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Equations in the Common Core: Algebraic Reasoning and Problem Solving

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Algebraic reasoning is a capstone of middle school math and serves as a gatekeeper of sorts for higher-level mathematics and future careers. Middle school students frequently lack the deep understanding of algebraic reasoning required to successfully manipulate and solve equations. This weaker foundation leads students to common algebraic mistakes like not completely distributing a term when multiplied to an expression or attempting to simplify an equation through inverse properties but only doing so on one side of the equation. These mistakes and their underlying misconceptions hinder student success, as the 8th grade curriculum requires an increasing level of sophistication in algebraic reasoning. A solid foundation in the underlying concepts of algebraic reasoning paired with a classroom approach rich with the use of manipulatives and physical models can increase students' capacity to solve multi-step equations. Manipulatives represent a concrete representation of abstract algebraic reasoning that can serve to make the symbolic processes of algebra more accessible to all students.

(Developed for Common Core, grade 8; recommended for Algebra, grades 8-9, and Pre-Algebra, grade 7)