Common Core Math Shift: Focus
Grade 6

Professional Development Module

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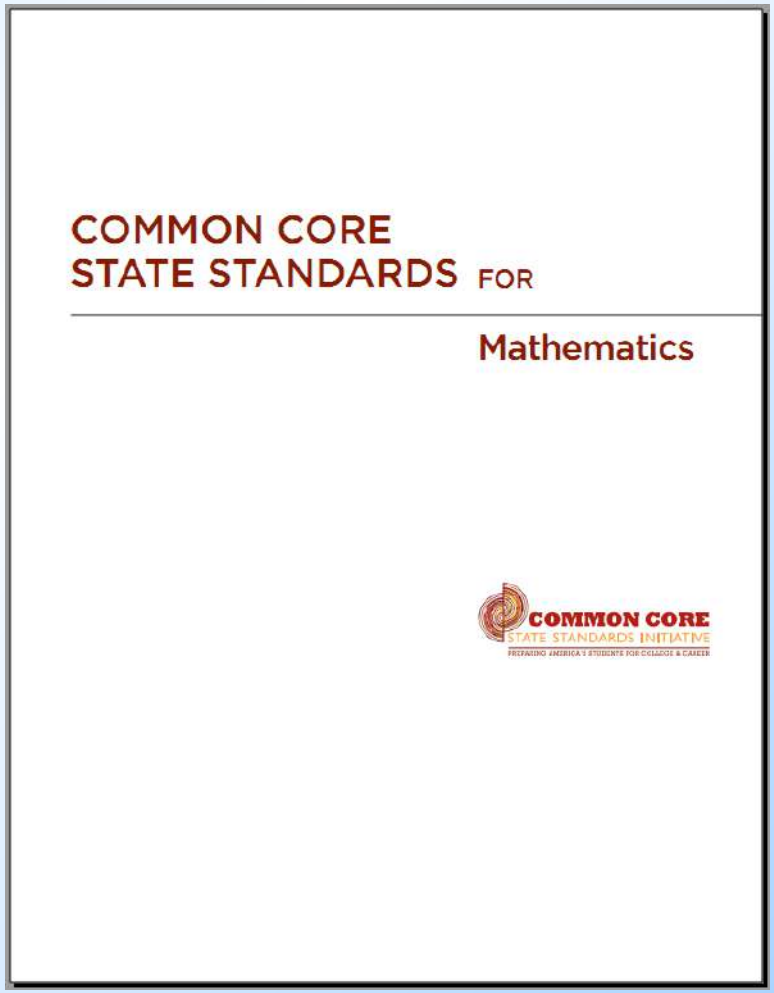
The Three Shifts in Mathematics

- **Focus**: Strongly where the standards focus
- **Coherence**: Think across grades and link to major topics within grades
- **Rigor**: Require conceptual understanding, fluency, and application



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Before we Dive In…

- Math Class Needs a Makeover

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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.

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Engaging with the shift: What do you think belongs in the major work of each grade?

Grade	Which two of the following represent areas of major focus for the indicated grade?		
K	Compare numbers	Use tally marks	Understand meaning of addition and subtraction
1	Add and subtract within 20	Measure lengths indirectly and by iterating length units	Create and extend patterns and sequences
2	Work with equal groups of objects to gain foundations for multiplication	Understand place value	Identify line of symmetry in two dimensional figures
3	Multiply and divide within 100	Identify the measures of central tendency and distribution	Develop understanding of fractions as numbers
4	Examine transformations on the coordinate plane	Generalize place value understanding for multi-digit whole numbers	Extend understanding of fraction equivalence and ordering
5	Understand and calculate probability of single events	Understand the place value system	Apply and extend previous understandings of multiplication and division to multiply and divide fractions
6	Understand ratio concepts and use ratio reasoning to solve problems	Identify and utilize rules of divisibility	Apply and extend previous understandings of arithmetic to algebraic expressions
7	Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers	Use properties of operations to generate equivalent expressions	Generate the prime factorization of numbers to solve problems
8	Standard form of a linear equation	Define, evaluate, and compare functions	Understand and apply the Pythagorean Theorem
Alg.1	Quadratic inequalities	Linear and quadratic functions	Creating equations to model situations
Alg.2	Exponential and logarithmic functions	Polar coordinates	Using functions to model situations

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Focus on the Major Work of the Grade

- Two levels of focus:
  - What's in/What's out?
  - Where to spend the majority of your time and effort?

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Grade Level Critical Areas:

In Grade 6, instructional time should focus on four critical areas:

1. Connecting ratio and rate to whole number multiplication and division and using concepts of ratio and rate to solve problems
2. Completing understanding of division of fractions and extending the notion of number to the system of rational numbers, which includes negative numbers;
3. Writing, interpreting, and using expressions and equations
4. Developing understanding of statistical thinking.

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6th Grade Domains and Clusters:

Ratios and Proportional Relationships

- Understand ratio concepts and use ratio reasoning to solve problems.

The Number System

- Apply and extend previous understandings of multiplication and division to divide fractions by fractions.
- Compute fluently with multi-digit numbers and find common factors and multiples.
- Apply and extend previous understandings of numbers to the system of rational numbers.

Expressions and Equations

- Apply and extend previous understandings of arithmetic to algebraic expressions.
- Reason about and solve one-variable equations and inequalities.
- Represent and analyze quantitative relationships between dependent and independent variables.

Geometry

- Solve real-world and mathematical problems involving area, surface area, and volume.

Statistics and Probability

- Develop understanding of statistical variability.
- Summarize and describe distributions.

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Cluster Sort Activity:

- Take your envelope and remove the strips of paper.
- Separate the Critical Area Strips (colored paper) and the Cluster Strips (white paper).
- Sort the clusters into where they link to the critical areas.

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Where are we NOW?

In groups:

* Take out the graphic organizer and label each cluster heading using the colored stars.

* How does the content compare with what you are already teaching this year?

 Green –We are doing this to the depth required

 Yellow – Could be easily added or depth should be increased

 Red – New and would need support

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Cluster ≠ Cluster

- Not all clusters are created equal
- Insert the Major/Supporting/Additional document

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NOW vs. Future?

- Compare how your group labeled the cluster with colored stars to the Major/Supporting/Additional document.

- Discuss and share.

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Reflection

- What are some things that you can begin to do NOW to prepare for the future?

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Digging Deeper:

- What are the opportunities for in-depth focus?
- What does it look like?

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Examples of Opportunities for In-Depth Focus (Grade 6)

- 6.RP.3When students work toward meeting this standard, they use a range of reasoning and representations to analyze proportional relationships.
- 6.NS.1This is a culminating standard for extending multiplication ad division to fractions.
- 6.NS.8When students work with rational numbers in the coordinate plane to solve problems, they combine and consolidate elements from the other standards in this cluster.
- 6.EE.3By applying properties of operations to generate equivalent expressions, students use properties of operations that they are familiar with from previous grades' work with numbers — generalizing arithmetic in the process.
- 6.EE.7When students write equations of the form $x + p = q$ and $px = q$ to solve real-world and mathematical problems, they draw on meanings of operations that they are familiar with from previous grades' work. They also begin to learn algebraic approaches to solving problems.[1]

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Examples of Key Advances from Grade 5 to Grade 6

- Students' prior understanding of and skill with multiplication, division, and fractions contribute to their study of ratios, proportional relationships and unit rates (6.RP).
- Students begin using properties of operations systematically to work with variables, variable expressions, and equations (6.EE).
- Students extend their work with the system of rational numbers to include using positive and negative numbers to describe quantities (6.NS.5), extending the number line and coordinate plane to represent rational numbers and ordered pairs (6.NS.6), and understanding ordering and absolute value of rational numbers (6.NS.7).
- Having worked with measurement data in previous grades, students begin to develop notions of statistical variability, summarizing and describing distributions (6.SP).

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Examples of Key Advances from Grade 6 to Grade 7

- In grade 6, students learned about negative numbers and the kinds of quantities they can be used to represent; they also learned about absolute value and ordering of rational numbers, including in real-world contexts. In grade 7, students will add, subtract, multiply, and divide within the system of rational numbers.
- Students grow in their ability to analyze proportional relationships. They decide whether two quantities are in a proportional relationship (7.RP.2a); they work with percents, including simple interest, percent increase and decrease, tax, markups and markdowns, gratuities and commission, and percent error (7.RP.3); they analyze proportional relationships and solve problems involving unit rates associated with ratios of fractions (e.g., if a person walks 1/2 mile in each 1/4 hour, the unit rate is the complex fraction ½ / ¼ miles per hour or 2 miles per hour) (7.RP.1); and they analyze proportional relationships in geometric figures (7.G.1).
- Students solve a variety of problems involving angle measure, area, surface area, and volume (7.G.4-6).

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Creating a Poster

5th grade	6th grade	7th Grade

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