
Developing Essential Understanding of Expressions, Equations, and Functions

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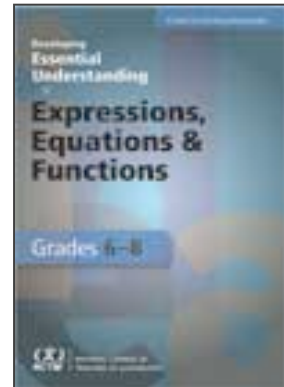
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Mathematical and Pedagogical Knowledge: Books

DESCRIPTION

Developing Essential Understanding of Expressions, Equations & Functions for Grades 6-8, by Gwendolyn Lloyd, Beth Herbel-Eisenmann, and Jon R. Star, engages the reader with ideas that need to be understood thoroughly and used flexibly by teachers in developing an understanding of algebraic ideas that transcend the content intended for students.



Chapter 1 is organized around five big ideas essential for 6th through 8th grade mathematics teachers to know about expressions, equations, and functions. Each big idea is supported by specific ideas called essential understandings. The big ideas include:

- Expressions as Building Blocks
- Variables as Useful Tools
- Equality and Equivalence
- Representing and Analyzing Functions
- Solving Equations

These big ideas of algebra are also important in upper elementary and high school. Chapter 2 describes connections in grades 3-5 and in grades 9-12 including:

- Properties of Addition and Multiplication
- Patterns
- Functions
- Solving Equations

Chapter 3 builds on the understanding of the big ideas and longitudinal connections from the first two chapters to help you choose and develop appropriate tasks, techniques, and tools for assessing student understanding to support the learning of significant mathematics.

STAGE 1 LEADERSHIP DEVELOPMENT

Developing Essential Understanding of Expressions, Equations & Functions for Grades 6-8, by Gwendolyn Lloyd, Beth Herbel-Eisenmann, and Jon R. Star, supports stage 1 leadership development of leaders working to collaborate and implement the Teaching and Learning Principle. Coaches wanting to deepen their understanding of expressions, equations, and functions will find this book useful. Working alone or with a colleague, coaches may begin by reading and reflecting on the mathematical ideas in chapters 1 and 2. With this perspective in mind, continue reading and reflecting about the challenges of teaching, learning, and assessment of algebraic ideas along with possible approaches to them in the final chapter. Chapter 3 draws on research about teaching algebra to provide a look at how the task, techniques, and tools work to shape the learning and teaching of expressions, equations, and functions in the classroom.

The reflection prompts throughout the book provide opportunities for readers to discuss the ideas presented. In chapter 3, the reflection prompts ask readers to think about their own classroom practices and their own curriculum materials:

- What different experiences are students provided to develop their own understanding?
- How are algebraic ideas presented in textbooks?
- What different representations are provided?
- What prompts are used to help students translate among representations?
- How is technology used in the classroom?
- What questions might be asked to scaffold understanding?
- How are ideas verbalized in the classroom?