

# Math Practice 1: Make Sense of Problems and Persevere in Solving Them (Facilitation Guide)

## Presenter:

## Intended Use

The facilitation guide is intended to be used by educators when viewing the voice-over recording of Math Practice 1: Make Sense of Problems and Persevere in Solving Them. State Support Team staff, Educational Service Center consultants, districts, and schools are encouraged to use this resource as part of a professional development series that spans all eight Standards for Mathematical Practice.

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 Slide 24: How did the teacher in your vignette support their students in making sense of the problem(s) they were given and/or build their students’ perseverance?*

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 QUESTION

*PowerPoint Slide 29:* How would you support students to make sense of these problems and persevere in their problem-solving in your classroom(s)?

## 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: