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Developing essential understanding of multiplication and division for teaching mathematics in grades 3–5.

Reston, VA: National Council of Teachers of Mathematics (NCTM) (ISBN 978-0-87353-667-7/pbk; 978-0-87353-799-5/ebook). 84 p. (2011).

Publisher's description: "Unpacking" the ideas related to multiplication and division is a critical step in developing a deeper understanding. To those without specialized training, many of these ideas might appear to be easy to teach. But those who teach in grades 3–5 are aware of their subtleties and complexities. This book identifies and examines two big ideas and related essential understandings for teaching multiplication and division in grades 3–5. Big Idea 1 captures the notion that multiplication is usefully defined as a scalar operation. Problem situations modeled by multiplication have an element that represents the scalar and an element that represents the quantity to which the scalar applies. Big Idea 2 relates to the algorithms that problem solvers have invented – some of which have become "standard" – for multiplying and dividing. The authors examine the ways in which counting, adding, and subtracting lead to multiplication and division, as well as the role that these operations play in algebraic expressions and other advanced topics. The book examines challenges in teaching, learning, and assessment and is interspersed with questions for teachers' reflection.

Classification: F32 F33