

# Workshop Agenda

- Presentation on the Shift to the Common Core
- Classroom Sessions

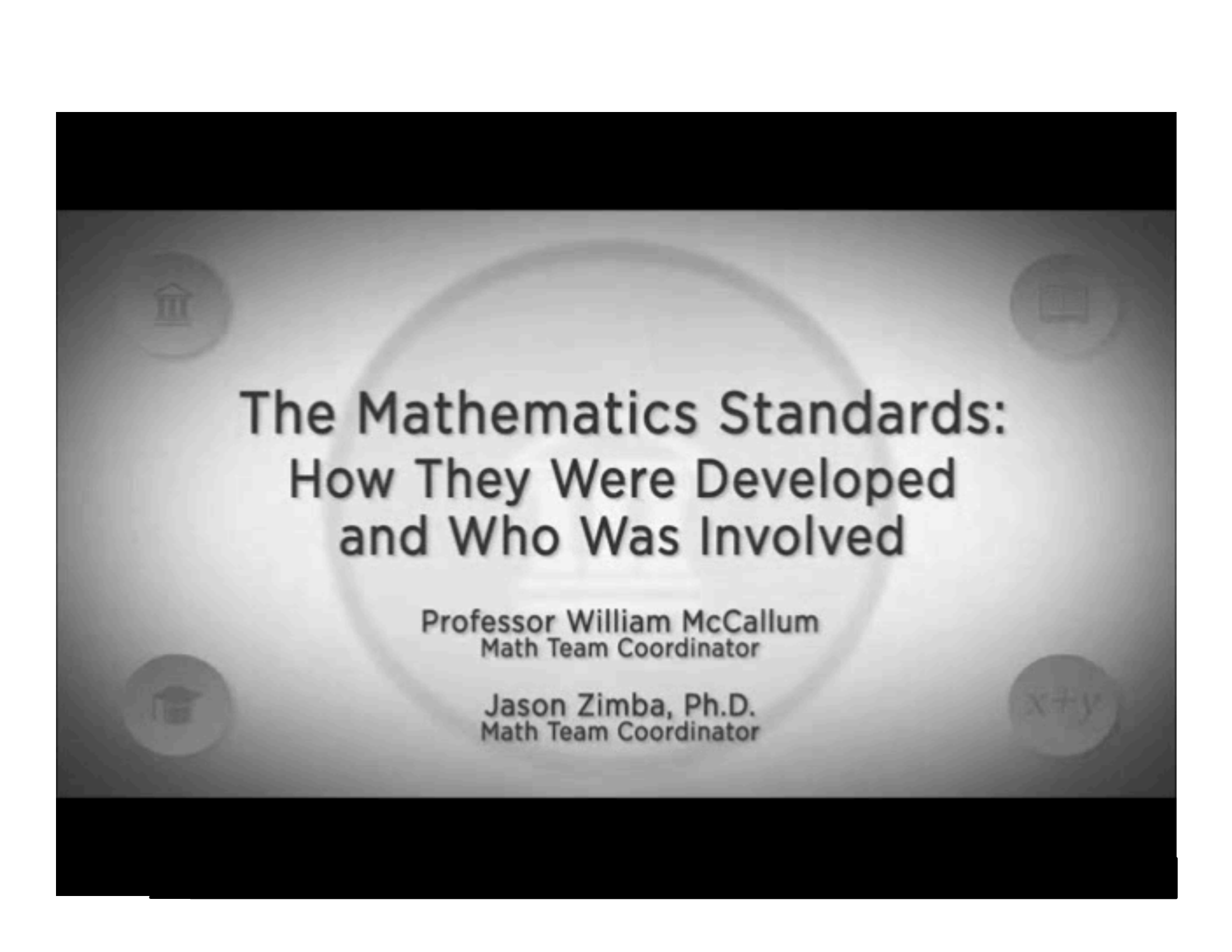
---

Thank you for attending!

# **Introduction to the Math Shifts of the Common Core State Standards**

---

Presentation adapted from  
[achievethecore.org](http://achievethecore.org)



# The Mathematics Standards: How They Were Developed and Who Was Involved

Professor William McCallum  
Math Team Coordinator

Jason Zimba, Ph.D.  
Math Team Coordinator

# The Background of the Common Core

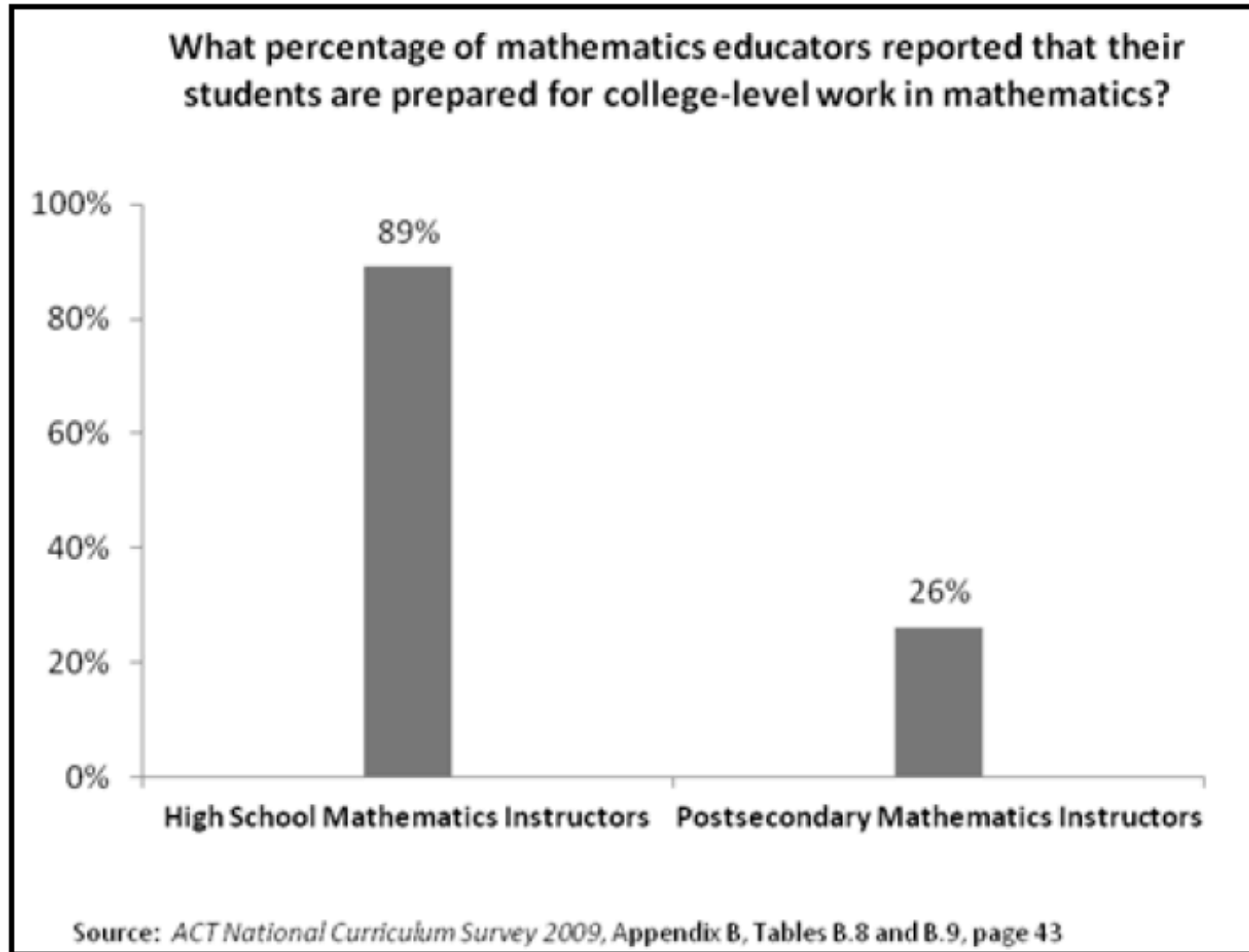
---

Initiated by the National Governors Association (NGA) and Council of Chief State School Officers (CCSSO) with the following design principles:

- Result in College and Career Readiness
- Based on solid research and practice evidence
- Fewer, higher, and clearer

# College Math Professors Feel HS students Today are Not Prepared for College Math

---



# What The Disconnect Means for Students

---

- Nationwide, many students in two-year and four-year colleges need remediation in math.
- Remedial classes lower the odds of finishing the degree or program.
- We need to set the agenda in high school math to prepare more students for postsecondary education and training.

# The CCSS Requires Three Shifts in Mathematics

---

1. **Focus:** Focus strongly where the standards focus.
2. **Coherence:** *Think* across grades, and *link* to major topics.
3. **Rigor:** In major topics, pursue *conceptual understanding*, procedural skill and *fluency*, and *application*.

# The CCSS Requires Three Shifts in Mathematics



## The Mathematics Standards and the Shifts They Require

Jason Zimba, Ph.D.  
Math Team Coordinator



# Shift #1: Focus Strongly where the Standards Focus

---

- Significantly narrow the scope of content and deepen how time and energy is spent in the math classroom.
- Focus deeply on what is emphasized in the standards, so that students gain strong foundations.

# What *is* Focus?



Council *of the* Great City Schools

## Focus

---

- Move away from "**mile wide, inch deep**" curricula identified in TIMSS.
- Learn from international comparisons.
- Teach less, learn more.

“Less topic coverage can be associated with higher scores on those topics covered because students have more time to master the content that is taught.”

– Ginsburg et al., 2005

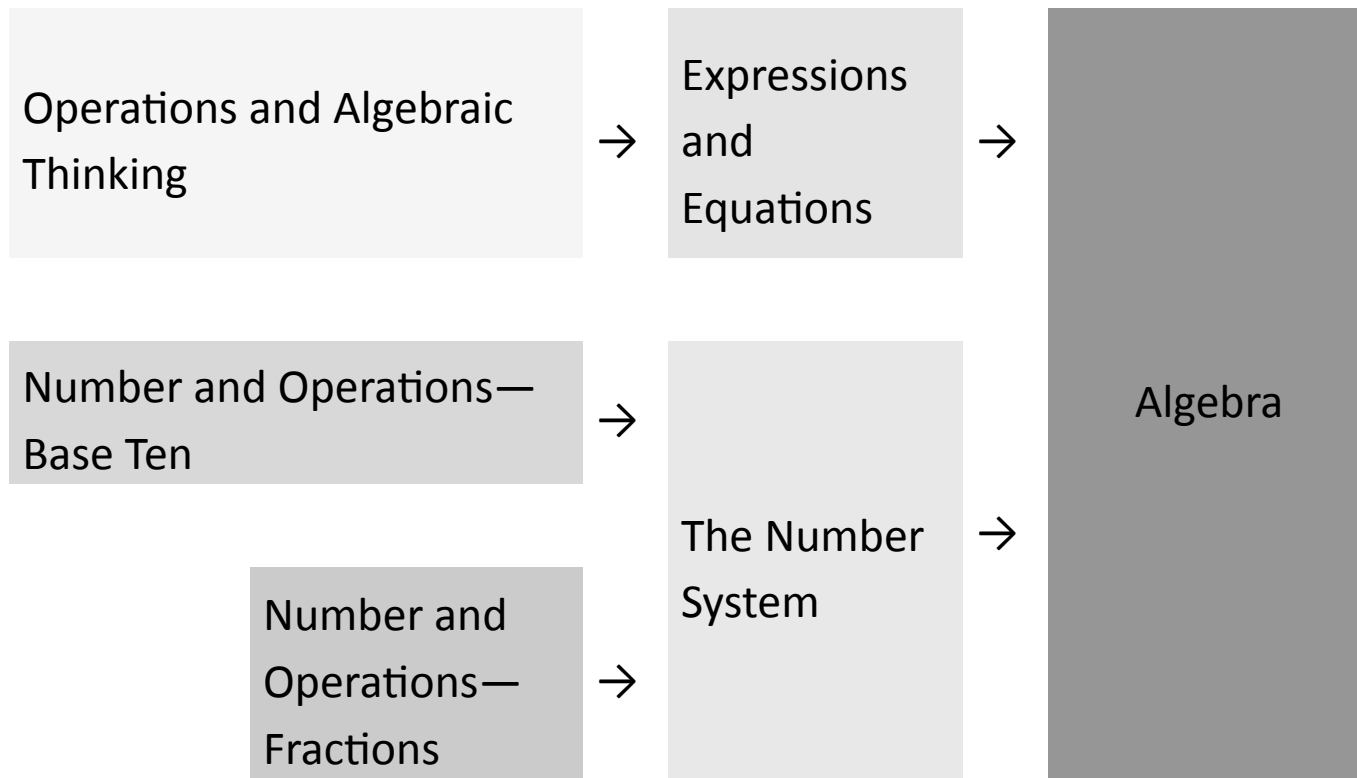
# Traditional U.S. Approach

---

	K	12
<b>Number and Operations</b>		
<b>Measurement and Geometry</b>		
<b>Algebra and Functions</b>		
<b>Statistics and Probability</b>		

# Focusing Attention Within Number and Operations

---



K 1 2 3 4 5 6 7 8 High School



# Key Areas of Focus in Mathematics

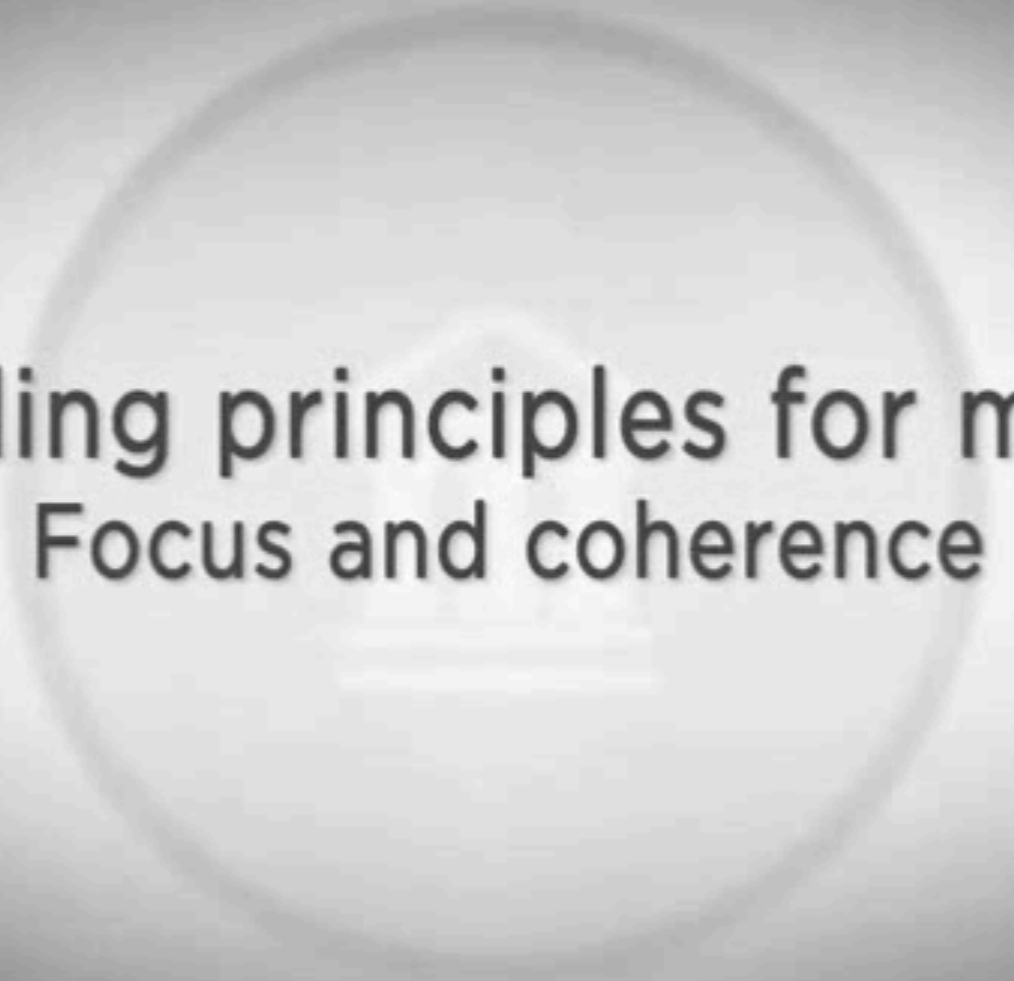
Grade	Focus Areas in Support of Rich Instruction and Expectations of Fluency and Conceptual Understanding
K–2	Addition and subtraction - concepts, skills, and problem solving and place value
3–5	Multiplication and division of whole numbers and fractions – concepts, skills, and problem solving
6	Ratios and proportional reasoning; early expressions and equations
7	Ratios and proportional reasoning; arithmetic of rational numbers
8	Linear algebra and linear functions

## **Shift #2: Coherence: Think Across Grades, and Link to Major Topics Within Grades**

---

- Carefully connect the learning within and across grades so that students can build new understanding on foundations built in previous years.
- Begin to count on solid conceptual understanding of core content and build on it. Each standard is not a new event, but an extension of previous learning.





**Guiding principles for math:  
Focus and coherence**



# Coherence: *Think Across Grades*

---

## *Example: Fractions*

“The **coherence** and sequential nature of mathematics dictate the foundational skills that are necessary for the learning of algebra. The most important foundational skill not presently developed appears to be proficiency with fractions (including decimals, percents, and negative fractions). **The teaching of fractions must be acknowledged as critically important and improved before an increase in student achievement in algebra can be expected.**”

Final Report of the National Mathematics Advisory Panel (2008, p. 18)

# Coherence: *Link* to Major Topics Within Grades

---

## *Example: Data Representation*

Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*

Standard 3.MD.  
3

# Coherence: *Link* to Major Topics Within Grades

---

*Example: Geometric Measurement*

**Geometric measurement: understand concepts of area and relate area to multiplication and to addition.**

3.MD, third  
cluster

## Shift #3: Rigor: In Major Topics, Pursue Conceptual Understanding, Procedural Skill and Fluency, and Application



# Rigor

---

- The CCSSM require a balance of:
  - Solid conceptual understanding
  - Procedural skill and fluency
  - Application of skills in problem solving situations
- Pursuit of all three requires equal intensity in time, activities, and resources.

# Solid Conceptual Understanding

---

- Teach more than “how to get the answer” and instead support students’ ability to access concepts from a number of perspectives
- Students are able to see math as more than a set of mnemonics or discrete procedures
- Conceptual understanding supports the other aspects of rigor (fluency and application)

# Fluency

---

- The standards require speed and accuracy in calculation.
- Teachers structure class time and/or homework time for students to practice core functions such as single-digit multiplication so that they are more able to understand and manipulate more complex concepts



# Required Fluencies in K-6

Grade	Standard	Required Fluency
K	K.OA.5	Add/subtract within 5
1	1.OA.6	Add/subtract within 10
2	2.OA.2 2.NBT.5	Add/subtract within 20 (know single-digit sums from memory) Add/subtract within 100
3	3.OA.7 3.NBT.2	Multiply/divide within 100 (know single-digit products from memory) Add/subtract within 1000
4	4.NBT.4	Add/subtract within 1,000,000
5	5.NBT.5	Multi-digit multiplication
6	6.NS.2,3	Multi-digit division Multi-digit decimal operations

# Application

---

- Students can use appropriate concepts and procedures for application even when not prompted to do so.
- Teachers provide opportunities at all grade levels for students to apply math concepts in “real world” situations, recognizing this means different things in K-5, 6-8.
- Teachers in content areas outside of math, particularly science, ensure that students are using grade-level-appropriate math to make meaning of and access science content.

# CPS Mathematics

---

- Focus
- Coherence
- Rigor
- Common Core Aligned Series & 2 Years Professional Development
- Historically High Math Standardized Math Assessments Compared to Peer Schools
- THE BEST STAFF

# Classroom Session Locations

---

Kindergarten Room **26**

Grades 1 and 2 Room **1**

Grades 3 and 4 Room **30**

Grades 5 and 6 Room **40**

Grades 7 and 8 Room **20**