Math Solutions
FOUNDED BY MARILYN BURNS

Math Solutions Professional Learning

AGENDA
Making Sense of Math: Reasoning and Discourse
Grades K–12

OUTCOMES

This course is designed to help teachers:

- 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

Opening

This introduction includes the goals, an overview of the course, and pertinent logistical information. In addition, time is provided for the group to build a community for learning.

Logical Reasoning and Classroom Discourse

Mathematically proficient students make sense of problems, reason abstractly and quantitatively, and are able to explain and justify mathematical ideas and arguments with precise mathematical language. During this session, participants focus on strategies to engage students in mathematical reasoning and discussions to communicate their reasoning. First, observing the instructor weave Talk Moves into the presentation, and then practicing using them, participants analyze the powerful influence of Talk Moves in developing students' reasoning skills and deepening their understanding.

BREAK

How Students Learn

When mathematical knowledge is based in logic, it requires students to interact with the knowledge in ways that help them uncover its meaning for themselves. In this session, participants develop an understanding of the standard formula for determining the circumference of a circle. Through this experience, they reflect on the conditions needed for students to make sense in order to develop understanding of mathematical ideas.

LUNCH

Comparing Math Tasks
The tasks teachers provide are the foundation for mathematics instruction that supports thinking, reasoning, and problem solving. In this session, participants engage in and reflect on two different mathematical tasks. They compare and contrast the two tasks and identify characteristics of tasks that build upon students' understanding and support their abilities to represent and communicate that understanding to others.

BREAK

Transforming Tasks
The focused progression of current state standards provides teachers time to uncover important mathematics, not just cover the content. This requires teachers to choose and use tasks that go below the surface level for each math concept they teach. This session provides time for teachers to transform low-cognitive-level tasks into high-cognitive-level tasks that require students to think, reason, communicate, and make sense of mathematics.

Closing
Teachers need a vision of the type of work students need to be engaged in to be mathematically successful. During this session, participants reflect on the experiences of the day and plan what they will do differently in their 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, ask questions that reveal and build understanding, and help students make sense of and solve problems.