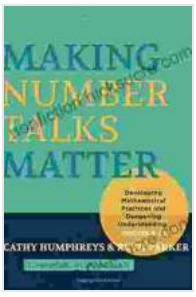
Developing Mathematical Practices and Deepening Understanding in Grades 10-12: A Comprehensive Guide for Educators



Making Number Talks Matter: Developing Mathematical Practices and Deepening Understanding, Grades 3-10

by Doc Severson

4.7 out of 5

Language	: English
Text-to-Speech	: Enabled
Enhanced typesetting	: Enabled
Word Wise	: Enabled
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Developing mathematical practices and deepening student understanding are essential goals for mathematics education in grades 10-12. By engaging in mathematical practices, students develop the skills and habits of mind that are necessary for success in mathematics and beyond. Deepening understanding, on the other hand, requires students to go beyond simply memorizing facts and procedures. They need to develop a conceptual understanding of mathematics and be able to apply their knowledge to new situations.

This guide provides educators with a comprehensive overview of the mathematical practices and strategies for deepening student understanding in grades 10-12. It includes:

- A discussion of the eight mathematical practices
- A description of strategies for deepening student understanding
- A collection of resources to support teachers in developing mathematical practices and deepening student understanding

The Mathematical Practices

The National Council of Teachers of Mathematics (NCTM) has identified eight mathematical practices that are essential for students to develop in order to be successful in mathematics:

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Express regularity in repeated reasoning.

These practices are not meant to be taught in isolation. Rather, they should be integrated into all aspects of mathematics instruction. By engaging in these practices, students develop the skills and habits of mind that are necessary for success in mathematics and beyond.

Strategies for Deepening Student Understanding

In addition to developing mathematical practices, it is also important to focus on deepening student understanding. This means helping students to develop a conceptual understanding of mathematics and be able to apply their knowledge to new situations.

There are a number of strategies that teachers can use to deepen student understanding:

- **Use manipulatives and visual aids.** Manipulatives and visual aids can help students to concretely represent mathematical concepts and relationships. This can make it easier for students to understand the underlying concepts and to apply their knowledge to new situations.
- **Encourage students to ask questions.** Questions are a powerful tool for learning. By asking questions, students can demonstrate their understanding of concepts and identify areas where they need more support.
- **Provide opportunities for students to explain their thinking.** Explaining their thinking helps students to clarify their understanding and to identify areas where they need more support.
- **Use problem-solving tasks.** Problem-solving tasks require students to apply their knowledge to new situations. This can help students to develop a deeper understanding of mathematical concepts.
- **Use technology.** Technology can be a powerful tool for deepening student understanding. There are a variety of software programs and online resources that can be used to support student learning.

Resources

There are a number of resources available to support teachers in developing mathematical practices and deepening student understanding. These resources include:

- The National Council of Teachers of Mathematics (NCTM) website: https://www.nctm.org
- The National Council of Supervisors of Mathematics (NCSM) website: https://www.ncsm.org
- The Association of Mathematics Teacher Educators (AMTE) website: https://www.amte.net
- The Mathematical Association of America (MAA) website: https://www.maa.org

These organizations provide a variety of resources for teachers, including lesson plans, professional development opportunities, and research-based articles.

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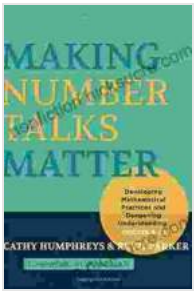

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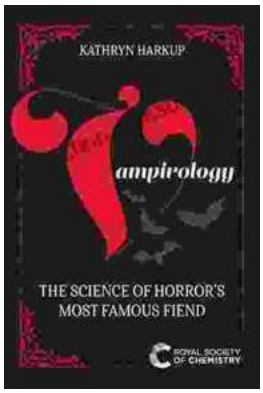

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