

AGENDA**Fractions, Course 1: Strategies for Supporting Fraction Sense (Grades 3–5)****Two Day course****OVERVIEW**

This two-day course focuses on fractions standards 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.

LEARNING OUTCOMES

- Explore the progression of current state standards related to fractions and fraction computation
- Characterize essential teaching strategies for building fraction sense to build deep understanding of fraction content standards included in *Go Math!*
- Design problem-solving lessons that address focus standards in these domains.
- Implement instructional strategies to enhance *Go Math!* instruction and that engage students in the habits of mathematical thinkers as called for in current state standards
- Explain the role of talk and use talk moves to support learning of mathematics with *Go Math!*

Instructor Agenda**Day 1****Opening**

This introduction includes the course goals, an overview of the mathematical practice or process standards that are part of current state standards, connections to *GO Math!*, 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. Participants reflect on including problem-solving lessons in their *Go Math!* instruction and consider components of *Go Math!* that offer more open tasks.

Grade-Level-Specific Tasks

- Fractions with Cookies

BREAK**Making Sense of Fractional Values with the Fraction Kit**

The Fraction Kit 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. Participants reflect on using tools in *Go Math!* to support students' development of mathematical ideas.

Grade-Level Specific Tasks

- Making a Fraction Kit
- Cover Up
- Uncover

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. They consider the understandings students need to be successful with *Go Math!* assessment items.

Grade-Level-Specific Tasks

- Measuring with Cuisenaire® Rods

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. Participants apply what they learn about Talk Moves to generate questions for a problem from *Go Math!*

Grade-Level Specific Tasks

- Video Clip 5.2 from *Classroom Discussions*
- Identifying Point A on the Number Line
- Cuisenaire® Rods Measurement and the 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 2**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. Participants review a set of questions they will use throughout the day to help consider how to transfer their learning to the decisions they make in their *Go Math!* classrooms.

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. Participants consider examples of components in the *Go Math!* Teacher's Edition that provide opportunities to optimize rigorous learning experiences for all students in their *Go Math!* classrooms.

Grade-Level Specific Tasks

- Which Strategy Would You Choose?

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.

Grade-Level Specific Tasks

- Fractions and Decimals on the Double Number Line
- Fractions and Decimals Lineup

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. Participants consider how ideas in the session apply to the “Daily Routines,” “Daily Classroom Management,” and “Differentiated Instruction” components of *Go Math!* instruction.

Specific Tasks

- Tell Me All You Can
- The Comparing Game
- Fraction Capture

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.

Grade-Level Specific Tasks

- Combining Fractions and Mixed Numbers and Finding Differences
- Problems with Oranges

Closing

This session connects back to the course outcomes so that participants are prepared to move forward as they go back into their *Go Math!* classrooms and implement both the instructional strategies and ideas 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.