

Math Practice 1: Make Sense of Problems and Persevere in Solving Them (District/Building Leader Facilitation Guide)

Presenter:

Intended Use

This facilitation guide is designed for district and school leaders to use when delivering sessions on the Standards for Mathematical Practice 1: Make Sense of Problems and Persevere in Solving Them. The document can be used by district and building leaders to facilitate broader conversations on the use of local data, focusing on the broader impact of the MPs across building and district levels. Its purpose is to help broaden discussions with staff members on Math Practice 1 (MP 1) to a building and district level.

Viewing the Math Practice series can be done in any order. While viewing the series is encouraged in groups, it can also be done individually. To get the full benefit of the professional development series, educators should engage in the tasks and participate in local discussions on Mathematical Practice. Therefore, viewing the professional learning series in small groups is encouraged over individuals watching it in isolation.

Reproducing the Facilitation Guide

If you would like to make copies of any portion of this facilitation guide or accompanying PowerPoint presentation, please credit the Ohio Department of Education and Workforce.

During Facilitation: Discussion Questions

Pause the recording at the times indicated in the recording and have discussions in smaller groups, and then in the larger group.

In slides 21-23, complete the task from [Implementing the Mathematical Practice Standards](#) for the grade band(s) you work with the most.

DISCUSSION QUESTIONS

PowerPoint Slide 21: Elementary School Task

- What does $\frac{2}{5} + \frac{1}{2}$ equal?
- Read the “[Adding Fractions with Unlike Denominators](#)” vignette from the task on page 3
- Answer the discussion questions from the “[Adding Fractions with Unlike Denominators](#)” vignette on page 4

DISCUSSION QUESTIONS

PowerPoint Slide 22: Middle School Task

- Two vertices of a triangle are located at (0,4) and (0,10). The area of the triangle is 12 square units. Where can the third vertex be located?
- Read the “[Finding Triangle Vertices](#)” vignette from the task starting on page 3

- Answer the discussion questions from the “[Finding Triangle Vertices](#)” vignette starting on page 7

DISCUSSION QUESTIONS

PowerPoint Slide 23: High School Task

- The following results describe the scores from a pre-test (a test given before a chapter is taught) in two math classes.

| | Class 1 | Class 2 |
|--------------------|---------|---------|
| Mean | 78 | 72 |
| Median | 65 | 73 |
| Standard deviation | 16 | 6 |

What do the pre-test scores seem to say about how much the students in each class already know about the topic of this test?

- Read the “[Interpreting Statistical Measures](#)” vignette from the task starting on page 3
- Answer the discussion questions from the “[Interpreting Statistical Measures](#)” vignette starting on page 6

DISCUSSION QUESTIONS

PowerPoint Slides 24

- How can we ensure that Math Practice 1 is consistently implemented across all classrooms in our district?
- What strategies can we use to support teachers in making sense of problems and persevering in solving them at the building and district levels?

In slides 26-28, complete the task from [Implementing the Mathematical Practice Standards](#) for the grade band(s) you work with the most.

DISCUSSION QUESTIONS

PowerPoint Slide 26: Elementary School Task

- In the student dialogue starting on page 4 of the “[Adding Fractions with Unlike Denominators](#)” vignette, how does Dana get $\frac{3}{7}$ from $\frac{2}{5} + \frac{1}{2}$? What is the common mistake the student is making?
- In line 3, how does Anita realize that $\frac{3}{7}$ is incorrect? How does Anita know this?
- In line 8, Dana is giving several examples of addition. What do you notice about all the examples? What does this tell you about two numbers if you want to add them together to get one number?

DISCUSSION QUESTIONS

PowerPoint Slide 27: Middle School Task

- In the “[Finding Triangle Vertices](#)” vignette (page 7), have the students in the dialogue found all possible coordinates for the third vertex of the triangle? Why or why not?
- What actions or questions would you use to get the students in the dialogue to extend their reasoning and find the second set of possible vertices?

- Suppose that the students in the dialogue were working in three dimensions. Given that two vertices are at $(0,4,0)$ and $(0,10,0)$, where could the third vertex of the triangle be located?

DISCUSSION QUESTIONS

PowerPoint Slide 28: High School Task

- In the “[Interpreting Statistical Measures](#)” vignette (page 6), what information does Lee use to generate the graphs in line 6? What does that graph tell you about the students in Classes 1 and 2?
- What information does Matei use to generate the graphs in line 7? What does it suggest about the students in Classes 1 and 2?
- In line 16, Lee points out that Chris has made an assumption about class size. How would class size affect Chris’ thinking? As you think about this question, try creating class sets for classes with 25 students, 30 students, and 50 students that have the given summary statistics.

DISCUSSION QUESTIONS

PowerPoint Slide 30

- What local data do we currently collect that can help us understand the implementation of Math Practice 1?
- How can we use this data to improve our instructional practices and student outcomes?

DISCUSSION QUESTIONS

Feedback on Additional Supports

- What additional support do our teachers and students need to effectively implement Math Practice 1?
- How can building and district leaders provide these supports?

Engagement Activities

The following are optional activities for district and school leaders to use as part of their facilitation session(s) to further engage their audience.

Student Engagement Strategies

- Generate a list of possible strategies to engage students in MP 1.
 - Brainstorm and share strategies for engaging students in meaningful demonstration for MP 1. Strategies could include, but are not limited to, hands-on activities, real-world applications, and technology integration

Instructional Materials Hunt

- Practice addressing common challenges in implementing MP 1
 - Find instructional tasks and examples of MP 1 in your local high-quality instructional materials for mathematics. Share your findings and discuss how these tasks can be used with instruction. Include any challenges students may have with MP 1 in the tasks and examples you selected.

Gallery Walk

- Discuss best practices for implementing MP 1.
 - Set up stations around the room with posters or digital displays showcasing best practices for implementing MP 1. Have participants walk around the room, review the displays, and leave comments or questions on sticky notes. Facilitate a group discussion to share insights and ideas.

Resource Links

Ohio Department of Education Documents

- [Standards for Mathematical Practice](#)
- [Kindergarten - Grade 5](#)
- [Grades 6-8](#)
- [High School](#)

University of Arizona Progressions

- [Standards for Mathematical Practice: Commentary and Elaborations for K-5](#)
- [Standards for Mathematical Practice: Commentary and Elaborations for 6-8](#)

Other National Resources

- [Carnegie Learning SMP Teacher Rubric](#)
- [Engaging the SMPs: Look Fors and Question Stems](#) by the Kentucky Department of Education
- [Illustrative Mathematics](#)
- [Implementing Standards for Mathematical Practice](#)
- [Inside Mathematics](#)
- [Math Talk Resources](#)
- [Rich Math Task Rubric](#) by the Virginia Department of Education
- [Robert Kaplinsky: Math CCSS Math Practices Readable](#)

Conversation Notes: