



Proposal for Partnership with Central Unified School District Fresno, California

Professional Learning for Improvement in Mathematics

Middle & High School Mathematics Support

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The purpose of this proposal is to create a plan for improving the effective teaching and student learning of mathematics in Central Unified School District. We believe that a partnership with you that focuses on your district goals, student data, and a thorough understanding of your instructional needs to meet Common Core State Standards, will lead to building the capacity required for student achievement in mathematics.

Why Math Solutions?

Math Solutions has been partnering with schools and districts to improve math instruction for more than 30 years. Founded by Marilyn Burns in 1984 and always focused exclusively on mathematics education, Math Solutions has the depth of professional development expertise to transform math instruction in your school/district. Over the years, we have supported thousands of schools and districts to build learning environments where teachers are more knowledgeable and confident about math instruction and students are more engaged and excited about learning math.

While many companies provide generic professional learning services, Math Solutions is the sole expert in *mathematics* professional learning. Math Solutions draws upon years of classroom-grounded research and extensive knowledge of curricula and state standards, to provide the highest-quality face to face courses, coaching, and resources, all developed and delivered by experts in math education.

Math Solutions has identified the four **Guiding Principles** to be essential to improving instruction and student outcomes. These **Guiding Principles** are the foundation of all the professional learning we provide and ensure that educators:

- **Know the math they need to teach**— know it well and flexibly enough to understand various solution paths to increase students' reasoning of mathematics. Math Solutions increases teachers' math content knowledge necessary to deliver effective classroom instruction.
- **Understand the conditions necessary for learning**, so they may understand deeply the unique conditions necessary for student learning in mathematics— what they need to provide and what students must make sense of for themselves
- **Recognize each student's strengths and weaknesses**, content knowledge, reasoning strategies, and misconceptions.
- **Have the expertise to make math accessible for all students**, to ask questions that reveal and build understanding, and help students make sense of and solve problems.

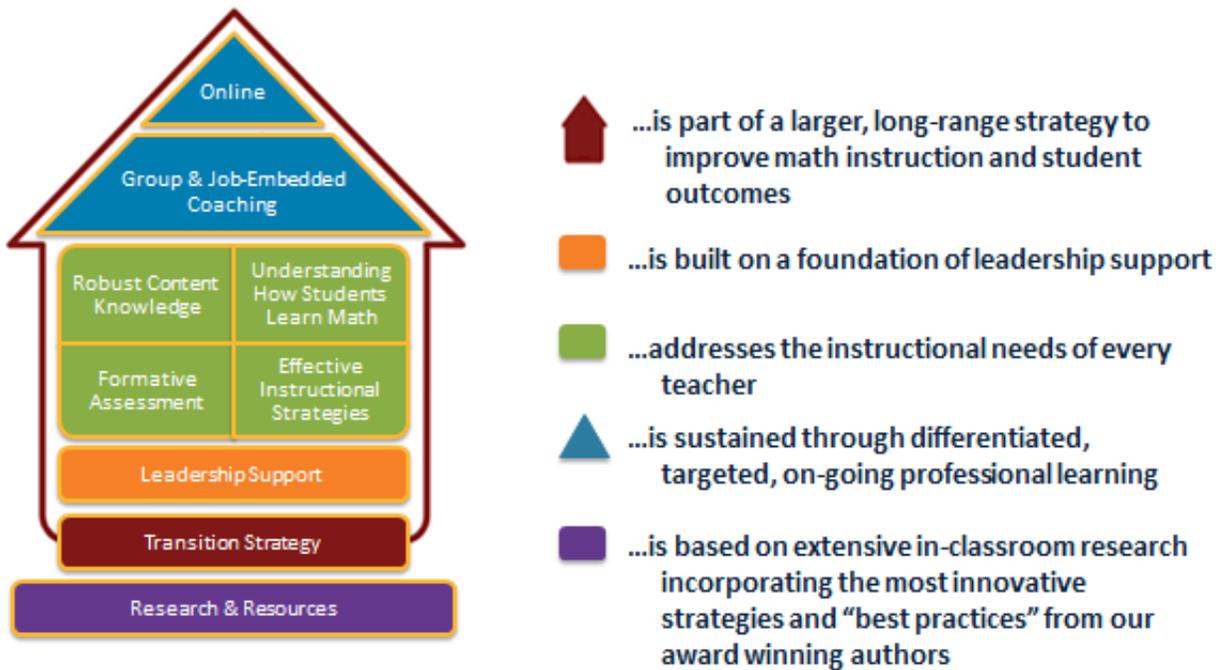
Based on these **Guiding Principles**, Math Solutions has identified key areas of instructional focus to reach math achievement goals: **learning environment, reasoning and sense making, focus and coherence, and formative assessment**. Math Solutions will help you recognize what a classroom that encompasses these key areas actually looks like with observable examples for both teachers and students. The **Instructional Practices Inventory (Appendix I)** guides leaders and teachers to know what works best to create a model math classroom. It outlines best teaching practices and student learning practices and is utilized in the assessment of the instructional needs of your teachers, monitoring progress, and end of the year or project summary.

30 years of experience has also resulted in a wealth of knowledge of individual state (or common) standards. Math Solutions has worked throughout the country with many curricula as well. Deep understanding of standards and the current curricula in your school or district, aligned with your professional learning goals is key to success.

More information about Math Solutions is in **Appendix II**.

Recent academic research tells us that a successful professional learning plan needs to be ongoing and include leadership support. At the foundation is math instruction that improves teachers' math content knowledge and pedagogy, which is sustained by classroom coaching and online support. Additionally, school and district leaders need to play a strong role in the plan, and the plan needs to connect to district goals.

Math Solutions Professional Learning



Description of Proposed Professional Learning Services for Central Unified School District

The scope of work below describes a proposal for professional learning that supports your teachers, instructional coaches, and building level leaders. Before implementation, we will meet and collaborate with you to ensure your goals are fully integrated in your *Professional Learning Plan*.

This proposal is organized into the following components:

- Component 1: Professional Learning Sessions for Middle and High School Teachers
 - o High School: To support teachers of Math I, II, and III from all school sites
 - High School Algebra and Functions: 2 Day Course
 - o Middle School: to support 7th and 8th grade math teachers from all school sites
 - Expressions, Equations, and Functions: 2 Day Course
- Component 2: Leadership Classroom Walkthroughs and Observations
- Component 3: Professional Learning for Middle & High School Site Leadership
 - o Leading the Transformation of Mathematics Teaching and Learning: 1 Day Course
 - Elementary Leadership has the option to attend as well
- Component 4: Personalized, Job-Embedded Coaching
 - o Coaching Cycles to support each of the three math courses: Math I, II, and III
 - o Coaching to support Middle School, grades 7 and 8

Component 1: Professional Learning Sessions – Middle & High School

High School Algebra and Functions – Two Day Course For Math I, II, and III

OVERVIEW:

This two-day course focuses on mathematical content involving algebra and functions for students in high school. The emphasis of this course is 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, realworld 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.

Expressions, Equations, and Functions – Grades 7-8, Two Day Course

OVERVIEW:

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 - After the session, participants will be able to:

- 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

Component 2: Leadership Classroom Walkthroughs and Observations

Build leadership capacity with highly customized, collaborative school-based instructional walk-through support that guides and develops the instructional leadership teams' expertise and ability to support instructional shifts.

Site and district leaders along with coaches, building teacher leaders and Math Solutions' instructors work together to analyze and discuss the implementation of instructional practices, calibrate expectations and design next steps or support for teachers as they implement instructional strategies focused on students explaining, justifying and writing about solutions.

Site and District Instructional Leaders will:

- Identify priorities and align strategies with specified goals;
- Learn what to look for during classroom observations to effectively evaluate instruction; and
- Explore ways to nurture instructional excellence through the introduction of research-based best practices.

The classroom walk-through component gives each site's instructional leaders the opportunity to analyze classroom practice with the mathematics consultant. Individual site walk-throughs give leaders the opportunity to observe how

teachers are implementing rigorous tasks and instructional strategies experiences learned in their professional learning days and support from district coaches.

The mathematics consultant's role in these walk-throughs is to provide questions and perspectives from his/her deep pedagogical content knowledge aligned with the Common Core content and mathematical practices standards. The instructional leadership team has the opportunity to design the 'next-steps of support' for teachers supported by the consultant's expertise.

Component 3: Professional Learning Sessions – Site Leadership

Leading the Transformation of Mathematics Teaching and Learning – for HS & MS Site Admin (Elementary Optional)

OVERVIEW:

This 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.

OPTIONAL:

- Identify and support math instruction that promotes thinking, reasoning, and sense-making
- 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.

Component 4: Personalized, Job-Embedded Coaching – Middle & High School Teachers

Math Solutions job-embedded coaching for individuals and teams drives innovation and instructional improvement and provides the tools for your teachers to transform theory into practical classroom practice. Team coaching builds a community of learners through collaboration. It is the fastest way to synchronize your teams across grade levels, share experience and expertise, and collaborate on plans and protocols. Individual coaching builds skills and leadership capacity through differentiation. With job-embedded coaching and model lessons, educators work side by side, enabling them to integrate new skills immediately into their practice.

Instructional coaching lessons support teachers to implement the strategies introduced in professional learning experiences. Teachers work side-by-side with a Math Solutions consultant to review highly-effective instructional practices and collaborate with colleagues to implement mathematics tasks that align to their subject-area Standards. Participating teachers have the opportunity to discuss the effect of instructional strategies on student learning as observed in the classroom and analyze the connection between tasks, active student engagement, reasoning and problem solving.

The most effective coaching occurs over time. Key to its effectiveness is the involvement of the principal, including a schedule that provides adequate time for teacher learning. Inherent in these experiences is a 'gradual release of responsibility' from the coach to the classroom teacher.

Model lessons are one aspect of job-embedded coaching. The model lesson cycle typically includes the following:

- **Lesson Pre-Brief**—Math Solutions consultant and teachers co-plan the lesson he/she will teach. The Math Solutions consultant might teach or co-teach the lesson with the teacher.
- **The Lesson**—Math Solutions consultant teaches the lesson to a class of students, while teachers observe with a specific focus identified during the lesson planning sessions.
- **Lesson Debrief**—Math Solutions consultant facilitates as teachers collaborate to debrief the lesson with a focus on student learning and student misconceptions, identifying specific aspects and strategies used that supported student learning. Finally, the team reflects on next instructional steps for students. In addition to model lessons, job-embedded coaching may include:
 - Support for implementing effective teaching practices aligned to their Standards
 - Strategies for differentiating instruction to meet the needs of all students, especially struggling students and those needing intervention

- Opportunities to focus on developing and deepening content knowledge
- Collaborative instructional planning and observation of participant lessons to refine instruction
- Cultivation of leadership skills to drive innovation and instructional change

Summary

Math Solutions looks forward to partnering with you to achieve your mathematics achievement goals. Along with student data and progress monitoring, we believe that effectiveness of professional development is measured by how it is brought back into classroom instruction. We are proud to share the evaluation results from past participant surveys:

- 98% gained new instructional strategies to try in their classrooms.
- 98% said Math Solutions instructors were knowledgeable and skilled in facilitating adult learning.
- 97% gained knowledge and strategies that will help them be better math teachers.

By setting goals together; focusing on the most important areas of improvement; investing in teacher's math content knowledge and use of instructional strategies; and building capacity on a sustainable basis, we are confident that we will reach the goals for students' sustained learning of mathematics from pre-school to college.

Investment Summary

Date	Description	Cost
TBD	<p>Component 1: PD for Middle & High School Teachers (4 total days) <i>Full-day, on-site trainings will math staff and leadership from all middle and high schools</i></p> <ul style="list-style-type: none"> - High School: To support teachers of Math I, II, and III from all school sites <ul style="list-style-type: none"> o High School Algebra and Functions: 2 Day Course - Middle School: to support 7th and 8th grade math teachers from all school sites <ul style="list-style-type: none"> o Expressions, Equations, and Functions: 2 Day Course 	\$15,400
TBD	<p>Component 2: Leadership Classroom Walkthroughs and Observation (12 total days) <i>Full-day, on-site walkthroughs with site administration and Math Solutions Consultant. Data from these sessions will drive the PD sessions. Full-day sessions may be split up between buildings. 12 total days, broken down as follows:</i></p> <ul style="list-style-type: none"> - 6 days for High School Leadership (3 per semester) - 6 days for Middle School Leadership (3 per semester) 	\$46,200
TBD	<p>Component 3: PD for Site Leadership (2 days) <i>Full-day, on-site trainings for district leadership and site administration from all MS and HS sites (elementary leadership may also attend)</i></p>	\$7,700
TBD	<p>Component 4: Personalized, Job-Embedded Coaching (30 total days) <i>Full-day, on-site coaching sessions with math staff in grades 7-12. Days broken down by grade level and subject as follows:</i></p> <ul style="list-style-type: none"> - High School: (18 total days) <ul style="list-style-type: none"> o Coaching Cycles to support each of the three math courses: Math I, II, and III o Each math course will receive 6 days of coaching, approximately one every six weeks - Middle School: Grades 7 and 8 (12 total days) <ul style="list-style-type: none"> o Each grade level will receive 3 days of coaching per semester <p><i>Coaching will be personalized to meet the needs of the participant group, but could include:</i></p> <ul style="list-style-type: none"> - Model Lessons - Classroom Walkthroughs and Observations - Peer Modeling, Lesson Planning, and Collaboration 	\$115,500
Total (All Inclusive)		\$184,800.00

Proposal terms and conditions valid for 30 days

Investments Above Include:	
Development	Agenda created by Educational Specialist Team Comprehensive logistics meeting with Course Management Coordinator
Reporting	Evaluation Report; provides analysis and overview of participant evaluations Collaborative follow-up meeting with Educational Consultant to discuss next steps
Travel and Expenses	Airfare Ground transportation Lodging Meals All other travel expenses
Materials	Instructional materials used during the session Shipping costs for all materials as well as additional orders placed with PD
Delivery	On-site & online professional development sessions delivered over time
Publications	30% discount on Math Solutions publications for one year

Appendix I

Math Solutions Instructional Practices Inventory

Professional development opportunities provided for teachers can only target the learning needs of students if information is collected from classrooms. This tool will be used to compile information gathered from multiple schools and classrooms in an effort to design professional development that targets identified needs. Information from one classroom or school will not be used in any way.

LEARNING ENVIRONMENT	
Teacher	Students
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 AND SENSE-MAKING	
Teacher	Students
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.	Understand math concepts and use procedures appropriately.
	Use appropriate tools strategically, including mental calculations, that fit the situation.
	Look closely to discern a pattern or structure.
FOCUS AND COHERENCE	
Teacher	Students
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.	Apply the math they know to solve real-world problems.
Selects problems that provide opportunities for students to apply math to real-world situations.	
FORMATIVE ASSESSMENT	
Teacher	Students
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.	

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Appendix II

About Math Solutions

Founded in 1984 by renowned math educator Marilyn Burns, Math Solutions, a division of Houghton Mifflin Harcourt (HMH), is the nation's leader in developing effective teachers of mathematics. With more than 30 years of experience working with thousands of school districts nationwide, our team of educational experts creates solutions for accelerated sustainable improvement in teacher effectiveness, student learning, and test results. You can learn more about Math Solutions services at www.mathsolutions.com.

Our Mission

Math Solutions is dedicated to improving students' learning of mathematics by providing educators with the highest quality professional development services, products, and resources.

Method of Approach

Math Solutions Directors of Professional Learning and Instructors collaborate with district and school leadership during each professional development engagement to ensure the improvement of school level practices and student learning. Drawing from academic research and more than 30 years of experience, Marilyn Burns has identified four goals for educators that are essential to improving the teaching of mathematics:

- Teachers' understanding of the math they teach
- Understanding of how students best learn math
- Development of effective strategies for teaching mathematics
- Formative assessment to guide instruction

Math Content Knowledge

As we implement the professional learning of adult educators, we identify what math content is of vital importance for teachers to understand by grade level and state standards. This content is different from the mathematics that a mathematician – instead, it's knowing mathematics deeply and flexibly enough to convey concepts, reasoning and the real-world application of the mathematics to students.

How Students Learn

In addition to being clear about what math content knowledge a teacher needs to understand, we also support teachers by helping them to understand how children learn mathematics—knowing what is important to *tell* children and what is best *not to tell* children. It implies asking thoughtful questions for the part of mathematics that we don't tell children. It also involves knowing what conditions are needed for learners to make sense of mathematics. Developing this understanding requires a career-long effort on the part of a teacher.

Effective Instructional Strategies

Given a deep and flexible understanding of the math content and a developing understanding of how children learn mathematics, we introduce teachers to effective instructional strategies, including choosing and scaffolding accessible tasks, asking questions that build and reveal understanding, and providing tools that help students make sense of mathematics and solve problems.

Formative Assessment

Assessment, or determining what students know, is a central element in the process of teaching and learning. Assessment generally falls into two categories—summative (assessment *of* learning) and formative (assessment *for* learning). Tests given at the end of teaching units and standardized tests are examples of summative assessments. Formative assessment is intended to provide teachers and students with information about what students *understand*, as well as unveiling student misconceptions. This type of assessment is used to guide instructional decisions on a daily basis, in order to improve student learning; it includes open questions and tasks, listening to students, observing students, and examining student work.

Math Solutions Support and Implementation Team

“It takes a village” for Math Solutions to create the most engaging and effective professional development experience for your teachers and administrators. The Math Solutions team will design professional development around your unique needs and deliver it in a format that works for you and includes:

A **Partnership Executive** who will listen to your current needs in math instruction, share ideas about how Math Solutions has supported schools and districts with similar needs, and work with the Math Solutions content team (below) to customize a plan to reach your goals.

Your **Director of Professional Learning** is an expert at designing and delivering professional development. He/she will manage all aspects of your project from start to finish, ensuring that it meets your goals. He/she will be engaged in every aspect of your project and will work with you throughout the process to ensure it is meeting your needs, and will refine the plan if needed. Your Director of Professional Learning will have an in-depth conversation with you to assess the needs of current math instruction and make recommendations for professional learning to help you reach your goals.

Content Instructional Designers work with your Director of Professional Learning to design the actual PD experiences for your teachers/coaches/administrators. Math Solutions’ Content Instructional Design team draws from the expertise of more than 150 consultants, academic thought leaders and authors, to ensure that your project is designed by the top minds in math education.

The **Consultant Development Director** will work with your Director of Professional Learning to match the needs of your project with the skills of more than 150 consultants. The Consultant Development Director has been a part of the Math Solutions content team for more than 10 years and is a former Presidential Award winner for Excellence in Mathematics and Science teaching.

Your **Professional Learning Consultant** is selected from more than 150 instructors and is matched to your project based on your needs and their expertise. The team consists of top mathematics educators in the country who have earned more than 60 national and local recognition awards, including the Presidential Award for Excellence in Mathematics and Science Teaching. Ninety-eight percent of Math Solutions participants reported that the Math Solutions instructors were knowledgeable and skilled in facilitating adult learning. Resumes of Instructors are available upon request.

Operations Services Specialists provide all logistical and contractual support so your courses and coaching experiences run as smoothly as possible. Math Solutions delivers thousands of PD engagements each year and has learned what is necessary to provide an effective learning environment for your teachers and administrators. Your Operations Services Specialist will walk you through those details and provide you with an easy checklist that outlines the specific technology and room requirements for your engagement. He/she will work with our warehouse to ensure that all your course materials are delivered on time and to the appropriate location. If necessary, he/she will work with your purchasing and contracting departments to keep the invoicing process seamless. The Operations Services Specialist will communicate course location details with your instructor. He/she also will ensure that the logistics are taken care of, so your participants can focus on learning.