

Description of Schedule

CCSS About Teaching Mathematics (K–8)

The following information describes the framework of the week long course, *About Teaching Mathematics*. This course supports a deep exploration of the Common Core Content and Practices in a way that will fundamentally change the way participants think about math and best practices for teaching all students.

How the Course Week Is Organized for Participants

During a Math Solutions course, participants meet in three different groups: the whole group, color groups, and grade-level groups.

Whole Group Sessions

A whole group general session is held for information that is best shared in a large group setting. There is usually some audience participation; however, for the most part, an instructor shares information about critical shifts called for in the Common Core State Standards in a lecture format.

Color Group Sessions

On the first morning of the course, colored nametags are used to randomly organize participants into smaller groups (about 40 per group). The random distribution creates color groups with representation of teachers from all grade levels.

Each color group attends the same program of sessions and has the opportunity to work with each instructor on site. Color group sessions give each participant opportunities to be a learner deepening his or her own mathematical understandings, to experience group support in problem-solving situations, and to explore mathematics with a problem-solving focus as called for in the Common Core State Standards.

During color group sessions, participants are randomly seated so that they work with different groups of teachers. This offers the opportunity to work with a variety of participants

throughout the week. Also, since philosophies, policies, and procedures of schools and districts often differ, those attending from different areas have the opportunity to learn from one another.

Grade-Level Group Sessions

On the first day of the course, participants are asked to select a grade level they will focus on during the week. Sessions can be a combination of grade levels or a single grade level, depending on the makeup of the group. For instance, the grade levels may be K–1, 2–3, 4–5, and 6–8 at a site. Instructors stay with the same grade-level group for the entire week, providing a sequential instructional program grounded in Common Core content.

Schedule for the Week

Monday

Whole Group

Introduction to the week includes course goals and information pertinent to the site.

Color Group—Four Triangle

This color group session is a geometry experience involving the use of manipulative materials, working as a group, and communicating one’s thinking. This experience focuses on the concepts of shape, symmetry, congruence, and similarity in both two- and three-dimensional space.

Color Group—Consecutive Sums

This color group session models the use of children’s literature as a context for a mathematical investigation involving number. The activity calls for a variety of arithmetic skills and can lead to important mathematical generalizations about numbers—their properties and the relationships among them. Participants work cooperatively to gather and display information in a way that allows them to see patterns and make important mathematical generalizations.

Color Group— Logical Thinking/Communication

The process of logical reasoning is basic to all mathematics and, therefore, is an important area in which students should have many experiences. In this color group, participants focus on the role of teachers and students in developing a classroom environment that supports thinking,

reasoning, and sense-making as key components of mathematics instruction and learning—always keeping in mind that students need to believe that mathematics makes sense.

Grade-Level Group

Sessions focus on specific grade-level content and issues.

Tuesday

Color Group— The Math Textbook

The purpose of this session is to engage participants in a simulation that allows them to explore the difficulties children encounter when classroom instruction focuses on manipulating symbols rather than making mathematical connections. Participants explore the assumptions held by traditional textbooks about learning and teaching written number notation.

Color Group— How Children Learn

The purpose of this session is to focus on a view of learning that says children can create or construct their own understanding of mathematical concepts through interactions between their minds and concrete experiences. Through a series of explorations, participants experience this process of interaction and encounter the important ingredients that support mathematics learning.

Grade-Level Group

Sessions focus on specific grade-level content and issues.

Color Group

Half of the groups experience a session on number and half of the groups experience a session on pattern, functions, and algebra. On Wednesday, groups experience the session they did not attend on Tuesday.

- **King’s Chessboard**

Participants explore large numbers through an activity based on *The King’s Chessboard* by David Burch. The large numbers generated during the activity provide motivation for discussions about place value, naming of large numbers, exponential notation, and limitations of calculators.

- **The Border Problem**

This session involves participants in a mathematical investigation that is in sharp contrast with what most participants experienced in their algebra education. The session introduces algebra

as an extension of arithmetic and geometric expressions, using the context of a “border” of an object. Participants figure the number of squares in the border of a square figure and, after describing and comparing their methods, they generalize their methods and express them first in words and then algebraically.

Wednesday

Color Group—Focus: The Menu

These sessions allow for independent exploration and are presented as ways to create a classroom atmosphere that encourages students to clarify and extend their thinking. Participants experience two menus during the week. Half of the groups experience the Area and Perimeter Menu on Wednesday and half of the groups experience the Number Menu. On Thursday, groups will experience the menu they did not attend on Wednesday.

- **Menu: Area and Perimeter**

This menu focuses on measurement and offers a collection of independent activities that provide participants an opportunity to explore the mathematical ideas surrounding the concepts of area and perimeter.

- **Menu: Number**

Participants experience a menu that focuses on concepts surrounding number and number sense. The menu is a tool that classroom teachers can use in planning for instruction.

Whole Group—Focus: Perspective on Arithmetic

The purpose of this whole group or color group session is to have participants revisit how arithmetic is used in everyday life and understand why it’s a crucial area of mathematics for students. This session helps participants understand students’ common errors and misconceptions, as well as ways that students make sense of number and operations.

Color Group

Half of the groups will attend the King’s Chessboard color group session and half of the groups will attend the Border Problem session described under Tuesday (see page 3).

Grade-Level Group

Sessions focus on specific grade-level content and issues.

Thursday

Color Group—Focus: The Menu

Half of the groups will attend the Number Menu session and half of the groups will attend the Area and Perimeter Menu session described under Wednesday (see above).

Color Group—Two Ways to Count to Ten

The activity calls for a variety of arithmetic skills and can lead to important mathematical generalizations about numbers, their properties, and relationships among them. Participants work cooperatively to gather and display information in a way that allows them to see patterns and make important numerical generalizations.

Grade-Level Group

Sessions focus on specific grade-level content and issues.

Friday

Color Group—Focus: Communication and Problem Solving

The purpose of this session is to highlight the importance of communication in a classroom that supports students' thinking and reasoning. The session provides participants the opportunity to communicate their thinking about a problem they have solved and hear and see how others communicate their mathematical thinking.

Grade-Level Group

Sessions focus on specific grade-level content and issues.

Whole Group—Focus: Closing

The purpose of this session is to bring closure to the week, allow participants to think about what they might do in their classrooms as a result of the course, and recognize that it is natural to need support from others when thinking about mathematics instruction.

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.