



**When I do well in math,
I believe in myself...
and I can succeed.**

Third Edition

TRANSMATH[®]

Grades 5–10

Build Proficiency for Success in Math

Create a successful path to algebra for struggling students through conceptual understanding and problem solving.

The Challenges of Learning Mathematical Concepts

Most students who struggle in math experience difficulties in two key areas:

- 1 The ability to move from concrete to abstract concepts
- 2 A lack of foundational skills related to addition, subtraction, multiplication and division

Even after addressing these challenges, some students continue to struggle because many standards-based math curricula are too dense, with unfamiliar and confusing mathematical vocabulary. Additionally, these same curricula rush students through the material without providing in-depth learning opportunities.

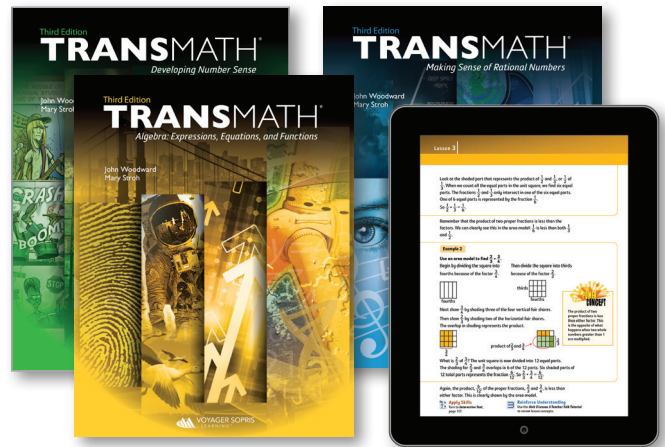
TransMath Bridges the Gap

TransMath® 3rd is a comprehensive math intervention that bridges the “math gap” for middle and high school students who:

- lack the foundational computational and problem solving skills
- struggle with the pace of grade-level material
- are two or more years below grade level based on a high-stakes test
- would be unsuccessful in Algebra I without intervention

The *TransMath* approach:

- ✓ Deepens conceptual understanding by building problem-solving skills through 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 with 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
- ✓ Uses well-chosen visual models and digital manipulatives in conjunction with conceptual explanations to help students understand and remember math concepts



ABOUT THE AUTHORS



Dr. John Woodward is a distinguished professor and dean in the School of Education at the University of Puget Sound.

Mary Stroh teaches mathematics at Central Michigan University.

Together, Woodward and Stroh developed the program after noticing middle school students had deep gaps in their understanding. When those students were taught the conceptual skills to fill those gaps, the students did better than their nonstruggling peers. The authors knew they were on to something, and developing *TransMath* became their passion.

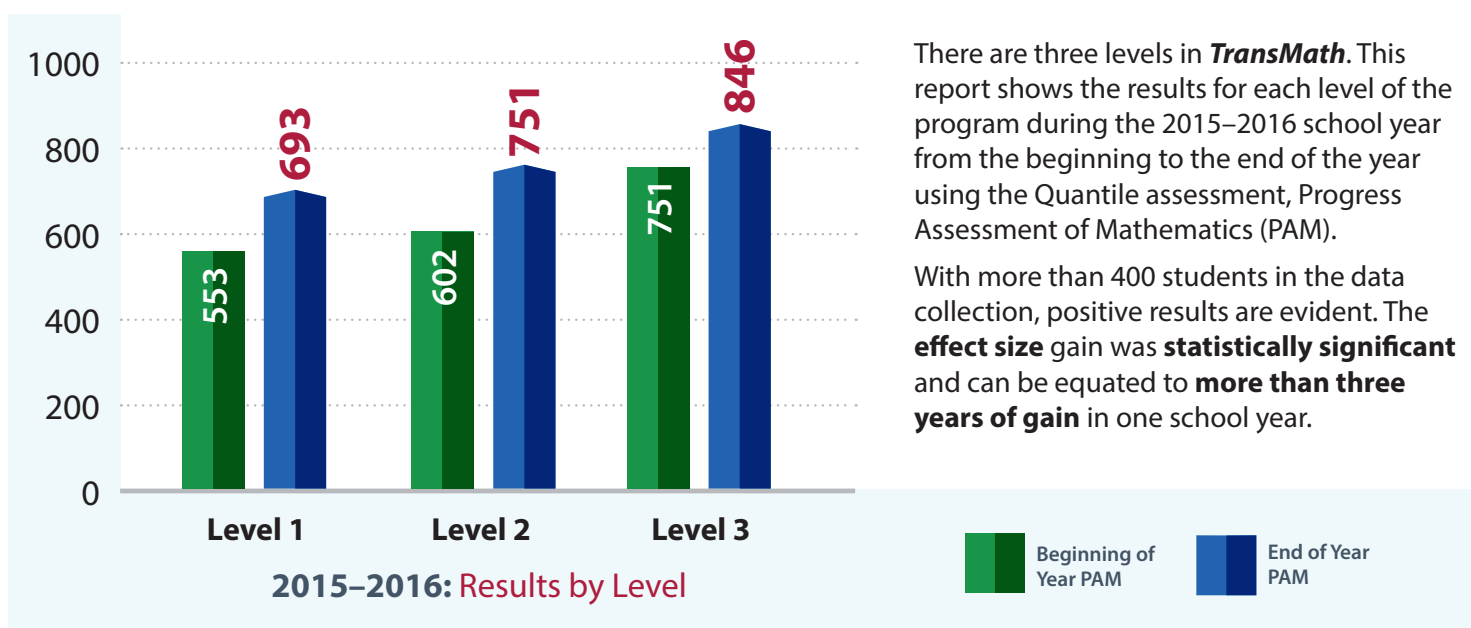


“Having a program like **TransMath** that breaks [math] down is amazing... When my students say, ‘I can’t do fractions,’ and then by the end of the lesson they’re getting 95 percent and saying, ‘Yes, I can,’ it’s really great to see.”

—Sarah Sherman, Kennedy Middle School, Albuquerque, NM

Struggling Students Advance with **TransMath**

Proven Results—More Than THREE years of growth in one year!



There are three levels in **TransMath**. This report shows the results for each level of the program during the 2015–2016 school year from the beginning to the end of the year using the Quantile assessment, Progress Assessment of Mathematics (PAM).

With more than 400 students in the data collection, positive results are evident. The **effect size** gain was **statistically significant** and can be equated to **more than three years of gain** in one school year.

TransMath Success in New Rochelle, NY

Proven results are what **TransMath** has given the City School District of New Rochelle, NY, where growth in math skills has led to growth in students’ class participation and confidence. Patrice Kentner, special education teacher, describes Voyager Sopris Learning’s **TransMath** as “like a Christmas present” and says the program is “great for multisensory learners and provides pacing to allow students to close the achievement gap in a timely manner as well as additional practice without the issue of cognitive overload for struggling students.”

Read more on the New Rochelle story: <http://go.voyagersopris.com/tl-math-in-new-ways>





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

—The National Mathematics Advisory Panel

Proven, effective elements accelerate students toward grade-level mathematics with lesson-by-lesson models

TransMath is a **skill-level program**, which means it is easy for teachers to combine students of various grade levels into the same class based on the needs of each student.

Also, with the goal of successful entry into algebra, the intentional scope and sequence of *TransMath* breaks down barriers that challenge student success in math.

Each level is intended to be a full year of instruction.



TransMath simultaneously teaches **foundational computational skills** and the **rich, grade-level problem-solving** experiences students need to succeed on high-stakes assessments.

Dual-Concept Approach Fuels Advancement

Each **TransMath** lesson is delivered in dual concepts: Topic 1 provides a conceptual skill; Topic 2 provides a problem-solving skill. These two topics often are 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.

The result? Students build confidence every step of the way as they master number sense, rational numbers, and algebraic expressions.

Designed to be taught in 50- to 60-minute segments daily, **TransMath**:

- Breaks learning into smaller parts
- Increases student engagement
- Balances foundational and grade-level instruction



Level 1: Developing Number Sense	
CONCEPTUAL SKILL	PROBLEM-SOLVING SKILL
Whole Number Operations	Working with Data
Factors, Primes, Composites	Problem Solving with Data
Common Factors	Measuring Two-Dimensional Objects
Compositions	Area and Perimeter
Fraction Concepts	Properties and Shapes
Adding and Subtracting Fractions	Transformations and Symmetry
	Statistics
	Units of Measurement

Level 2: Making Sense of Rational Numbers	
CONCEPTUAL SKILL	PROBLEM-SOLVING SKILL
Fractions: Fair Shares and Part/Whole	Fraction Problem Solving
Fractions: Magnitude, Equivalence, and Operations	Tools for Measurement
Mixed Numbers	Tessellations
Decimals and Operations	Geometry
Percent	Measurement
Probability	Probability and Percent Problem Solving
Integers and Integer Operations	Graphing
	Coordinate Graphs

Level 3: Algebra: Expressions, Equations, and Functions	
CONCEPTUAL SKILL	PROBLEM-SOLVING SKILL
Fractions and Decimals	Statistics
Variables	Ratios, Proportions, Percents
Inequalities	Surface Area of 3D Shapes
Algebraic Patterns	Volume of 3D Shapes
Algebraic Expressions	Geometry
Algebraic Rules and Properties	Construction & Angle Measurement
Intro to Functions	Lines and Angles
Square Roots	Working with Coordinate Graphs
Irrational Numbers	Non-Linear Functions



Download samples at www.voyagersopris.com/transmath

WHY it Works

Logical, consistent lesson design keeps students moving toward conceptual understanding and mastery.

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.

Lesson 3 ► Part-to-Whole Relationships
Problem Solving:
► Representing Fractions with Cuisenaire Rods

Lesson Planner

Vocabulary Development
unit fraction
Cuisenaire rods

Skills Maintenance
Making Fair Shares

Building Number Concepts:
► Part-to-Whole Relationships

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Problem Solving:
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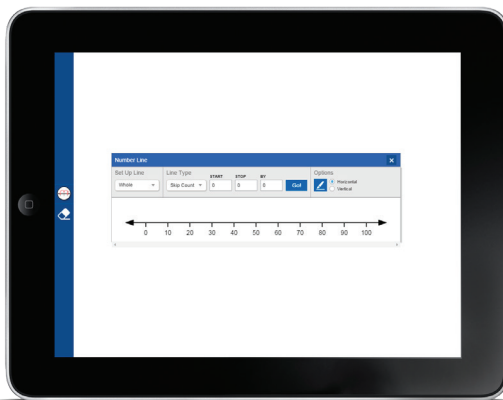
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Objective
Students will use a linear model (Cuisenaire rods) to examine part-to-whole relationships.

Homework
Students fill in missing fractions on a number line, divide rectangles into fair shares, and tell the unit fraction represented by rods. In Distributed Practice, students practice basic computational skills with whole numbers.

22 Unit 1 • Lesson 3

VOCABULARY DEVELOPMENT builds student understanding.



DIGITAL MANIPULATIVES provide opportunities for students to interact.

Lesson 3

What is a part-to-whole relationship?
(continued)

Demonstrate

- Have students look at **Example 2** at the top of page 14 of the *Student Text*. This example shows one part and the whole. Point out to students that three of the parts are needed to make the whole. It is the same part-to-whole relationship as in Example 1. The Cuisenaire rods are a different size, but the relationship between them remains the same. The one part is one-third of the whole.
- Review key vocabulary at the end of the example. Ask students, “What is the numerator and what does it represent? What is the denominator and what does it represent? What is a unit fraction and why is it important?” Be sure students understand these terms and their importance.
- Summarize the concept students should take away from today’s concept building. When working with a part-to-whole relationship, the focus is on how the part compares to the whole. It is that relationship that gives the fraction meaning.

Discuss
Call students’ attention to the **Power Concept**.

POWER CONCEPT

The part-to-whole relationship is a comparison of the part to what we define as the whole.

Reinforce Understanding
Remind students that they can review lesson concepts by accessing the online Unit 1 Lesson 3 Teacher Talk Tutorial.

Check for Understanding
Engagement Strategy: Think, Think
Draw two purple rods on the board. Label one rod as “the whole.” Label the other rod as $\frac{1}{2}$. Ask students the questions listed below. Allow think time after each question and encourage them to use the rods to help them answer the questions. Then call on one student to answer.

Ask:

Can you give an example of a comparison where the purple rod is the whole and the white rod represents one whole?

Can you give an example of a comparison where the purple rod is $\frac{1}{2}$? (When compared to the brown rod, the purple rod represents one whole.)

VISUAL MODELS illustrate difficult concepts.

ASK questions help teachers guide discussions that assess understanding.

POWER CONCEPTS focus instruction.

Ask:
Can you give an example of a comparison where the purple rod is the whole? (When compared to the white rod, the purple rod represents one whole and the white rod represents $\frac{1}{4}$.)

Can you give an example of a comparison where the purple rod is $\frac{1}{2}$? (When compared to the brown rod, the purple rod represents $\frac{1}{2}$ and the brown rod represents one whole.)

HOW it Works

WATCH FOR questions guide teachers in assessing student understanding.

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 with interactive online models.



Reinforce Understanding

Remind students that they can review lesson concepts by accessing the online *Unit 1 Lesson 3 Teacher Talk Tutorial*.

SKILL APPLICATION provides immediate opportunity for students to practice what they learned.

Lesson 3

Apply Skills
Using knowledge to see Part to Whole Relationships
(Interactive Text, pages 10–11)

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 1
Students are given two rods representing a unit fraction and the whole and are to name the unit fraction. Remind them to divide up 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 complete 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 1 Lesson 3 Teacher Talk Tutorial*.

26 Unit 1 • Lesson 3

ENGAGEMENT STRATEGIES provide ongoing, informal assessment in every lesson.

Lesson 3

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

Demonstrate

- Have students look at **Example 2** on page 16 of the *Student Text*. In this example, students are shown how to model the fraction $\frac{2}{5}$.
- Have students look at the denominator of $\frac{2}{5}$ first. Explain that this helps to determine which rods to use. The denominator is the same as the denominator in Example 1. In Example 1, we modeled the unit fraction $\frac{1}{5}$ with a red rod. Use the red rod to represent the unit fraction and the orange rod for the whole.
- Ask students to look at the fraction to be modeled. The fraction $\frac{2}{5}$, NOT $\frac{1}{5}$, is being modeled. Ask students to name how many more red rods are needed to model $\frac{2}{5}$. Because two unit fractions are needed, the fraction can be written as $2 \times \frac{1}{5}$, or $\frac{2}{5}$.
- Have students look at the next picture in Example 2. The picture shows a representation for $\frac{2}{5}$. Two of the red rods and one orange rod represent the fraction $\frac{2}{5}$. Have students model $\frac{2}{5}$ at their desk. Be sure they have two red rods and one orange rod to model the fraction $\frac{2}{5}$.
- Review the vocabulary at the end of the example. These key terms are critical to conceptual understanding of part-to-whole relationships.

Check for Understanding
Engagement Strategy: Look About
Have students model the fraction $\frac{2}{5}$ at their desks. Tell them to look about the classroom and get help from other students if they are having any difficulties. Circulate around the room and be sure students have used three red rods and one orange rod to model $\frac{2}{5}$.

Reinforce Understanding
Remind students that they can review lesson concepts by accessing the online *Unit 1 Lesson 3 Problem Solving Teacher Talk Tutorial*.

28 Unit 1 • Lesson 3

Lesson 3

Homework

Go over the instructions on pages 17–18 of the *Student Text* for each part of the homework.

Activity 1
Students fill in missing fractions on number lines.

Activity 2
Students divide rectangles into equal parts as instructed. Remind them these fractional parts must be fair shares.

Activity 3
Students tell the unit fraction represented by two rods.

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.

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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.

Built-in Features and Resources Aid in Differentiation

Units in **TransMath** are built for differentiation. Structured in either 10 or 15 lessons, units are designed for 50- to 60-minute blocks per day with designated times for differentiation. **TransMath** gives teachers the tools and time they need to assess, reinforce, and differentiate student instruction.

Throughout **TransMath**, students receive:

- ✓ Concrete and Visual Representations
- ✓ Distributed Practice
- ✓ Varied Opportunities for Communication
- ✓ Multiple Forms of Assessment
- ✓ Reinforcement of Concepts



Teacher Differentiation Support

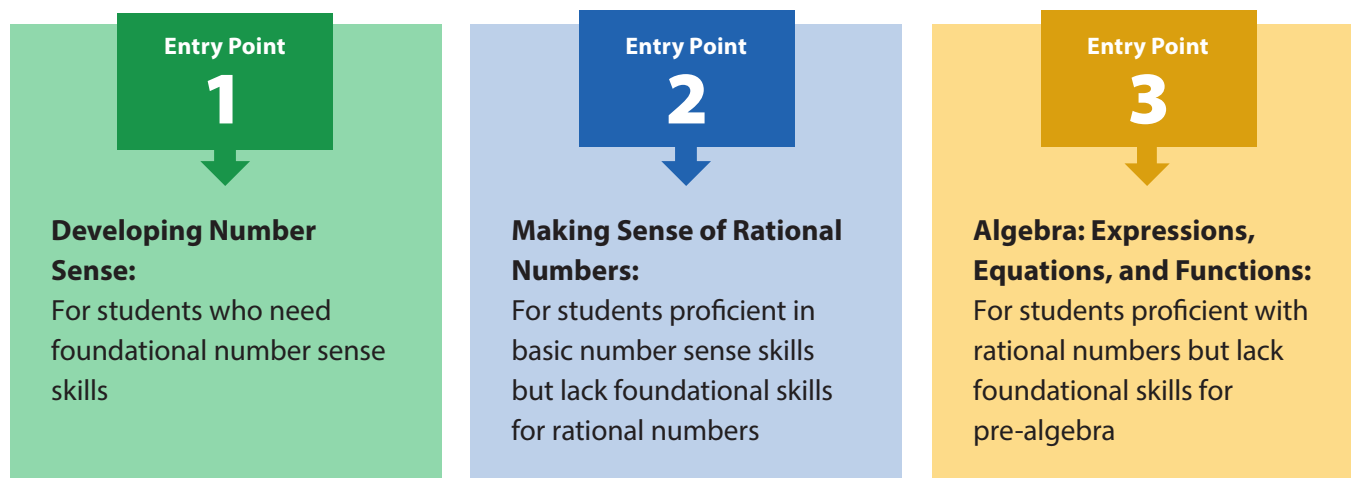
Teachers have access to all Teacher and Student materials in eBook format, as well as:

- **Math Toolbox** that provides a variety of digital manipulatives to use with **TransMath** lessons
- **TeacherTalk Tutorials** that reinforce lesson concepts using narrated, animated visual models that make the concept concrete for the student
- **Interactive Click-Thru** slideshow presentations that use visual models to concretely develop concepts
- **On Track! Extension Activities** that are multistep word problems designed for small groups, to prepare students for high-stakes tests
- **Form B Retests** for Quizzes and End-of-Unit Assessments can be downloaded

Student Placement and Balanced Assessment

A proven approach to student placement—based on skill levels, not grade levels—ensures students learn at a comfortable pace.

Three entry points build incremental success:



Balanced Assessment

Numerous opportunities to assess knowledge as students master concepts and skills is critical to efficient progress monitoring. **TransMath** provides data-driven insights to identify areas of struggle.

Informal Assessment

- Check for understanding after each major concept
- Activities to apply skills learned in Building Numbers Concept section of each lesson
- Problem-solving section activities to apply knowledge of concepts from each lesson

Formal Assessment

- Quizzes every five lessons to provide feedback on student progress
- End-of-unit assessment to measure student mastery of skills through a whole unit
- Performance assessment to measure each student's ability to reason and communicate

PROGRESS ASSESSMENT

POWERED BY THE QUANTILE FRAMEWORK BY METAMETRICS

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

Built-in Resources for Additional Practice and Online Engagement

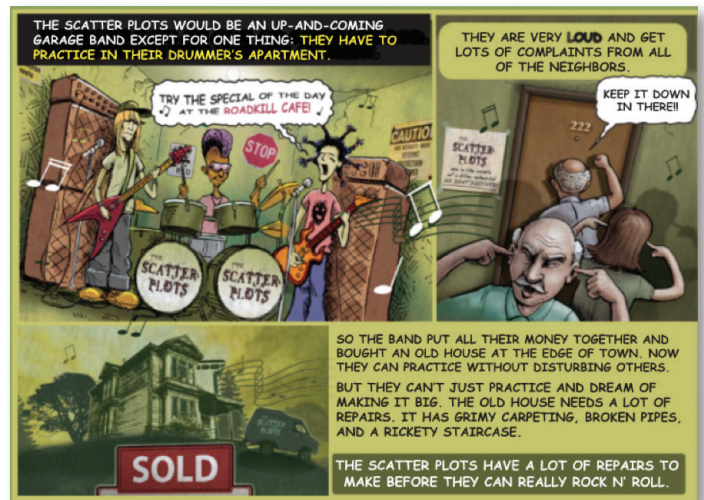
Once students begin to master concepts, they gain confidence and become enthusiastic and eager learners.

TransMath consistently builds student enthusiasm with online, interactive digital tools that make learning math more relevant and understandable.

Various built-in digital manipulatives help reinforce concepts and bring them to life. Age-appropriate unit openers and **graphic novellas** are used to introduce concepts and motivate and engage students to work on word problems.

Student Support

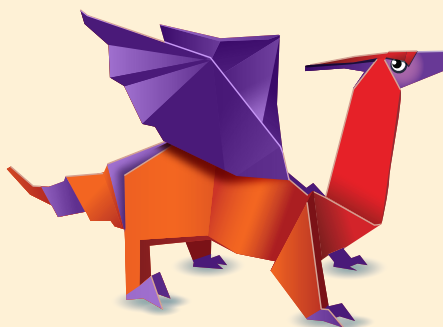
All **TransMath** resources are available to students in eBook format. The **Math Toolbox**, a collection of digital manipulatives, also is available to students in the eBook, as well as through the **TransMath** Student Center.



VmathLive®

TransMath is accompanied by **VmathLive** at no additional charge

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



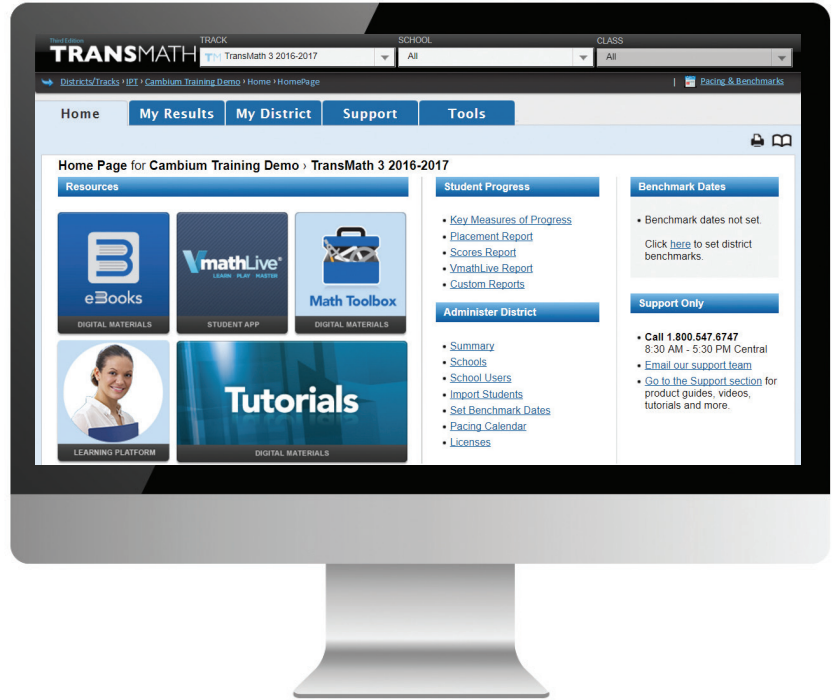
- Practice for essential math concepts, skills, and problem-solving strategies
- Playful origami avatars and virtual tutors
- Combination of "learn" and "play" activities
- Embedded multimedia hints—including online conceptual models and videos in English and Spanish

On-Demand Professional Development Included

In addition to face-to-face support options, teachers using **TransMath** have access to our integrated **Learning Platform** of “on demand” training and support.

When you click on the icon of the teacher in the Teacher Center, you'll find the Learning Platform, which is organized into modules, such as Program Overview, how to get started, assessment, online resources, and implementation, with many topics to explore.

And best of all, the Learning Platform is **included in the cost** of the program.



Platform Overview



Program Overview



Getting Started



Assessment



Online Resources



Implementation



Partnering to Provide Results

Teaching math to struggling students requires a unique set of skills. We partner with you to create a custom implementation that fits the exact needs of your teachers and students. Our Support Services team provides **unparalleled support** using a model built around **keys to success**:

- The **amount of instruction** struggling students receive is critical.
- Through the **use of assessments**, we can monitor student progress.
- Having assessment data allows teachers to **differentiate instruction**.
- Incorporating strong **classroom management** strategies allows for **quality instruction**.

We offer in-person and online self-paced training, ongoing training, coaching and support, and a Train-the-Trainer model to help you sustain the program for many years to come.



"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, NM

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Performance on Standardized Assessments*



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