Math Solutions
FOUNDED BY MARILYN BURNS

Math Solutions Professional Learning

Agenda
Fractions: Strategies for Supporting Fraction Sense (Grades 3-5)

OVERVIEW

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 fractions as numbers and 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 two.

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 learning of mathematics

Day One

Opening

This introduction includes the course goals, an overview of the mathematical practice or process standards that are part of current state standards, and pertinent logistical information.

Laying the Groundwork for Fractions

In this session, participants share "cookies" among different sized groups of people. From this exploration, participants consider how students learn about dividing different quantities into equal shares and see relationships among the fractions.

BREAK

Making Sense of Fractional Values with the Fraction Kit

The fraction kit, although often used, is included in this session because of the need to clearly communicate the depth of this model. The lessons using the Fraction Kit as a way to represent fractions provide opportunities for participants to think about equivalence, comparing, ordering, and representing fractions.

LUNCH

Understanding Fraction Equivalency through Measurement

To develop a deep understanding of fraction equivalency, it is necessary that students go beyond the ability to use a procedure to create equivalent fractions. In this session, participants explore equivalent fractions through a measurement task.

BREAK

Communicating About Fractions on a Number Line
This session provides an experience that supports the understanding of part/whole relations and fraction notation, which applies to any fraction representation. In addition, it provides a direct link between students' understanding of partitioning and fractions as numbers on a number line.

Closing
Participants take time to reflect on the experiences of the day and ways that these experiences will positively impact their classroom instruction.

Day Two

Opening
This introduction includes the course goals and working agreements. It provides an opportunity to review the learning and experiences from the first day of the course and answer questions.

Reasoning with Benchmark Fractions
Just as understanding benchmark numbers is an essential aspect of number sense, understanding fraction benchmarks is an essential aspect of fraction sense. In this session participants use the number lines from the previous session to reason about benchmarks and develop fraction sense strategies for ordering and comparing fractions.

BREAK

Linking Fractions and Decimals
This session provides an experience that supports the understanding of part/whole relations and fraction notation, which applies to any fraction representation. In addition, it provides a direct link between students' understanding of partitioning and fractions as numbers on a number line.

LUNCH

Using Games to Foster Fraction Sense
Fraction sense emerges as learners experience, understand, and develop proficiency with fractions. The experiences in this session illustrate how to foster students' flexibility and confidence with fractions and reinforce the importance of making explicit connections between models and symbolic representations.

BREAK

Introducing Addition and Subtraction

Learning to add and subtract fractions requires that students understand the idea of equivalence and can represent fractions as equivalent fractions. This session provides experiences using representations to combine and find difference of fractions and mixed numbers.

Closing

This session connects back to the course outcomes so that participants are prepared to move forward as they go back into classrooms and implement both the instructional strategies and content lessons modeled throughout the course.

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.