

Math Practice 5: Use Appropriate Tools Strategically (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 5: Use Appropriate Tools Strategically. 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 5 (MP 5) 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.

DISCUSSION QUESTIONS

PowerPoint Slide 20

- How can we ensure that Math Practice 5 is consistently implemented across all classrooms in our district?
- What strategies can we use to support teachers in using appropriate tools strategically at the building and district levels?

DISCUSSION QUESTIONS

PowerPoint Slide 28

- What are the specific learning needs of our students across the building and district levels?
- How can we address these needs to ensure that students regularly demonstrate their understanding of Math Practice 5 in the classroom?

DISCUSSION QUESTIONS

PowerPoint Slide 33

- What local data do we currently collect that can help us understand the implementation of Math Practice 5?
- How can we use this data to improve our instructional practices and student outcomes?

DISCUSSION QUESTION

PowerPoint Slide 16

- What are some common physical or virtual manipulatives used in the classroom?

DISCUSSION QUESTIONS

PowerPoint Slide 20: A Pencil and an Eraser Task

- The pencil costs 75 cents. The eraser costs 20 cents less than the pencil. How much does the eraser cost?
- How might Grade 2 students solve this problem?

DISCUSSION QUESTION

PowerPoint Slide 21: Postage Stamps Task

- The post office packages stamps like this:
 - 10 stamps in each row.
 - 10 rows of 10 in each sheet.

Yesterday, a student was at the post office. They saw 4 full sheets, 7 rows, and 2 extra stamps. How many stamps did they see?

How might Grade 2 students solve this problem?

DISCUSSION QUESTION

PowerPoint Slide 22: Who Sold the Most Chocolate? Task

- Jared sold 194 Boy Scout chocolate bars.

Matthew sold three times as many as Jared.

Gary sold 297 fewer than Matthew.

How many bars did Gary sell?

DISCUSSION QUESTION

PowerPoint Slide 23: Baking Bread Task

- Kelly was baking bread but could only find her $\frac{1}{8}$ -cup measuring cup. She needs $\frac{1}{4}$ cup sugar, $\frac{3}{4}$ cup whole wheat flour, and $\frac{1}{2}$ cup all-purpose flour. How many $\frac{1}{8}$ cups will she need for each ingredient?

DISCUSSION QUESTION

PowerPoint Slide 24: What's the Difference? Task

- What is the difference between the two expressions? Convince me.
20% of 50 AND 50% of 20

DISCUSSION QUESTION

PowerPoint Slide 25: Difference of 2.45

- Find a pair of numbers that have a difference of 2.45.

Table 1: Difference of 2.45			
3.4	6.05	17.21	12.91
14.76	5.85	10.46	8.5

Explain how you selected your numbers.

DISCUSSION QUESTIONS

PowerPoint Slide 26: Function Table

- Write a rule for the function table.

Input (x)	Output (y)
1	5
2	7
5	13
8	19

DISCUSSION QUESTIONS

PowerPoint Slide 27: Picking Candy Task

- A teacher has a bag of candy. There are 12 candies in the bag. There are 7 milk chocolate candies and 5 bubble gum candies.

What is the probability that the teacher takes 2 pieces of candy from the bag and they are both chocolate candies or both are bubble gum candies?

How do you know?

DISCUSSION QUESTIONS

PowerPoint Slide 28: Painting a Cube Task

- A teacher has a bag of candy. There are 12 candies in the bag. There are 7 candies with milk chocolate in the center and 5 other candies with bubble gum in the center.

DISCUSSION QUESTION

PowerPoint Slide 29: Breakout Room Discussion Debrief

- Share out some of the tools and manipulatives you use the most at your grade band.
- What are the tools that you could use at your grade band to help students be more successful?
- How can we ensure that Math Practice 5 is consistently implemented across all classrooms in our district?
- What are the commonalities and differences across the grade bands you notice as you listen to the responses?

DISCUSSION QUESTION

PowerPoint Slide 30: Choice (Video)

- Where are the manipulatives being used in the video?
- Who decides what manipulatives to use?

DISCUSSION QUESTIONS

PowerPoint Slide 32

- How do you see students' use of mathematical tools evolving from elementary through high school? Can you share specific examples of how students in different grade levels use tools to solve problems?
- In what ways do you encourage students to reflect on the effectiveness and limitations of the tools they choose? How do you guide them to make strategic decisions about which tools to use in various mathematical contexts?
- How do you integrate technology into your instruction to support students in using appropriate tools strategically? Can you provide examples of how technology has enhanced students' understanding and problem-solving abilities?

DISCUSSION QUESTIONS

Feedback on Additional Supports

- What additional support do our teachers and students need to effectively implement Math Practice 5?
- 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.

Tool Exploration Activity

- Participants explore and evaluate various mathematical tools.
 - Set up stations with different mathematical tools (e.g., physical and virtual manipulatives, calculators, software). Ask participants to rotate through the stations, explore the tools, and discuss their potential uses and limitations. Facilitate a group discussion to share insights and best practices.

Scenario-Based Problem Solving

- Practice using appropriate tools strategically in different mathematical scenarios.
 - Present participants with a series of mathematical problems or scenarios. Divide them into small groups and ask each group to choose and use appropriate tools to solve the problems. Afterward, have each group present their solutions and discuss the reasoning behind their tool choices.

Technology Integration Workshop

- Explore the use of technology to support the strategic use of mathematical tools.
 - Provide participants with access to various technological tools (e.g., virtual manipulatives, graphing calculators, dynamic geometry software). Ask them to work in pairs or small groups to complete tasks that require the use of these tools. Facilitate a group discussion to share experiences and discuss how technology can enhance students' understanding and problem-solving abilities.

Resource Links

Ohio Department of Education and Workforce 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

- [Inside Mathematics](#)
- [Illustrative Mathematics](#)
- [Robert Kaplinsky: Math CCSS Math Practices Readable](#)

Conversation Notes: