Facilitation Guide
Module 4: Focus on Implementation- Classroom Discourse to Support Argumentation

This module is the fourth of five modules created for professional learning purposes as part of the Bridging Math Practices project. An Overview for our facilitation guides and the modules is available at http://bridges.education.uconn.edu/argumentation-pd-modules/. This module can be used independently or in conjunction with one or more of the other four modules. We encourage user to become familiar with the set of materials and then adapt them to your particular needs and timeframe.

The Facilitation Guide includes the following:

- Goals for Module 4
- Background Information on classroom discourse
- List of Materials Needed for Module 4
- Timing Table for Module 4 Activities
- Implementation Guide and Possibilities
    - Detailed description of each activity and suggestions for implementation
    - Includes additional background on *funneling* and *focusing* discourse patterns
- References
- Additional Resources

All handouts and other materials for Module 4 can be found at
http://bridges.education.uconn.edu/classroom-discourse/

Goals: Module 4

Participants will

- Develop a deeper understanding of argumentation and its potential in the math classroom.
- Analyze mathematics classroom discourse interactions that can support students to engage in argumentation
- Reflect on current instructional strategies to consider how they will promote discourse and argumentation in the classroom

Overarching Questions for the 5-Module Sequence

- What is a mathematical argument? What "counts" as an argument?
- What is the purpose(s) of argumentation in mathematics? In the math classroom?
- How do we organize our classroom to support student participation in the practice of mathematical argumentation, and to support them in developing their proficiency with argumentation (both verbal/interactive and written forms)?
- What does student argumentation look like at different levels of proficiency?

Background Information: Classroom Discourse

This module extends the focus on implementation started in Module 3. Having engaged the Talk Frame routine in Module 3, Module 4 starts with introducing other pedagogical routines that can be used to support argumentation and be integrated readily into lessons. The attention to implementation continues as we turn to mathematical discourse and consider, in detail, how different patterns of interaction and teacher prompts support (or thwart) argumentation. The terms *focusing* and *funneling,* which describe patterns of discourse, are introduced and used to analyze and revise classroom dialogues.

Materials:

Copies of Handouts
PowerPoint Slides (draft slides provided)
Technology to play a web-based video, with audio

Timing and Activity Table for Module 4

Session activity and focus	Estimated Timing		Materials
	Monthly (1.5 hrs)	Workshop (3.5 hrs)	
Opening Activities: PLC format: Participants share their "Bridging to Practice" work Workshop format: Community Building or Problem Solving	5 mins	(as appropriate for workshop timing)	Handout: *Opening Activities Template*
Activity 4.1 Additional Routines to Support Argumentation Building on Module 3, participants engage in some other, "smaller" routines to support student argumentation and are provided with a handout with some additional ideas and websites	15 mins	35 mins	Handout 1: *Small Routines to Support Argumentation* Handout 2: *Additional Routines to Support Argumentation*
Activity 4.2 "Is It A Half?" video and discussion Participants watch and discuss two short video clips focused on a teacher supporting a pair of students to understand the meaning of a half through questioning.	20 mins	35 mins	Handout 3: Is It A Half? Task Overview and Task Cards Handout 4: Video Viewing: Is It a Half? Handout 5: Is It a Half? Video Transcript
Activity 4.3 Funneling and Focusing: Two Discourse Patterns Participants read transcripts to compare the discourse patterns of two classrooms. Discussion focused on the advantages of opening discourse to help illuminate student thinking	40 mins	60 mins	Handout 6: Two Classroom Dialogues Handout 7: Additional Thoughts on Questioning in Math Class
Activity 4.4 Bridging To Practice	5 mins	65 mins	Bridging to Practice: Student Work Samples Sorting Protocol (available in Individual Handouts section only)
Activity 4.5 Session Closure	5 mins	15 mins	

Implementation Guide and Possibilities: Module 4

In the sections that follow we provide suggestions on how to use the materials for two different models of professional development: monthly meetings during the school year and an intensive five-day workshop. We also include the goals of specific activities (indicating how they contribute to the goals of the module) and some of our reasoning for including particular activities and/or materials. Following each activity description, we include a table with common issues for the different activities and suggest questions or prompts you might use to help address those issues.

Opening Activities

Monthly PLC Format

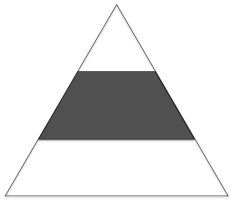
In the monthly PLC, you might organize participants into pairs or groups of three to debrief their Bridging-to-Practice work from Module 2 related to tasks. For example, participants may have enacted an argumentation task with students and video recorded a class or small group discussion. Participants can discuss any changes they observed in student responses, peer-to-peer conversations, and/or student work as a result of the changes they made to their teaching practices or the task.
We suggest that this time is used to debrief any Between Sessions work, or to engage participants in some problem solving. *Please see Opening Activities templates.*

Workshop Format

In the workshop format, this is a good time to revisit the Community Agreements, do a math problem together, address any questions that have come up, or otherwise re-engage the group.

For our implementation, we used the following prompt (included on the Module 4: *Opening Activities Template*:

> Under what conditions, *if any,* will the area of the shaded region be 1/3 the area of the triangle? Justify your answer.



The discussion of this problem involved identifying assumptions or conditions needed to evaluate the possibility that the shaded region was 1/3 the area. It also provided the opportunity to consider whether the triangle *had* to be equilateral, isosceles, or whether it could be any triangle. Finally, the problem solving provided the opportunity to again consider the many different ways that participants (and therefore also our students) might tackle producing an argument. Approaches included using manipulatives, visual manipulation of the shape, scale drawings, using variables and formulas, and using features such as symmetry and arguments related to congruence.

Module Objectives:

Prior to Activity 4.1, the session objectives should be introduced.
Participants will

- Develop a deeper understanding of argumentation and its potential in the math classroom.
- Analyze mathematics classroom discourse interactions that can support students to engage in argumentation
- Reflect on current instructional strategies to consider how they will promote discourse and argumentation in the classroom

Activity 4.1 Additional Routines to Support Argumentation

Overview: In this segment, participants are introduced to additional routines that can support argumentation. The main goal is to help participants see the many ways that argumentation can be incorporated into a lesson using routines. They have been introduced in depth to the Talk Frame. The Talk Frame may be appealing, but also overwhelming, as teachers wonder where they can find the time regularly. By recognizing that argumentation is an everyday event, and there are many routines that support argumentation (verbal and/or written), teachers can create a strong vision for their practice. This idea relates to the idea of creating a culture of thinking that was discussed in previous modules.

Participants are given Handout 1: *Small Routines to Support Argumentation* with three "shorter" routines: (1) *How Do You Know?* (2) *Eliminate It!* and (3) *Would You Rather?* The facilitator poses the questions to the group and allows them some time to do the problem before sharing their ideas. This is an excellent opportunity to model teaching to support student participation in argumentation. Participants get the opportunity to consider the effectiveness of these smaller routines from both the teacher and student perspective. For example, participants, who are the students here, have the opportunity to construct their own arguments and listen to and query the reasoning of others.

This timing can be quite flexible – allowing extended engagement with the format and mathematics, or a quicker sampling to provide brief overview of the routines. Note that for the Workshop Format, these routines set up some of the Bridging-to-Practice work.

Though the main purpose of this segment is exposure and offering "food for thought," with time, facilitators can engage participants in questions about when and how they might use each routine and whether they have other routines they already use. The conversation could also turn toward other topics. Here are some that might emerge depending on what participants offer or the facilitator's guidance:

- how to introduce a new routine to students
- how to prompt broad-based participation, particularly if there are students who seem less comfortable sharing their ideas
- the need to communicate to students a focus on *defending* or *supporting* your answer – versus having a "right" answer, or defending your answer at all cost

- the value of revising one's response as you hear what others took into account in making their assertions/choices

And particularly for *Would You Rather?* prompts, which seem often to have a context (though this can apply to contextual prompts in other formats as well), the following ideas might be brought up:

- how both mathematics and values/preferences can play a role in decision making. When justifying or offering an argument in "real life," one usually considers both of these and must make both of these clear to the audience.
- how cultural knowledge plays a role (e.g., Would you Rather Pool Problem)

After discussion of these three routines, provide the participants with the Handout 2: *Additional Pedagogical Routines to Support Argumentation*. This handout can be offered as a reference resource, or participants can be given time to review and discuss it.

Activity 4.2 "Is It A Half?" Video and Discussion

This activity begins a focus on classroom discourse, and is followed by information about discourse patterns. A main goal of the activity is to conceptually set the stage, allowing participants to start thinking about features of discourse in different classrooms, and particularly how math discourse is supported and organized for argumentation. This pair of video clips is also a useful example of how *argumentation supports the development of conceptual understanding.* In this case, students are broadening their understanding of ½.

The materials for this activity include the classroom task (for reference, or to have participants do, as the facilitator deems appropriate), the transcripts of each of the video clips, the videos online (with subtitles), and a handout sheet with the Guiding Questions. The running time for the clips are about 2:30 minutes and about 2:40 minutes, respectively.

This particular examination of classroom discourse uses a video clip of two students working with Megan Staples, a visiting researcher, in the third-grade classroom of Sarah Brown, a Bridging Math Practice participant. The activity asks participants to consider how the nature of student dialogue is shaped by the teacher's prompts, questions and comments. It also provides the opportunity to see how mathematical argumentation supports the development of conceptual understanding and even procedural strategies.

Our proposed structure is the following:

- Introduce general focus on classroom discourse and how teachers support student argumentation when in dialogue with students
- Remind of purposes for watching video, as was done in Module 3
- Introduce the task, provide some background on the class and video clip (Handout 3: *Is it a Half? Task Cards*)
- Pose the Guiding Questions to help focus participant attention during the video; note the transcripts as a resource (Handout 4: *Video Viewing Is It a Half?*; Handout 5: *Is it a Half? Video Transcript*)
- Show Clip 1 (2:30 mins)*

- Engage participants in small group discussions; whole group comments/discussion
- Show Clip 2 (2:40 mins)*
- Small group discussions; whole group comments/discussion

Video links can be found on the Additional Resources page of the Bridging Math Practices website: http://bridges.education.uconn.edu/resources/ and also in Session 2 of the self-paced learning modules.

Detailed descriptions of potential participant contributions and foci of the small group discussions mentioned above in the "proposed structure" are included below.

Guiding Questions:

1. What kinds of questions and prompts are being asked?
2. How is argumentation being supported?

Common issues/comments from participants:	**Potential responses or follow ups:**
The prompts often elicited the students' ideas. The prompts asked them to share how they were thinking about the cards.	Formative assessment can go hand-in-hand with argumentation. As students articulate their reasoning, teachers gain valuable understanding. Building on students' prior knowledge also goes hand-in-hand with argumentation. Arguments require that we use what we know (or think we know) to make a case for something new. So for a student to offer an argument, they have to be building on their prior knowledge. In this case, they're first working off their everyday knowledge. For them to gain a better understanding of what ½ is mathematically, they'll need to merge their everyday experience of ½ with the definition of ½ in math class (and extend it some).
The prompts did not have much evaluation. Ideas were noted as "interesting" or responded to with a request to confirm what they said, "so you're saying…"	Making sure that the *mathematics* is the authority, and not the teacher, is crucial to supporting argumentation. Also, it is important that participants recognize that mathematical argumentation relies on whether or not a student's argument is *reasonable* (logical, sequential) to establish something as true or not. By not evaluating students' card placement right away, the teacher/researcher maintains space for students to think, decide, revise, and argue. The comments of "interesting" indicate to students that their ideas have value. The lack of evaluation, however, indicates that that there is more thinking to be done!

The teacher/researcher kept hammering on the definition of ½ -- bringing it back many times.	This is an important observation. You might ask the follow up question: why do you think that was important? Or How do you think that impacted this exchange and the students' thinking? Two comments about that emphasis: (1) a goal of this lesson was to develop conceptual understanding of ½, so that meant that the definition needed to be a focus. Students had yet to make sense of this "new" definition of ½ in the context of these shaded cards; and (2) mathematical argumentation, requires teachers/students/mathematicians to work off a shared basis or set of criteria. Unless the teachers and students shared a version of what ½ is, they could accept, reject or evaluate each other's arguments. In this case, not only do we want the students and teachers to share a definition, we also want that definition to be consistent with mathematics.
Why didn't the teacher/researcher just tell the students? – or – That is fine for working with a pair, but a teacher doesn't have that luxury with a whole class, and will probably need to tell the students.	How does "telling" in this situation "help"? (what's productive about it?) How does "telling" in situation "hinder"? (what's not productive about it?) Concerns such as time and student levels of frustration may come up when responding to the above questions; it is critical to have participants attend to students' developing thinking and sense of selves as mathematical thinkers as well. You might ask participants to think about the cost-benefit of telling. It may "move you forward" in the moment, but important learning opportunities are lost– where students get to make sense of what ½ is and extend their own ideas about it. You don't get that opportunity back. Also, think about all the re-teaching teachers do. One assertion is that by allowing more time to grow the conceptual, you save time later. Overall, the time on this likely will have a pay-off later.
As a teacher, I need to think about what I *don't* want to say, as well as what I *do* want to say. I have to hold myself accountable for *not telling* certain things.	This strategy is a useful one to think about, and a nice observation about focus and potentially planning. As you get deeper into this work, you may find it sufficient to focus on what you *do* want, and you'll need to attend less to what you don't want (as, since it's not what you do want, you won't pursue it!). It's also important to have back up strategies that support students in moving forward *even when you do not tell.* You may be committed to "not telling" but what will you do. Think about supports (e.g., offering additional examples; asking a reflective question; etc.) that can be used when there is a temptation to tell a strategy or other information that would be more valuable to students if hard-won by their own thinking process rather than being told.
The bolder student clearly has a better understanding than the other. -- or – The quieter student seems to have a better understanding, but can't get	We have heard both assertions from participants about which student has a better understanding than the other. We cannot tell from this video clip. More importantly, their understanding is *emerging* and *being developed.* The more important questions perhaps then is: do we see them both making progress in their

in her ideas	ways of thinking and sense making about ½? Note that from a review of the video later lesson segments, in whole class format where students are explaining their ideas, the bolder girl demonstrates she can independently explain why something is or isn't one half, and can critique other's assertions. The quieter girl demonstrates that she has a sense of the counting strategy, and may be thinking about symmetry as important as well.

After participants watch Clip 1 of the Is it a Half? video and discuss the two original Guiding Questions, you might wish to pose the question: "What would you do next as the teacher?" This question does not directly relate to argumentation, but does relate to how the teacher could continue supporting the pair of girls in developing their understanding of a half *through* argumentation. Note that this likely will raise questions about how to move students from their current (strong) concepts of ½ to bridge toward and develop a broader sense, and ultimately more precise definition, of a half.

The main purpose of video Clip 2 is to show that the students do start making sense of these ideas and are able to develop their own strategies for determining whether ½ of the rectangle is shaded. This helps reinforce the idea that conceptual understanding and a development of strategies can come about through deliberate attention to argumentation, with appropriate support for the students. Clip 2 also shows the researcher indicating that they are understanding things in new ways, and shows the researcher continuing to ask them to justify with respect to what it means to be ½. For example, when students say that one card "is not a half" because it's "all over the place," the researcher brings them back to the definition, and asks them to construct an argument using the definition (which they are able to do).

Some potential "take aways" from the discussion that participants may offer and facilitators may wish to highlight:

- we see argumentation supporting students to develop a *conceptual understanding* of ½ and deepening their thinking. This is a useful example of how the practice of argumentation (practice standard) supports the development of an understanding of ½ and its definition (content standard)
- students are extending their everyday "thinking" about ½
- teacher questions were responsive to the students' ideas
- there were very few (if any) evaluative comments about right and wrong
- the information provided to students was information about the *definition* of what ½ is. Student were not provided with strategies. Students developed strategies in response to making sense of the definition.
    - There is a fundamental difference between telling students a counting strategy, which they can then use, and letting them develop the strategy as a logical approach to solving a problem – which here was determining whether something is a half based on their understanding of ½. If you tell the child, s/he may be able to do it, but s/he may now hold onto her idea of ½ and then think "in math class, to find ½, you do this counting." You have added a tool to their kit, but it is not connected to their understanding.

Other participants have noted:

- the teacher was patient and persistent, and gave students time to develop (extend) their understanding
- in general, teachers need persistence. Just as we as teachers ask our students to persist, we must hold ourselves accountable to persisting and trusting our students can develop the ideas and strategies

Background on Funneling & Focusing Discourse Patterns

In the next activity, Activity 4.3: *Funneling and Focusing: Two Dialogues*, participants are introduced to two discourse patterns, *funneling* and *focusing.* For more information about these discourse patterns you may wish to read the article by Herbel-Eisenmann and Breyfogle (2005) listed in the additional readings section at the end of this guide.

The purpose is for participants to have the opportunity to think carefully about how their prompts and questions structure the nature of student contributions and the mathematics they get to do. We use transcripts from two classroom excerpts to allow for a close examination of these ideas. As teachers become aware of these patterns and how they can construct alternate possibilities, they increase the tools they have to organize discourse that supports argumentation.

Activity 4.3 Funneling and Focusing: Two Dialogues

We utilize the two dialogues activity to help teachers see how the patterns in the types of questions being asked shapes the nature of contributions students can make. This activity is designed to help participants look closely at classroom interactions and how teacher questions or prompts may support students' thinking and wrestling with ideas, or may support students' in answering smaller, factual questions to progress through the problem, but perhaps not make sense of the problem or key ideas of the problem.

Our proposed structure is the following:

- Introduce the terms *focusing* discourse pattern and *funneling* discourse pattern. *Note that the "Is It a Half?" video should have conceptually primed these terms.* The draft powerpoint slides can be helpful here, as can be the Herbel-Eisemann & Breyfogle (2005) article (reference below).
- Give examples of each type of discourse pattern
- Once the general ideas are understood, provide participants with *Handout 6: Two Dialogues*.
- Participants can read the dialogues silently, or "act out" the dialogues. (If acting out, you may want to be the teacher in each dialogue to include the proper markings on the board, or have someone come to the board.) Reading is guided by questions on the slide:

Two Dialogues

Excerpt #1: Brownies Problem Teacher: Ms. Carter	**Excerpt #2: Simplifying Fractions** **Teacher: Ms. Reardon**
	$\frac{12}{21} = ?$

- Please read the dialogues & jot down notes.
- What do you notice? How do teacher questions (& other verbal moves) impact student reasoning?
- We will discuss these in a few minutes.

- Participants discuss in pairs or small groups what they noticed.
- Whole group discussion about what was noticed. See comments below about **common issues and goals**.
- Participants review the Ms. Reardon dialogue and re-write lines to open up the discourse, and shift questions from promoting a funneling pattern to a focusing pattern.

The final part of the conversation should turn back to the key questions:

- How do our approaches to ***discourse*** shape opportunities for students to engage in argumentation and to support a culture of inquiry?
- How do our approaches to math classroom ***discourse*** impact student reasoning and conceptual understanding?

Participants will likely notice that Ms. Reardon is asking very "small" or low-level questions, where students can answer her questions without engaging in the larger process, although some may follow her thinking and understand why the steps are being done. By contrast, participants will likely notice that Ms. Carter is asking questions about the student's decision making and mathematics and having them articulate how they are making sense of the values and results.

Common issues/comments	Potential responses or approaches
Excerpt 1: The Brownie Problem	
Participants may wonder why the student cut the first 4 into halves and the last 5 into eighths.	This approach most likely has to do with the problem given right before this one, which was sharing 4 brownies among 8 friends.
The teacher asked many meaning-making questions	Ask for examples. Highlight idea that Ms. Carter asked about the student's choices (why did you chose eighths) Highlight prompt about "what does that mean if there are eighth halves?"

Participants may notice fewer students participate in this discussion	One question to ask is how participation matters. Comparing this to the type of participation in Ms. Reardon's dialogue offers the opportunity to think about the depth and meaningfulness of participation, and the types of contributions students are given the opportunity to make in a math class.
Excerpt 2: Fractions and Factors	
May notice broad based participation	Acknowledge the wide range of contributors. Follow up: what kinds of contributions are they making? What kinds of mathematics are they contributing?
The "aside" is not really an aside – it's core to the math Some may consider this "modeling"	Emphasize idea that students need to understand the purpose of mathematical work. The Herbel-Eisemann and Breyfogle (2005) article emphasizes that if this kind of modeling work is done, there should be some questioning about it after – why did I do this "aside"? What was its purpose? When is it that we need to find common denominators?
Participants may notice a lot of the questions are "next step questions"	Link this to funneling – this is typical where students are answering the small question asked, but not thinking about the big question they are solving overall
Appreciate the question to try to clarify what it means to rewrite in simple form May feel like not enough attention is given to the idea of the number staying the same but the numerator and denominator may get smaller in value.	These comments attend to a common misconception and imprecision in the ways we sometimes use language. While note directly related to argumentation, in general, precision with language
Participants may also be troubled that the Ms. Reardon dialogue is a "Review" and it seems the students need a lot of help, or she might just be reviewing, and doesn't usually do this.	This can be acknowledged. Regardless of timing in the unit, the pattern is funneling. It is also important to note that *funneling* can be useful as *modeling* in some cases, but only if students have the opportunity to later reflect on this sequence of steps and questions and make sense of the mathematics that was done.

After discussing the Two Dialogues, participants are asked to re-write some portion of the Ms. Reardon dialogue. This can be done in several ways, for example, you might have participants focus on changing one or two questions, or re-write larger segments of the dialogue. To wrap up this part, participants can share their re-writes, discuss general strategies for approaching this kind of questioning, and/or ask questions.

One slide we find powerful to share with participants is titled Comparing Student Participation: Two Dialogues with Student Turns Only. This slides helps emphasize the differences in the dialogues and brings home the idea that the teacher's prompts play a crucial role in shaping students' opportunities to participate and the mathematical thinking they are asked to do. In Ms. Carters dialogue, without the teacher's contribution the transcript reads much like a conversation between the students, with students providing the majority of the mathematical ideas. In contrast, in Ms. Reardon's dialogue, without the teacher's contributions, the transcript does not make much sense and the students contributions are not well connected.

We have included a handout on Questioning that may be useful to share or provide as a resource.

Activity 4.4 Bridging to Practice

Monthly PLC Format:
One possibility for Bridging to Practice between Module 4 and Module 5 is to ask participants to audio record a classroom discussion. Then participants listen to their classroom discussion and select two short segments, approximately 2 minutes each: (1) an exchange where you did a good job at questioning and prompting that *focused* students' thinking; (2) an exchange where you didn't do so well and mostly *funneled*. Once participants select their segments, they can transcribe them and bring those transcriptions to the next module.

A second possibility is to do a version of the activity proposed for the Workshop Format related to classroom routines.

Workshop Format:
One option for a Bridging to Practice activity during Module 4 is for participants to work independently and/or collaboratively to plan how they might use a specific routine to support argumentation in their classroom.

Handout 8: *Planning for Routines to Support Argumentation in YOUR Classroom* outlines the order and timing for this activity. First, for about 25 minutes, participants plan and/or design their routine. In our enactments we gave participants the following prompts:

- Think about your first weeks of math instruction at the start of the school year.
- Select or develop a routine and choose a math task to use with that routine. You may want to consider the following questions as you plan:
  - *How will you introduce the routine to your students?*
  - *What specific materials or tools (handouts, charts, PowerPoint, song, etc.) do you plan to use to help your students learn the routine?*
  - *How will you model this fabulous routine?*
  - *How does this routine engage students in argumentation?*

After the initial planning time, participants can work in groups of three or more to workshop the routines they developed. Encourage participants to both share ideas and listen to suggestions. Depending on the sizes of your group, timing might vary. In our enactment, we gave each participant five minutes to present their plans and then another five minutes to listen to constructive feedback from group members. For groups of three with this timing, this portion of the activity requires 30 minutes.

To conclude this activity, participants can use the final 10 minutes to reflect on suggestions given by their colleagues to revise their plan, record next steps, ask questions or write other good ideas discussed.

Module 4 References

Herbel-Eisemann, B., & Breyfogle, M. L. (2005). Questioning our patterns of questioning. *Mathematics teaching in the middle school, 10*(9), 484-489. A copy of this article is available through the Silicon Valley Math Initiative website at http://www.svmimac.org or http://www.svmimac.org/images/SVMIPD.091312.Questioning_our_Patterns.pdf

Additional Resources: Module 4

We have developed a self-paced learning module on these same ideas. The web-based module is well suited for individuals working through on their own, or for a pair to work through and discuss together. See http://teachers.bridges.education.uconn.edu/session-2-mathematical-argumentation-in-the-classroom-new/

Hoffman, B., Breyfogle, M. L. & Dressler, J. (2009). The power of incorrect answers. *Math Teaching in the Middle School, 15*(4), 232-238.

Kazemi, E. (1998, March). Discourse that promotes conceptual understanding. *Teaching Children Mathematics, 4*(7), 410-414.

Lannin, J., Barker, D., & Townsend, B. (2006). Why, why should I justify? *Math Teaching in the Middle School, 11*(9), 438 -443.

Smith, M. (2004). Beyond presenting good problems: how a Japanese teacher implements a mathematics task (pp. 96-106). In R. Rubenstein & G. Bright (Eds.), *Perspectives on the Teaching of Mathematics, NCTM 66th Yearbook.* Reston VA: NCTM.

Facilitation guide prepared by Megan Staples and Jillian Cavanna based on 2014-2015 and 2016 implementations of the Bridging Math Practices Project. Last updated September, 2016.