Math Solutions
FOUNDED BY MARILYN BURNS

Math Solutions Professional Learning

AGENDA
Common Core State Standards: Measurement and Data, Grades K-5

OVERVIEW

This two-day course focuses on the domain of Measurement and Data for students in grades K–5. The emphasis of this course is on developing understanding of the natural progressions in thinking that children pass through as they develop an understanding of the concepts of measurement. Experiences and discussions help participants understand the importance of providing students with many and varied measurement tasks. The tasks must be meaningful and require students to gather measurement data for a purpose or in connection with clarifying important ideas. Data investigations provide the opportunity to consider the components and skills involved with collecting, representing, and interpreting data.

OUTCOMES

This course will help participants develop an understanding of the *Common Core State Standards* of Measurement and Data and consider necessary instructional shifts as they:

- examine important ideas about how students learn to measure including decisions students make as they measure as well as their understanding of ideas about estimation, precision, and accuracy;
- consider the types of experiences needed for students to make sense of and accurately use measurement tools;
- investigate methods for representing and interpreting data;
- plan lessons that integrate measurement and data skills with standards from the domain of Number and Operations as articulated in the *Common Core State Standards*;
- utilize a variety of ways to organize the classroom – whole-class, small-group, and individual learning to maximize the learning of all students; and
- implement instructional strategies including the use of classroom discussions, small group work, and the use of concrete materials and contexts to support students' learning.

Day One
Opening

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To begin the day, participants consider what it means to measure, the application of measurement in everyday activities, and the mathematical practices students must engage in to make sense of measurement.

Measurement Decisions
The Common Core State Standards establish expectations across the grades that students describe measurable attributes of an object and recognize that these measures can be quantified. A literature link and small group investigation of a measurement task provide the context for teachers to examine important ideas about how students learn to measure.

BREAK

Developing Standard Units of Measure – Linear Measurement
The Common Core State Standards set expectations for students to measure using appropriate tools. This portion of the day focuses on the importance of students using nonstandard measurement to build an understanding of what it means to measure and apply that understanding to measuring with standard units. As stated in the Common Core Standards for Mathematical Practices, mathematically proficient students consider the available tools when solving a problem (Practice #5). They are careful about specifying units of measure and express answers with a degree of precision appropriate for the problem context (Practice #6).

LUNCH

Area and Perimeter
The Common Core State Standards place importance on understanding concepts of measurement as well as the use of formulas. In this segment of the day, participants investigate the progression students must make in order to understand the concepts of area and perimeter. Following the experience, participants reflect on the progression of experiences needed by students to link understanding of measurement concept to procedures.

BREAK

Examining the Standards
Participants are introduced to the idea of Measurement Sense. They reorganize into grade level groups and discuss the experiences of the day, make connections to big ideas of Measurement Sense, and review their grade level standards.

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

<u>Day Two</u>

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Opening
During this opening segment, participants solve a problem that involves measurement. Strategies are discussed and displayed, and student work is examined.

Representing Data
In this session, participants supply numerical information about themselves in response to predetermined questions. The data are collected and distributed to groups. Pairs organize their data and represent it using an appropriate graphical display. They also analyze their data and write a statement that reflects what is typical for the large group.

BREAK

Investigating Categorical Data
In this session, participants supply numerical information about themselves in response to predetermined questions. The data are collected and distributed to groups. Pairs organize their data and represent it using an appropriate graphical display. They also analyze their data and write a statement that reflects what is typical for the large group.

LUNCH

Connecting Measurement, Data, and Number: Part 1

In this session, participants engage in an experience that integrates measurement, data, and number and operations. At the conclusion of the investigation, participants have time to examine the Common Core State Standards to find the connections articulated for their grade level.

BREAK

Connecting Measurement, Data, and Number: Part 2
Participants have an opportunity to apply the integration of content that was modeled in Part 1 of this session as they plan a lesson that is appropriate for their students. Teachers will share their plans within K-2 and 3-5 groups.

Closing
In this session, participants create a mind map in order to visualize, generate, structure, and classify the ideas assimilated throughout the course. Through this activity, participants reflect on the experiences of the course and the ways that these experiences will impact their classroom instruction.

Math Solutions Guiding Principles

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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.

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