Using Data from "Practical Measures" to Reflect on and Improve Classroom Practice and Professional Learning
TDG Leadership Seminar 2020
Kara Jackson, Hilda Borko, Anita Lenges, & Michael Jarry-Shore
http://www.pmr2.org

Practical Measures,
Routines & Representations

Thanks for expressing interest in our team's whole-class discussion survey!

In this document, you'll find student-facing versions of the surveys and annotated versions of the surveys, which include the research informing each set of items and information for use of the surveys.

Please note that we are in the process of refining these surveys. It is important to us that we learn from those who are using them. We are currently operating under a Creative Commons license. As such, we ask that you track and share any revisions you make to the surveys.

If you'd like to read more about how the surveys were developed, to find the most recent version of this survey, or to download other tools for instructional improvement, visit http://pmr2.org.

A word of caution about the survey: This tool is intended to inform improvement efforts, and as such we see it as useful for guiding conversations, rather than as a tool to evaluate teachers' work.

Thank you!
The PMR2 Team

WHOLE-CLASS DISCUSSION SURVEY
STUDENT COPY

For each question, select one response that best describes your experience in the whole class discussion in today's math class.

1. What did you need to do in order to be successful in your math class today?
   - ◯ Solve problems using the steps the teacher showed me
   - ◯ Listen to and make sense of other students' reasoning

2. Was there only one right way to solve the problem(s) today?
   - ◯ Yes ◯ No

3. Were you comfortable sharing your thinking in today's whole class discussion?
   - ◯ Yes ◯ No

4. Did you have trouble understanding other students' thinking in today's whole class discussion?
   - ◯ Yes ◯ No

5. Did listening to other students in today's whole class discussion help make your thinking better?
   - ◯ Yes ◯ No

6. What was the purpose of today's whole class discussion?
   - ◯ Share how we solved problems using the steps our teacher showed us
   - ◯ Learn the way the teacher showed us to solve the problem
   - ◯ Learn different ways that work to solve a problem from other students
   - ◯ Share a mathematical idea we came up with on our own
   - ◯ Check to see if our answers are correct

7. Who talked the most in today's whole class discussion?
   - ◯ Students
   - ◯ The teacher

VERSION 190116, pmwcd10, Whole Class Discussion.10

WHOLE-CLASS DISCUSSION SURVEY: ANNOTATED COPY

Aspects of discussions that research indicates make a difference for students' learning opportunities Items are assessing students' perceptions of …	Survey items	Sample improvement goals & conversation starters
Cognitive demand of the task as implemented. We draw on Stein and Lane (1996) to define cognitively-demanding tasks as tasks that can be solved in multiple ways, that offer opportunities for students to explain and justify their reasoning, and/or that prompt students to represent a mathematical relationship in multiple ways. Absent multiple strategies, it is difficult to press students to make connections between mathematical strategies – and doing so is pivotal in deepening students' conceptual understandings of mathematical ideas (Stein & Lane, 1996). To ensure that students are engaging in cognitively demanding tasks, it is important to both choose cognitively demanding tasks and maintain the rigor of the task during a lesson. Research indicates that it is common for the cognitive demand of a task to be lowered across the course of a lesson (Stein & Lane, 1996); e.g., teachers might suggest a procedure for students to solve the given task. Students' responses to these items may provide information about how the task was implemented, and/or the cognitive demand of the task chosen for the lesson.	**Item 1** What did you need to do in order to be successful in your math class today? ☐ Solve problems using the steps the teacher showed me ☐ Listen to and make sense of other students' reasoning **Item 2** Was there only one right way to solve the problem(s) today? ☐ Yes ☐ No	Note: In interpreting students' responses, It is critical to look at the task, alongside responses to these survey items. **Selecting rigorous task(s):** ● How might we choose a more rigorous task? Note: Our team's analysis of rigor of the task tool might be useful here. **Maintaining the rigor of the task(s):** ● What could we do to keep this task "open"? How do we anticipate students will solve the task? How can we encourage students to use multiple strategies? ● We started with a rigorous task … what happened? ○ How could we launch the task so that we encourage multiple strategies? ○ How could we maintain the cognitive demand of the task in the discussion?

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WHOLE-CLASS DISCUSSION SURVEY: ANNOTATED COPY

What students are accountable for in the discussion. Mathematics discussions frequently focus on evaluating whether students' answers are correct (Cazden, 2001). Focusing exclusively on answers is unlikely to present students with opportunities to grapple with and make sense of other students' ideas, because answers alone provide little insight into students' thinking process. We have found that attending to students' views of what they are accountable for in a discussion can provide useful information about the extent to which discussions focus on students' thinking.	Item 6 What was the purpose of today's whole class discussion? ☐ Share how we solved problems using the steps our teacher showed us ☐ Learn the way the teacher showed us to solve the problem ☐ Learn different ways that work to solve a problem from other students ☐ Share a mathematical idea we came up with on our own ☐ Check to see if our answers are correct **Note**: We have found it useful to collapse options 1, 2, and 5 as "producing correct answers" and, separately, options 3 and 4 as "sense-making."	Questioning: ● What questions might we ask in the discussion so students are reasoning about mathematical ideas? **Selecting students to share their ideas:** ● What ideas do we want to surface and why?

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WHOLE-CLASS DISCUSSION SURVEY: ANNOTATED COPY

Opportunities for students to listen to, reason about, and make sense of others' ideas. Productive discussions involve students sharing their own ideas and strategies for solving problems (Cobb, Yackel, & Wood, 1989). While having students share ideas is an essential aspect of mathematically productive discussions, sharing ideas alone does not guarantee that students' understanding of key mathematical ideas is advanced (Ball, 2001). It is also important that the teacher presses students to explain and justify their reasoning in ways other students will understand (Cobb, 1998; Thompson et al. 1994). For example, it is crucial that students both describe how they solved the problem and explain why they solved the problem the way they did (Kazemi and Stipek, 2001).	Item 4 Did you have trouble understanding other students' thinking in today's whole class discussion? ☐ Yes ☐ No Item 5 Did listening to other students in today's whole class discussion help make your thinking better? ☐ Yes ☐ No	**Supporting students to explain their thinking:** ● How can we support students to explain why they solved the problem in the way they did? ● How can we support students to talk about the meaning of the numbers they are manipulating? ● What key mathematical ideas do we want to make sure we have students repeat or revoice? **Pressing students to make sense of each other's ideas:** ● What questions do we want to ask to highlight key mathematical ideas? ● How can we press students to elaborate on their explanations? ● What can you ask listening students to help them understand the explanation? **Representing students' strategies:** ● How could we represent this strategy in a way other students can make sense of?

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WHOLE-CLASS DISCUSSION SURVEY: ANNOTATED COPY

Establishing a classroom culture in which students want to share their ideas and feel their ideas are valued. Engaging all students in productive discussion is hard work. It requires establishing a classroom culture in which all students see value in sharing their ideas and feel their ideas are valued. This involves negotiating norms regarding how students should treat each other and mathematical ideas (Horn 2012; Kazemi & Stipek, 2001). For example, it is important that students see value in listening to one another and view mistakes as opportunities for learning, rather than as something to be embarrassed about (Horn, 2012; Kazemi & Stipek, 2001).	Item 3 Were you comfortable sharing your thinking in today's whole class discussion? ☐ Yes ☐ No	**Establishing classroom norms for participation in whole class discussions:** ● What can we do to signal that it's important for students to share in-process ("rough draft") thinking, mistakes ...? ● How might we position students as having valuable mathematical ideas the class can build on? ● Whose ideas do we want to strategically highlight, and why?
Centering students' thinking in instruction Productive discussions involve students sharing their strategies for solving problems and making sense of other students' explanations (Cobb, Yackel, & Wood, 1989). While it is important that teachers facilitate discussions, the conversation should build on students' current ways of thinking. Therefore, students typically do most of the talking in productive whole class discussions.	Item 7 Who talked the most in today's whole class discussion? ☐ Students ☐ The teacher	**Selecting students' strategies for whole class discussions:** ● How can we build from students' ideas and strategies? ● When might we have students repeat or revoice other students' contributions, and why?

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References

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Measure of Professional Learning
DRAFT

Think about your experiences today. For each statement, **select yes or no**.	Yes	No
a. I felt like my ideas were valued in the group today	◯	◯
b. My colleagues' ideas contributed to my learning today	◯	◯
c. I felt like I could share a **mathematical idea** I was unsure about today	◯	◯
d. I felt like I could share an **idea about teaching** I was unsure about today	◯	◯
e. I felt like I could offer an alternative point of view today	◯	◯
f. I felt like I could push back on an idea today	◯	◯
g. I felt like I could ask someone to expand on an idea today	◯	◯

Think about your experiences today. For each statement, **check all that apply**.

	The whole group	My small group	Neither the whole group nor my small group
I felt like my ideas were valued today by…	☐	☐	☐
I felt like I could ask someone to expand on an idea today in....	☐	☐	☐
I felt like I could share an idea I was unsure about today with…	☐	☐	☐
I felt like I could push back on an today idea in…	☐	☐	☐

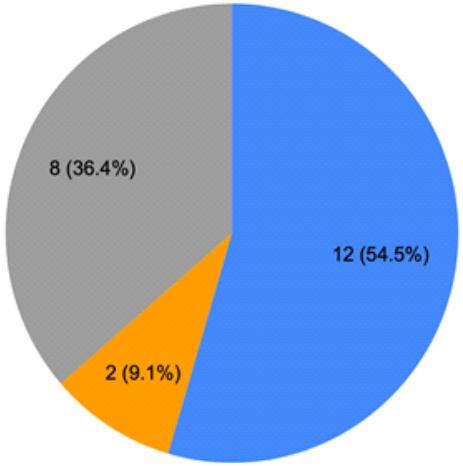
Sample Classroom Data: Whole Class Discussion

(*This is an older version of the survey, so some items stems and responses vary slightly from current version)

N = 22, but on some questions, 21 students respond

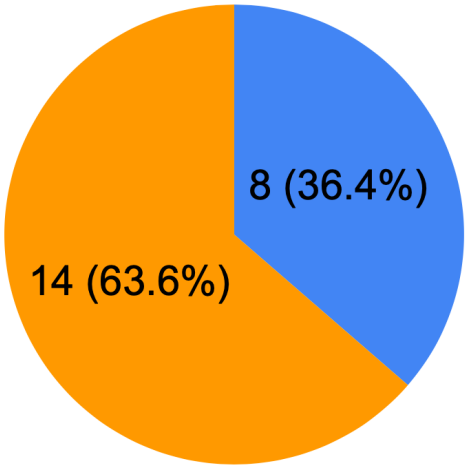
***1)** What did you need to do in order to be successful in your math class today?

A. **Solve problems using the steps the teacher showed me**
B. **Listen to and make sense of other students' reasoning**
C. **Finish all my work**



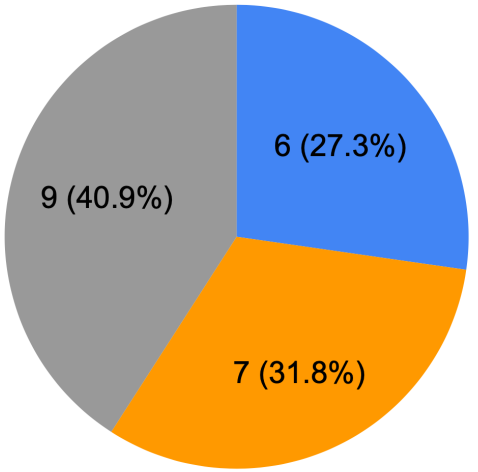
2) Was there one right way to solve the problem(s) today?

A. **Yes**
B. **No**



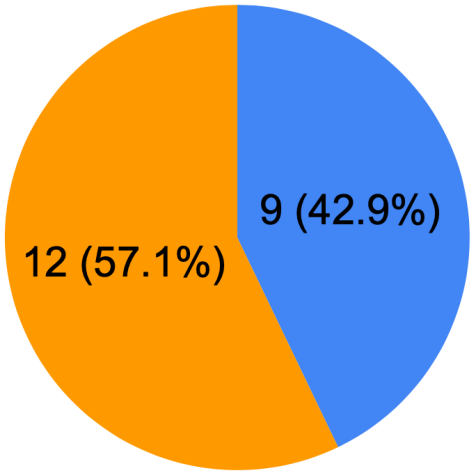
***3)** How comfortable were you sharing your thinking in the **whole class** today?

A. **Not comfortable**
B. **Somewhat comfortable**
C. **Very comfortable**



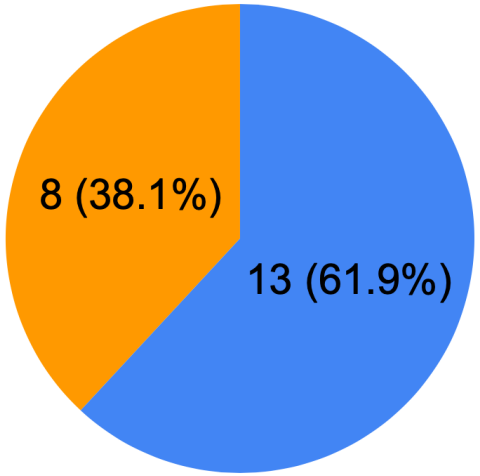
4) Did you have trouble understanding your classmates' thinking in today's whole class discussion?

A. **Yes**
B. **No**



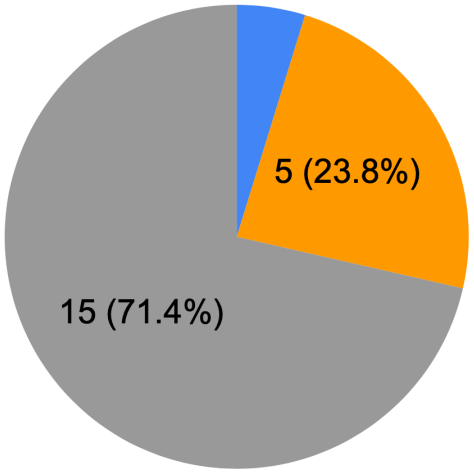
5) Did listening to other students in today's whole class discussion help make your thinking better?

A. **Yes**
B. **No**



***6)** What was the purpose of today's whole class discussion?

A. **Make sure I did the problem the way the teacher taught me (n = 1)**
B. **Check to see if our answers are correct**
C. **Learn different ways that work to solve a problem**



***7)** Who talked the most in today's whole class discussion?

A. **Students who knew the right answer**
B. **Students who shared ideas**
C. **Students who asked questions (n = 1)**
D. **The teacher (n= 1)**