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Susan L. Addington* (saddingt@csusb.edu), Math Dept., CSUSB, 5500 University Pkwy., San Bernardino, CA 92407. *Measuring the World: Preparing Elementary Teachers to Prepare Students for Algebra.*

Measuring the World is a complete textbook for a math for elementary teachers course. It is available in preliminary form online. MtW takes the point of view that arithmetic and algebra are a syntax for modeling measurement, as well as counting. The book grounds students in measurement activities and links the activities to the symbolic mathematics they have previously learned in school. Pretests show huge gaps in these students' mastery of measurement. Much research in the last few decades has shown that "multiplicative thinking" is the main bottleneck for algebra; this includes not only multiplication and division, but also fractions, proportions, linear functions, exponents and logarithms, as well as basic aspects of measurement such as units and area. Preparation for algebra in MtW happens in three stages: (1) Concepts of measurement, number, and operations. This includes discussions of properties of number systems in contextual situations, as well as reading and writing expressions. (2) Multiplicative thinking, modeling proportional relationships with tables, parallel number lines and graphs, and function arrow diagrams, before moving to the traditional algebraic methods for solving proportions. (3) Elementary functions, in context, with tables and graphs. (Received September 22, 2009)