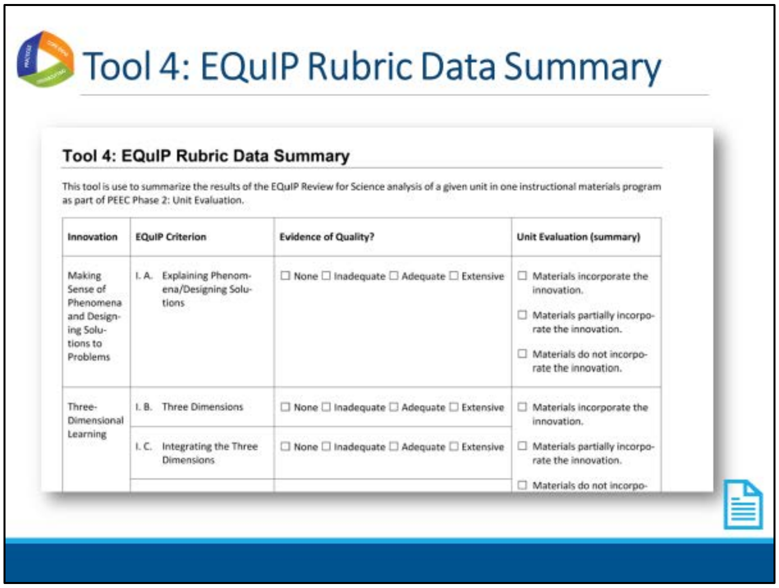
Slide 76

Facilitator Notes:

- Since participants will be transferring their findings from the EQuIP rubric to PEEC's Tool 4, they do not need to complete the EQuIP rubric's overall rating. You can acknowledge that this section exists (so participants do not get confused as to why a whole form is being skipped in the rubric), but that since we are not using the rubric as a stand-alone evaluation, the overall rating does not need to be completed.

Talking Points:

- If we were using the EQuIP rubric for evaluating a unit outside of the PEEC process, we would continue to give an overall rating for the unit using the scoring guide on the last page.
- However, since we are using the rubric for the PEEC process, instead of completing the overall rating, we will now need to transfer our findings from the EQuIP rubric to *Tool 4* in the PEEC process.



Slide 77

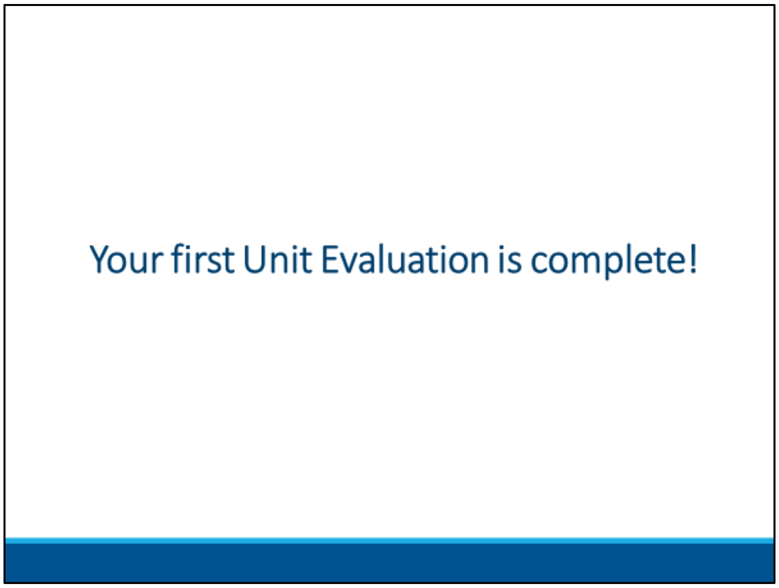
Facilitator Notes:

- Participants will need a copy of *Handout 24 – Tool 4: EQuIP Rubric Data Summary.*
- You can have participants either fill out the tool by hand or digitally.
- Participants will transfer their evaluations from the EQuIP Rubric to PEEC's Tool 4. If you need individual reports from each participant, make sure that each participant transfers their evaluation and submits a Tool 4 form. If you need one consensus report from each group, make sure that participants reach a consensus as they transfer the information to one Tool 4 form. In this case, the talking points below will need to be altered to reflect the completion of only one Tool 4 form.

Talking Points:

- Please pull out your copy of *Tool 4: EQuIP Rubric Data Summary.*
- We will transfer the information that you captured in the "Evidence of Quality?" checkboxes on the EQuIP Rubric to *Tool 4: EQuIP Rubric Data Summary*. Then, based on the pattern of checks and the evidence recorded in the rubric, you will decide the degree to which the unit appears to have integrated the NGSS Innovations.
- Take a minute to look through *Tool 4.*
- As you can see, the EQuIP criteria are not organized in the same way in Tool 4 as they were in the EQuIP Rubric. *Tool 4* reorganizes the criteria by the NGSS Innovations. Remember that there are five NGSS Innovations that we have learned about. The goal for the Unit Evaluation (and Tool 4) is to see whether an instructional materials program integrates the NGSS Innovations. If it integrates all five innovations, the unit shows evidence of NGSS design. So, for each of the five Innovations, you need to decide whether the unit incorporates the innovation, partially incorporates the innovation, or does not incorporate the innovation. To help you make that decision, you completed the EQuIP Rubric for a unit. Tool 4 organizes the EQuIP criteria by the Innovations and places each criterion under one of the Innovations. Some Innovations may have one EQuIP criteria under them (such as the first Innovation) and some may have more. While the order of the EQuIP criteria is different in Tool 4 than the EQuIP Rubric, the title for each criterion is the same across the two forms. The title for each criterion is in the second column of Tool 4. In the third column are the Evidence of Quality checkboxes that you will transfer over from the EQuIP rubric. The fourth column titled "Unit Evaluation (summary)" introduces new checkboxes that show whether an entire Innovation was integrated in the unit. To decide whether the materials incorporate the innovation or not, you will have to look at the evidence of quality that you selected for all the criteria grouped in that Innovation, and will need to go back and look at the specific evidence that you recorded as comments for the criterion in EQuIP. Then you can select whether the Innovation was not incorporated, was partially incorporated, or was incorporated.

- Take five minutes to first transfer the information in the “Evidence of Quality?” checkboxes from the EQuIP Rubric to Tool 4.
- Now, take five-ten minutes to discuss as a group and decide the degree to which the unit appears to have integrated the NGSS Innovations. Use the evidence you have collected in your EQuIP rubric and information from the NGSS Innovations handouts to help guide your discussion and support your claims. At the end of your discussion, mark the appropriate boxes in the fourth column.



Slide 78

Facilitator Notes:

- Collect all the completed Tool 4 forms and completed EQuIP Rubrics from participants.

Talking Points:

- Congratulations! You have now completed your first unit evaluation of an instructional materials program.

Slide 79

Facilitator Notes:

- The process of completing an EQuIP Rubric for a unit and transferring the information over to the Tool 4 form should be repeated and completed for the remaining instructional materials programs. The first unit evaluation was structured and completed as a group so that participants would understand exactly what they were supposed to do. Now that participants understand the criteria and the process, each group can complete the rest of the unit evaluations at their own pace. They should still keep a group timer for each category, and suggested evaluation times are recommended on the next slide. As participants become more comfortable with the EQuIP Rubric, they may need less time to find evidence for each criterion and for their group discussions, and their timer should be adjusted accordingly. Allowing each group to keep their own timer and move at their own pace is recommended, because depending on the size of the group, and whether the groups are all reviewing the same program, the groups may move at different speeds, and this method will help maximize the use of each group's time. If you notice that groups are spending too much time on each category where they may not be able to complete the evaluation of all programs in the allotted time, or that they are not spending enough time to generate quality reports, then support them with their timing.
- Based on the amount of time it took you to get through the first unit evaluation, you may have time to do one or more unit evaluations today. The entire day tomorrow (Day 3 of the professional learning) will be spent completing the unit reviews. Each group will need to know how many programs they have left to review and how much time they have available. For each group, divide the time available with the number of programs so they know how much time they can spend evaluating each program. Suggested times for how long participants should spend reviewing each category are on the next slide, but they should be adjusted based on the amount of time you have available and how comfortable the participants are in using EQuIP.

Talking Points:

- You will now repeat the process of filling out an EQuIP Rubric and Tool 4 form for the remaining instructional materials program. The rest of the day today and the all day tomorrow will be spent completing these unit evaluations.
- We walked through the first unit evaluation as a group so that you could become familiar with the criteria and process. Now that you understand the process, you will complete evaluating the rest of the programs. Your groups will be responsible for keeping your own timers and for moving through the evaluation process. *[Note to facilitator: Inform each group how many programs they need to review and the amount of time they have to review the programs. Divide the time available with the number of programs so they know how much time they can spend evaluating each program. Suggested times for how long participants should spend reviewing each*

category are on the next slide, but they should be adjusted based on the amount of time you have available and how comfortable the participants are using EQuIP.]

- Your table facilitator will keep track of the timer and will make sure that you stay on task. *[Note to facilitator: Have groups pick table facilitators, if they have not already done so.]*

Suggested Evaluation Times

Section	Individual Time	Group Time
Category I	45	25
Category II	35	15-20
Category III	35	15-20
Tool 4	5	10

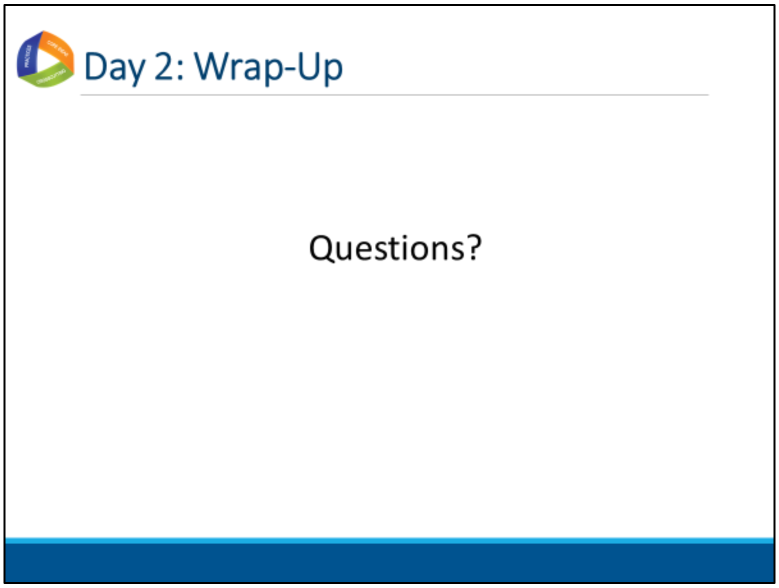
Slide 80

Facilitator Notes:

- This slide contains the suggested times for how long participants should spend reviewing each category – both individually and as a group. The suggested evaluation time per program is three hours. These times should be adjusted based on the amount of time you have available and the number of programs left for review (this was calculated on the last slide) and on how comfortable the participants are in using EQuIP.
- As participants become more comfortable with the EQuIP rubric with each program review, they may need less time to find evidence for each criterion and for their group discussions, and their timer should be adjusted accordingly.
- Depending on the number and type of resources that a program has and the amount of evidence found that indicates NGSS design, some programs may take longer to evaluate than others. If participants find no evidence for a group of criteria, they will not need to spend time writing down the evidence, decreasing the amount of individual time needed for that category.
- Allow each group to keep their own timer, and provide support as necessary.
- You can keep this slide (with your adjusted times) projected for the rest of the day to remind participants of the time structure they should try to follow.
- Remember to collect the completed EQuIP rubrics and Tool 4 forms for each program.

Talking Points:

- As you move on the evaluate the remaining programs, keep in mind how much time you have to review each program. This slide will remain on the screen to help structure the time you have available to review a program. Your table facilitator should keep track of your timer and will make sure that you stay on task.
- Let’s get your materials for the next program and begin your second unit evaluation.



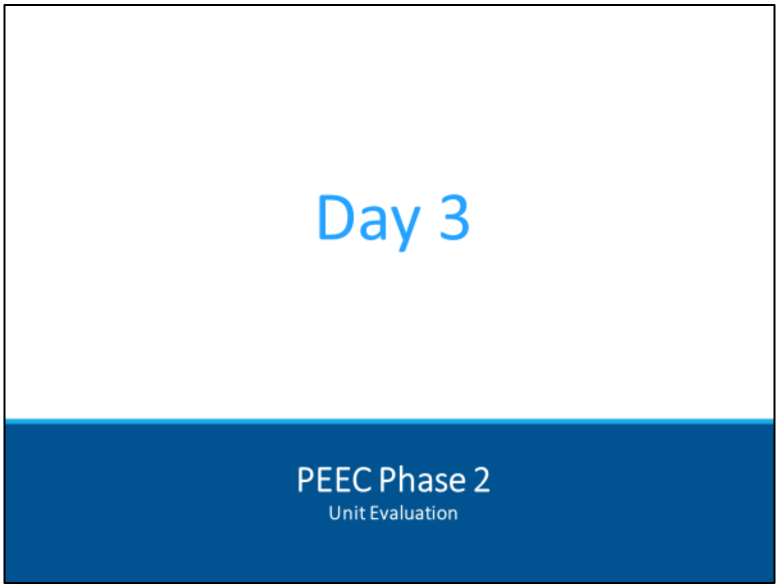
Slide 81

Facilitator Notes:

- Before participants leave for the day, check-in with each group to see the progress that they have made and how far they are in their unit evaluations. Check-in and see if they have any questions or concerns.
- The process of completing an EQuIP Rubric for a unit and transferring the information over to the Tool 4 form will be repeated the remaining instructional materials programs tomorrow.

Talking Points:

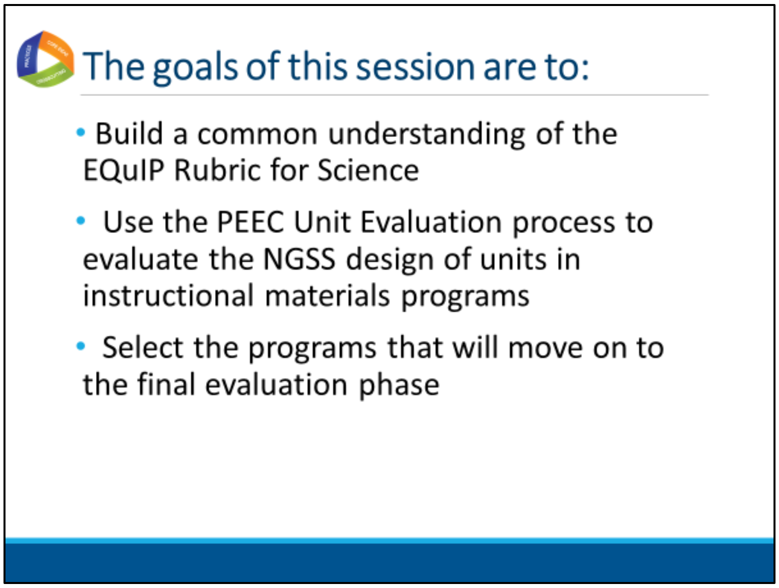
- Do you have questions or concerns about the unit evaluation process?



Slide 82

Facilitator Notes:

- On Day 2, participants worked on building a common understanding of the EQuIP rubric, and they used the PEEC Unit Evaluation process to evaluate the NGSS design of units in instructional materials programs.
- Today (Day 3), participants will continue to work on evaluating units for the remaining instructional materials program, so that the list of programs can be narrowed for the final evaluation phase.



Slide 83

Facilitator Notes:

- In Day 2, participants worked on building a common understanding of the EQuIP rubric, and they used the PEEC Unit Evaluation process to evaluate the NGSS design of units in instructional materials programs.
- Today (Day 3), participants will continue to work on evaluating units for the remaining instructional materials program, so that the list of programs can be narrowed for the final evaluation phase.

Talking Points:

- Yesterday, you worked on building a common understanding of the EQuIP Rubric for Science. You also used the PEEC Unit Evaluation process to evaluate the NGSS design of units in instructional materials programs.
- You will continue your unit evaluations for the remaining programs today and we will use the information from your Tool 4 forms to narrow the list of instructional materials programs that will move on to the final evaluation phase.

Suggested Evaluation Times

Section	Individual Time	Group Time
Category I	45	25
Category II	35	15-20
Category III	35	15-20
Tool 4	5	10

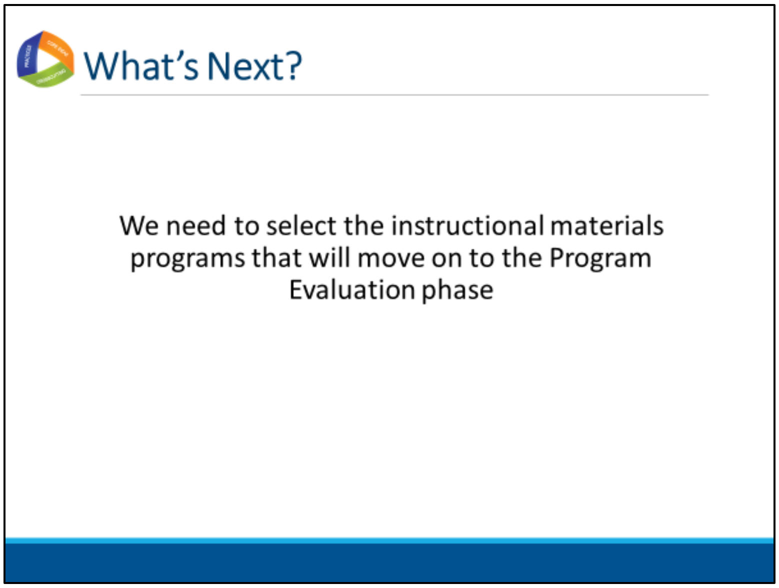
Slide 84

Facilitator Notes:

- This slide contains the suggested times for how long participants should spend reviewing each category – both individually and as a group. The suggested evaluation time per program is three hours. These times should be adjusted based on the amount of time you have available and the number of programs left for review (this was calculated on the last slide) and on how comfortable the participants are in using EQuIP.
- As participants become more comfortable with the EQuIP Rubric with each program review, they may need less time to find evidence for each criterion and for their group discussions, and their timer should be adjusted accordingly.
- Depending on the number and type of resources that a program has and the amount of evidence found that indicates NGSS design, some programs may take longer to evaluate than others. If participants find no evidence for a group of criteria, they will not need to spend time writing down the evidence, decreasing the amount of individual time needed for that category.
- Allow each group to keep their own timer, and provide support as necessary.
- You can keep this slide (with your adjusted times) projected for the rest of the day to remind participants of the time structure they should try to follow.
- Remember to collect the completed EQuIP rubrics and Tool 4 forms for each program.

Talking Points:

- We will structure our day similar to the latter half of yesterday. As you move on the evaluate the remaining programs, keep in mind how much time you need to review each program. This slide will remain on the screen to help structure the time you have available to review a program. Your table facilitator should keep track of your timer and will make sure that you stay on task.
- Let's get your materials for another program and begin your next unit evaluation.



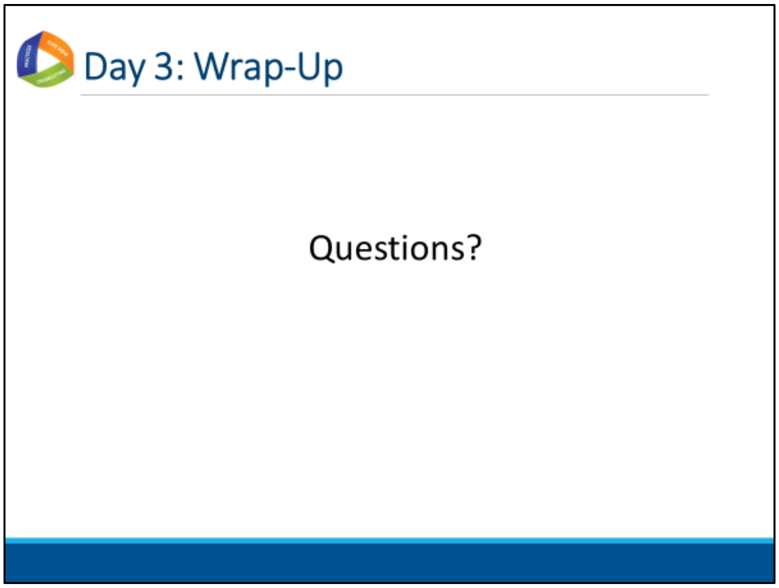
Slide 85

Facilitator Notes:

- After reports have been completed and collected for each program, the leadership team should evaluate whether all programs are worthy of further review. The leadership group can complete this task by themselves (they can stay late for Day 3 or find another time to meet before Session 3 begins), or they can split up and work with the groups to select the programs (before everyone leaves at the end of Day 3). Either way, the decisions will need to be based on findings from the completed Tool 4 forms. Since the participants have spent a lot of time digging through the programs, it is recommended that the leadership team members work with the groups to select the programs. Unless the separation in quality is very small, it is recommended that only the top two or three programs continue to the final phase of the PEEC process.

Talking Points:

- The last step of this session is to select the instructional materials programs that will move on to the final phase of the PEEC process: the program evaluation phase.
- *[Note to facilitator: Develop your talking points based on whether the participants will be a part of the discussion of which programs move forward.]*
- The next session, Session 3, will focus on the final phase of the PEEC process. Similar to the structure of this session, you will learn about the Program Evaluation process as a group, and will then work on using the process to evaluate the selected programs and generating a final recommendation.



Slide 86

Facilitator Notes:

- Check-in with participants to see if they have any questions about this session or the upcoming one.

Talking Points:

- Do you have questions or concerns about the unit evaluation process or our next steps?

Professional Learning Session Three: PEEC Program Evaluation (Days 4 & 5)

The purpose of this session is to use the PEEC Program Evaluation process to evaluate instructional materials programs and to generate final recommendations to support the selection of instructional materials programs designed for the NGSS.

The EQuIP Rubric for Science provides a close look at a single unit, but in programs designed for the NGSS, the NGSS Innovations need to build across the program. For each of the Innovations, this means looking for evidence beyond just the unit that was evaluated in PEEC Phase 2. In this third phase of evaluation, the student and teacher materials are evaluated to look for evidence of claims that would be expected to be present in materials designed for the NGSS. This will build on the evidence base of the PEEC Prescreen and Unit Evaluation to move reviewers to a final decision about which program to select.

Logistics & Materials

- If reviewers have access to computers, they will be to type up their evidence for each tool in the PEEC process. This is highly recommended, as it will allow them to capture more of their ideas and group discussions. A fillable PDF version and a Microsoft Word version of PEEC can be found at https://www.nextgenscience.org/peec. A fillable PDF version a Microsoft Word version of EQuIP Rubric for Science v.3 can be found at https://www.nextgenscience.org/resources/equip-rubric-lessons-units-science.
- Reviewers will need to be able to look up the standards and NGSS appendices, either digitally or in print format.
- The number of PEEC Tool handouts that will be needed will depend on the number of instructional materials programs that need to be reviewed for the program evaluation phase.
- The presentation requires a computer, projector, and speaker system.

Handouts needed:

- Handout 1 – NGSS Innovations
- Handout 4 – NSTA DCIs Matrix
- Handout 5 – NGSS Appendix F
- Handout 6 – NGSS Appendix G
- Handout 15 – Innovation Three
- Handout 25 – Tool 5 – Program Level Evaluation
- Handout 26 – Evaluating Claims Ratings – Program Evaluation
- Handout 27 – Tool 6 – PEEC Evidence Summary
- Handout 28 – Tool 7 – Final Evaluation

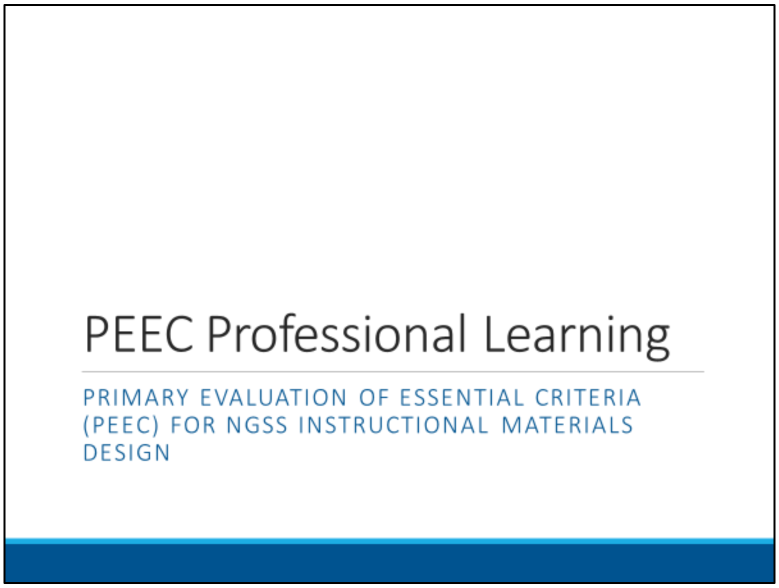
Considerations

How will you choose the sections to evaluate?

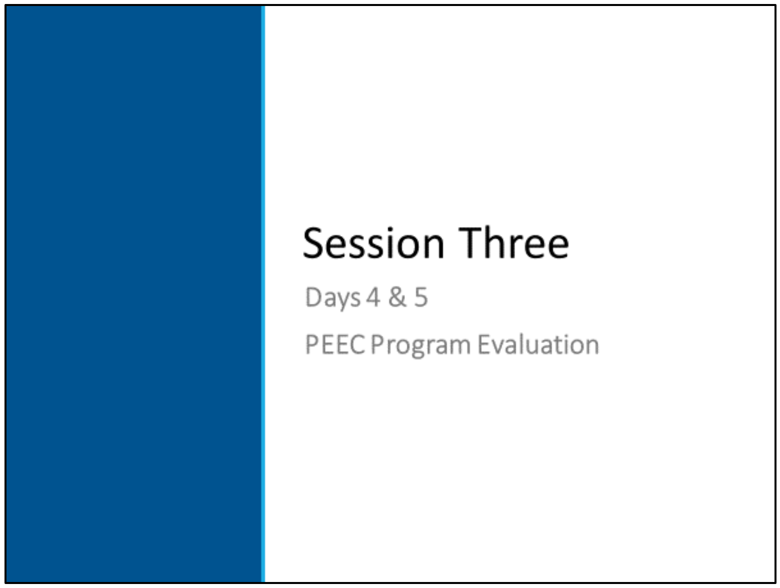
Reviewing every lesson, unit, and component of an instructional materials program is not feasible in most circumstances—the time and effort for such a task would outweigh the benefit for most users. Instead, PEEC users should develop a sampling plan that articulates which portion of the instructional materials program will be reviewed. If all five days of this professional learning will be back-to-back, this sampling plan should decided before the broader materials selection team is brought together. Here is an example of how you can create a sampling plan:

1. The first step in creating a sampling plan is to focus on defining learning sequences. Reviewers need to reach a consensus about what they consider a learning sequence, so that comparable portions of programs are compared. Here are some helpful guidelines for defining learning sequences:
    a. The learning sequences are a larger grain size than a task but are not as large as a unit. Reviewers should look for learning sequences that are about one-fourth to one-third the size of the unit they chose in Phase 2.
    b. Learning sequences should be large enough to be anchored by a phenomenon or a problem, and reviewers should be able to see students engage in three-dimensional performances to build their understanding of that phenomenon or problem.
2. Select at least three learning sequences in each program to review for Phase 3.
    a. The learning sequences should be spaced across the program. There should be one in the beginning, one in the middle, and one in the end. This will help reviewers look at how student proficiency is building across the entirety of the program.
    b. One of the lesson sequences should be directly before or after the unit that was evaluated for the program in Phase 2. Reviewers are extremely familiar with the unit that they evaluated in depth during Phase 2, and this will give them a jump-start in seeing if there is coherence directly between two learning sequences in the program.
3. If possible, select learning sequences that bring the same SEP or the same CCC to the foreground so that reviewers can clearly see the progression of a SEP or CCC across the program.
    a. It will be hard to find multiple learning sequences with a heavy focus on the same CCC *and* the same SEP, so reviewers should choose one of these dimensions to follow through the program to help them select the learning sequences. Remember, they will be gathering evidence for all three dimensions, not just the one that they use to help select the sequences.
4. Once the three steps above have been discussed, reviewers should write out their sampling plan (their ideas/selections for each of the three steps) in detail. The plan should include the page numbers of each learning sequence for *each* resource or component of the program that they will be evaluating. This will help ensure that all group members will be evaluating the same pieces of the program.

Slides



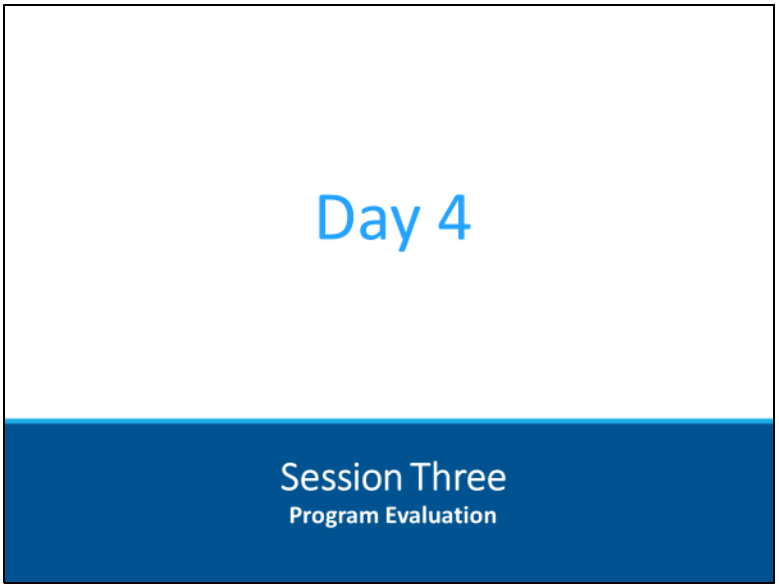
Slide 1



Slide 2

Facilitator Notes:

- The EQuIP Rubric for Science provides a close look at a single unit, but in programs designed for the NGSS, the NGSS Innovations need to build across the program. For each of the Innovations, this means looking for evidence beyond just the unit that was evaluated in PEEC Phase 2. In this session, participants will learn about the final phase of evaluation, and will evaluate the student and teacher materials to look for evidence of claims that would be expected to be present in materials designed for the NGSS. This will build on the evidence base of the PEEC Prescreen and Unit Evaluation to move reviewers to a final decision about which program to select.
- Depending on state and district requirements, you may need to complete additional evaluation forms, or participants may have to transfer their findings from the PEEC review process to state reporting forms. If so, you will need to build in the time to work on these forms and can complete these additional reporting forms either at the end of each program evaluation or after completing all program evaluations.



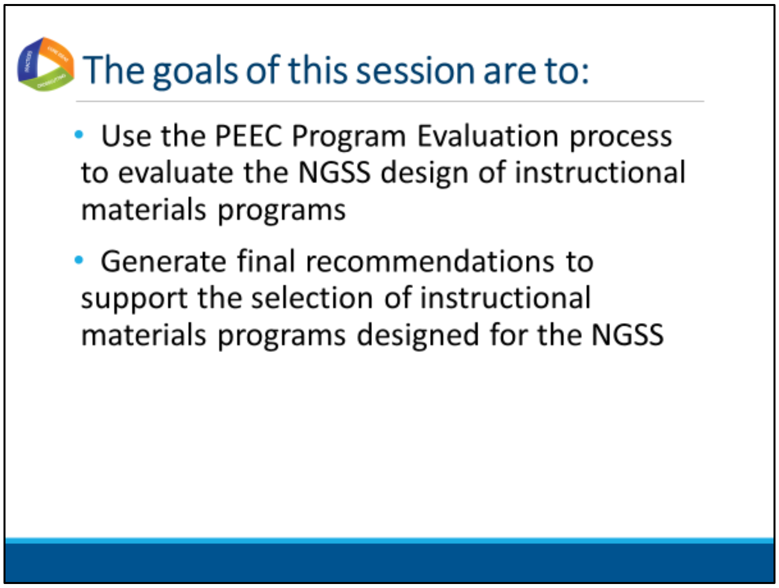
Slide 3

Facilitator Notes:

- Participants will learn about the PEEC Phase 3 Program Evaluation by using the process to evaluate an instructional materials program. Participants will then apply the process to the remaining instructional materials programs.
- Participants should be seated in groups. The type of groups and number of people in each group will vary by the type of review that you are doing.
    - For example, if this session is part of a review and selection process for a single grade's instructional materials program, such as a 3rd grade program, then the participants do not need to be separated by grade or discipline. You can divide all the participants up into groups of four-six and all participants can evaluate all of the programs that passed the prescreen (if you have adequate time). You may wish to group participants with varying levels of knowledge (i.e. spread out educators who have an understanding of the NGSS into separate groups), to allow for a rich discussion with multiple perspectives. The leadership team can be split across the groups, with one person from the leadership team serving as the table facilitator for each group.
    - If this session is part of a middle school review and selection process, and programs need to be selected per discipline, then you can create three groups: one that will review life sciences programs; one that will review earth and space sciences programs, and one that will review physical sciences programs. Or, if you need to be even more specific, then the groups could be: Biology, Chemistry, Physics, and Earth Science. You can assign participants to a group based on their expertise. If any particular group has a lot of members, you can split that large discipline group into smaller groups.

Talking Points:

[Note to facilitator: Create talking points for a welcome and introductions. If people in the room do not know each other, include an ice breaker activity to get the day started.]



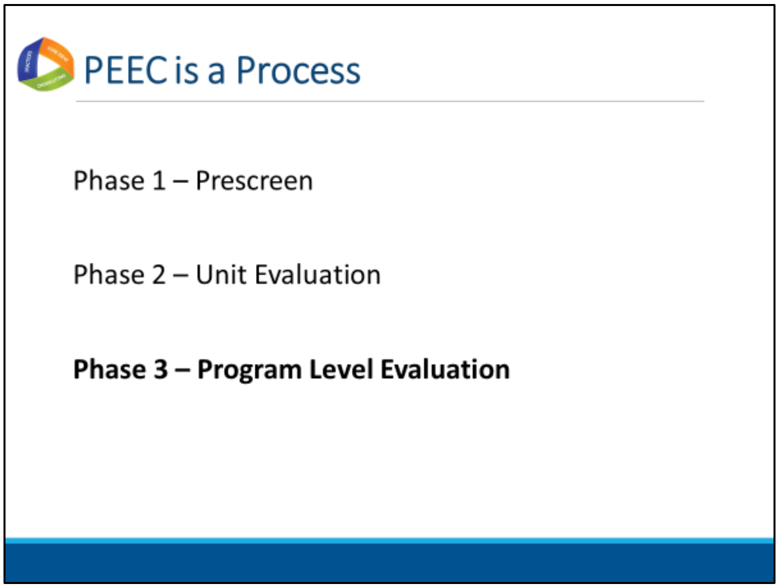
Slide 4

Facilitator Notes:

- The EQuIP Rubric for Science provides a close look at a single unit, but in programs designed for the NGSS, the NGSS Innovations need to build across the program. For each of the Innovations, this means looking for evidence beyond just the unit that was evaluated in PEEC Phase 2. In this session, participants will learn about the final phase of evaluation, and will evaluate the student and teacher materials to look for evidence of claims that would be expected to be present in materials designed for the NGSS. This will build on the evidence base of the PEEC Prescreen and Unit Evaluation to move reviewers to a final decision about which program to select.

Talking Points:

- In the last session, you learned about the second phase of PEEC and used the *Educators Evaluating the Quality of Instructional Products (EQuIP) Rubric for Science* to measure the alignment and overall quality of units in the instructional materials programs with respect to the NGSS. The programs that showed some evidence for NGSS design at the unit level were selected to move on to the final evaluation phase – the program evaluation.
- In this session, you will use the third phase of PEEC, the program evaluation process, to evaluate whether instructional materials programs show evidence of NGSS design at the program level.
- After completing the program evaluation process for all the programs that have made it this far, you will generate your final recommendations as to whether each program shows evidence of NGSS design. Your recommendations will help support the selection of science instructional materials programs.



Slide 5

Talking Points:

- For materials that successfully complete the second phase, the third and final phase of the PEEC process evaluates the evidence that the NGSS innovations are embedded across the entire instructional materials program.
- For each of the NGSS Innovations, this means looking for evidence beyond just the unit that was evaluated in Session Two.
- There is one Innovation that plays a key role in the evaluation of materials at the program level that we have not discussed yet.

Slide 6

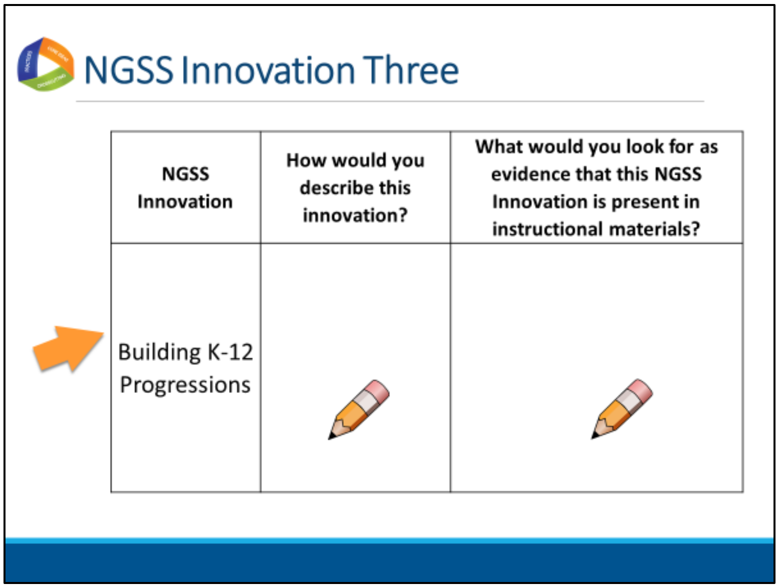
Facilitator Notes:

- In programs designed for the NGSS, the NGSS Innovations need to build across the program.
  - For example, the unit may have provided multiple and varied opportunities for students to ask scientific questions based on their experiences—clearly engaging students in the SEP “Asking Questions and Designing Problems”, but the scope of the unit may have been limited to developing a particular element of the SEP (e.g., only asking scientific questions without opportunities to define criteria and constraints associated with the solution to a problem) or to developing student facility with a particular element to a certain degree (e.g., appropriately removing scaffolds for development within the unit but not for the full expression of the SEP; only beginning to connect this SEP to other relevant SEPs). It is also important that that elements of that practice are effectively incorporated throughout the instructional year.
  - As is described in *Innovation 3: Building Progressions*, an instructional materials program designed for the NGSS will not only engage students in the practices, but will also build their understanding and use of each practice over time. If the unit evaluated in PEEC Phase 2 is either the only time that students engage in this practice, or if students engage in the practice the same way every time, then this innovation is not embedded in the program. PEEC Phase 3: Program Level Evaluation will support reviewers in examining the instructional materials program to determine whether the unit was representative of how well the NGSS Innovations are embedded throughout the instructional materials program.
- To do this across the entire instructional materials program, PEEC uses a different lens for evaluation. In this phase of evaluation, the student and teacher materials are evaluated to look for evidence of claims that would be expected to be present in materials designed for the NGSS. This will build on the evidence base of the PEEC Prescreen and Unit Evaluation to move reviewers to a final decision about which program to select.

Talking Points:

- The three-dimensional learning experiences described in NGSS Innovation 2 need to be coherently coordinated over time to increase student proficiency in all three dimensions. The ideas behind this coordination are a part of NGSS Innovation 3: Building Progressions.
- What does the phrase “building progressions across the dimensions” mean to you? Take a few minutes to write down your ideas. *[Note to facilitator: Pause for a few minutes and then continue when it looks like most people have 3-5 ideas written down.]*
- Take five minutes to discuss your ideas with your group.

- Let’s have each group share out one or two thoughts about what “building progressions across the dimensions” mean to you.
- *[Note to facilitator: Depending on how the conversation develops, you should pull talking points from the facilitator notes above, or here are some ideas that you can share or prompt participants toward:*
    - *The way that students use any given science and engineering practice on day one of a curriculum should be significantly different from how they are using that practice on day 180, and students should have many experiences across the year learning new elements of the practice and applying elements of the practice that have already been learned to new situations. The same can be said of the DCIs and the CCCs.*
    - *Progressions of all three dimensions should be coordinated over time, and clear support should be provided to the teacher to see how these progressions build over time.]*



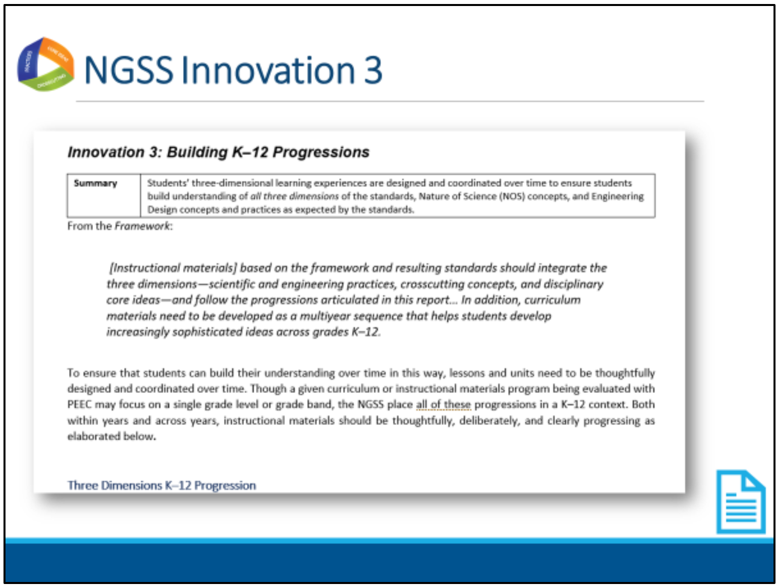
Slide 7

Facilitator Notes:

- Participants will need their copy of *Handout 1 – NGSS Innovations*.

Talking Points:

- Let's go back to our *NGSS Innovations* handout.
- Turn to page 2 in the handout.
- How has your description of the third NGSS Innovation changed since the first day of our professional learning? Take a few minutes to talk to your group and come up with a working group description for Building K-12 Progressions. Write your new description of this innovation in the table. *[Note to facilitator: Click for animation.]*
- Based on what you have learned so far, what would look for as evidence that this NGSS innovation is present in instructional materials? Discuss your thoughts with your group and then write your thoughts down in the table. *[Note to facilitator: Click for animation.]*



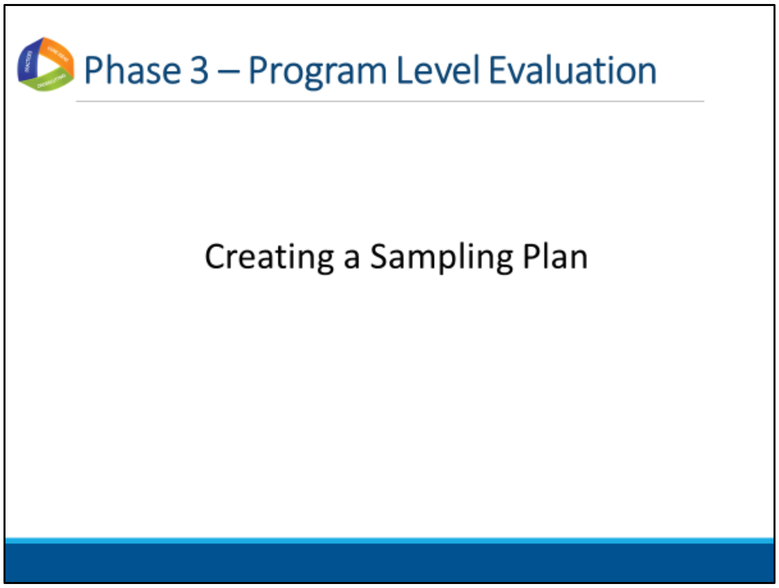
Slide 8

Facilitator Notes:

- Participants will need a copy of *Handout 15 – PEEC Innovation 3.*

Talking Points:

- Please take out your copy of the *PEEC Innovation 3* handout.
- Take a few minutes to discuss any new points that jump out for you with your group.
- Take a few minutes to go back to your *NGSS Innovations* handout and add in any additional thoughts in the table. Discuss your thoughts with your group. Especially focus on any new ideas about what you would look for as evidence that this NGSS Innovation is present in instructional materials.
- Remember that NGSS Appendices E, F, and G have information about the learning progression for each dimension.
- *Note to facilitator: It may be helpful to have a whole group share out after individual teams have completed their discussions.*



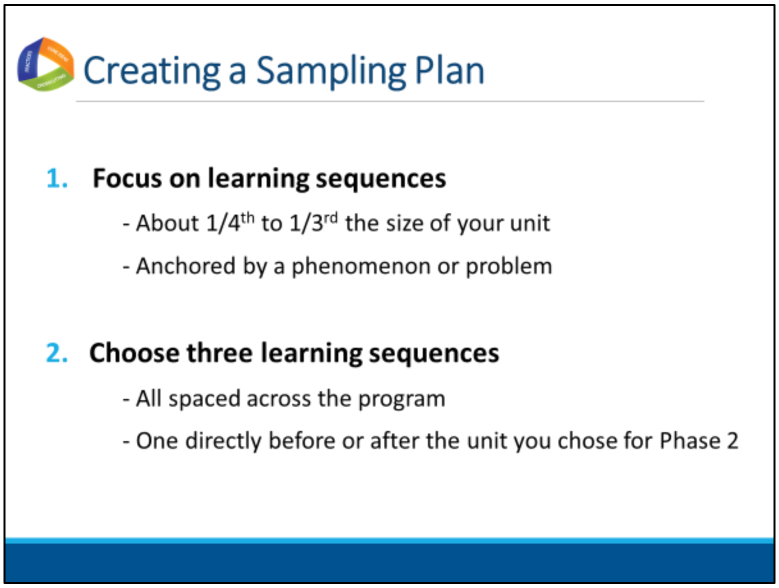
Slide 9

Facilitator Notes:

- Reviewing every lesson, unit, and component of an instructional materials program is not feasible in most circumstances—the time and effort for such a task would outweigh the benefit for most users.
- Instead, you should develop a sampling plan that articulates which portion of the instructional materials program will be reviewed in Phase 3. The next slide has suggestions for how to develop the sampling plan.

Talking Points:

- Reviewing every unit and component of the instructional materials programs to look for NGSS design across the entire program is not feasible.
- Instead, you will be creating a sampling plan that will allow you to evaluate sample learning sequences in different places in the program to help you create a larger picture of whether the program shows NGSS design in the five innovations.
- Each team will create a sampling plan for each instructional materials program that they are assigned to review. All group members will need to use the same sampling plan, so it is important that you collaboratively develop your plan as a group.



Slide 10

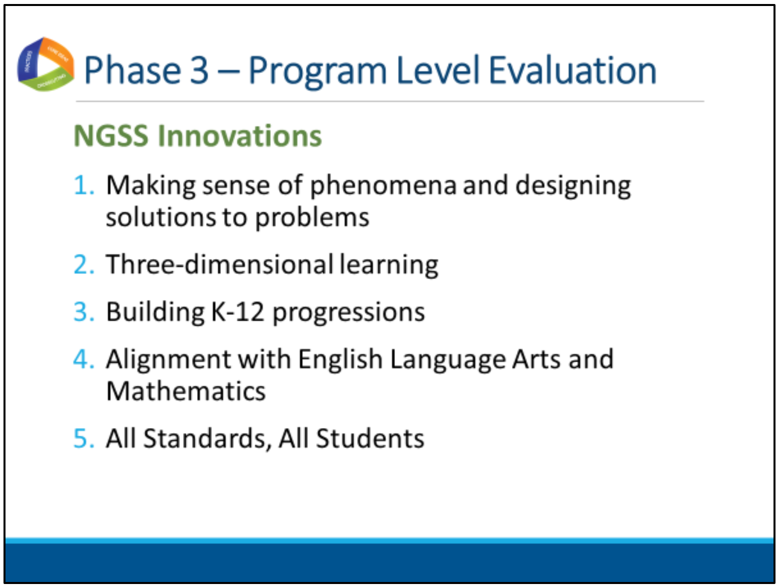
Facilitator Notes:

- Participants will need access to the first instructional materials program that they will be completing a program evaluation for.
- Reviewing every lesson, unit, and component of an instructional materials program is not feasible in most circumstances—the time and effort for such a task would outweigh the benefit for most users. Instead, you should develop a sampling plan that articulates which portion of the instructional materials program will be reviewed in Phase 3. The recommended steps for creating a sampling plan are included as talking points below.

Talking Points:

- You will be creating a sampling plan for each instructional materials program.
- Let's begin with the first program that you will review. Choose the program that scored the highest/showed the most promise for NGSS design in the unit evaluation. *[Note to facilitator: You may choose to allow the participants pick which program they will review first, or you may choose to pick the program before the session begins. It is highly recommended that the program that scored the highest in the unit evaluation be reviewed first for the full program evaluation. Since the entire group will walk through the first program level evaluation together, the program that shows the most potential will lead to richer discussions of the criteria in this phase of the process. Either way, all members of a group should review the same program at the same time, or if possible and applicable to your situation, all groups should review the same program at the same time.]*
- The first step in creating a sampling plan is to focus on learning sequences. There is not enough time to do an EQuIP review for more units, so we will be focusing on a slightly smaller grain size – learning sequences.
- The learning sequences are not meant to be as small as one task or as large as a unit.
- We want to look for learning sequences that are about one-fourth to one-third the size of the unit you chose in Phase 2.
- The most important part is that the learning sequences should be large enough to be anchored by a phenomenon or a problem, and you should be able to see students engage in three-dimensional performances to build their understanding of that phenomenon or problem. *[Note to facilitator: If groups have found that a program is lacking in the integration of phenomenon or problems in general, then have them pick a smaller theme or concept within units.]*
- You will need to choose at least three learning sequences in each program to review for Phase 3.
    - The learning sequences should be spaced across the program. There should be one in the beginning, one in the middle, and one in the end. This will help you look at how student proficiency is building across the entirety of the program.

    - One of the lesson sequences should be directly before or after the unit that you evaluated in Phase 2. You are extremely familiar with the unit that you evaluated in depth during Phase 2, and this will give you a jump-start in seeing if there is coherence directly between two learning sequences in the program.
- If you are able to, select learning sequences that bring the same SEP or the same CCC to the foreground so that you can clearly see the progression of a SEP or CCC across the program. It will be hard to find multiple learning sequences with a heavy focus on the same CCC **and** the same SEP, so chose one of these dimensions to follow through the program to help you select the learning sequences. Remember, you will be gathering evidence for all three dimensions, not just the one that you use to help select the sequences.
- Once you have discussed all of this as a group, write out your sampling plan in detail. Include the page numbers of each learning sequence for **each** resource or component of the program that you will be evaluating. This will help ensure that all team members will be evaluating the same pieces of the program.
- *Note to facilitator: Give teams 10-15 minutes to create their sampling plan. Walk around to help remind them of the requirements of the sampling plan, as needed.*



Slide 11

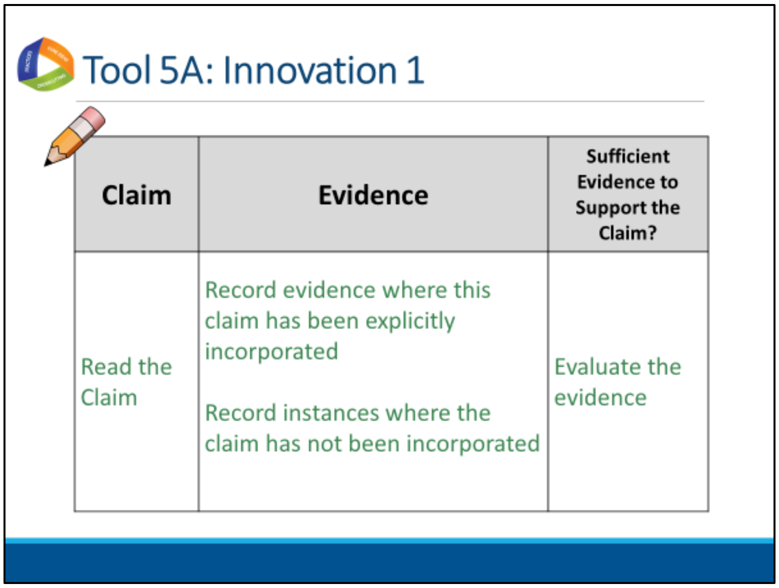
Facilitator Notes:

- This slide helps participants understand how the tools in this evaluation phase are structured and what evidence needs to be collected.
- Participants will need a copy of *Handout 25 – Tool 5: Program Level Evaluation*. Depending on your requirements, they can either fill out a copy by hand or digitally for the first program that they will review.
- Participants will need access to the NGSS Appendices F and G and the NSTA DCI matrix. These copies are provided as *Handout 04 – NSTA DCIs Matrix; Handout 05 – NGSS Appendix F; Handout 06 – NGSS Appendix G*
- Participants will need their copies of the Innovations handouts (*Handouts #13-17).*

Talking Points:

- Now that we have our sampling plans, let's begin our program evaluation.
- The program evaluation consists of five tools or five response forms. Each tool is for a NGSS Innovation that we have already discussed.
- Please take out your copy of the *Tool 5: Program Level Evaluation* packet. This packet contains all five tools/response forms for the evaluation.
- Turn to your copy of Tool 5A in your packet and take a few minutes to read through it. *[Note to facilitator: Give participants a few minutes to read through the tool.]*
- How is this tool similar to and different from the EQuIP rubric and Tool 4 (from the unit evaluation)?
    - *[Note to facilitator: The expected answers are:*
    - *It is organized by the NGSS Innovations, similar to Tool 4.*
    - *Instead of criteria, there are claims.*
    - *Instead of recording evidence that a criterion is met, we are searching for and recording evidence of places where the Innovation has been incorporated and also where it has not been incorporated.*
    - *There are check-boxes for "sufficient evidence to support claim" which is similar to the "evidence of quality" check-boxes in the EQuIP rubric.]*
- *Note to facilitator: If the discussion in the previous talking point did not raise the following points, discuss them now with the participants:*
    - The Program Level Evaluation tools examine an instructional materials program to determine how well the NGSS Innovations are embedded throughout the instructional materials program.
    - To do this across the entire instructional materials program, PEEC uses a different lens for evaluation. In this phase of evaluation, the student and teacher materials are evaluated to look for evidence of claims that would be expected to be present in materials designed for the NGSS.

- Each innovation is represented by a claim. You will use your sampling plan to find evidence where the Innovation has been clearly incorporated into the materials and to find evidence where it does not appear to be incorporated into the materials.



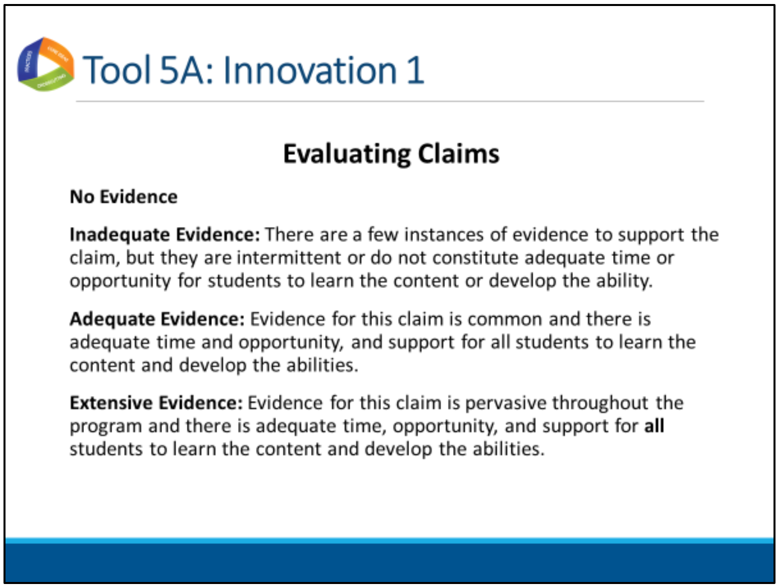
Slide 12

Facilitator Notes:

- Participants will need a copy of *Handout 25 – Tool 5: Program Level Evaluation*. Depending on your requirements, they can either fill out a copy by hand or digitally for the first program that they will review.
- Participants will need access to the NGSS Appendices F and G and the NSTA DCI matrix. These copies are provided as *Handout 04 – NSTA DCIs Matrix; Handout 05 – NGSS Appendix F; Handout 06 – NGSS Appendix G*
- Participants will need their copies of the Innovations handouts (*Handouts #13-17).*
- Posting a timer that is visible to all participants can help everyone keep track of their time and stay on task.

Talking Points:

- The first tool that we will use is Tool 5A: Program Level Evaluation for Innovation 1: Making Sense of Phenomena and Designing Solutions to Problems.
- You will use Tool 5A to collect evidence and make claims about how well a program addresses NGSS Innovation 1.
- There are two claims in this tool that you will be looking for evidence for in the program.
- The first claim states, "from the student's perspective, most learning experiences are focused on making sense of phenomena and designing solutions to problems."
- The second claim states, "guidance is provided to teachers to support students in making sense of phenomena and designing solutions to problems."
- As you go through the sample learning sequences that are outlined in the sampling plan, look for evidence for each of these claims.
- In the second column titled "evidence," record evidence of where the innovation has been clearly and explicitly incorporated into the materials. Also record instances where it does not appear to have been incorporated.
- Your evidence should be in complete sentences and thoughts, and should include page numbers, a brief description of the evidence, and an explanation of how it either supports or contradicts the claim.
- The second claim box has some specific examples of evidence that you can look for that can help support the claim is present (or absent) in the materials.
- Remember to refer to the NGSS Appendices, the NSTA DCI Matrix, and the individual innovation handouts, as needed.
- Take 15 minutes to individually look for and record evidence for both claims. *[Note to facilitator: Set a timer for 15 minutes.]*



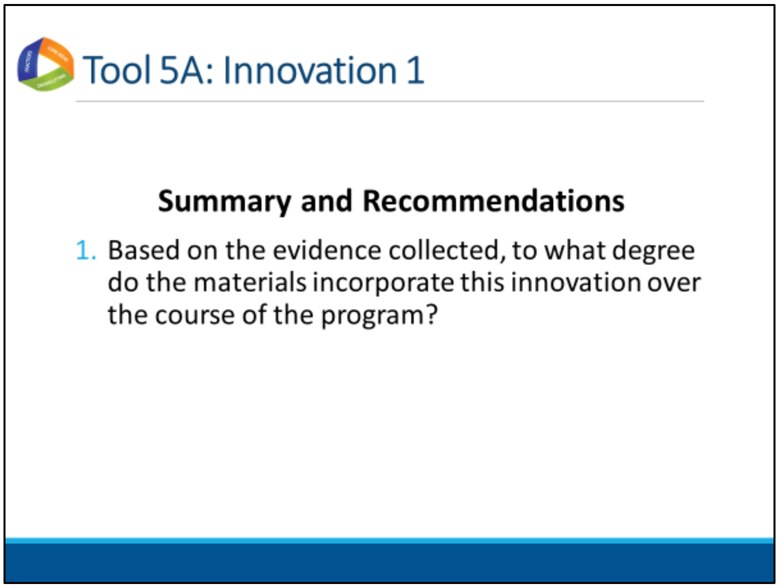
Slide 13

Facilitator Notes:

- Participants will need a copy of *Handout 26 – Evaluating Claims Rating – Program Evaluation* handout.
- Posting a timer that is visible to all participants can help everyone keep track of their time and stay on task.

Talking Points:

- Now that you have your individual evidence, take a few minutes to evaluate the degree to which there is sufficient evidence to support each claim.
- Use your *Evaluating Claims Rating – Program Evaluation* handout (also pictured on the screen) to help you fill out the third column.
- Now, take 10 minutes to discuss the evidence as a group and come to a consensus about the degree to which there is sufficient evidence to support each claim.
- Use your copy of the *Evaluating Claims Rating – Program Evaluation* handout (also pictured on the screen), to help you in your discussion.



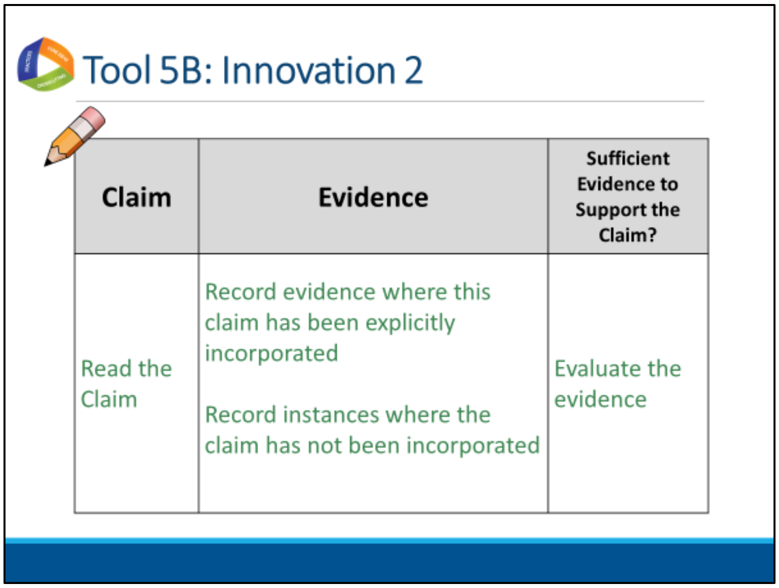
Slide 14

Facilitator Notes:

- The third question in the summary and recommendations section asks for suggestions about what support and/or resources will be needed for programs that partially incorporate innovations. Depending on your district's ability to provide and implement the suggested support and/or resources, you can ask this question in several different ways:
    - Ask for suggestions for the overall program after the team has completed all five program evaluation tools
    - Ask for suggestions for how to support each innovation in the program
    - Ask for suggestions for only those instructional materials that end up passing the program evaluation phase. *(Note: Asking for suggestions could be removed as a question from the five tools in phase and could be a separate process after all materials have been evaluated in phase 3.)*

Talking Points:

- Based on the evidence collected, you will now complete the summary and recommendations portion of the tool.
- The first question asks you to decide the degree to which the innovation shows up across the program.
- For materials that only partially incorporate the innovation, provide suggestions as your answer to the third question for what will be needed—professional learning; additional lessons, units, or modules; developing a district-wide approach to using the crosscutting concepts (because they aren't well represented in the materials); etc.
- There is also a space in the second question to leave notes and comments about your recommendation.
- *[Note to facilitator: Give participants 5-10 minutes to complete the summary and recommendations section.]*



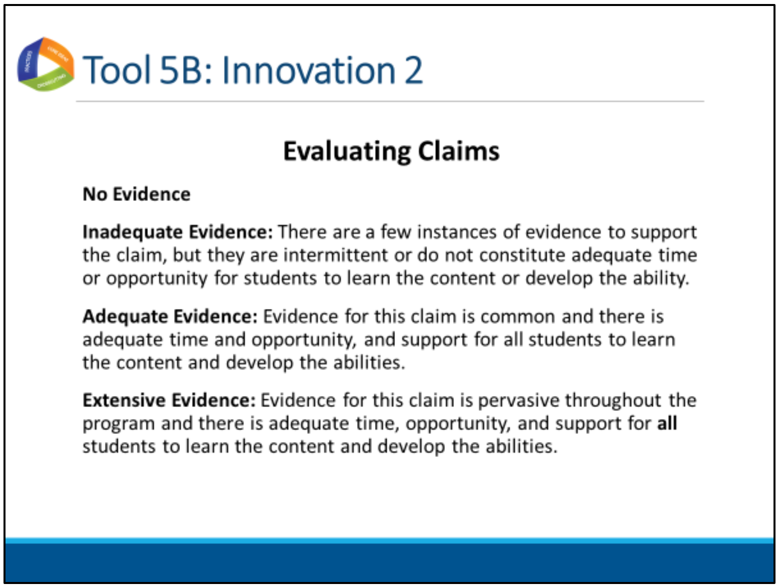
Slide 15

Facilitator Notes:

- Participants will need their copy of *Handout 25 – Tool 5: Program Level Evaluation*. Depending on your requirements, they can either fill out a copy by hand or digitally for the first program that they will review.
- Participants will need access to the NGSS Appendices F and G and the NSTA DCI matrix. These copies are provided as *Handout 04 – NSTA DCIs Matrix; Handout 05 – NGSS Appendix F; Handout 06 – NGSS Appendix G*
- Participants will need their copies of the Innovations handouts (*Handouts #13-17).*
- Posting a timer that is visible to all participants can help everyone keep track of their time and stay on task.

Talking Points:

- Turn to your copy of Tool 5B and take a few minutes to read through it.
- You will use Tool 5B to collect evidence and make claims about how an instructional materials program addresses NGSS Innovation 2: Three-Dimensional Learning.
- There are five claims in this tool that you will be looking for evidence for in the program.
- As you go through the sample learning sequences that are outlined in the sampling plan, look for and record evidence for each of these claims.
- Remember that some of the claim boxes have examples of evidence you can look for that can help support the claim is present (or absent) in the materials.
- Remember to refer to the NGSS Appendices E, F, and G, and the individual innovation handouts, as needed.
- Take 25 minutes to individually look for and record evidence for both claims. *[Note to facilitator: Set a timer for 25 minutes.]*



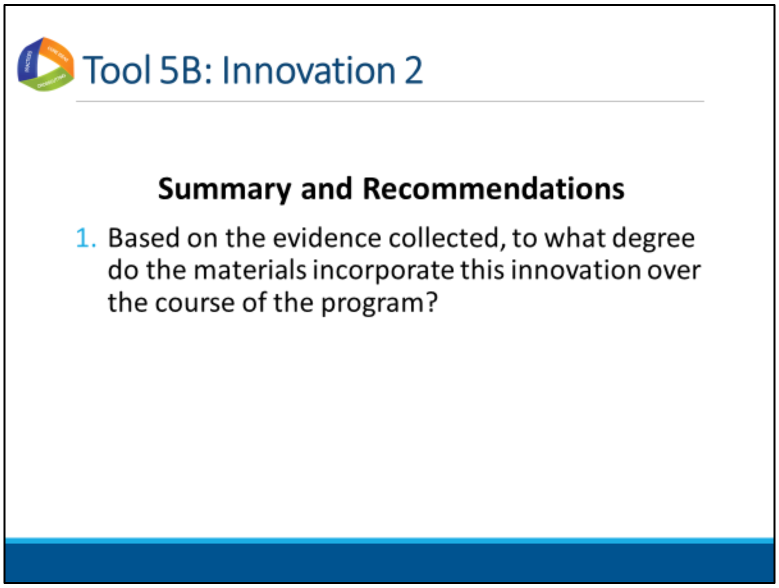
Slide 16

Facilitator Notes:

- Participants will need their copy of *Handout 26 – Evaluating Claims Rating – Program Evaluation* handout.
- Posting a timer that is visible to all participants can help everyone keep track of their time and stay on task.

Talking Points:

- Now that you have your individual evidence, take a few minutes to evaluate the degree to which there is sufficient evidence to support each claim.
- Use your *Evaluating Claims Rating – Program Evaluation* handout (also pictured on the screen) to help you fill out the third column.
- Now, take 10 minutes to discuss the evidence as a group and come to a consensus about the degree to which there is sufficient evidence to support each claim.
- Use your copy of the *Evaluating Claims Rating – Program Evaluation* handout (also pictured on the screen), to help you in your discussion.



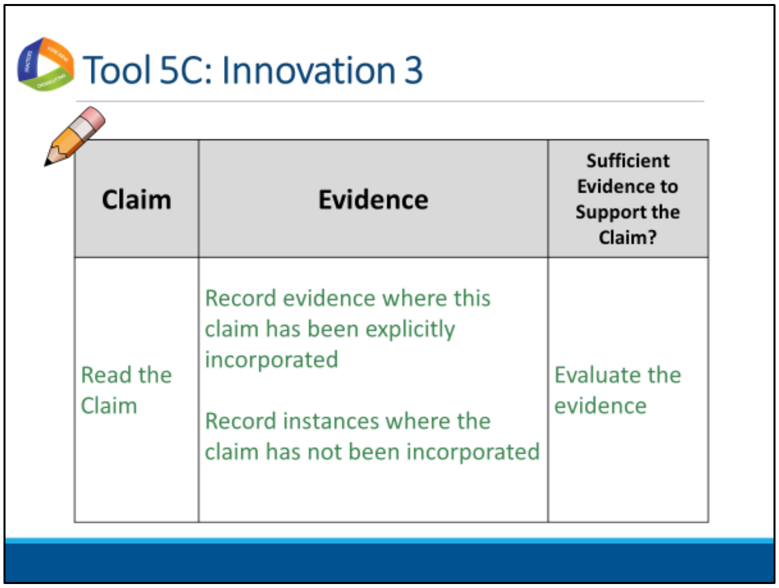
Slide 17

Facilitator Notes:

- The third question in the summary and recommendations section asks for suggestions about what support and/or resources will be needed for programs that partially incorporate innovations. Depending on your district's ability to provide and implement the suggested support and/or resources, you can ask this question in several different ways:
    - Ask for suggestions for the overall program after the team has completed all five program evaluation tools
    - Ask for suggestions for how to support each innovation in the program
    - Ask for suggestions for only those instructional materials that end up passing the program evaluation phase. *(Note: Asking for suggestions could be removed as a question from the five tools in phase and could be a separate process after all materials have been evaluated in phase 3.)*

Talking Points:

- Based on the evidence collected, you will now complete the summary and recommendations portion of the tool.
- The first question asks you to decide the degree to which the innovation shows up across the program.
- For materials that only partially incorporate the innovation, provide suggestions as your answer to the third question for what will be needed—professional learning; additional lessons, units, or modules; developing a district-wide approach to using the crosscutting concepts (because they aren't well represented in the materials); etc.
- There is also a space in the second question to leave notes and comments about your recommendation.
- *[Note to facilitator: Give participants 5-10 minutes to complete the summary and recommendations section.]*



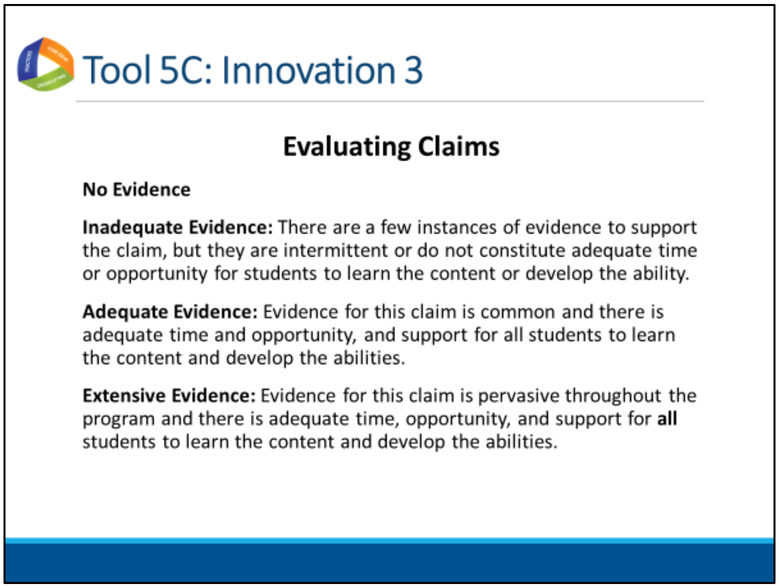
Slide 18

Facilitator Notes:

- Participants will need their copy of *Handout 25 – Tool 5: Program Level Evaluation*. Depending on your requirements, they can either fill out a copy by hand or digitally for the first program that they will review.
- Participants will need access to the NGSS Appendices F and G and the NSTA DCI matrix. These copies are provided as *Handout 04 – NSTA DCIs Matrix; Handout 05 – NGSS Appendix F; Handout 06 – NGSS Appendix G*
- Participants will need their copies of the Innovations handouts (*Handouts #13-17).*
- Posting a timer that is visible to all participants can help everyone keep track of their time and stay on task.

Talking Points:

- Turn to your copy of Tool 5C and take a few minutes to read through it.
- You will use Tool 5C to collect evidence and make claims about how an instructional materials program addresses NGSS Innovation 3: Building Progressions.
- There are eight claims in this tool that you will be looking for evidence for in the program.
- As you go through the sample learning sequences that are outlined in the sampling plan, look for and record evidence for each of these claims.
- Remember that some of the claim boxes have examples of evidence you can look for that can help support the claim is present (or absent) in the materials.
- Remember to refer to the NGSS Appendices E, F, and G, and the individual innovation handouts, as needed.
- Take 30 minutes to individually look for and record evidence for both claims. *[Note to facilitator: Set a timer for 30 minutes.]*



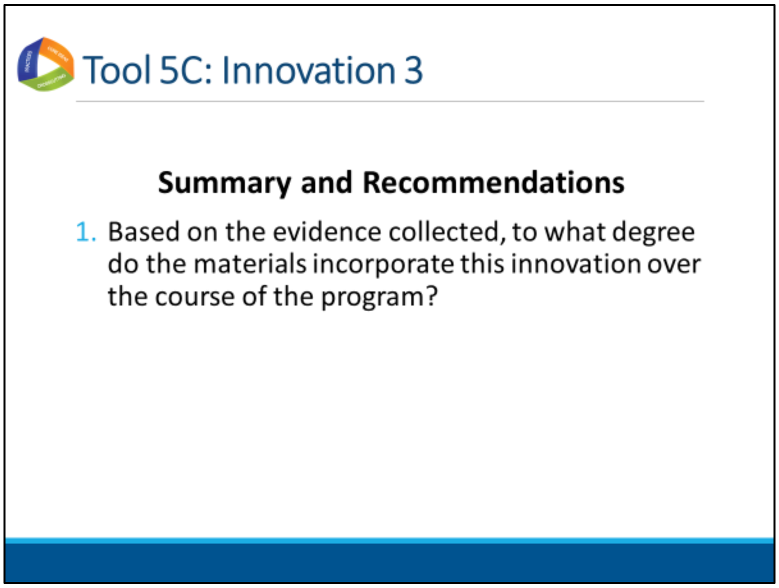
Slide 19

Facilitator Notes:

- Participants will need their copy of *Handout 26 – Evaluating Claims Rating – Program Evaluation* handout.
- Posting a timer that is visible to all participants can help everyone keep track of their time and stay on task.

Talking Points:

- Now that you have your individual evidence, take a few minutes to evaluate the degree to which there is sufficient evidence to support each claim.
- Use your *Evaluating Claims Rating – Program Evaluation* handout (also pictured on the screen) to help you fill out the third column.
- Now, take 10 minutes to discuss the evidence as a group and come to a consensus about the degree to which there is sufficient evidence to support each claim.
- Use your copy of the *Evaluating Claims Rating – Program Evaluation* handout (also pictured on the screen), to help you in your discussion.



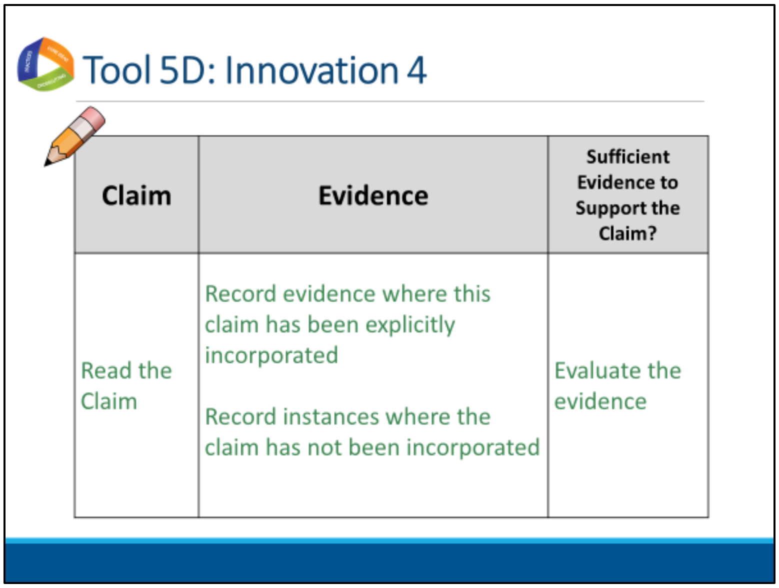
Slide 20

Facilitator Notes:

- The third question in the summary and recommendations section asks for suggestions about what support and/or resources will be needed for programs that partially incorporate innovations. Depending on your district's ability to provide and implement the suggested support and/or resources, you can ask this question in several different ways:
    - Ask for suggestions for the overall program after the team has completed all five program evaluation tools
    - Ask for suggestions for how to support each innovation in the program
    - Ask for suggestions for only those instructional materials that end up passing the program evaluation phase. *(Note: Asking for suggestions could be removed as a question from the five tools in phase and could be a separate process after all materials have been evaluated in phase 3.)*

Talking Points:

- Based on the evidence collected, you will now complete the summary and recommendations portion of the tool.
- The first question asks you to decide the degree to which the innovation shows up across the program.
- For materials that only partially incorporate the innovation, provide suggestions as your answer to the third question for what will be needed—professional learning; additional lessons, units, or modules; developing a district-wide approach to using the crosscutting concepts (because they aren't well represented in the materials); etc.
- There is also a space in the second question to leave notes and comments about your recommendation.
- *[Note to facilitator: Give participants 5-10 minutes to complete the summary and recommendations section.]*



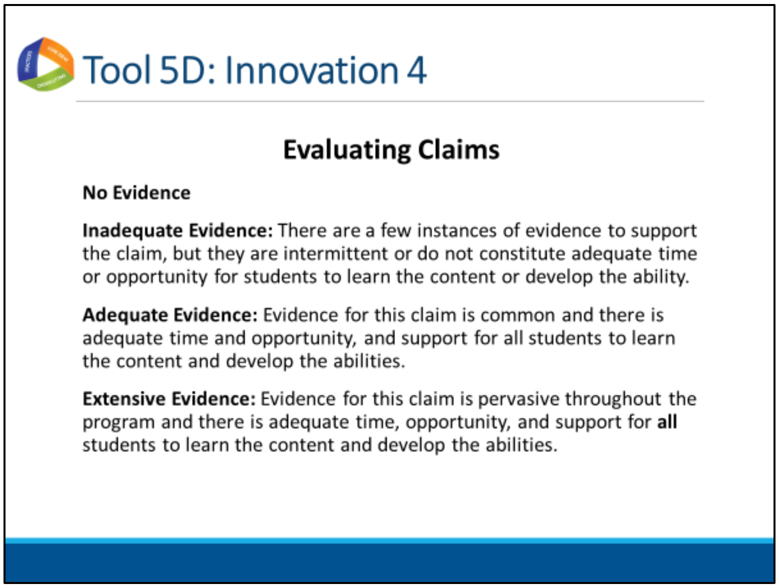
Slide 21

Facilitator Notes:

- Participants will need their copy of *Handout 25 – Tool 5: Program Level Evaluation*. Depending on your requirements, they can either fill out a copy by hand or digitally for the first program that they will review.
- Participants will need access to the NGSS Appendices F and G and the NSTA DCI matrix. These copies are provided as *Handout 04 – NSTA DCIs Matrix; Handout 05 – NGSS Appendix F; Handout 06 – NGSS Appendix G*
- Participants will need their copies of the Innovations handouts (*Handouts #13-17).*
- Posting a timer that is visible to all participants can help everyone keep track of their time and stay on task.

Talking Points:

- Turn to your copy of Tool 5D and take a few minutes to read through it.
- You will use Tool 5D to collect evidence and make claims about how an instructional materials program addresses NGSS Innovation 4: Alignment with English-Language Arts and Mathematics.
- There are three claims in this tool that you will be looking for evidence for in the program.
- As you go through the sample learning sequences that are outlined in the sampling plan, look for and record evidence for each of these claims.
- Remember to refer to the NGSS Appendices E, F, and G, and the individual innovation handouts, as needed.
- Take 15 minutes to individually look for and record evidence for both claims. *[Note to facilitator: Set a timer for 15 minutes.]*



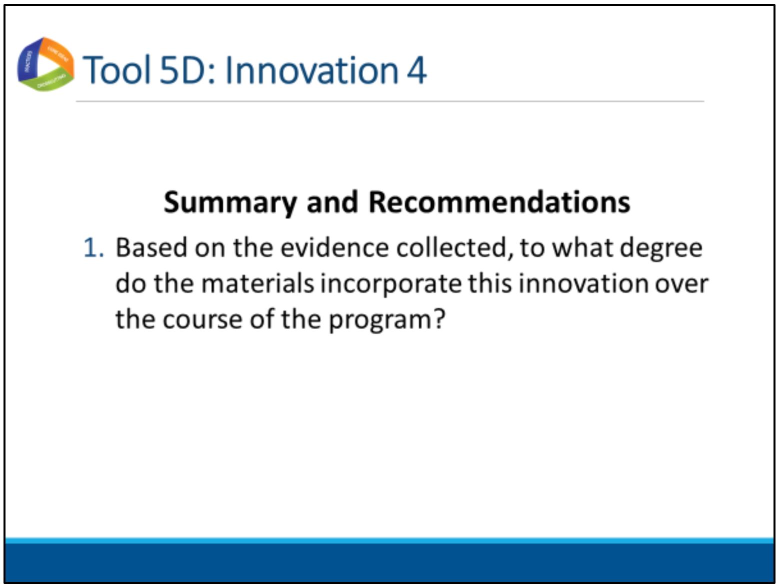
Slide 22

Facilitator Notes:

- Participants will need their copy of *Handout 26 – Evaluating Claims Rating – Program Evaluation* handout.
- Posting a timer that is visible to all participants can help everyone keep track of their time and stay on task.

Talking Points:

- Now that you have your individual evidence, take a few minutes to evaluate the degree to which there is sufficient evidence to support each claim.
- Use your *Evaluating Claims Rating – Program Evaluation* handout (also pictured on the screen) to help you fill out the third column.
- Now, take 10 minutes to discuss the evidence as a group and come to a consensus about the degree to which there is sufficient evidence to support each claim.
- Use your copy of the *Evaluating Claims Rating – Program Evaluation* handout (also pictured on the screen), to help you in your discussion.



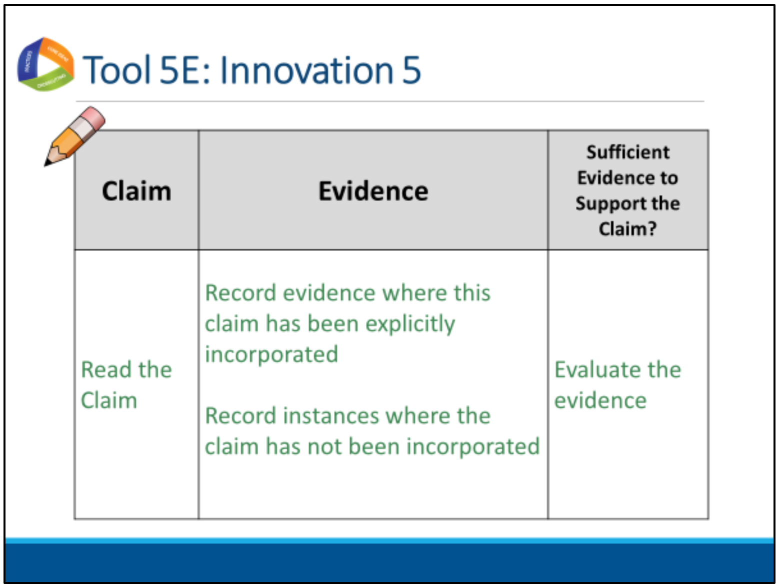
Slide 23

Facilitator Notes:

- The third question in the summary and recommendations section asks for suggestions about what support and/or resources will be needed for programs that partially incorporate innovations. Depending on your district's ability to provide and implement the suggested support and/or resources, you can ask this question in several different ways:
    - Ask for suggestions for the overall program after the team has completed all five program evaluation tools
    - Ask for suggestions for how to support each innovation in the program
    - Ask for suggestions for only those instructional materials that end up passing the program evaluation phase. *(Note: Asking for suggestions could be removed as a question from the five tools in phase and could be a separate process after all materials have been evaluated in phase 3.)*

Talking Points:

- Based on the evidence collected, you will now complete the summary and recommendations portion of the tool.
- The first question asks you to decide the degree to which the innovation shows up across the program.
- For materials that only partially incorporate the innovation, provide suggestions as your answer to the third question for what will be needed—professional learning; additional lessons, units, or modules; developing a district-wide approach to using the crosscutting concepts (because they aren't well represented in the materials); etc.
- There is also a space in the second question to leave notes and comments about your recommendation.
- *[Note to facilitator: Give participants 5-10 minutes to complete the summary and recommendations section.]*



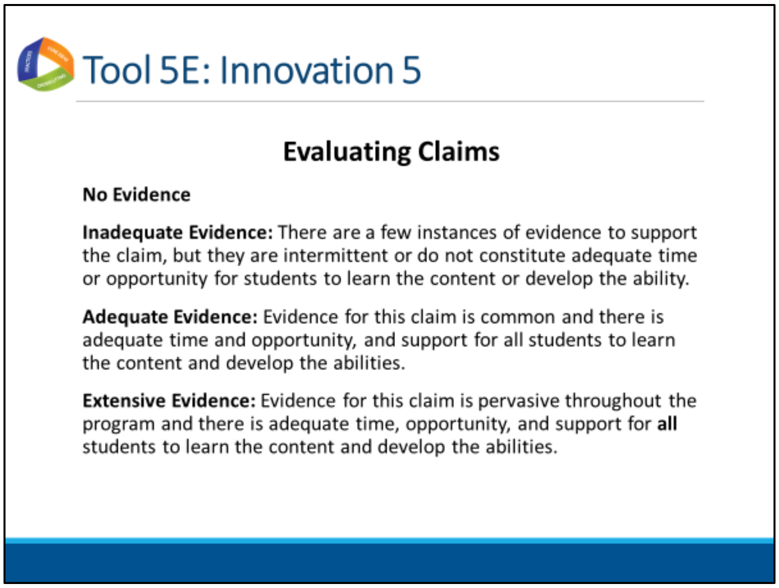
Slide 24

Facilitator Notes:

- Participants will need their copy of *Handout 25 – Tool 5: Program Level Evaluation*. Depending on your requirements, they can either fill out a copy by hand or digitally for the first program that they will review.
- Participants will need access to the NGSS Appendices F and G and the NSTA DCI matrix. These copies are provided as *Handout 04 – NSTA DCIs Matrix; Handout 05 – NGSS Appendix F; Handout 06 – NGSS Appendix G*
- Participants will need their copies of the Innovations handouts (*Handouts #13-17).*
- Posting a timer that is visible to all participants can help everyone keep track of their time and stay on task.

Talking Points:

- Turn to your copy of Tool 5E and take a few minutes to read through it.
- You will use Tool 5E to collect evidence and make claims about how an instructional materials program addresses NGSS Innovation 5: All Standards, All Students.
- There are five claims in this tool that you will be looking for evidence for in the program.
- The first claim states, "from the student's perspective, most learning experiences are focused on making sense of phenomena and designing solutions to problems."
- The second claim states, "guidance is provided to teachers to support students in making sense of phenomena and designing solutions to problems."
- As you go through the sample learning sequences that are outlined in the sampling plan, look for evidence for each of these claims.
- In the second column titled "evidence," record evidence of where the innovation has been clearly and explicitly incorporated into the materials. Also record instances where it does not appear to have been incorporated.
- Your evidence should be in complete sentences and thoughts, and should include page numbers, a brief description of the evidence, and an explanation of how it either supports or contradicts the claim.
- The second claim box has some specific examples of evidence that you can look for that can help support the claim is present (or absent) in the materials.
- Remember to refer to the NGSS Appendices E, F, and G, and the individual innovation handouts, as needed.
- Take 20 minutes to individually look for and record evidence for both claims. *[Note to facilitator: Set a timer for 20 minutes.]*



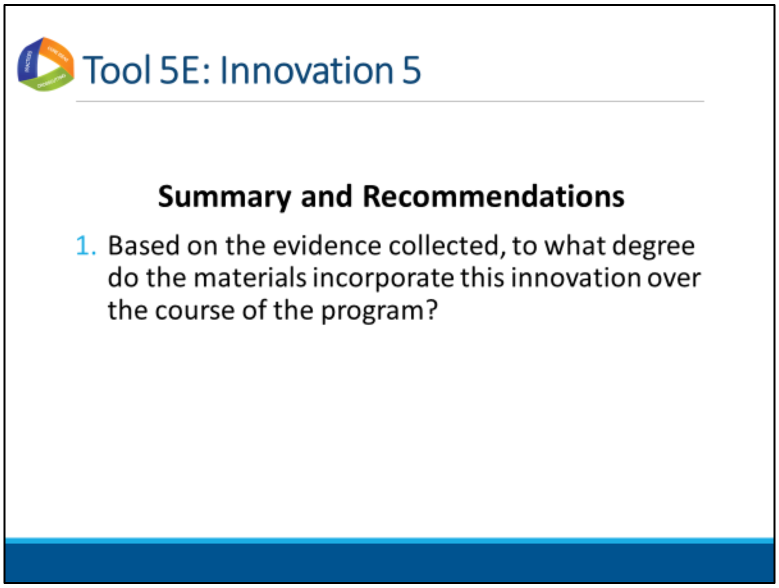
Slide 25

Facilitator Notes:

- Participants will need their copy of *Handout 26 – Evaluating Claims Rating – Program Evaluation* handout.
- Posting a timer that is visible to all participants can help everyone keep track of their time and stay on task.

Talking Points:

- Now that you have your individual evidence, take a few minutes to evaluate the degree to which there is sufficient evidence to support each claim.
- Use your *Evaluating Claims Rating – Program Evaluation* handout (also pictured on the screen) to help you fill out the third column.
- Now, take 10 minutes to discuss the evidence as a group and come to a consensus about the degree to which there is sufficient evidence to support each claim.
- Use your copy of the *Evaluating Claims Rating – Program Evaluation* handout (also pictured on the screen), to help you in your discussion.



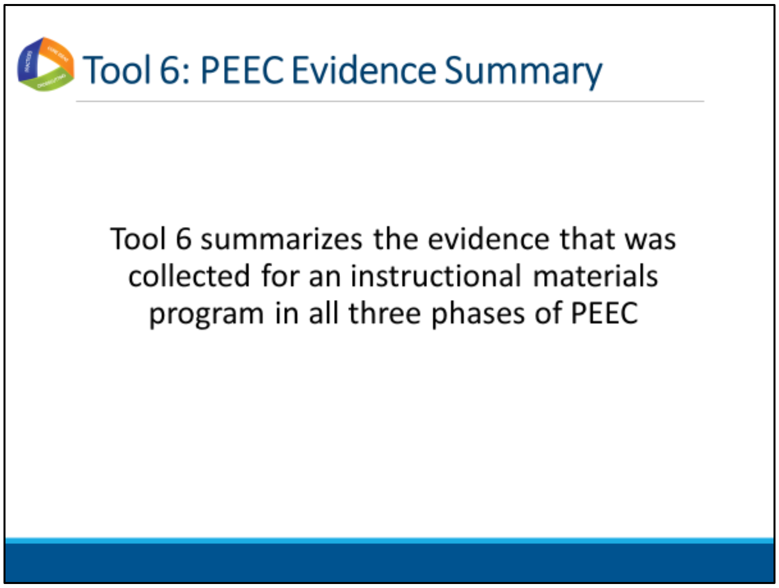
Slide 26

Facilitator Notes:

- The third question in the summary and recommendations section asks for suggestions about what support and/or resources will be needed for programs that partially incorporate innovations. Depending on your district's ability to provide and implement the suggested support and/or resources, you can ask this question in several different ways:
    - Ask for suggestions for the overall program after the team has completed all five program evaluation tools
    - Ask for suggestions for how to support each innovation in the program
    - Ask for suggestions for only those instructional materials that end up passing the program evaluation phase. *(Note: Asking for suggestions could be removed as a question from the five tools in phase and could be a separate process after all materials have been evaluated in phase 3.)*

Talking Points:

- Based on the evidence collected, you will now complete the summary and recommendations portion of the tool.
- The first question asks you to decide the degree to which the innovation shows up across the program.
- For materials that only partially incorporate the innovation, provide suggestions as your answer to the third question for what will be needed—professional learning; additional lessons, units, or modules; developing a district-wide approach to using the crosscutting concepts (because they aren't well represented in the materials); etc.
- There is also a space in the second question to leave notes and comments about your recommendation.
- *[Note to facilitator: Give participants 5-10 minutes to complete the summary and recommendations section.]*



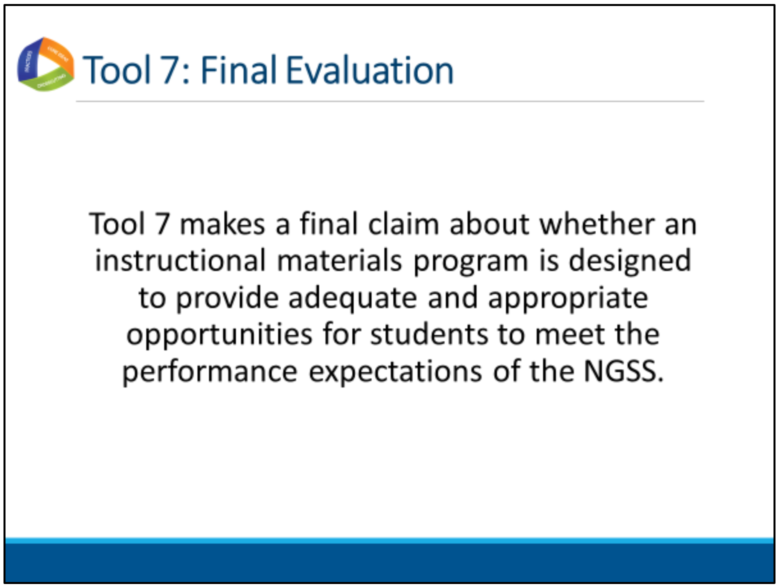
Slide 27

Facilitator Notes:

- After participants complete all five parts of Tool 5 for a program, they need to fill out Tool 6: PEEC Evidence Summary and Tool 7: Final Evaluation for the program. In order to complete Tool 6, participants will need access to the prescreen tools and unit evaluation tools that were completed for each instructional materials program.
- Depending on whether you are required to submit individual reports or consensus reports, you will need to either ask all participants to fill out individual copies of Tool 6 or for the group to complete a consensus copy of Tool 6.
- Tool 6 is available as *Handout 27 – Tool 6: PEEC Evidence Summary.*

Talking Points:

- Now that you have completed the program evaluation for your first instructional materials program, you will need to summarize the evidence that was collected for this program in all three phases of PEEC. The leadership team completed phase 1 of the PEEC during their planning session, and you all worked on phase 2 of PEEC in the last session. These completed tools are available for you to see and to use to complete Tool 6.
- You will have five minutes to work in your groups to fill out one consensus copy of Tool 6. *[Note facilitator: Give participants five minutes to complete this task.]*



Slide 28

Facilitator Notes:

- After completing Tool 6, participants will need to use that tool to make a final recommendation about the instructional materials program. They will fill out Tool 7 with their final claim about whether an instructional materials program is designed to provide adequate and appropriate opportunities for students to meet the performance expectations of the NGSS.
- Depending on whether you are required to submit individual reports or consensus reports, you will need to either ask all participants to fill out individual copies of Tool 7 or for the group to complete a consensus copy of Tool 7.
- Tool 7 is available as *Handout 28 – Tool 7: Final Evaluation.*

Talking Points:

- Based on the compilation of evidence findings in Tool 6 and the entire evaluation process, you will complete on last evaluation form. In *Tool 7: Final Evaluation*, you will make one final claim about whether an instructional materials program is designed to provide adequate and appropriate opportunities for students to meet the performance expectations of the NGSS. You will explain how the data in Tool 6 supports this claim and will highlight the most compelling evidence from each of the phases of PEEC to support this claim. After establishing the evidence for the claim, you will summarize any recommendations for what would need to happen during implementation of the materials to address any weaknesses that were identified in the analysis.
- As a group, complete one Tool 7 handout for the program. *[Note facilitator: Give participants five-ten minutes to complete this task.]*
- After you have completed filling out Tool 7, compile all of the tools from all three PEEC phases and turn them in.

Slide 29

Facilitator Notes:

- Collect all of the completed PEEC forms from participants for the program they have completed evaluating.

Talking Points:

- Congratulations! You have now completed your first program evaluation and final recommendation for an instructional materials program.

Slide 30

Facilitator Notes:

- The program evaluation process should be completed for the remaining instructional materials programs. The first program evaluation was structured and completed as a group so that participants would understand exactly what they were supposed to do. Now that participants understand the tools and the process, each group can complete the rest of the program evaluations at their own pace. They should still keep a group timer for each tool, and suggested evaluation times are recommended on the next slide. Allowing each group to keep their own timer and move at their own pace is recommended, because depending on the size of the group, and whether the groups are all reviewing the same program, the groups may move at different speeds, and this method will help maximize the use of each group's time. If you notice that groups are spending too much time on each category where they may not be able to complete the evaluation of all programs in the allotted time, or that they are not spending enough time to generate quality reports, then support them with their timing.
- Based on the amount of time it took you to get through the first program evaluation, you may have time to do one or more program evaluations today. The entire day tomorrow (Day 5 of the professional learning) will be spent completing the unit reviews. Each group will need to know how many programs they have left to review and how much time they have available. For each group, divide the time available with the number of programs so they know how much time they can spend evaluating each program. Suggested times for how long participants should spend reviewing each category are on the next slide, but they should be adjusted based on the amount of time you have available (remember to allow account for time needed to complete Tools 6 & 7 and any state or district specific forms you may need to complete as well.)

Talking Points:

- We will now repeat this entire process for the remaining instructional materials programs. The rest of the day today and the all day tomorrow will be spent completing these program evaluations.
- We walked through the first program evaluation as a group so that you could become familiar with the tools and process. Now that you understand the process, you will complete evaluating the rest of the programs. Your groups will be responsible for keeping your own timers and for moving through the evaluation process. *[Note to facilitator: Inform each group how many programs they need to review and the amount of time they have to review the programs. Divide the time available with the number of programs so they know how much time they can spend evaluating each program. Suggested times for how long participants should spend reviewing each category are on the next slide, but they should be adjusted based on the amount of time you have available (remember to allow account for time needed to complete Tools 6 & 7 and any state or district specific forms you may need to complete as well).]*
- Your table facilitator will keep track of the timer and will make sure that you stay on task. *[Note to facilitator: Have groups pick table facilitators, if they have not already done so.]*

Suggested Evaluation Times

Tool	Individual Time	Group Time	Summary & Recommendations
5A: Innovation 1	15	10	5
5B: Innovation 2	25	10	5
5C: Innovation 3	30	15	5
5D: Innovation 4	15	10	5
5E: Innovation 5	20	10	5

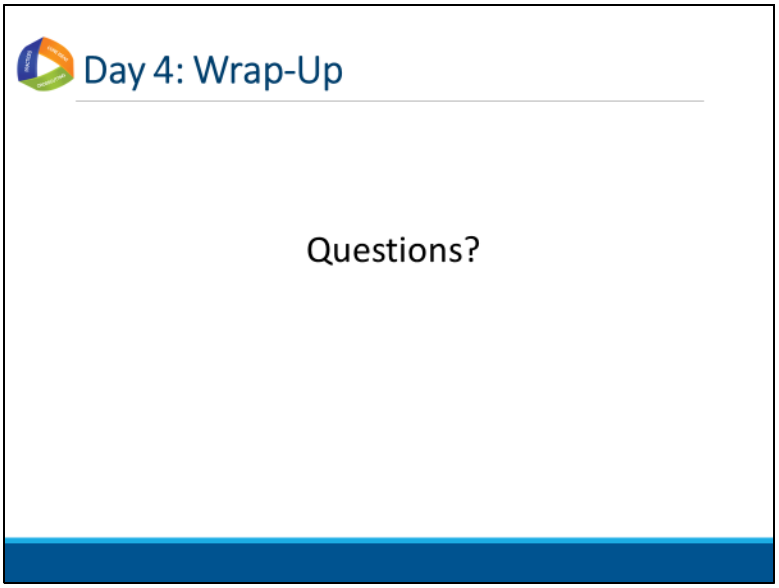
Slide 31

Facilitator Notes:

- This slide contains the suggested times for how long participants should spend reviewing each Tool – both individually and as a group. The suggested evaluation time per program is approximately three hours. These times should be adjusted based on the amount of time you have available and the number of programs left for review (this was calculated on the last slide).
- Allow each group to keep their own timer, and provide support as necessary.
- You can keep this slide (with your adjusted times) projected for the rest of the day to remind participants of the time structure they should try to follow.
- Remember to collect the completed forms for each program.

Talking Points:

- As you move on the evaluate the remaining programs, keep in mind how much time you have to review each program. This slide will remain on the screen to help structure the time you have available to review a program. Your table facilitator should keep track of your timer and will make sure that you stay on task.
- Let's get your materials for the next program and begin your next program evaluation.



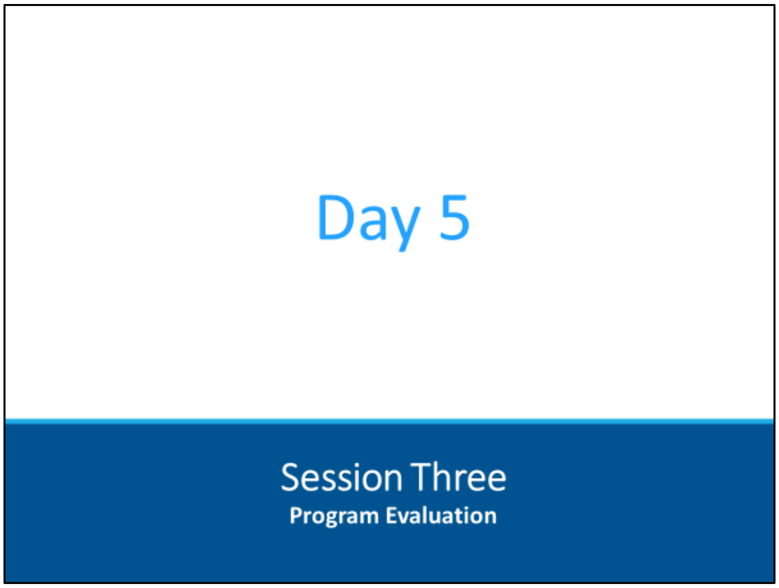
Slide 32

Facilitator Notes:

- Before participants leave for the day, check-in with each group to see the progress that they have made and how far they are in their evaluations. Check-in and see if they have any questions or concerns.
- The program evaluation process will be repeated the remaining instructional materials programs tomorrow.

Talking Points:

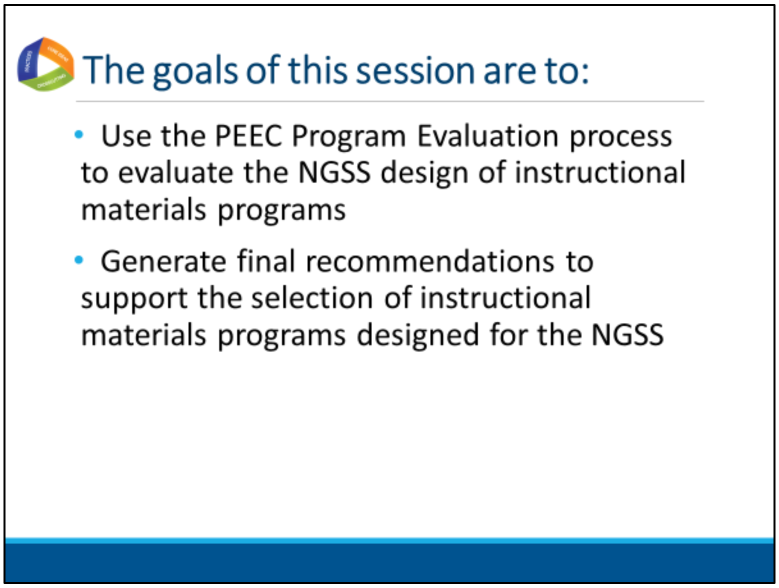
- Do you have questions or concerns about the program evaluation process?



Slide 33

Facilitator Notes:

- On Day 4, participants use the PEEC program evaluation tools to evaluate instructional materials programs.
- Today (Day 5), participants will continue to work on completing program evaluations and final recommendations for the remaining instructional materials program.
- Depending on state and district requirements, you may need to complete additional evaluation forms, or participants may have to transfer their findings from the PEEC review process to state reporting forms. If you decided to complete these additional reporting forms after completing all program evaluations, you will need to set time aside today for participants to complete the additional forms.



Slide 34

Talking Points:

- Today, you will continue to evaluate whether instructional materials programs show evidence of NGSS design at the program level.
- After completing the program evaluation process for all of the programs that have made it this far, you will continue to generate your final recommendations as to whether each program shows evidence of NGSS design. Your recommendations will help support the selection of science instructional materials programs.

Suggested Evaluation Times

Tool	Individual Time	Group Time	Summary & Recommendations
5A: Innovation 1	15	10	5
5B: Innovation 2	25	10	5
5C: Innovation 3	30	15	5
5D: Innovation 4	15	10	5
5E: Innovation 5	20	10	5

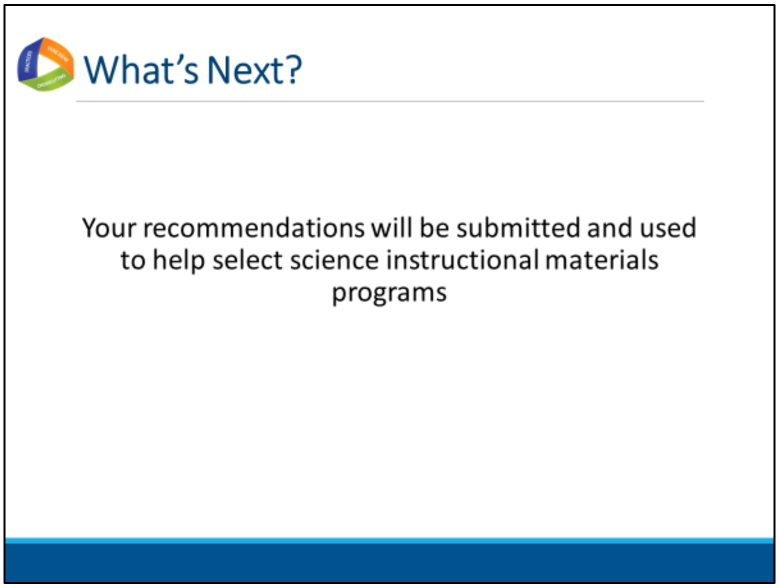
Slide 35

Facilitator Notes:

- This slide contains the suggested times for how long participants should spend reviewing each Tool – both individually and as a group. The suggested evaluation time per program is approximately three hours (not including completing Tools 6 & 7). These times should be adjusted based on the amount of time you have available and the number of programs left for review (this was calculated on the last slide).
- Allow each group to keep their own timer, and provide support as necessary.
- You can keep this slide (with your adjusted times) projected for the rest of the day to remind participants of the time structure they should try to follow.
- Remember to collect the completed forms for each program.

Talking Points:

- As you move on the evaluate the remaining programs, keep in mind how much time you have to review each program. This slide will remain on the screen to help structure the time you have available to review a program. Your table facilitator should keep track of your timer and will make sure that you stay on task.
- Let’s get your materials for the next program and begin your next program evaluation.



Slide 36

Facilitator Notes:

- This slide is included as a reminder that you should inform participants of what will happen with their recommendations. They should know why they put in all this work and what the next steps in the process are, whether they are directly involved or not.
- Depending on the goals for your professional learning, this slide and the talking points will vary.
- You should develop this slide and your talking points based on your situation.

Appendix: Sample Biology Textbook Request

District X

Biology Adoption Description and Non-Negotiables

1. The program must be aligned with the Academic Content Standards for Science as outlined in the scope and goals for Biology.
2. The program must have a digital version as well as hardback texts.
3. The program reflects current and confirmed research showing evidence of efficacy established through carefully designed experimental studies. Confirmed research is research that has been replicated and the results duplicated. Current research is research that has been conducted and is reported consistent with the principles of scientific investigation.
4. The teachers' materials are well organized and easy to use.
5. Content includes diverse cultural perspectives and backgrounds.
6. Academic vocabulary is included and focuses on developing students' academic vocabulary in context through instruction.
7. The program provides formative and summative assessments as well as performance tasks that are multi-dimensional (integrate Science and Engineering Practices and Crosscutting Concepts with Disciplinary Core Ideas) to measure students' abilities to integrate knowledge and skills across multiple standards (performance expectations).
8. The program includes differentiated materials based upon student language proficiency levels in reading, writing, speaking, and listening.
9. The program explicitly focuses on students explaining meaningful, relevant, and age-appropriate phenomena and designing solutions to problems as the basis for learning experiences.
10. The program includes Crosscutting Concepts that are integrated and students use them as sense-making tools.
11. The program includes a carefully and purposefully designed sequence of learning experiences that develop a student's understanding of the three dimensions.
12. The program includes technology components including assessments, student materials, and teacher resources.
13. **A complete description of all technology and trial accounts during the textbook screening process must be included.**

The vendor must submit answers to the following questions when submitting materials:

A. What type of support can you offer District X in implementing your program? How is the professional development and follow-up support provided?
B. What other districts/states have adopted your program? Please share contact information with us.
C. How will you provide support in the initial roll-out of all technology aspects of the program?