Hands-On Equations®
OBJECTIVES - LEVEL I

LESSON 1	Students will use a symbol to represent an unknown.
	Students will demonstrate an understanding of the concepts of *equivalence, variable, constant, equation, equal to* (=), and *not equal to* (≠).
	Students will use substitution and mental math to find and check solutions to physical or pictorial representations of algebraic equations in one variable.
LESSON 2	Students will demonstrate an understanding of the abstract representation of an algebraic equation in one variable.
	Students will model an abstract algebraic equation using concrete materials.
	Students will use repeated addition to represent multiplication in an algebraic expression.
	Students will use concrete models, guess-and-check, and number sense to solve one- and multi-step algebraic equations in one variable.
LESSON 3	Students will use concrete models to represent algebraic equations in one variable with unknowns on both sides of the equation.
	Students will use the Subtraction Property of Equality with variables to form equivalent statements when solving algebraic equations in one variable with unknowns on both sides of the equation.
	Students will use kinesthetic motions (physical actions) to solve algebraic equations in one variable with unknowns on both sides of the equation.
	Students will use substitution and mental math to check solutions to algebraic equations in one variable.
LESSON 4	Students will use the Subtraction Property of Equality with variables and with constants to form equivalent statements when solving algebraic equations in one variable.
LESSON 5	Students will use concrete models and kinesthetic motions (physical actions) to represent and solve algebraic equations in one variable with unknowns on both sides of the equation.
	Students will add and subtract monomials and combine like terms to form equivalent expressions when solving algebraic equations in one variable.
	Students will use Properties of Equality, such as the Subtraction Property of Equality, to form equivalent statements when solving algebraic equations in one variable with unknowns on both sides of the equation.

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LESSON 6	Students will use concrete models to represent the multiplication of a binomial by a positive integer constant, such as 2(x + 1).
	Students will use algebraic properties, such as the Subtraction Property of Equality and the Distributive Property of Multiplication over Addition, to form equivalent statements and expressions when solving algebraic equations in one variable.
LESSON 7	Students will use pictorial models to represent abstract algebraic equations that contain multiplication of a binomial by a positive integer constant, such as 2(x + 1).
	Students will use pictorial representations to solve algebraic equations in one variable with unknowns on both sides of the equation.

HANDS-ON EQUATIONS® VERBAL PROBLEMS BOOK
Introduction & Level I Objectives

- Students will analyze verbal problems and determine what strategy is best for representing the problem using concrete models or pictorial symbols.

- Students will use mathematical models (e.g., concrete, pictorial) to represent and solve application problems involving quantitative relationships with rational numbers.

- Students will write down the representation of the unknown elements of the verbal problem.

- Students will use multiple strategies (e.g., a 5-step problem solving process, breaking a problem into parts, and determining whether a problem has too much information or not enough information) to solve real-world application problems.

- Students will represent physically or pictorially given relations, such as Jim's age 10 years from now given his current age, the amount of rain that falls in three months given the amount it falls in one month, the distance travelled by a train in two hours given the distance it travels in one hour.

- Students will represent and solve application problems including problems involving distance, money, age, and patterns of numbers (e.g., consecutive numbers, consecutive even numbers, and consecutive odd numbers).

- Students will provide the answer to verbal problems in full sentence format.

- Students will use substitution and mental math to check solutions to algebraic equations in one variable.

For correlations with the NCTM Standards, please visit our website at www.borenson.com
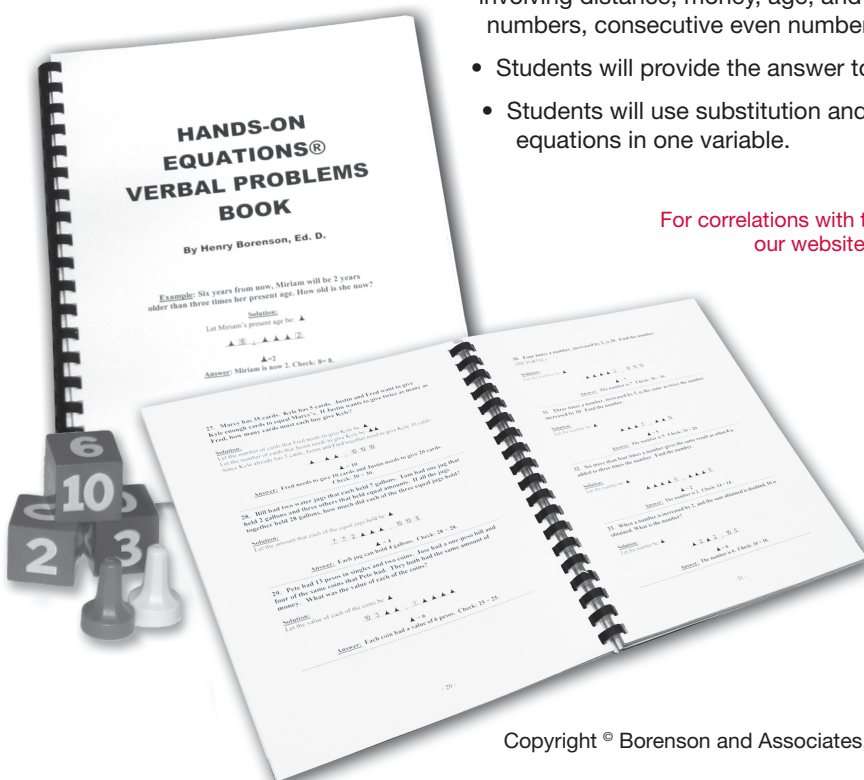
HANDS-ON EQUATIONS®
Borenson and Associates, Inc
P.O. Box 3328, Allentown, PA 18106
(800) 993-6284
www.borenson.com