



How Do We Support Student Sensemaking With Equitable Discourse?

Facilitator's Guide

Summer 2024

Module Overview

The *How Do We Support Student Sensemaking With Equitable Discourse* module, contains materials to be used in professional learning sessions at the district, school, or department level. This module is intended to provide guidance in the successful implementation of equitable academic discourse, supporting the three-dimensional student learning through collaboration called for in the *Kentucky Academic Standards (KAS) for Science*.

The duration and scope may be customized to accommodate local needs and conditions. It is recommended that the sequence of the sessions be maintained since each session builds upon one another. Skipping parts may result in less effective learning about how academic discourse can support sensemaking and equity in the science classroom.

Goals

At the completion of *How Do We Support Student Sensemaking With Equitable Discourse* module, participants will be able to:

- **Establish** a learning environment where all students have equitable access and opportunity to learn through discourse.
- **Develop** a collaborative understanding of equitable academic discourse that supports student sensemaking.
- **Explore** how both teachers and students contribute to equitable academic discourse.
- **Examine** why we should use equitable academic discourse in the science classroom.
- Intentionally **plan** for equitable academic discourse.

Module Sessions – Completing this module entirely will take approximately 8-10 hours and

Session A: How can we establish a learning environment to ensure all students have equitable access and opportunity to learn?

Session B: What is equitable academic discourse and how does it support student sensemaking in the science classroom?

Session C: How can both teachers and students contribute to equitable academic discourse?

Session D: Why should equitable academic discourse be used in the science classroom and how does it support the development of science ideas and skills contained in the *Kentucky Academic Standards for Science*?

Session E: How might we intentionally plan for equitable academic discourse to support student sensemaking in the classroom?

Materials

KDE developed materials available at [KYStandards](#) that are part of this module:

- *How Do We Support Student Sensemaking With Equitable Discourse?* [Overview Document](#)
- *How Do We Support Student Sensemaking With Equitable Discourse?* [Facilitator's Guide](#)
- *How Do We Support Student Sensemaking With Equitable Discourse?* [Slide Presentation](#)
- *How Do We Support Student Sensemaking With Equitable Discourse?* [Participant Packet](#)

Materials also needed for this module:

- [STEM Teaching Tool #54- How to Build an Equitable Learning Community in your Science Classroom](#)
- [Evidence-Based Instructional Practices: Establishing the Learning Environment and the *Kentucky Academic Standards for Science*](#)
- [Communicating in Scientific Ways Poster](#)
- [Discussion Diamond Protocol](#)
- [STEM Teaching Tool #6: How Can I Get My Students to Learn Science by Productively Talking with Each Other?](#)
- [STEM Teaching Tool #47: How can I promote equitable sensemaking by setting expectations for multiple perspectives?](#)
- [OpenSciEd Instructional Materials for 6th grade Weather, Climate and Water Cycling Unit](#)
 - [6.3 Lesson 2 Teacher Edition](#)
 - [Weather Data from Seven Hailstorm Sites](#)
- [OpenSciEd Features of Classroom Culture that Support Equitable Sensemaking](#)
- [Lesson Scenario](#)
- [Talk Science Primer](#)
- [Kentucky Academic Standards for Science](#)
- [Lesson Internalization Protocol for Science](#)
- [3 Discussion Types: Building Understanding Discussions \(pg. 1 and 3\)](#)
- [Lesson Rehearsal Protocol \(ky.gov\)](#)

Intended Audiences

Participants: Module participants are district teams that may include, but are not limited to, district leadership, school administrators, instructional specialists/coaches, intervention specialists, department chairs, special educators and active or pre-service classroom teachers.

Facilitators: Module session facilitators may include, but are not limited to, district leadership, school administrators, instructional specialists/coaches, intervention specialists, department chairs, special educators, classroom teachers and higher education faculty.

Using This Facilitator's Guide

This facilitator's guide provides suggestions for structuring each section of this module, recommended learning experiences to prompt meaningful discourse and guidance on talking points to use with the provided presentation. As you work through the module, there will be learning experiences provided to aid in developing, or reinforcing, participant knowledge. Facilitators may need to revise specific tasks to meet the needs of the participants or to be respectful of the time planned within the work session.

Setup for Success

This module begins with group norms intentionally embedded to promote an environment of trust between facilitators and participants and among the participants themselves. Throughout the module, participants will be expected to collaborate in a variety of ways. Attending to the group norms will be critical for participants to actively participate and accept collective responsibility for the successful attainment of the module goals. Facilitators should feel free to adapt these group norms in collaboration with the participants.

Building a Community

Building a community is important for any group that will work together, especially if participants have not worked together before. The concept is the same as building a safe, respectful, productive classroom climate. Incorporating community-building into each session builds trust, shows participants that they are valuable as individuals and engages them in the learning process. It is also useful for creating a professional learning network where participants can be supported in their work. Community-building can be as simple as allowing participants to introduce themselves and their role in the school/district, developing or refining group norms, allowing for questions and/or the sharing of answers to reflection questions or individual discovery task items that are included in the module. Again, time allotted for community-building intentionally embedded in this module will allow participants to have a voice and be engaged as active contributors and learners.

Helpful Hint

It is important to realize that while you are the facilitator of these work sessions, you may not have all the answers to the questions asked by participants. And that is okay. When this happens, reflect on this quote from Graham Fletcher, “*Every teachable moment, doesn’t need to be a teachable moment, in that moment.*” Use these moments to encourage participants to engage in discussion with other participants so that a shared understanding may be developed. If participants ask questions, you are not prepared to answer, offer to seek out answers to those questions and share with the larger group. If the question is pressing and doesn’t appear to be addressed in this module, talk to your district team, and determine who would be the best person to contact at the KDE. You may also e-mail questions or feedback to KDEScience@education.ky.gov

Planning Ahead

- Determine which stakeholders to invite as participants. In the invitation, describe how the work session will benefit them.
- A few days before the meeting, you may want to remind participants to bring their documents to the meeting.
- Reserve adequate space and equipment. Tables should be set up to support small-group discussion.
- Access to the internet for the facilitator and participants (if needed) to access the links embedded within this module.

Preparation

All sessions have specific materials that are needed for that learning experience and is noted at the beginning of each session. **Ensure participants have a device to access or receive hard copies of the participant packet and session resources.** The facilitator will need to prepare the following items to be used within **ALL** module sessions.

- Computer with access to the module slide presentation
- Technology with projection capability including a speaker system
- Copies of handouts needed for each session
- Charts/Posters for the Room
 - Driving Question Board Poster
 - Norms Chart
 - Post a copy of these norms in the room so it can be referred to throughout the sessions. As participants come back for the sessions, revisit these norms, and continue to give participants to adjust these norms to fit the needs of the group as they work together.
 - Parking Lot
 - The participant can use the Parking Lot to note ideas, questions, or issues constructively while the other attendees

continue to focus on an activity or lesson. This may be a poster, or you may prefer to have a digital parking lot where participants can access a Google document, for example, to post questions and that you can modify as the participants work through the sections of the module. The purpose of the Parking Lot is to provide participants with a safe way of asking questions or suggesting ideas. Participants should feel free to add to the Parking Lot throughout the module.

- Paper
- Poster paper
- Self-Sticking Notes
- Colored markers
- Tape





Preparation for Session A




Focus Question: How can we establish a learning environment to ensure all students have equitable access and opportunity to learn?




Agenda: 1 hour 30 minutes




Time	Slides #'s	Outline	Materials Needed
15 minutes	2-5	Introduction <ul style="list-style-type: none"> • Establishing Goals • Focus Questions • Meta Moment 	<ul style="list-style-type: none"> • Participant Packet (used throughout the session) • Parking Lot Poster
65 minutes	6-17	Establishing the Learning Environment <ul style="list-style-type: none"> • Building the Community • Establishing Group Agreements • Equitable Access and Opportunity 	<ul style="list-style-type: none"> • STEM Teaching Tool #54: How to build an equitable learning community in your classroom. • Evidence-Based Instructional Practices: Establishing the Learning Environment and the Kentucky Academic Standards for Science • Paper for Participants Scientist Drawing • Poster Papers for Group Agreements • Communicating in Scientific Ways Poster • Scientist Circle • Framework for Thinking About culture and Identify in Science Learning and Teaching
10 minutes	18-20	Closing <ul style="list-style-type: none"> • Shared Understanding • Meta Moment • Reflection 	
5 minutes	21	Next Steps - Considerations for Implementation	



Session A: How can we establish a learning environment to ensure all students have equitable access and opportunity to learn?



Guidance	Accompanying Slide(s)
<p><i>Officially welcome the participants. Introduce yourself (if necessary).</i></p> <p>Explain: This module is intended to build or reinforce your understanding on how we support student sensemaking with equitable discourse.</p>	<p style="text-align: center;">Slide 1</p>  <p style="text-align: center;">How Do We Support Student Sensemaking With Equitable Discourse?</p> <p style="text-align: center;"><small>Modified from Emily Asher Miller, Patricia Winters, Rebecca Howell, Liz Shigley, and Erica Baker (2022). How do we support student sensemaking with equitable discourse? From the Advancing Classroom and Equitable Systems of Science Education (ACCESS) Project. This work is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License. Educators and others may use it freely. If modified, please attribute and verify. CC BY-NC-SA license details are at https://creativecommons.org/licenses/by-nc-sa/4.0/</small></p> <p style="text-align: center;"></p>
<p>Explain: We will now begin session A of this module.</p>	<p style="text-align: center;">Slide 2</p>  <p style="text-align: center;"></p> <p style="text-align: center;">SESSION A</p>


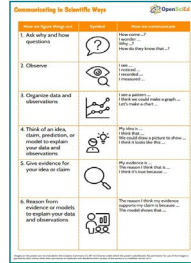
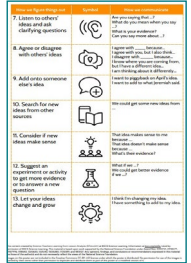

Guidance	Accompanying Slide(s)
<p>Explain: Throughout this module, we will be learning more about “effective science talk.” During these sessions, we will work toward the goals on the screen. Take a moment to read the goals on the screen. For this first session, we will focus on goal one, establishing a learning environment where all students have equitable access and opportunity to learn through discourse.</p>	<p style="text-align: center;">Slide 3</p> <p>Module Goals</p> <ul style="list-style-type: none"> ➔ Establish a learning environment where all students have equitable access and opportunity to learn through discourse. • Develop a collaborative understanding of equitable academic discourse that supports student sensemaking. • Explore how both teachers and students contribute to equitable academic discourse. • Examine why we should use equitable academic discourse in the science classroom. • Intentionally plan for equitable academic discourse. 
<p>Explain: This slide shows the content incorporated within this module. At the end of each session, you should have a deeper understanding of equitable academic discourse to answer the focus question aligned to each session. To accompany session A’s goal, we will focus on the following question, “How can we establish a learning environment to ensure all students have equitable access and opportunity to learn?”</p>	<p style="text-align: center;">Slide 4</p> <p>Sessions Included in This Module</p> <p>Session A: ➔ How can we establish a learning environment to ensure all students have equitable access and opportunity to learn?</p> <p>Session B: What is equitable academic discourse and how does it support student sensemaking in the science classroom?</p> <p>Session C: How can both teachers and students contribute to equitable academic discourse?</p> <p>Session D: Why should equitable academic discourse be used in the science classroom and how does it support the development of science ideas and skills contained in the <i>Kentucky Academic Standards for Science</i>?</p> <p>Session E: How might we intentionally plan for equitable academic discourse to support student sensemaking in the classroom?</p> 
<p>Explain: As we begin session A, our focus question for this section of the module is: How can we establish a learning environment to ensure all students have equitable access and opportunity to learn? Please take a meta moment to individually respond to the focus question in your participant packet. A meta moment is a brief pause to capture your current thinking.</p> <p>Facilitator Note: <i>Check to make sure participants have a copy of the participant packet as a digital file or printed. They will use this throughout the session to record their thoughts to various prompts embedded in the session.</i></p>	<p style="text-align: center;">Slide 5</p> <p style="text-align: center;">Session A Meta Moment</p> <p>Focus Question</p> <p>How can we establish a learning environment to ensure all students have equitable access and opportunity to learn?</p> 






Guidance	Accompanying Slide(s)
<p>Explain: One of the most important steps in ensuring equitable academic discourse is to establish a positive learning environment for all students. Teachers are responsible for disrupting problematic practices and developing science classroom communities that welcome all students into a safe extended science learning opportunity. We are going to read a couple of documents, Stem Teaching Tool 54 on building an equitable learning community and Evidence Based Instruction Practice 1: Establishing the Learning Environment. These one-page documents will help us understand why it is important to establish a positive learning environment and allow us to explore strategies to help build and sustain an equitable classroom community.</p> <p>Facilitator Note: <i>Since these are short reads, we encourage each person to read through both of these documents. As you read, jot down your responses in your participant packet to the questions on the screen. Allow participants to share their takeaways in small groups, then ask each group to share a key takeaway from their group’s conversation.</i></p> <p>Listen Fors:</p> <ul style="list-style-type: none"> • Engage students in exploring phenomena. • Utilize student and community interest. • Collaborate with families and community members as students engage in citizen science projects. • Recognize the diversity and leverage of student perspectives. • Alter classroom layout to meet the needs of the task. • Use students’ questions to drive instruction. • Implement norms/agreements and routines. • Reduce the risk of social injuries associated with learning together by disrupting adverse stereotypes, storylines, and practices. • Build a respectful classroom community. • Ensure all students feel comfortable contributing and that differences in how they contribute are respected. • Engage in critical reflection for teacher learning on issues of equity individually, with colleagues, and in your PLC. • Improve deeper science talk through discourse. 	<p style="text-align: center;">Slide 6</p> <p style="text-align: center;">Establishing a Learning Environment</p> <p>As you read both documents, jot your response to the following questions.</p> <ul style="list-style-type: none"> ➤ Why is it important to take the time to establish a positive learning environment? ➤ What are some key strategies you can use to build and sustain an equitable classroom community? <div style="text-align: right;">   </div> <div style="text-align: right; margin-top: 10px;">  </div>

Guidance	Accompanying Slide(s)
<p>Explain: Three key strategies noted in the readings and discussions we wish to focus in on, are: 1) build the community of learners by getting to know each other’s diverse experiences, 2) establish and implement agreements and routines to support a safe and supportive learning environment and 3) ensure all students have equitable access and opportunity. We will take some time as a group to dive deeper into each of these strategies to help us establish a positive learning environment.</p>	<p style="text-align: center;">Slide 7</p> <p style="text-align: center;">Key Strategies to Build and Sustain an Equitable Classroom Community</p> <ol style="list-style-type: none"> 1. Build the community of learners by getting to know each other’s diverse experiences. 2. Establish and implement agreements and routines to support a safe and supportive learning environment. 3. Ensure all students have equitable access and opportunity. 
<p>Explain: The first strategy we will consider is building our learning community.</p> <p>Community building prepares all students for the deep sensemaking discourse experiences required by the vision of the science standards. “Research shows that when students feel that they belong to their academic community, that they matter to one another, and that they can find emotional, social, and cognitive support for one another, they are able to engage in dialogue and reflection more actively and take ownership and responsibility of their own learning” (Baker, 2009).</p> <p>We will take a few minutes to draw a picture of or describe yourself as a scientist. In your drawing, include key features that you think are critical to your identity. Now, consider the ways that you, as a scientist, communicate and represent those in your drawing.</p> <p>Facilitator Note: <i>Consider posting these in the room and allow participants to share out or complete a gallery walk of these posters to see connections between one another.</i></p>	<p style="text-align: center;">Slide 8</p> <p style="text-align: center;">Strategy 1: Build Our Learning Community</p> <p style="background-color: #00728f; color: white; padding: 2px; font-size: small;">“Community building prepares all students for the deep sensemaking discourse experiences required by the vision of new science standards.” (STEM Teaching Tool #54)</p> <ul style="list-style-type: none"> • Take a moment to draw a picture of or describe yourself as a scientist. In your drawing, include key features that you think are critical to your identity. • Now, consider the ways that you, as a scientist, communicate and represent those in your drawing.  




Guidance	Accompanying Slide(s)
<p>Explain: The second strategy is revolved around establishing group agreements, commonly referred to as norms. Norms are slightly different from work agreements because they are the general best practices of all productive groups, while working agreements are agreed upon guidelines for how group members will conduct themselves to achieve desired outcomes. (Thinking Collaborative, 2024)</p> <p>Working to develop the group agreements where the needs and styles of participants are honored will assist the group in collectively figuring out science ideas through productive discourse and talk. This requires a culture where all members of the learning community feel like they belong and it is safe to participate, share ideas, disagree, and productively struggle together.</p> <p>Our learning space integrates varied cultural and linguistic experiences and ways of knowing. These elements are integral to the community's sensemaking and can be leveraged to enhance everyone's learning. Developing and using agreements can support safe and equitable participation in collaborative sensemaking.</p> <p>The quote on the screen reminds that, "As part of their practice, scientists rely on norms of thinking and discourse that enable them to pursue the work of the discipline and communicate with other scientists. In order to successfully engage students in the scientific practices, teachers need to support the development of these agreements and routines in their classrooms."</p> <p>As we work together to build our agreements, we will identify those as our group agreements. Let's take a moment to consider the following agreements for our learning community as we begin working together:</p> <ul style="list-style-type: none"> • We share ideas even when we are not sure. • We look, listen and consider each other's ideas. • We let our ideas change and grow. <p>Are there any changes to this list are additional agreements you would like the group to consider?</p>	<p style="text-align: center;">Slide 9</p> <p style="text-align: center;">Strategy 2: Establish Group Agreements</p> <div style="border: 1px solid black; background-color: #00728f; color: white; padding: 5px; font-size: small;"> "As part of their practice, scientists rely on norms of thinking and discourse that enable them to pursue the work of the discipline and communicate with other scientists. In order to successfully engage students in the scientific practices, teachers need to support the development of these norms and routines in their classrooms." (TeachingWorks, 2024) </div> <p>Our Initial Agreements:</p> <ul style="list-style-type: none"> • We share ideas even when we are not sure. • We look, listen and consider each other's ideas. • We let our ideas change and grow. <div style="text-align: right;">  </div> <div style="text-align: right; margin-top: 10px;">  </div>



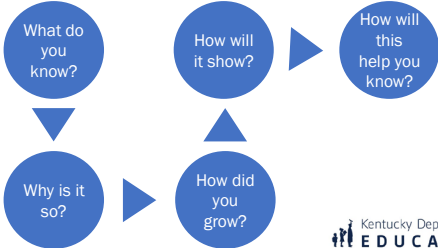

Guidance	Accompanying Slide(s)
<p>Explain: If we have come to a consensus on these agreements for our learning community let's take a moment to reflect on what these agreements mean. What do these agreements mean? What would they look, sound and feel like? Let's consider the first agreement, "We share ideas even we are not sure." If participants are attending to this agreement, what would it look like, sound, and feel like?</p> <p>Facilitator Note: <i>Use chart paper to create a 3x3 table with the norms in the left column, one per cell. The middle column will be what the norms look, sound and feel like. Capture the thoughts of the participants. Continue this process will all group agreements. After gathering responses for these agreements...</i></p> <p>Explain: We are working towards a common goal of growing together. This means that we learn collectively, and it is not enough to simply share our ideas without connecting to others' ideas. Establishing agreements around being prepared and focused during discussions is important. We all have a responsibility to our learning community to come prepared and share our thinking clearly so others can understand. Listening carefully and asking questions are also crucial. Encouraging contributions even when unsure and celebrating all ideas, whether correct or incorrect, supports these agreements.</p>	<p style="text-align: center;">Slide 10</p> <p>Group Agreements</p> <ul style="list-style-type: none"> • We share ideas even when we are not sure. • We look, listen and consider each other's ideas. • We let our ideas change and grow. <div style="border: 1px solid gray; border-radius: 50%; padding: 10px; width: fit-content; margin-left: auto; margin-right: auto;"> <p>What do these agreements mean? What would they look, sound and feel like?</p> </div> <p style="text-align: center;">Take a moment to write your thoughts to this question.</p> <div style="background-color: #008080; height: 20px; width: 100%;"></div> 
<p>Explain: The third strategy towards building and sustaining an equitable classroom community is to ensure all students have equitable access and opportunity. The following quote can help us take a moment to gauge our thinking, "Regardless of their race, culture or socio-economic status all children, unless they have severe mental disabilities, have well-develop ways of telling stories, giving accounts, providing reasons, making arguments, and providing evidence." (Michaels, 2008)</p> <p>It is crucial that all students have access to conversation. This doesn't mean every student has to speak in every discussion, but it should be clear that they are welcome and expected to participate. Equitable discussions should not be dominated by a few students, nor should there be an assumption that certain students will carry the conversation. To support equitable discussions, it is necessary to monitor speaking time, encourage voices that haven't been heard yet, and recognize that people think, share, and represent their ideas in different ways.</p>	<p style="text-align: center;">Slide 11</p> <p>Strategy 3: Ensure all students have equitable access and opportunity</p> <div style="background-color: #008080; color: white; padding: 10px; border-radius: 15px; margin: 10px 0;"> <p>"Regardless of their race, culture or socioeconomic status, all children, unless they have severe mental disabilities, have well-developed ways of telling stories, giving accounts, providing reasons, making arguments, and providing evidence." (Michaels, 2008)</p> </div> 



Guidance	Accompanying Slide(s)
<p>Explain: One way to ensure all students have equitable access and opportunity is to provide support and resources to assist students with effective talk practices.</p> <p>When using this in the classroom, teachers should encourage all students to join the conversation and ensure everyone feels welcomed. Engaging students in productive talk involves asking them to communicate in ways they might not be comfortable with or used to at home.</p> <p>This can be particularly challenging for shy students, emerging multilingual students, those with high-frequency learning needs, or students new to academic discussions. These students will require scaffolding and support from both teachers and peers to help them formulate arguments and explanations in a way that others can understand.</p>	<p style="text-align: center;">Slide 12</p> <p style="text-align: center;">Recommended Actions for Strategy 3</p> <ul style="list-style-type: none"> • Provide supports and resources to assist students with effective talk practices. <div style="text-align: right;">  </div>
<p>Explain: Let's take a moment to look at the Communicating in Scientific Ways (CSW) document. Supporting science discourse in our classrooms involves teaching students how to effectively communicate within a scientific community. This includes understanding how to present scientific arguments and evidence and practicing productive social interactions during science investigations.</p> <p>Teachers can use and model specific questions to help students communicate. These questions encourage listening, considering different perspectives, and clearly presenting their own ideas and evidence. Structuring this communication is vital for building a scientific community in the classroom where ideas are shared, challenged, and refined.</p> <p>Here are some examples of teacher questions that support science discourse:</p> <ul style="list-style-type: none"> • Did anyone have a similar/different question to that? • Can anyone add onto this idea? • Who has a different way of thinking about this topic? • Who can summarize some of the ideas we've heard today? • What questions do you have for this group about their model/solution? • What do the rest of you think of that idea? <p>By using these sentence stems, students can engage more deeply in scientific discourse, fostering a classroom environment where ideas are collaboratively developed and refined. The</p>	<p style="text-align: center;">Slide 13</p> <p style="text-align: center;">Supports for Talk Practices</p> <div style="display: flex; justify-content: space-between;"> <div data-bbox="1402 824 1591 1084">  </div> <div data-bbox="1602 824 1791 1084">  </div> <div data-bbox="1801 824 1976 1084" style="background-color: #003366; color: white; padding: 10px; border-radius: 15px;"> <p>How might this resource, <i>Communicating in Scientific Ways (CSW)</i>, help ensure equitable access and opportunity?</p>  </div> </div>

Guidance	Accompanying Slide(s)
<p>questioning strategies we use in the classroom serve as teacher talk moves, encouraging students to share, revise, and challenge ideas constructively. While these strategies initially help guide students, a key goal is for students to begin communicating naturally with each other as their thinking evolves. This allows the teacher to step back from being the teller of the science ideas in the discussion and instead become the listener and facilitator. By noting the progression of their thinking and areas of disagreement, teachers can better plan future instruction. How might this resource, CSW help ensure equitable access and opportunity?</p> <p>Facilitator Note: <i>Consider printing a larger poster of this document and/or printing individual copies for each participant to reference and use in their discussions throughout these sessions.</i></p>	
<p>Explain: Another way to ensure all students have equitable access and opportunity is to design the classroom layout in such a way that students will be able to engage with one another as they employ sensemaking skills.</p>	<p style="text-align: center;">Slide 14</p> <p style="text-align: center;">Recommended Actions for Strategy 3 (2)</p> <ul style="list-style-type: none"> • Provide supports and resources to assist students with effective talk practices. • Design the classroom layoutn such a way that students will be able to engage with one another as they employ sensemaking skills. <p style="text-align: right;"> Kentucky Department of EDUCATION</p>
<p>Explain: There are a variety of classroom layouts that may support different structures for discourse.</p> <p>Partner Pairing: Students share their ideas and listen to the ideas of another student. Partner talk allows the quiet students to share in a low-risk situation before speaking in a larger group.</p> <p>Small Group: Students actively engage with their peers by sharing their ideas and listening to the ideas of others to grow their understanding of science ideas.</p> <p>Small groups help to build confidence in students and prepare them to share out in a larger group.</p>	<p style="text-align: center;">Slide 15</p> <p style="text-align: center;">Classroom Layout Should Support Different Structures for Discourse</p> <div style="display: flex; flex-direction: column; align-items: flex-start;"> <div style="margin-bottom: 10px;">  <p>Partner Pairing</p> <p>Students share their ideas and listen to the ideas of another student. Partner talk allows the quiet students to share in a low -risk situation before speaking in a larger group.</p> </div> <div style="margin-bottom: 10px;">  <p>Small groups</p> <p>Students actively engage with their peers by sharing their ideas and listening to the ideas of others to grow their understanding of science ideas. Small groups help to build confidence in students and prepare them to share out in a larger group.</p> </div> <div>  <p>Scientists Circle</p> <p>Students form a circle where all students are seen and heard. The circle arrangement makes listening and building on ideas easier while holding students accountable to the group. The scientists circle positions the students as the “knowers” and “thinkers” as they work to figure things out.</p> </div> </div> <p style="text-align: right;"> Kentucky Department of EDUCATION</p>

Guidance	Accompanying Slide(s)
<p>Scientists Circle: Students form a circle where all students are seen and heard. The circle arrangement makes listening and building on ideas easier while holding students accountable to the group. The scientist circle positions the students as the “knowers” and “thinkers” as they work to figure things out. Take a moment to read the one pager around using a scientists circle for equitable discourse from OpenSciEd. As you read, note what stands out to you when implementing this classroom layout to support discourse.</p> <p>Facilitator Note: <i>Have participants share out whole group using Communicating in Scientific Ways stems #2: Observe and #9: Add on to someone else’s idea. Capture the group thinking in a visual way using an anchor chart, Google doc or Figjam. Consider these questions for facilitating the discussion:</i></p> <ul style="list-style-type: none"> • <i>What did you notice about...</i> • <i>Who wants to add on to what _____ is saying?</i> • <i>Can others add on to this thought....</i> • <i>Were there others that had something similar/different marked?</i> • <i>Can you say more about that?</i> <p><u><i>Listen For:</i></u></p> <ul style="list-style-type: none"> • <i>Desks are set up in circles already so I can easily implement science circles.</i> • <i>Students will be more likely to share knowing the expectations of these discussions.</i> • <i>Students sit in a circle with the teacher outside the circle. Students need their notebooks to pull from.</i> • <i>Puts the focus on the students and their ideas.</i> • <i>This structure allows students to have more communication of ideas.</i> • <i>Teachers are not the sole source of knowledge.</i> • <i>Getting up and moving also helps students stay engaged.</i> • <i>Set the expectation of ALL students participating.</i> • <i>It's important to capture ideas and ideas that are agreed upon or ideas that need further clarification.</i> 	

Guidance	Accompanying Slide(s)
<p>Explain: One final thing to consider when working towards all students having equitable access and opportunity is to recognize and leverage the diversity in the classroom.</p>	<p style="text-align: center;">Slide 16</p> <p style="text-align: center;">Recommended Actions for Strategy 3 (3)</p> <ul style="list-style-type: none"> • Provide supports and resources to assist students with effective talk practices. • Design the classroom layout in such a way that students will be able to engage with one another as they employ sensemaking skills. • Recognize and leverage the diversity in the classroom. <p style="text-align: right;"></p>
<p>Explain: The NGSS framework says, “All science learning can be understood as a cultural accomplishment...What counts as learning and what types of knowledge are seen as important are closely tied to a community’s values and what is useful in that community context. There are many opportunities to connect learners’ social ecological sensemaking with their lived experiences, interests, and cultural practices, and the like. We are going to read about some ways teachers can begin to incorporate these ideas into their instructional practices. We are going to take a moment to read before we move into small groups to discuss. In your small groups, be an active listener so that you can build off one another’s ideas and offer new thoughts that resonated with you. Utilize the Communicating in Scientific Ways stems from OpenSciEd #1: Ask why and how questions, #7: Listening to other’s ideas and ask clarifying questions and #9: Add onto someone else’s idea.</p> <p>Facilitator Note: <i>Allow each group to share out a notice or wondering. Consider the following questions to help navigate the discussion:</i></p> <ul style="list-style-type: none"> • <i>What did you notice about...</i> • <i>Who wants to add on to what _____ is saying?</i> • <i>Can others add on to this thought....</i> • <i>Were there others that had something similar/different marked?</i> • <i>Can you say more about that?</i> • <i>What you mean when you say...</i> • <i>What wonderings do you have?</i> 	<p style="text-align: center;">Slide 17</p> <p style="text-align: center;">Recognize and Leverage Diversity</p> <p>The NGSS framework says, “All science learning can be understood as a cultural accomplishment...What counts as learning and what types of knowledge are seen as important are closely tied to a community’s values and what is useful in that community context” (p. 284, NRC, 2012).</p>  <p style="text-align: right;"></p>

Guidance	Accompanying Slide(s)
<p>Explain: Here are some shared understandings from session A.</p> <ul style="list-style-type: none"> Establishing an equitable, safe and supportive learning environment will encourage students to be open to share their ideas and experiences with others. Building community is worth the extra time and will produce learning gains that will more than compensate for the loss of instruction time. Changing the physical arrangement of the classroom is necessary to shift whose voice and what ideas are valued in discussion. Bridging learning between school, community and the students' everyday lives will show students you value their individuality. 	<p style="text-align: center;">Slide 18</p> <p>Session A: Shared Understandings</p> <ul style="list-style-type: none"> Establishing an equitable, safe and supportive learning environment will encourage students to be open to share their ideas and experiences with others. Building community is worth the extra time and will produce learning gains that will more than compensate for the loss of instruction time. Changing the physical arrangement of the classroom is necessary to shift whose voice and what ideas are valued in discussion. Bridging learning between school, community and the students' everyday lives will show students you value their individuality. 
<p>Explain: Take a moment to go back and look at your individual initial thoughts recorded at the start of this session. Consider adding on to your initial thoughts in a different color. How have your thoughts grown or changed after completing session A?</p>	<p style="text-align: center;">Slide 19</p> <p style="text-align: center;">After Completing Session A: Meta Moment.</p> <p>Focus Question</p> <p>How can we establish a learning environment to ensure all students have equitable access and opportunity to learn?</p> 
<p>Explain: Take some time to reflect on today's session.</p> <ul style="list-style-type: none"> What do you know? –Something you have learned from our session today. Why is it so? – The why or the evidence that supports what you learned today. How did you grow? – Explain how this helped you grow. How will it show? – The actions you are putting into place. How will this help you know? – Identify how those actions will help you know you have grown. <p>Facilitator Note: <i>Encourage participants to share how did they grown today in our session. If there is time invite a few to share.</i></p>	<p style="text-align: center;">Slide 20</p> <p>Session A: Reflection</p> <p>Take some time to record your thoughts from today's session.</p>  <p style="text-align: right;"></p>

Guidance	Accompanying Slide(s)
<p>Explain: Consider this quote from Socrates, “The secret of change is to focus all of your energy not on fighting the old, but on building the new.” As you begin to focus your energy on building the new, what small step you might take to establish an equitable, safe and supportive learning environment? Record your responses in Session 1: Next Steps – Considerations for Implementation section of your participant packet.</p>	<p style="text-align: center;">Slide 21</p> <p>Session A: Next Steps: Considerations for Implementation</p> <p>Think about how you might plan for or transform your classroom to establish an equitable, safe and supportive learning environment.</p> <ul style="list-style-type: none"> ✓ How will you plan to co-develop norms/agreements to support respectful discourse? ✓ How will you sustain equitable communities throughout the year?  


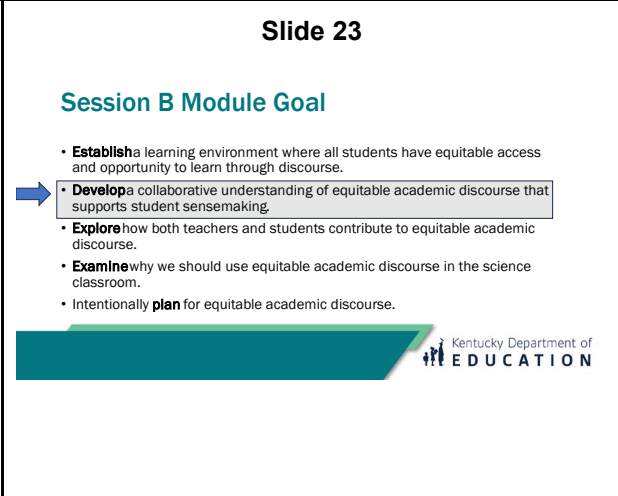
Preparation for Session B




Focus Question: What is equitable academic discourse and how does it support student sensemaking in the science classroom?

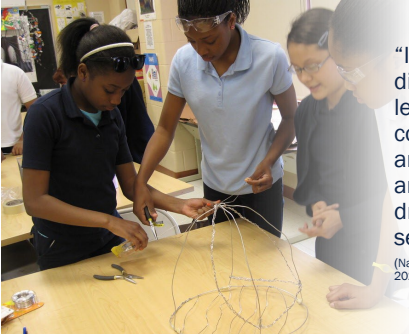

Agenda: 2 hours






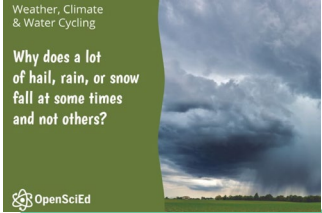


Time	Slides #'s	Outline	Materials Needed
10 minutes	22-26	Introduction <ul style="list-style-type: none"> • Establishing Goals • Focus Questions • Group Agreements • Meta Moment 	<ul style="list-style-type: none"> • Participant Packet (used throughout the session) • Agreement Poster • Parking Lot Poster • Communicating in Scientific Ways Poster
1 hour 35 minutes	27-49	Developing a Collaborative Understanding <ul style="list-style-type: none"> • Adult Learning Experience • Initial Ideas about Discourse • Building Understanding Around Discourse 	<ul style="list-style-type: none"> • Weather Data from Eight Hailstorm Sites • Discussion Diamond Protocol • STEM Teaching Tool #6: How Can I Get My Students to Learn Science by Productively Talking with Each Other? • STEM Teaching Tool #47: How can I promote equitable sensemaking by setting expectations for multiple perspectives?
10 min	50-53	Closing <ul style="list-style-type: none"> • Shared Definition and Understanding • Meta Moment • Reflection 	
5 minutes	54	Next Steps - Considerations for Implementation	



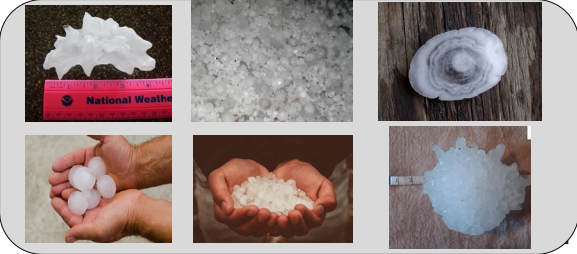
Session B: What is equitable academic discourse and how does it support student sensemaking in the science classroom?

Guidance	Accompanying Slide(s)
<p>Explain: We will now begin session B.</p>	<p style="text-align: center;">Slide 22</p> 
<p>Explain: In session A, our goal was to work through how to establish a learning environment where all students have equitable access and opportunity to learn through discourse. In this session, we are going to focus on developing a collaborative understanding of equitable academic discourse that supports student sensemaking.</p>	<p style="text-align: center;">Slide 23</p> <p style="text-align: center;">Session B Module Goal</p> <ul style="list-style-type: none"> • Establish a learning environment where all students have equitable access and opportunity to learn through discourse. ➔ • Develop a collaborative understanding of equitable academic discourse that supports student sensemaking. • Explore how both teachers and students contribute to equitable academic discourse. • Examine why we should use equitable academic discourse in the science classroom. • Intentionally plan for equitable academic discourse. 

Guidance	Accompanying Slide(s)
<p>Explain: As you can see our focus questions are closely aligned to our goals throughout our sessions. Our focus question for this session will be, “What is equitable academic discourse and how does it support student sensemaking in the science classroom?”</p>	<p style="text-align: center;">Slide 24</p> <p style="text-align: center;">Sessions Included in This Module (2)</p> <p>Session A: How can we establish a learning environment to ensure all students have equitable access and opportunity to learn?</p> <p>➡ Session B: What is equitable academic discourse and how does it support student sensemaking in the science classroom?</p> <p>Session C: How can both teachers and students contribute to equitable academic discourse?</p> <p>Session D: Why should equitable academic discourse be used in the science classroom and how does it support the development of science ideas and skills contained in the <i>Kentucky Academic Standards for Science</i>?</p> <p>Session E: How might we intentionally plan for equitable academic discourse to support student sensemaking in the classroom?</p> 
<p>Explain: During the previous session, we came to a consensus that these agreements are important for our community. We identified what participants would look, sound and feel like while honoring these agreements. Now, let’s take a moment to reflect on the potential impacts on our learning community if these agreements were fully attended to?</p> <p>Facilitator Note: <i>You will add the potential impacts for each agreement to the right column on your agreements chart made during session A.</i></p>	<p style="text-align: center;">Slide 25</p> <p style="text-align: center;">Group Norms/Agreements (2)</p> <ul style="list-style-type: none"> • We share ideas even when we are not sure. • We look, listen and consider each other’s ideas. • We let our ideas change and grow. <div style="border: 1px solid gray; border-radius: 50%; padding: 10px; width: fit-content; margin-left: auto; margin-right: auto;"> <p>What are the potential impacts on our learning community if these norms were fully attended to?</p> </div> <p style="text-align: center;">Take a moment to write your thoughts to this question.</p> 
<p>Explain: Let’s take a meta moment and jot down our initial ideas around today’s focus question in your participant packet, what is equitable academic discourse and how does it support student sensemaking in the science classroom?</p> <p>Facilitator Note: <i>Check to see that participants have their participant packet for this module. If not, provide one for them.</i></p>	<p style="text-align: center;">Slide 26</p> <p style="text-align: center;">Session B Meta Moment</p> <p>Focus Question</p> <p>What is equitable academic discourse and how does it support student sensemaking in the science classroom?</p> 

Guidance	Accompanying Slide(s)
<p>Explain: Pause and reflect on this powerful quote from the National Academy of Science. “In three-dimensional learning, communication and collaboration are the gears that drive sensemaking. Would anyone like to share what this quote means to you?”</p> <p>Facilitator Note: <i>Allow time for participants to share out in whole group.</i></p>	<p style="text-align: center;">Slide 27</p>  <p style="text-align: right;">“In three-dimensional learning, communication and collaboration are the gears that drive sensemaking.” <small>(National Academy of Science, 2023 pg. 121)</small></p>
<p>Explain: At this time, we are going to engage in a learning experience symmetrical to the classroom experience anchored in a high-quality instructional resource. We will be using a 6th grade unit on Weather, Climate and Water Cycling from the open educational resource, OpenSciEd.</p> <p>It is important to provide opportunities to learn in ways that reflect how students learn (Mehta and Fine 2019). If we expect you as educators to use curricula in ways consistent with the NGSS vision, then the learning experiences designed for teachers should be symmetrical to the learning experiences we design for students.</p> <p>In addition, it allows the participants to reflect from multiple perspectives. You will experience learning in the adult learner hat while building background of the phenomenon and reflecting in the teacher hat.</p> <p>Facilitator Note: <i>Refrain from sharing the teacher’s guide to this lesson prior to engaging as an adult learner. Participants will have the opportunity to examine this later.</i></p>	<p style="text-align: center;">Slide 28</p> <p style="text-align: center;">Let’s Engage in a Learning Experience Anchored in a High-Quality Instructional Resource (HQIR)!</p> <p>What?</p> <ul style="list-style-type: none"> • OpenSciEd 6th Grade Unit on Weather, Climate and Water Cycling <p>Why?</p> <ul style="list-style-type: none"> • To give teachers opportunities to learn in ways that reflect how students learn Mehta and Fine 2019. If we expect teachers to use curricula in ways consistent with the NGSS vision, then the learning experiences we design for teachers should be symmetrical to the learning experiences we design for students. • Allows the participants to reflect from multiple perspectives. <p>How?</p> <ul style="list-style-type: none"> • Learning in the adult learner hat • Building background of the phenomenon and reflecting in the teacher hat 

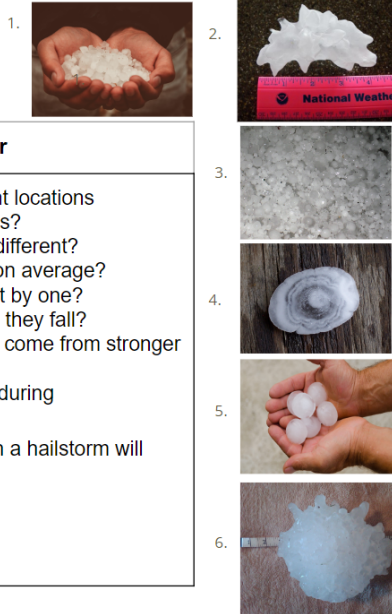
Guidance	Accompanying Slide(s)
<p>Explain: As already shared, you will be experiencing the learning from both a teacher and an adult learner perspective. When in “teacher hat,” we will grow our understanding of the phenomenon and take time to analyze the <i>Kentucky Academic Standards for Science</i>. Most importantly, we will reflect on our teaching and consider new shifts in our teaching practice.</p> <p>As we shift our focus from the “teacher hat” to the “adult learner hat,” it is very important we do not speak as one of our students, but rather be engaged in the learning for ourselves. This will provide a safe space for all participants to engage in the phenomenon, ask questions and deepen their own understanding of science. In the “adult learner hat” it is very important that the participant stays in the learner hat. Staying in the “adult learner hat” will honor the investigative process for the adult learning community as it is very likely that the adults in the room have varying backgrounds and past opportunities to make sense of the science content they are learning. As we navigate between these two hats the corresponding symbol can be found in the upper right-hand corner of the slide.</p> <p>Facilitator Note: <i>Refrain from encouraging participants to engage in the learning experience as one of their students. Participants should engage as an adult learner rather than pretending to be a 6th grade student.</i></p> <p><i>Provide a space for participants to ask clarifying questions regarding these two hats.</i></p>	<p style="text-align: center;">Slide 29</p> <p style="text-align: center;">Teacher Hat Versus Adult Learner Hat</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Teacher Hat</p>  </div> <div style="text-align: center;"> <p>Adult Learner Hat</p>  </div> </div> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>While in teacher hat we will:</p> <ul style="list-style-type: none"> • Grow our understanding of phenomena. • Analyze <i>Kentucky Academic Standards for Science</i>. • Reflect on our teaching and consider new shifts in our teaching practice. </div> <div style="width: 45%;"> <p>While in adult learner hat we will:</p> <ul style="list-style-type: none"> • Build and deepen our own science content knowledge. • Engage in a learning opportunity that is symmetrical to the student experience. </div> </div>  
<p>Explain: To build the background of the phenomenon and answer the driving question, “Why does a lot of hail, rain, or snow fall at some times and not others?” You will need some information regarding what has happened prior to engaging as an adult learner.</p> <p>The phenomenon was launched by exploring a series of videos of hailstorms from different locations across the country at different times of the year. From the videos, the observations on the screen were made.</p>	<p style="text-align: right;">Slide 30</p> <p style="text-align: right;"></p> <p style="text-align: center;">Building the Background</p> <div style="display: flex;"> <div style="width: 60%;">  </div> <div style="width: 35%; padding-left: 10px;"> <p>Observations</p> <ul style="list-style-type: none"> ✓ Pieces of ice of different sizes (some very large) falling out of the sky. ✓ These pieces of ice were sometimes accompanied by rain and wind gusts. ✓ All happened on days when the temperature of the air outside remained above freezing for the entire day. </div> </div>  

Guidance	Accompanying Slide(s)
<p>Explain: Next, models were developed to explain what causes this to occur and questions were developed for a Driving Question Board (DQB) about the mechanisms that cause different kinds of precipitation events. Then, investigations were brainstormed that could help them collect data and figure out answers to their questions. The picture on the screen provides a visual of what that could look like.</p> <p>Facilitator Note: <i>For more information regarding Driving Question Boards, please refer to the Professional Learning Module, Improving Student Engagement Using a Driving Question Board.</i></p>	<p style="text-align: center;">Slide 31</p>  <p>Next Steps</p> <ul style="list-style-type: none"> • Students develop a model to try to explain what causes this to occur. • Students then develop questions for our Driving Question Board (DQB) about the mechanisms that cause different kinds of precipitation events. • Students brainstorm investigations to do and sources of data that could help them figure out answers to their questions. <p style="text-align: right;"><small>Kentucky Department of EDUCATION</small></p>
<p>Explain: Lesson 2 addresses one of the questions on the driving question board, which is what the conditions are like on days when it hails. Photos of hailstorms were provided to make observations and identify patterns. Look at the photos of hailstones. What do you think the students would have noticed or wondered when observing these photos?</p> <p>Facilitator Note: <i>Capture these notices and wonderings on a t-chart. Notices on the left and wonderings on the right. An example of this can be found below.</i></p>	<p style="text-align: center;">Slide 32</p> <p>Beginning of Lesson 2 </p> <p>Examine photos of hailstones, make observations and identify patterns</p> 

Guidance

Accompanying Slide(s)

Hailstone Photos: Notice and Wonder Chart



Notice	Wonder
<ul style="list-style-type: none"> • Some are bigger than others • Different shapes and sizes • The hailstones look different • Some look they are starting to melt • Some have different layers • Some are bumpy and some smooth and some are rough • Different mass 	<ul style="list-style-type: none"> • Are they from different locations • Why does one of rings? • Why are the shapes different? • How heavy are they on average? • Would it hurt to get hit by one? • What time of year did they fall? • Do bigger hail stones come from stronger storms/ • Do they always form during thunderstorms? • Can you predict when a hailstorm will occur?

Explain:

Here are a few notices and wonders about the hailstones. Just like what you mentioned, students noticed...

- Different sizes (small/pea – big/baseball)
- Different shapes (most round with some flat)
- Some smooth and some spiky
- See "layers" or "rings"
-

These notices lead them to wonder...

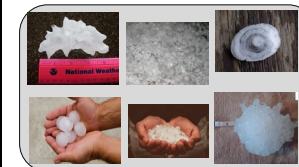
- How do they get so big?
- What are the "rings"?
- If they are so big, how do they stay up there?
- Why spikes?

Slide 33

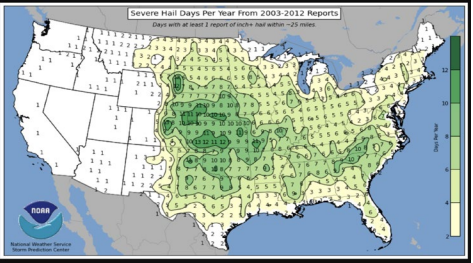
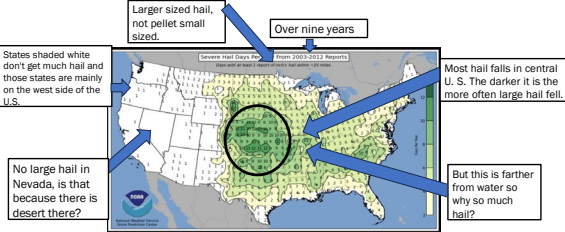
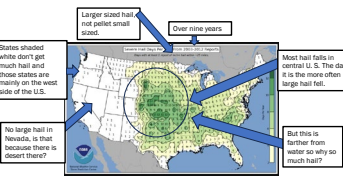
Beginning of Lesson 2 (2)







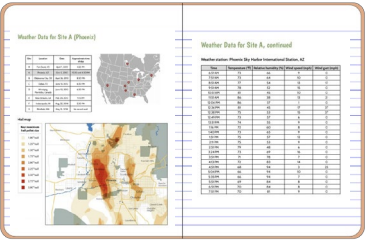








- Examine photos of hailstones and make observations



Notice	Wonder
<ul style="list-style-type: none"> • Different sizes (small – big) (pea – baseball) • Different shapes (most round with some flat) • Some smooth and some spiky • See "layers" or "rings" 	<ul style="list-style-type: none"> • How do they get so big? • What are the "rings"? • If they are so big, how do they stay up there? • Why spikes?

Guidance	Accompanying Slide(s)				
<p>Explain: Utilize the “WIS” strategy to analyze the hail frequency map data for patterns showing the frequency of occurrences of hail in the United States. The WIS strategy stands for “What I see.”</p> <p>Without making any interpretations, what do you think the students would see from the data included on this map?</p>	<p style="text-align: center;">Slide 34</p> <p style="text-align: center;">Hail Frequency Map</p> <p style="text-align: center;">Analyze the hail frequency map data for patterns and questions.</p> 				
<p>Explain: On the screen you see what the students saw in this data.</p>	<p style="text-align: center;">Slide 35</p> <p style="text-align: center;">Hail Frequency Map (2)</p> <p style="text-align: center;">Analyze the hail frequency map data for patterns and questions.</p> 				
<p>Explain: From the information gathered from the map, students noticed...</p> <ul style="list-style-type: none"> • Not very many big hail days on the west coast. • Some places get lots of hail. • More hail days in the middle of the country. <p>and wondered...</p> <ul style="list-style-type: none"> • Why more hail in the middle? • What is it like in the middle where there is more hail? • What was it like outside in those days? • Does CA get small hail? <p>Are there any additional notice and wondering you had that are not captured here?</p>	<p style="text-align: center;">Slide 36</p> <p style="text-align: center;">Hail Frequency Map</p> <p style="text-align: center;">Analyze the hail frequency map data for patterns and questions.</p>  <table border="1" data-bbox="1776 1166 1982 1373"> <thead> <tr> <th>Notice</th> <th>Wonder</th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> • Not very many big hail days on the west coast. • Some places get lots of hail • More hail days in the middle of the country. </td> <td> <ul style="list-style-type: none"> • Why more hail in the middle? • What is it like where there is more hail? • What was it like outside on those days? • Does CA get small hail? </td> </tr> </tbody> </table> <p style="text-align: right;">Kentucky Department of EDUCATION</p>	Notice	Wonder	<ul style="list-style-type: none"> • Not very many big hail days on the west coast. • Some places get lots of hail • More hail days in the middle of the country. 	<ul style="list-style-type: none"> • Why more hail in the middle? • What is it like where there is more hail? • What was it like outside on those days? • Does CA get small hail?
Notice	Wonder				
<ul style="list-style-type: none"> • Not very many big hail days on the west coast. • Some places get lots of hail • More hail days in the middle of the country. 	<ul style="list-style-type: none"> • Why more hail in the middle? • What is it like where there is more hail? • What was it like outside on those days? • Does CA get small hail? 				

Guidance	Accompanying Slide(s)
<p>Explain: Staying in the adult learner hat is one way to honor the figuring out process for our adult learning community. It is likely that we have varying backgrounds, past experiences and opportunities to make sense of this science.</p> <p>As we shift to the adult learner hat, teacher thoughts or wonderings may linger. While these thoughts are important, we want to honor staying in the adult learner hat too.</p> <p>Please feel free to capture these teacher thoughts on a post it notes or on the parking lot.</p>	<p style="text-align: center;">Slide 37</p> <p style="text-align: center;">Adult Learner Hat</p> <div style="text-align: center;">  </div> <p style="text-align: right;"></p>
<p>Explain: We have weather data from eight sites where hail hit, shown in the map on the right. Three of these storms were present in the videos during the phenomenon launch. Please direct your attention to the photograph of the weather station on the left of the slide. Near each of the eight sites is a weather station that measures weather conditions. What do you think is meant by “weather” and “weather conditions”? <i>Listen for: Temperature, Humidity, Wind Speed, Precipitation, Wind Gusts</i></p> <p>All these conditions together make up our weather in a particular place at any given point in time. So, when we talk about weather conditions, we mean what the air is like at a given time in terms of things like the temperature, how windy it might be, how humid it is, and other factors.</p>	<p style="text-align: center;">Slide 38</p> <p style="text-align: center;">Shared Learning Experience</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Near each of the 8 sites is a weather station. This image shows a typical station with the instruments mounted on it to keep them off the ground.</p> </div> <div style="text-align: center;">  <p>We have weather data from 8 sites for the day when a hailstorm hit that location.</p> </div> </div> <p style="text-align: right;"></p> <p style="text-align: right;"></p>
<p>Explain: We will divide into small groups to analyze hailstorm data at 1 of the 8 sites. During this time, you will be utilizing the Weather Data for Sites. Your group will be assigned one of the sites to analyze. Group 1 will analyze site A and so forth. Each site consists of 3-4 pieces of data.</p> <p>As you are making your observations, consider marking up the data. Feel free to draw arrows to things you noticed. Be sure to capture your observations using the “WIS” What I See strategy. To help make sense of the data, consider putting a mark next to the time the hail event started and use that to help determine the weather conditions around that time of day.</p> <p>Be open to discussion with your group to understand more about your site. As you discuss, be</p>	<p style="text-align: center;">Slide 39</p> <p style="text-align: center;">Analyze Your Case File with a Partner</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 60%;">  </div> <div style="width: 35%;"> <p><u>Make Observations.</u></p> <ol style="list-style-type: none"> 1. Draw arrows to things you notice in the zoomed-in map and the data table. 2. Write “What I see” (or “WIS”), then write your observations. 3. Discuss your observations with a partner using CSW 2, 3, and 8. 4. Collect your case data: location and scale, timing, conditions, and other important information. </div> </div> <p style="text-align: right;"></p> <p style="text-align: right;"></p>

Guidance	Accompanying Slide(s)																																																																								
<p>intentional with your discussions by considering the following Communicating in Scientific Ways stems, CSW#2: Observe, CSW#3: Organize Data and Observations and CSW#8: Agree or Disagree with others' ideas. Before we move into groups, what questions might you have?</p> <p>Facilitator Note: <i>Participants will need around 8-10 minutes to collect their case data. Consider walking around to check on small groups to address any questions or concerns they have with the task. You may need to remind participants to remain in the adult learner hat. If they have thoughts or questions in their teacher's hat, capture those on a post it and place it on parking lot. This will honor their thoughts while encouraging them to stay in adult learner hat.</i></p>																																																																									
<p>Explain: Now that you have had some time to look at your case, we will share our site data with the whole group to identify patterns in our hailstorm cases. Please bring your chairs, notebooks, data, and pencils to gather in a scientists circle. Record the data observations for each site on chart paper or a spreadsheet.</p> <p>Facilitator Note: <i>If time allows, have 2 small groups share their findings and identify patterns across those 2 sites before moving into whole group sharing with all 8 sites.</i></p>	<p style="text-align: right;">Slide 40</p> <p style="text-align: right;"></p> <p>Compile Hailstorm Case Data</p> <p>Examine the compiled hailstorm data and collect your thoughts to the question below in your notes.</p> <table border="1" data-bbox="1627 787 1984 966"> <thead> <tr> <th>State</th> <th>Temp (F)</th> <th>Humid</th> <th>Wind</th> <th>Gusts</th> <th>Size</th> <th>Shape</th> <th>Time</th> </tr> </thead> <tbody> <tr><td>KS</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>AZ</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>OK</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>TX</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>Canada</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>LA</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>IN</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MA</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table> <p style="text-align: right;"></p>	State	Temp (F)	Humid	Wind	Gusts	Size	Shape	Time	KS								AZ								OK								TX								Canada								LA								IN								MA							
State	Temp (F)	Humid	Wind	Gusts	Size	Shape	Time																																																																		
KS																																																																									
AZ																																																																									
OK																																																																									
TX																																																																									
Canada																																																																									
LA																																																																									
IN																																																																									
MA																																																																									
<p>Facilitator Note: <i>This slide is optional and can be used if someone is working through this module independently. This will allow the participant to have the completed hailstorm case data for all 8 sites.</i></p>	<p style="text-align: right;">Slide 41</p> <p style="text-align: right;"></p> <p>Compiled Hailstorm Case Data</p> <p>Examine the compiled hailstorm data and collect your thoughts to the question below in your notes.</p> <table border="1" data-bbox="1627 1161 1984 1356"> <thead> <tr> <th>State</th> <th>Temp (F)</th> <th>Humid</th> <th>Wind</th> <th>Gusts</th> <th>Size</th> <th>Shape</th> <th>Time</th> </tr> </thead> <tbody> <tr><td>KS</td><td>59</td><td>78%</td><td>High</td><td>High</td><td>40 mm</td><td>1 thick line</td><td>Afternoon Spring</td></tr> <tr><td>AZ</td><td>68</td><td>94%</td><td>High</td><td>High</td><td>30 mm</td><td>2 lines</td><td>Afternoon Fall</td></tr> <tr><td>OK</td><td>77</td><td>79%</td><td>High</td><td>High</td><td>60 mm</td><td>2 train track lines</td><td>Evening Spring</td></tr> <tr><td>TX</td><td>66</td><td>75%</td><td>High</td><td>High</td><td>10-20 mm</td><td>3 slashes</td><td>Evening Summer</td></tr> <tr><td>Canada</td><td>32-64</td><td>59-82%</td><td>High</td><td>High</td><td>?</td><td>?</td><td>Evening Summer</td></tr> <tr><td>LA</td><td>61</td><td>94%</td><td>High</td><td>High</td><td>30 mm</td><td>1 thick line</td><td>Evening Winter</td></tr> <tr><td>IN</td><td>82</td><td>74%</td><td>Low</td><td>---</td><td>50 mm</td><td>1 thickish line</td><td>Summer Evening</td></tr> <tr><td>MA</td><td>Lower</td><td>87%</td><td>High</td><td>High</td><td>45 mm</td><td>1 skinny line</td><td>Afternoon Spring</td></tr> </tbody> </table> <p style="text-align: right;"></p>	State	Temp (F)	Humid	Wind	Gusts	Size	Shape	Time	KS	59	78%	High	High	40 mm	1 thick line	Afternoon Spring	AZ	68	94%	High	High	30 mm	2 lines	Afternoon Fall	OK	77	79%	High	High	60 mm	2 train track lines	Evening Spring	TX	66	75%	High	High	10-20 mm	3 slashes	Evening Summer	Canada	32-64	59-82%	High	High	?	?	Evening Summer	LA	61	94%	High	High	30 mm	1 thick line	Evening Winter	IN	82	74%	Low	---	50 mm	1 thickish line	Summer Evening	MA	Lower	87%	High	High	45 mm	1 skinny line	Afternoon Spring
State	Temp (F)	Humid	Wind	Gusts	Size	Shape	Time																																																																		
KS	59	78%	High	High	40 mm	1 thick line	Afternoon Spring																																																																		
AZ	68	94%	High	High	30 mm	2 lines	Afternoon Fall																																																																		
OK	77	79%	High	High	60 mm	2 train track lines	Evening Spring																																																																		
TX	66	75%	High	High	10-20 mm	3 slashes	Evening Summer																																																																		
Canada	32-64	59-82%	High	High	?	?	Evening Summer																																																																		
LA	61	94%	High	High	30 mm	1 thick line	Evening Winter																																																																		
IN	82	74%	Low	---	50 mm	1 thickish line	Summer Evening																																																																		
MA	Lower	87%	High	High	45 mm	1 skinny line	Afternoon Spring																																																																		

Guidance

Explain:

We are building our understanding of what the conditions are like when it hails. Let's continue building our understanding together. What patterns did you notice in the compiled data? Please feel free to share with the group. As we engage in this discussion, I will invite you to use CSW #4: Think of an idea, claim, prediction or model to explain your data and observations. As you discuss, be intentional with your discussions by considering the following Communicating in Scientific Ways stems CSW #7: Listen to others' ideas and ask clarifying questions, CSW# 9: Add onto someone else's idea, and CSW #11: Consider if new ideas make sense.

Facilitator Note:

Suggested prompts if participants struggle with identifying patterns:

- *What was one pattern you noticed in the location, scale, timing, and weather conditions that lead to the formation of hail?*
- *What does the pattern of data lead you to conclude about the timing of hailstorms?*
- *What patterns do you observe in the data about the weather conditions around the time of a hailstorm?*
- *What other patterns do you observe in the data about the weather conditions?*

Listen For:

Location and scale

- *Hailstorms happen more often in the Midwest.*
- *Hailstorms appear to happen in "lines."*
- *Hailstorms impact relatively small areas (20-60 square miles).*
- *Hailstorms are relatively short (10-30 minutes).*

Timing

- *Hail is less common in the winter months.*
- *Hail happens later in the day.*

Weather conditions

- *The temperature is relatively warm (above 50°F) on days when it hails.*
- *Humidity is relatively high when it hails.*
- *Note: general trends like the one listed below are easily identified, though they are difficult ones to find in the data due to the relatively brief nature of the hailstorm vs. where weather stations are located and how often they are sampling the weather conditions:*
- *The humidity often goes up and the temperature often goes down and there are often changes in the wind around the time of a hailstorm.*

Accompanying Slide(s)

Slide 42







Group Discussion











Discuss the following questions in whole group using the sentence stems to the right:



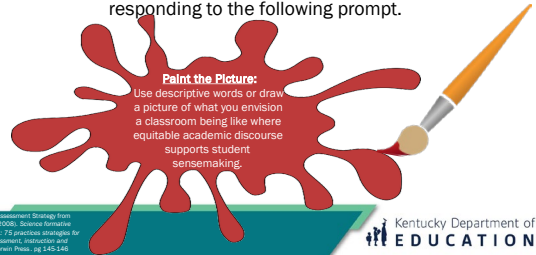

- What patterns did you notice in the location, scale, timing and weather conditions?
- Based on those patterns, what can we determine about the commonalities between most hail events?


How we figure things out	How we communicate
Think of an idea, claim, prediction or model to explain your data and observations	My idea is... I think that... We could draw a picture to show... I think it looks like this...
Listen to others' ideas and ask clarifying questions	Are you saying that...? What do you mean when you say...? What is your evidence? Can you say more about...?
Add onto someone else's idea	I want to piggyback on April's idea. I want to add to what Jeremiah said.
Consider if new ideas make sense	That idea makes sense to me because... That idea doesn't make sense because... What's their evidence?

Guidance	Accompanying Slide(s)
<p>Explain: Now that you have had the opportunity to discuss with your peers and share your thinking as you let your ideas change and grow, take some individual time to capture what we figured out from our analysis and discussion of the hailstorm data in your participant packet. Feel free to use words and/or pictures.</p> <p>Facilitator Note: <i>Allow participants to share if they feel comfortable.</i></p>	<p style="text-align: center;">Slide 43</p> <p style="text-align: right;"></p> <p>What We Figured Out...</p> <p>We have been investigating the question, “What are the conditions like on days when it hails?”</p> <p>Take some individual time to capture what we figured out from our analysis and discussion of the hailstorm data. Use words and/or pictures.</p> 
<p>Explain: Now we will reflect on the adult learning experience as a teacher. Take a few moments to jot your thinking down and we will take some time to share with the whole group. Let’s consider the first question, how did the discussion support your sensemaking around hailstorm conditions? How did the discussion encourage equity in the learning community?</p> <p>Facilitator Note: <i>Check the parking lot or ask the participants if they have any questions they would like to discuss in the teacher hat.</i></p>	<p style="text-align: center;">Slide 44</p> <p style="text-align: right;"></p> <p>Reflect on the Adult Learning Experience</p> <p>Record your responses to the questions below in your notes.</p> <ul style="list-style-type: none"> • How did the discussion support your sensemaking around hailstorm conditions? • How did the discussion encourage equity in the learning community? 
<p>Explain: In the top right-hand corner of your discussion diamond protocol found in your participant packet, record your initial ideas and understanding answering the following question. Feel free to use words and/or pictures.</p> <ul style="list-style-type: none"> • What is <i>equitable</i> academic discourse? How can we know if we are getting closer to achieving it? • How might equitable academic discourse <i>support</i> student sensemaking? <p>Facilitator Note: <i>The discussion diamond protocol is designed for a group of 4 coming to a consensus. If you are working through the module independently, you may want to adapt the protocol. You can write</i></p>	<p style="text-align: center;">Slide 45</p> <p>Session B: Stop and Jot (1)</p> <p>Following the Discussion Diamond Protocol, independently reflect and record your initial ideas and understanding answering these questions:</p> <ul style="list-style-type: none"> • What is <i>equitable</i> academic discourse? How can we know if we are getting closer to achieving it? • How might equitable academic discourse <i>support</i> student sensemaking? <p>Your ideas could be recorded as words and/or pictures in the upper right triangle.</p>  

Guidance	Accompanying Slide(s)								
<p><i>your ideas from each learning experience on each corner then pull all your ideas together in the middle in the form of a summary of your learning.</i></p>									
<p>Explain: Read the STEM Teaching Tools Practice Briefs on sensemaking and discourse. As you read respond to the following questions in your participant packet:</p> <ul style="list-style-type: none"> • What is equitable academic discourse? • What is the purpose of academic discourse in the science classroom? • How does academic discourse support sensemaking? 	<p style="text-align: center;">Slide 46</p> <p style="text-align: center;">STEM Teaching Tools Practice Briefs</p> <p>Read the STEM Teaching Tools Practice Briefs on sensemaking and discourse. As you read consider the following questions:</p> <ul style="list-style-type: none"> • What is equitable academic discourse? • What is the purpose of academic discourse in the science classroom? • How does academic discourse support sensemaking? <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Discourse: STEM Teaching Tool #6: How Can I Get My Students to Learn Science by Productively Talking with Each Other?</p> </div> <div style="text-align: center;">  <p>Sensemaking: STEM Teaching Tool #47: How can I promote equitable sensemaking by setting expectations for multiple perspectives?</p> </div> </div> 								
<p>Explain: Using your notes, discuss the following questions in your small groups.</p> <ul style="list-style-type: none"> • What is equitable academic discourse? • What is the purpose of academic discourse in the science classroom? • How does academic discourse support sensemaking? <p>Remember to be an active listener so that you can build off one another's' ideas and offer new thoughts that resonate with you. Utilize the Communicating in Scientific Ways (CSW) stems, CSW#7: Listening to other's ideas and ask clarifying questions, CSW#8: Agree or disagree with other ideas and CSW #9: Add onto someone else's idea.</p>	<p style="text-align: center;">Slide 47</p> <p style="text-align: center;">Session B: Pause and Discuss</p> <p><u>Using your notes, discuss these questions with a colleague(s) by using the sentence starters to the right:</u></p> <ul style="list-style-type: none"> ▪ What is equitable academic discourse? ▪ What is the purpose of academic discourse in the science classroom? ▪ How does academic discourse support sensemaking? <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">How we figure things out</th> <th style="text-align: center;">How we communicate</th> </tr> </thead> <tbody> <tr> <td style="font-size: small;">Listen to other's ideas and ask clarifying questions</td> <td style="font-size: small;">Are you saying that...? What do you mean when you say...? What is your evidence? Can you say more about...?</td> </tr> <tr> <td style="font-size: small;">Agree or disagree with other's ideas</td> <td style="font-size: small;">I agree with ____ because... I agree with you, but I also think... I disagree with ____ because... I know where you are coming from, but I have a different idea... I am thinking about it differently...</td> </tr> <tr> <td style="font-size: small;">Add onto someone else's idea</td> <td style="font-size: small;">I want to piggyback on April's idea. I want to add to what Jeremiah said.</td> </tr> </tbody> </table> 	How we figure things out	How we communicate	Listen to other's ideas and ask clarifying questions	Are you saying that...? What do you mean when you say...? What is your evidence? Can you say more about...?	Agree or disagree with other's ideas	I agree with ____ because... I agree with you, but I also think... I disagree with ____ because... I know where you are coming from, but I have a different idea... I am thinking about it differently...	Add onto someone else's idea	I want to piggyback on April's idea. I want to add to what Jeremiah said.
How we figure things out	How we communicate								
Listen to other's ideas and ask clarifying questions	Are you saying that...? What do you mean when you say...? What is your evidence? Can you say more about...?								
Agree or disagree with other's ideas	I agree with ____ because... I agree with you, but I also think... I disagree with ____ because... I know where you are coming from, but I have a different idea... I am thinking about it differently...								
Add onto someone else's idea	I want to piggyback on April's idea. I want to add to what Jeremiah said.								

Guidance	Accompanying Slide(s)
<p>Explain: Take a moment to record your key takeaways from your small group discussion in the bottom right-hand corner of the diamond protocol.</p>	<p style="text-align: center;">Slide 48</p> <p style="text-align: center;">Session B: Stop and Jot (2)</p> <p>Add to your ideas in your corner of the <i>Discussion Diamond Protocol</i> by considering the following questions...</p> <ul style="list-style-type: none"> • What is the purpose of academic discourse in the science classroom, and how might it support sensemaking? <p>Your ideas could be recorded in the bottom right triangle.</p>  
<p>Explain: What common themes arose in your discussion and what wondering does your group have? Who would like to share out?</p> <p>As you share, please use Communicating in Scientific Ways stems: CSW #7: Listening to other's ideas and ask clarifying questions, CSW#8: Agree or disagree with other ideas and CSW #9: Add onto someone else's idea.</p>	<p style="text-align: center;">Slide 49</p> <p style="text-align: center;">Session B: Group Synthesis</p> <p>Discussion Questions:</p> <ul style="list-style-type: none"> ▪ What is equitable discourse? ▪ What is the purpose of equitable discourse in the science classroom? ▪ How does academic discourse support sensemaking? <p>➤ What common themes arose in your discussion?</p> <p>➤ What wonderings does your group have?</p> 
<p>Explain: Here is a shared definition for the group to consider. Equitable academic discourse is productive science talk centered around a phenomenon where <u>ALL</u> students are actively <u>sharing</u> and <u>clarifying</u> their thoughts to <u>deepen their understanding</u> while fostering a <u>collaborative</u> learning environment where every voice is <u>valued</u> and <u>heard</u>.</p> <p>Is there anything that needs to be added or revised?</p>	<p style="text-align: center;">Slide 50</p> <p style="text-align: center;">Shared Definition for Consideration</p> <p>Equitable academic discourse is productive science talk centered around a phenomenon where <u>ALL</u> students are actively <u>sharing</u> and <u>clarifying</u> their thoughts to <u>deepen their understanding</u> while fostering a <u>collaborative</u> learning environment where every voice is <u>valued</u> and <u>heard</u>.</p> 

Guidance	Accompanying Slide(s)
<p>Explain: Equitable discourse supports students' sensemaking by:</p> <ul style="list-style-type: none"> ➤ Providing a real-world experience true to the field of science where students make sense of their work, gather feedback and refine their ideas. ➤ Carrying out the deeply social nature of the science and engineering practices. ➤ Revealing students' thinking to the teacher and classmates. ➤ Positioning students as developing experts towards the understanding of a phenomenon based on available interpretations and evidence. ➤ Broadening participation within the room where all students share, clarify and develop their ideas. ➤ Valuing student diversity, cultures and ideas within the classroom. 	<p style="text-align: center;">Slide 51</p> <p>Session B: Shared Understandings</p> <p>Equitable discourse supports students' sensemaking by</p> <ul style="list-style-type: none"> ➤ Providing a real-world experience true to the field of science where students make sense of their work, gather feedback and refine their ideas. ➤ Carrying out the deeply social nature of the science and engineering practices. ➤ Revealing students' thinking to the teacher and classmates. ➤ Positioning students as developing experts towards the understanding of a phenomenon based on available interpretations and evidence. ➤ Broadening participation within the room where all students share, clarify and develop their ideas. ➤ Valuing student diversity, cultures and ideas within the classroom. 
<p>Explain: Let's take a meta moment and jot down our initial ideas around today's focus question in your participant packet, what is equitable academic discourse and how does it support student sensemaking in the science classroom?</p> <p>Consider adding on to your initial thoughts in a different color. How have your thoughts grown or changed after completing session B?</p>	<p style="text-align: center;">Slide 52</p> <p style="text-align: center;">After Completing Session B: Meta Moment</p> <p>Focus Question</p> <p>What is equitable academic discourse and how does it support student sensemaking in the science classroom?</p> 
<p>Explain: Take some time to record your thoughts from today's session by responding to the following prompt at the end of your participant packet called, <u>Paint the Picture</u>. Use descriptive words or draw a picture of what you envision a classroom being like where equitable academic discourse supports student sensemaking.</p> <p>Facilitator Note: <i>Invite everyone to choose a word they used or a word that would describe their drawing you made and share it out with the whole group. You might consider a word cloud with these descriptor words.</i></p>	<p style="text-align: center;">Slide 53</p> <p>Session B: Reflection</p> <p>Take some time to record your thoughts from today's session by responding to the following prompt.</p>  

Guidance	Accompanying Slide(s)
<p>Explain: “The first step toward change is awareness. The second step is acceptance.” This quote by Nathaniel Branden helps us to see the importance of taking inventory of the nature and quality of talk occurring in our classroom. Video a science lesson and listen for the nature and quality of talk that occurs. Reflect on the current state of science talk in your classroom.</p> <ul style="list-style-type: none"> • What is the balance of talk between you as the teacher and students? • Do some students talk more than others? • Is there evidence of equitable academic discourse as described in this session? • How is student thinking and reasoning made public and visible? 	<p style="text-align: center;">Slide 54</p> <p>Session B: Next Steps: Considerations for Implementation</p> <p>Video a science lesson and listen for the nature and quality of talk that occurs. Reflect on the current state of science talk in your classroom.</p> <ul style="list-style-type: none"> • What is the balance of talk between you as the teacher and students? • Do some students talk more than others? • Is there evidence of equitable academic discourse as described in this session? • How is student thinking and reasoning made public and visible? 





Preparation for Session C


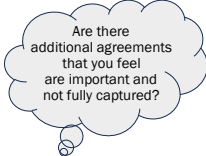


Focus Question: How can both teachers and students contribute to equitable academic discourse?



Agenda: 2 hours

Time	Slides #'s	Outline	Materials Needed
10 minutes	55-59	Introduction <ul style="list-style-type: none"> • Establishing Goals • Focus Questions • Group Agreements • Meta Moment 	<ul style="list-style-type: none"> • Participant Packet (used throughout the session) • Agreements Poster • Parking Lot Poster • Communicating in Scientific Ways Poster
1 hour 30 minutes	60-71	Video Analysis <ul style="list-style-type: none"> • Teacher VS Student • Features of Classroom Culture • Vignette • Diamond Protocol to Capture Thinking 	<ul style="list-style-type: none"> • Video Featuring a 2nd-3rd Grade Classroom • Transcript of the Grade 2-3 Classroom Video • Features of Classroom Culture that Support Equitable Sensemaking • Video Featuring a Primary Classroom • Transcript of the Primary Classroom Video • Video Featuring an Intermediate Classroom • Transcript of the Intermediate Classroom Video • Video Featuring a Middle School Classroom • Transcript of the Middle School Classroom Video • Video Featuring a High School Classroom • Transcript of the High School Classroom Video
10 minutes	72-73	Closing <ul style="list-style-type: none"> • Meta Moment and Reflection 	
10 minutes	74	Next Steps - Considerations for Implementation	<ul style="list-style-type: none"> • Self-evaluation: Engaging in Classroom Discourse

Session C: How can both teachers and students contribute to equitable academic discourse?

Guidance	Accompanying Slide(s)
<p>Explain: We will now begin session C.</p>	<p style="text-align: center;">Slide 55</p>   <p style="text-align: center;">SESSION C</p>
<p>Explain: As you can see, we have worked towards the first two goals and during this session we will explore how both teachers and students contribute to equitable academic discourse.</p> <p>We will be engaging in some video analysis to see how both teachers and students are contributing to equitable academic discourse.</p>	<p style="text-align: center;">Slide 56</p> <p>Session C Module Goal</p> <ul style="list-style-type: none"> • Establish a learning environment where all students have equitable access and opportunity to learn through discourse. • Develop a collaborative understanding of equitable academic discourse that supports student sensemaking. ➔ Explore how both teachers and students contribute to equitable academic discourse. • Examine why we should use equitable academic discourse in the science classroom. • Intentionally plan for equitable academic discourse.  

Guidance	Accompanying Slide(s)
<p>Explain: This goal aligns to our focus question, how can both teachers and students contribute to equitable academic discourse?</p>	<p style="text-align: center;">Slide 57</p> <p style="text-align: center;">Sessions Included in This Module (3)</p> <p>Session A: How can we establish a learning environment to ensure all students have equitable access and opportunity to learn?</p> <p>Session B: What is equitable academic discourse and how does it support student sensemaking in the science classroom?</p> <p>Session C: → How can both teachers and students contribute to equitable academic discourse?</p> <p>Session D: Why should equitable academic discourse be used in the science classroom and how does it support the development of science ideas and skills contained in the <i>Kentucky Academic Standards for Science</i>?</p> <p>Session E: How might we intentionally plan for equitable academic discourse to support student sensemaking in the classroom?</p> 
<p>Explain: Reflecting on our agreements we have built together this week, are there any additional agreements that you feel are important to add and have not fully been captured? Thank you for the ideas you have shared on the potential impacts on our learning community if these agreements are fully attended to.</p> <p><i>Bring in some of the participants' thoughts regarding the impacts shared during session B.</i></p> <p>Explain: Let's continue as we work today to honor these thoughts and contributions from one another that will impact all of us.</p>	<p style="text-align: center;">Slide 58</p> <p style="text-align: center;">Group Agreements (3)</p> <ul style="list-style-type: none"> • We share ideas even when we are not sure. • We look, listen and consider each other's ideas. • We let our ideas change and grow.  
<p>Explain: Let's take a meta moment and jot down our initial ideas around today's focus question in your participant packet, what is equitable academic discourse and how does it support student sensemaking in the science classroom?</p>	<p style="text-align: center;">Slide 59</p> <p style="text-align: center;">Session C Meta Moment</p> <p>Focus Question</p> <p>How can both teachers and students contribute to equitable academic discourse?</p> 

Guidance	Accompanying Slide(s)				
<p>Explain: As we prepare for video analysis it is important to follow a few ground rules to support our work today. Teaching and the classrooms we will see are complex. There is much we don't know about the students, the teacher and their history together. These teachers are giving us a gift by opening their classroom. Let's presume expertise on the part of the teacher acknowledging that there may be missed opportunity or alternative moves that could continue opening the space for student sensemaking in other ways. Assume what the kids are saying makes sense to them. In these few minutes, we do not get to see what happened before or after to continue supporting students in their sensemaking. Lastly, focus on how the classroom talk (teacher and students) is serving the learning goals of the lesson and the science and engineering practices.</p>	<p style="text-align: center;">Slide 60</p> <p style="text-align: center;">Guidelines for Watching Videos of Teaching</p> <p>These are real classrooms.</p> <p>Ground Rules:</p> <ul style="list-style-type: none"> • Teaching and the classrooms we will see are complex. There is much we don't know about the students and teacher and their history together. • Presume expertise on the part of the teacher. • Assume what the kids are saying makes sense to them. • Focus on how the classroom talk (teacher and students) is serving the learning goals of the lesson and the science and engineering practices involved. <p style="text-align: right; font-size: small;">*Adapted from: Classroom Discussions: Seeing Math Discourse in Action, Grades K - 6. A Multimedia Professional Learning Resource and the Next Generation Science Exemplar Program (NGSX)</p> 				
<p>Explain: A t-chart can be found in our participant packet. As we watch this video note what the teacher and students are doing. Consider how equitable discourse is supporting student sensemaking in the classroom. You will also need the transcript. Feel free to make notes, highlight, or underline evidence as we go or during that independent time after the video. These markings will help support your thoughts as we share out in the whole group.</p> <p>Facilitator Note: <i>Watch video.</i></p> <p>Explain: Let's take a moment to continue collecting our thoughts and mark the transcript where we see evidence of what the teacher and students are saying and doing. As we come back into the conversation, we will use the timestamps in the transcript to call out the place we are referring to so others can navigate to that spot as well and continue adding on to the conversation.</p> <p>Who would like to begin sharing a timestamp and describe what the teacher is saying and doing?</p> <p>Facilitator Note: <i>As participants are sharing, encourage them to note the specific timestamp so that others can follow.</i></p> <p><u><i>Listen Fors:</i></u></p>	<p style="text-align: center;">Slide 61</p> <p style="text-align: center;">A Look Inside the Classroom: Videos</p> <p>1. Make a T-Chart like the one below. Use this to note what the teacher and students are doing. Consider how equitable discourse is supporting student sensemaking in the classroom. You may want to view the video twice - once to attend to what the students are doing, and once to watch what the teacher is doing.</p> <table border="1" data-bbox="1528 841 1822 917"> <thead> <tr> <th data-bbox="1528 841 1675 873">What is the teacher saying and doing?</th> <th data-bbox="1675 841 1822 873">What are the students saying and doing?</th> </tr> </thead> <tbody> <tr> <td data-bbox="1528 873 1675 917" style="height: 20px;"></td> <td data-bbox="1675 873 1822 917" style="height: 20px;"></td> </tr> </tbody> </table> <p>2. Watch the following video using the accompanying transcript and note what the teacher and students are doing.</p> <p>Video Featuring a 2nd-3rd Grade Classroom Transcript of the Grade 2-3 Classroom Video</p> 	What is the teacher saying and doing?	What are the students saying and doing?		
What is the teacher saying and doing?	What are the students saying and doing?				

Guidance	Accompanying Slide(s)
<p>What is the teacher saying and doing?</p> <ul style="list-style-type: none"> • 1:34 Teacher uses specific prompts and questions such as tell me more. • 00:41 Teacher acknowledges a claim and invites discourse, which prompts students to think and begin speaking. • 5:46 Teacher guides the conversation. • 7:44-8:29 Teacher is talking less but providing prompts. • 3:28-5:55 At one point the students noticed that one of the drawings they created matched another claim and the teacher led that into another discussion about agreeing or explaining why it fit better with the other claim. • 1:17 Teacher asked, “What claim did you hear?” • 5:36 Teacher asked the student to share their idea again. • 5:55 Teacher pushes students’ ideas to further support their claim. • 1:27-1:34 Teacher says, “Mm-hmm” and asks, “Can you tell me more?” The teacher doesn’t confirm or deny what the students are thinking. <p>What are the students saying and doing?</p> <ul style="list-style-type: none"> • 9:11 Student 9 began talking about why he agreed with what another student said - then he asked that student to repeat what he said for clarification. • 7:31 Student 6 is sharing their claim. • 1:45 and 9:25 Students add on or agree to what another student said. • 1:17-1:45 Student 1 explained what they heard and adding on to their thoughts as the teacher probed at 1:34, “Can you tell me more?” • 9:24 Students asked other students to repeat their idea for clarification. • 1:36 Students felt comfortable adjusting their understanding of the models based on new evidence. • 5:55 and 7:28-8:30 Students gave nonverbal cues as they actively listened to one another. Students were willing to share with one another even when different from their peers. Through their thinking it was challenged, and they allowed their science ideas to grow and change. • 5:36 – 5:55 Brought in their own experiences and background into the classroom. Students then lead an evidence-based discussion. • 7:29 Teacher shares several notices of students in the class where they have gained in confidence in sharing their thinking, engaging in discussion where they agree and disagree comfortable, challenge each other’s thinking, ask questions, clarify one another’s thinking, thank one another for their contribution in their learning community 	

Guidance

Explain:

This document from OpenSciEd describes four features of classroom culture that support equitable sensemaking. Take a moment to examine this document closely. As you read, what resonates with you? What questions or concerns do you have?

Facilitator Note:

Open the floor up for discussion. As participants share, you may want to add in the information below.

Feature 1: *Who is engaged in (or excluded from) classroom activity? Participation is equitable when everyone has a chance to share their ideas. Providing multiple arrangements (e.g., pairs, small group, whole group) and modalities (e.g., talking, drawing, gesturing) for students to express their ideas can support all students.*

Feature 2: *Who is treated as a “knower” in the classroom? Central to an equitable learning environment is the need for students to see themselves and other students, rather than just the teacher or the textbook, as knowers.*

Feature 3: *What ways of knowing are privileged in the classroom? We cannot consider and build on all ideas if students and the teacher do not value the diverse resources that each person brings. Making space for students to use their everyday and native languages for their sensemaking as well as other ways to communicate (e.g., gestures, drawing, storytelling) signals that students’ ideas and experiences are valued.*

Feature 4: *What science is practiced in the classroom? If we want to establish a classroom culture where we consider all ideas, students need opportunities to observe, wonder, and explain complex phenomena or design solutions.*

Explain:

We are going to think about the video through a different lens, the features of classroom culture that support equitable sensemaking. Point out specific examples of features of classroom culture that support equitable sensemaking. As you discuss, don’t forget to use your CSW stems, #2:

Observe, #5: Give evidence for your idea or claim, and #11: Consider if new ideas make sense. Be sure to cite specific lines/timestamps from the transcript as evidence.

Would anyone like to share?

Facilitator Note:

Listen For: Add in ideas from the transcript of workshop.

Accompanying Slide(s)

Slide 62

Features of Classroom Culture that Support Equitable Sensemaking

Feature	Description	Observations
1. Who is engaged in (or excluded from) classroom activity? All students are engaged in the classroom activities.	<ul style="list-style-type: none"> Equity means we focus on all students having opportunities to learn. Equity means we ensure the participation of students from historically marginalized groups. Participation can include speaking, but also includes nodding, hand signals, body language and other physical expressions of engagement. 	<div style="border: 1px solid blue; padding: 5px; width: fit-content;"> <p>Examine this document closely.</p> <ul style="list-style-type: none"> What resonates with you? What questions or concerns do you have? </div>
2. Who is treated as a “knower” in the classroom? Students see themselves, one another and the teacher as the “knower” in the classroom.	<ul style="list-style-type: none"> The teacher is not the sole holder of knowledge in the classroom. Students lend valuable ideas to the discussion. The class respects all participants (students and teacher) and their ideas are seen as valuable, important, and helpful. Student sensemaking is not straightforward and may not seem logical to others, but is logical, rich and meaningful to the student. 	
3. What ways of knowing are privileged in the classroom? Students and the teacher value the diverse resources one another bring to the social endeavor of science.	<ul style="list-style-type: none"> Learning is meaningful when home and school worlds connect. All students bring valuable life experiences that are relevant to classroom learning, including their everyday language. Encourage and value students’ use of resources to make sense of phenomena including non-academic language, gesturing, metaphors, storytelling and other modes of expression. 	
4. What science is practiced in the classroom? Instruction is organized around phenomena and design challenges to surface student ideas and questions to drive future instruction.	<ul style="list-style-type: none"> Science is not framed as the memorization of facts and definitions. Science is about making sense of the world around us including phenomena and design challenges. Student ideas and questions are surfaced and used to guide future investigations and inquiries. Students can tell you how/when what they’re doing today is helping them explain a phenomenon or solve a problem. 	

Adapted from Wilgert, K. Classroom Culture Investigations. Presentation at CCSI Science Scales, Los Angeles, CA, 30 Feb 2019.

Slide 63

Features of Classroom Culture that Support Equitable Sensemaking (1)

Feature	Description	Observations
1. Who is engaged in (or excluded from) classroom activity? All students are engaged in the classroom activities.	<ul style="list-style-type: none"> Equity means we focus on all students having opportunities to learn. Equity means we ensure the participation of students from historically marginalized groups. Participation can include speaking, but also includes nodding, hand signals, body language and other physical expressions of engagement. 	
2. Who is treated as a “knower” in the classroom? Students see themselves, one another and the teacher as the “knower” in the classroom.	<ul style="list-style-type: none"> The teacher is not the sole holder of knowledge in the classroom. Students lend valuable ideas to the discussion. The class respects all participants (students and teacher) and their ideas are seen as valuable, important, and helpful. Student sensemaking is not straightforward and may not seem logical to others, but is logical, rich and meaningful to the student. 	
3. What ways of knowing are privileged in the classroom? Students and the teacher value the diverse resources one another bring to the social endeavor of science.	<ul style="list-style-type: none"> Learning is meaningful when home and school worlds connect. All students bring valuable life experiences that are relevant to classroom learning, including their everyday language. Encourage and value students’ use of resources to make sense of phenomena including non-academic language, gesturing, metaphors, storytelling and other modes of expression. 	
4. What science is practiced in the classroom? Instruction is organized around phenomena and design challenges to surface student ideas and questions to drive future instruction.	<ul style="list-style-type: none"> Science is not framed as the memorization of facts and definitions. Science is about making sense of the world around us including phenomena and design challenges. Student ideas and questions are surfaced and used to guide future investigations and inquiries. Students can tell you how/when what they’re doing today is helping them explain a phenomenon or solve a problem. 	

Adapted from Wilgert, K. Classroom Culture Investigations. Presentation at CCSI Science Scales, Los Angeles, CA, 30 Feb 2019.

Small Group:
Do you see specific examples of features of classroom culture that support equity? Cite specific lines/timestamps from the transcript as evidence.

Whole Group:
Share out key ideas from your small group.

Guidance

Explain:

We will now watch a video with accompanying transcript of the grade level you most identify with.

You will complete a T-chart identifying the actions and talk of both the teacher and students just like you did with the first video.

Facilitator Note:

Group participants in small groups by grade level. Allow them to watch the video in their groups and complete the t-chart as they watch. Allow time for groups to discuss their evidence of what the teacher and students are doing.

If you have more than one group for each grade, consider allowing the same grade level groups to join and share their findings.

You may decide to ask participants to complete this first watch on their own, then come together to discuss the following slide on the features of classroom culture that supports equitable sensemaking.

Explain:

Now consider specific examples of the features of classroom culture that support equitable sensemaking, just like you did with the last video. You can do these one of 2 ways. You can all watch the video again independently and return to your small group for discussion or one person can oversee sharing screen while you all watch together.

While discussing your examples of the four features, be sure to cite specific lines/timestamps from the transcript as evidence in your discussion.

Facilitator Note:

Allow grade level groups to discuss their findings.

Optional: Let each group share out key takeaways as they come back whole group.

Accompanying Slide(s)

Slide 64

A Look Inside the Classroom: Videos (2)

1. Make a T-Chart like the one below. Use this to note what the teacher and students are doing. Consider how equitable discourse is supporting student sensemaking in the classroom. You may want to view the video twice - once to attend to what the students are doing, and once to watch what the teacher is doing.

What is the teacher saying and doing?	What are the students saying and doing?

2. Choose one additional video with accompanying transcript highlighting the grade band you identify with and continue to collect your thoughts in the T-chart.

[Video Featuring a Primary Classroom](#)
Transcript of the Primary Classroom Video

[Video Featuring a Middle School Classroom](#)
Transcript of the Middle School Classroom Video

[Video Featuring an Intermediate Classroom](#)
Transcript of the Intermediate Classroom Video

[Video Featuring a High School Classroom](#)
Transcript of the High School Classroom Video






Slide 65




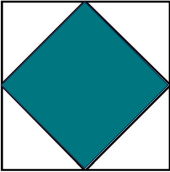

Features of Classroom Culture that Support Equitable Sensemaking (2)




Feature	Description	Observation
1. Equity is engaged in (or enacted from) classroom activity? All students are engaged in the classroom activity.	<ul style="list-style-type: none"> Equity means we focus on all students having opportunities to learn. Equity means we ensure the participation of students from historically marginalized groups. Participation can include speaking, but also includes reading, hand signals, body language, and other forms of expression or engagement. 	
2. Equity is evident as a "norm" in the classroom? Students are familiar with one another and the teacher is the "owner" of the classroom.	<ul style="list-style-type: none"> The teacher is not the sole holder of knowledge in the classroom. Students feel comfortable to ask the teacher. The class respects all perspectives (students and teacher) and has clear protocols to resolve disagreement and conflict. Quality conversations are not disrupted and all voices are heard. Logical inferences, but a logical and meaningful for the students. 	
3. Equity is evident in knowing and privileging all perspectives in the classroom? Students and the teacher value the diverse perspectives and contribute to the social construction of knowledge.	<ul style="list-style-type: none"> Learning is meaningful when home and school worlds connect. Establishing trust, respect, the experience that development in classroom learning, including the complex language. Encourage and acknowledge use of evidence to claim sense of phenomena including how students can provide evidence. Encourage, accepting, and other modes of explanation. 	
4. Equity is evident in promoting "the classroom"? Instruction is organized around phenomena or a design challenge to solve a problem. There are opportunities for peer-to-peer interaction.	<ul style="list-style-type: none"> Science is not framed as the memorization of facts and definitions. Science is about making sense of the world around us including observation and evidence. We have not solving problems. Investigations and experiments are things that are being done to solve a problem. 	

Small Group:
Do you see specific examples of features of classroom culture that support equity? Cite specific lines/timestamps from the transcript as evidence.

Whole Group:
Share out key ideas from your small group.

Guidance	Accompanying Slide(s)																		
<p>Explain: Take a moment to locate your discussion diamond protocol from your participant packet from session B. Add to your ideas to the bottom left triangle of the <u><i>Discussion Diamond Protocol</i></u> by considering the following questions...</p> <ul style="list-style-type: none"> • What are the roles of the teacher and students while engaging in equitable discourse? • How does the teacher create a classroom culture where equitable discourse supports student sensemaking? 	<p style="text-align: center;">Slide 66</p> <p>Session C: Stop and Jot (1)</p> <p>Add to your ideas in your corner of the <u><i>Discussion Diamond Protocol</i></u> by considering the following questions...</p> <ul style="list-style-type: none"> • What are the roles of the teacher and students while engaging in equitable discourse? • How does the teacher create a classroom culture where equitable discourse supports student sensemaking? <p>Your ideas could be recorded in the bottom left triangle.</p>  																		
<p>Explain: We are now going to read through the <u>lesson scenario</u> and think about how equitable discourse is supporting student sensemaking in the classroom. Take a moment to read and mark what the teacher was saying and doing and what were the students saying and doing? Refer to your t-chart from the previous notes and add ideas from this vignette.</p>	<p style="text-align: center;">Slide 67</p> <p>A Look Inside the Classroom: Vignette</p> <p>Read through the <u>lesson scenario</u> and think about how equitable discourse is supporting student sensemaking in the classroom.</p> <ul style="list-style-type: none"> ➢ What was the teacher saying and doing and what were the students saying and doing? ➢ Refer to your t-chart from the previous slide and add ideas from this vignette.  																		
<p>Explain: Let's engage in a whole group discussion around the features of classroom culture that support equitable sensemaking. Do you see specific examples of features of classroom culture that support equity? Cite specific lines/timestamps from the transcript as evidence. Feel free to unmute or place your thinking in the chat for the whole group to consider. As you are sharing, try to reference the feature you see evidence of and where your example is located.</p>	<p style="text-align: center;">Slide 68</p> <p>Features of Classroom Culture that Support Equitable Sensemaking for Vignette</p> <table border="1" data-bbox="1423 1182 1768 1416"> <thead> <tr> <th>Feature</th> <th>Observation</th> <th>Comments</th> </tr> </thead> <tbody> <tr> <td>1. 1:03:10 Engage in a whole group discussion around the features of classroom culture that support equitable sensemaking.</td> <td>Equity means we focus on all students being opportunities to learn.</td> <td></td> </tr> <tr> <td>2. 1:03:15 Engage in a whole group discussion around the features of classroom culture that support equitable sensemaking.</td> <td>Equity means we engage the participation of students from all backgrounds, including those who are struggling, but also include reading, hand signals, body language and the personal experiences of all learners.</td> <td></td> </tr> <tr> <td>3. 1:03:25 Engage in a whole group discussion around the features of classroom culture that support equitable sensemaking.</td> <td>The teacher is not the sole holder of knowledge in the classroom. Students bring valuable ideas to the discussion. The teacher respects all students' questions and insights and facilitates their own learning, inquiry, and insight. Student sensemaking is not straightforward and may not appear right away, but is logical and meaningful for the student.</td> <td></td> </tr> <tr> <td>4. 1:03:35 Engage in a whole group discussion around the features of classroom culture that support equitable sensemaking.</td> <td>Learning is meaningful when done and about words connect. All students bring valuable experiences that contribute to classroom learning, including their own life language. Encourage and value students' questions and observations of phenomena including your students' language, questions, responses, developing and other modes of responses.</td> <td></td> </tr> <tr> <td>5. 1:03:45 Engage in a whole group discussion around the features of classroom culture that support equitable sensemaking.</td> <td>Science is not formed by the memorization of facts and definitions. Science is about making sense of the world around us including phenomena and developing explanations. Student ideas and questions are valued and used to guide future investigations. Use the data and ideas being shared to help determine your own or others' problems.</td> <td></td> </tr> </tbody> </table> <p>Small Group: Do you see specific examples of features of classroom culture that support equity? Cite specific lines/timestamps from the transcript as evidence.</p> <p>Whole Group: Share out key ideas from your small group.</p> 	Feature	Observation	Comments	1. 1:03:10 Engage in a whole group discussion around the features of classroom culture that support equitable sensemaking.	Equity means we focus on all students being opportunities to learn.		2. 1:03:15 Engage in a whole group discussion around the features of classroom culture that support equitable sensemaking.	Equity means we engage the participation of students from all backgrounds, including those who are struggling, but also include reading, hand signals, body language and the personal experiences of all learners.		3. 1:03:25 Engage in a whole group discussion around the features of classroom culture that support equitable sensemaking.	The teacher is not the sole holder of knowledge in the classroom. Students bring valuable ideas to the discussion. The teacher respects all students' questions and insights and facilitates their own learning, inquiry, and insight. Student sensemaking is not straightforward and may not appear right away, but is logical and meaningful for the student.		4. 1:03:35 Engage in a whole group discussion around the features of classroom culture that support equitable sensemaking.	Learning is meaningful when done and about words connect. All students bring valuable experiences that contribute to classroom learning, including their own life language. Encourage and value students' questions and observations of phenomena including your students' language, questions, responses, developing and other modes of responses.		5. 1:03:45 Engage in a whole group discussion around the features of classroom culture that support equitable sensemaking.	Science is not formed by the memorization of facts and definitions. Science is about making sense of the world around us including phenomena and developing explanations. Student ideas and questions are valued and used to guide future investigations. Use the data and ideas being shared to help determine your own or others' problems.	
Feature	Observation	Comments																	
1. 1:03:10 Engage in a whole group discussion around the features of classroom culture that support equitable sensemaking.	Equity means we focus on all students being opportunities to learn.																		
2. 1:03:15 Engage in a whole group discussion around the features of classroom culture that support equitable sensemaking.	Equity means we engage the participation of students from all backgrounds, including those who are struggling, but also include reading, hand signals, body language and the personal experiences of all learners.																		
3. 1:03:25 Engage in a whole group discussion around the features of classroom culture that support equitable sensemaking.	The teacher is not the sole holder of knowledge in the classroom. Students bring valuable ideas to the discussion. The teacher respects all students' questions and insights and facilitates their own learning, inquiry, and insight. Student sensemaking is not straightforward and may not appear right away, but is logical and meaningful for the student.																		
4. 1:03:35 Engage in a whole group discussion around the features of classroom culture that support equitable sensemaking.	Learning is meaningful when done and about words connect. All students bring valuable experiences that contribute to classroom learning, including their own life language. Encourage and value students' questions and observations of phenomena including your students' language, questions, responses, developing and other modes of responses.																		
5. 1:03:45 Engage in a whole group discussion around the features of classroom culture that support equitable sensemaking.	Science is not formed by the memorization of facts and definitions. Science is about making sense of the world around us including phenomena and developing explanations. Student ideas and questions are valued and used to guide future investigations. Use the data and ideas being shared to help determine your own or others' problems.																		

Guidance	Accompanying Slide(s)								
<p>Explain: Add to your ideas in your corner of the <u><i>Discussion Diamond Protocol</i></u> by considering the following questions...</p> <ul style="list-style-type: none"> • What are the responsibilities of the teacher and students to foster equitable discourse? • How does the teacher create a classroom culture where equitable discourse supports student sensemaking? • How did this teacher use multiple modalities for communication to attend to equity and sensemaking? <p>Record your ideas in the upper left triangle.</p>	<p style="text-align: center;">Slide 69</p> <p>Session C: Stop and Jot (2)</p> <p>Add to your ideas in your corner of the <u><i>Discussion Diamond Protocol</i></u> by considering the following questions...</p> <ul style="list-style-type: none"> • What are the responsibilities of the teacher and students to foster equitable discourse? • How does the teacher create a classroom culture where equitable discourse supports student sensemaking? • How did this teacher use multiple modalities for communication to attend to equity and sensemaking?  <p style="text-align: center;">Your ideas could be recorded in the upper left triangle.</p> 								
<p>Explain: Allow participants to share their thinking with a shoulder partner. Encourage them to use Communicating in Scientific Ways stems, #4: Think of an idea, claim, prediction, or model to explain your data and observations, #11: Consider if new ideas make sense, and #13: Let your ideas change and grow.</p>	<p style="text-align: center;">Slide 70</p> <p>Session C: Pause and Discuss</p> <p>Discuss each focus question with a colleague(s) using the sentence stems to the right:</p> <ul style="list-style-type: none"> • What are the responsibilities of the teacher and students to foster equitable academic discourse? • How does the teacher create a classroom culture where equitable discourse supports student sensemaking? <table border="1" data-bbox="1696 808 1955 971"> <thead> <tr> <th>How we figure things out</th> <th>How we communicate</th> </tr> </thead> <tbody> <tr> <td>Think of an idea, claim, prediction or model to explain your data and observations</td> <td>My idea is... I think that... We could draw a picture to show... I think it looks like this...</td> </tr> <tr> <td>Consider if new ideas make sense</td> <td>That idea makes sense to me because... That idea doesn't make sense because... What's their evidence?</td> </tr> <tr> <td>Let your ideas change and grow</td> <td>I think I'm changing my idea. I have something to add to my idea.</td> </tr> </tbody> </table> 	How we figure things out	How we communicate	Think of an idea, claim, prediction or model to explain your data and observations	My idea is... I think that... We could draw a picture to show... I think it looks like this...	Consider if new ideas make sense	That idea makes sense to me because... That idea doesn't make sense because... What's their evidence?	Let your ideas change and grow	I think I'm changing my idea. I have something to add to my idea.
How we figure things out	How we communicate								
Think of an idea, claim, prediction or model to explain your data and observations	My idea is... I think that... We could draw a picture to show... I think it looks like this...								
Consider if new ideas make sense	That idea makes sense to me because... That idea doesn't make sense because... What's their evidence?								
Let your ideas change and grow	I think I'm changing my idea. I have something to add to my idea.								
<p>Explain: We will now take some time to synthesize our thoughts from all 4 corner triangles into the center diamond.</p> <p>Facilitator Note: <i>If time allows, have a few participants share out their synthesis.</i></p>	<p style="text-align: center;">Slide 71</p> <p>Session C: Synthesis</p> <p>Synthesize your shared ideas from all the triangles on your discussion diamond and record your synthesis in the center diamond.</p>  								

Guidance	Accompanying Slide(s)
<p>Explain: Meta moment to go back to our initial ideas as we began our session today. With a different colored pen please take a moment to show how your ideas have grown and changed.</p>	<p style="text-align: center;">Slide 72</p> <p style="text-align: center;">After Completing Session C: Meta Moment</p> <p>Focus Question</p> <p>How can both teachers and students contribute to equitable academic discourse?</p> 
<p>Explain: Take some time to record your thoughts from today's session by completing the SWOT analysis, one of the oldest and most widely adopted strategy tools worldwide.</p> <p>S- What are your strengths (things you do well) when it comes to equitable academic discourse?</p> <p>W- What are your weaknesses (where you need to improve) when it comes to equitable academic discourse?</p> <p>O- What opportunities (goals) do you see possible?</p> <p>T- What threats (obstacles) do you face and how might you overcome them?</p> <p>Facilitator Note: <i>This is a private reflection and will not be shared out with the group. If you want to share one of these, have participants share out their opportunity (goals) they see possible.</i></p>	<p style="text-align: center;">Slide 73</p> <p style="text-align: center;">Session C: Reflection</p> <p style="text-align: center;">Take some time to record your thoughts from today's session by completing the SWOT analysis.</p>  <p>S What are your strengths (things you do well) when it comes to equitable academic discourse?</p> <p>W What are your weaknesses (where you need to improve) when it comes to equitable academic discourse?</p> <p>O What opportunities (goals) do you see possible?</p> <p>T What threats (obstacles) do you face and how might you overcome them?</p> 

Guidance

Explain:

George Evans said, “Every student can learn, just not on the same day or in the same way.” Knowing that all students are unique, consider the different styles of talk and sensemaking in your classroom and how you may support those differences.

- What *cultural* styles of talk and sensemaking are present in your community of students that you should make room for in science learning conversations. List the needs of your students.
- What supports might you provide to students to engage all students in academic discourse?

Facilitator Note:

One supportive document that can be provided to students is the [Self-evaluation: Engaging in Classroom Discourse](#) document from OpenSciEd. Provide a copy of this resource and time for educators to share how they might use this in their implementation plan.

Self-evaluation: Engaging In Classroom Discourse

Setting	Criteria	Absent I do not do this	Developing I occasionally do this (sometimes)	Proficient I often do this	Mastery I consistently do this
In large/whole group settings (Scientist Circle discussions, gallery walks, etc...)	Shares one's own thinking by contributing new ideas, questions, and additional clarification.				
	Listens actively to others, rephrasing, repeating and/or reusing the ideas others have shared and asking others to repeat their statements or to clarify ideas when they are difficult to hear or understand.				
	Respectfully provides and receives critiques about explanations, procedures, models, and questions by citing relevant evidence and posing and responding to questions.				
	Invites others to share their thinking and contribute their ideas.				
In small group settings (partner talk, small group discussions, lab work)	Shares one's own thinking by contributing new ideas, questions, and additional clarification.				
	Listens actively to others, rephrasing, repeating and/or reusing the ideas others have shared and asking others to repeat their statements or to clarify ideas when they are difficult to hear or understand.				
	Respectfully provides and receives critiques about explanations, procedures, models, and questions by citing relevant evidence and posing and responding to questions.				
	Invites others to share their thinking and contribute their ideas.				

These materials were developed with funding through grants from the National Science Foundation, the Gordon and Betty Moore Foundation, Denver Public Schools to Northwestern University and the University of Colorado Boulder

This work is licensed under a Creative Commons Attribution 4.0 license
<http://creativecommons.org/licenses/by/4.0/>



Accompanying Slide(s)

Slide 74

Session C: Next Steps: Considerations for Implementation

- What *cultural* styles of talk and sensemaking are present in your community of students that you should make room for in science learning conversations?
- List the needs of your students. What supports might you provide to students to engage all students in academic discourse?

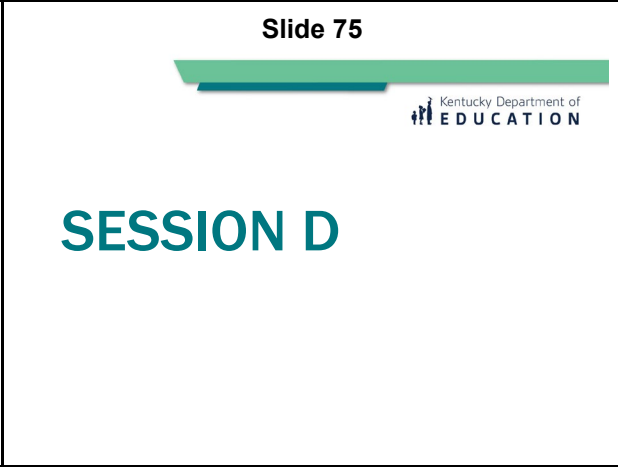
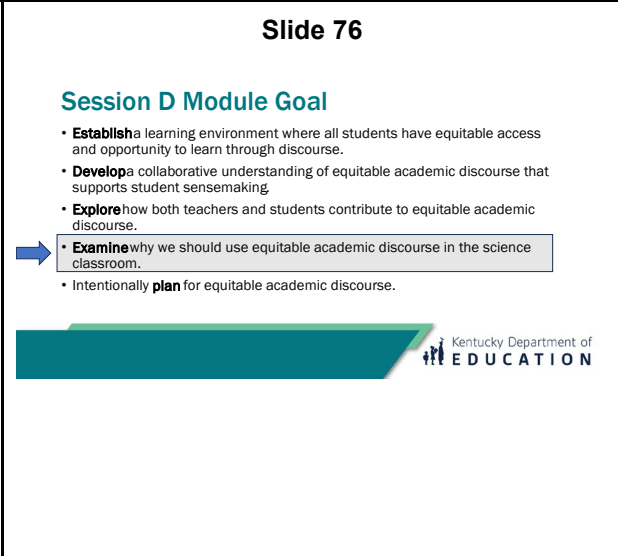
Preparation for Session D




Focus Question: Why should equitable discourse be used in the science classroom and how does it support the development of science ideas and skills contained in the *Kentucky Academic Standards for Science*?

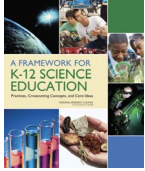



Agenda: 1 hour 30 minutes

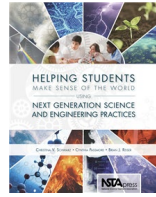

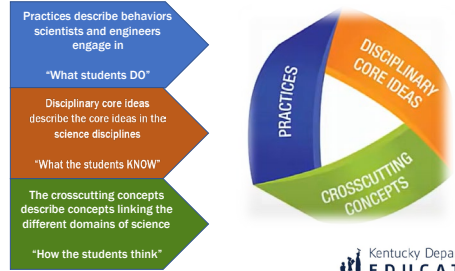

Time	Slides #'s	Outline	Materials Needed
10 minutes	75-79	Introduction <ul style="list-style-type: none"> • Establishing Goals • Focus Questions • Group Agreements • Meta Moment 	<ul style="list-style-type: none"> • Participant Packet (used throughout the session) • Agreement Poster • Parking Lot Poster • Communicating in Scientific Ways Poster
65 minutes	80-91	Development of Science Ideas and Skills <ul style="list-style-type: none"> • Why is talk critical? • <i>KAS for Science</i> • Lesson Internalization 	<ul style="list-style-type: none"> • Talk Science Primer: Why is talk important? (pgs. 4-6) • Kentucky Academic Standards (KAS) for Science • OpenSciEd 6th Grade Unit on Weather, Climate and Water Cycling Lesson 2
10 minutes	92-94	Closing <ul style="list-style-type: none"> • Shared Understanding • Meta Moment • Reflection 	
5 minutes	95	Next Steps - Considerations for Implementation	<ul style="list-style-type: none"> • Lesson Internalization Protocol

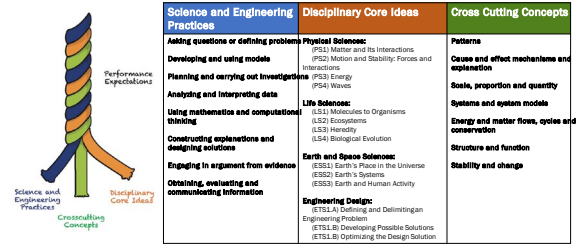
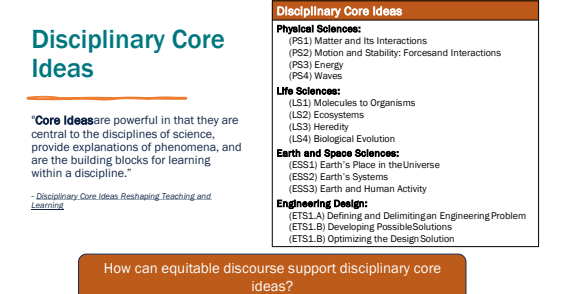
Session D: Why should equitable academic discourse be used in the science classroom and how does it support the development of science ideas and skills contained in the *Kentucky Academic Standards for Science*?

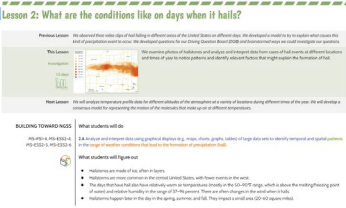

Guidance	Accompanying Slide(s)
<p>Explain: We will now begin session D.</p>	<p style="text-align: center;">Slide 75</p> 
<p>Explain: Our goal for today is to examine why we should use equitable academic discourse in the science classroom.</p>	<p style="text-align: center;">Slide 76</p> <p style="text-align: center;">Session D Module Goal</p> <ul style="list-style-type: none"> • Establish a learning environment where all students have equitable access and opportunity to learn through discourse. • Develop a collaborative understanding of equitable academic discourse that supports student sensemaking. • Explore how both teachers and students contribute to equitable academic discourse. • Examine why we should use equitable academic discourse in the science classroom. • Intentionally plan for equitable academic discourse. 

Guidance	Accompanying Slide(s)
<p>Explain: This leads us to our focus question for the day: Why should equitable academic discourse be used in the science classroom and how does it support the development of science ideas and skills contained in the <i>Kentucky Academic Standards for Science</i>?</p>	<p style="text-align: center;">Slide 77</p> <p style="text-align: center;">Sessions Included in This Module (4)</p> <p>Session A: How can we establish a learning environment to ensure all students have equitable access and opportunity to learn?</p> <p>Session B: What is equitable academic discourse and how does it support student sensemaking in the science classroom?</p> <p>Session C: How can both teachers and students contribute to equitable academic discourse?</p> <p>Session D: Why should equitable academic discourse be used in the science classroom and how does it support the development of science ideas and skills contained in the <i>Kentucky Academic Standards for Science</i>?</p> <p>Session E: How might we intentionally plan for equitable academic discourse to support student sensemaking in the classroom?</p> 
<p>Explain: As you can see on the screen, the questions in the thought bubbles on the right capture the questions we have worked through each session to build out our agreements that we are using in our community. As we reflect on how this has impacted our learning community, let us keep in mind how we might carry this over into the classroom with our students.</p>	<p style="text-align: center;">Slide 78</p> <p style="text-align: center;">Group Agreements (4)</p> <ul style="list-style-type: none"> • We share ideas even when we are not sure. • We look, listen and consider each other's ideas. • We let our ideas change and grow. <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid gray; border-radius: 50%; padding: 5px; width: 150px; text-align: center;"> <p>What do these agreements mean? What would they look, sound and feel like?</p> </div> <div style="border: 1px solid gray; border-radius: 50%; padding: 5px; width: 150px; text-align: center;"> <p>Are there additional agreements that you feel are important and not fully captured?</p> </div> </div> <div style="border: 1px solid gray; border-radius: 50%; padding: 5px; width: 150px; text-align: center; margin: 10px auto;"> <p>What are the potential impacts on our learning community if these agreements were fully attended to?</p> </div> 
<p>Explain: As we navigate to the participant packet, let's take a meta moment to write our initial thoughts around our focus question on the screen.</p>	<p style="text-align: center;">Slide 79</p> <p style="text-align: center;">Session D Meta Moment</p> <p>Focus Question</p> <p>Why should equitable academic discourse be used in the science classroom and how does it support the development of science ideas and skills contained in the <i>Kentucky Academic Standards for Science</i>?</p> 

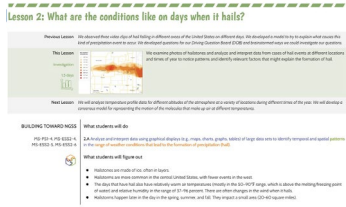

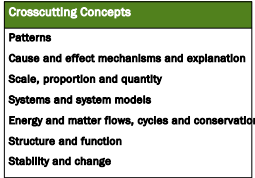
Guidance	Accompanying Slide(s)
<p>Explain: A strong research-based resource for science educators is a book called <i>A Framework for K-12 Science Education</i>.</p> <p>This resource supports teachers in understanding the shifts called for in our standards, shifts from students learning about science to figuring it out. It also highlights that science content is three-dimensional: including disciplinary core ideas, cross-cutting concepts and science practices. In addition, it supports an <i>equity vision</i> of science instruction in which all students are known, heard and supported with access and opportunities for learning.</p>	<p style="text-align: center;">Slide 80</p> <p style="text-align: center;">Key Goals in the NRC Framework and KAS for Science</p> <ul style="list-style-type: none"> • Shift from <i>learning about</i> to <i>figuring out</i>. • Science content is <i>three-dimensional</i>: disciplinary core ideas, cross-cutting concepts and science practices. • Supports an <i>equity vision</i> of science instruction in which all students are known, heard and supported with access and opportunities for learning.  
<p>Explain: Locate the Talk Science Primer and turn to page 4 using the green page numbers at the bottom. We are going to read this section.</p> <p>As you read, consider the following questions.</p> <ul style="list-style-type: none"> • How does talk promote learning? • Why is it particularly critical in science? <p>We will move back into small groups and take time to share evidence from the passage that supports how talk promotes learning and why it is particularly critical in science.</p> <p>Choose a person from your group who will come back prepared to share out the group's key takeaways.</p> <p>Does any have any questions before moving into small groups?</p> <p>Facilitator Note: <i>Small groups can be formed by grade level or can be mixed, whatever you think is best and will meet the needs of the participants.</i></p>	<p style="text-align: center;">Slide 81</p> <p style="text-align: center;">Why is talk important?</p> <p>Read Part 2 of the Talk Science Primer: Why is talk important? (pgs. 4-6)</p> <p>As you read, consider the following questions.</p> <ul style="list-style-type: none"> ➤ How does talk promote learning? ➤ Why is it particularly critical in science?  

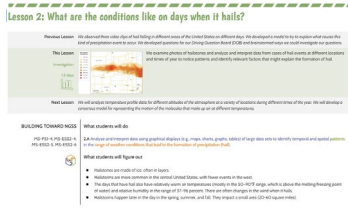

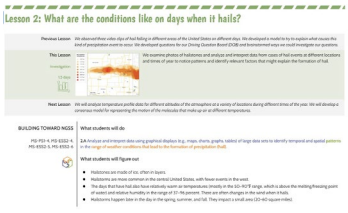

Guidance	Accompanying Slide(s)
<p>Explain: As we have mentioned several times during this workshop that it is important to notice and leverage the diversity of our students in the classroom and the resources they bring. How do we notice and leverage student resources? “By attending closely to what students actually say and do in science, teachers can expand the relationships that are possible among themselves, their students, and science. In this way, they can begin to create more equitable opportunities to learn in science for historically underserved students.” (Brown, 2017)</p>	<p style="text-align: center;">Slide 82</p> <p style="text-align: center;">How Do We Notice and Leverage Student Resources?</p> <p>“By attending closely to what students actually say and do in science, teachers can expand the relationships that are possible among themselves, their students, and science. In this way, they can begin to create more equitable opportunities to learn in science for historically underserved students.” (p. 33) <small>-Bang, Brown, Calabrese Barton, Rosebery & Warren (2017)</small></p>  
<p>Explain: Understanding science and how it works goes beyond knowing discrete pieces of information. To meet the vision of scientifically literate students, the integration of the three dimensions of science, as outlined in the Framework for K-12 Science Education, must be maintained.</p> <p>These dimensions are:</p> <ul style="list-style-type: none"> • Science and Engineering Practices refers to what the students do and describes the way in which scientists and engineers engage in their work. They engage in wonder, design, modeling, argumentation, communication, and engineering thinking. • Disciplinary Core Ideas refer to what the students know. Core ideas found in the Kentucky Academic Standards for Science are foundational understandings so that students may later acquire additional information on their own. The core ideas are organized by discipline: physical science, life science and earth/space science. • Crosscutting Concepts are conceptual tools that are used as lenses for understanding the natural/designed world. They provide ways of thinking and reasoning about phenomena across disciplines, uniting core ideas throughout the fields of science and engineering. While specific crosscutting concepts may be identified in each performance expectation, explicit instruction and engagement in all crosscutting concepts is expected. 	<p style="text-align: center;">Slide 83</p> <p style="text-align: center;">Three-Dimensional Standards</p>  



Guidance	Accompanying Slide(s)
<p>Explain: Think of the three components of three-dimensional learning as three intertwining strands 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. 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 (science and engineering practices, core ideas, and crosscutting concepts working together) is therefore a non-negotiable for science lessons and units.</p>	<p style="text-align: center;">Slide 84</p> <p style="text-align: center;">Three-Dimensional Standards (2)</p>  <p>The slide features a diagram of three intertwined strands (blue, green, orange) representing Science and Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts. To the right is a table with three columns: Science and Engineering Practices, Disciplinary Core Ideas, and Cross Cutting Concepts. Each column lists specific standards and their descriptions.</p>
<p>Explain: We will take a closer look at the disciplinary core ideas. "Core ideas are powerful in that they are central to the disciplines of science, provide explanations of phenomena, and are the building blocks for learning within a discipline." "Because of the easy access of information, or facts, an important role of science education is to prepare students with sufficient core knowledge so that they can acquire additional information on their own. Therefore, a small set of core ideas that meet these criteria were developed. These core ideas, or elements of them, appear across science domains.</p> <p>How might equitable discourse support the understanding of the DCIs?"</p> <p>Facilitator Note: <i>If participants are struggling with making the connections between the DCIs and discourse, encourage them to use the Talk Science Primer they just read for support.</i></p> <p><u>Listen for:</u></p> <ul style="list-style-type: none"> • <i>Through discussion students reveal current thinking of science ideas.</i> • <i>If students talk about the content they are studying, teachers can see more clearly what they do not understand and what they do understand.</i> • <i>Students themselves may realize what they do not and do understand.</i> • <i>Students are willing to try out ideas before they are fully formed, so that others can hear them and think with them.</i> • <i>Students take one another seriously as thinkers, and evaluate the content of others'</i> 	<p style="text-align: center;">Slide 85</p> <p style="text-align: center;">Disciplinary Core Ideas</p>  <p>The slide features a title "Disciplinary Core Ideas" and a list of standards categorized by Physical Sciences, Life Sciences, Earth and Space Sciences, and Engineering Design. A text box explains that core ideas are central to disciplines and provide explanations of phenomena. A callout box asks: "How can equitable discourse support disciplinary core ideas?"</p>




Guidance	Accompanying Slide(s)
<p><i>contributions, challenging ideas, not people. They gain confidence in expressing their ideas.</i></p> <ul style="list-style-type: none"> • <i>Students can work through naïve concepts.</i> • <i>Students' ideas can grow or change.</i> • <i>Capture science ideas visually (add or change them in a different color as students build their understanding).</i> 	
<p>Explain: We engaged as an adult learner during session B. We are going to utilize that same lesson to complete a lesson internalization of how the lesson aligns to the <i>Kentucky Academic Standards for Science</i> and how the writers of this lesson intentionally planned for discussion to help students make sense of the phenomenon.</p> <p>Let's first consider, "Which standard(s) or part(s) of standards from the Kentucky Academic Standards (KAS) for Science are addressed in this lesson?"</p> <p>Consider the Disciplinary Core Ideas (DCIs) within the lesson. What are the fundamental scientific ideas students will engage in?</p> <p>Facilitator Note: <i>Lesson 2 aligns with Performance Expectation 6-ESS2-5: Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions.</i></p> <p><i>DCIs addressed in this lesson:</i></p> <ul style="list-style-type: none"> • <i>ESS2.C Roles of Water in Earth's Surface Processes: The complex patterns of the changes and the movement of water in the atmosphere, determined by winds, landforms, and ocean temperatures and currents, are major determinants of local weather patterns.</i> • <i>ESS2.D Weather and Climate: Because these patterns are so complex, weather can only be predicted probabilistically.</i> 	<p style="text-align: right;">Slide 86</p> <p>Review the Standards (1)</p>  <p>Which standard(s) or part(s) of standards from the Kentucky Academic Standards (KAS) for Science are addressed in this lesson?</p> <p>Consider the Disciplinary Core Ideas (DCIs) within the lesson. What are the fundamental scientific ideas students will engage?</p> 

Guidance	Accompanying Slide(s)
<p>Explain: Key to the vision expressed in the Framework is that students learn the Disciplinary Core Ideas (DCIs) in the context of science and engineering practices. Students are expected to be able to use their understanding of the DCIs to investigate the natural world through the practice of science inquiry and solve meaningful problems through the practices of engineering design.</p> <p>“When student sensemaking is the focus of the classroom goals and purposes, it becomes critical to use science and engineering practices to make sense of the world. Science and engineering practices are the way we build, test, refine and use knowledge either to investigate questions or to solve problems.</p> <p>How might equitable discourse support the SEPs?”</p> <p>Facilitator Note:</p> <p><u>Listen For:</u></p> <ul style="list-style-type: none"> • Involving students actively in “communication” about their thinking and investigations, while encouraging them to use evidence to support their claims, conjectures, predictions, and explanations. • When teachers “open up the conversation” and engage students actively in reasoning with evidence and building and critiquing academic arguments, students make dramatic learning gains. • This requires dedicated and disciplined approaches to the explication and sharing of evidence and agreed-upon ways of challenging or critiquing evidence in the effort to advance knowledge and understanding. • Discussion may cause us to ask more questions or define problems. • Discussion gives us an avenue to communicate information with others. 	<p style="text-align: center;">Slide 87</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 60%;"> <p>Science and Engineering Practices</p> <p><small>“When student sensemaking is the focus of the classroom goals and purposes, it becomes critical to use science and engineering practices to make sense of the world. Science and engineering practices are the way we build, test, refine and use knowledge either to investigate questions or to solve problems.</small></p> <p><small>Helping Students Make Sense of the World</small></p> </div> <div style="width: 35%; border: 1px solid black; padding: 5px;"> <p>Science and Engineering Practices</p> <ul style="list-style-type: none"> Asking questions or defining problems Developing and using models Planning and carrying out investigations Analyzing and interpreting data Using mathematics and computational thinking Constructing explanations and designing solutions Engaging in argument from evidence Obtaining, evaluating and communicating information </div> </div> <div style="text-align: center; margin-top: 10px; background-color: #4a7ebb; color: white; padding: 5px; border-radius: 10px; width: fit-content; margin: 0 auto;"> How can equitable discourse support the science and engineering practice(s)? </div>

Guidance	Accompanying Slide(s)
<p>Explain: Let's go back to Lesson 2 to identify the science and engineering practices from the KAS for Science that are addressed in Lesson 2. How did your experiences with discourse support you in those SEPs?</p> <p>Facilitator Note <i>While a specific practice may be identified in each performance expectation, students should engage in all practices to help them understand how scientific knowledge develops and the links between science and engineering.</i></p> <p><u>Listen For:</u></p> <ul style="list-style-type: none"> • Using models • Analyzing and Interpreting Data • Constructing Explanations • Asking questions 	<p style="text-align: center;">Slide 88</p> <p style="text-align: center;">Review the Standards (2)</p>  <p>Which science and engineering practice(s) from the Kentucky Academic Standards (KAS) for Science are addressed in lesson 2: What are the conditions like on days when it rains?</p> 
<p>Explain: The framework identifies seven CCCs that bridge disciplinary boundaries, uniting core ideas throughout the fields of science and engineering. Their purpose is to help students deepen their understanding of the DCIs and develop a coherent and scientifically based view of the world.</p> <p>“Among the most powerful ways that CCCs help students learn science is by providing multiple lenses through which they can make sense of phenomena.” How might equitable discourse support the crosscutting concepts?</p> <p>Facilitator Note:</p> <p><u>Listen For:</u></p> <ul style="list-style-type: none"> • Student talk helps them begin to see ideas from more angles and make links to other concepts and meanings they already have. • Allows the discussion to be focused on a specific purpose such as identifying patterns or identifying the cause-and-effect relationship. 	<p style="text-align: center;">Slide 89</p> <p style="text-align: center;">Crosscutting Concepts (CCCs)</p>  <p>“Among the most powerful ways that CCCs help students learn science is by providing multiple lenses through which they can make sense of phenomena.”</p> <p><small>*Crosscutting Concepts Strengthening Science and Engineering Learning</small></p> <p style="text-align: center;">How can equitable discourse support the crosscutting concepts?</p>

Guidance	Accompanying Slide(s)
<p>Explain: Going back a third time to look closer at this lesson, which Crosscutting Concepts from the KAS are addressed in this lesson? How were you able to use these CCC in your discussion as you were working to make sense of hailstorms?</p> <p>Facilitator Note:</p> <p><u>Listen For:</u></p> <ul style="list-style-type: none"> Patterns 	<p style="text-align: center;">Slide 90</p> <p style="text-align: center;">Review the Standards (3)</p>  <p>Which crosscutting concept(s) from the Kentucky Academic Standards (KAS) for Science are addressed in lesson 2: What are the conditions like on days when it hails?</p> 
<p>Explain: I want us to consider the three dimensionality of this lesson. Let's begin with the focus question for this lesson. What was the overall phenomenon? What were we trying to figure out? How did all three dimensions work together to help you make sense of the phenomenon?</p> <p>Facilitator Note:</p> <p><u>What was the overall phenomenon?</u></p> <ul style="list-style-type: none"> Variety of storms taking place. <p><u>What was the lesson level phenomenon?</u></p> <ul style="list-style-type: none"> Hailstorms <p><u>What was the lesson focus question?</u></p> <ul style="list-style-type: none"> What are the conditions like on days when it hails? <p><u>What are the students supposed to figure out from this lesson?</u></p> <ul style="list-style-type: none"> Hailstones are made of ice, often in layers. Hailstorms are more common in the central United States, with fewer events in the west. The days that have hail also have relatively warm air temperatures (mostly in the 50–90°F range, which is above the melting/freezing point of water) and relative humidity in the range of 37–96 percent. There are often changes in the wind when it hails. Hailstorms happen later in the day in the spring, summer, and fall. They impact a small area (20-60 square miles). <p><u>How did all three dimensions work together to help you make sense of the phenomenon?</u></p> <ul style="list-style-type: none"> ADD SOMETHING FROM TRANSCRIPT 	<p style="text-align: center;">Slide 91</p> <p style="text-align: center;">What are students learning?</p>  <p>Write down the following for Lesson 2:</p> <ul style="list-style-type: none"> The question Phenomenon/problem/activity What we figured out <p>Discuss: How do all three dimensions come together to help students figure out the phenomenon or solve the problem?</p> 

Guidance	Accompanying Slide(s)
<p>Explain: Academic discourse...</p> <ul style="list-style-type: none"> • Provides a window into student thinking and reveals understanding and misunderstanding. • Allows students to see ideas from more angles and make links to other concepts and meanings they already have. • Improves students' evidence-based reasoning which translates to improved writing performance. • Empowers students to learn science true to the field of science by communicating about their ideas, data and findings. • Helps students develop social skills and motivates them to learn through interacting with others. • Supports three-dimensional learning as students work to "figure out" a phenomenon or problem. 	<p style="text-align: center;">Slide 92</p> <p style="text-align: center;">Session D: Shared Understandings</p> <p>Academic discourse...</p> <ul style="list-style-type: none"> • Provides a window into student thinking and revealing understanding and misunderstanding. • Allows students to see ideas from more angles and make links to other concepts and meanings they already have. • Improves students' evidence-based reasoning which translates to improved writing performance. • Empowers students to learn science true to the field of science by communicating about their ideas, data and findings. • Helps students develop social skills and motivates them to learn through interacting with others. • Supports three-dimensional learning as students work to "figure out" a phenomenon or problem. 
<p>Explain: Let's take a meta moment to respond to our focus question at the top of our participants packet in a different color to see how our individual ideas have grown and changed.</p>	<p style="text-align: center;">Slide 93</p> <p style="text-align: center;">After Completing Session D: Meta Moment</p> <p>Focus Question</p> <p>Why should equitable academic discourse be used in the science classroom and how does it support the development of science ideas and skills contained in the <i>Kentucky Academic Standards for Science</i>?</p> 

Guidance	Accompanying Slide(s)
<p>Explain: For our final reflection record your thoughts from this workshop found at the end of your participant packet.</p> <ul style="list-style-type: none"> • If you had to choose a most important point (MIP) what would it be and why? • Who would you consider to be your most valuable player (s) (MVPs) in this process and why? <p>Facilitator Note: <i>If time allows, have participants share their MIP of the learning from today with the whole group.</i></p>	<p style="text-align: center;">Slide 94</p> <p>Session D: Reflection Take some time to record your thoughts from today's session.</p> <p style="text-align: center;">Most Important Point and Most Valuable Players</p>  <p>Reflect on your learning through out this session and previous sessions.</p> <ul style="list-style-type: none"> ❖ If you had to choose a Most Important Point (MIP), what would it be and why? ❖ Who would you consider to be your Most Valuable Player(s) (MVPs) in this process and why? <p style="text-align: right;"></p>
<p>Explain: To continue thinking about intentionally planning for discourse in your classroom, Examine and complete the Lesson Internalization Protocol for an upcoming lesson in your instructional resource. Go through your teacher guide and highlight evidence of the students engaging in discourse.</p> <p>Consider the following questions:</p> <ol style="list-style-type: none"> 1. What is/are the question(s) students are trying to answer through this discussion? 2. What is the intended outcome of the discussion? (Coming to consensus on something we just experienced? Figuring out improvements to our model? Designing an investigation? Getting students to realize they have new questions?) <p>Facilitator Note: <i>You may ask participants to bring this with them to the next session. This would be a great exercise to complete during common planning time. Participants will be using this lesson to rehearse and prepare to engage students in deep discussion.</i></p>	<p style="text-align: center;">Slide 95</p> <p>Session D: Next Steps: Considerations for Implementation</p> <p>Examine and complete the Lesson Internalization Protocol for an upcoming lesson in your instructional resource.</p> <p>Highlight evidence of the students engaging in discourse.</p> <p>Consider the following questions:</p> <ol style="list-style-type: none"> 1. What is/are the question(s) students are trying to answer through this discussion? 2. What is the intended outcome of the discussion? (Coming to consensus on something we just experienced? Figuring out improvements to our model? Designing an investigation? Getting students to realize they have new questions?) <p style="text-align: right;"></p>


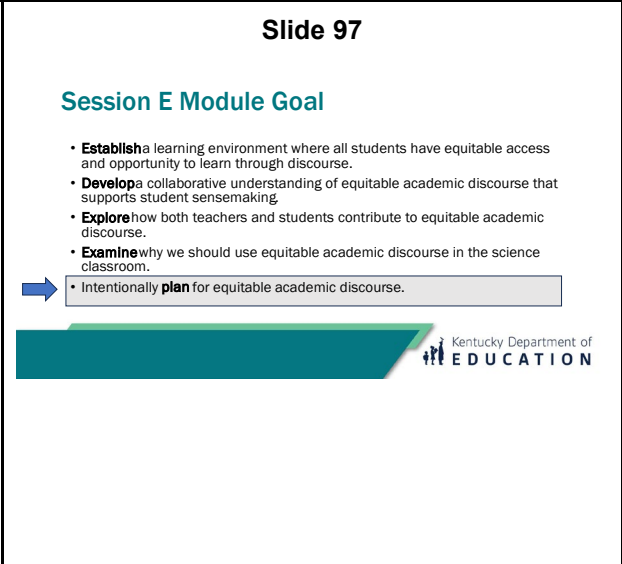
Preparation for Session E






Focus Question: How might we intentionally plan for equitable discourse to support student sensemaking in the classroom?

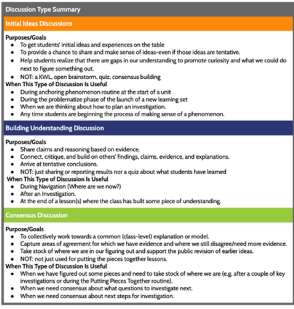



Agenda: 1 hour 30 minutes


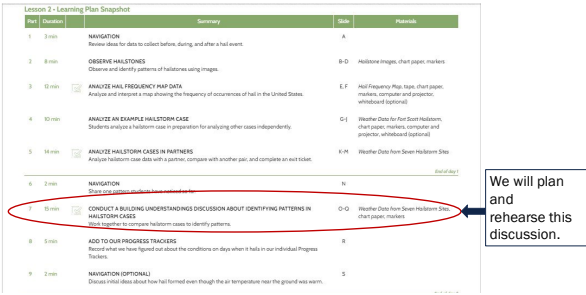
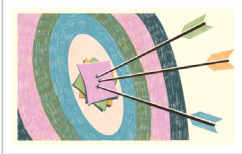

Time	Slides #'s	Outline	Materials Needed
10 minutes	96-100	Introduction <ul style="list-style-type: none"> • Establishing Goals • Focus Questions • Group Agreements • Meta Moment 	<ul style="list-style-type: none"> • Participant Packet (used throughout the session) • Agreement Poster • Parking Lot Poster • Communicating in Scientific Ways Poster
1 hour 10 minutes	101-110	Lesson Internalization <ul style="list-style-type: none"> • 3 Discussion Types • Lesson Rehearsal 	<ul style="list-style-type: none"> • OpenSciEd 6th Grade Unit on Weather, Climate and Water Cycling Lesson 2 • Lesson Rehearsal Protocol (ky.gov) • Session B Meta Moment Focus Question Answer
10 minutes	111-113	Closing <ul style="list-style-type: none"> • Meta Moment • Next Steps - Considerations for Implementation • Reflection 	<ul style="list-style-type: none"> • Chart Paper
	114	Feedback and Certificate of Completion	<ul style="list-style-type: none"> • Kentucky Department of Education Professional Learning Module Feedback and Certification

Session E: How might we intentionally plan for equitable academic discourse to support student sensemaking in the classroom?

Guidance	Accompanying Slide(s)
<p>Explain: We will now begin session E.</p>	<p style="text-align: center;">Slide 96</p> 
<p>Explain: We are beginning the final session where our goal is to intentionally plan for equitable academic discourse.</p>	<p style="text-align: center;">Slide 97</p> <p style="text-align: center;">Session E Module Goal</p> <ul style="list-style-type: none"> • Establish a learning environment where all students have equitable access and opportunity to learn through discourse. • Develop a collaborative understanding of equitable academic discourse that supports student sensemaking. • Explore how both teachers and students contribute to equitable academic discourse. • Examine why we should use equitable academic discourse in the science classroom. <p>➔ Intentionally plan for equitable academic discourse.</p> 

Guidance	Accompanying Slide(s)
<p>Explain: To align with this goal, our focus question is, “How might we intentionally plan for equitable academic discourse to support student sensemaking in the classroom?”</p>	<p style="text-align: center;">Slide 98</p> <p style="text-align: center;">Sessions Included in This Module (5)</p> <p>Session A: How can we establish a learning environment to ensure all students have equitable access and opportunity to learn?</p> <p>Session B: What is equitable academic discourse and how does it support student sensemaking in the science classroom?</p> <p>Session C: How can both teachers and students contribute to equitable academic discourse?</p> <p>Session D: Why should equitable academic discourse be used in the science classroom and how does it support the development of science ideas and skills contained in the Kentucky Academic Standards for Science?</p> <p>Session E → How might we intentionally plan for equitable academic discourse to support student sensemaking in the classroom?</p> 
<p>Explain: The development and ongoing use of classroom norms can support safe and equitable student participation in collaborative sensemaking. In circling back to the agreements, think about how you have been doing in attending to the agreements in this learning community. Place a plus sign next to where you think we are doing well as a learning community. Place a dot near where you think we could improve/continue to work. Take a moment and think about what actions you can take to ensure that you are improving with the agreement that you need to work on.</p> <p>Facilitator Note: The agreements should be posted in the room. Allow participants to use a marker or a sticker to identify the area of strength and area of improvement.</p>	<p style="text-align: center;">Slide 99</p> <p style="text-align: center;">Revisiting Group Agreements</p> <div style="display: flex; align-items: flex-start;"> <div style="margin-right: 20px;"> <p> Place a plus sign next to where you think we are doing well as a learning community.</p> <p> Place a dot near where you think we could improve/continue to work.</p> </div> <ul style="list-style-type: none"> • We share ideas even when we are not sure. • We look, listen and consider each other's ideas. • We let our ideas change and grow. </div> 
<p>Explain: Find your participant packet and let's take a meta moment to write our initial thoughts around our focus question on the screen.</p>	<p style="text-align: center;">Slide 100</p> <p style="text-align: center;">Session E Meta Moment</p> <p>Focus Question</p> <p>How might we intentionally plan for equitable academic discourse to support student sensemaking in the classroom?</p> 

Guidance	Accompanying Slide(s)
<p>Explain: OpenSciEd breaks discussion into three different types: Initial Ideas Discussion, Building Understanding Discussion, and Consensus Discussion.</p> <p>Let's look at page 1 of this document to get a brief overview of these discussion types and their purpose.</p> <p>What basic features do you notice?</p> <ul style="list-style-type: none"> • How do these three discussion types differ in purpose/goal? • How might these impact the skills students need, and the facilitation strategies teachers use? 	<p style="text-align: right;">Slide 101</p>  <p>3 Discussion Types</p> <ul style="list-style-type: none"> • What basic features do you notice? • How do these three discussion types differ in purpose/goal? • How might these impact the skills students need and the facilitation strategies teachers use? 
<p>Explain: We will continue examining lesson 2 from session D, but now looking for examples of discourse. Read through the lesson with a focus on the discourse moves of the teachers and students.</p> <p>Highlight, underline or note evidence of the students engaging in the building understanding discussion.</p> <p>What do you notice and wonder about the support for discourse in this lesson? We will break into small groups to read and discuss.</p> <p>When we return, please identify a spokesperson for your group to share some of your group's thinking. Try to connect to specific notations from the lesson.</p> <p>Facilitator Note: <i>Allow participants time in their small groups to identify evidence and discuss. Once all the groups are finished, allow each group to share with the whole group.</i></p>	<p style="text-align: right;">Slide 102</p> <p style="text-align: center;">Examine the Discourse in Lesson 2</p>  <p>Using the Teacher Edition for Lesson 2 of 6.3, begin at the Learning Plan on page 5.</p> <ul style="list-style-type: none"> • Read carefully • Highlight evidence of the students engaging in discourse. • Annotate your notice and wonderings. 

Guidance	Accompanying Slide(s)
<p>Explain: Lesson rehearsal provides a structured opportunity for educators to refine key aspects of the local curriculum and to receive feedback to support effective classroom implementation. This collaborative time—typically about 45 minutes—may be facilitated by an administrator, coach, lead teacher or other instructional staff member.</p>	<p style="text-align: center;">Slide 103</p> <p style="text-align: center;">Lesson Rehearsal Protocol (ky.gov)</p> <p>"Lesson rehearsal provides a structured opportunity for educators to refine key aspects of the local curriculum and to receive feedback to support effective classroom implementation. This collaborative time—typically about 45 minutes—may be facilitated by an administrator, coach, lead teacher or other instructional staff member."</p> 
<p>Explain: As revealed through the lesson, part 7 is where the building understanding discussion about identifying patterns in hailstorm data. We will plan and rehearse this discussion in small groups.</p>	<p style="text-align: center;">Slide 104</p> <p style="text-align: center;">Plan and Rehearse a Sensemaking Discussion</p> 
<p>Explain: The first step in conducting a lesson rehearsal is to set clear expectations for the discussion and assign roles for the discussion. Working with a small group, you will plan a Building Understandings Discussion for the investigation we just completed. The goal of this discussion is: to help students make sense of weather conditions that lead to the formation of hail. Have groups determine who will be in the role of “facilitator,” “teacher” and “student(s).”</p> <p>Facilitator Note: <i>Groups will consist of a minimum of 4 participants, so all the roles are filled.</i></p>	<p style="text-align: center;">Slide 105</p> <p style="text-align: center;">Set clear expectations for the discussion</p> <p>Working with a small group, you will plan a Building Understandings Discussion for the investigation we just completed.</p> <p>The goal of this discussion is: to help students make sense of weather conditions that lead to the formation of hail.</p>  

Guidance

Accompanying Slide(s)

Explain

The following is the building understanding discussion support document that identifies the teacher and student role within this discourse. Questions are categorized to provide additional prompts teachers and students can use during key opportunities within the unit. The unit material provides specific teacher and student prompts and ideas to look and listen for. These questions intended to focus and support students' sensemaking work.

Slide 106

**Talk Moves
and
Strategies**

3 Discussion Types: Building Understanding Discussions (Pg. 3)

Explain:

These are some specific aspects you need to consider before the discussion and while leading the discussion.

Slide 107

Preparing for Rehearsal

Before the Discussion

1. What is the question students are trying to answer through this discussion?
2. What is the intended outcome of the discussion?
3. What are the key elements of the model or explanation you want the students to grapple with?
4. What other ideas might students have? What questions might they ask?

Leading the Discussion

1. What will you say to launch the discussion?
2. What are some things you will say to encourage your students to work with one another's ideas?
3. If students seem to think they have explained the phenomenon, but you know they need to go deeper, what kinds of questions could you ask to help students see the need to extend or revise their explanations?
4. What will you say to help close the discussion to synthesize what it is you all agree on and/or what new questions you have?

Explain:

As will any collaboration, set expectations are helpful to keep everyone on the same page.

Facilitator Note:





Read the expectations from the slide.




Slide 108

Engage in Lesson Rehearsal

Expectations for rehearsal:

- The facilitator can call a "time-out" at any time.
 - Ask question about decision making
 - Offer suggestion/feedback
 - Point out good thing that happened
- Expectations for Rehearsal
 - Everyone participates in their assigned roles.
 - No stopping, redoing, or adding commentary or explanations. Keep teaching.
 - Mistakes are part of the learning process. Embrace them.
 - Awkwardness is normal and to be expected. Embrace it.
 - Feedback stays targeted and actionable.

Guidance	Accompanying Slide(s)								
<p>Explain: Allow each group time to debrief the rehearsal. There are some questions on the screen that can be helpful as you reflect on this experience for both the facilitator and the participants engaged in the discussion. During discussion, be intentional by using the Communicating in Scientific Ways stems,</p> <p>#7: Listen to other’s ideas and ask clarifying questions, #8: Agree or disagree with others’ ideas and #9: Add onto someone else’s idea.</p>	<p style="text-align: center;">Slide 109</p> <p>Debrief the Rehearsal</p> <ul style="list-style-type: none"> • Facilitator of discussion: <ul style="list-style-type: none"> ○ What went well in the discussion? ○ What was challenging? ○ Describe a moment when you weren’t sure what to do. What <i>did</i> you do and why? And what was the result? • Participants engaged in discussion: <ul style="list-style-type: none"> ○ What was helpful for you as a participant? ○ What was challenging for you as a participant? ○ What are your take-aways from this process? <table border="1" data-bbox="1724 386 1955 597"> <thead> <tr> <th>How we figure things out</th> <th>How we communicate</th> </tr> </thead> <tbody> <tr> <td>Listen to other’s ideas and ask clarifying questions</td> <td>Are you saying that...? What do you mean when you say...? What is your evidence? Can you say more about...?</td> </tr> <tr> <td>Agree or disagree with others’ ideas</td> <td>I agree with ____ because... I agree with you, but I also think... I disagree with ____ because... I know where you are coming from, but I have a different idea... I am thinking about it differently...</td> </tr> <tr> <td>Add onto someone else’s idea</td> <td>I want to piggyback on April’s idea. I want to add to what Jeremiah said.</td> </tr> </tbody> </table> 	How we figure things out	How we communicate	Listen to other’s ideas and ask clarifying questions	Are you saying that...? What do you mean when you say...? What is your evidence? Can you say more about...?	Agree or disagree with others’ ideas	I agree with ____ because... I agree with you, but I also think... I disagree with ____ because... I know where you are coming from, but I have a different idea... I am thinking about it differently...	Add onto someone else’s idea	I want to piggyback on April’s idea. I want to add to what Jeremiah said.
How we figure things out	How we communicate								
Listen to other’s ideas and ask clarifying questions	Are you saying that...? What do you mean when you say...? What is your evidence? Can you say more about...?								
Agree or disagree with others’ ideas	I agree with ____ because... I agree with you, but I also think... I disagree with ____ because... I know where you are coming from, but I have a different idea... I am thinking about it differently...								
Add onto someone else’s idea	I want to piggyback on April’s idea. I want to add to what Jeremiah said.								
<p>Explain: Now that participants have had the opportunity to engage in a symmetrical like classroom experience as an adult learner, to see into a couple of classrooms where equitable discourse was happening, to examine the connections between discourse and its intentionality to align with the three-dimensional standards and practice these moves as a teacher and/or student, how have your ideas grown or changed since your initial thinking of what equitable academic discourse is and how it supports student sensemaking in the science classroom?</p> <p>Use the stems from Communicating in Scientific Ways #13: Let your ideas change and grow.</p>	<p style="text-align: center;">Slide 110</p> <p>Let Your Ideas Grow and Change </p> <div data-bbox="1430 813 1587 948" style="border: 1px solid black; border-radius: 15px; padding: 5px; width: fit-content;"> <p>What is equitable academic discourse and how does it support student sensemaking in the science classroom?</p> </div> <p>Find your initial ideas you captured from Session B. Compare your current thinking to your previous ideas. How have your ideas grown or changed?</p> <ul style="list-style-type: none"> • I think I am changing my initial idea... • I have something to add to my idea... • My understanding has grown by... 								
<p>Explain: Let’s take a meta moment to respond to our focus question at the top of our participants packet in a different color to see how our individual ideas have grown and changed.</p>	<p style="text-align: center;">Slide 111</p> <p style="text-align: center;">After Completing Session E: Meta Moment</p> <p>Focus Question</p> <p>How might we intentionally plan for equitable academic discourse to support student sensemaking in the classroom?</p> 								

Guidance	Accompanying Slide(s)
<p>Explain: Alexander Graham Bell once said, “Before anything else, preparation is the key to success.” Discourse in our classroom is no different. For discourse to be successful, we need to intentionally plan for it. With your learning community, examine an upcoming lesson in your instructional resource you plan to teach.</p> <p>Use the lesson rehearsal process from this session to:</p> <ul style="list-style-type: none"> • Identify the goal of the discussion. • Consider talk moves and strategies you may utilize. • Plan before the discussion and leading the discussion. • Rehearse with a partner. • Reflect on the discussion. • Implement the discussion with students. <p>Facilitator Note: <i>Here are some suggestions for follow-up:</i></p> <ul style="list-style-type: none"> • <i>Consider inviting a coach or administrator to observe the lesson and provide targeted feedback.</i> • <i>Collect data from the lesson and collaboratively analyze to determine impact.</i> 	<p style="text-align: center;">Slide 112</p> <p>Session E: Next Steps: Considerations for Implementation</p> <p>With your learning community, examine an upcoming lesson you plan to teach. Use the process from this session to:</p> <ul style="list-style-type: none"> ○ Identify the goal of the discussion. ○ Consider talk moves and strategies you may utilize. ○ Plan before the discussion and leading the discussion, (slide 81) ○ Rehearse with a partner ○ Reflect on the discussion ○ Implement the discussion with students. <p>Suggestions for follow-up</p> <ul style="list-style-type: none"> • Consider inviting a coach or administrator to observe the lesson and provide targeted feedback. • Collect data from the lesson and collaboratively analyze to determine impact. 
<p>Explain: As a final reflection for session E, if you were to share a recipe for equitable academic discourse, what would your recipe be? What would you name your dish? From whose kitchen would it come from? Who would it serve? What would the ingredients be? Develop your recipe in small groups and post it on chart paper.</p>	<p style="text-align: center;">Slide 113</p> <p>Session E: Recipe Reflection</p> <p>Take some time to record your thoughts from today's session. Recipe for <u>Equitable Academic Discourse</u>.</p> <ul style="list-style-type: none"> • Name of the dish _____. • From the kitchen of _____. • Serves _____. • Ingredients: _____.  <p>Develop your recipe in small groups and post on chart paper.</p> 

Guidance	Accompanying Slide(s)
<p>Explain: Thank you for completing this module provided by the Kentucky Department of Education. Please use the link to obtain your certificate of completion.</p>	<p style="text-align: center;">Slide 114</p> <p style="text-align: center;">Certificate of Completion</p> <p>Thank you for completing this module provided by the Kentucky Department of Education.</p> <p>Please use the link below to obtain your certificate of completion.</p> <p>Kentucky Department of Education Professional Learning Modules</p> <p><small>Educators can use the PLBB to find learning sessions, and it is the local school district who determines if they are acceptable for credit based on their district policies. See 704 KAR 0:025 for more details.</small></p> 