Math Practice 2: Reason Abstractly and Quantitatively (School 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 Standard for Mathematical Practice 2: Reason Abstractly and Quantitatively. 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 the Math Practice 1 (MP 2) 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

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 Slides 19-28: Looking at Tasks That Promote MP 2

- Explore the instructional tasks aligned to the grade level(s) you teach or work with the most.
- As you explore the instructional tasks, discuss:
    - Where in the task are there opportunities for students to show their understanding of MP 2?
    - As a teacher, how would you highlight this with your instruction?

DISCUSSION QUESTIONS

PowerPoint Slide 29

- How can we ensure that Math Practice 2 is consistently implemented across all classrooms in our district?
- What strategies can we use to support teachers in reasoning abstractly and quantitatively at the building and district levels?
- 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 2 in the classroom?

DISCUSSION QUESTIONS

PowerPoint Slide 40

- What local data do we currently collect that can help us understand the implementation of Math Practice 2?
- 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 2?
- 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.

Data Analysis Activity

- Analyze local data to identify trends and areas for improvement in the implementation of Math Practice 2.
    - Divide participants into small groups and provide them with local data sets. Ask each group to analyze the data and identify key trends, strengths, and areas for improvement. Have each group present their findings and discuss how the data can inform instructional practices.

Concept Mapping

- Create visual representations of the connections between abstract and quantitative reasoning in various mathematical contexts.
    - Provide participants with large sheets of paper and markers. Ask them to create concept maps that illustrate the relationships between different mathematical concepts and how they can be used to reason abstractly and quantitatively. Encourage participants to share and discuss their maps with the group.

Interactive Problem-Solving

- Engage participants in solving complex mathematical problems that require abstract and quantitative reasoning. This can be done by participating in the problem-solving tasks on PowerPoint Slides 19 -29 with others who do not teach or work primarily at the task-aligned grade band.
    - 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 mathematical reasoning behind their approaches.

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
- Illustrative Mathematics
- Implementing Standards for Mathematical Practice
- Inside Mathematics
- Rich Math Task Rubric
- Robert Kaplinsky: Math CCSS Math Practices Readable

References

Illustrative Mathematics. (2014, February 12). Standards for Mathematical Practice: Commentary and Elaborations for K–5. Tucson, AZ.

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., & SanGiovanni, J. (2013). *Putting the practices into action: Implementing the common core standards for mathematical practice, K-8*. Portsmouth, NH: Heinemann.

Conversation Notes: