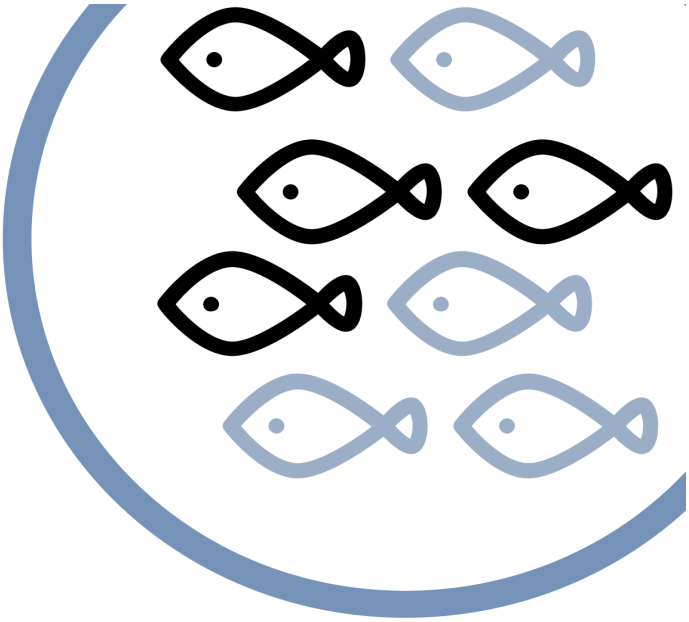
Practical Measures,
Routines & Representations



Small Group Work Survey

Thanks for your interest in the small group work survey!

In this document, you'll find a student-facing version of the survey and an annotated version of the survey, which includes 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 the survey, find the most recent version of this survey, or download other tools for instructional improvement, visit http://pmr2.org

A word of caution: 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.

Please note: **You will likely want to reduce the number of items that you administer, depending on your improvement focus. We recommend using no more than 10 items.**

Thank you!
The PMR2 Team

For each question, select one response that best describes your experience 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) 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

4) Did you work with a partner/small group in today's class?

- ◯ Yes
- ◯ No

STOP taking the survey if you answered NO to question 4.

CONTINUE taking the survey if you answered YES to question 4.

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

5) Did all students work together to solve a problem in your small group today?

- ◯ Yes
- ◯ No

6) Did you have trouble understanding other students' thinking in your small group today?

- ◯ Yes
- ◯ No

7) Did listening to other students in your small group help make your thinking better?

- ◯ Yes
- ◯ No

8) What was the purpose of working in a small group today?

- ◯ Solve a problem using the steps our teacher showed us
- ◯ Check with my group members to see if my answers were correct
- ◯ Investigate a mathematical idea
- ◯ Share the different ways students in my group were solving a problem

9) What was the purpose of your teacher asking questions in your small group today?

- ◯ My teacher did not talk to my group today
- ◯ Help us work together as a group
- ◯ Remind us of the right steps for solving a problem
- ◯ Ask us about a mathematical idea we were coming up with on our own
- ◯ Find out the ways we were thinking about a problem

10) Who talked the most in your small group today?

- ◯ Students who knew the right answer
- ◯ Students who shared ideas
- ◯ Students who asked questions
- ◯ The teacher

11) Were you comfortable sharing your thinking in your small group today?

- ◯ Yes
- ◯ No

12) Would it have been okay to share thinking you were unsure about in your small group today?

- ◯ Yes
- ◯ No

13) Did you feel like other students really thought about your mathematical ideas in your small group today?

- ◯ Yes
- ◯ No
- ◯ I did not share in the small group today

14) Did you feel like your teacher really thought about your mathematical ideas in your small group today?

- ◯ My teacher did not join my small group today
- ◯ Yes
- ◯ No
- ◯ I did not share in the small group today

Annotated Small-Group Discussion Survey

This survey includes fourteen items. We have found that this is too many items to give in one administration of the measure. Please choose the categories of items that make sense for your current goals. However, we suggest you ALWAYS include item 2 (Was there only one right way to solve the problem(s) today?) because it provides information about the cognitive demand of the task.

Note: We have included a small set of items that are specific to whole-class discussions on the current version of the small-group discussion survey. See the annotated version of the whole-class discussion survey for details about those items. In addition, Item 4 is used to assess which students worked in small groups. If a student answers "no," their survey will end.

Item 4

Did you work with a partner/small group in today's class?

☐ Yes ☐ No

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 &	**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?	*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.

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.	☐ Yes ☐ No	**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?

What students are accountable for in small-group discussions 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 (both whole-class and small-group) focus on students' thinking.	**Item 8** What was the purpose of working in a small group today? ☐ Solve a problem using the steps our teacher showed us ☐ Check with my group members to see if my answers were correct ☐ Investigate a mathematical idea ☐ Share the different ways students in my group were solving a problem *Note: We have found it useful to collapse options 1 and 2 as "producing correct answers" and, separately, options 3 and 4 as "sense-making."*	**Monitoring small groups:** ● What question might we ask students to engage with in their small group, so they are reasoning about mathematical ideas? **Establishing small group norms:** ● What are students expected to do or produce in their small groups? How can we communicate those expectations to them? How can we support them to meet those expectations?
Establishing norms and routines for small groups in which students want to share their ideas and feel their ideas are valued Engaging all students in productive discussion in small groups is hard work. It requires establishing norms and routines for small group work in which all students see value in sharing their ideas and feel their ideas are valued by each other. This involves negotiating norms regarding how students should treat each other and mathematical ideas (Horn 2012; Wood & Yackel, 1990). For example, it is important that students	**Item 11** Were you comfortable sharing your thinking in your small group today? ☐ Yes ☐ No **Item 5** Did all students work together to solve a problem in your small group today? ☐ Yes ☐ No **Item 10**	**Establishing small group norms for participation:** ● How do we set up routines for students' work in small groups to ensure everyone's voice is heard? ● What can we do to signal that it's important for students to share in-process ("rough draft") thinking, mistakes ... in

see value in listening to one another and view mistakes as opportunities for learning, rather than as something to be embarrassed about (Horn, 2012).	Who talked the most in your small group today? ☐ Students who knew the right answer ☐ Students who shared ideas ☐ Students who asked questions ☐ The teacher	their small groups? **Positioning students as competent:** ● How might we position students as having valuable mathematical ideas their group can build on?
Opportunities for students to listen to, reason about, and make sense of others' ideas 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 6** Did you have trouble understanding other students' thinking in your small group today? ☐ Yes ☐ No **Item 7** Did listening to other students in your small group today help make your thinking better? ☐ Yes ☐ No	**Establishing small group norms for sharing thinking and listening to one another:** ● How do we set up routines for students' small group work so that they press one another to clarify why they're doing what they're doing? ● How do we set up routines for students' small group work so that they press one another to talk about the *meaning* of the numbers they are manipulating?
Teacher's role during small group work Literature suggests that one important role of the teacher concerns supporting students to work together (Item 9, option #2; Cohen, 1994; Horn,	**Item 9** What was the purpose of your teacher asking questions in your small group today?	**Monitoring small groups:** ● Which groups did you check in with today, and why?

2012). A second important role of the teacher is to elicit students' thinking so that they can support students' efforts to solve tasks without telling students exactly how to solve the task (Item 9, option #4; Kazemi & Stipek, 2001; O'Connor & Michaels, 1996; Stein, Engle, Smith, & Hughes, 2008; Wood & Yackel, 1990). A third role of the teacher concerns assessing student understanding, so that the teacher can plan for a future whole-class discussion or lesson (Item 9, option #5; Stein et al., 2008). On the other hand, if teachers are reminding students of the steps for solving a problem (Item 9, option #3), they are likely diminishing students' opportunities to develop conceptual understanding and disciplinary reasoning.	☐ My teacher did not talk to my group today ☐ Help us work together as a group ☐ Remind us of the right steps for solving a problem ☐ Ask us about a mathematical idea we were coming up with on our own ☐ Find out the ways we were thinking about a problem	• What are key questions to ask each group so that we can get an idea of how different students are approaching the problem? • How might we avoid telling students the steps to solve the problem? What questions can ask / what we can do if they're struggling?
The extent to which students' ideas are valued by other students and the teacher 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 (Yackel & Cobb, 1996; Horn, 2012; Kazemi & Stipek, 2001). In order to support a productive and safe learning environment, it is critical that students feel like their mathematical ideas are valued. These items aim to learn about how students perceive their ideas are being treated in the classroom.	**Item 13** Did you feel like other students really thought about your mathematical ideas in your small group today? ☐ Yes ☐ No ☐ I did not share in the small group today **Item 14** Did you feel like your teacher really thought about your mathematical ideas in your small group today?	**Supporting students to see the value in each other's mathematical ideas** • What structures and processes (e.g. rubrics, sentence stems, etc.) might support students to see value in one another's thinking? **Supporting students to see that you value their mathematical ideas** • In what ways can you

	☐ My teacher did not join my small group today ☐ Yes ☐ No ☐ I did not share in the small group today	position students' ideas as valuable/meaningful? How might you communicate that to students?
Whether students can share tentative, exploratory (or "rough draft;" Jansen, 2020) mathematical thinking Engaging in deep mathematical learning involves trying out tentative, exploratory ideas and revising those ideas through engagement with others (Jansen, Cooper, Vascellaro, & Wandless, 2016). Establishing a culture in which students are willing to take "intellectual risks" is especially difficult in mathematics, where students have often been taught that mistakes are to be avoided (Jansen et al., 2016). It is therefore important to support students to treat mistakes as opportunities for learning, rather than as something to be embarrassed about (Horn, 2012; Kazemi & Stipek, 2001). In classrooms where students willingly share tentative, exploratory thinking, they are more likely to engage in deep learning, work on more challenging tasks, and persist.	**Item 12** Would it have been ok to share thinking you were unsure about in your small group today? ☐ Yes ☐ No	**Normalizing tentative, exploratory thinking** ● How might we begin to normalize students' sharing tentative, exploratory ideas? ● What structures might we use to support students to see tentative, exploratory ideas as a valuable part of learning? ● How might I foster a classroom culture in which students can take intellectual risks? ● How might I support students to see learning mathematics as involving revising their thinking over time?

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