

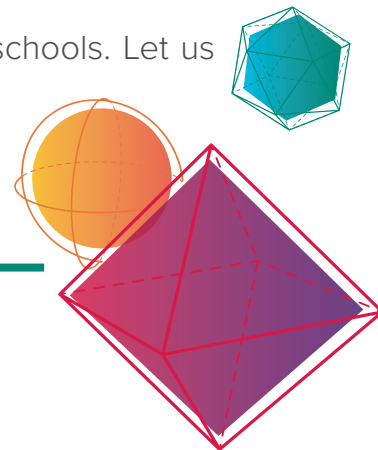
Inspire A CULTURE OF MATH ACHIEVEMENT

When teachers are empowered to teach, and students have the foundations they need to **build** and grow, something **extraordinary** happens: **math achievement** becomes inherent to the school culture.

Initiating and sustaining this type of change requires involvement at every level—from district leaders to classroom teachers. Most importantly, schools must make a **commitment** to a strong plan for professional learning.

For more than 30 years, Math Solutions has been **transforming instruction** by focusing exclusively on the **highest-quality** mathematics professional development, courses, **coaching**, and educator resources. We have collaborated with schools and districts across the nation, **proving** time and again that high-quality teaching is the most important driver of student achievement.

And just as every educator seeks to **inspire** a love of learning in his or her students, we, as educators ourselves, **strive** for the same with our partner schools. Let us help inspire your school to **reach** higher and raise achievement.



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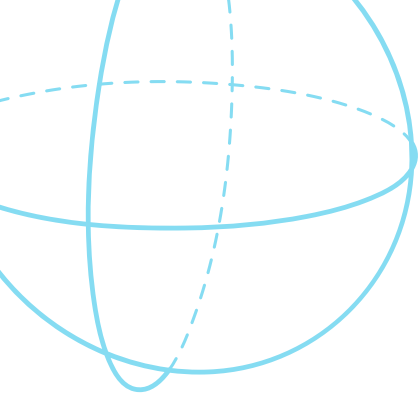
A division of **Houghton Mifflin Harcourt**

Inspire a Culture of Math Achievement

with Professional Learning for Grades PreK–12



Math Solutions.
FOUNDED BY MARILYN BURNS



Marilyn Burns is one of today’s most highly respected mathematics educators. In 1984, Marilyn formed Math Solutions®, dedicated to improving students’ learning of mathematics by providing educators with the highest-quality professional learning services and resources. Working with a team of mathematics teaching and learning experts to offer specialized professional learning to teachers and administrators, Marilyn and the Math Solutions team have contributed to the transformation of thousands of school districts nationwide.



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The Backbone of Everything We Do

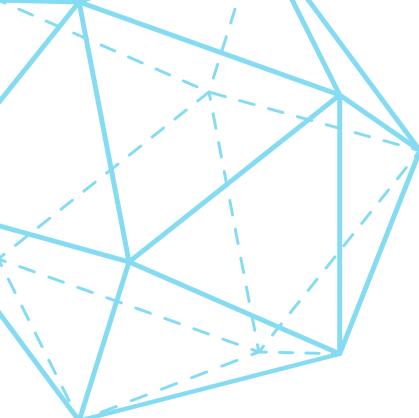
Your Guide to an Effective Math Classroom

Schools and districts need examples of model math classrooms that provide observable guidelines to help teachers implement best practices quickly and efficiently. Based on more than 30 years of focusing exclusively on the teaching and learning of math, Math Solutions has developed the **Instructional Practices Inventory**, a comprehensive guide to instructional excellence for both teachers and students. These instructional practices help schools focus on and improve four key areas of instruction in order to reach math achievement goals: **learning environment**, **reasoning** and **sense making**, **focus** and **coherence**, and **formative assessment**. This tool is also used by administrators to recognize what to look for in math classrooms and is the foundation of our Needs Assessment and Progress Monitoring.

The **Instructional Practices Inventory** shown on the right provides you with your own model math classroom. This map will help you recognize what these key instructional areas look like through the lens of both teachers and students.

Math Solutions **Instructional Practices Inventory**

	TEACHER	STUDENTS
 <p>LEARNING ENVIRONMENT</p>	<p>Provides a respectful, safe learning environment in which mistakes are seen as an opportunity to learn.</p> <p>Structures the class for independent work, pairs, groups, and whole class in a thoughtful and deliberate way.</p> <p>Asks questions that both build and reveal new understanding of content and practice. Avoids yes/no questions unless they also ask for justification.</p> <p>Makes appropriate tools available and encourages their use.</p>	<p>Take an academic risk and rely on their own thinking and the thinking of other students.</p> <p>Listen and ask questions to each other to clarify information; respectfully challenge ideas; make conjectures.</p> <p>Explain their reasoning; construct viable arguments and critique the reasoning of others.</p> <p>Communicate using appropriate mathematical language both orally and in writing.</p> <p>Work well in a variety of grouping structures.</p>
 <p>REASONING & SENSE MAKING</p>	<p>Selects rigorous learning experiences.</p> <p>Makes learning experiences accessible to all students without compromising the rigor in the problem.</p> <p>Expects students to justify their reasoning for all answers, whether correct or incorrect.</p> <p>Selects learning experiences that represent a balance of conceptual understanding and procedural fluency.</p>	<p>Persevere in making sense of rigorous problems.</p> <p>Seek out multiple approaches to solving a problem.</p> <p>Use multiple representations when solving problems, such as symbols, diagrams, graphs, words, etc.</p> <p>Use appropriate tools strategically, including mental calculations, that fit the situation.</p> <p>Look closely to discern a pattern or structure.</p>
 <p>FOCUS & COHERENCE</p>	<p>Understands the expectation of the standard to be taught and its connection to previous standards; aligns the lesson to grade-level content and practice standards.</p> <p>Differentiates instruction based on student needs.</p> <p>Selects problems that provide opportunities for students to contextualize and/or decontextualize.</p> <p>Selects problems that provide opportunities for students to apply math to real-world situations.</p> <p>Selects learning experiences that represent a balance of conceptual understanding and procedural fluency.</p>	<p>Connect their current learning to previously learned standards.</p> <p>Use math to contextualize and/or decontextualize problems.</p> <p>Use appropriate tools strategically, including mental calculations, that fit the situation.</p> <p>Apply the math they know to solve real-world problems.</p> <p>Look closely to discern a pattern or structure.</p>
 <p>FORMATIVE ASSESSMENT</p>	<p>Uses data to make instructional decisions based on student need.</p> <p>Provides feedback to students or structures opportunities for students to provide feedback to each other.</p> <p>Identifies and communicates the learning target(s) of the lesson.</p> <p>Implements a variety of strategies to monitor student learning.</p> <p>Selects learning experiences that represent a balance of conceptual understanding and procedural fluency.</p>	<p>Take responsibility for their learning by monitoring their progress toward a learning target.</p> <p>Evaluate the reasonableness of their results using feedback from the teacher or a peer.</p> <p>Articulate what they are learning and why.</p> <p>Use appropriate tools strategically, including mental calculations, that fit the situation.</p> <p>Look closely to discern a pattern or structure.</p>



Partnering with Math Solutions Is Proven to Work

Math Solutions services are based on the most current research in the field of instruction and deliver proven results. Our partner districts report high educator satisfaction and student achievement. Whether you are a rural school or a large urban district, Math Solutions can help you reach your goals. Over the last 30 years, we have partnered with thousands of districts and schools across the country and have learned that every school has its own unique set of strengths, challenges, and resources.

Sunnyside Elementary School, MT

Staff at Sunnyside recognized that teaching the same concepts over and over again without freshening their approach was among the possible reasons behind the school's low math performance.

Their partnership with Math Solutions has led to great success. Students began to enjoy rigorous math problems interwoven with several mathematical concepts. These exercises developed the students' perseverance and demonstrated their ability to solve more advanced problems. By planning lessons around critical thinking skills and concepts instead of mathematical procedures, Sunnyside teachers were able to instill a deeper understanding of math foundations that students could apply to a variety of math problems.

DISTRICT PROFILE

Total Schools: 20
Grades: Kindergarten–Grade 6
Total Enrollment: 444 Students
Student Demographics:
■ 65% Free and Reduced-Price Lunch

Math Scores Jump from **72% to 84%**

North Kansas City Schools, MO

In 2012 the North Kansas City School District student test scores in mathematics had plateaued. Chad Sutton, Assistant Superintendent – PreK–8, decided to target a solution that centered on enhancing the skills and competency of the classroom teacher. The school district identified two main challenges. The first challenge was deepening the content knowledge of teachers to align with new standards. The second challenge was identifying instructional methods that would support students' ability to think abstractly about math and develop conceptual understanding—allowing kids to talk about and make sense of math as opposed to only memorizing computations.

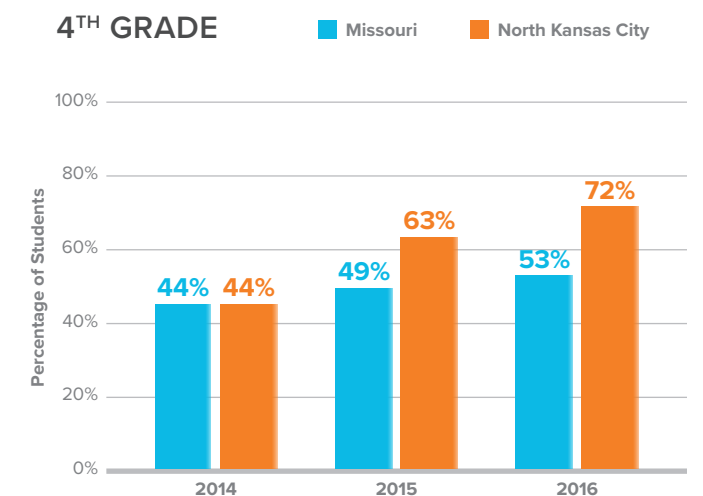
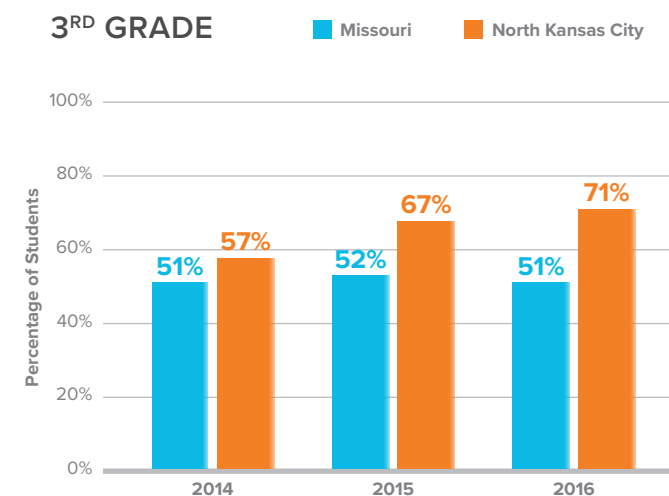
Beginning in the spring of 2012, the school district implemented the use of Math Solutions in elementary and secondary schools and established a sustainable, collaborative model for training and self-sufficiency across the district.

Numbers Are Just the Beginning

In state exams, the district achieved its highest level of third-grade math proficiency in over ten years with about 71% earning scores in the advanced or proficient categories in 2016, an increase of 14% in two years. In Grade Four, achievement scores jumped from 44% in 2014 to 72% in 2016 in advanced or proficient categories and from 55% to 65% in the same categories in Grade Five, outperforming the state by 23% and 17% respectively. At the secondary level, the district reported a 7% increase in proficient and advanced scores for Algebra I, Geometry, and Algebra II. This success was not measured solely by achievement scores, but also by a noticeable change in the energy in classrooms, increased pride in teachers, and positive attitudes toward math among students.

DISTRICT PROFILE

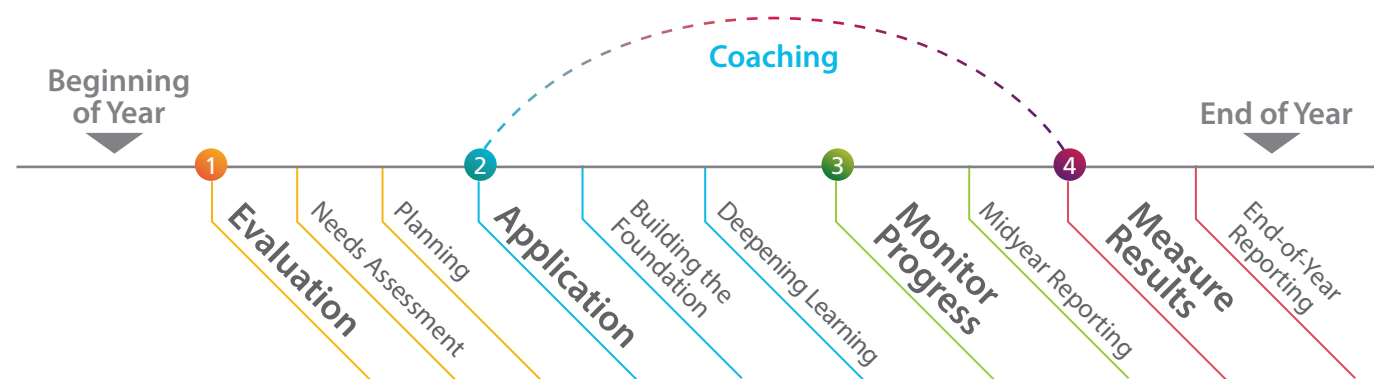
Metro Status: Large City
Total Schools: 31
Grades: Kindergarten–Grade 12
Total Enrollment: 19,300 Students
Student Demographics:
■ ELL Students: 1,289
■ Students with IEPs: 1,687



How We Achieve Results

Math Solutions will help your school or district identify instructional needs, create a plan to address them, build capacity throughout the educator staff, provide the skills and best practices your teachers and students need to make measurable gains, and ensure that you are able to sustain the momentum of success. Together, your school or district can become a success story.

TIMELINE TO SUCCESS



PHASE 01 EVALUATION

Perform a Comprehensive Instructional Needs Assessment and Create a Plan of Action

Math Solutions helps you create a strategic plan that not only identifies where you are and where you need to be, but includes the tactical steps necessary to help you reach your goals. Together, we will help set specific student learning targets and develop a focused plan to support instruction and get results!

PHASE 02 APPLICATION

Implement the Plan with Coaching, Courses, and Strategic Support

From one-on-one coaching to multi-day and single-day courses, Math Solutions has the targeted professional learning that leaders and teachers need to implement effective math instruction for all students in Grades PreK–12.

PHASE 03 MONITOR PROGRESS

Review and Analyze Progress

The Math Solutions team helps you measure results and analyze student progress data to ensure that school improvement plans are moving forward successfully.

PHASE 04 MEASURE RESULTS

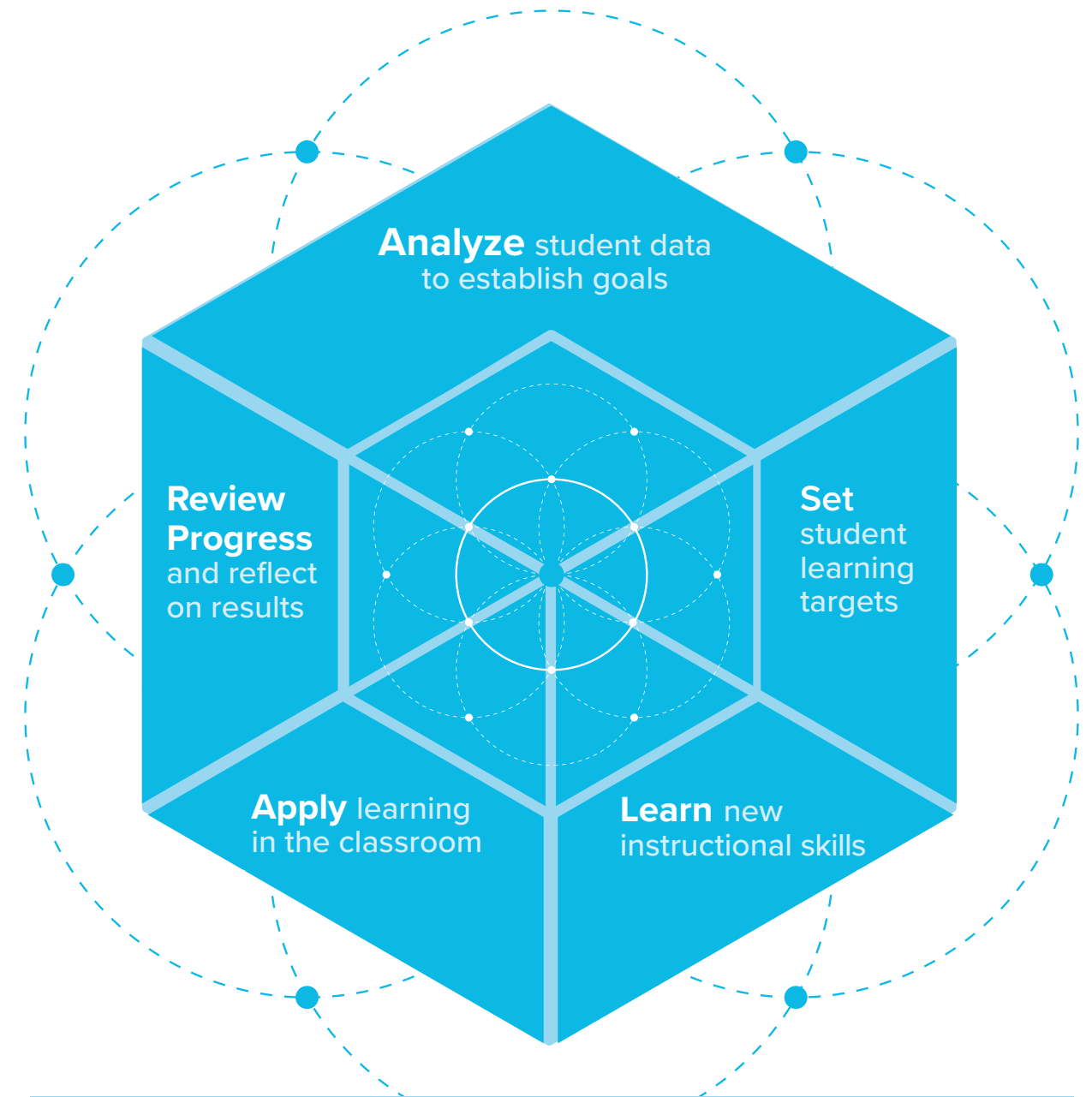
Measure Results and Ensure Sustainable Success

With data to measure and maintain performance, Math Solutions is the ultimate partner for long-term math achievement.

Coaching That Drives Instructional Improvement into the Classroom

The **Math Solutions Coaching Model** is designed to deepen teachers' math content and pedagogical knowledge for immediate implementation in the classroom. Based on your goals, coaches, leaders, and teachers work collaboratively to improve teaching skills and student learning. Our coaches have years of in-classroom teaching and coaching experience. They are experts at helping educators plan for instruction that meets the needs of all students while maintaining the level of rigor required by today's standards. From the classroom to the district office, our experienced coaches provide sustained support, both in person and virtually, to help you see results and continuous improvement.

Our **Research-Based** Coaching Model

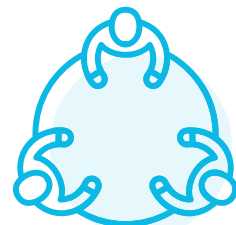


CUSTOMIZED COACHING SERVICES FOR INDIVIDUALS AND TEAMS



INDIVIDUAL COACHING

With individual coaching, educators work side by side, which enables them to integrate new skills immediately into their practice.



TEAM COACHING

Team coaching builds a community of learners through collaboration and fosters a culture of achievement in a group setting. It is the fastest way to synchronize your teams across grade levels, share experience and expertise, and collaborate on plans and protocols.

COACHING SERVICES PROVIDE:

- Model lessons to illustrate instructional techniques
- Support for implementing effective teaching practices
- Differentiation strategies to meet the needs of all students
- Focus on developing and deepening math content knowledge
- Analysis of student work samples to assess learning and determine instructional next steps
- Leadership strategies for innovation and instructional change
- Facilitation of professional learning communities, cadres, and collaborative planning



Assess and Address Immediate and Long-Term Needs

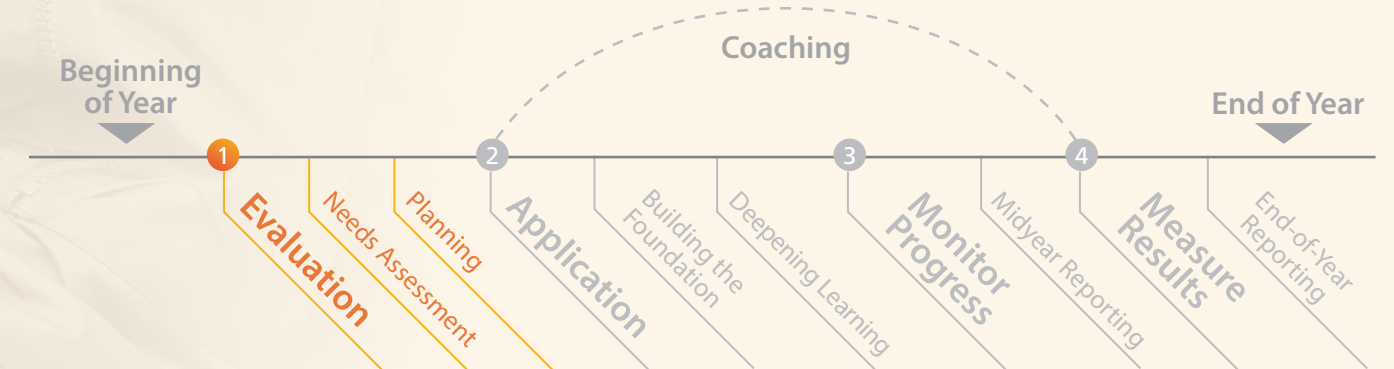
Turning Challenges into Strengths . . .

The Math Solutions team will help you identify your needs and **develop a plan** of action to address them!

Through a series of online surveys, classroom observations, and interviews with administrative and instructional leadership, Math Solutions helps your team pinpoint what you do well and, in turn, address critical challenges needing immediate attention.

Following this assessment, Math Solutions will deliver:

- A data-rich **Instructional Needs Assessment Report** and Professional Learning Plan that identifies math instruction strengths and opportunities for improvement
- Specific, prioritized recommendations to address critical challenges required to meet **state standards and assessments**





Courses & Coaching

The following instructional needs—absolutely essential to improving instruction and student outcomes—drive the design of all Math Solutions courses, consulting, coaching, and resources.

BUILDING THE FOUNDATION:

Leadership 14

Designed to help leaders define a vision for their role as instructional leaders of mathematics and increase their understanding of and ability to communicate about current state standards.

Mathematical Practices 15

Designed to strengthen math content and pedagogical knowledge as well as provide instructional strategies, these courses promote thinking, reasoning, and sense making.

Math Workshop 19

The Math Workshop approach supports all learners in the mathematics classroom. This course conveys how the model, structures, and learning environment increase learning for all students.

DEEPENING LEARNING:

Content Standards by Grade Level 20

Content courses explain math content by grade level necessary for growth on assessments and how to achieve your instructional goals. Each course is aligned to your particular state standards.

INSTRUCTIONAL STRATEGIES:

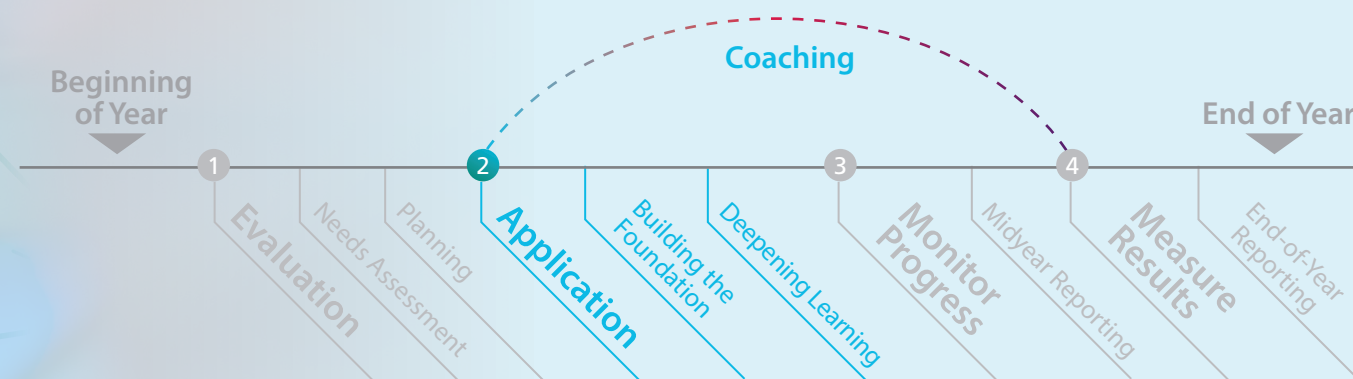
Instructional Strategies 25

Supporting all learning—every teacher needs a toolkit of instructional strategies to bring into his or her classroom.

DEVELOPING COACHING EXPERTISE:

Coaching Development 29

Designed for new coaches, coaches new to coaching mathematics, and current coaches who are looking to improve their coaching expertise.





Leadership

Leading the Transformation of Mathematics Teaching and Learning

Target Audience: Administrators, Curriculum Directors/
Specialists, Principals, Superintendents

Grades: K–12

Format: Full Day

A strategic plan is only as effective as the team that implements it. Ensuring quality instruction requires the support of a strong instructional leadership team with the vision and confidence to initiate and sustain a cultural and tactical shift in instruction.

Math Solutions courses and coaching will guide the members of your leadership team as they learn how to observe, assess, and support the incorporation of “*best-practice*” instructional strategies that promote **thinking, reasoning, and sense making** in the classroom.

This full-day course refines participants’ vision for their role as instructional leaders of mathematics. Participants increase their understanding of and ability to communicate about current state standards. They engage in mathematical tasks and discover the use of tools and structures to lead stakeholders toward effective mathematics teaching and learning.

OUTCOMES

- Identify and support math instruction that promotes thinking, reasoning, and sensemaking.
- Provide instructional leadership and support to empower teachers to become more effective in their teaching of mathematics.
- Articulate a vision for leadership that includes collaboration among all stakeholders to promote effective mathematics teaching and learning.

Mathematical Practices

Mathematical Practices Series™

Target Audience: Math Coaches, Teacher Leaders, Teachers

Grades: K–2, 3–5, 6–8, 9–12

Format: Three-Day | Additional Options May Be Available

This three-day series focuses on effective teaching and learning required to meet the increased rigor of state standards and current assessments. We align what educators already know with what they need to learn about developing the habits of mind their students need for success with mathematics. Participants will leave each course with instructional skills and strategies they can use in their classrooms immediately.

COURSE 1

Making Sense of Math—Reasoning and Discourse

COURSE 2

Mathematical Thinking—Representation and Procedural Fluency

COURSE 3

Problem Solving—Developing Disposition, Competence, and Confidence

OUTCOMES

- Strengthen participants’ math content and pedagogical knowledge in order to understand various solution paths and students’ reasoning.
- Understand how students learn in order to make instructional decisions about tasks to complete and questions to pose.
- Develop insight into individual learners’ content mastery and math reasoning.
- Cultivate new instructional strategies that promote thinking, reasoning, and sensemaking.

“*Math Solutions* courses help teachers appreciate math with a more hands-on approach to learning concepts.”

—Sandra Garza
Instructional Specialist,
Socorro ISD, El Paso, Texas



Making Sense of Math— Reasoning and Discourse

Target Audience: Math Coaches, Teacher Leaders, Teachers
Grades: K–2, 3–5, 6–8, 9–12
Format: Full Day

Students need to build a deep understanding of mathematics and use that understanding to reason about problems, make sense of new learning, and communicate their thinking to others. This course is designed to introduce participants to the processes and habits of mind students need to develop, with particular emphasis on the role of reasoning and discourse in mathematics. In addition, they will analyze the complexity of mathematical tasks and consider strategies for transforming grade-level tasks to increase the level of rigor.

DEVELOPING TASKS THAT PROMOTE REASONING

For students to develop habits of mind that rely on reasoning and making sense of mathematics, teachers must provide multiple practice opportunities with mathematical tasks and questions that require students to do more than memorize a procedure or answer. The National Council of Teachers of Mathematics (NCTM) recommends that teachers use tasks that:

- Invite exploration of important mathematical concepts
- Allow students the opportunity to solidify and extend knowledge
- Encourage students to make connections and develop a coherent framework for mathematical ideas
- Call for problem formulation, problem solving, and mathematical reasoning
- Provide more than one solution path
- Promote the development of all students' dispositions to do math

OUTCOMES

- Use strategies to help all students deepen and communicate their mathematical reasoning.
- Identify the difference between social conventions of mathematics and mathematical knowledge that students need to make sense of for themselves.
- Select tasks and use classroom discussions to develop students' mathematical habits of mind and to assess understanding.

“Math Solutions, in general, is making the teaching of math more accessible—helping teachers use their tools wisely by evaluating the learning situation in front of them.”

—Valerie Samn
Math Coach, New York

Mathematical Thinking— Representation and Procedural Fluency

Target Audience: Math Coaches, Teacher Leaders, Teachers
Grades: K–2, 3–5, 6–8, 9–12
Format: Full Day

Students need to develop knowledge of computational procedures along with knowledge of when and how to use them appropriately. The goal is for students to become skillful in performing computational procedures flexibly, accurately, efficiently, and with understanding.

FLEXIBLE, ACCURATE, AND EFFICIENT

For many students, procedures have been the mainstay of learning mathematics. “Yours is not to reason why, just invert and multiply” was a phrase used by teachers to help students remember the procedure for dividing fractions. The approach to learning computational procedures was based on a set of steps, or an algorithm, learned through repeated practice and memorization.

This full-day course provides teachers with a deeper understanding of procedural fluency beyond merely the ability to memorize procedures and apply them with little understanding. In addition, teachers will learn strategies to support students in representing ideas visually, symbolically, and verbally, as well as strategies for helping students make connections between these different representations.

OUTCOMES

- Expand understanding of procedural fluency to include carrying out procedures appropriately with flexibility and accuracy.
- Connect multiple representations for the purpose of helping all students better understand underlying mathematical ideas.
- Consider students' use of tools and representations for the purpose of assessing student understanding of math and reasoning.

“I am so glad that I signed up for this course. It has helped me to take a closer look at the way I teach math and realize the changes I need to make. I’ve always wanted students to enjoy math and now I have some tools to begin to make this happen.”

—Teacher, Grade 4
Savannah-Chatham County, Georgia



Problem Solving— Developing Disposition, Competence, and Confidence

Target Audience: Math Coaches, Teacher Leaders, Teachers

Grades: K–2, 3–5, 6–8, 9–12

Format: Full Day

Students need to make sense of problems and persevere in solving them. Teachers’ instructional practices directly affect students’ confidence in their mathematical skills and their willingness to persevere to solve difficult problems.

This full-day course provides teachers with a deeper look at building perseverance in problem solving and applying mathematics to everyday situations. Participants will learn strategies for engaging students in appropriate levels of constructive struggle, thus allowing all students to approach mathematics with confidence and competence.

SUPPORTING CONSTRUCTIVE STRUGGLING

It is important for all students to experience some struggle in order to make sense of mathematics and develop new knowledge. Students will not persevere and be confident in their mathematical skills if we do not provide opportunities to make sense of the math and support them in the process.

Teachers maintain the integrity of high-level tasks by structuring lessons to allow students to make connections and develop new mathematical knowledge.

OUTCOMES

- Describe the features of a classroom environment that support student learning and promote confidence and perseverance in students.
- Engage students in constructive struggle that develops mathematical habits of mind.
- Structure lessons in ways that require critical thinking and sense making.

Math Workshop

NEW! Math Workshop: Structures and Practices for Student Learning

Target Audience: Curriculum Directors/Specialists, Math Coaches, Teacher Leaders, Teachers, Principals

Grades: K–5

Format: Full Day | Additional Options May Be Available.

Standards and student needs drive mathematics instruction. This course highlights Math Workshop, a model for organizing standards-based instruction to support all learners in the mathematics classroom. Participants engage in the Math Workshop model of instruction, reflect on how the structures and learning environment leverage increased learning for all students, and create a plan to implement Math Workshop in the classroom.

Math Solutions goes beyond traditional professional learning by focusing on implementation, providing continuous support for continued success. When professional development merely describes a skill, only 10 percent of teachers can transfer it to their practice. However, when teachers are coached through the awkward phase of implementation, more than 95 percent can replicate what they’ve seen. Sustain your Math Workshop professional learning with coaching from Math Solutions.

OUTCOMES

- Understand the purpose and use of the three structures of Math Workshop.
- Verbalize and act on the roles of the teacher and students in the Math Workshop classroom.
- Implement a plan for getting started with Math Workshop.
- Create a Math Workshop classroom that relies on formative assessment and differentiation.

“Math Workshop is a pedagogical philosophy that transcends curriculum. It enhances student agency by making learning more student-centered—pushing students to reflect, reason, collaborate, communicate, and make sense of mathematical content—transforming them from math students to student mathematicians.”

—Trish Kepler
Math Coordinator
The Greenwich Country Day School
Greenwich, Connecticut



Content Standards by Grade Level

Number & Operations— Base Ten

Target Audience: Math Coaches, Teacher Leaders, Teachers

Grades: K–2, 3–5

Format: Three Day | Additional Options May Be Available

This three-day course focuses on Number and Operations in Base Ten, for students in Grades K–5. The emphasis of this course is on developing a foundation of understanding of multiplication and division, and on extending understanding of place value with whole numbers to decimals. Experiences and discussions help participants discern the role of place-value understanding and properties of operations.

OUTCOMES

- Articulate key aspects of the standards for number and operations and algebraic reasoning for Grades K–5.
- Consider instructional shifts needed to foster the depth of understanding communicated in current standards.
- Describe the interconnectedness of place value and the base-ten number system to operations and algebraic thinking.
- Characterize teaching strategies that exemplify mathematical processes.
- Implement instructional strategies including the use of classroom discussions, small-group work, and the use of concrete materials and contexts to support students' learning.

Strategies for Supporting Fraction Sense

Target Audience: Math Coaches, Teacher Leaders, Teachers

Grades: 3–5

Format: Two Day

COURSE 1 OF 2. This two-day course focuses on the priority domain of Number and Operations: Fractions for students in Grades 3–5. The emphasis of the course is two-fold, first to build understanding of fractions as numbers and second to make connections between whole-number knowledge and fraction knowledge. The strategies and foundation developed in this course are prerequisites for the further work with fraction computation that is developed in Course 2, Making Sense of Fraction Computation.

OUTCOMES

- Articulate the progression of current state standards related to fractions and fraction operations.
- Describe similar ways in which fractions and whole numbers operate.
- Apply properties of operations in fraction computation.
- Characterize teaching strategies for building fraction sense, and distinguish the importance of each.
- Implement instructional strategies that engage students in the habits of mathematical thinkers as called for in current state standards, and build deep understanding of fraction content standards.
- Explain and use the role of talk to support the learning of mathematics.

Making Sense of Fraction Computation

Target Audience: Math Coaches, Teacher Leaders, Teachers

Grades: 3–7

Format: Two Day

COURSE 2 OF 2. This two-day course focuses on the priority domain of Number and Operations: Fractions for students in Grades 3–7. The emphasis of the course is on building understanding of fraction computation. In this course, participants learn to build on students' understanding of whole-number operations to make sense of fraction computation. Strategies that support the development of fraction operation sense are highlighted.

OUTCOMES

- Articulate the progression of current state standards related to fraction operations.
- Apply properties of operations in fraction computation.
- Characterize teaching strategies for building fraction sense and distinguish the importance of each.
- Implement instructional strategies that engage students in the habits of mathematical thinkers and build deep understanding of fraction content called for in current state standards.
- Use rich tasks, multiple models and representations, and classroom discourse to support learning of mathematics.



Ratios & Proportional Relationships

Target Audience: Math Coaches, Teacher Leaders, Teachers

Grades: 6–8

Format: Two Day | Additional Options May Be Available

This two-day course explores proportionality, proportional relationships, and proportional reasoning, acknowledging that the ability to reason proportionally is at the forefront of the middle school mathematics curriculum. The course supports teachers with strategies to help make this content accessible to all students.

OUTCOMES

- Articulate the progression of current state standards related to ratios and proportional relationships.
- Implement effective instructional strategies such as the use of real-world application, tools, and multiple representations to develop students' mathematical understanding.
- Conduct classroom discussions in ways that support students' understanding of ratios and proportional relationships.
- Challenge students with rigorous tasks that build proportional reasoning and engage students in the habits of mathematical thinkers.

Connecting High School Content Using an Integrated Approach

Target Audience: Math Coaches, Teacher Leaders, Teachers

Grades: 9–12

Format: Two Day

This high school course focuses on math experiences that connect algebra, geometry, and statistics. Participants explore content designed to deepen and extend understanding of linear relationships. This includes engaging in experiences that contrast linear and exponential functions as well as applying linear models to data that exhibit a linear trend. During this course, participants also investigate how emphasizing properties and theorems about congruent shapes deepen students' geometric understanding and examine the connection between geometry and algebra through the lens of analytic geometry.

OUTCOMES

- Apply a fundamental understanding of standards in the conceptual categories of Algebra, Geometry, and Statistics and Probability to implement effective tasks.
- Articulate key aspects of an integrated mathematics course and consider the instructional shifts needed for this approach.
- Integrate effective instructional strategies such as the use of classroom discourse, real-world applications, and appropriate tools to facilitate the learning of all students.
- Challenge students with rigorous math problems that require the habits of mind called for in the Standards for Mathematical Practice.

Geometry—Elementary School

Target Audience: Math Coaches, Teacher Leaders, Teachers

Grades: K–5

Format: Two Day

This course focuses on content from the strand of Geometry and Measurement. Participants gain an understanding of the levels of geometric thinking, the important measurement decisions students need opportunities to make, and types of learning experiences that promote rigorous thinking.

OUTCOMES

- Formulate questions that promote rigorous thinking.
- Select problem-solving activities that develop students' skills in geometry and geometric measurement.
- Incorporate effective strategies for teaching mathematics vocabulary into lessons.

Geometry—Middle School

Target Audience: Teachers

Grades: 6–8

Format: Two Day

This course focuses on strategies and tools that build on students' thinking and spatial reasoning skills developed in elementary school. Teachers gain an understanding of levels of geometric thinking and the types of learning experiences that promote rigorous thinking. Specific attention is paid to area, surface area, volume, congruence, the Pythagorean theorem, coordinate geometry, and transformations.

OUTCOMES

- Analyze problem-solving activities that deepen understanding and develop participants' skills in geometry, geometric measurement, and informal proof.
- Apply an understanding of the Van Hiele levels of geometric thought to lesson design choices.
- Challenge participants with rigorous math problems that require the habits of mind called for in the Standards for Mathematical Practice.

Geometry—High School

Target Audience: Math Coaches, Teacher Leaders, Teachers

Grades: 9–12

Format: Two Day

This course focuses on geometry experiences that formalize high school students' geometry work in elementary and middle school by utilizing more precise definitions and developing careful proofs. During the course participants engage in activities devoted to plane Euclidean geometry, both synthetically (without coordinates) and analytically (with coordinates).

OUTCOMES

- Apply a fundamental understanding of standards in the conceptual category of Geometry to implement effective tasks.
- Integrate effective instructional strategies such as the use of classroom discourse, real-world applications, and appropriate tools to facilitate the learning of all students.

Expressions, Equations, and Functions

Target Audience: Math Coaches, Teacher Leaders, Teachers

Grades: 6–8

Format: Two Day

This course focuses on how students develop algebraic reasoning and an understanding of the different representations for functions. Teachers and coaches explore the progression of middle school content that develops an understanding of expressions, equations, and functions and prepares students for success in high school and beyond.

OUTCOMES

- Engage with current state standards that address expressions, equations, and functions.
- Analyze problem-solving activities that develop students' skills in these areas.
- Design problem-solving lessons that address expressions, equations, and functions focus standards.
- Integrate effective instructional strategies to facilitate the learning of all students.
- Challenge students with rigorous math problems that require habits of mathematical thinking called for in current state standards.

High School: Algebra and Functions

Target Audience: Math Coaches, Teacher Leaders, Teachers

Grades: 9–12

Format: Two Day | Additional Options May Be Available

This two-day course focuses on the conceptual aspects of algebra and functions for students in high school, with an emphasis on strategies and tools to help leverage students' ways of thinking so they can approach any type of function, work with it, and understand how it behaves.

OUTCOMES

- Apply a fundamental understanding of standards addressing algebra and functions to implement effective tasks.
- Integrate effective instructional strategies such as the use of classroom discourse, real-world applications, and multiple representations to facilitate the learning of all students.
- Challenge students with rigorous math problems that require the habits of mind called for in current state standards.
- Identify purposeful ways to organize the classroom—whole-class, small group, and individual learning—to maximize the learning of all students.

Instructional Strategies

Number Talks: Whole Number Computation

Target Audience: Math Coaches, Teacher Leaders, Teachers

Grades: K–2, K–5, 3–5

Format: Full Day

This one-day course introduces teachers, math coaches, and curriculum specialists to the theory, structure, and focus of number talks. As participants interact throughout the day, they reflect on their current practices and target essential understandings about numbers and operations called for in their state standards.

OUTCOMES

- Recognize number talks as a valuable classroom routine for making sense of mathematics, developing efficient computation strategies, communicating reasoning, and proving solutions.
- Characterize the key components of number talks and understand the importance of each.
- Recognize and support students' development of common strategies for addition and subtraction.
- Scribe student strategies that emphasize the important mathematical ideas inherent in the strategies.
- Use models and tools that support student understanding and proficiencies with whole-number operations.

NEW! Number Talks: Fractions, Decimals, and Percentages

Target Audience: Math Coaches, Teacher Leaders, Teachers

Grades: 3-5, 6-7

Format: One Day | Additional Options May Be Available

This full-day course focuses on number talks that build conceptual understanding of fractions, decimals, and percentages. Participants learn how to use this routine as a vehicle to focus on the essential understandings of rational numbers and develop a robust fluency.

OUTCOMES

- Facilitate number talks to draw attention to student thinking and bring their reasoning to the forefront of the class.
- Shift instruction about rational numbers from procedure- and rule-based toward sensemaking and understanding.
- Highlight contexts and models during number talks to develop and anchor flexible and efficient strategies for reasoning and computing with rational numbers.



Differentiating Mathematics Instruction

Target Audience: Math Coaches, Teacher Leaders, Teachers

Grades: K–2, K–5, K–8, 3–5, 6–8

Format: Two Day

This course helps teachers understand what it means to support all students by differentiating three aspects of the math curriculum—content, process, and product. Teachers examine a variety of approaches that help them make instructional adjustments to content, provide activities that accommodate different students' learning styles, and offer a variety of ways for students to demonstrate what they've learned.

OUTCOMES

- Experience and analyze strategies to adapt classroom practices to address the wide range of learners in classrooms and make learning accessible for all students.
- Gather and use information about what students already know, their interests, and how they learn best.
- Choose, analyze, and adjust tasks to accommodate students' varying levels of readiness.
- Experience a classroom atmosphere that stimulates and supports learning of mathematics.

Developing Number Sense

Target Audience: Math Coaches, Teacher Leaders, Teachers

Grades: K–5

Format: One Day | Additional Options May Be Available.

Number sense is a broad concept that covers a range of numerical thinking. This course helps teachers gain an understanding of what number sense is, why it is important, and what strategies they can use to help promote their students' number sense. Through firsthand experiences, teachers explore their own number sense and are introduced to instructional approaches that promote thinking and communicating about numbers. Samples of student work help connect course investigations to teachers' classroom needs.

OUTCOMES

- Strengthen math content and pedagogical knowledge for the purpose of making math accessible to all students.
- Understand how students learn mathematics.
- Identify ways to develop students' sense of number, which enables them to become flexible in their ability to reason numerically.

Teaching Preschool and Kindergarten Math

Target Audience: Math Coaches, Teacher Leaders, Teachers

Grades: PreK–K

Format: Four Day | Additional Options May Be Available

This course offers teachers of young children hands-on experiences with instructional strategies that promote thinking and reasoning. Video clips are used to bring teachers into the young child's classroom to see students grapple with counting and building and dealing with data. Participants have multiple and varied opportunities to consider instructional decisions, differentiation, and assessment.

OUTCOMES

- Strengthen math content and pedagogical knowledge to make math accessible to all students.
- Increase understanding of how young children learn mathematics.
- Identify ways to develop students' number sense and flexibility around numerical reasoning.
- Implement instructional strategies that promote thinking, reasoning, and sense making.
- Appreciate and delight in working with young children as they build foundations in number.

Supporting Students Who Struggle with Mathematics

Target Audience: Math Coaches, Teacher Leaders, Teachers

Grades: K–2, K–5, K–8, 3–5, 6–8

Format: Three Day | Additional Options May be Available

Offers guidance to classroom teachers, special educators, and math specialists in understanding and supporting children who struggle with mathematics. The struggles that children encounter may be the result of cognitive learning challenges, background and experience, or previous instruction. The approach in this course is to use a framework of assessments to understand student thinking and to examine and choose instructional strategies to help struggling students be successful in the regular mathematics classroom.

OUTCOMES

- Broaden perspectives about students who have difficulties with mathematics.
- Provide a sequential system of assessment to identify struggling students and understand their difficulties.
- Incorporate instructional strategies that promote student confidence and understanding in mathematics.

Using Formative Assessment to Impact Student Learning—6–12*

Target Audience: Math Coaches, Teacher Leaders, Teachers

Grades: 6–8, 9–12

Format: Two Day | Additional Options May be Available

Based on Math Solutions’ experience with the Gates Foundation Mathematics Design Collaborative, this course helps high school teachers engage students in the rigorous mathematics called for in the Common Core State Standards. Using formative assessment lessons, produced by the Shell Centre in England and the University of California at Berkeley, participants extend and apply a fundamental understanding of formative assessment for the purpose of promoting student learning.

*Using Formative Assessment to Impact Student Learning—K–5 also available.

OUTCOMES

- Shift classroom culture to one in which students take responsibility for their own work and teachers prompt students to reflect and reason through their ideas.
- Conduct classroom dialogue in ways that support students’ mathematical thinking.
- Provide feedback that promotes understanding and supports students’ metacognition about the quality of their arguments.
- Formulate questions to extend students’ thinking.
- Select and use tasks for formative assessment that exemplify the Standards for Mathematical Practice.

Teaching Math through Problem Solving

Target Audience: Math Coaches, Teacher Leaders, Teachers

Grades: K–5, 6–8

Format: One Day. Additional Options May Be Available

This full-day course provides teachers with a firsthand experience of learning mathematics through problem solving. Through this experience, participants are introduced to approaches and strategies to help students build new mathematical knowledge and use a range of problem-solving strategies. Throughout the course, teachers experience and learn how to provide a classroom environment that encourages students to explore, take risks, and share their thinking.

OUTCOMES

- Characterize problem-solving experiences that require mathematical reasoning and communication of that reasoning.
- Understand how current state standards impact teaching, curriculum, and learning in mathematics.
- Implement instructional strategies to support student learning as called for in state standards.
- Use strategies to help all students deepen and communicate their mathematical reasoning.

Coaching Development

Developing Math Coaching Expertise

Target Audience: Math Coaches, Teacher Leaders, Teachers

Grades: K–12

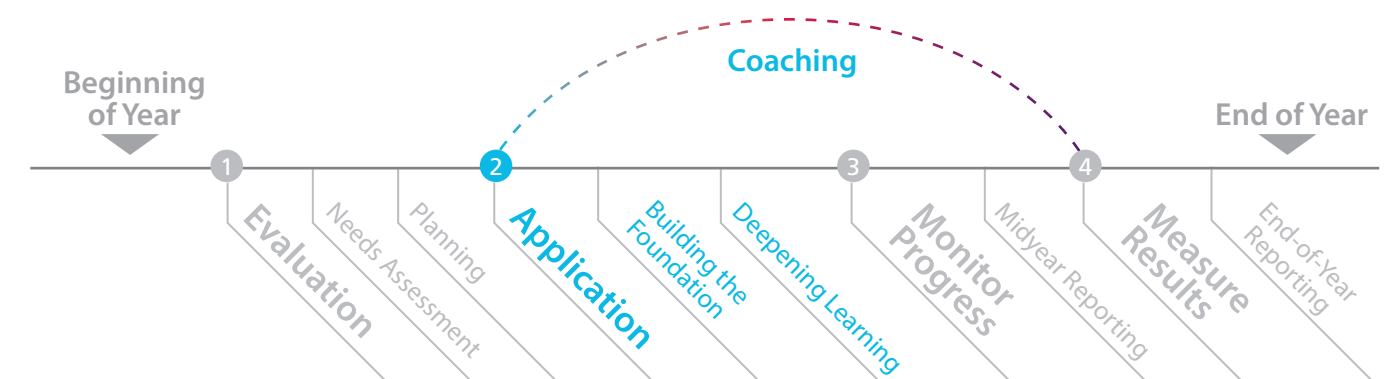
Format: Two Day

This course focuses on the disposition, skills, and knowledge math coaches need to support teachers’ understanding and application of new content knowledge and effective instructional practices. Based on current research and Math Solutions’ extensive experience with coaching, participants learn strategies to effectively partner in a collaborative coaching cycle to enhance student learning.

Designed for new coaches, coaches new to coaching mathematics, and current coaches who are looking to improve their coaching expertise.

OUTCOMES

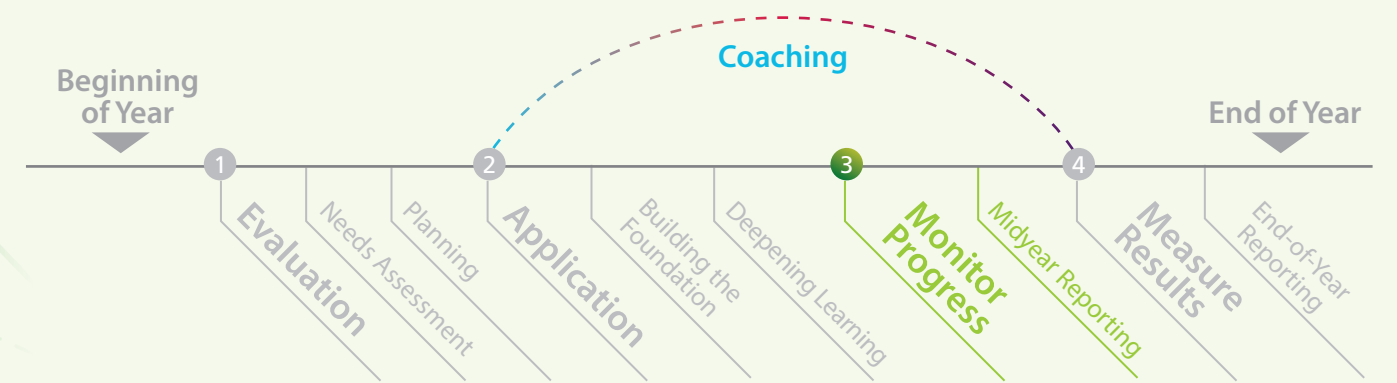
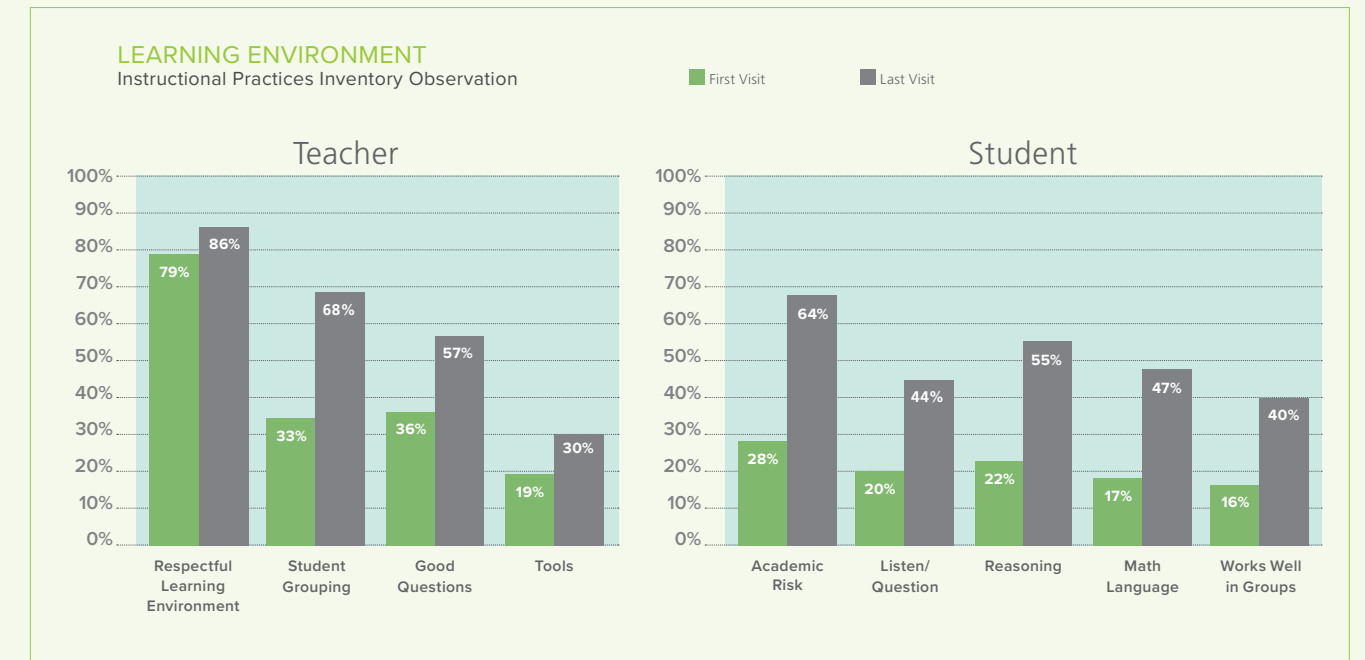
- Recognize and apply the characteristics of an effective mathematics coach.
- Focus coaching work on students through the use of questioning, tools, and student data.
- Develop effective communication strategies to grow productive coaching partnerships.





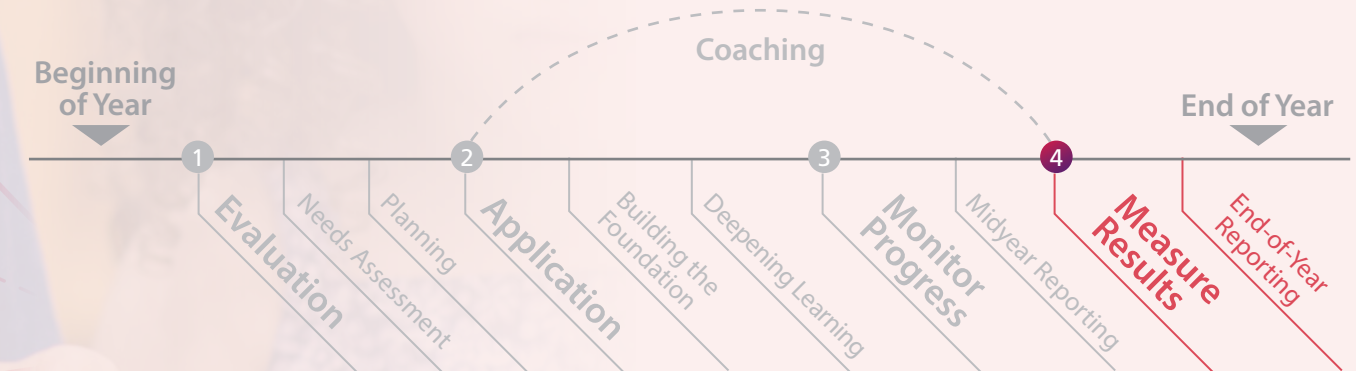
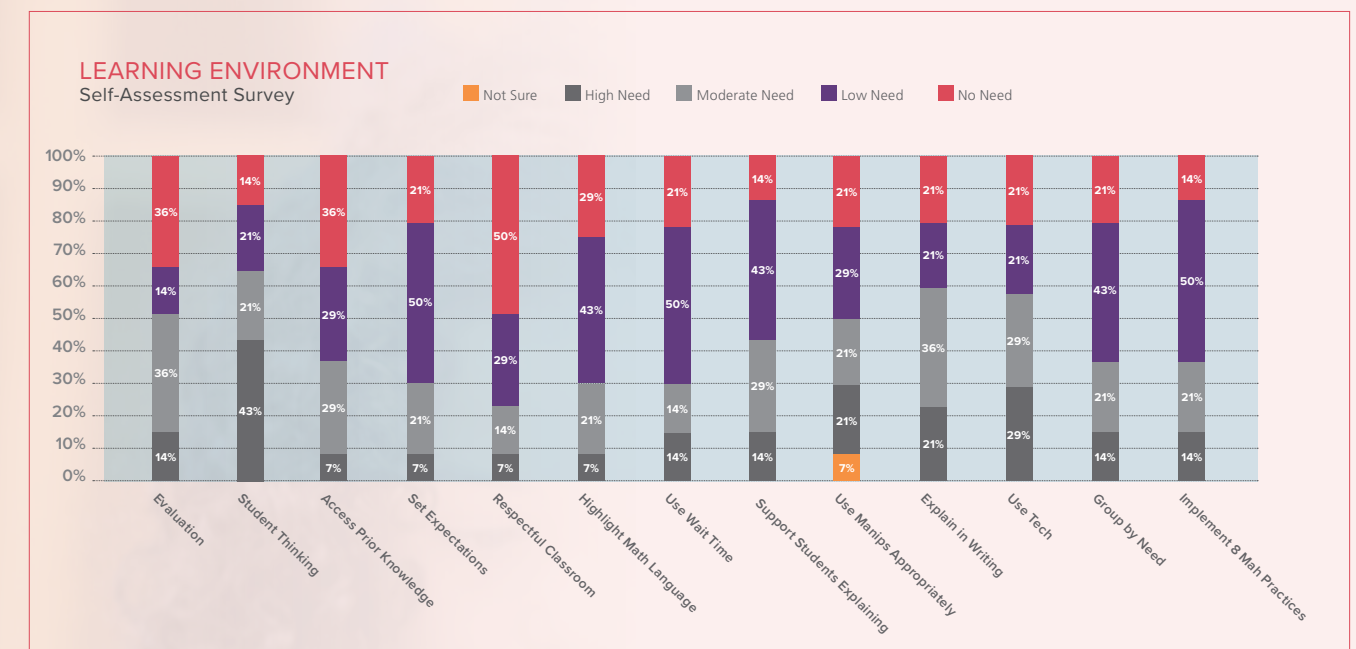
Measure Results and Analyze Midyear Progress

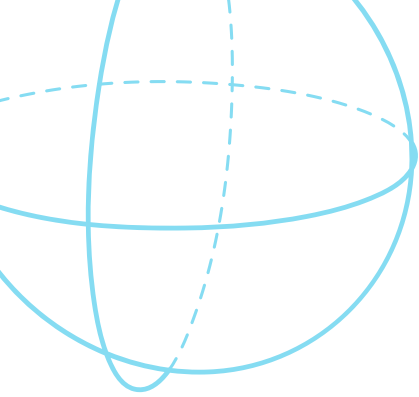
Monitoring and assessing progress during implementation allows you to make adjustments in your professional learning plan and provides accountability for your investment with data and reporting.



Sustain a Culture of Math Achievement

From the initial Instructional Needs Assessment to implementation of the Professional Learning Plan, Math Solutions will help you identify areas of success and areas in need of improvement. This analysis and reporting (based on leader, teacher, and student data) helps you understand where you are in meeting your math achievement goals.





Program **Implementation**, Professional Learning, and Additional **Resources** for Professional Excellence

HMH® math intervention programs focus on building student competency in three key areas: **Procedural Fluency, Conceptual Understanding, and Problem Solving**. We provide extensive professional learning services to help schools and districts implement with fidelity while building teachers' content knowledge and providing instructional strategies to enhance the effectiveness of the program with coaching and classroom support.

Math Solutions professional learning services for HMH intervention programs are designed to complement the programs in your district by providing cohesive implementation support to improve math instruction.

ENHANCE MATH INSTRUCTION WITH POWERFUL PROFESSIONAL SUPPORT FOR:



MATH 180

Services designed to help teachers consider how *MATH 180*® prepares students to meet rigorous College and Career Readiness Standards.



Created by
Marilyn Burns

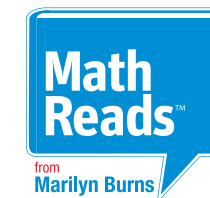
Do The Math and Do The Math Now!

Help teachers deepen their understanding of how to effectively implement the rich classroom and digital tools in *Do The Math*® and *Do the Math Now!* with a focus on planning, monitoring progress, digital instruction, and differentiation.



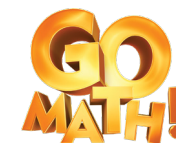
Math Inventory®

Participants will learn about this powerful universal screening and growth-monitoring assessment that measures math abilities and progress. Mathematics growth is measured on the Quantile® Framework for Mathematics—a scientific taxonomy of over 500 math concepts and skills—placing student readiness and difficulty of math tasks on the same scale.

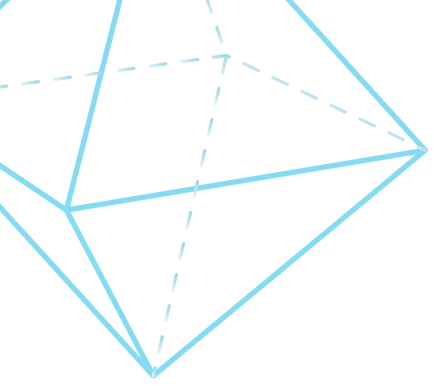


Math Reads

Participants will recognize *Math Reads*® as a valuable teaching resource with lessons for helping students make sense of mathematics.



Math Solutions professional learning services helps teachers using *GO Math!*, *AGA*, or *Integrated Math* programs improve the quality and frequency of classroom Math Talk, use instructional tools more purposefully, increase the rigor of lessons with a focus on problem solving, and cultivate instructional strategies that promote the understanding of math content standards.



Our Team of **Leading Researchers & Authors**



Marilyn Burns

Marilyn Burns is one of today's most highly respected mathematics educators. In 1984, Marilyn formed Math Solutions while continuing to author numerous best-selling professional resources including *About Teaching Mathematics 4th Edition*, *The Marilyn Burns Fraction Kit*, and *Math: Facing an American Phobia*. Working with a team of Math Solutions colleagues, Marilyn has also developed the programs *Do The Math*, *Do The Math Now!*, *Math Reads*, and the web-based formative assessment program, *Math Reasoning Inventory*.



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