

ZMATH 2015e.00696**Colton, Connie; Smith, Wendy M.****Successfully transitioning to linear equations.**

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Summary: The Common Core State Standards for Mathematics asks students in as early as fourth grade to solve word problems using equations with variables. Equations studied at this level generate a single solution, such as the equation $x + 10 = 25$. For students in fifth grade, the Common Core standard for algebraic thinking expects them to generate and compare the relationship between two patterns, such as those formed by $x + 3$ and $x + 6$. The standard goes on to ask students to graph ordered pairs on a coordinate plane to support their investigation. Students in sixth grade are asked to evaluate expressions as well as write and solve equations derived from real-world contexts. These early expectations lay the foundation for meeting multiple standards outlined in the Common Core standard for high school algebra. However, for many students, progressing from modeling situations with equations such as $3x + 10 = 25$ to equations such as $3x + 10 = y$ creates a seemingly insurmountable problem. The transition from one-variable equations with a single solution to linear equations with two variables and infinitely many solutions presents many challenges. One specific obstacle to making this transition lies in students' misunderstanding of the equals sign. For many students, the equals sign indicates an operation rather than a relationship [*E. R. Ronda*, Math. Educ. Res. J. 21, No. 1, 31–53 (2009; ME 2010d.00479)]. Once the concept of relational equality is sufficiently developed, students can begin the task of making sense of two-variable equations. Knowledge construction for understanding linear equations occurs in various stages. Ronda [loc. cit.] suggests four clearly defined stages of conceptual development, which range from the most elementary level – being able to evaluate variables for specific values – to the most complex level – being able to view the function holistically. (ERIC)

Classification: H33 D73*Keywords:* linear equations; algebra; word problems; activities; problem solving; transition; linear function; graph; equal sign<http://www.nctm.org/publications/article.aspx?id=40434>