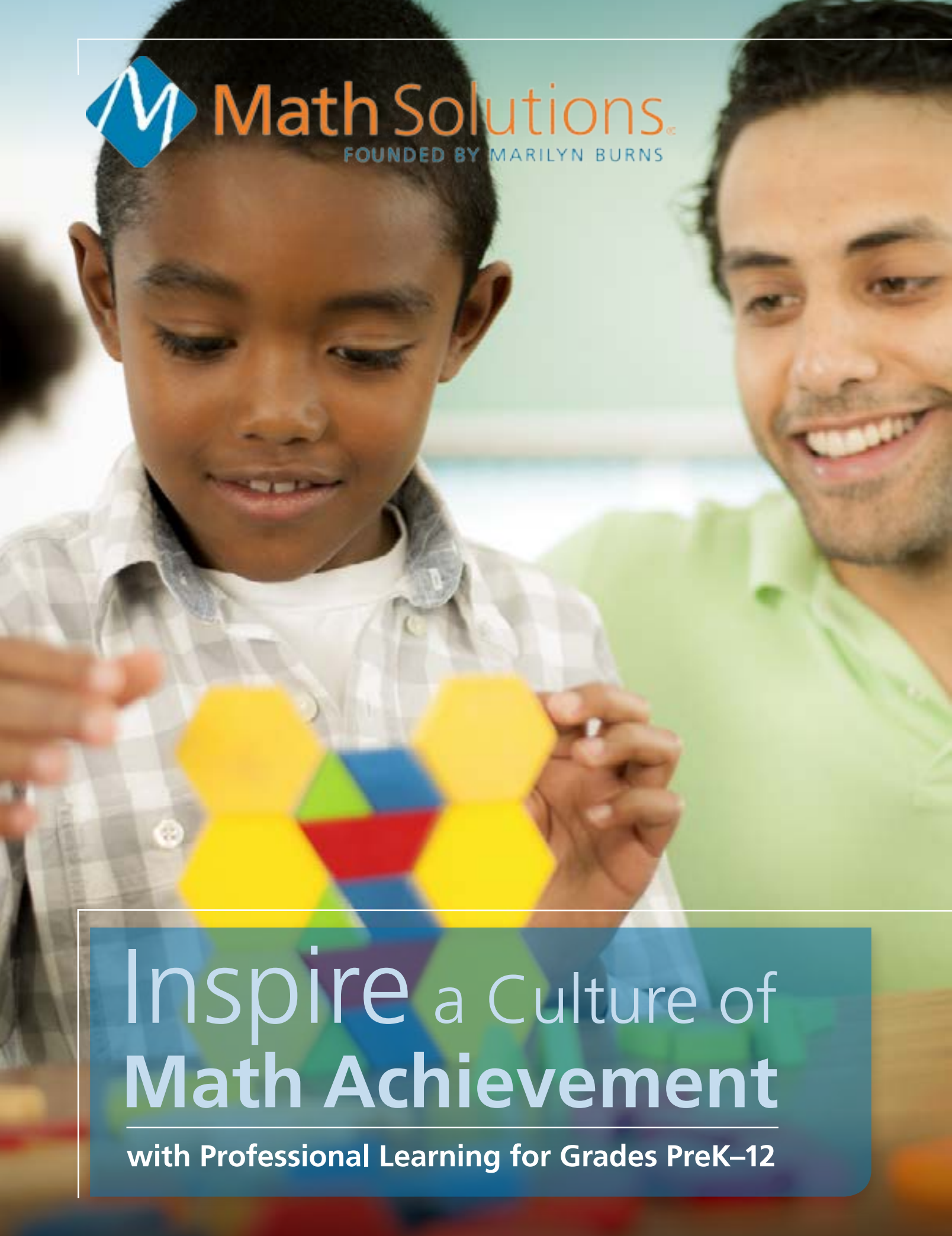


Inspire a Culture of **Math Achievement**

with Professional Learning for Grades PreK–12

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.

Table of Contents

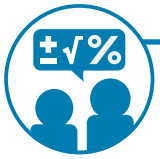
The Backbone of **Everything We Do**

Your Guide to an Effective Math Classroom

Schools and districts need examples of a model math classroom that provides 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 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.

Math Solutions **Instructional Practices Inventory**

Based on more than 30 years of focusing exclusively on the teaching and learning of math, Math Solutions has identified these four key areas of instructional focus to reach math achievement goals. Math Solutions will guide you to recognize what a model classroom that encompasses these key areas looks like with examples for both teachers and students, as shown below:

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

Partnering with Math Solutions Is **Proven to Work**

These Schools and Districts Met Their Goals

Whether you are a large, urban district or small, rural school, Math Solutions has the expertise to 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. **A partnership with Math Solutions is customized to meet your requirements and achieve your goals**.

North Kansas City Schools, MO

The North Kansas City Schools, Missouri identified a plateau in recent mathematic test scores. Chad Sutton, the district's Deputy Director of Elementary Education, decided to take action and make an investment in his teachers. **"As a district, we believe that the effectiveness of our organization will never exceed the effectiveness of our teachers,"** said Sutton. Math Solutions and the district worked together to create a customized, 3-year plan for embedding professional learning. The result—**the district has achieved its highest level of third-grade math proficiency in ten years, with approximately 57 percent earning scores in the advanced or proficient categories.**

DISTRICT PROFILE

Metro Status: Large City

Total Schools: 30

Grades: Kindergarten–Grade 12

Total Enrollment: 19,397 Students*

Student Demographics:

- ELL Students: 1,289**
- Students with IEPs: 1,687**

* 2016 Statistics

** 2012 Statistics from Math Solutions Case Study

Sunnyside Elementary School, MT

When discussing the possible reasons behind the low math performance, the staff members at Sunnyside recognized that perhaps because **they were teaching the same concepts over and over again without taking any fresh approaches to their teaching style, the concepts would not stick with the students.**

Math Solutions professional learning has inevitably led to great successes in the classroom setting. **Students began to enjoy rigorous math problems interwoven with several mathematical concepts, sometimes taking days to work through and solve the problem. These exercises developed the students' perseverance and demonstrated their ability to solve more advanced problems than the teachers had expected.** By planning lessons around critical thinking skills and concepts instead of simple mathematical procedures, Sunnyside teachers were able to **instill in their students a deeper understanding of math foundations that students could apply to a variety of math problems—not just the one they happened to be working on.** Active participation and discussions about mathematical concepts ensued in classrooms.

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%

The School District of Osceola County, FL

In the final weeks of the 2012–13 school year, Dr. Lissette Brizendine, Assistant Superintendent for Elementary Curriculum and Instruction, organized small focus groups of principals to explore ways to improve math achievement. **"The final conclusion from the team was that we needed to find training for math—ongoing, comprehensive professional development—that was not tied to any particular program or book and was district-wide, reaching as many teachers as possible,"** she recalled. From the start, district administrators recognized that Math Solutions was a much-needed resource to support their teachers. At the elementary level, Osceola outperformed the state for third, fourth, and fifth grades. Dr. Brizendine put it simply: "Something was happening in math that we had not experienced before. And that was very promising." Numerous surveys of teachers also showed that Math Solutions was already having an impact on them. **All grades reported that at least 93 percent of teachers agreed or strongly agreed that they could apply what was learned in the Math Solutions courses to improve student achievement.**

DISTRICT PROFILE

Total Schools: 52

Grades: PreK–Grade 12

Total Enrollment: 61,736 Students

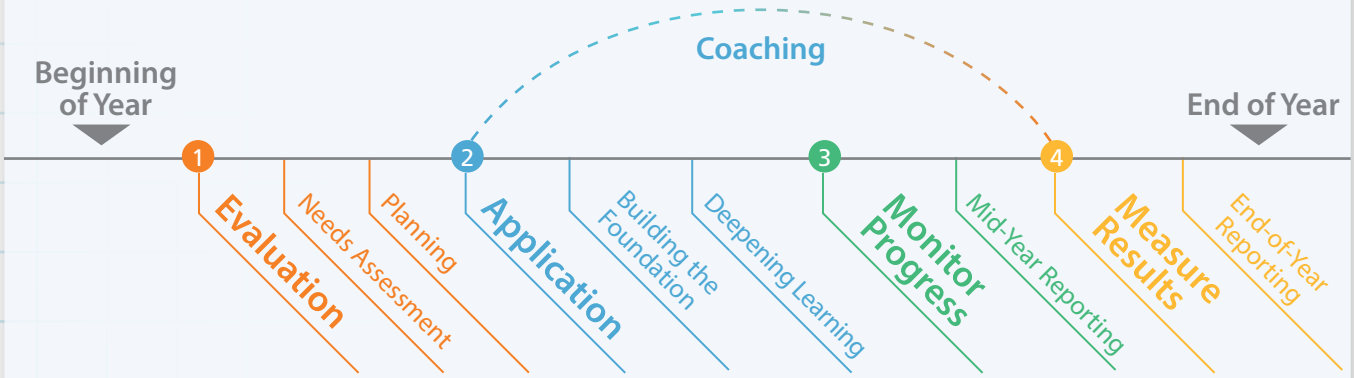
Student Demographics:

- 59.4% Multiracial
- 57% Hispanic
- 26.7% White
- 10.9% African American

How We Can **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.

TIME LINE 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 multiday 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

Math Solutions Coaching Model is designed to deepen teachers' math content and pedagogical knowledge for immediate implementation in the classroom. 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.

INDIVIDUAL COACHING

With individual coaching, educators work side by side, enabling 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.

Our Research-Based Coaching Model

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


Professional
School District of

Assess and Address

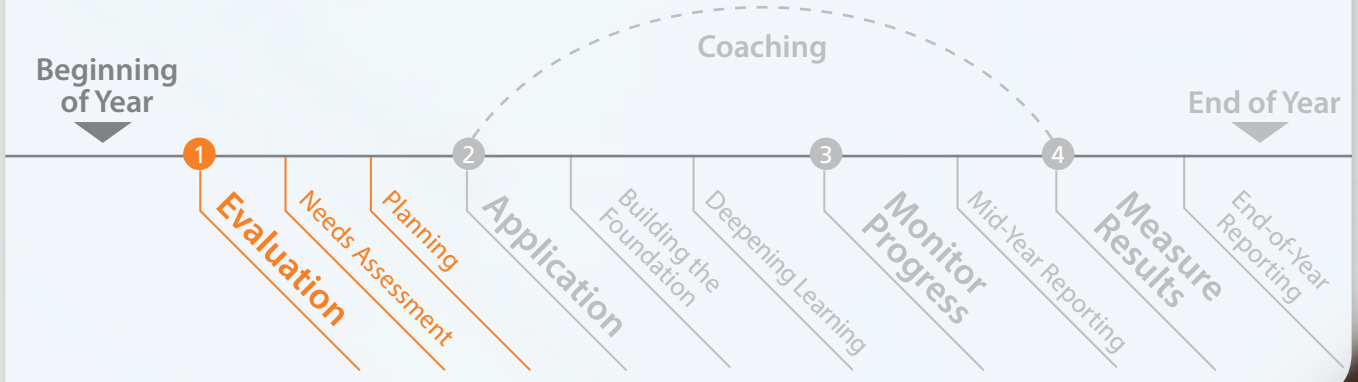
Immediate and Long-Term Needs

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, addresses critical challenges needing immediate attention.

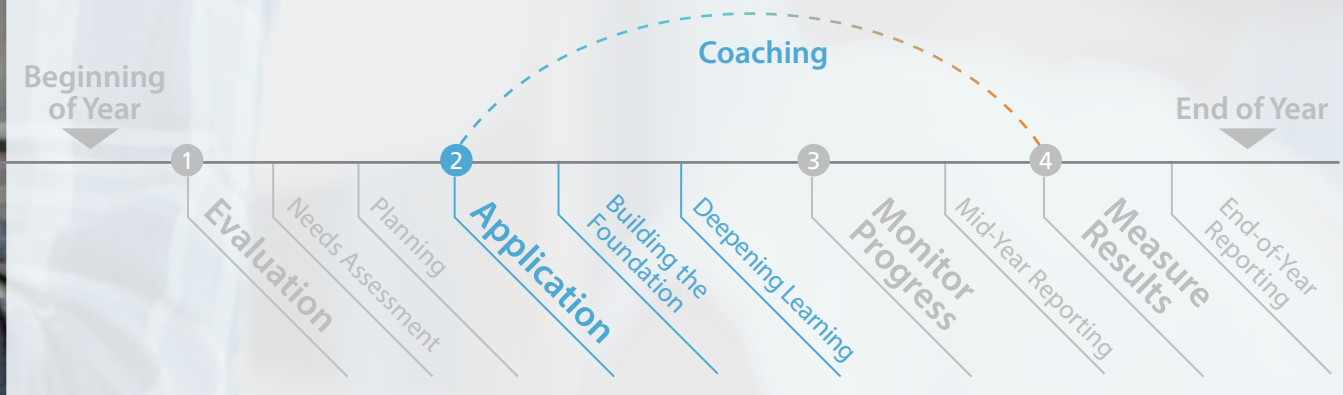
Following this assessment, Math Solutions will deliver:

- A data-rich **Instructional Needs Assessment Report** and Professional Learning Plan that identifies math instruction strengths and opportunities for improvement
- Identification of 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.



Mathematical Processes

Mathematical Processes Series™

Target Audience: Math Coaches | Teacher Leaders | Teachers

Grades: K–2 | K–5 | K–8 | 3–5 | 6–8 | 9–12 | 6–12

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 sense making.

Making Sense of Math—
Reasoning and Discourse

Target Audience: Math Coaches | Teacher Leaders | Teachers

Grades: K–2 | K–5 | K–8 | 3–5 | 6–8 | 9–12 | 6–12

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 full-day 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. During this course, teachers will engage in reasoning and discourse and discuss the implications for their students. 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

- Discern how mathematical tasks and questions differ with respect to the level of thinking required to solve them.
- Deepen understanding that learning mathematics involves students constructing ideas and systems.
- Recognize the role of productive discourse in students' mathematical reasoning and sense making.

> "*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 | K–5 | K–8 | 3–5 | 6–8 | 9–12 | 6–12

Format: One-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.

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.

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.

"*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

OUTCOMES

- Expand understanding of procedural fluency to include carrying out procedures appropriately with flexibility and accuracy.
- Broaden the definition of mathematical tools to include anything that students use to think about mathematics
- 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.
- Cultivate new instructional strategies that promote thinking, reasoning, and sense making.

Problem Solving—
Developing Disposition, Competence, and Confidence

Target Audience: Math Coaches | Teacher Leaders | Teachers

Grades: K–2 | K–5 | K–8 | 3–5 | 6–8 | 9–12 | 6–12

Format: Full Day

Current state standards call for students 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. Teachers learn how to maintain the integrity of high-level tasks by structuring lessons to allow students to make connections and develop new mathematical knowledge.

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

- Broaden participants' understanding of how students learn and the features of a classroom environment that promote confidence and perseverance in students.
- Develop a working knowledge of constructive struggle as offering opportunities to involve students in problems that require critical thinking and connections across multiple mathematical concepts, skills, and ideas rather than those that entail superficial application of a rote procedure.
- Examine three core features of the role of the teacher who teaches for understanding.
- Consider how two cognitive processes that are key in students' efforts to understand mathematics—reflection and communication—are also tools teachers use to assess student understanding.

About Teaching Mathematics—
Multiday Institute

Target Audience: Math Coaches | Teacher Leaders | Teachers

Grades: K–2 | 3–5 | 6–8 | 9–12

Format: Four or Five Consecutive Day Institute

Designed to fundamentally change the way teachers think about math and how they teach their students, this relevant, engaging, multiday institute brings math instruction best practices to life. Through hands-on, research-based activities, teachers deepen their own content knowledge while learning how to develop students' abilities to think and reason and deepen students' number sense, computation, and problem-solving skills. Participants will attend both grade-level and mixed-grade sessions in order to understand not only their own content, but to think across grades to examine progressions and how content develops over time. As part of the course, each participant will receive a copy of ***About Teaching Mathematics: A K–8 Resource, 4th Edition***, by Marilyn Burns, plus a collection of various course readings and manipulatives for hands-on learning.

Participants will participate in grade-level breakout sessions for part of the week and K–8 (or cross-grade-level) breakout sections for the second part of the week.

OUTCOMES

- Strengthen math content and pedagogical knowledge relative to current state standards in order to understand various solution paths and students' reasoning.
- Understand how students learn in order to make instructional decisions about tasks to use and questions to pose to make math accessible to all students.
- Develop insight into individual learners' skills and math reasoning.
- Cultivate new instructional strategies that promote thinking, reasoning, and sense making.
- Experience a variety of ways to organize the classroom—whole-class, small-group, and individual learning and various tools and materials to support learning.

"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

Address Content Standards by Grade Level

Number & Operations—
Base Ten

Target Audience: Math Coaches | Teacher Leaders | Teachers

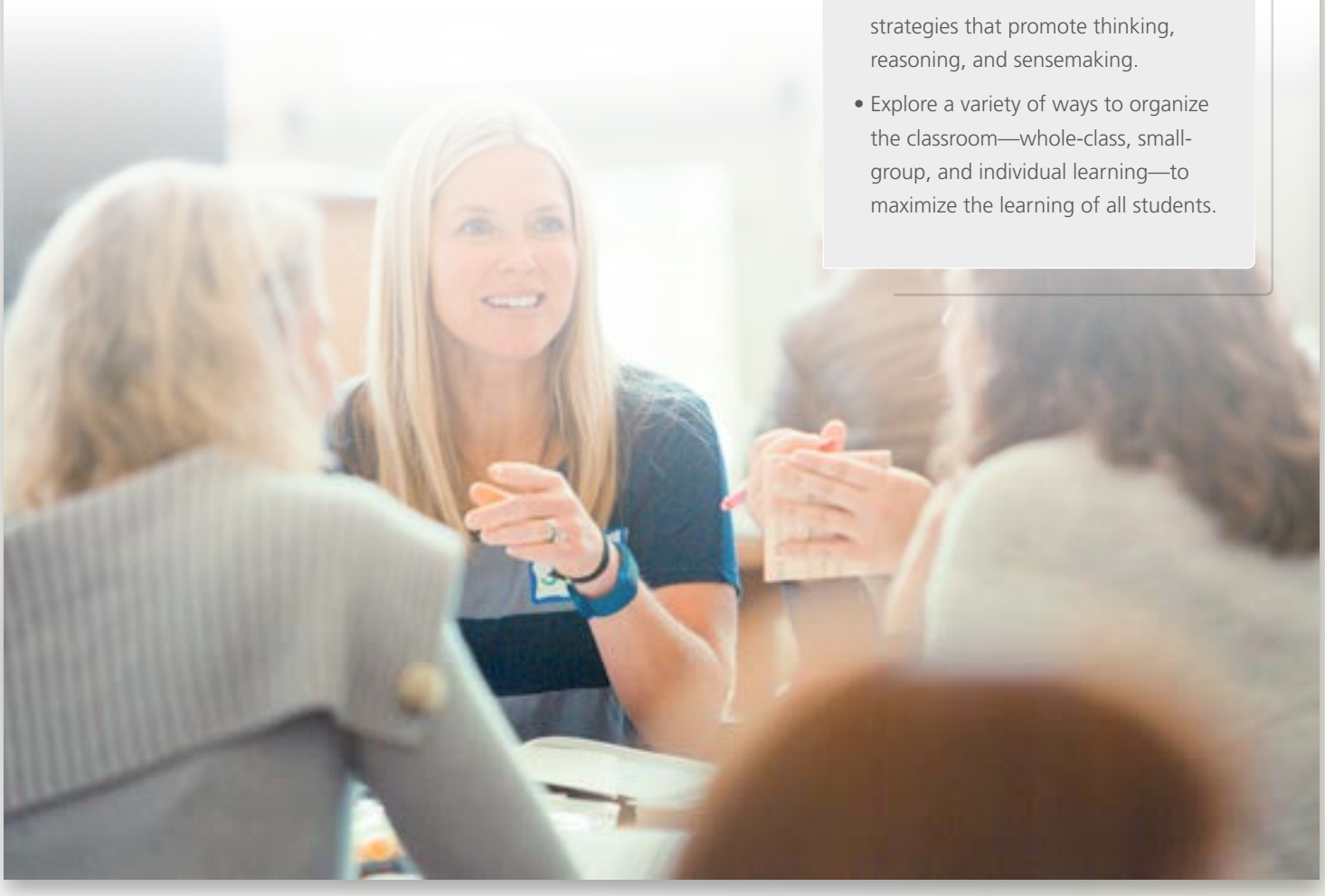
Grades: K–2

Format: Three Day | Additional Options May Be Available

This three-day course focuses on Number and Operations in Base Ten, K–2 in current state standards. The emphasis of the course is on building understanding of the role of place value and properties of operations in the primary grades, as well as the coherence across the grades.

OUTCOMES

- Learn the content of the individual state standards for the strand of number at Grades K–2.
- Understand the complex nature of the base-ten number system with the purpose of supporting all learners as they develop concepts and internalize the intricacies of our numeration system.
- Gain insight into the interconnectedness of place value and the base-ten number system to operations and algebraic thinking.
- Observe and characterize instructional strategies that promote thinking, reasoning, and sensemaking.
- Explore a variety of ways to organize the classroom—whole-class, small-group, and individual learning—to maximize the learning of all students.



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 2-fold, first to build understanding of fractions as numbers and secondly 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: 3–5

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 3–5. 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: Three Day | Additional Options May Be Available

Participants learn 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.

This three-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 addresses current state standards for ratios and proportional relationships in the middle grades and supports teachers with strategies to help make the standards accessible to all students.

OUTCOMES

- Examine problem-solving activities and investigations that develop proportional reasoning.
- Identify proportionality as stated in current state standards.
- Implement instructional strategies that support students' proportional reasoning.
- Explore a variety of ways to organize the classroom—whole-class, small-group, and individual learning—to maximize the learning of all students.

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

- Develop a fundamental understanding of content standards focused on algebra and functions.
- Analyze problem-solving activities and experiences that address and develop students' skills in the areas of algebra and functions.
- Connect content standards and mathematical habits of mind to current classroom practices.
- Explore a variety of ways to organize the classroom—whole-class, small-group, and individual learning—to maximize the learning of all students.

Geometry
Elementary School

Target Audience: Math Coaches | Teacher Leaders | Teachers

Grades: K–5

Format: Two Day

This course focuses on content from the domain of Geometry and connects to expectations in the geometric measurement content cluster from the domain of Measurement and Data. 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 and provide formative assessment data.
- Analyze problem-solving activities that develop students' skills in geometry and geometric measurement.
- Incorporate effective strategies for teaching mathematics vocabulary into lessons.
- Implement instructional strategies including the use of classroom discussions, small-group work, and the use of concrete materials to support students' learning.

Geometry
Middle School

Target Audience: Teacher

Grades: 6–8

Format: Two Day

This course focuses on content from the domain of Geometry and connects to expectations in the geometric measurement content cluster from the domain of Measurement and Data. 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

- Articulate the progression of content in the Common Core State Standards in the domain of geometry, specifically around deductive reasoning..
- Analyze problem-solving activities that deepen understanding and develop participants' skills in geometry, geometric measurement, and informal proof.
- Incorporate effective strategies for teaching mathematics vocabulary into lessons.
- 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.
- Challenge students with rigorous math problems that require the habits of mind called for in the Standards for Mathematical Practice.

Instructional Strategies

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.

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

- Learn strategies to adapt classroom practices to address the wide range of learners.
- Gather 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.

Using Formative Assessment to Impact Learning

Target Audience: Teachers
Grades: K–5
Format: Two-Day

This course merges any ongoing assessment that participants are currently using while simultaneously developing probing questions. It is a culmination of more than forty reflections that support teachers in evaluating tasks, making inferences about student understandings and creating plans to address to address student misconceptions.

This course supports participants' extension and application of a fundamental understanding of formative assessment for the purpose of promoting student learning.

OUTCOMES

- Shift classroom culture to one in which students take responsibility for their own work and reflect on and reason through their ideas.
- Conduct dialogue to support mathematical thinking.
- Provide feedback that promotes understanding and supports students' metacognition.
- Formulate questions to extend students' thinking.
- Select and use tasks for formative assessment.
- Attend to learning targets aligned with state standards.

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.

Number Talks

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.
- Explore ways to 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.

Coaching

Developing Math Coaching Expertise

Target Audience: Math Coaches | Teacher Leaders

Grades: K–12

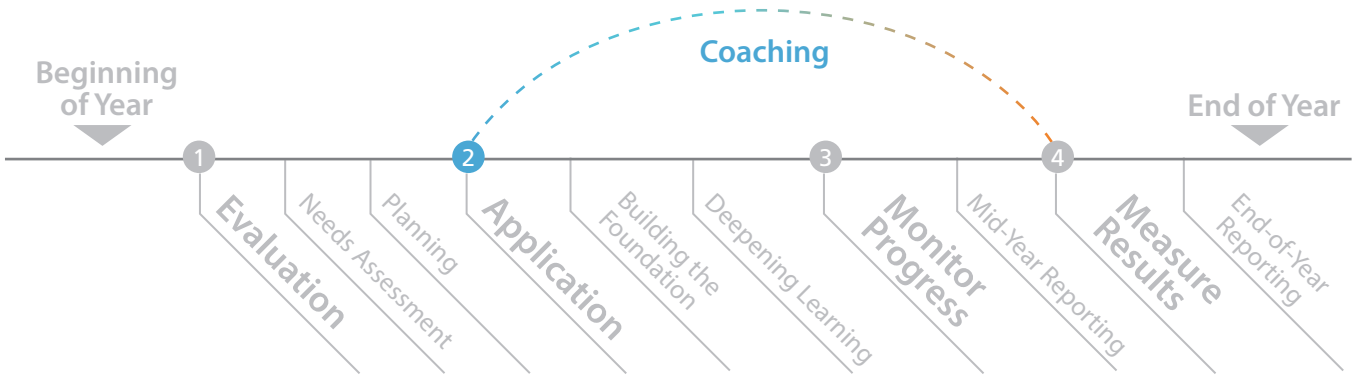
Format: Two-Day

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.

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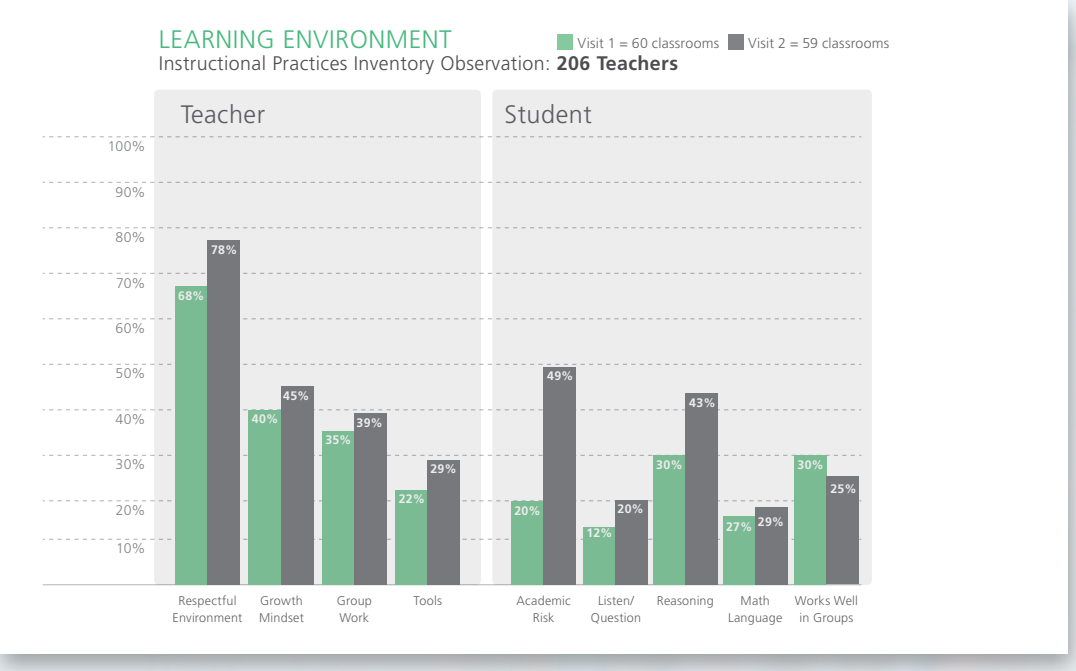
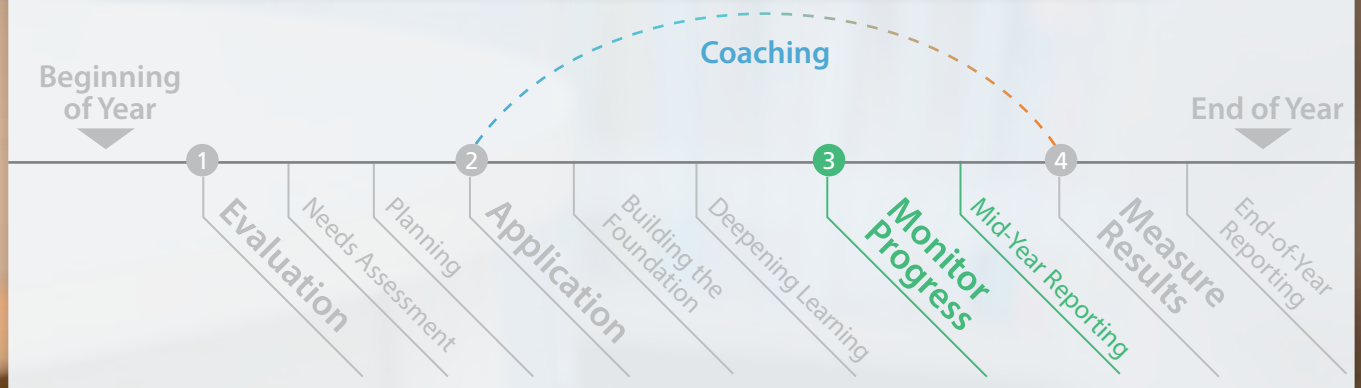
Measure Results
and Analyze Midyear Progress

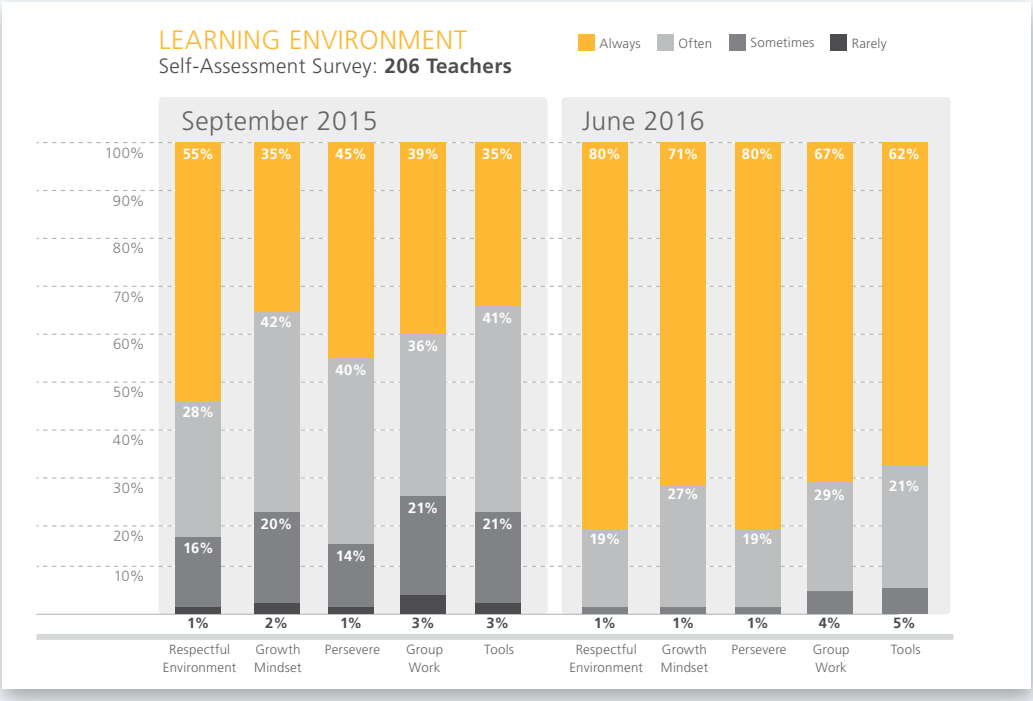
Monitoring and assessing progress during implementation allows you to make adjustments in your professional learning plan and provides accountability for your investment with data and reporting.

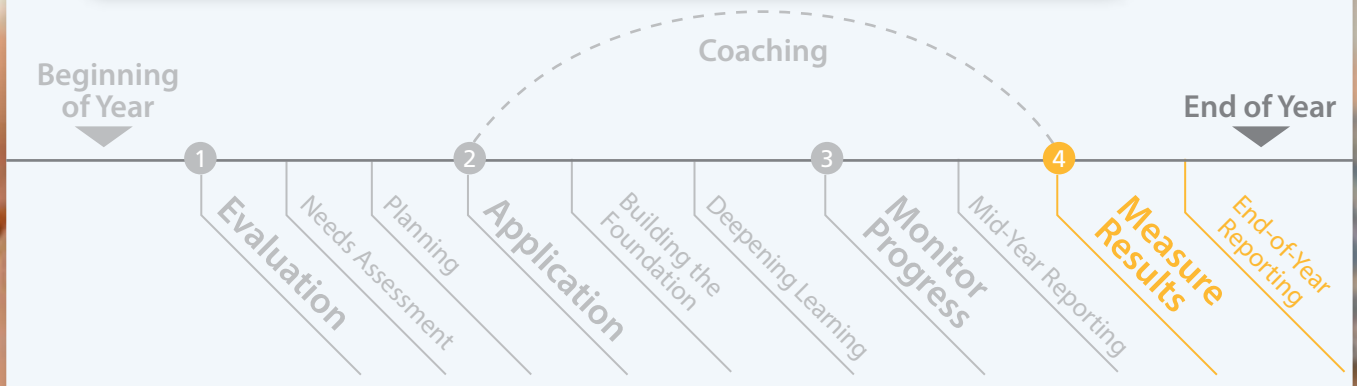




Sustain a Culture of Math Achievement

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 from leader, teacher, and student data), allows you thoroughly understand where you are in meeting your math achievement goals.





Program **Implementation** & Professional Learning

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.

Additional **Resources** for Professional Excellence

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. 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 classroom support.

Enhance Math Instruction with Powerful Professional Support for the Programs:

MATH 180®

Math Solutions professional learning services is designed to help teachers consider how *MATH 180* prepares students to meet rigorous College and Career Readiness Standards.

Do the Math® and *Do The Math Now!*

Math Solutions professional learning services 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

Math Solutions professional learning services 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

Math Solutions professional learning services participants will recognize *Math Reads* as a valuable teaching resource with lessons for helping students make sense of mathematics.

ALSO AVAILABLE:

GO MATH!

Math Solutions professional learning services helps *GO Math!* teachers to improve the quality and frequency of classroom MathTalk, use *GO Math!* instructional tools more purposefully, and increase the rigor of lessons with a focus on problem-solving.

Our Team of **Leading Researchers** & Authors

Excellent outcomes begin with world-class research. Math Solutions professional learning is based on some of the country's foremost thought leaders and specialists in math education and professional learning.

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***.

Cathy L. Seeley

Cathy has been a mathematics teacher, K–12 district coordinator, and K–12 State Director of Mathematics for Texas. From 1999 to 2001, she taught mathematics (in French) as a Peace Corps volunteer in Burkina Faso. Dr. Seeley served as President of NCTM from 2004 to 2006 and is the author of ***Faster Isn't Smarter—Messages About Math, Teaching, and Learning in the 21st Century, 2nd Edition*** and ***Smarter Than We Think: More Messages About Math, Teaching, and Learning in the 21st Century.*** She recently retired as a Senior Fellow at the Charles A. Dana Center at The University of Texas, however she continues to speak, write, and consult on improving mathematics teaching and learning. A sample of Cathy's presentation topics include ***Visibly and Invisibly Helping Every Teacher Help Every Student Achieve***, ***Math is Supposed to Make Sense!***

Julie McNamara

Julie is an assistant professor of Mathematics Education at California State University. She has also served as Mathematics Specialist with TeachingWorks at the University of Michigan. Julie spent two years supporting elementary and middle school teachers as a full-time designer and provider of mathematics professional development for Math Solutions and continues to consult for Math Solutions part-time. She is a former classroom teacher in the San Francisco Bay Area. Her experience in the classroom led her to pursue graduate studies in the Development in Mathematics and Science program at the University of California, Berkeley, and to earn her master's degree and PhD in mathematics education. Her research focuses on the teaching and learning of mathematics concepts that are foundational but considered "hard to teach and hard to learn." Julie is the author of ***Beyond Pizzas and Pies: 10 Essential Strategies for Supporting Fraction Sense, Grades 3–5, 2nd Edition*** and ***Beyond Invert, & Multiply: Making Sense of Fractions, Grades 3–5.***

Sherry Parrish

Sherry is a native of Birmingham, Alabama, and began her career in education in 1979. She currently serves as an assistant professor for The University of Alabama at Birmingham where she teaches math and education courses for the College of Arts and Sciences. Sherry holds a doctorate in Educational Leadership from Samford University, is a national board certified teacher, and is a recipient of the 1997 Presidential Award for Excellence in Mathematics Teaching. Sherry is the author of ***Number Talks: Helping Children Build Mental Math and Computation Strategies, Grades K–5*** and ***coauthor of Number Talks: Fractions Decimals, and Percentages.***

Ann Dominick

Ann Dominick received her undergraduate degree in education from Auburn University, a Master's in Education from the University of Alabama at Birmingham, a doctorate from Vanderbilt University, and a Certificate of Advanced Studies in Curriculum and Instruction at Harvard University. She was awarded the National Science Foundation's Presidential Award for Excellence in Teaching Elementary Mathematics and is a former Alabama State Teacher of the Year. She is currently an Assistant Professor at the University of Alabama at Birmingham, teaching mathematics and education courses and preparing undergraduates to be secondary mathematics and science teachers. Ann is the coauthor of the new ***Number Talks: Fractions, Decimals, and Percentages.***

Nancy Anderson

Nancy Anderson is K–8 Mathematics Coordinator and Grade 8 Mathematics Teacher at Milton Academy. Nancy is an experienced classroom teacher, curriculum specialist, and professional developer. She is a frequent speaker at regional and national conferences and a published author in the field of mathematics education. Nancy's publications include ***Good Questions for Math Teaching: Why Ask Them and What to Ask, Grades 5–8 , Talk Moves: A Teacher's Guide for Using Classroom Discussions in Math, Grades K–6 3rd Edition, and Classroom Discussions in Math: a Facilitators Guide to Support Professional Learning of Discourse, Grades K–6, 3rd Edition.*** Nancy earned her doctoral degree in Mathematics Education from Boston University in 2012.

Suzanne H. Chapin

Suzanne is a professor of Mathematics Education at Boston University. She is interested in mathematics curricula, the education of the gifted, and how to further the mathematics achievement of economically disadvantaged students. Over the past 25 years, Chapin has directed many projects and written many books in these areas, including ***Talk Moves: A Teacher's Guide for Using Classroom Discussions in Math, Grades K–6, 3rd Edition*** and ***Classroom Discussions in Math: a Facilitators Guide to Support Professional Learning of Discourse, Grades K–6, 3rd Edition.***

Our Team Is **YOUR Team!**

At Math Solutions, there is a full team working behind the scenes to ensure that your professional learning is an unparalleled experience. Your collaborative team includes:

Executive Director of Math Partnerships helps to customize the Professional Learning Plan tailored to your unique challenges.

Director of Professional Learning, supported by our course logistics team, manages your project from beginning to end, ensuring we are exceeding your expectations at every step.

Content Design Team draws on the expertise of over 200 Math Solutions instructors, and authors to design professional learning experiences for you and your team.

Math Solutions Instructors, a group of highly credentialed educators, have earned more than 80 national and local recognition awards, including the Presidential Award for Excellence in Mathematics and Science Teaching. Skilled in facilitating adult learning, your instructors are matched to your project based on your needs and their experience.

To learn more about our team, our experience, and how we can create a custom plan to raise math achievement in your school or district, please call 800.868.9092.

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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 **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 their 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...