

Math Practice 8: Look for and Express Regularity in Repeated Reasoning (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 8: Look for and Express Regularity in Repeated Reasoning. 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 8 (MP 8) to a building and district level.

The Math Practice sessions can be done in any order. While viewing the presentation 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 at the times indicated in the presentation and have discussions in smaller groups, and then in the larger group.

DISCUSSION QUESTION

PowerPoint Slide 16: In-person Discussion or Virtual Waterfall Chat

- *Live Session Participants:* Engage in local discussions using the question, “What comes to your mind when you think about MP 8: Look for and Express Regularity in Repeated Reasoning?”
- *Virtual Presentation Participants:* Allow time for individual reflection and writing. Have participants enter their response to the question. “What comes to your mind when you think about MP 8: Look for and Express Regularity in Repeated Reasoning?”, in a waterfall chat. Provide time for the attendees to read through and discuss responses from the waterfall chat prior to moving on.

DISCUSSION QUESTION

PowerPoint Slide 25: Kindergarten-Grade 2 Tasks

- What is the same about the four problems below? What is different?
 - A. A student has 7 pieces of candy. He gives 3 pieces to a friend. How many pieces do he still have for himself?

- B. A person with \$12 buys an item for \$8. How much money does the person have left?
- C. Packet A contains 9 pieces of candy. Packet B contains 5 pieces of candy. How many more pieces does A have than B?
- D. If one job pays \$11 and another pays \$7, how much more does the first job pay than the second?

DISCUSSION QUESTION

PowerPoint Slide 26: Grades 3-5 Tasks

- Use mental math to solve the two Number Talk tasks.
- Discuss your mental math problem-solving strategies for both Number Talk Tasks with colleagues afterward.

DISCUSSION QUESTION

PowerPoint Slide 27: Grades 6-8 Tasks

- Use mental math to solve the two Number Talk tasks.
- Discuss your mental math problem-solving strategies for both Number Talk Tasks with colleagues afterward.

DISCUSSION QUESTION

PowerPoint Slide 28: Grades 9-12 Tasks

- Compare and contrast the mathematical proofs.

DISCUSSION QUESTION

PowerPoint Slide 29

- How can we ensure that Math Practice 8 is consistently implemented across all classrooms in our district?
- What strategies can we use to support teachers in looking for and expressing regularity in repeated reasoning at the building and district levels?

DISCUSSION QUESTION

PowerPoint Slide 30: Discussion Debrief

- 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 8 in the classroom?

DISCUSSION QUESTION

PowerPoint Slides 31-36: Discussion

- What do you think Math Practice 8: Look for and Express Regularity in Repeated Reasoning means or looks like at your grade level/course?
- How does your school or district support students' progression of repeated reasoning across grade levels and/or courses?

DISCUSSION QUESTIONS

PowerPoint Slides 37: Discussion Debrief

- What do you think Math Practice 8: Look for and Express Regularity in Repeated Reasoning means or looks like at your grade level/course?
- How does your school or district support students' progression of repeated reasoning across grade levels and/or courses?

DISCUSSION QUESTIONS

PowerPoint Slide 42

- What local data do we currently collect that can help us understand the implementation of Math Practice 8?
- How can we use this data to improve our instructional practices and student outcomes?

DISCUSSION QUESTIONS

Feedback on Additional Supports

- What additional supports do our teachers and students need to effectively implement Math Practice 8?
- 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 engage their audience further.

Pattern Recognition Activity

- Identify and use patterns and structures in mathematical problems.
 - Provide participants with a series of mathematical problems that involve patterns and structures. Ask them to identify the patterns and use them to solve the problems. Facilitate a group discussion on the importance of recognizing and using patterns in mathematics.

Structure Exploration Workshop

- Explore the structure of mathematical concepts and how they can be used to solve problems.
 - Set up stations with different mathematical concepts (e.g., number systems, algebraic expressions, geometric figures). Ask participants to explore the structure of each concept and discuss how it can be used to solve problems. Facilitate a group discussion to share insights and best practices.

Interactive Problem-Solving

- Engage participants in solving complex mathematical problems that require the use of structure.
 - Present participants with a series of challenging mathematical problems. Divide them into small groups and ask each group to solve the problems using different strategies. Afterward, have each group present their solutions and discuss the reasoning behind their approaches.

Resources Links

Ohio Department of Education Documents

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

Other Resources

- [Implementing Standards for Mathematical Practices](#) from Louisiana Believes
- [The Power of Making Mistakes in Learning Math”](#)
- [Implementing the Mathematical Practice Standards](#)
- [Mathematical Practice Standards](#) by Charles A. Dana Center
- [Standards for Mathematical Practice Rubric](#) by the Ohio Department of Education
- [Ohio Learning Standards](#)
- [Math Argumentation Rubric](#) (Draft)
- [What Isn’t Mathematical Modeling?](#)

References

Boston, M., Dillon, F., Smith, M., & Miller, S. (2017). *Taking Action Implementing Effective Mathematics Teaching Practices, Grades 9-12*. Reston, VA: The National Council of Teachers of Mathematics

Graham, K., Cuoco, A., & Zimmermann, G., (2010). *Focus on High School Mathematics: Reasoning and Sense Making*. Reston, VA: The National Council of Teachers of Mathematics

Gurl, Theresa J, et al. *Implementing the Common Core State Standards through Mathematical Problem Solving. High School*. Reston, Va, NCTM, 2012.

Illustrative Mathematics. (2014, May 6). Standards for Mathematical Practice: Commentary and Elaborations for 6–8. Tucson, AZ.

Koestler, C., Felton-Koestler, M. D., Bieda, K., & Otten, S. (2013). *Connecting the NCTM process standards and the CCSSM practices*. Reston, VA: The National Council of Teachers of Mathematics.

O'Connell, S., & San Giovanni, J. (2013). *Putting the practices into action: Implementing the common core standards for mathematical practice, K-8*. Portsmouth, NH: Heinemann.

Conversation Notes: