



Mathematical and Pedagogical Foundations

Math Innovations is a coherent and focused middle grades curriculum that aligns to the Common Core State Standards and is designed to engage students in gaining a richer, deeper, and more proficient understanding of mathematics. Mathematical ideas are presented in a real-world context to help students understand how math is related and relevant to their daily lives. Every lesson incorporates the Standards for Mathematical Practice to support the development of mathematically proficient students.

The curriculum consists of three levels, each featuring five units that focus on a single integrated concept. It addresses critical mathematics areas and supports student learning with a variety of real-life problem-solving scenarios that are addressed through activities, games, and investigations.

Course 1: A Balancing Act: Focusing on Equality, Algebraic Expressions and Equations

Course 1: Notable Numbers: Focusing on Fractions, Decimals, and Percents

Course 1: Sizing Up Shapes: Focusing on Geometry, Measurement and Graphing

Course 1: Fraction Times: Focusing on Multiplication and Division of Fractions and Decimals

Course 1: At This Rate: Focusing on Ratios, Proportions and Statistics

Course 2: Let's Be Rational: Focusing on Fractions, Decimals and Integers

Course 2: Accent on Algebra: Focusing on Equations, Tables and Graphs

Course 2: Puzzling Proportions: Focusing on Rates, Percents and Similarity

Course 2: Sizing Up Solids: Focusing on Angles, Surface Area and Volume

Course 2: Driven by Data: Focusing on Probability and Data Analysis

Course 3: Line It Up: Focusing on Linear Relationships

Course 3: Solve It: Focusing on Equations, Inequalities and Exponents

Course 3: Delving into Data: Focusing on Representing, Interpreting and Analyzing Data

Course 3: Prove It: Focusing on Mathematical Reasoning and the Pythagorean Theorem

Course 3: Shape Up: Focusing on Triangles, Transformations and Measurement

These units are designed to be used flexibly within or between courses. Courses can easily be designed to prepare students for 8th grade algebra or to incorporate needed remediation for struggling learners.

Instructional Design

Each full-color student eBook includes unit goals, sections and lessons, hints, a glossary, and study guides for each unit and the sections contained within it.

Unique features of the student eBook include:

- Real-life problem-solving scenarios to which middle grade students can relate
- Clear and colorful graphics that illustrate important concepts
- *Mathematically Speaking*, *Wrap it Up*, and *Write About It* features that address mathematical discourse and emphasize student discussion and written communication about the mathematics

The dynamic digital activities, games and tools captivate students, develop and reinforce concepts, and promote fluency. They also serve as a flexible and affordable way to integrate digital curriculum components into traditional classroom instruction.

Math Innovations offers flexible differentiation strategies to reach learners of all ability levels. Games, and whiteboard-ready activities allow students to review material on their own time in the classroom or at home whether they use the eBook or print Student Edition.

Features within the curriculum that encourage students to review or expand on their knowledge and ensure comprehension include:

- *Think Back*, which prompts students to go back and review material
- *Think Beyond*, which challenges talented students and provides additional support
- *Think Differently*, which provides teaching strategies for all learners, including ELL students

The teacher eBook as well as the print editions feature a wrap-around format and includes all of the resources needed to teach the program as well as access to annotated student pages.

Teacher Editions include:

- Lesson-level CCSS correlations
- Teaching and learning strategies, including unit goals, overview and assessment opportunities
- Mathematics concepts addressed in the unit
- A unit planner with pacing guide
- Detailed answers and explanations for On Your Own questions
- Section and Unit Study Guide answers
- *Think Differently* differentiation tools and tips
- Reflections questions for planning purposes
- Whiteboard-ready activities are linked in the teacher and student eBooks and provide opportunities for classroom interaction as well as practice outside of class

Math Innovations eBooks provide a variety of digital tools that encourage collaboration among students, teachers, and parents. An interactive table of contents, glossary, and resources menu allow teachers to quickly access lesson content and supplemental materials. The teacher eBook also illustrates how to use Talk Moves, an innovative program feature, to facilitate discussions and foster mathematical discourse.

Assessment

Formative Assessment

Math Innovations offers a rich variety of formative assessment within the student eBook, including:

- *Wrap It Up* questions to help students and teachers assess understanding of the key concepts in each lesson

- The Student Study Guide, a unique and important tool that helps the middle grades student develop study skills
- Student Self Reflection and Student Snapshot features that serve as formative assessments

Summative Assessment

Tests and quizzes focus on skills, procedures and concepts.

- A variety of questions—short answer, multiple choice and open-response—reflect the types of questions on state tests.
- *Write About It* focuses on mathematical discourse and helps students think and communicate their reasoning like practicing mathematicians.
- Projects encourage creative and critical thinking and often involve students working together to create a product.
- The online Cohesive Assessment System (CAS) includes an interactive Test Generator that allows teachers to search for assessment items by type and objective, generate and tweak assessment items, create alternative versions and share assessments with other teachers, assign tests and quizzes to students, and automatically grade objective items for online assessments.

Implementation Support

Student discovery is at the heart of *Math Innovations*. Implementation workshops will provide you with the pedagogical basis for implementing the CCSS with *Math Innovations* and related teacher support materials.

The fundamental goal is to increase your confidence and give you a vision for how to successfully use this program in your classroom. Written by national leaders in mathematics education and led by highly trained presenters, these workshops delve deeply into specific topics—from instructional strategies to technology integration and authentic assessment.

Kendall Hunt will develop a customized PD plan that best meets your school’s vision for instruction. PD can be delivered in a variety of modes, including face-to-face workshops, webinars, in-class coaching, and train the trainer models.

Efficacy Research

During the 2012-2013 school year, a research study was conducted to measure mathematics achievement in students using the Course 1 and Course 2 *Math Innovations* program. The study group consisted of teachers and students in Connecticut, Kentucky, Massachusetts, North Carolina, and South Carolina who had used the program as their core mathematics curriculum for at least one year prior to the study. There were a total of 466 students in this group, called the Intervention Group for purposes of reporting results. Within this group, 277 students were studying Course 1 (Grade 6) and 189 students were studying Course 2 (Grade 7). The study also included a Comparison Group of students who were studying with a mathematics curriculum other than *Math Innovations*. In the Comparison Group, there were 190 students in Grade 6 and 176 students in Grade 7. Students came from both urban and suburban school settings, and the Intervention and Comparison Groups were composed of students with comparable socioeconomic backgrounds.

To measure student achievement, *Math Innovations* unit tests were administered prior to and after studying the units (five for each course) to all the students in the Intervention Group. In addition, separate CCSS-based assessments were developed for Grade 6 and Grade 7. These were administered to both the Intervention and Comparison Groups at the beginning and end of the school year. Items for these CCSS-based assessments were developed using sample items that the Smarter Balanced Assessment Consortium (SBAC) released in their Showcase Math Materials for grades 6 and 7. Dr. Shelbi Cole, Director of Mathematics for SBAC, confirmed that these items would be similar to the items on the final SBAC assessment. There were also two items on each test taken from standardized assessments: one from released items on the eighth grade National Assessment of Educational Progress (NAEP), and one from released items on the eighth grade Trends in International Mathematics and Science Study (TIMSS).

Dr. Susan Carroll, President of Words & Numbers Research, Inc., was the external evaluator on the project and conducted the data analyses. Results on all 10 units showed statistically significant gains in achievement for the *Math Innovations* students. Students who were studying an accelerated sequence of *Math Innovations* units starting in fifth grade to prepare to take Algebra in eighth grade were also part of the unit analysis.

Hierarchical Linear Modeling, a stringent statistical methodology that takes into account the classroom effect on students, was used to compare test scores of the Intervention Group and the Comparison Group. Results showed significant differences ($p < .001$) favoring the students in the *Math Innovations* program with an effect size of 1.29 for grade 6 and 1.62 for grade 7. Note that some researchers translate effect size into understandable classroom application; using their interpretation, the sixth grade students studying *Math Innovations* were 1.29 years above the Comparison Group on a grade-equivalent-score scale in their understanding of the concepts tested and the seventh grade students studying *Math Innovations* were 1.62 years above the Comparison Group on a grade-equivalent-score scale in their understanding of concepts tested.