

AIM-TRU PLT FACILITATION GUIDE

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How to Use This Guide

This guide is to be used in conjunction with the [AIM-TRU PLT Facilitation Basedeck](#). This guide is separated into two sections.

“Pre/Post-Work for Each Session” includes instructions for how facilitators and teachers can prepare for their session, and this work should be completed prior to the PLT session and the other for use in running the session. This also includes a recommended post-session survey.

“Facilitation Basedeck Protocol and Notes” is organized by sections. Each section represents an important component of the PD model, and includes the following: Group Norms, AIM-TRU cycle, dimensions, and FAL, Developing our Big Mathematical Picture, and Video discussion.

For each slide in the basedeck, we have included a facilitation **protocol**, additional **notes**, and suggested **slide edits**. The **protocol** provides facilitators with a brief overview of the purpose of the slide and in some cases, suggested language and/or facilitation moves. The **notes** provide helpful suggestions for running the PLT session that have been curated over time from feedback we received from our AIM-TRU facilitators. Finally, **slide edits** give guidance to facilitators on how to best customize the Facilitation Basedeck based on which video case you decide to use.

We are excited to share this work with you and hope that this guide and our supporting materials help make your professional learning experience meaningful!

Pre/Post-Work for Each Session

Choose a formative assessment lesson (FAL) video case

- All AIM-TRU video cases appear in the MfA Video Case Library, housed in the [Teaching and Learning Exploratory](#) (TLE) website at the University of Michigan.
 - NOTE: If this is your first visit to the site, you will need to create a free account to view the library.
- Choose video cases for your meetings that align to the learning goals for participants. Selection criteria might include the lesson topic, mathematical standards, a particular TRU dimension, and/or the type of activity in the lesson (e.g., whole class discussion or small group work).
 - NOTE: If participants are completely new to FALs, we have found that the video case, **Representing Conditional Probabilities 1**, is a good introduction. This case illustrates rich mathematical activity and interesting implementation challenges posed by FALs.
- Review the video case: the FAL and associated video clip.
 - NOTE: In reviewing the FAL, it is beneficial to do the mathematics and consider the big mathematical picture for yourself. This helps you think about how you will manage productive mathematical discussions during the workshop. In reviewing the associated video clip, you have the opportunity to reflect on how the TRU dimension that is the focus of the case presents itself in the clip. This helps you prepare for how you might support teachers during the workshop with their thinking about teaching moves that could be aligned with the TRU dimension and the big mathematical picture.
 - NOTE: We also recommend that you review the *Mathematical Context* and *Video Supplement* documents associated with the case. The Mathematical Context includes directions for the activity and accompanying materials, adapted as necessary for the teacher learning environment. In some cases, you may want to have teachers engaging in other aspects of the FAL that are not highlighted in the video clip, or do some of the mathematical work outside of your time together. This document provides these suggestions to help you facilitate meaningful conversations around the big mathematical picture.

The Video Supplement provides context and a transcript for the video clip to help you prepare to facilitate discussions around teaching moves that

could be aligned with the TRU dimension and big mathematical picture for the case.

Communicate with participants before the workshop

- Email or give a printed copy of the associated lesson to all participants, preferably the week before meeting to give time to read before the lesson. A PDF link to the lesson plan is included for each case in the library on the [TLE](#) website. All lessons can also be accessed from the [Mathematics Assessment Project](#) website.
- Communicate to all participants that they should read the entire FAL lesson plan in preparation for the workshop.
 - FALs have detailed plans that take about 30 minutes to read. Since the video cases show brief episodes, it is important for all participants to have a good sense of where those episodes fit within the overall lesson context. For this reason the facilitator should ask all participants to read the selected lesson plan in its entirety before the meeting.
 - Asking participants to do 30 minutes of homework before a meeting is a big ask! You might explain that discussions during the meeting will be much more productive if all participants are familiar with the lesson. Reading the lesson plan will also help participants to become more familiar with the typical FAL format. Finally, after reading the plan, all participants will know more about a great lesson they can potentially use with their students.

Prepare materials for session

- Copy the [Facilitation Basedeck](#). You will need to edit several of the slides based on your chosen case. For example, you will first add your site's name and the FAL and Facilitators' names to the title slide. Other edits are presented throughout the Facilitation Basedeck Protocol and Notes.
- For in-person workshops, prepare chart paper for discussions and/or individual documents (e.g., Big Mathematical Idea; Mathematical Task; Discussion Diamond; On Target).
- For virtual workshops, copy and edit the [PLT Discussion Questions Jamboard](#).

Prepare materials for participants

For in-person workshops:

- Print a copy of the Mathematical Context document and Video Supplement document associated with the selected video case for each participant. A PDF

link to these documents is included on the page for each video case in the library on the TLE website.

- Print out adequate copies of the mathematical task, remembering that you may need to do some cutting out to prepare the materials. The task is in the mathematical context document, and can be found on the TLE or MAP websites.

For virtual workshops:

- Create a shared folder with PDF copies of the Mathematical Context document and Video Supplement document associated with the selected video case for each participant to download. A PDF link to these documents is included on the page for each video case in the library on the TLE website.
- Links for the remote versions for the mathematics tasks can be found in the TLE library for some of the video cases in the library. Our remote resources are being developed and regularly updated on the TLE website. If no remote version is available in the TLE library, you may be able to find past facilitators' digital versions of these FAL tasks on DESMOS, or simply search for the particular FAL task you need.
- Collections:
 - [Dr. Dave Wilson - SUNY Buffalo](#)
 - [Dr. John Russell - MfA NYC](#)
- If you cannot find it there, consider making a remote version of the task yourself, using Google Jamboard, Docs, Slides, or Forms. There are also several other tools that our teachers have found useful, including Nearpod, Pear Deck, or Padlet. For instance, for a card matching activity you could take screenshots of each card from the FAL lesson plan and paste them in a Jamboard frame. Then, duplicate the Jamboard frame for as many groups as you need, and you've created a digital version of the FAL task that you can facilitate remotely.

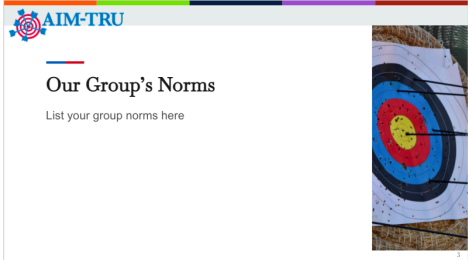
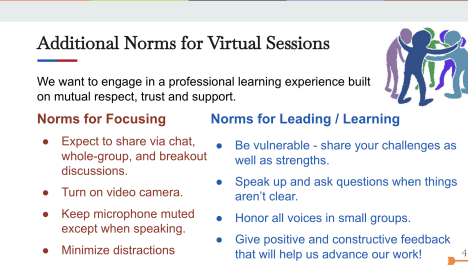
Post session reflection survey

At the conclusion of each PLT session, make a copy of the [Post PLT Session Survey](#) and send it to each participant. This survey is only intended to take 5 minutes to complete by participants. Facilitators should feel free to add items to their copy of the survey, as appropriate. We recommend making the [Post PLT Session Survey](#) into a google form to make collecting responses easier.

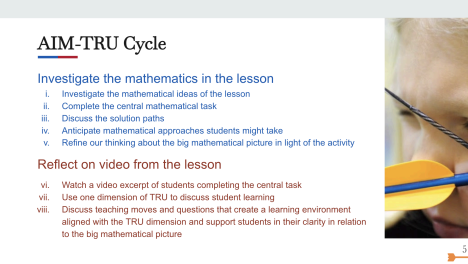
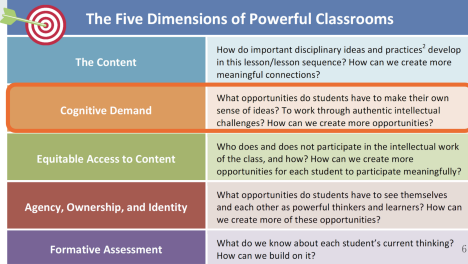
The goal of this survey is to provide the facilitator with information to better understand the participants' experience. The survey may also allow facilitators to reflect on the most interesting ideas participants are taking away from each session.

Facilitation Basedeck Protocol and Notes

Group Norms

	<p>Protocol: Review your group's norms.</p> <p>Notes: <i>List your group's norms on this slide prior to FAL.</i></p>
	<p>Protocol: For virtual workshops, you may also review these norms.</p> <p>Notes: <i>These norms are suggestions from past groups.</i></p> <p>Slide Edits: For in-person workshops, you can hide/delete this slide.</p>

AIM-TRU cycle, Dimension, and FAL


	<p>Protocol: Quickly review the AIM-TRU PD cycle for the workshop.</p>
	<p>Protocol: Review the dimension of TRU associated with your chosen FAL.</p> <ul style="list-style-type: none"> Ask the PLT for input regarding what they should see in a learning environment that is aligned to the selected TRU dimension? <p>Slide Edits: Move the yellow box to highlight the dimension of the chosen FAL.</p>

Insert Lesson Name Here

Mathematical Goals:

This lesson unit is intended to help you assess how well students are able to:

- Insert goals from FAL here




Sample edited slide:

Defining Lines by Points, Slopes and Equations

Mathematical Goals:

This lesson unit is intended to help you assess how well students are able to:

- Find the slopes and equations of linear graphs defined by pairs of coordinates.
- Calculate the slope and y-intercept of a straight line.
- Use the slope and y-intercept of a straight line to derive its equation. Students may use the properties of similar triangles to achieve these goals.



Protocol: Have all participants look at the Mathematical Context Document and Lesson Plan. Either read or ask someone to read the mathematical goals for the lesson.

Notes: *The Mathematical Context document can be found on the TLE website under the specific FAL.*


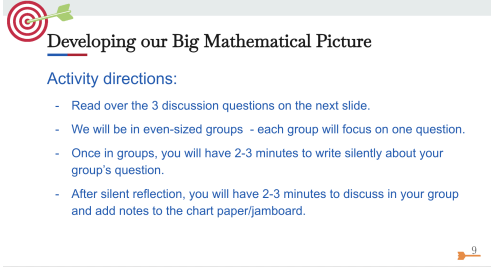
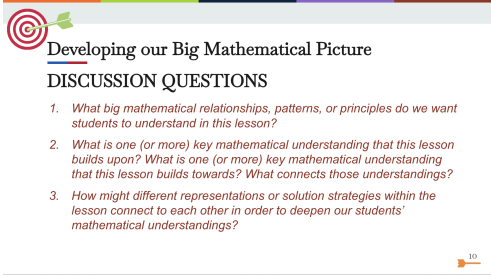
The goal for a particular FAL is to help teachers assess how their students understand specific mathematical ideas. During the lesson, teachers have to make decisions about what moves to make and what questions to ask that appropriately push students to think more deeply about these ideas.


The choices teachers make about how to assess and advance student thinking depend on what teachers want students to understand about the relevant mathematical objects, principles, patterns, and relationships, as well as their connection to other content in the curriculum. In short, teachers' choices about how to engage students depend on a big mathematical idea that they want students to ultimately see.

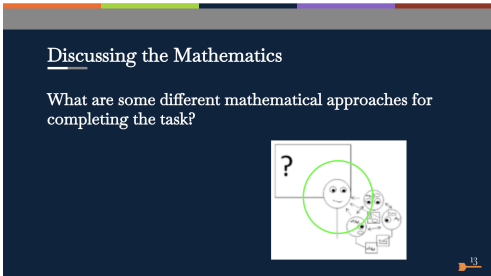
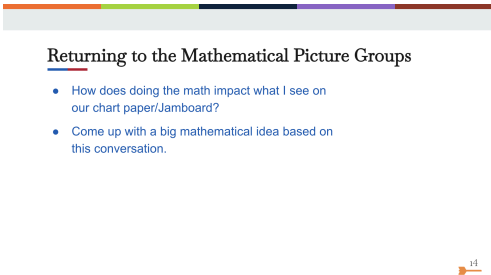
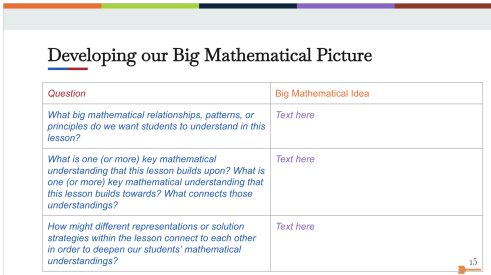
This big mathematical idea is not, however, specified in any FAL lesson plan. It lives in the heads of teachers and is rarely made explicit in professional development. The first activity in AIM-TRU is to collectively explore the big mathematical picture framing the lesson in the video case.

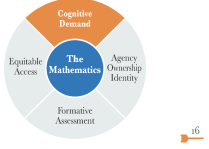
Slide Edits: Prior to the PLT, insert the name of the lesson as well as the mathematical goals for your chosen FAL. These can be found on the [TLE](#) or the [Mathematics Assessment Project](#) websites. You should also copy and replace the figure with the focal dimension. All dimension slides are located on the last slide of the basedeck.

Developing our Big Mathematical Picture


 <p>Developing our Big Mathematical Picture</p>	<p>Section Header</p>
 <p>Developing our Big Mathematical Picture</p> <p>Activity directions:</p> <ul style="list-style-type: none"> - Read over the 3 discussion questions on the next slide. - We will be in even-sized groups - each group will focus on one question. - Once in groups, you will have 2-3 minutes to write silently about your group's question. - After silent reflection, you will have 2-3 minutes to discuss in your group and add notes to the chart paper/jamboard. 	<p>Protocol: Review the directions on this slide with the group.</p> <p>Notes: <i>For this activity, there needs to be at least 2 teachers in each group. Groups should be roughly the same size.</i></p>
 <p>Developing our Big Mathematical Picture</p> <p>DISCUSSION QUESTIONS</p> <ol style="list-style-type: none"> 1. What big mathematical relationships, patterns, or principles do we want students to understand in this lesson? 2. What is one (or more) key mathematical understanding that this lesson builds upon? What is one (or more) key mathematical understanding that this lesson builds towards? What connects those understandings? 3. How might different representations or solution strategies within the lesson connect to each other in order to deepen our students' mathematical understandings? 	<p>Protocol: Have participants choose which question they want to address, adjusting if needed to have equally sized groups, to the extent possible.</p> <p>For in-person workshops, leave this slide showing while the groups are working.</p> <p>For virtual workshops, copy and paste questions into the chat before splitting into breakout rooms. Place each participant in the breakout room that correlates with their question. Have everyone change their Zoom name so the number of the question you select is first. (e.g., 1, Dave (he/him)). Have participants go to the Jamboard and take 2-3 minutes to write silently about ONE of the questions.</p> <p>Notes: <i>Have space on Jamboard/chart paper for the eventual revisiting of the conversation and BMI conversation that will happen during the “Returning to the Mathematical Picture Groups” slide.</i></p>

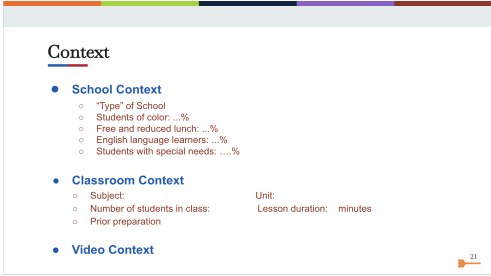
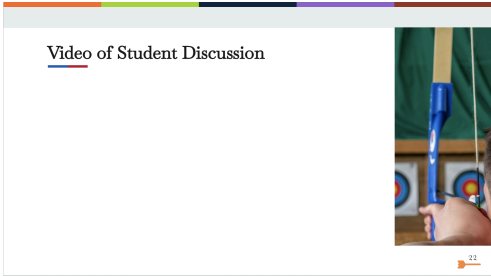
 <p>Developing our Mathematical Picture</p> <p>Breakout Activity</p> <ul style="list-style-type: none"> - In groups, allow everyone to have the opportunity to share their thoughts. (leader coordinates, lists everyone's name) - Collect everyone's thoughts on the jamboard/chart paper <p>11</p>	<p>Protocol: Let participants know that we will be revisiting these after “doing the math,” so we will expand on them again later.</p> <p>Notes: <i>For virtual workshops, you will use the Jamboard activity. Once the most significant idea is generated - copy it and paste it on the next slide of the Jamboard.</i></p>
<p>Doing the Mathematics</p> <p>12</p> <p>Sample edited slide:</p> <div data-bbox="241 1045 651 1350"> <p>Working Together</p> <p>Take it in turns to:</p> <ol style="list-style-type: none"> 1. Select an expression card and find all other cards that have the same value as the one you have chosen. 2. Explain your matching to your partner. 3. Your partner must check your matching and challenge your explanation if they disagree. 4. Once agreed, glue the cards onto the poster and record your explanation for each match. 5. Continue to take turns until you have ten groups of cards. <p><small>Project resources Analyzing Properties of Expressions P-2</small></p> </div>	<p>Protocol: Do the specific mathematical activity from the video clip. You will explain to participants that they will do the same mathematical activity from the lesson plan that they will see in the video.</p> <p>Notes: <i>To engage in the mathematical activity, you should utilize the Mathematical Context document found on the TLE website. This document includes directions for the activity and accompanying materials, adapted as necessary for the teacher learning environment. You may also find the original materials, including not just the task, but what occurs during the rest of the lesson, on the Mathematics Assessment Project website.</i></p> <p><i>Most FALs require some sort of turn-taking for students. Emphasize to the participants that they should be acting as if they are students and abiding by the directions. For some FALs, it is appropriate to discuss the lesson launch and perhaps even include it as part of the PLTs work. e.g., Representing Quadratic Functions. This information is outlined in the Mathematical Context.</i></p> <p><i>Engaging in the mathematics of the task in this way is important as this activity allows a deeper understanding of how students will engage in big mathematical ideas through this task and thus sets participants up for watching the video.</i></p> <p>Slide Edits: Revise the slide to match the specific FAL in the video case. For this slide, you can insert the materials from the Mathematical Context</p>

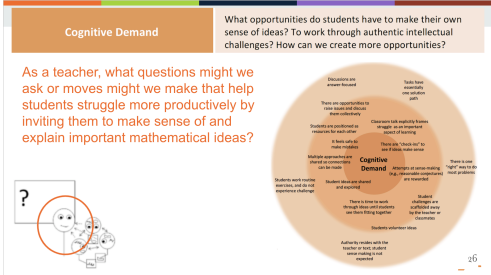
	<p>Document or use the remote teaching resources located on the TLE website.</p>								
 <p><u>Discussing the Mathematics</u></p> <p>What are some different mathematical approaches for completing the task?</p>	<p>Protocol: Facilitate a whole group conversation to generate ideas each breakout room discussed in their small groups from the “Developing our Big Mathematical Picture” slide.</p> <p>Notes: <i>You may want to target this discussion in part around the FAL that you are using. For instance, during open-ended FALs such as “Representing Conditional Probability,” we have asked participants to use chart paper to write down their solution strategy, so the discussion could revolve around the ways that they answered the problem.</i></p> <p><i>For card-matching and sorting activities, we have found it useful for participants to point to the cards that they had trouble with, and why they thought that match/sort tested their cognitive load.</i></p> <p><i>In each case, thinking about the nature of the questions asked helps you in being able to turn the discussion back towards the Big Mathematical Idea.</i></p>								
 <p><u>Returning to the Mathematical Picture Groups</u></p> <ul style="list-style-type: none"> • How does doing the math impact what I see on our chart paper/Jamboard? • Come up with a big mathematical idea based on this conversation. 	<p>Protocol: At this point, you should have participants return to their groups to consider the question, <i>How does doing the math impact what I see on our chart paper/Jamboard?</i></p> <p>Notes: <i>If needed, have participants return to the PLT Discussion Questions Jamboard</i></p>								
 <p><u>Developing our Big Mathematical Picture</u></p> <table border="1"> <thead> <tr> <th>Question</th> <th>Big Mathematical Idea</th> </tr> </thead> <tbody> <tr> <td>What big mathematical relationships, patterns, or principles do we want students to understand in this lesson?</td> <td>Text here</td> </tr> <tr> <td>What is one (or more) key mathematical understanding that this lesson builds upon? What is one (or more) key mathematical understanding that this lesson builds towards? What connects those understandings?</td> <td>Text here</td> </tr> <tr> <td>How might different representations or solution strategies within the lesson connect to each other in order to deepen our students' mathematical understandings?</td> <td>Text here</td> </tr> </tbody> </table>	Question	Big Mathematical Idea	What big mathematical relationships, patterns, or principles do we want students to understand in this lesson?	Text here	What is one (or more) key mathematical understanding that this lesson builds upon? What is one (or more) key mathematical understanding that this lesson builds towards? What connects those understandings?	Text here	How might different representations or solution strategies within the lesson connect to each other in order to deepen our students' mathematical understandings?	Text here	<p>Protocol: Transition to whole-group where the leader/spokesperson for question #1 shares their big mathematical idea, followed by group #2, then group #3.</p> <p>Notes: <i>Facilitator back pocket questions to help with the discussion:</i></p> <ul style="list-style-type: none"> • <i>How did doing the math impact your thinking?</i> • <i>In what ways are the presented ideas connected?</i>
Question	Big Mathematical Idea								
What big mathematical relationships, patterns, or principles do we want students to understand in this lesson?	Text here								
What is one (or more) key mathematical understanding that this lesson builds upon? What is one (or more) key mathematical understanding that this lesson builds towards? What connects those understandings?	Text here								
How might different representations or solution strategies within the lesson connect to each other in order to deepen our students' mathematical understandings?	Text here								


	<ul style="list-style-type: none"> How did each question bring up different big mathematical ideas? <p>Note that the big mathematical ideas are a part of the big mathematical picture. Because of this, you may also want to consider if the ideas that are being presented are “big” and if the teachers are actually discussing understandings, practices, or the learning goals of the lesson.</p>
<p>Pulling it Together</p> <p>Keeping the previous conversation in mind, consider the following:</p> <p>How do the tasks in the lesson provide opportunities for students to productively struggle and make sense of important mathematical ideas?</p> 	<p>Protocol: Display slide for the dimension being discussed, hide all other dimension slides.</p> <p>Notes: You may find it helpful to have a conversation around how the teacher view is similar to and different from the student view. One purpose for this discussion is that the students in the video clip may verbalize understandings that aren’t related to the mathematical ideas curated by the group. You can use these questions to help set up the post-video conversation in order to focus on moving to the center of the On Target while connecting to the mathematical ideas curated in the beginning of the PLT meeting.</p>

Video discussion

<p>NORMS for watching Video</p>  <ul style="list-style-type: none"> Speak from the “I” perspective. For example: “If I could rewind the tape and ask students a question, I would ask...” Be inquisitive, not judgmental. For example: “I wonder what might happen if,” instead of “the teachers should have...” Justify your ideas and conjectures based on the video clip, and not other parts of the lesson that you didn’t see. For example: “I think that the student understands...because in the video she...” Focus on how what you learned from the video might help you implement this (or similar lessons) with your own students. 	<p>Protocol: Provide each participant with the Video Supplement document. Review group norms specific to watching video, which is the first section of the document.</p> <p>Notes: The Video Supplement document can be found on the TLE website under the specific FAL.</p> <p>As you review the norms for video watching, you may want to reiterate the goal in watching the video is for participants to reflect on how the lesson played out in a real classroom. The point is NOT to evaluate or judge the teacher who produced the video. You may want to remind participants that the teachers and their students in the video have welcomed us into their</p>
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	<p><i>classroom to record the teaching and learning experience and deserve a huge thank you.</i></p> <p><i>It is also important for everyone to acknowledge that they can not have any idea as to what interactions, discussion, etc. happened outside of the limited viewing that is shared.</i></p>
 <p>Context</p> <ul style="list-style-type: none"> • School Context <ul style="list-style-type: none"> ◦ "Type" of School ◦ Students of color: ...% ◦ Free and reduced lunch: ...% ◦ English language learners: ...% ◦ Students with special needs: ...% • Classroom Context <ul style="list-style-type: none"> ◦ Subject: _____ Unit: _____ ◦ Number of students in class: _____ Lesson duration: _____ minutes ◦ Prior preparation • Video Context <p>21</p> <p>Sample edited slide:</p> <p>Context</p> <ul style="list-style-type: none"> • School Context <ul style="list-style-type: none"> ◦ Urban Public School ◦ Students of color: 60% ◦ Free and reduced lunch: 50% ◦ English language learners: <5% ◦ Students with special needs: 20% • Classroom Context <ul style="list-style-type: none"> ◦ Subject: 7th grade Mathematics Unit: Exponents and Identities ◦ Number of students in class: 30 Lesson duration: 90 minutes ◦ Prior preparation: Students have been introduced to the rules for exponential identities, and also to factoring and expansion • Video Context <p>Students have already done the opening problem, and are now working through the card sort activity, where they are trying to match up expressions. The teacher is currently circulating around the room, and the video highlights the same group of three students working with different cards.</p> 	<p>Protocol: Review the context of the FAL in the video, which include the School Context, Lesson Context, and Video Context sections of the Video Supplement.</p> <p>Slide Edits: Update this slide to include the information presented in the Video Supplement document located on the TLE Website for the FAL being discussed.</p>
 <p>Video of Student Discussion</p> <p>22</p>	<p>Protocol: Tell participants that you will now play the video from the lesson. Let them know that they will have access to a full transcript to support discussion after the video in the Video Supplement document.</p> <p>Notes: <i>You may play the video from the TLE website or embed it into this slide. We recommend that participants watch the video without the aid of the transcript, since this better approximates what it is like to teach the lesson.</i></p>

	<p>Supplement Discussion Questions while reading the diamonds.</p> <p>For virtual workshops, create breakout rooms of no more than 4 participants.</p> <ol style="list-style-type: none"> 1) Give each group a separate frame on the PLT Discussion Questions Jamboard that corresponds with the dimension of the FAL 2) Give each participant 3 minutes to write silently in one corner of the Discussion Diamond, giving their answer to the question in the middle. 3) Give each group 3 minutes to construct a consensus answer to the question, using the center of the diamond. 4) Have the teachers do a 2 minute gallery “walk” to read each group’s consensus. Prompt participants to think about question 2 from the Video Supplement Discussion Questions while reading the diamonds. <p>Notes: <i>The point of this exercise is to bring the particular TRU dimension to the center of the teachers’ thinking about what was viewed in the video clip. The dimension serves as a lens to bring focus to particular events that are central to the video case. The responses generated in this task serve as a springboard for the discussion of possible teacher moves in the next segment.</i></p> <p>Slide Edits: All Discussion Diamond slides are included in the slideshow - Unhide the slide that correlates with the dimension of the chosen FAL.</p>
	<p>Protocol: After the gallery walk, read the question on the corresponding slide, which corresponds with the second discussion question in the Video Supplement document.</p> <p>Provide 2-3 minutes of individual think time for participants to generate ideas and consider where they may fall on the On Target document. If virtual, you can use the TRU On Target document in the PLT</p>

	<p>Discussion Questions Jamboard that corresponds with the dimension of the FAL.</p> <p>Follow this with an open, whole-group discussion.</p> <p>Notes: <i>Focus the discussion to fully explore one proposed question or teaching move and the related justification for that move with respect to the On Target document before transitioning to a new proposed teaching move.</i></p> <p><i>In this step, participants imagine what questions they might ask or moves they might make if they were the teacher of the lesson to address the implementation concerns noted in the Discussion Diamonds. The point of this exercise is to generate ideas for how teachers can push students to think more deeply about the mathematics in ways that help them see the big mathematical idea more clearly. The goal for Question 2 is to have the participants connect moves framed within a TRU dimension to creating powerful mathematics environments for their students.</i></p> <p>Slide Edits: All On Target slides are included in the slideshow - Unhide the slide that correlates with the dimension of the chosen FAL.</p>
	<p>Protocol: Announce next session, and if your community is at the stage of thinking about videotaping lessons in their own classrooms, this is a good place to see if anyone is open to doing an FAL in their own classroom before the next session.</p> <p>Additionally, at the conclusion of each PLT session, make a copy of the Post PLT Session Survey and send to each participant. The goal of this survey is to provide the facilitator with information on which to reflect and better understand the participants' experience. It will also allow facilitators to reflect on the most interesting ideas that participants are taking away from each session. Facilitators should feel free to add items to their copy of the survey, as</p>

	<p>appropriate. This survey is only intended to take 5 minutes to complete by participants.</p> <p>Notes: <i>We recommend making the survey into a Google form to make collecting responses easier.</i></p>
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