**Hands-On Equations®**
Making algebra child's play!®

## Our *30ᵗʰ* Year of
## Making Algebra Child's Play!®

The Making Algebra Child's Play workshop is our most popular workshop. Since 1990 more than 50,000 teachers from grades 3 - 8 have attended this workshop.
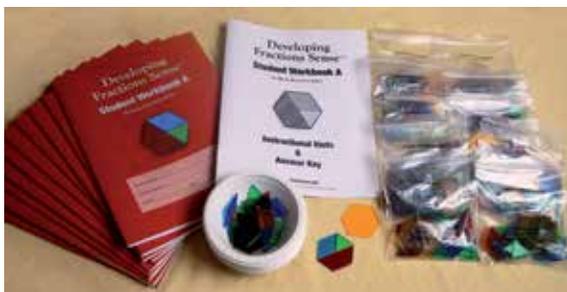
At the left, a workshop participant is setting up the equation $2x + 7 = 3x + 2$ on the Hands-On Equations Teacher Demonstration Balance Scale.

**See page 2.**

COURTESY OF THE AGNES IRWIN SCHOOL

The Developing Fractions Sense™ Workshops empower teachers of grades 3 - 5 to present fraction concepts conceptually using visual fraction models.

**See pages 4 and 5.**

Developing Fractions Sense class sets of material are available for grades 3 and 4.

**See page 6 and 7.**

# Making Algebra Child's Play®

## (For teachers of grades 3 to 8)



## Demystifying the Learning of Algebra!

This one-day workshop empowers teachers to understand and use the visual, kinesthetic, and pictorial Hands-On Equations teaching methodology to successfully present essential algebraic concepts to students in grades 3 to 8. By "breaking the code" of algebra, Hands-On Equations empowers students to work with sophisticated-looking algebraic concepts, thereby enhancing their self-esteem and interest in mathematics. **Balancing equations with the unknown on both sides of the equal sign becomes child's play!**

- Learn how to **physically and pictorially** represent algebraic equations!

- Understand the **"legal moves"** which may be used to balance and solve algebraic equations!

- Enable your students to **understand and solve equations** such as $4x + 2 = 2x + 10$ and $2(x + 4) + x = 2x + 9$, in as <u>little as seven lessons!</u>

- Experience the **"teacher-as-the-coach"** mode of instruction.

- Understand the power of **Piagetian Learning**!

- Learn how to use Hands-On Equations to teach students to set up and solve **verbal problems!**

- Learn how to work with the white pawn, which is the **opposite** of the blue pawn, to solve equations such as $2x + 3 = 6 - x$.

- Learn a meaningful way to teach **addition and subtraction of integers!**

**Learn how to intuitively teach the Subtraction Property of Equality, the Distributive Property, the Property of Additive Inverses, the Additive Identity Element, and see the Common Core Standards for Mathematical Practice in action!**

### Recommended for:

This workshop is recommended for teachers of math (3 – 8), teachers of the gifted (2 – 5), teachers of students struggling with math (9 – 12), math coaches and supervisors. **To inquire about an onsite workshop call 800-993-6284 or write to info@borenson.com.**

# Demystifying Verbal Problems!

## (For teachers of grades 5 to 8)



## Do verbal problems scare the daylights out of your students?

Many students are intimidated by verbal problems. The words seem so abstract. They do not know how to visualize the problem, or where to begin. Yet, the ability to solve verbal problems is essential to success in mathematics.

### "Problem solving must be the focus of school mathematics."

*An Agenda for Action,* NCTM, 1980

In this workshop participants will experience a five-step approach enabling students to represent and solve "advanced" verbal problems by means of the concrete and pictorial approach of Hands-On Equations, including consecutive integer, age and distance problems.

- *Four times a number, increased by 5, is the same as three times a number, increased by 9. Find the number.*

- *Sarah played the piano three days in a row. Each day she played twice as long as the previous day. If she played 24 minutes on the last day, how many minutes did she play on the first day?*

- *2/3 of a number increased by 4, is the same as 1/3 of the number, increased by 8. Find the number.*

- *Two wagons leave the same location and travel in opposite directions. One wagon goes 6 miles per hour faster than the other. The slower wagon leaves at noon, while the faster one leaves at 2:00 pm. If at 4:00 pm the wagons are 36 miles apart, how fast does each wagon travel? (PICTORIAL)*

- *Jose is 6 years younger than twice Juan's age. In 5 years, Juan will be Jose's present age. How old is each?*

- *The sum of two numbers is 10. Twice the first number, increased by the second number, is 18. Find the two numbers.*

### Recommended for:

This workshop is recommended for teachers of math (5 − 8), teachers of the gifted (3 − 6) and teachers of students struggling with math (9 − 12), math coaches and supervisors. *It is highly recommended that teachers attending this workshop have prior experience with Hands-On Equations.* **To inquire about an onsite workshop call 800-993-6284 or write to info@borenson.com.**

# Developing Fractions Sense™ 3 & 4

### (For teachers of grades 3 - 5)

## Sample Problems

- On a number line, locate the numbers 3/4, 7/4, 3/1 and 5/5.
- Use the fraction blocks to find the missing number: 5/3 = ?/6.
- Use a benchmark fraction to determine which is greater: 2/5 or 4/7.
- Use a 3 by 4 grid to explain which is greater: 2/3 or 3/4.
- Decompose 1 2/3 into a sum of fractions in two different ways.
- If 2/3 of a cup of flour is needed to bake one cake, how much flour is needed to bake 4 cakes? Show a visual and symbolic solution.
- A rectangle is 6 feet long and has a perimeter of 20 1/3 feet. What is its width?

## Demystify the teaching of fractions!

In this workshop, focusing on grades 3 and 4 fractions standards, participants will learn how the use of visual fraction models such as fraction blocks, rectangular grids and number lines empower students to develop a conceptual understanding of fractions.

**"This workshop is absolutely essential for any elementary teacher who teaches 3rd - 5th grade math. It provides foundational concepts to truly understand fractions."** *– Workshop participant*

## Participants at this workshop will learn:

- Why working with unit fractions is the key to all work with fractions
- The importance of specifying the whole in any given problem
- How the use of the term "copies" helps in understanding fractions such as 5/3
- How to form equivalent fractions using fraction blocks and rectangular grids
- A clear way to explain and illustrate how to generate equivalent fractions symbolically
- How to use benchmark fractions to compare fractions
- Creative ways to add and subtract mixed fractions having a common denominator
- A simple way to explain multiplication of a fraction by a whole number
- Strategies for working with perimeter problems for rectangles having fractional side lengths
- How to use fraction blocks, rectangular grids and number lines to solve word problems
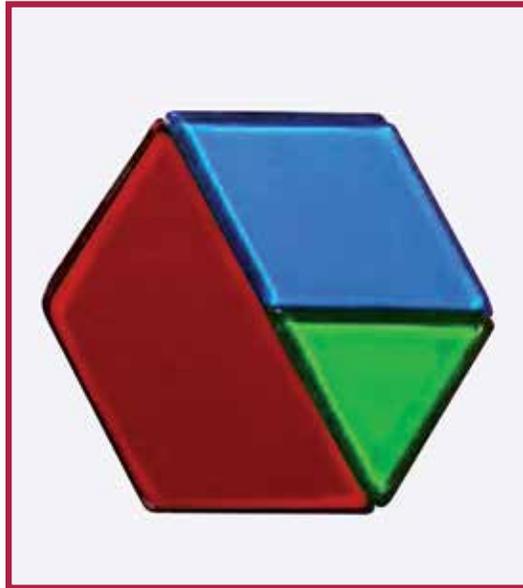
## Recommended for:

This workshop is recommended for teachers of math (3 – 5), teachers of the gifted (2 – 4), teachers of students struggling with math (6 – 8), math coaches and supervisors. **To inquire about an onsite workshop call 800-993-6284 or write to info@borenson.com.**
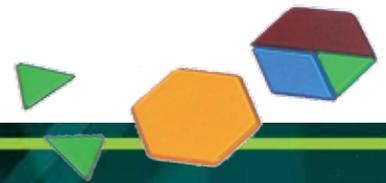
# Developing Fractions Sense™ 5
### (For teachers of grade 5)

## Sample Problems

- By inspection, indicate whether this statement is true or false: 13 1/3 - 11 2/5 = 3/5 + 1 1/3.

- Mentally calculate: a) 2/5 x 20; b) 2/5 x 20/3.

- Use the fraction blocks to calculate 3/5 x 2 1/2.

- Mr. Jones planted corn on 3/5 of his field and wheat on 1/3 of his field. He left the rest of his field empty. What fractional part of the field was left empty?

- Four-fifths of the class passed the fractions test. Of those who passed 2/3 received less than an A. What fraction of the class passed with an A?

- What is the area of rectangle with sides 2/3 and 4/5? Provide a visual illustration.

## Demystify the teaching of fractions!

In this workshop focusing on grade 5 fractions standards, participants will learn the conceptual power that students can gain when they first work with visual fraction models such as fraction blocks and rectangular grids, before moving to symbolic skills.

*"I like the way this workshop presented the teaching of fraction multiplication by going from the concrete to the abstract. It makes so much sense!" – Workshop participant*

## Participants at this workshop will learn:

- The key to subtracting fractions with unlike denominators using the fraction blocks

- The key to illustrating addition and subtraction of fractions with unlike denominators on grid paper

- A simple, direct way to add fractions with unlike denominators symbolically

- How to clarify the distinction between *a* divided by *b* and *a/b*

- How to concretely illustrate the difference in meaning between 4 x 2/3 and 2/3 x 4

- How to concretely and pictorially illustrate multiplication of a fraction by a fraction

- How to use grid paper to find the area of a rectangle with fractional side lengths

- A clear way to explain why multiplication by a fraction greater than 1 scales up and less than 1 scales down

- An intuitive way to help students understand division of a unit fraction by a whole number and a whole number by a unit fraction
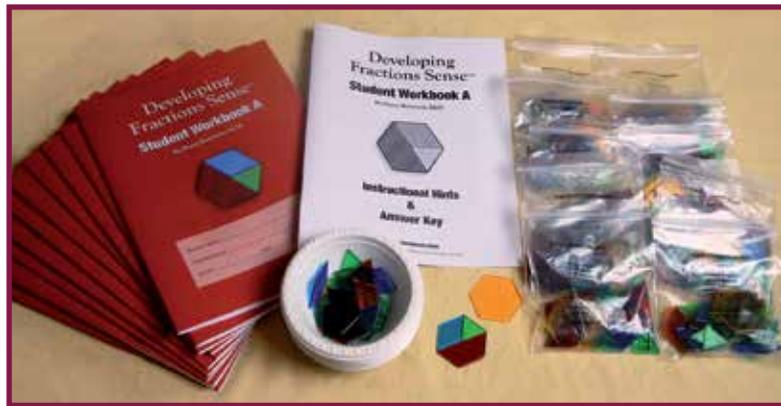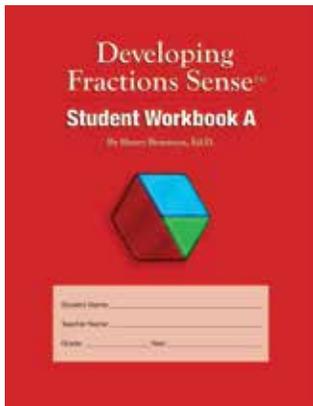
## Recommended for:

This workshop is recommended for math teachers in grade 5, teachers of the of gifted (3 – 5), students struggling with math (6 - 8) coaches and supervisors. **To inquire about an onsite workshop call 800-993-6284 or write to info@borenson.com.**

# Developing Fractions Sense™ A

### (3rd Grade Standards)



The *Developing Fractions Sense Student Workbook A* (red booklet) consists of 32 short lessons which focus on and expand upon third grade fractions standards. Each lesson begins with an instructional component and is followed by a set of exercises. Review exercises are included to reinforce prior lessons. Visual fraction models such as fraction blocks, rectangular grids and number lines are used to enable students to develop a conceptual understanding of fractions. For example, students use their fraction blocks to find the missing number in $5/3 = ?/6$. The workbook also includes five enrichment lessons related to 4th and 5th grade standards.

## CLASS SETS A SERIES (3rd grade standards)

The **Developing Fractions Sense Class Set A for 30 Students** includes the *Developing Fractions Sense Student Workbook A* and a set of plastic fraction blocks for each student. In addition, it includes the Instructional Hints and Answer Key A booklet for the teacher.

| | | |
|---|---|---|
| | DFS-C1030A | $219.95 |

| | | |
|---|---|---|
| Developing Fractions Sense Class Set A for 10 Students | DFS-C1010A | $79.95 |
| Developing Fractions Sense Class Set A for 20 Students | DFS-C1020A | $149.95 |

## STUDENT WORKBOOK A

| | | |
|---|---|---|
| Developing Fractions Sense Student Workbook A - One copy | DFS-WKA | $3.95 |
| Developing Fractions Sense Student Workbook A - Set of 10 | DFS-10WKA | $39.50 |
| Developing Fractions Sense Student Workbook A - Set of 20 | DFS-20WKA | $74.50 |
| Developing Fractions Sense Student Workbook A - Set of 30 | DFS-30WKA | $109.50 |

## TEACHER SET A

**Developing Fractions Sense Teacher Set A.** This is the complete program for teaching one student. It includes one copy of the *Developing Fractions Sense Student Workbook A*, a set of plastic fraction blocks, and the Instructional Hints and Answer Key A booklet. **Note:** This product is included in every fractions class set A.

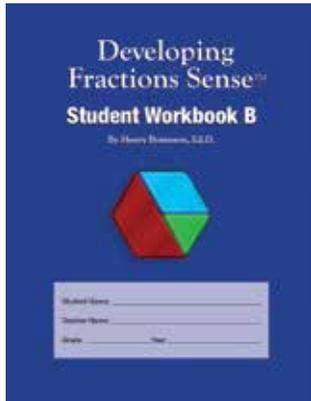| | | |
|---|---|---|
| | DFS-1000A | $9.95 |

**Order online at www.borenson.com or by phone at 800-993-6284.**

**See page 11 for other ordering options.**

# Developing Fractions Sense™ B

## (4th Grade Standards)



The *Developing Fractions Sense Student Workbook B* (blue booklet) consists of 45 short lessons which focus on fourth grade fractions standards. Each lesson begins with an instructional component and is followed by a set of exercises. Every new concept or skill is first introduced concretely with fraction blocks, or pictorially with rectangular grids, before the student is provided with the symbolic approach. For example, students first use the fraction blocks to subtract 3 1/3 - 1 2/3 using renaming or using improper fractions, before they learn the corresponding symbolic approach. **This concrete to symbolic approach enables conceptual learning.**

## CLASS SETS B SERIES (4th grade standards)

The **Developing Fractions Sense Class Set B for 30 Students** includes the *Developing Fractions Sense Student Workbook B* and a set of plastic fraction blocks for each student. In addition, it includes the Instructional Hints and Answer Key B booklet for the teacher.

|  |  |  |
|---|---|---|
| | **DFS-C1030B** | **$234.95** |
| Developing Fractions Sense Class Set B for 10 Students | DFS-C1010B | $84.95 |
| Developing Fractions Sense Class Set B for 20 Students | DFS-C1020B | $159.95 |

## STUDENT WORKBOOK B

|  |  |  |
|---|---|---|
| Developing Fractions Sense Student Workbook B - One copy | DFS-WKB | $4.75 |
| Developing Fractions Sense Student Workbook B - Set of 10 | DFS-10WKB | $47.50 |
| Developing Fractions Sense Student Workbook B - Set of 20 | DFS-20WKB | $87.50 |
| Developing Fractions Sense Student Workbook B - Set of 30 | DFS-30WKB | $127.50 |

## TEACHER SET B

**Developing Fractions Sense Teacher Set B.** This is the complete program for teaching one student. It includes one copy of the *Developing Fractions Sense Student Workbook B*, a set of plastic fraction blocks, and the instructional Hints and Answer Key B booklet. **Note:** This product is included in every fractions class set B.          DFS-1000B          $10.75

**Order online at www.borenson.com or by phone at 800-993-6284.**

## The Hands-On Equations® Learning System
**(See page 10 for additional information)**

### Sample Equations:

**Level 1:** (Lessons 1 - 7) Red booklet. Students use the blue pawns and red cubes to solve equations such as: $4x + 3 = 3x + 9$ and $2(2x + 1) = 3x + 10$.

**Level II:** (Lessons 8 - 16) Blue booklet. Students use the blue pawns, white pawns and red cubes to solve equations such as: $2x = * + 6$ and $2x - * = 12$, where star = $(-x)$.

**Level III:** (Lessons 9 - 25) Green booklet. Students use the blue pawns, white pawns, red and green cubes to solve equations such as: $2* + 3 = -6 + x$ and $x - 2(* + 2) = 5$.

**Note:** In Lessons 7, 16 and 25 students learn a pictorial method of solution. In Lesson 26, they learn the traditional written notation.

## Hands-On Equations® Verbal Problems Introductory Workbook
**(See page 10 for additional information)**

### Sample Problems:

**#4.** Tom had five bags of marbles. Each bag contained the same number of marbles. If he had 40 marbles in total, how many marbles were in each bag?

**#22.** Four times a number gives the same result as three times the same number increased by 9. Find the number.

**#65.** The length of a rectangle is 5 units more than its width. If the perimeter of the rectangle is 50, how long is each side?

## Hands-On Equations® Verbal Problems Book
**(See page 10 for additional information)**

### Sample Problems:

**Level I:** Celeste is 12 years older than Rosa. In four years, she will be twice as old as Rosa will be then. How old is each now? (Page 58/17)

**Level II:** The sum of two numbers is 10. Twice the first, increased by the second number, is 18. Find the two numbers. (Page 27/18)

**Level III:** A private plane flying for two hours meets a headwind that reduces its speed by 20 miles per hour. If it took the plane a total of 5 hours to travel 440 miles, find the speed of the plane prior to meeting the headwind. (Page 106/40)
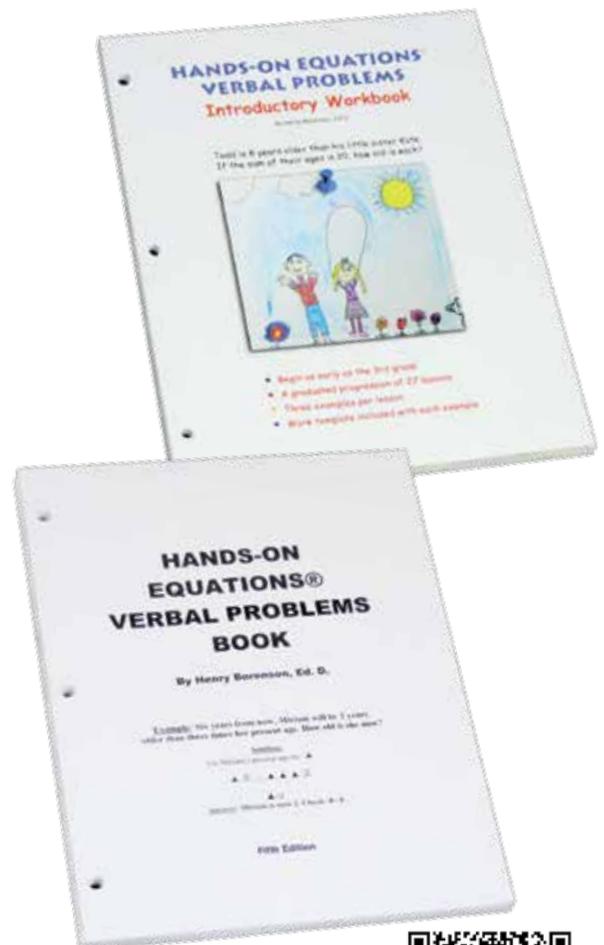
# Early Algebra for the SMART Board Hands-On Equations® Apps
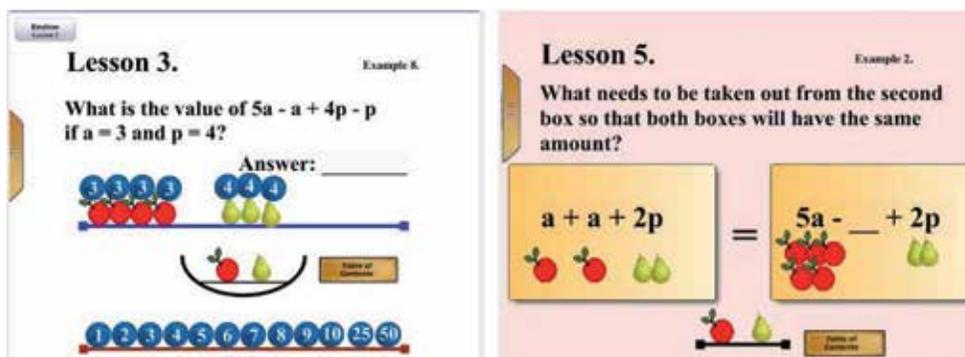


**Early Algebra for the SMART Board.** This interactive application is intended to provide young gifted students (1st and 2nd grade) with an understanding of equality and the ability to evaluate expressions using the visual icons of the application. It consists of eight lessons with 10 examples each, as well as a set of worksheets which may be solved pictorially. This product is also available for other interactive whiteboards (Promethean, Mimio, etc.)

**EA-SB-01...License for one... $50;   EA-SB-05...$175;   EA-SB-10...$300;   EA-SB-25...$625**



# Download Hands-On Equations®
# for your iPad or tablet device!



## Hands-On Equations is available for IOS, Android and Kindle devices.
(All Hands-On Equations® apps are also available for the smart phone, except Level 3 which requires a tablet.)

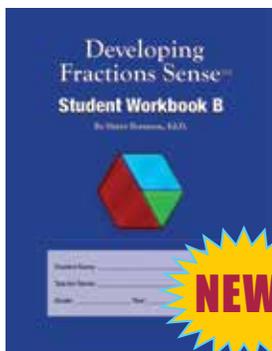*Download from the App Store, Google Play or Amazon Appstore.*

### The Hands-On Equations® Learning System

Complete program for use with one student. Includes manuals for Levels I, II, III, worksheets, answer key, and one student kit of game pieces with flat laminated balance.

**S-1000  $34.95**

### Developing Fractions Sense: Student Workbook B

Forty-five short lessons focusing on 4th grade fractions standards.

**DFS-WKB $4.75**
**DFS-10WKB $47.50**
**DFS-20WKB $74.50**
**DFS-30WKB $109.50**

**NEW!**

**See page 7.**

### Hands-On Equations® Verbal Problems Introductory Workbook

Twenty-seven lessons, each containing three Level 1 verbal problems with work template. Solution section included. Grades 3 and up.
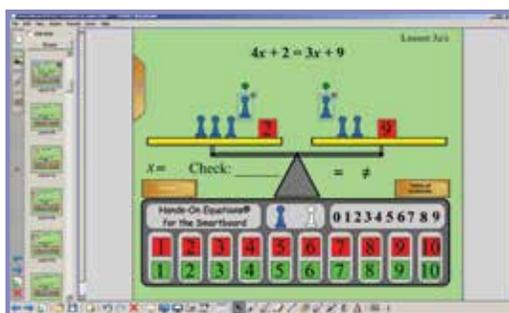
**VP-IW  $20.00**

### Hands-On Equations® Verbal Problems Book

More than 350 verbal problems with solutions. Included in this resource are number, age, coin and distance problems. Problems are provided for Levels I, II and III

**VPB-1000  $35.00**

### Hands-On Equations® for the SMART Board

For teachers of Hands-On Equations® who are also using the SMART Board. A slide is included for each teaching example of the red, blue and green manuals. To maintain the effectiveness of the program, the teacher and students must also use the physical game pieces.

**Single license $35; license for 5 teachers: $150; license for 10 teachers: $250**

**Also available for other interactive whiteboards (Promethean, Mimio, etc.)**

### The Hands-On Equations® Instructional Video Manual

(Designed to be used with Hands-On Equations® materials) A step-by-step visual guide to Hands-On Equations®. Each of the twenty-five lessons of the program is clearly demonstrated by Eric Borenstein, Molly Richman or Dr. Borenson. This video is designed to be viewed one lesson at a time. Ideal for:

- Teacher classroom introduction or review of each lesson
- Student self-introduction or review of each lesson
- Twenty-five (25) lessons. Program time: approx. 120 minutes.

**DVD-2000  $14.95**

### Class Set of Hands-On Equations® for Teacher and Ten (10) Students

Includes The Hands-On Equations® Learning System, ten (10) student kits, classroom worksheet reproduction rights, teacher's demonstration balance and demonstration game pieces.

**C-1010  $175**

### Class Set of Hands-On Equations® for Teacher and Twenty (20) Students
**C-1020  $225**

### Class Set of Hands-On Equations® for Teacher and Thirty (30) Students
**C-1030  $275**

### Class Set of Hands-On Equations® for Teacher and Forty (40) Students
**C-1040  $325**

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| DVD-2000 | | The Hands-On Equations® Instructional DVD Manual | $ 14.95 | |
| C-1010 | | Class Set of Hands-On Equations® for Teacher and Ten (10) Students | $ 175.00 | |
| C-1020 | | Class Set of Hands-On Equations® for Teacher and Twenty (20) Students | $ 225.00 | |
| C-1030 | | Class Set of Hands-On Equations® for Teacher and Thirty (30) Students | $ 275.00 | |
| C-1040 | | Class Set of Hands-On Equations® for Teacher and Forty (40) Students | $ 325.00 | |
| CWS-1000 | | Additional Classwork Sheets® Set of 10 additional examples per lesson w/answer key. | $ 25.00 | |
| VP-IW | | Hands-On Equations® Verbal Problems Introductory Workbook | $ 20.00 | |
| VPB-1000 | | Hands-On Equations® Verbal Problems Book | $ 35.00 | |
| VP-BM1 | | Verbal Problems Blackline Masters for Level I More than 200 Level I verbal problems from the VPB-1000, one per page. | $ 25.00 | |
| SB-01 | | Hands-On Equations® for the SMART Board – license for one | $ 35.00 | |
| WB-01 | | Hands-On Equations® for the Interactive Whiteboard – license for one For use with the Promethean Board, Mimio, etc. Choose platform: PC ☐ Mac (download only) ☐ | $ 35.00 | |
| EA-SB-01 | | Early Algebra for the SMART Board – license for one (See pg. 9) | $ 50.00 | |
| EA-WB-01 | | Early Algebra for the Interactive Whiteboard – license for one (See pg. 9) For use with the Promethean Board, Mimio, etc. Choose platform: PC ☐ Mac (download only) ☐ | $ 50.00 | |
| DFS-1000A | | Developing Fractions Sense A: Teacher Set – 3rd Grade (See pg. 6) | $ 9.95 | |
| DFS-1000B | | Developing Fractions Sense B: Teacher Set – 4th Grade (See pg. 7) | $ 10.75 | |
| DFS-C1030A | | Developing Fractions Sense A: Class Set of Thirty – 3rd Grade (See pg. 6) | $ 219.95 | |
| DFS-C1030B | | Developing Fractions Sense B: Class Set of Thirty – 4th Grade (See pg. 7) | $ 234.95 | |

**New**

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**Bring these powerful instructional programs to your district. See inside for workshop offerings.**

**Visit the App Store, Google Play or Amazon Appstore to download your Hands-On Equations app!**

**We participate in the App Store school discount program!**

**Dr. Henry Borenson**
Inventor of Hands-On Equations®

"There is no longer any reason for a student to experience frustration learning essential algebraic concepts. You can provide your students with the gift of understanding. Our hands-on workshops will empower you to visually simplify abstract algebraic concepts."