Math Solutions
FOUNDED BY MARILYN BURNS

GO MATH!

Math Solutions Professional Learning Aligned with *Go Math!*

AGENDA

Problem Solving—Disposition, Competence & Confidence

OVERVIEW

This full-day course provides teachers with a deeper look at building perseverance in problem solving. Participants 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.

OUTCOMES

- Broaden participants' understanding of how students learn and the features of a *GO Math!* classroom environment that promotes confidence and perseverance in students
- Develop an understanding of constructive struggle as opportunities to engage students in rigorous math problems that require critical thinking and connections across multiple mathematical concepts, skills, and ideas
- Challenge students with lessons that require critical thinking and sense-making

OPENING—WELCOME, LOGISTICS, AND EXPERIENCES

In this session, participants solve a problem that introduces them to the notion of perseverance and confidence in problem solving—along with the role of the teacher in supporting and nurturing these qualities in students. They are introduced to the course learning outcomes and review the habits of mathematical thinkers to be addressed during the day.

THE NATURE OF TASKS

Both task selection and lesson facilitation promote a positive disposition in all students toward mathematics, competence in doing mathematics, and feelings of confidence in their ability to do mathematics. In this session, participants experience firsthand an example of a task that is rigorous yet accessible to all students. Following their experience, they reflect on the power of listening as a teaching strategy for building student confidence and perseverance in problem solving, and consider how this impacts implementation of lesson components of *GO Math!.*

PROBLEM SOLVING AND CONSTRUCTIVE STRUGGLE

This session highlights the importance of constructive struggle in *GO Math!* classroom environments that support students' practice of making sense of mathematical problems and persevering in solving them. Participants solve a problem that is an example of one that is accessible for all students. The task

provides participants opportunity to communicate orally about their solutions and write to explain their thinking. In processing this experience, participants discuss important ideas about the role that constructive struggle plays in developing students' problem-solving skills.

ASPECTS OF LEARNING

After engaging in two different mathematical investigations, participants identify mathematical ideas around which students need to reason and make sense.

LUNCH

THE PROBLEM-SOLVING LESSON

This session focuses on structuring lessons to maximize students' opportunities to make sense of important mathematical ideas. During this session, participants engage in a lesson and use the experience to make explicit connections to role of the *GO Math!* teacher during each phase of the lesson. Participants consider problem solving opportunities embedded in *GO Math!* lessons.

REFLECTION AND CLOSING

Teachers need opportunities to translate professional learning experiences to practical classroom application. During this session, participants reflect on the types of work students need to be engaged in to be mathematically proficient and plan what they will do differently in their *GO Math!* classrooms as a result of their new or deepened understanding.

MATH SOLUTIONS GUIDING PRINCIPLES

Drawing upon academic work and our own classroom-grounded research and experience, Math Solutions has identified the following four instructional needs as absolutely essential to improving instruction and student outcomes:

- Robust Content Knowledge
- Understanding of How Students Learn
- Insight into Individual Learners through Formative Assessment
- Effective Instructional Strategies

These four instructional needs drive the design of all Math Solutions courses, consulting and coaching. We consider them our guiding principles and strive to ensure that all educators:

- Know the math they need to teach—know it deeply and flexibly enough to understand various solution paths and students' reasoning.
- Understand the conditions necessary for learning, 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.