Developing Essential Understanding of Ratios, Proportions, and Proportional Reasoning

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DESCRIPTION

Developing Essential Understanding of Ratios, Proportions, and Proportional Reasoning, by Joanne Lobato, Amy Ellis, and Rose Mary Zbiek, discusses many mathematical ideas that are common in middle school mathematics. The book will engage teachers and their leaders with these ideas, helping to guide them in planning and implementing lessons and assessing student learning.
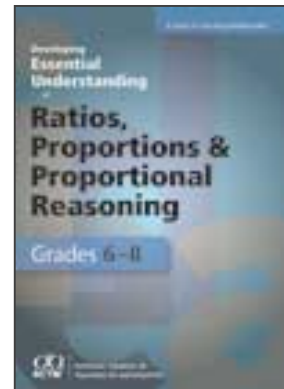
In chapter 1, two methods of proportional reasoning are described. Method 1 uses iteration and partitioning and Method 2 uses a multiplicative comparison. Both methods suggest the following big idea: When two quantities are related proportionally, the ratio of one quantity to the other is invariant as the numerical values of both quantities change by the same factor. Supporting this one big idea are ten interconnected essential understandings that are related to the big idea.

Chapter 2 considers how the essential understandings associated with the big idea are connected to slope, linear functions, and algebraic equations and also how proportional reasoning supports understanding measurement. Chapter 3 outlines three shifts that teachers can help students make on their way to becoming proportional thinkers and describes strategies for negotiating these shifts and evaluating student understanding.

STAGE 1 LEADERSHIP DEVELOPMENT

Developing Essential Understanding of Ratios, Proportions, and Proportional Reasoning, by Joanne Lobato, Amy Ellis and Rose Mary Zbiek, supports stage 1 leadership development of specialists working to know and model the Teaching and Learning Principle. Specialists wanting to deepen their understanding of ratios, proportions, and proportional reasoning and the challenges in teaching rational numbers will find this book a useful tool. Working alone or with a colleague, specialists may begin by reading about the challenges of teaching, learning, and assessment of ratios, proportions, and proportional reasoning along with possible approaches to them in chapter 3. With this perspective in mind, read and reflect on the mathematical ideas in chapters 1 and 2.