PREPARE STUDENTS FOR ALGEBRA
WITH NUMBER SENSE AND PROBLEM SOLVING
WHAT IS TRANSMATH?

TransMath® is a comprehensive math intervention curriculum that targets middle and high school students who lack the foundational skills necessary for entry into algebra. Typical TransMath students are two or more years below grade level and respond to the unique approach of TransMath.

Using a dual topic approach, TransMath emphasizes fewer topics in greater depth while accelerating students to more advanced math, from number sense to rational numbers to understanding algebra.

TransMath:

• Deepens conceptual understanding and builds problem-solving proficiency through the use of explicit instruction and multisensory strategies

• Embeds lesson-by-lesson models to support teacher preparation and strengthen teachers’ content knowledge

• Facilitates whole-class and individual interactive learning accessing digital tools to increase opportunities for mathematical discourse and peer learning

• Provides students and teachers with eBook access to support learning and foster more meaningful interaction
TransMath simultaneously teaches foundational computation skills while providing the rich, grade-level problem-solving experiences necessary for high-stakes assessments.

LEVEL 1
Developing Number Sense
• Place Value
• Whole Numbers
• Operations
• Factors
• Multiples
• Estimation
• Fractions
• Multistep Problems
• Mean, Median, Range
• Measurement

LEVEL 2
Making Sense of Rational Numbers
• Fractions
• Decimal Numbers
• Percentages
• Exponents
• Negative Numbers
• Estimation
• Data and Statistics
• Two-Dimensional Geometry
• Probability

LEVEL 3
Algebra: Expressions, Equations, and Functions
• Properties
• Simple Algebraic Expressions
• Inequalities
• Functions
• Square Roots
• Irrational Numbers
• Estimation
• Ratio and Proportion
• Coordinate Graphs
• Slope
• Three-Dimensional Geometry

The National Mathematics Advisory Panel says ...

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

“Having a program like TransMath that breaks [math] down is amazing ... When my students say ‘I can’t do fractions,’ and then by the end of the lesson they’re getting 95 percent and saying ‘Yes, I can,” it’s really great to see.

—Sarah Sherman, Teacher
Kennedy Middle School, Albuquerque, NM
**WHO IS TRANSMATH FOR?**

TransMath benefits students who require immediate support:

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

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**Can your students solve this equation:**

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

**Prerequisite skills for Algebra proficiency**

<table>
<thead>
<tr>
<th>Step</th>
<th>Equation</th>
<th>Key Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10((x + 5) = 2x + 56)</td>
<td>Recognize that the equation is balanced</td>
</tr>
<tr>
<td>2</td>
<td>10(x + 50 = 2x + 56)</td>
<td>Recognize that unlike terms cannot be combined</td>
</tr>
<tr>
<td>3</td>
<td>10(x + 50 + \text{-}50 = 2x + 56 + \text{-}50)</td>
<td>Understand the need to maintain a balanced equation</td>
</tr>
<tr>
<td>4</td>
<td>10(x + 50 \text{-} 50 = 2x + 56 + \text{-}50)</td>
<td>Know the Property of Opposites (i.e., 50 and (-50))</td>
</tr>
<tr>
<td>5</td>
<td>10((x + 0) = 2x + 6)</td>
<td>Recognize that the equation is balanced</td>
</tr>
<tr>
<td>6</td>
<td>10((x + \text{-}2x) = 2x + 6 + \text{-}2x)</td>
<td>Understand the need to maintain a balanced equation</td>
</tr>
<tr>
<td>7</td>
<td>10((x + 0 - 2x) = 2x + 6 + \text{-}2x)</td>
<td>Know the Property of Opposites (i.e., (2x) and (-2x))</td>
</tr>
<tr>
<td>8</td>
<td>(-2x + 10x = 2x + \text{-}2x + 6)</td>
<td>Be able to use the Commutative Property to combine like terms</td>
</tr>
<tr>
<td>9</td>
<td>8(x = 0 + 6)</td>
<td>Know how to add integers</td>
</tr>
<tr>
<td>10</td>
<td>(\frac{1}{8} \cdot 8x = \frac{1}{8} \cdot 6)</td>
<td>Recognize that the equation is balanced</td>
</tr>
<tr>
<td>11</td>
<td>(\frac{8}{8}x = \frac{6}{8})</td>
<td>Know how to multiply fractions</td>
</tr>
<tr>
<td>12</td>
<td>(\frac{8}{8}x = \frac{3}{4})</td>
<td>Know that (1x = x) (the “invisible coefficient”)</td>
</tr>
<tr>
<td>13</td>
<td>(x = \frac{3}{4})</td>
<td>Know about fractions equal to one (i.e., (\frac{8}{8} = 1))</td>
</tr>
<tr>
<td>14</td>
<td>(\frac{8}{8}x = \frac{6}{8})</td>
<td>Know basic multiplication</td>
</tr>
<tr>
<td>15</td>
<td>(x = \frac{3}{4})</td>
<td>Know how to simplify fractions</td>
</tr>
<tr>
<td>16</td>
<td>(\frac{8}{8}x = \frac{6}{8})</td>
<td>Know about greatest common factors</td>
</tr>
</tbody>
</table>

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**Taught to Mastery in:**

- Level 1
- Level 2
- Level 3

[www.voyagersopris.com/transmath](http://www.voyagersopris.com/transmath)
TRANSIMUMTH THIRD EDITION: REDESIGNED TO INTEGRATE THE CONCEPTS AND SKILLS OF TODAY’S STANDARDS

Each TransMath lesson is delivered in dual concepts: topic 1 provides a conceptual skill; topic 2 provides a problem-solving skill. These two topics are often not related to avoid cognitive overload and provide students a greater opportunity to not only master foundational skills but also move toward grade-level proficiency through problem-solving activities.

<table>
<thead>
<tr>
<th>CONCEPTUAL SKILL</th>
<th>PROBLEM-SOLVING SKILL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole Number Operations</td>
<td>Working with Data</td>
</tr>
<tr>
<td>Factors, Primes, Composites</td>
<td>Problem Solving with Data</td>
</tr>
<tr>
<td>Common Factors</td>
<td>Measuring Two-Dimensional Objects</td>
</tr>
<tr>
<td>Compositions</td>
<td>Area and Perimeter</td>
</tr>
<tr>
<td>Fraction Concepts</td>
<td>Properties and Shapes</td>
</tr>
<tr>
<td>Adding and Subtracting Fractions</td>
<td>Transformations and Symmetry</td>
</tr>
<tr>
<td>Statistics</td>
<td>Units of Measurement</td>
</tr>
</tbody>
</table>

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<tr>
<th>CONCEPTUAL SKILL</th>
<th>PROBLEM-SOLVING SKILL</th>
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</thead>
<tbody>
<tr>
<td>Fractions: Fair Shares and Part/Whole</td>
<td>Fraction Problem Solving</td>
</tr>
<tr>
<td>Fractions: Magnitude, Equivalence, and Operations</td>
<td>Tools for Measurement</td>
</tr>
<tr>
<td>Mixed Numbers</td>
<td>Tessellations</td>
</tr>
<tr>
<td>Decimals and Operations</td>
<td>Geometry</td>
</tr>
<tr>
<td>Percent</td>
<td>Measurement</td>
</tr>
<tr>
<td>Probability</td>
<td>Probability and Percent Problem Solving</td>
</tr>
<tr>
<td>Integers and Integer Operations</td>
<td>Graphing</td>
</tr>
<tr>
<td>Statistics</td>
<td>Coordinate Graphs</td>
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<tr>
<td>Fractions and Decimals</td>
<td>Statistics</td>
</tr>
<tr>
<td>Variables</td>
<td>Ratios, Proportions, Percents</td>
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<tr>
<td>Inequalities</td>
<td>Surface Area of 3D Shapes</td>
</tr>
<tr>
<td>Algebraic Patterns</td>
<td>Volume of 3D Shapes</td>
</tr>
<tr>
<td>Algebraic Expressions</td>
<td>Geometry</td>
</tr>
<tr>
<td>Algebraic Rules and Properties</td>
<td>Construction &amp; Angle Measurement</td>
</tr>
<tr>
<td>Intro to Functions</td>
<td>Lines and Angles</td>
</tr>
<tr>
<td>Square Roots</td>
<td>Working with Coordinate Graphs</td>
</tr>
<tr>
<td>Irrational Numbers</td>
<td>Non-Linear Functions</td>
</tr>
</tbody>
</table>

Download samples at www.voyagersopris.com/transmath
TRANSMATH MOVES STUDENTS TOWARD ALGEBRA READINESS

The Measure: Progress Assessment of Quantile Growth

The Progress Assessment 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.

Quantile Growth
Overall Quantile Gain for All Students, Students with Disabilities (SWD), and English Language Learners (ELL)

<table>
<thead>
<tr>
<th>Group</th>
<th># of Students</th>
<th>Initial PA</th>
<th>Final PA</th>
<th>Quantile Gain</th>
<th>Effect Size</th>
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<tbody>
<tr>
<td>All Level 1</td>
<td>3,751</td>
<td>402.93</td>
<td>500.37</td>
<td>97.44</td>
<td>0.51</td>
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<tr>
<td>SWD</td>
<td>406</td>
<td>368.09</td>
<td>474.10</td>
<td>106.01</td>
<td>0.60</td>
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<tr>
<td>ELL</td>
<td>164</td>
<td>344.94</td>
<td>483.08</td>
<td>138.14</td>
<td>0.80</td>
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</table>

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<th>Effect Size</th>
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</thead>
<tbody>
<tr>
<td>All Level 2</td>
<td>2,745</td>
<td>476.54</td>
<td>803.70</td>
<td>327.16</td>
<td>1.84</td>
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<tr>
<td>SWD</td>
<td>296</td>
<td>413.68</td>
<td>762.50</td>
<td>348.82</td>
<td>2.35</td>
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<tr>
<td>ELL</td>
<td>147</td>
<td>414.83</td>
<td>758.33</td>
<td>343.50</td>
<td>2.31</td>
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</table>

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<th>Initial PA</th>
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</thead>
<tbody>
<tr>
<td>All Level 3</td>
<td>1,442</td>
<td>676.28</td>
<td>761.02</td>
<td>84.74</td>
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<tr>
<td>SWD</td>
<td>239</td>
<td>645.29</td>
<td>730.86</td>
<td>85.57</td>
<td>0.57</td>
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<tr>
<td>ELL</td>
<td>59</td>
<td>630.59</td>
<td>858.31</td>
<td>227.72</td>
<td>1.38</td>
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</tbody>
</table>
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.

Higher Academic Outcomes for TransMath Students in Two Bremerton, Washington, Schools
WHAT MAKES TRANSMATH WORK?

**DUAL TOPICS** avoid cognitive overload.

**Building Number Concepts:**
- **Part-to-Whole Relationships**
  
  In this lesson, students learn about the importance of the part-to-whole relationship represented by a fraction. They learn that this relationship begins with recognizing the "whole" and then comparing part(s) to the whole. Students are introduced to the unit fraction, which is at the foundation of the conceptual understanding of fractions.
  
  **Objective**
  Students will understand fractions as part-to-whole relationships.

**Problem Solving:**
- **Representing Fractions with Cuisenaire Rods**
  
  Students are introduced to a new tool for understanding fractions, Cuisenaire rods. These are the Cuisenaire rods that young students use to learn place value. They are a helpful tool for understanding fractions as well. Like the number line, they are linear models.
  
  **Objective**
  Students will use a linear model (Cuisenaire rods) to examine part-to-whole relationships.

**VOCABULARY DEVELOPMENT** builds student understanding.

**VISUAL MODELS** illustrate difficult concepts.

**DIGITAL MANIPULATIVES** provide opportunities for students to interact.

**POWER CONCEPTS** focus instruction.

**Lesson 3**

**Part-to-Whole Relationships**

**Skills Maintenance**

- **Finding Unit Fractions**
  
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**Vocabulary Development**

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Watch for:
- Can students name a fraction given a model of the unit fraction and the whole?
- Do students understand that there are other fractions using the same whole that are multiples of the unit fraction?
- Can students use a unit fraction to name other fractions that use the same whole?

Reinforce Understanding
Remind students that they can review lesson concepts by accessing the online Interactive Text.

Apply Skills
Have students turn to pages 10 and 11 in the Interactive Text, which provides students an opportunity to practice identifying part-to-whole relationships represented by rods.

Activity 2
Students are given two rods representing a unit fraction and the whole and are to name the whole if they cannot see the relationship without the lines.

Activity 2
Students are shown the unit fraction and a second fraction made up of multiple unit fractions. Students compute the multiplication that shows the number of unit fractions in the second fraction and then name the second fraction. A model is provided to help students understand what is expected of them.

Monitor students’ work as they complete these activities.

Watch for:
- Can students name a fraction given a model of the unit fraction and the whole?
- Do students understand that there are other fractions using the same whole that are multiples of the unit fraction?
- Can students use a unit fraction to name other fractions that use the same whole?

Reinforce Understanding
Remind students that they can review lesson concepts by accessing the online Unit 3 Teacher Talk Tutorial.

Engagement Strategies
provide ongoing, informal assessment in every lesson.

Lesson 3
How do we select Cuisenaire rods to model a fraction? (continued)

Demonstrate
- How students look at a fraction in Example 1, students are shown how to model the fraction.
- How students look at the denominator in Example 2. Explain that the denominator is the same as the denominator in Example 1. In Example 1, we modeled the unit fraction 1/5 with a red rod. One red rod represents the unit fraction and the orange rod for the whole.
- Ask students to look at the fraction to be modeled. The fraction 2/5, for instance, is being modeled. Ask students to state how many more red rods are needed to model the fraction.
- Because two unit fractions are needed, the fraction can be written as 2 x 1/5 = 2/5.
- How students look at the numerator in Example 2. The picture shows a representation for 3. One of the red rods and one orange rod represent the fraction.
- Have students model the unit fraction on their desk. Do they have two red rods and one orange rod to model the fraction?
- Review the vocabulary words of the example. These words are critical to conceptual understanding of part-to-whole relationships.

Skill Application
provides immediate opportunity for students to practice what they learned.

Activity 4 • Distributed Practice
Students practice basic computational skills. Tell students that they practice these skills so they do not forget the algorithms and they continue to get better at them.

Distributed Practice
in every lesson provides continued practice of previously learned skills.
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**: Algebra: Expressions, Equations, and Functions: For students showing proficiency with rational numbers but lacking the foundational skills for prealgebra

ONGOING ASSESSMENT

**Informal Assessment**

TransMath provides teachers with numerous opportunities to assess student knowledge as concepts and skills are being developed.

**Check for Understanding**

Informally assesses student learning and prescribes solutions for immediate support. Embedded engagement strategies provide varied opportunities for student communication, engaging all. Check for Understanding occurs after the modeling of each major lesson concept.

**Apply Skills**

These activities allow students to apply the skills they learned in the Building Number Concepts section of each lesson.

**Problem-Solving Activity**

Activities allow students to apply knowledge of the concepts from the Problem Solving section of each lesson.
FORMAL ASSESSMENT

Each unit of TransMath contains multiple methods to assess students’ reasoning and ability to communicate ideas. Each type of assessment serves a different purpose.

Quiz
Quizzes occur every five lessons to give teachers important feedback on student progress. Results inform instruction for differentiation days and subsequent lessons.

<table>
<thead>
<tr>
<th>Students</th>
<th>Assess</th>
<th>Differentiate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>Quiz X</td>
<td>Review Quiz</td>
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<tr>
<td>Scored 80% or Above</td>
<td>Form A</td>
<td>Extension</td>
</tr>
<tr>
<td>Scored Below 80%</td>
<td></td>
<td>Reinforcement</td>
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</table>

Day 1: Students take Quiz during the second half of the lesson.
Day 2: Students work on differentiation activities based on their performance on the Quiz.

End-of-Unit Assessment
The End-of-Unit Assessment measures student mastery of skills taught in the unit. Targeted support is then provided on differentiation days to reinforce difficult skills to help students achieve mastery.

<table>
<thead>
<tr>
<th>Students</th>
<th>Assess</th>
<th>Differentiate</th>
<th>Assess</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 1</td>
<td>Day 2</td>
<td>Day 3</td>
<td>Day 4</td>
</tr>
<tr>
<td>All</td>
<td>End-of-Unit Assessment</td>
<td>Review Test</td>
<td>Performance Assessment Begin new unit</td>
</tr>
<tr>
<td>Scored 80% or Above</td>
<td>Extension</td>
<td>Extension</td>
<td></td>
</tr>
<tr>
<td>Scored Below 80%</td>
<td></td>
<td>Retest End-of-Unit Assessment</td>
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</tbody>
</table>

Day 1: Students take End-of-Unit Assessment to determine differentiation needs.
Day 2: Students work on differentiation activities based on their performance on the assessment.
Day 3: Students continue with differentiation activities or retest.
Day 4: Students take Performance Assessments.

Performance Assessment
The Performance Assessment measures each student’s ability to reason and communicate. Students practice applying unit concepts in the context of a high-stakes test.
DIFFERENTIATION INFORMED BY DATA

TransMath offers tools and time to assess, reinforce, and differentiate instruction. Key tools include:

**Teacher Differentiation Support**

Teachers have access to all of the Teacher and Student materials in eBook format. In addition, teachers have access to:

- **Math Toolbox** provides a variety of digital manipulatives to use with TransMath lessons
- **TeacherTalk 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
- **On Track! Extension Activities** multistep word problems designed for small groups to prepare students for high-stakes tests
- **Form B Retests** for Quizzes and End-of-Unit Assessments are available for download

**Student Differentiation Support**

All of the TransMath resources are available to students in eBook format. Additionally, students have access to the TeacherTalk Tutorials to reinforce difficult concepts. The Math Toolbox is also available to students in their student eBook as well as through the TransMath Student Center.

**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 encourage continued student participation
- Combination of “learn” and “play” activities
- Embedded multimedia hints to assist students in solving problems—including online conceptual models and videos in English and Spanish

VmathLive provides engaging online practice aligned with TransMath content.
BUILT-IN TIME FOR DIFFERENTIATION

Units are either 10 lessons or 15 lessons. TransMath is designed for 50- to 60-minute blocks per day and designates time for differentiation.

10-Lesson Unit

<table>
<thead>
<tr>
<th>Day</th>
<th>1</th>
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<tr>
<td>Lessons 1–5</td>
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<td>Lessons 6–10</td>
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Quiz  End-of-Unit Assessment  Performance Assessment  Time for Differentiation

15-Lesson Unit

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<td>Lessons 1–5</td>
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<td>Lessons 6–10</td>
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<td>Lessons 11–15</td>
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Quiz  End-of-Unit Assessment  Performance Assessment  Time for Differentiation

PACING GUIDE AT THE LESSON LEVEL

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

<table>
<thead>
<tr>
<th>LESSON STRUCTURE</th>
<th>APPROXIMATE TIME FOR A 50- TO 60-MINUTE LESSON</th>
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<tbody>
<tr>
<td>Skills Maintenance</td>
<td>Starts each lesson with distributed practice warm-ups</td>
</tr>
<tr>
<td>Building Number Concepts</td>
<td>Develops conceptual understanding of number, operation, and prealgebra topics through:   • Teacher Modeling   • Engagement Strategies   • Extensive Use of Visual Models   • Apply Skills Activities</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>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</td>
</tr>
<tr>
<td>Homework</td>
<td>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.</td>
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</tbody>
</table>
STREAMLINDED TEACHER MATERIALS

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. Print and digital options.

Teacher Center
Provides access to the resources needed to support an effective TransMath implementation—eBooks, Data Management Resources, VmathLive, TeacherTalk Tutorials and Click Thrus as well as the Math Toolbox.

Online Assessment System
Embedded within the Teacher Center, a comprehensive data-management system guides instruction and monitors change.

ENGAGING STUDENT MATERIALS

Student Texts and Interactive Texts—3 Levels
Student Texts provide Unit Openers, detailed examples, real-world connections, and homework for each lesson. Print and digital options.
Interactive texts provide the in-class activities for application of skills.

Student Center
Provides access to eBooks, VmathLive, Math Toolbox, and animated tutorials
OUR GOAL: PROVIDE THE HIGHEST LEVEL OF EDUCATOR SUPPORT TO INCREASE STUDENT ACHIEVEMENT

The Support Services team is committed to serving teachers and school leaders to achieve results. Our team specializes in partnering with schools and districts to build custom implementation support plans—including planning, training, and ongoing support—to ensure all stakeholders are prepared to implement and sustain Voyager Sopris Learning instructional programs.

These comprehensive services support districts in providing comprehensive, data-focused professional development that aligns with the curriculum and develops the capacity of all teachers. Our services enable districts to have a common framework for evaluating both teacher effectiveness and student achievement.

“...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:

PRE-IMPLEMENTATION PLANNING
LAUNCH
ONGOING
DATA REVIEW

Visit www.voyagersopris.com/transmath to review training options and a comprehensive menu of services.
We’ve been implementing now for almost three years, and this last semester, we had 23 percent overall growth in our students who were in TransMath Level 3. That was looking at all six of our traditional high schools.

—April Brantley
Exceptional Children Program Specialist, Middle and Secondary Alamance-Burlington School System, North Carolina

Implement digitally, with print components, or with a combination of print and digital.