PROVEN SOLUTION

TRANSMATH®

TEACHES FOUNDATIONAL SKILLS WHILE PROVIDING RICH PROBLEM-SOLVING EXPERIENCES

VOYAGER SOPRIS LEARNING™

WHAT IS *TRANSMATH*?

TransMath® is the comprehensive mathematics intervention that provides key foundational skill-building and problem-solving experiences through multisensory strategies.

***TransMath*:**

- Affords **ample time** for practice and appropriate pacing
- Teaches **multistep problems** gradually and in a meaningful context
- Utilizes **numerous visual representations** to build conceptual understanding
- Uses **fewer steps**, decreasing mistakes in routine procedures
- Offers a **dual-topic approach**—students experience a numbers strand and an applications strand in every lesson
- **Embedded placement, baseline, ongoing, and summative assessment**, along with robust online data management and reporting
- *mBook*™ tools offer **seamless online access** to *TransMath* materials, including ready-made lesson presentations, videos, and interactive whiteboard activities

Endorsed by:

VISION · LEADERSHIP · EXCELLENCE
case
COUNCIL OF ADMINISTRATORS OF SPECIAL EDUCATION

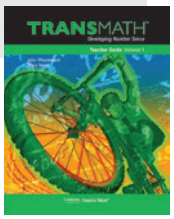
"We needed a math intervention for our students who struggle or 'turn off' from the general curriculum. After implementing *TransMath*, we have seen the achievement of our students greatly increase. I can't believe it!"

—Pat Herzig
Mathematics Instructional Specialist
Bremerton School District, Washington

TransMath simultaneously teaches **foundational computation skills** while providing the **rich, grade-level problem-solving** experiences necessary for high-stakes assessments.

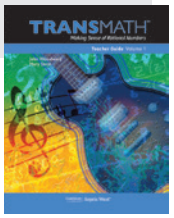
LEVEL 1
Number Sense

- Place Value
- Whole Numbers
- Operations
- Factors
- Multiples
- Estimation
- Fractions
- Multistep Problems
- Mean, Median, Range
- Measurement



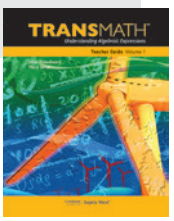
LEVEL 2
Rational Numbers

- Fractions
- Decimal Numbers
- Percentages
- Exponents
- Negative Numbers
- Estimation
- Data and Statistics
- Two-Dimensional Geometry
- Probability



LEVEL 3
Algebraic Thinking

- Properties
- Simple Algebraic Expressions
- Inequalities
- Functions
- Square Roots
- Irrational Numbers
- Estimation
- Ratio and Proportion
- Coordinate Graphs
- Slope
- Three-Dimensional Geometry



Successful entry into algebra

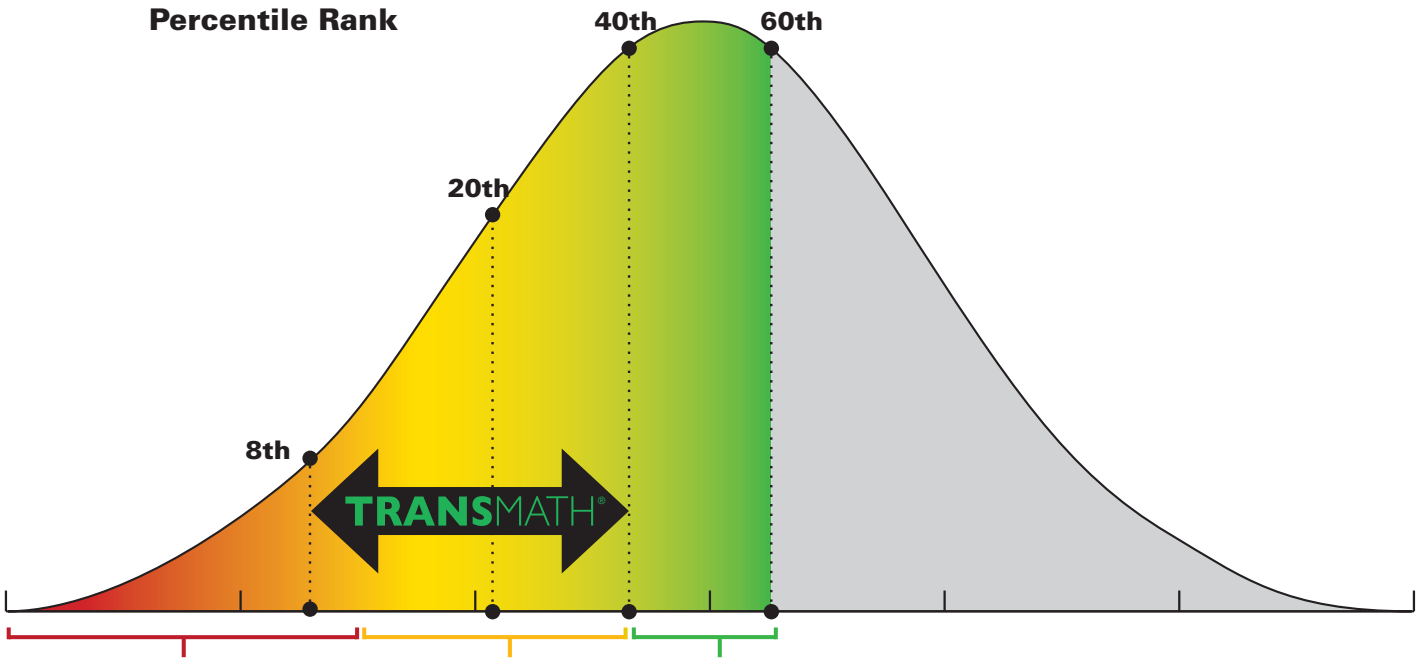
The National Mathematics Advisory Panel says ...

"To prepare students for algebra, the curriculum must simultaneously develop conceptual understanding, computational fluency, and problem-solving skills."

WHO IS *TRANSMATH* FOR?

***TransMath* targets the specific learning needs of students who require immediate support:**

- Students lacking the foundational skills necessary for successful entry into algebra
- Students scoring two or more years below grade level on state standardized tests



Extensively cited by the Task Group on Instructional Practices for the National Mathematics Advisory Panel's Final Report, *TransMath (Transitional Mathematics)* provides comprehensive skill building by targeting instruction with fewer topics, taught in greater depth. This approach was cited as a key finding for mathematical success by the Trends in International Mathematics and Science Studies (TIMSS) and is supported by the National Council of Teachers of Mathematics (NCTM) Curriculum Focal Points.

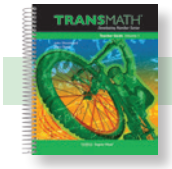
CAN YOUR STUDENTS SOLVE THIS EQUATION:

$10(x + 5) = 2x + 56$?

Prerequisite skills for algebra proficiency

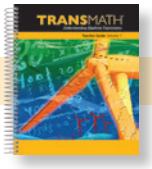
$10(x + 5) = 2x + 56$ ←	Recognize that the equation is balanced Recognize that unlike terms cannot be combined Recognize that 2 is a coefficient Be able to use the Distributive Property to delete the parentheses Know basic multiplication
$10x + 50 = 2x + 56$ ←	Recognize that unlike terms cannot be combined
$-50 + 10x + 50 = 2x + 56 + -50$ ←	Understand the need to maintain a balanced equation Know the property of opposites (i.e., 50 and –50)
$10x + -50 + 50 = 2x + 56 + -50$ ←	Be able to use the Commutative Property to combine like terms Know how to add integers Know basic subtraction
$10x = 2x + 6$ ←	Recognize that the equation is balanced
$-2x + 10x = 2x + 6 + -2x$ ←	Understand the need to maintain a balanced equation Know the property of opposites (i.e., $2x$ and $-2x$)
$-2x + 10x = 2x + -2x + 6$ ←	Be able to use the Commutative Property to combine like terms Know how to add integers
$8x = 0 + 6$ ←	Recognize that the equation is balanced Know basic addition
$\frac{1}{8} \cdot 8x = 6 \cdot \frac{1}{8}$ ←	Be able to use reciprocals Know how to multiply fractions
$\frac{8}{8}x = \frac{6}{8}$ ←	Know that $1x = x$ (the "invisible coefficient") Know about fractions equal to one (i.e., $\frac{8}{8}$) Know basic multiplication Know how to simplify fractions Know about greatest common factors
$x = \frac{3}{4}$	

Taught to Mastery in:



Level 1

Level 2



Level 3

TRANSMATH STUDENTS EXCEED EXPECTED QUANTILE GAINS AND IMPROVE MATH PERFORMANCE

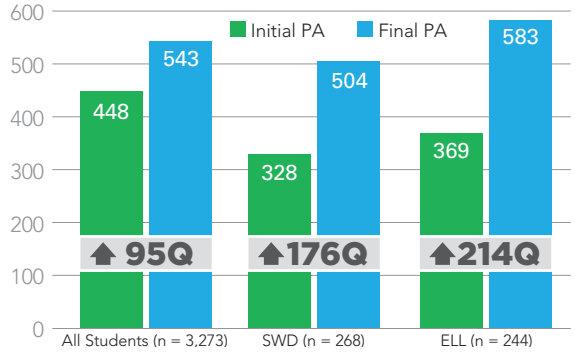
The Measure: Progress Assessment of Quantile Growth

The Progress Assessment, administered four times throughout the school year, yields a Quantile® (Q) score based on the Quantile Framework® for Mathematics from MetaMetrics. Used to indicate students' optimal learning range and monitor progress toward grade-level goals, the Quantile scores indicate what math content students are ready to learn and what they already understand.

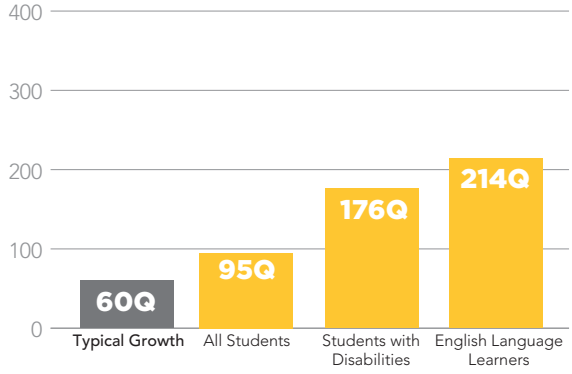
TransMath Level 1: Quantile Growth

All Students with Matched Scores across 71 Districts in 33 States, 2012–13 School Year

TransMath Level 1 Quantile Gains
Progress Assessment 2012–2013



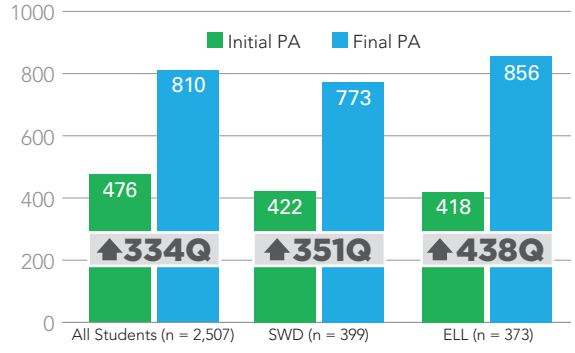
TransMath Level 1 Quantile Gains
Compared to Typical* Growth



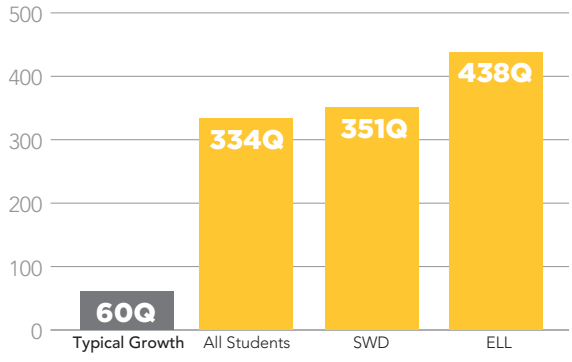
TransMath Level 2: Quantile Growth

All Students with Matched Scores across 57 Districts in 29 States, 2012–13 School Year

TransMath Level 2 Quantile Gains
Progress Assessment 2012–2013

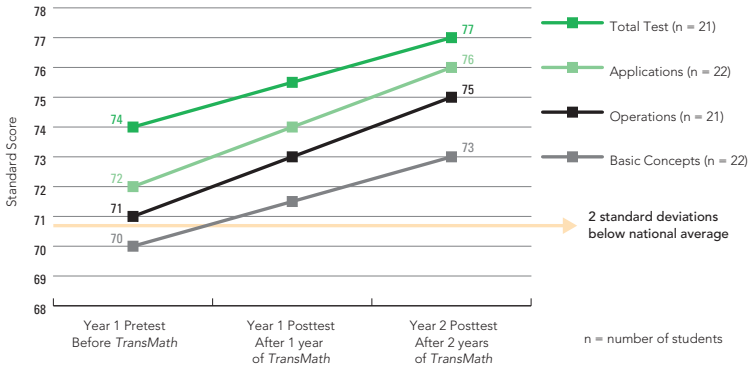


TransMath Level 2 Quantile Gains
Compared to Typical* Growth



*These are typical results for an average student at the 50th percentile based on research from MetaMetrics®: Typically students in grades 5–8 gain 60 Quantiles over 30 weeks, which is the same time period represented above for students in TransMath.

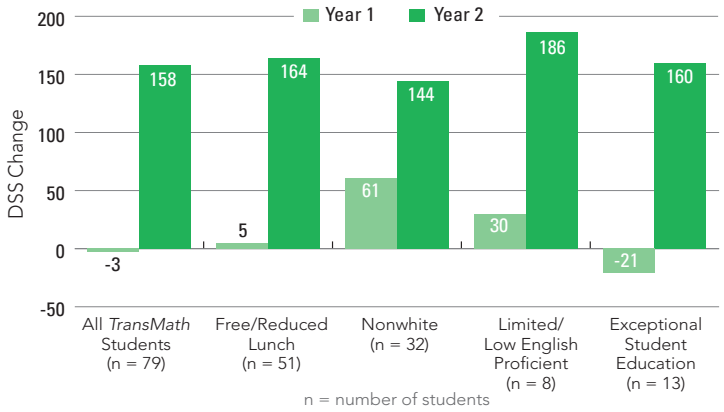
Students Improve Standard Score by Nearly Four Points in a Georgia School District



KeyMath3 results for students with special needs with *TransMath* instruction over two school years: Fall 2008 to Spring 2010.

On average, *TransMath* students who had scored nearly two standard deviations below the national average at pretest were able to improve their standard score by nearly four points or nearly one-third of a standard deviation; that is, the *TransMath* group brought its performance closer to the national average.

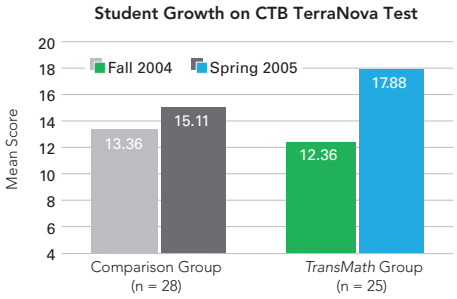
Two-Year Gain on the State Assessment for Lee County Public Schools, Florida

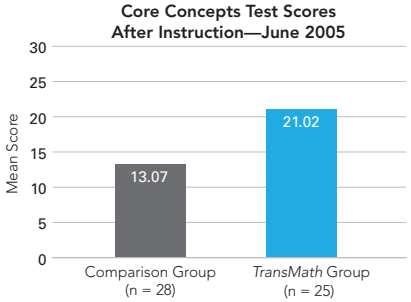


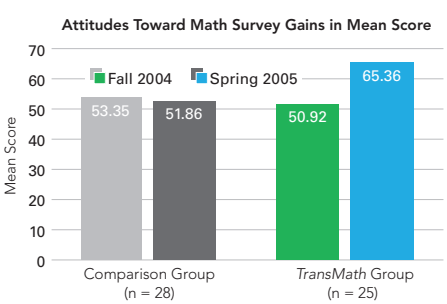
Intervention programs targeting students struggling in math often take more than one year of implementation to effect positive change, which makes the results in Year 2 of particular interest. In Year 1 of the *TransMath* implementation, the *TransMath* students showed no significant gains in FCAT developmental scale score. In Year 2, by contrast, the *TransMath* students made statistically significant growth, gaining, on average, 158 DSS points.

1. Year 1: $F(1,78) < 1$; Year 2: $F(1,78) = 145.20$, $p < .001$, MSE = 988291
2. FRL: $F(1,50) = 117.65$, $p < .001$, MSE = 683881; Nonwhite: $F(1,31) = 90.89$, $p < .001$, MSE = 331776; LEP: $F(1,7) = 41.97$, $p < .001$, MSE = 137270; ESE: $F(1,12) = 37.01$, $p < .001$, MSE = 167521

Higher Academic Outcomes for *TransMath* Students in Two Bremerton, Washington, Schools







WHAT MAKES *TRANSMATH* WORK?

Dual Topics avoid cognitive overload.

Building Number Concepts:
▶ Expanded Subtraction With Regrouping

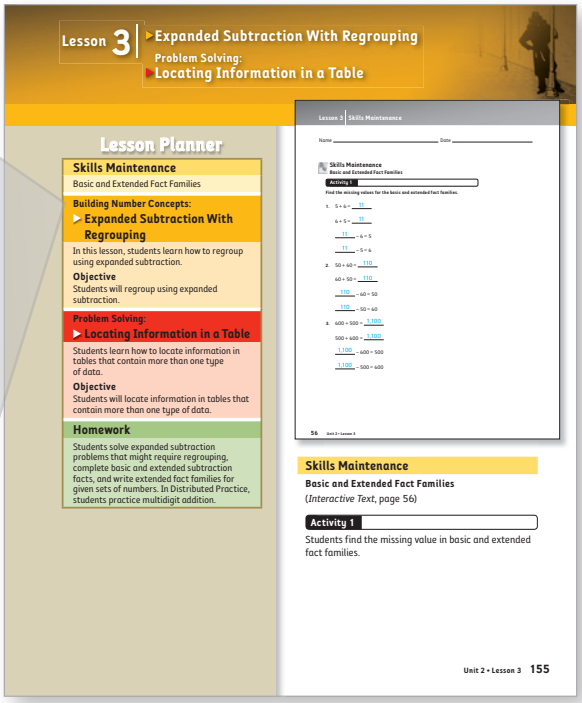
In this lesson, students learn how to regroup using expanded subtraction.

Objective
Students will regroup using expanded subtraction.

Problem Solving:
▶ Locating Information in a Table

Students learn how to locate information in tables that contain more than one type of data.

Objective
Students will locate information in tables that contain more than one type of data.



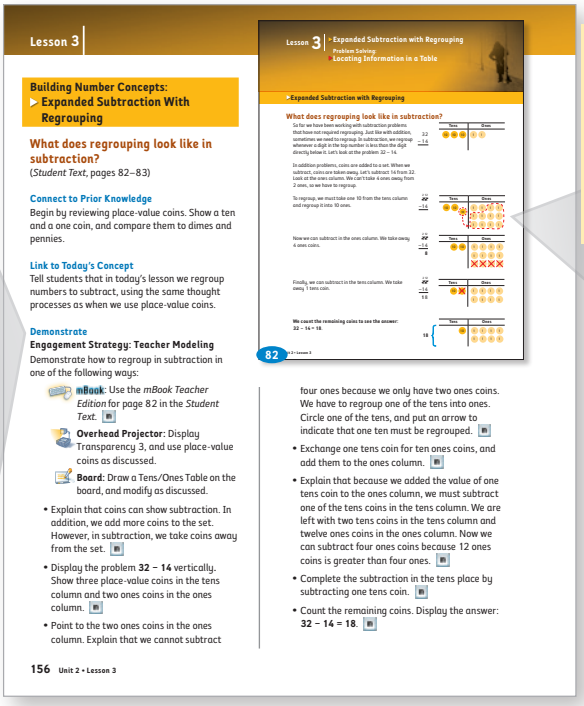
Engagement Strategies provide varied and continuous communication opportunities.

Demonstrate

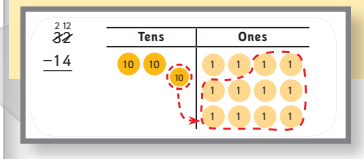
Engagement Strategy: Teacher Modeling

Demonstrate how to regroup in subtraction in one of the following ways:

- **mBook**: Use the *mBook Teacher Edition* for page 82 in the *Student Text*.
- **Overhead Projector**: Display Transparency 3, and use place-value coins as discussed.
- **Board**: Draw a Tens/Ones Table on the board, and modify as discussed.



Visual Models illustrate difficult concepts.



Ask questions help teachers guide discussions that assess understanding.

Ask:

Has Jackie paid her dues? (*yes*)

Which player is the goalie? (*April*)

What are the names of Trinity's parents? (*Mark and Tina*)

Watch for questions guide teachers in assessing student understanding.

Watch for:

- Are students able to identify the correct row?
- Are students able to identify the correct column?
- Do students check to make sure they answered the question that was asked?

Check for Understanding provides ongoing, informal assessment in every lesson.

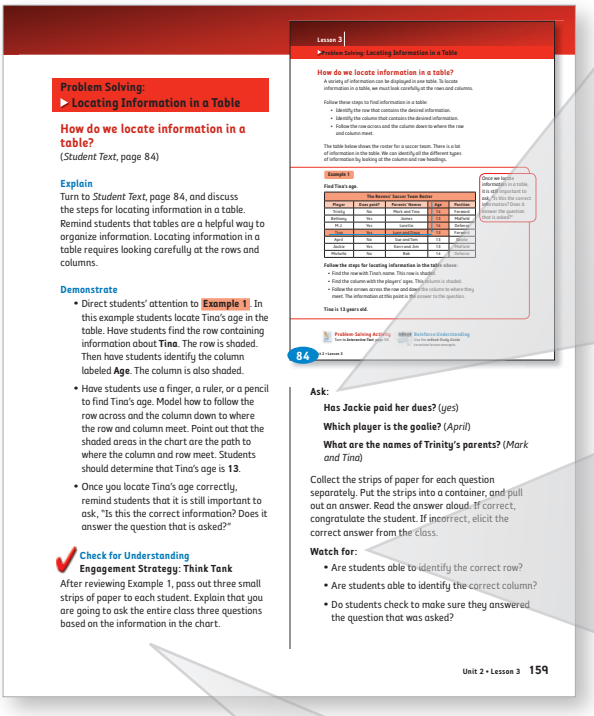
Check for Understanding
Engagement Strategy: Think Tank

After reviewing Example 1, pass out three small strips of paper to each student. Explain that you are going to ask the entire class three questions based on the information in the chart.

Distributed Practice in every lesson provides continued practice of previously learned skills.

Activity 4 • Distributed Practice

Students practice multidigit addition.



Problem Solving:
▶ Locating Information in a Table

How do we locate information in a table?
(*Student Text*, page 84)

Explain
Turn to *Student Text*, page 84, and discuss the steps for locating information in a table. Remind students that tables are a helpful way to organize information. Locating information in a table requires looking carefully at the rows and columns.

Demonstrate
- Direct students' attention to Example 1. In this example students locate Tina's age in the table. Have students find the row containing information about **Tina**. The row is shaded. Then have students identify the column labeled **Age**. The column is also shaded.
- Have students use a finger, a ruler, or a pencil to find Tina's age. Model how to follow the row across and the column down to where the row and column meet. Point out that the shaded areas in the chart are the path to where the column and row meet. Students should determine that Tina's age is **13**.
- Once you locate Tina's age correctly, remind students that it is still important to ask, "Is this the correct information? Does it answer the question that is asked?"

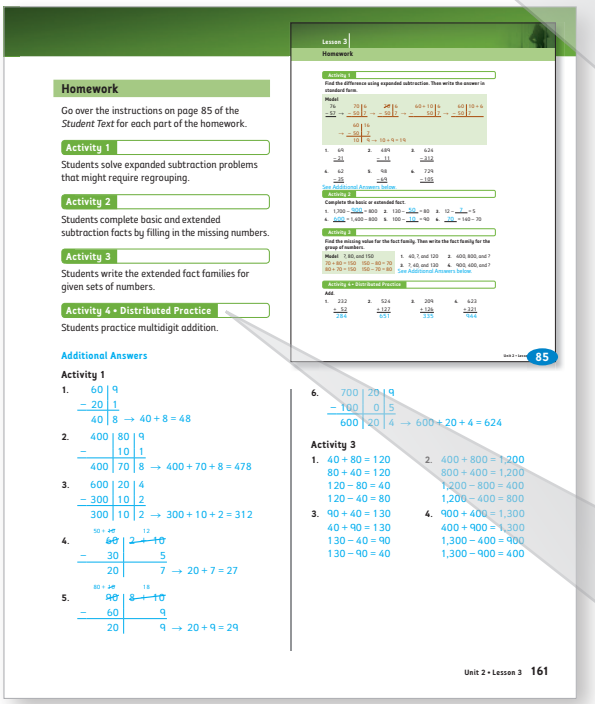
Check for Understanding
Engagement Strategy: Think Tank
After reviewing Example 1, pass out three small strips of paper to each student. Explain that you are going to ask the entire class three questions based on the information in the chart.

Ask:
Has Jackie paid her dues? (*yes*)
Which player is the goalie? (*April*)
What are the names of Trinity's parents? (*Mark and Tina*)

Collect the strips of paper for each question separately. Put the strips into a container, and pull out an answer. Read the answer aloud. If correct, congratulate the student. If incorrect, elicit the correct answer from the class.

Watch for:
- Are students able to identify the correct row?
- Are students able to identify the correct column?
- Do students check to make sure they answered the question that was asked?

Unit 2 • Lesson 3 159



Homework

Go over the instructions on page 85 of the *Student Text* for each part of the homework.

Activity 1
Students solve expanded subtraction problems that might require regrouping.

Activity 2
Students complete basic and extended subtraction facts by filling in the missing numbers.

Activity 3
Students write the extended fact families for given sets of numbers.

Activity 4 • Distributed Practice
Students practice multidigit addition.

Additional Answers

Activity 1

1. 60 | 9 / − 20 | 1 / 40 | 8 → 40 + 8 = 48
2. 400 | 80 | 9 / − | 10 | 1 / 400 | 70 | 8 → 400 + 70 + 8 = 478
3. 600 | 20 | 4 / − 300 | 10 | 2 / 300 | 10 | 2 → 300 + 10 + 2 = 312
4. 50 + 15 — 60 | 2 + 10 / − 30 | 5 / 20 | 7 → 20 + 7 = 27
5. 80 + 15 — 80 | 8 + 10 / − 60 | 9 / 20 | 9 → 20 + 9 = 29
6. 700 | 20 | 9 / − 100 | 0 | 5 / 600 | 20 | 4 → 600 + 20 + 4 = 624

Activity 3

1. 40 + 80 = 120; 80 + 40 = 120; 120 − 80 = 40; 120 − 40 = 80
2. 400 + 800 = 1,200; 800 + 400 = 1,200; 1,200 − 800 = 400; 1,200 − 400 = 800
3. 90 + 40 = 130; 40 + 90 = 130; 130 − 40 = 90; 130 − 90 = 40
4. 900 + 400 = 1,300; 400 + 900 = 1,300; 1,300 − 400 = 900; 1,300 − 900 = 400

Unit 2 • Lesson 3 161

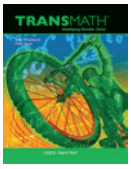
DUAL TOPICS PROVIDE A BALANCE OF CONCEPTUAL LEARNING AND PROBLEM-SOLVING APPLICATIONS

The dual-topic approach:

- Breaks learning into smaller parts
- Increases student engagement
- Addresses the issue of cognitive overload for struggling students

		Building Number Concepts	Problem Solving
Level 1: Developing Number Sense	Unit 1	Addition	Working With Data
	Unit 2	Subtraction	Working With Data
	Unit 3	Multiplication	Introduction to Measurement
	Unit 4	Division	Measuring Two-Dimensional Objects
	Unit 5	Factors, Primes, Composites	Area and Perimeter
	Unit 6	Common Factors and Number Patterns	Properties of Shapes
	Unit 7	More Number Patterns and Common Multiples	Slides, Flips, Turns, and Symmetry
	Unit 8	Concept of Fractions	Introduction to Statistics
	Unit 9	Adding and Subtracting Fractions	Converting Units of Measurement
Level 2: Making Sense of Rational Numbers	Unit 1	Review of Whole Numbers and Fractions	Working With Data
	Unit 2	Multiplication and Division of Fractions	Tools for Measurement and Construction
	Unit 3	Working With Mixed Numbers	Tessellations, Geometry, and Measurement
	Unit 4	The Concept of Decimal Numbers	Triangles and Quadrilaterals
	Unit 5	Operations on Decimal Numbers	Area of Two-Dimensional Shapes
	Unit 6	Understanding Percents	Percents in Word Problems and Graphs
	Unit 7	Scientific Notation	Probability
	Unit 8	Integers	Finding Points on a Graph
	Unit 9	Operations on Integers	Coordinate Graphs and Transformations
Level 3: Understanding Algebraic Expressions	Unit 1	Fractions and Decimal Numbers	Statistics
	Unit 2	Variables	Ratios and Proportions
	Unit 3	Inequalities	Working With Rates
	Unit 4	Algebraic Patterns	Ratios
	Unit 5	Algebraic Expressions	Surface Area of Three-Dimensional Shapes
	Unit 6	Algebraic Rules and Properties	Volume of Three-Dimensional Shapes
	Unit 7	Introduction to Algebraic Equations	Geometric Construction and Angle Measurement
	Unit 8	Solving Different Kinds of Algebraic Equations	Links and Angles
	Unit 9	Introduction to Functions	Working With Coordinate Graphs
	Unit 10	Square Roots and Irrational Numbers	Nonlinear Functions

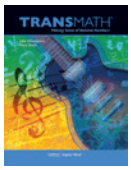
SCOPE & SEQUENCE



Level 1: Developing Number Sense

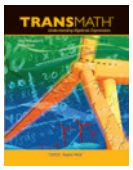
Level 1: Developing Number Sense

	Building Number Concepts	Problem Solving
Unit 1	**Addition** • Determine the place value of digits in a whole number. • Find sums of whole numbers with and without regrouping. • Round and estimate with whole numbers.	**Working With Data** • Read and interpret word problems. • Create, read, and interpret bar graphs. • Create pictographs.
Unit 2	**Subtraction** • Understand the relationship between basic and extended subtraction facts. • Solve whole-number subtraction problems using a variety of strategies. • Estimate the solution to problems by rounding.	**Working With Data** • Identify the question being asked in a word problem. • Read and analyze data in bar graphs and tables. • Solve word problems using whole-number subtraction.
Unit 3	**Multiplication** • Understand the relationship between basic and expanded multiplication. • Recognize and factor out powers of 10 from multiplication problems. • Estimate the solution to whole-number multiplication problems.	**Introduction to Measurement** • Measure using common objects. • Measure objects using inches and metric units. • Use a variety of measurement strategies in real-world problems.
Unit 4	**Division** • Understand the relationship between multiplication and division. • Solve problems using basic and extended division facts. • Represent whole-number division problems in a variety of ways.	**Measuring Two-Dimensional Objects** • Use square units to measure the area of shapes. • Apply the concept of area to real-world situations. • Solve word problems using whole-number division.
Unit 5	**Factors, Primes, Composites** • Factor whole numbers using a variety of methods. • Determine if a given number is prime or composite. • Find the prime factorization of a whole number.	**Area and Perimeter** • Explore the relationship between perimeter and area of shapes. • Discover and use area formulas for triangles and parallelograms. • Find the area of irregularly shaped objects.
Unit 6	**Common Factors and Number Patterns** • Find common factors for whole numbers using a variety of methods. • Identify the greatest common factor for two or more whole numbers. • Explore patterns in odd, even, and square numbers.	**Properties of Shapes** • Group shapes based on common properties. • Explore congruence and similarity of shapes. • Expand and contract shapes on a grid.
Unit 7	**More Number Patterns and Common Multiples** • Understand the relationships between triangular and square numbers. • Use exponents to show repeated multiplication. • Identify common multiples of two or more whole numbers.	**Slides, Flips, Turns, and Symmetry** • Recognize slides, flips, and turns in shapes. • Use tangrams to explore the properties of shapes. • Understand reflection and rotational symmetry.
Unit 8	**Concept of Fractions** • Recognize common fractions between whole numbers. • Represent fractions using shapes and fraction bars. • Find equivalent fractions.	**Introduction to Statistics** • Find the mean, median, and range of a set of data. • Use tables to organize data. • Read and create line plots and stem-and-leaf plots.
Unit 9	**Adding and Subtracting Fractions** • Add and subtract fractions with like and unlike denominators. • Find the least common multiple of two or more whole numbers. • Use least common multiples to find common denominators.	**Converting Units of Measurement** • Understand common units of measurement. • Convert units using a conversion table. • Measure objects to the nearest ¼ inch.



Level 2: Making Sense of Rational Numbers

		Building Number Concepts	Problem Solving
Level 2: Making Sense of Rational Numbers	Unit 1	**Review of Whole Numbers and Fractions** • Use place-value concepts to add and subtract whole numbers. • Use a variety of representations for fractions and decimal numbers. • Find the least common multiple of two or more whole numbers.	**Working With Data** • Read, create, and interpret bar graphs, pictographs, stem-and-leaf plots, and line graphs. • Use a bar graph to find the average of a set of data.
	Unit 2	**Multiplication and Division of Fractions** • Use models to show multiplication and division of fractions. • Understand how multiplication and division of fractions is different from whole numbers. • Use the traditional methods to multiply and divide fractions.	**Tools for Measurement and Construction** • Develop an understanding of basic geometric terms. • Measure lengths and angles using a variety of tools and units. • Use a compass to complete basic geometric constructions.
	Unit 3	**Working With Mixed Numbers** • Use the LAPS strategy to add, subtract, multiply, and divide mixed numbers. • Use approximations to estimate answers to problems involving fractions and mixed numbers.	**Tessellations, Geometry, and Measurement** • Recognize and use translations, reflections, and rotations of shapes. • Create and analyze tessellations.
	Unit 4	**The Concept of Decimal Numbers** • Understand the relationship between fractions and decimal numbers. • Convert fractions to decimal numbers and decimal numbers to fractions. • Use strategies to round decimal numbers.	**Triangles and Quadrilaterals** • Classify triangles based on their properties. • Classify quadrilaterals based on their properties. • Understand the result of changing the dimensions of a shape.
	Unit 5	**Operations on Decimal Numbers** • Demonstrate addition and subtraction of decimal numbers. • Use models to show multiplication and division of decimal numbers. • Use rounding strategies when working with decimal numbers.	**Area of Two-Dimensional Shapes** • Use formulas to find the area of rectangles, triangles, and other quadrilaterals. • Develop an understanding of the parts of a circle. • Find the circumference and area of a circle.
	Unit 6	**Understanding Percents** • Understand the relationship between fractions, decimal numbers, and percents. • Convert between fractions, decimal numbers, and percents. • Use models to represent and understand percents.	**Percents in Word Problems and Graphs** • Read, create, and interpret circle graphs. • Use graphs to show percent increase or decrease. • Solve problems involving percent increase or decrease.
	Unit 7	**Scientific Notation** • Understand the use of standard notation and scientific notation. • Use scientific notation to write very large and very small numbers.	**Probability** • Use fractions, decimal numbers, and percents to show probabilities. • Use models to find the probability of a single event. • Find the probability of independent and dependent events.
	Unit 8	**Integers** • Use integers to represent values greater than and less than zero. • Use a number line to order and compare integers. • Use models to add and subtract integers.	**Finding Points on a Graph** • Read, create, and interpret dot graphs. • Use a coordinate grid to graph *x* and *y* coordinates. • Recognize and describe symmetry on a coordinate graph.
	Unit 9	**Operations on Integers** • Use rules for integer operations to solve problems. • Use models to show multiplication and division of integers. • Use the PASS rule to multiply and divide integers.	**Coordinate Graphs and Transformations** • Use a coordinate graph to show translated and reflected shapes. • Use a coordinate graph to tell the difference between a translation and a reflection. • Use a table to show translated and reflected shapes.



Level 3: Understanding Algebraic Expressions

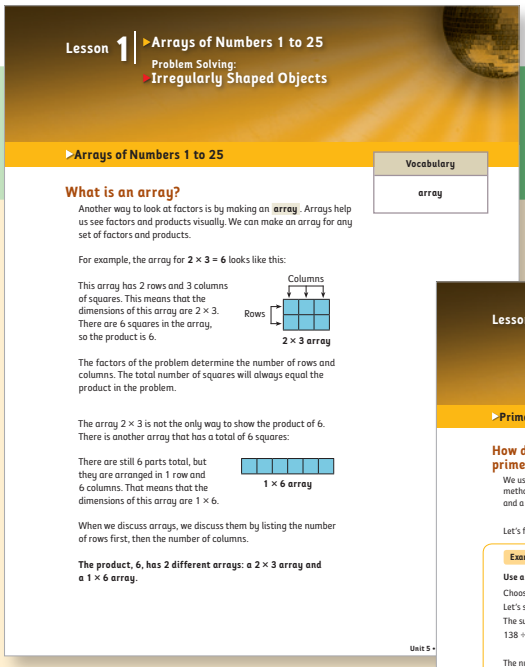
Level 3: Understanding Algebraic Expressions		Building Number Concepts	Problem Solving
	Unit 1	**Fractions and Decimal Numbers** • Use models to show the relationship between fractions and decimal numbers. • Use a variety of methods to add, subtract, multiply, and divide rational numbers. • Use rounding and estimation strategies with rational numbers.	**Statistics** • Find the mean, median, mode, and range of a set of data. • Read, create, and interpret box-and-whisker plots and scatter plots. • Identify direct and indirect relationships in data using a scatter plot.
	Unit 2	**Variables** • Use variables to describe patterns. • Use variables to represent unknown values in formulas and equations. • Convert between equations and statements using words.	**Ratios and Proportions** • Represent part-to-whole and part-to-part relationships using ratios. • Recognize and represent proportional relationships. • Use proportions to identify similar shapes.
	Unit 3	**Inequalities** • Represent inequalities using symbols and number lines. • Represent written statements using inequalities. • Create written statements from inequalities.	**Working With Rates** • Solve rate problems using proportions. • Find unit rates using proportions. • Compare two rates using proportions.
	Unit 4	**Algebraic Patterns** • Use variables to represent numeric patterns. • Use variables to analyze patterns and make predictions. • Represent even and odd numbers and divisibility rules using algebraic equations.	**Ratios** • Represent part-to-whole and part-to-part relationships using ratios. • Solve real-world problems involving ratios. • Use percents to make comparisons.
	Unit 5	**Algebraic Expressions** • Evaluate numeric expressions using order of operations rules. • Recognize like and unlike terms in an algebraic expression. • Simplify algebraic expressions using the properties of numbers.	**Surface Area of Three-Dimensional Shapes** • Identify the attributes of three-dimensional shapes. • Use formulas to find the surface area of cylinders and prisms. • Find the surface area of pyramids and polyhedrons by breaking the shapes into familiar parts.
	Unit 6	**Algebraic Rules and Properties** • Use order of operations rules to evaluate algebraic and numeric expressions. • Use substitution to evaluate algebraic expressions. • Apply the distributive property to algebraic expressions.	**Volume of Three-Dimensional Shapes** • Use formulas to find the volume of cylinders and prisms. • Find the volume of pyramids and cones by comparing them to prisms and cylinders. • Use a formula to find the volume of a sphere.
	Unit 7	**Introduction to Algebraic Equations** • Understand the basic properties of algebraic equations. • Balance equations involving symbols or variables. • Solve problems involving algebraic equations.	**Geometric Construction and Angle Measurement** • Use a compass and straightedge to construct basic figures. • Use algebraic reasoning to find missing angle measures. • Explore the properties of triangles with congruent angles.
	Unit 8	**Solving Different Kinds of Algebraic Equations** • Use a variety of rules and properties to solve algebraic equations. • Use algebraic equations to describe a given situation. • Solve word problems involving algebraic equations using models, and check answers for how reasonable they are.	**Lines and Angles** • Use algebra to find the measures of interior angles in a polygon. • Use angle rules to solve problems involving related angles (vertical, corresponding, right, and supplementary). • Complete simple proofs involving angle measures.
	Unit 9	**Introduction to Functions** • Use word problems and tables to think about functional relationships. • Interpret the slope and *y*-intercept of a function in a real-world situation. • Use a function to make predictions in a real-world situation.	**Working With Coordinate Graphs** • Graph linear functions on a coordinate graph. • Convert functions between representations (tables, graphs, and equations). • Interpret the intersection of two functions in a real-world situation.
	Unit 10	**Square Roots and Irrational Numbers** • Solve algebraic equations and estimate answers involving square roots. • Use the Pythagorean theorem to find the lengths of sides of right triangles. • Identify and use irrational numbers.	**Nonlinear Functions** • Tell whether a function is linear or nonlinear given a table, equation, or graph. • Graph nonlinear functions on a coordinate graph. • Understand the role of the coefficient in a nonlinear function.

DEVELOP FOUNDATIONAL PROFICIENCIES WITH THE BUILDING NUMBER CONCEPTS STRAND

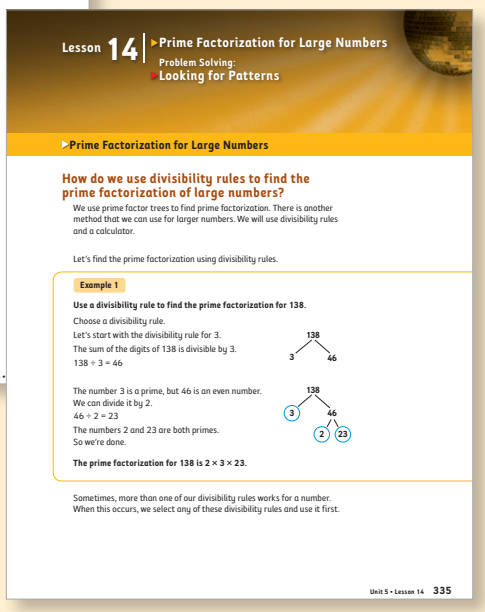
Students are taught concepts and skills in the order in which they need to learn them—from developing number sense to thinking algebraically.

The Building Number Concepts strand encompasses:

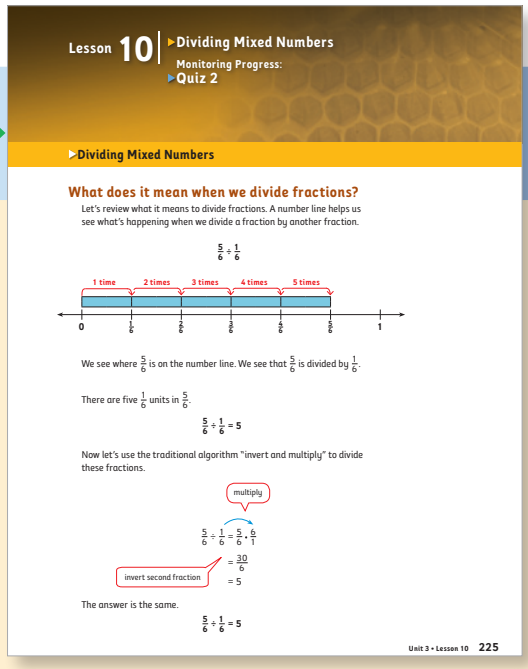
- Whole-number computation
- Factors, primes, and composites
- Rational-number computation
- Comparison of fractions, decimal numbers, and percents
- Exponents and integers
- Variables and algebraic equations
- Inequalities and functions



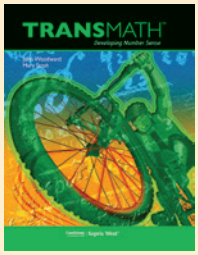
Level 1, Unit 5, Lesson 1



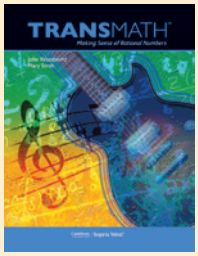
Level 1, Unit 5, Lesson 14



Level 2, Unit 3, Lesson 10

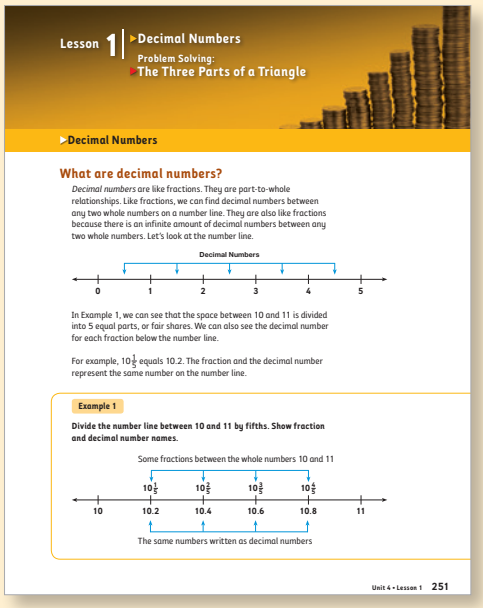


Developing Number Sense

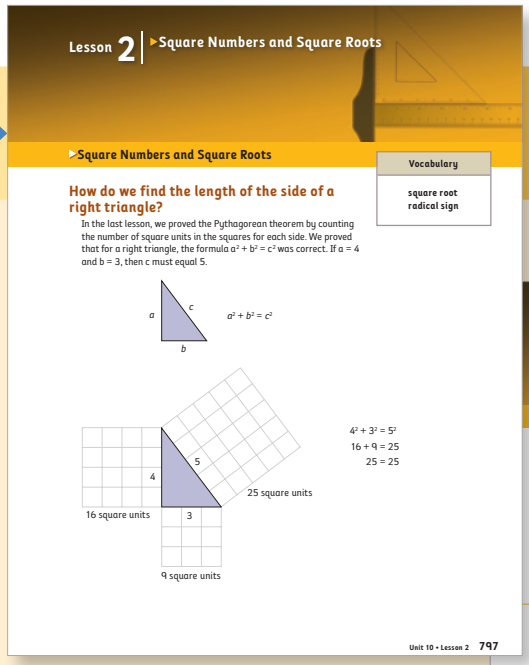


Making Sense of Rational Numbers

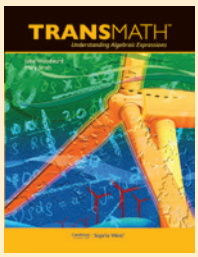
> In-depth coverage of key topics and concepts involving whole numbers and then rational numbers is critical for future success in mathematics.
>
> —Assisting students struggling with mathematics, 2009*



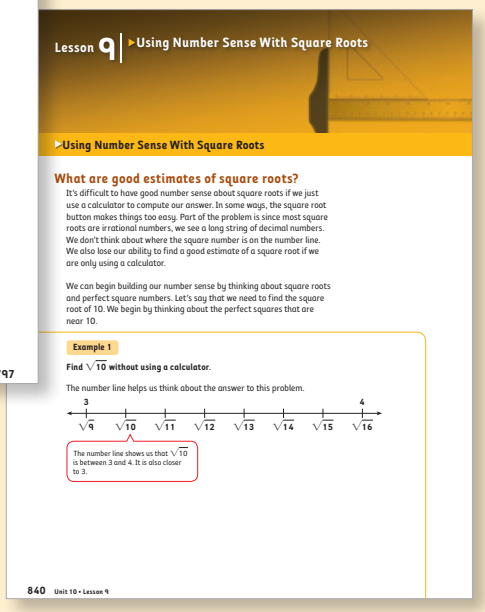
Level 2, Unit 4, Lesson 1



Level 3, Unit 10, Lesson 2



Understanding Algebraic Expressions



Level 3, Unit 10, Lesson 9

Successful entry into algebra

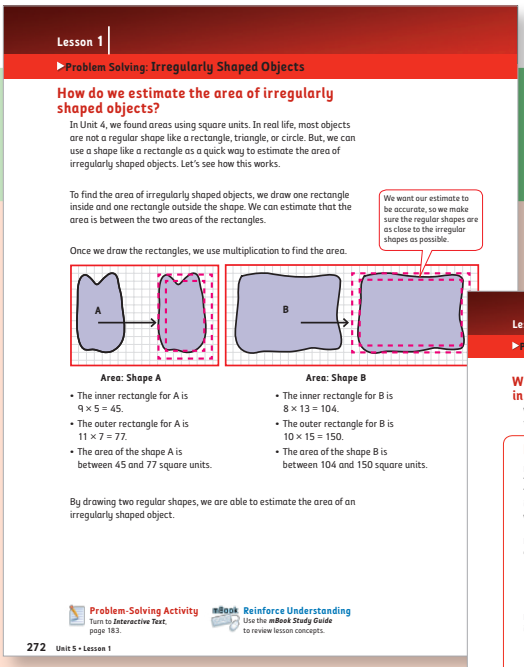
Gersten, R., Beckmann, S., Clarke, B., Foegen, A., Marsh, L., Star, J. R., & Witzel, B. (2009). Assisting students struggling with mathematics: Response to intervention (RtI) for elementary and middle schools (NCEE 2009-4060). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. Retrieved from http://ies.ed.gov/ncee/wwc/publications/practiceguides/.

PROVIDE RICH, GRADE-LEVEL PROBLEM-SOLVING EXPERIENCES WITH THE PROBLEM-SOLVING STRAND

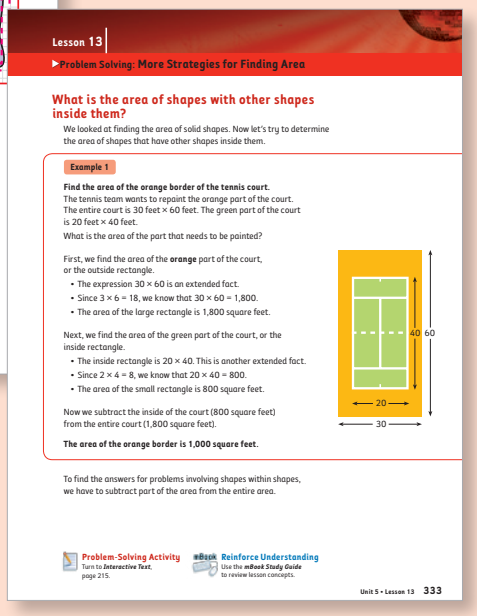
With *TransMath*, students apply previously learned concepts and engage in critical thinking to solve multistep problems needed for higher mathematics or the working world.

The Problem-Solving strand encompasses:

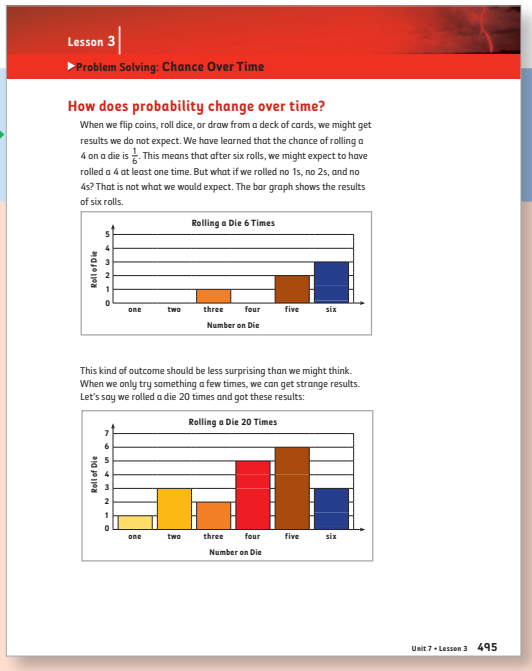
- Work with data
- One-, two-, and three-dimensional objects
- Measurement tools
- Probability
- Proportional thinking
- Properties of shapes
- Angles, transversals, and geometric transformations



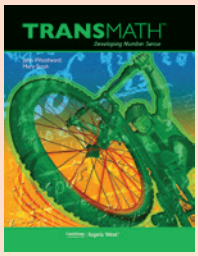
Level 1, Unit 5, Lesson 1



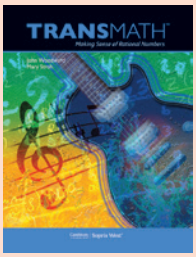
Level 1, Unit 5, Lesson 13



Level 2, Unit 7, Lesson 3



Developing Number Sense

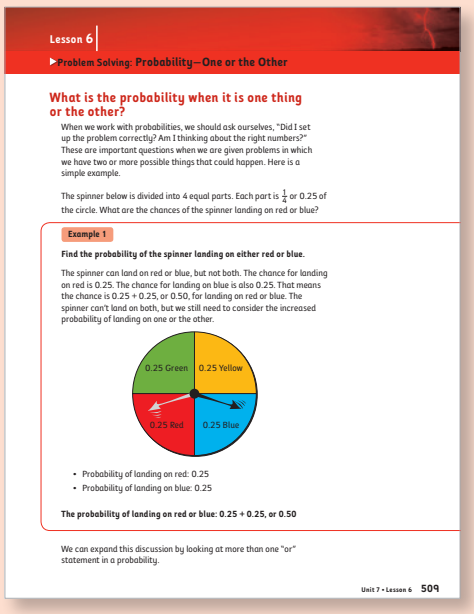


Making Sense of Rational Numbers

Problem solving involves reasoning and analysis, argument construction, and the development of innovative strategies. These abilities are used not only in advanced mathematics topics—such as algebra, geometry, and calculus—but also throughout the entire mathematics curriculum beginning in kindergarten, as well as in subjects such as science. Moreover, these skills have a direct impact on students' achievement scores, as many state and national standardized assessments and college entrance exams include problem solving.

—Improving mathematical problem solving in grades 4 through 8: A practice guide, 2012*

Successful entry into algebra


Lesson 6

Problem Solving: Probability—One or the Other

What is the probability when it is one thing or the other?

When we work with probabilities, we should ask ourselves, "Did I set up the problem correctly? Am I thinking about the right numbers?" These are important questions when we are given problems in which we have two or more possible things that could happen. Here is a simple example.

The spinner below is divided into 4 equal parts. Each part is $\frac{1}{4}$ or 0.25 of the circle. What are the chances of the spinner landing on red or blue?

Example 1

Find the probability of the spinner landing on either red or blue.

The spinner can land on red or blue, but not both. The chance for landing on red is 0.25. The chance for landing on blue is also 0.25. That means the chance is 0.25 + 0.25, or 0.50, for landing on red or blue. The spinner can't land on both, but we still need to consider the increased probability of landing on one or the other.

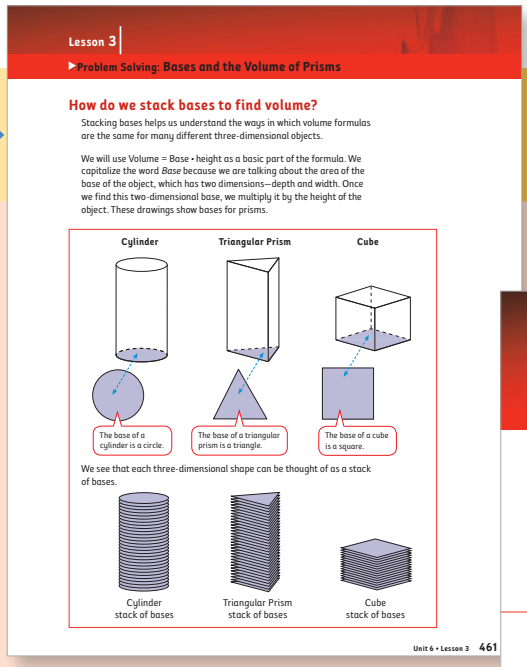
- Probability of landing on red: 0.25
- Probability of landing on blue: 0.25

The probability of landing on red or blue: 0.25 + 0.25, or 0.50

We can expand this discussion by looking at more than one "or" statement in a probability.

Unit 7 • Lesson 6 509

Level 2, Unit 7, Lesson 6


Lesson 3

Problem Solving: Bases and the Volume of Prisms

How do we stack bases to find volume?

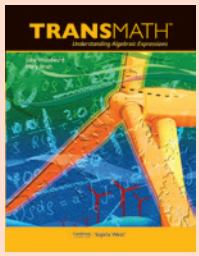
Stacking bases helps us understand the ways in which volume formulas are the same for many different three-dimensional objects.

We will use Volume = Base • height as a basic part of the formula. We capitalize the word *Base* because we are talking about the area of the base of the object, which has two dimensions—depth and width. Once we find this two-dimensional base, we multiply it by the height of the object. These drawings show bases for prisms.

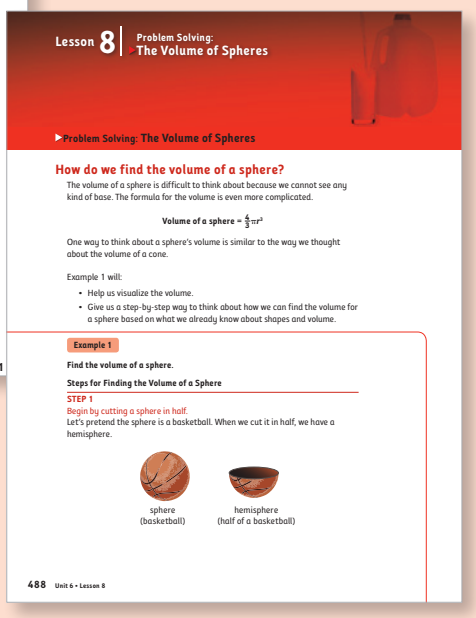
We see that each three-dimensional shape can be thought of as a stack of bases.

Unit 6 • Lesson 3 461

Level 3, Unit 6, Lesson 3



Understanding Algebraic Expressions


Lesson 8 Problem Solving: The Volume of Spheres

Problem Solving: The Volume of Spheres

How do we find the volume of a sphere?

The volume of a sphere is difficult to think about because we cannot see any kind of base. The formula for the volume is even more complicated.

Volume of a sphere = $\frac{4}{3}\pi r^3$

One way to think about a sphere's volume is similar to the way we thought about the volume of a cone.

Example 1 will:

- Help us visualize the volume.
- Give us a step-by-step way to think about how we can find the volume for a sphere based on what we already know about shapes and volume.

Example 1

Find the volume of a sphere.

Steps for Finding the Volume of a Sphere

STEP 1

Begin by cutting a sphere in half.

Let's pretend the sphere is a basketball. When we cut it in half, we have a hemisphere.

488 Unit 6 • Lesson 8

Level 3, Unit 6, Lesson 8

Woodward, J., Beckmann, S., Driscoll, M., Franke, M., Herzig, P., Jitendra, A., Koedinger, K. R., & Ogbuehi, P. (2012). Improving mathematical problem solving in grades 4 through 8: A practice guide (NCEE 2012-4055). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. Retrieved from http://ies.ed.gov/ncee/wwc/publications_reviews.aspx#pubsearch/.

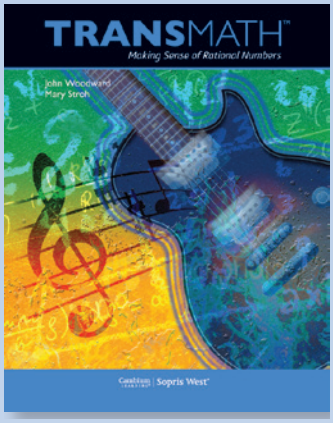
PLACEMENT

TransMath placement is based on students' skill levels, not grade levels. Students may place into one of these three entry points:

Entry Point 1

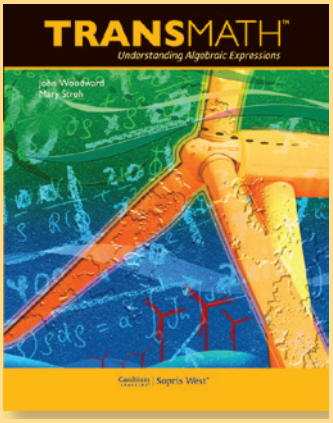
Developing Number Sense: For students showing the need for foundational number sense skills

Entry Point 2

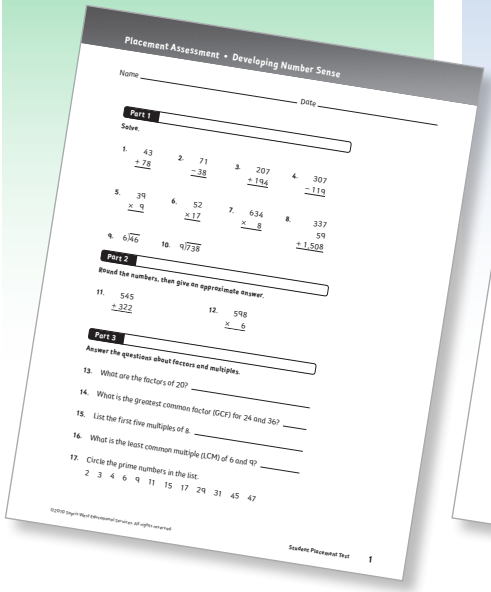


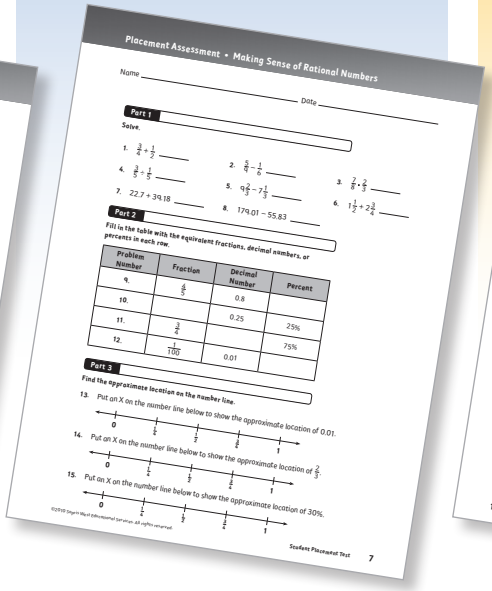
Making Sense of Rational Numbers: For students showing proficiency in basic number sense skills but lacking the foundational skills for rational numbers

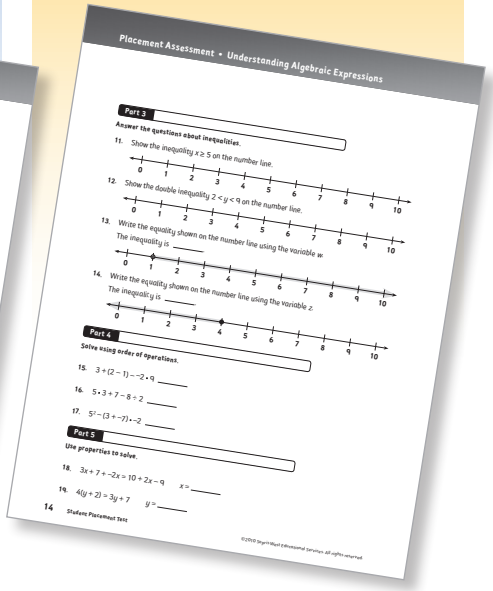
Entry Point 3



Understanding Algebraic Expressions: For students showing proficiency with rational numbers but lacking the foundational skills for prealgebra

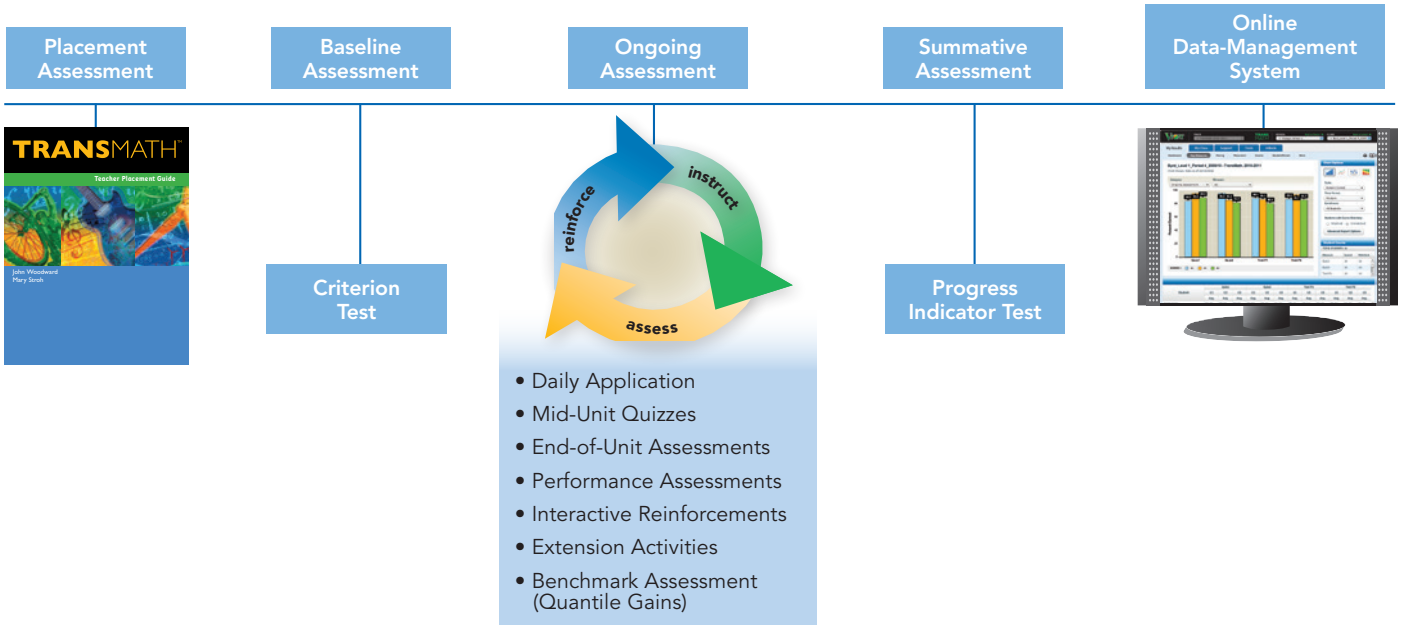






THE *TRANSMATH* ASSESSMENT SYSTEM

This comprehensive assessment system provides teachers with the measures they need to accurately place students into the curriculum and to monitor their progress through the curriculum. It furnishes the teacher with the data necessary to inform instruction to ensure each student meets his or her goals.



Placement

Based on students' demonstrated understanding of key mathematics concepts and skills, data from the *TransMath* placement tests accurately place students at one of the three entry points of the curriculum.

Baseline Assessments

Administered at the beginning of each book level, the Baseline Assessment establishes a starting point for measuring students' progress through the curriculum.

Ongoing Assessments—Include Progress Assessment Powered by the Quantile Framework

Regular assessment of student mastery of the concepts and skills taught in the curriculum ensures that teachers can adjust pacing or instruction to meet the needs of individual students. As part of ongoing assessments, the Benchmark Progress Assessment is administered four times throughout the school year to monitor progress. This assessment yields a Quantile® score based on the Quantile Framework for Mathematics.

Summative Assessments

Given at the end of each book level, the Progress Indicators measure the critical skills of mathematics through curriculum-based measures. Comparing Progress Indicators to the Baseline Assessments accurately tracks students' progress through the curriculum.

Online Data-Management and Reporting System

This user-friendly database allows teachers and administrators to record, track, and report student test results. Reports can be generated at the individual, class, building, and district levels.

DIFFERENTIATION INFORMED BY DATA

TransMath offers tools and time to assess, reinforce, and differentiate instruction. Key differentiation tools are described below:

Teacher Differentiation Support

Online resources include:

- **Teacher-Talk Tutorials** reinforce lesson concepts using narrated, animated visual models that make the concept concrete for the student
- **Interactive Click-Thru** slideshow presentations use visual models to concretely develop concepts
- **Whiteboard Activities** motivate and engage students
- **On Track! Extension Activities**—multistep word problems designed for small groups to prepare students for high-stakes tests
- **Interactive Reinforcement Exercises**—online, interactive, multiple-choice activities that provide immediate feedback
- **Form B Retests** for Quizzes and End-of-Unit Assessments are available for downloading

Student Differentiation Support

Online resources include:

- The entire ***Student Text*** to review missed concepts
- **Teacher-Talk Tutorials** to reinforce difficult concepts
- **Interactive Reinforcement Exercises** to review, reinforce, and practice missed concepts

VmathLive® provides meaningful online math practice anytime, anywhere. With activities directly aligned with *TransMath* content, *VmathLive* provides:

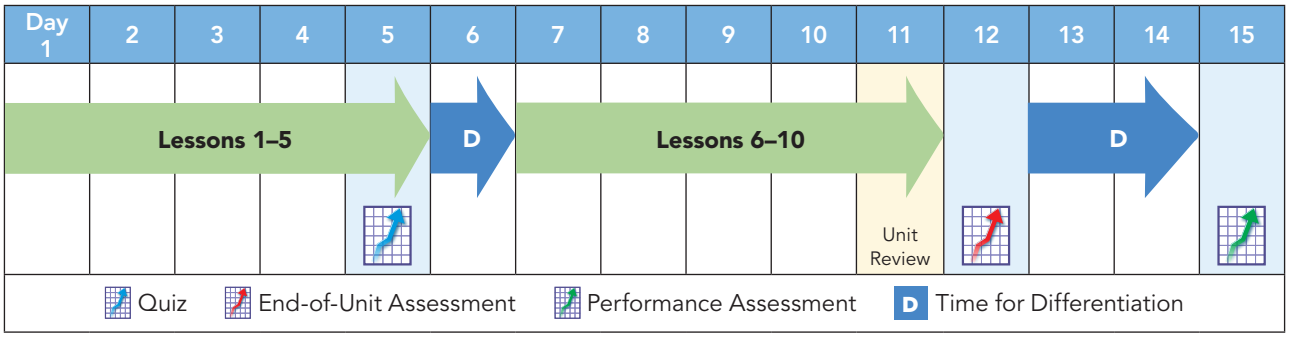
- Extra practice in essential math concepts, skills, and problem-solving strategies
- Playful origami avatars and virtual tutors that motivate continued student participation
- Combination of "learn" and "play" activities
- Embedded multimedia hints to assisst students in solving problems—including online conceptual models and videos in English and Spanish

Overhead Manipulative Set provides opportunities for multisensory modeling of missed concepts.

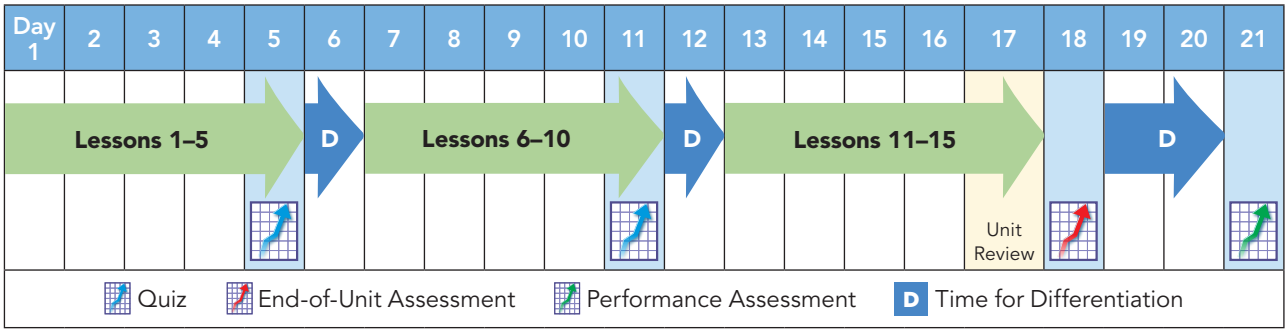
BUILT-IN TIME FOR DIFFERENTIATION

Units are either 10 lessons or 15 lessons in length. *TransMath* lessons are designed for 50–60 minute lesson blocks per day and designate time for differentiation.

10-Lesson Unit



15-Lesson Unit

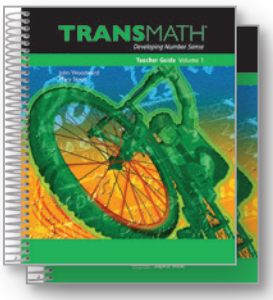


PACING GUIDE AT THE LESSON LEVEL

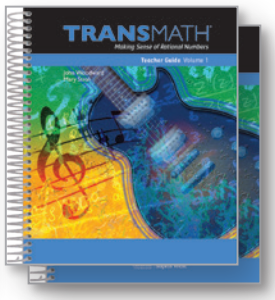
Every lesson has a predictable lesson structure. Although *TransMath* lessons are designed for 50–60 minute lesson blocks per day, adjustments can be made to fit multiple scheduling needs.

LESSON STRUCTURE	APPROXIMATE TIME FOR A 50–60 MINUTE LESSON	
Skills Maintenance	Starts each lesson with distributed practice warm-ups	4–5 minutes
Building Number Concepts	Develops conceptual understanding of number, operation, and prealgebra topics through: • Teacher Modeling • Engagement Strategies • Extensive Use of Visual Models • Apply Skills Activities	20–25 minutes
Problem Solving	Develops conceptual understanding of geometry, measurement, data, and probability through: • Teacher Modeling • Engagement Strategies • Extensive Use of Visual Models • Rich, Grade-Level Problem-Solving Activities	20–25 minutes
Homework	Provides daily, independent practice with lesson concepts and skills as well as earlier learned skills for continued distributed practice. Assignments take 15–20 minutes outside class.	5 minutes—Assign Homework

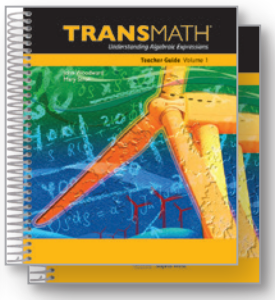
STREAMLINED TEACHER MATERIALS



Level 1: 9 units

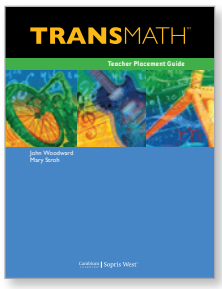


Level 2: 9 units

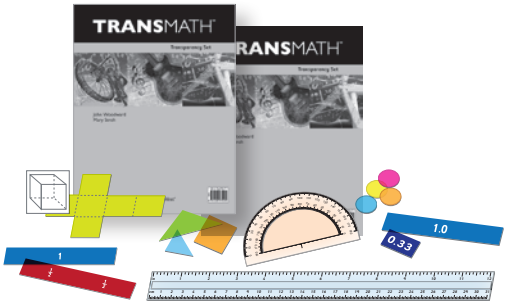


Level 3: 10 units

Teacher Guides—3 Levels
Two-Volume Set at each level
Provides Unit Openers, Lesson Planners, step-by-step instruction, assessment and differentiation supports, and images of related student materials



Teacher Placement Guide
Guides teachers in administering and scoring the placement test



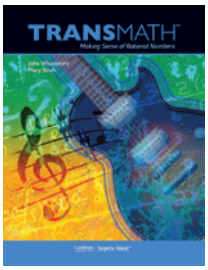
Transparencies and Manipulatives
Supports conceptual learning and problem-solving skills

Online Assessment System
Comprehensive data-management system guides instruction and monitors change

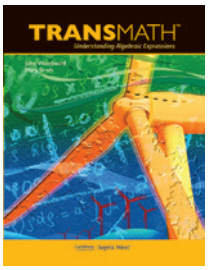
mBook Online Tools
Provides online access to all teacher and student components and tools for Professional Development, Concept Modeling, and Reinforcement
See page 24

ENGAGING STUDENT MATERIALS

Level 1: 9 units



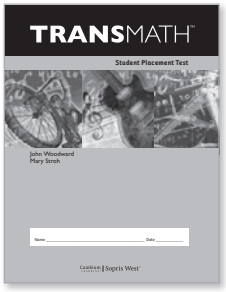
Level 2: 9 units



Level 3: 10 units

Student Text—3 Levels
Provides Unit Openers, detailed examples, real-world connections, and homework for each lesson

mBook Study Guide
Provides online access to Student Text and Interactive Reinforcement Exercises
See page 25



Student Placement Test
Accurately places students into the curriculum

Assessment Book
Contains all Quizzes, End-of-Unit Assessments, and Performance Assessments

VmathLive
Provides interactive online practice and tutorials

Interactive Text
Provides the in-class activities for application of skills

NEXT PAGE
Learn about *mBook* Online Tools

ONLINE TOOLS SUPPORT TEACHERS WITH JUST-IN-TIME INSTRUCTIONAL TOOLS AND RESOURCES

The *mBook* Teacher Edition provides powerful online resources to support teachers in the successful daily implementation of *TransMath*®. The *mBook* online tools:

- Provide complete online access to Teacher Editions and student components
- Include friendly Teacher-Talk Tutorial videos, which provide overviews of essential math concepts to aid teacher modeling
- Offer Click-Thru slideshow presentations that can be used to model concepts in the classroom
- Provide tools for differentiation: reinforcement and extension activities, alternate forms of assessments for retesting, printable Interactive Text pages, and more
- Provide direct correlations to state standards

***mBook* Teacher Materials**
Level 3

Click-Thru/Slide-Show Presentation
Level 3, Unit 1, Lesson 1

Teacher-Talk Tutorial
Level 3, Unit 1, Lesson 4

MAKING A CONNECTION TO HOME: DAILY SUPPORT FOR STUDENTS AND PARENTS THROUGH TECHNOLOGY

mBook for Students and Parents

TransMath is accessible to both students and parents—anytime, anywhere—through the *TransMath mBook Study Guide*. This online system provides students and parents with:

- **The complete Student Text**
  - Access to all lesson pages
  - Homework pages online—no need to take books home
- **Online Reinforcement**
  - Teacher-Talk Tutorials narrate and animate initial lesson concepts using concrete visual models to aid conceptual understanding
  - Interactive Reinforcement Exercises provide immediate corrective feedback and track student progress
  - Anytime, anywhere access to lesson pages to review missed content

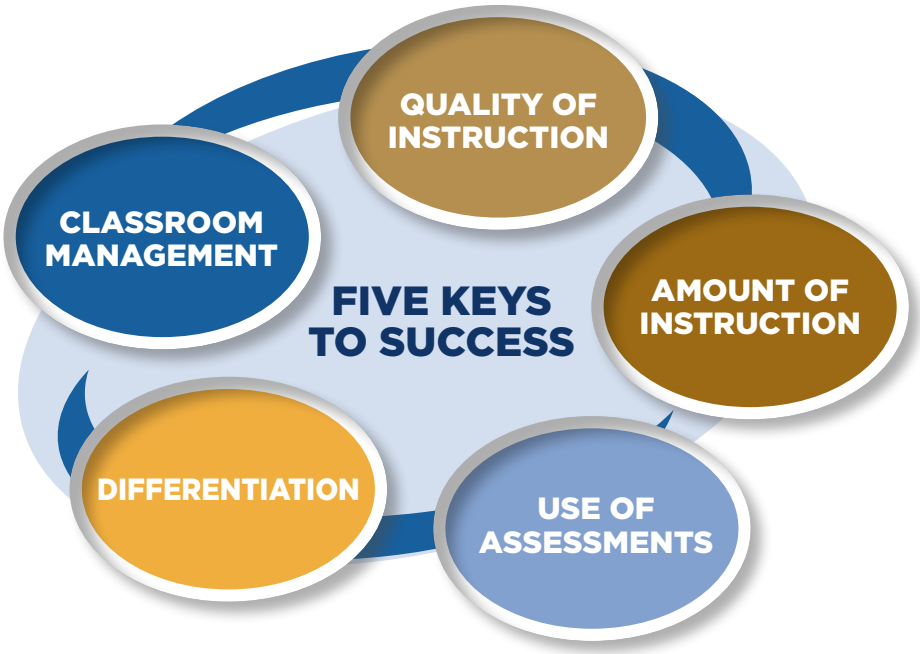
VmathLive: Interactive, Online Support

- Provides computational practice and tutorials of key math concepts
- Provides self-paced learning practice in a computer-based environment
- Reinforces essential math skills and strategies
- Provides real-time math skills competitions with learners worldwide

Teacher-Talk Tutorial from *TransMath mBook Study Guide*, Unit 1, Lesson 1

OUR GOAL: PROVIDE THE HIGHEST LEVEL OF EDUCATOR SUPPORT TO INCREASE STUDENT ACHIEVEMENT

Service does not come in a box; it must be custom-built to meet the specific needs of districts, schools, administrators, and teachers. Firmly grounded in research, the Voyager Sopris Learning approach is built around the **"Five Keys to Success,"** which form the foundation for a personalized strategy for planning, training, and ongoing support:



> The professional development was incredible because the leaders engaged me in all ways. They wanted my feedback; I felt appreciated for my work. I found all *TransMath* professional development engaging, thought-provoking, and motivating.
>
> —Angel Roman
> Hayes Middle School
> Albuquerque Public Schools, New Mexico

Our team specializes in partnering with schools and districts to build custom *TransMath* implementation support plans—including planning, training, and ongoing support—to ensure all stakeholders are prepared to implement and sustain *TransMath* implementation. **Key stages of *TransMath* implementation include:**

Visit www.voyagersopris.com/transmath to review training options and a comprehensive menu of services.

WHAT DO EDUCATORS SAY?

"Teachers are extremely pleased with *TransMath*. It is easy to implement, and their students are enjoying it and learning the concepts."

—Helen O'Connor
Curriculum Director
Harrison School District, Colorado

"In my 23 years of teaching, *TransMath* is the first program where I can fill in the math gaps that my students have. My students kept asking me, 'Why has no one ever shown us how to do it this way before?'"

—James R. McGhee
Middle School Teacher
Albuquerque, New Mexico

"I have used *TransMath* for students in special education who are low performing, low socio-economic, and Title I. I use the program to raise student assessment scores and support the tier system of our school, as well as to support students' individualized education programs (IEPs)."

—Angel Roman
Hayes Middle School
Albuquerque Public Schools, New Mexico

Proven to Dramatically Increase Quantile Gains
and Performance on Standardized Assessments

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- Comprehensive research and results overview
- Video testimonials from educators
- Standards correlations

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