

BIG IDEAS
MATH[®]
Modeling Real Life

Grade 6

Common Core Edition

Ron Larson
Laurie Boswell



Erie, Pennsylvania
BigIdeasLearning.com



Big Ideas Learning, LLC
1762 Norcross Road
Erie, PA 16510-3838
USA

For product information and customer support, contact Big Ideas Learning at 1-877-552-7766 or visit us at BigIdeasLearning.com.

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About the Authors



Ron Larson

Ron Larson, Ph.D., is well known as the lead author of a comprehensive program for mathematics that spans school mathematics and college courses. He holds the distinction of Professor Emeritus from Penn State Erie, The Behrend College, where he taught for nearly 40 years. He received his Ph.D. in mathematics from the University of Colorado. Dr. Larson's numerous professional activities keep him actively involved in the mathematics education community and allow him to fully understand the needs of students, teachers, supervisors, and administrators.

A handwritten signature of Ron Larson in black ink, written in a cursive style.



Laurie Boswell

Laurie Boswell, Ed.D., is the former Head of School at Riverside School in Lyndonville, Vermont. In addition to textbook authoring, she provides mathematics consulting and embedded coaching sessions. Dr. Boswell received her Ed.D. from the University of Vermont in 2010. She is a recipient of the Presidential Award for Excellence in Mathematics Teaching and is a Tandy Technology Scholar. Laurie has taught math to students at all levels, elementary through college. In addition, Laurie has served on the NCTM Board of Directors and as a Regional Director for NCSM. Along with Ron, Laurie has co-authored numerous math programs and has become a popular national speaker.

A handwritten signature of Laurie Boswell in black ink, written in a cursive style.

Dr. Ron Larson and Dr. Laurie Boswell began writing together in 1992. Since that time, they have authored over four dozen textbooks. This successful collaboration allows for one voice from Kindergarten through Algebra 2.

Contributors, Reviewers,

Big Ideas Learning would like to express our gratitude to the mathematics education and instruction experts who served as our advisory panel, contributing specialists, and reviewers during the writing of *Big Ideas Math: Modeling Real Life*. Their input was an invaluable asset during the development of this program.

Contributing Specialists and Reviewers

- **Sophie Murphy**, Ph.D. Candidate, Melbourne School of Education, Melbourne, Australia
Learning Targets and Success Criteria Specialist and Visible Learning Reviewer
- **Linda Hall**, Mathematics Educational Consultant, Edmond, OK
Advisory Panel and Teaching Edition Contributor
- **Michael McDowell**, Ed.D., Superintendent, Ross, CA
Project-Based Learning Specialist
- **Kelly Byrne**, Math Supervisor and Coordinator of Data Analysis, Downingtown, PA
Advisory Panel and Content Reviewer
- **Jean Carwin**, Math Specialist/TOSA, Snohomish, WA
Advisory Panel and Content Reviewer
- **Nancy Siddens**, Independent Language Teaching Consultant, Las Cruces, NM
English Language Learner Specialist
- **Nancy Thiele**, Mathematics Consultant, Mesa, AZ
Teaching Edition Contributor
- **Kristen Karbon**, Curriculum and Assessment Coordinator, Troy, MI
Advisory Panel and Content Reviewer
- **Kery Obradovich**, K–8 Math/Science Coordinator, Northbrook, IL
Advisory Panel and Content Reviewer
- **Jennifer Rollins**, Math Curriculum Content Specialist, Golden, CO
Advisory Panel
- **Becky Walker**, Ph.D., School Improvement Services Director, Green Bay, WI
Advisory Panel
- **Anthony Smith**, Ph.D., Associate Professor, Associate Dean, University of Washington Bothell, Seattle, WA
Reading/Writing Reviewer
- **Nicole Dimich Vagle**, Educator, Author, and Consultant, Hopkins, MN
Assessment Reviewer
- **Jill Kalb**, Secondary Math Content Specialist, Arvada, CO
Content Reviewer
- **Janet Graham**, District Math Specialist, Manassas, VA
Response to Intervention and Differentiated Instruction Reviewer
- **Sharon Huber**, Director of Elementary Mathematics, Chesapeake, VA
Universal Design for Learning Reviewer

Student Reviewers

- Jackson Currier
- Mason Currier
- Taylor DeLuca
- Ajalae Evans
- Malik Goodwine
- Majesty Hamilton
- Reilly Koch
- Kyla Kramer
- Matthew Lindemuth
- Greer Lippert
- Zane Lippert
- Jeffrey Lobaugh
- Riley Moran
- Zoe Morin
- Deke Patton
- Brooke Smith
- Dylan Throop
- Jenna Urso
- Madison Whitford
- Jenna Wigham

Research

Ron Larson and Laurie Boswell used the latest in educational research, along with the body of knowledge collected from expert mathematics instructors, to develop the *Modeling Real Life* series. The pedagogical approach used in this program follows the best practices outlined in the most prominent and widely accepted educational research, including:

- *Visible Learning*
John Hattie © 2009
- *Visible Learning for Teachers*
John Hattie © 2012
- *Visible Learning for Mathematics*
John Hattie © 2017
- *Principles to Actions: Ensuring Mathematical Success for All*
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- *What Works in Schools: Translating Research into Action*
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- *Classroom Instruction That Works: Research-Based Strategies for Increasing Student Achievement*
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- *Principles and Standards for School Mathematics*
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- *Rigorous PBL by Design: Three Shifts for Developing Confident and Competent Learners*
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- *Universal Design for Learning Guidelines*
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- Rigor/Relevance Framework®
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- *Understanding by Design*
Grant Wiggins and Jay McTighe © 2005
- Achieve, ACT, and The College Board
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John A. Van de Walle and Karen S. Karp © 2015
- *Evaluating the Quality of Learning: The SOLO Taxonomy*
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- *Unlocking Formative Assessment: Practical Strategies for Enhancing Students' Learning in the Primary and Intermediate Classroom*
Shirley Clarke, Helen Timperley, and John Hattie © 2004
- *Formative Assessment in the Secondary Classroom*
Shirley Clarke © 2005
- *Improving Student Achievement: A Practical Guide to Assessment for Learning*
Toni Glasson © 2009

Standards for Mathematical Practice



1 Make sense of problems and persevere in solving them.

- Multiple representations are presented to help students move from concrete to representative and into abstract thinking.
- *Modeling Real Life Examples* and **PROBLEM-SOLVING** exercises encourage students to use problem-solving strategies, such as drawing a diagram, making a table, and solving a simpler problem. They also use a formal problem-solving plan: understand the problem, make a plan, and solve and check.

2 Reason abstractly and quantitatively.

- Visual problem-solving models help students create a coherent representation of the problem.
- *Explorations* allow students to investigate concepts to understand the **REASONING** behind the rules.
- Questions ask students to explain and justify their **REASONING**.
- Questions encourage students to apply **NUMBER SENSE** and formulate consistent and appropriate **REASONING**.

3 Construct viable arguments and critique the reasoning of others.

- *Explorations* help students make conjectures, use **LOGIC**, and **CONSTRUCT ARGUMENTS** to support their conjectures.
- Exercises, such as **YOU BE THE TEACHER**; **DIFFERENT WORDS, SAME QUESTION**; and **WHICH ONE DOESN'T BELONG?**, provide students the opportunity to critique the reasoning of others.

4 Model with mathematics.

- Real-life situations are translated into diagrams, tables, equations, and graphs to help students analyze relations and to draw conclusions.
- Real-life problems are provided to help students apply the mathematics they are learning to everyday life.
- **MODELING REAL LIFE** examples and exercises help students see that math is used across content areas, other disciplines, and in their own experiences.

5 Use appropriate tools strategically.

- *Graphic Organizers* support the thought process of what, when, and how to solve problems.
- A variety of tools, such as number lines and graph paper, manipulatives, and digital tools, are available as students **CHOOSE TOOLS** and begin **USING TOOLS** to solve problems.

6 Attend to precision.

- **PRECISION** exercises encourage students to formulate consistent and appropriate reasoning.
- Cooperative learning opportunities support precise communication.

7 Look for and make use of structure.

- *Learning Targets* and *Success Criteria* at the start of each chapter and section help students understand what they are going to learn.
- *Explorations* provide students the opportunity to see **PATTERNS** and **STRUCTURE** in mathematics.
- Real-life problems help students use the **STRUCTURE** of mathematics to break down and solve more difficult problems.

8 Look for and express regularity in repeated reasoning.

- Opportunities are provided to help students make generalizations through **REPEATED REASONING**.
- Students are continually encouraged to check for reasonableness in their solutions.

Achieve the Core

Meeting Proficiency

As standards shift to prepare students for college and careers, the importance of focus, coherence, and rigor continues to grow.

- FOCUS** *Big Ideas Math: Modeling Real Life* emphasizes a narrower and deeper curriculum, ensuring students spend their time on the major topics of each grade.
- COHERENCE** The program was developed around coherent progressions from Kindergarten through eighth grade, guaranteeing students develop and progress their foundational skills through the grades while maintaining a strong focus on the major topics.
- RIGOR** *Big Ideas Math: Modeling Real Life* uses a balance of procedural fluency, conceptual understanding, and real-life applications. Students develop conceptual understanding in every *Exploration*, continue that development in the *Lessons* while gaining procedural fluency during the *Concepts and Skills Examples*, and then tie it all together with *Modeling Real Life Examples*. Every set of *Exercises* reflects this balance, giving students the rigorous practice they need to be college- and career-ready.
-

Major Topics in Grade 6

Ratio and Proportional Relationships

- Understand ratio concepts and use ratio reasoning to solve problems.

The Number System

- Apply and extend previous understandings of multiplication and division to divide fractions by fractions.
- Apply and extend previous understandings of numbers to the system of rational numbers.

Expressions and Equations

- Apply and extend previous understandings of arithmetic to algebraic expressions.
- Reason about and solve one-variable equations and inequalities.
- Represent and analyze quantitative relationships between dependent and independent variables.

Use the color-coded Table of Contents to determine where the major topics, supporting topics, and additional topics occur throughout the curriculum.

- Major Topic
- Supporting Topic
- Additional Topic



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- Major Topic
- Supporting Topic
- Additional Topic

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How to Use Your Math Book

- ▶ Get ready for the chapter by watching the **STEAM Video**, completing the **Chapter Exploration**, and recording your thoughts on **Vocabulary**.
- ▶ Read the **Learning Target** and **Success Criteria** for each section. Work with a partner to complete the **EXPLORATIONS**. Discuss the **Math Practice** question with your partner.
- ▶ Find the **Key Vocabulary**  words highlighted in yellow. Read their definitions. Study the concepts in each  **Key Idea**. If you forget a definition, you can look it up online in the  **Multi-Language Glossary** at *BigIdeasMath.com*.
- ▶ During the **Lessons**, study each **EXAMPLE** and then complete the **Try It** exercises. Pay special attention to the push-pin notes and other helpful tips, such as **Common Errors** , **Remember** , and **Reading** .
- ▶ Use the **Self-Assessment for Concepts & Skills** and **Self-Assessment for Problem Solving** to assess your understanding of the success criteria from the lesson.
- ▶ The **Practice** is broken into two parts: **Review & Refresh** and **Concepts, Skills, & Problem Solving**. The **Review & Refresh** reviews prior skills and prepares you for the next lesson. The **Concepts, Skills, & Problem Solving** exercises are for the current lesson and are color-coded red for concepts and skills and blue for real-life problem solving.
- ▶ Use your **Problem-Solving Strategies** to complete the **Connecting Concepts** lesson, where you will practice previously learned skills with current concepts.
- ▶ Use the **Chapter Review** to study for your test, where you will **Review Vocabulary**, use **Graphic Organizers**, and complete the **Chapter Self-Assessment**. Remember to assess your understanding of each learning target! You can also take a **Practice Test** on the concepts from the chapter.
- ▶ Use the **Cumulative Practice** to prepare for high-stakes tests, where you will complete standardized test questions from throughout the course.

SCAVENGER HUNT

Use this **Scavenger Hunt** to find where things are in **Chapter 1**.

