Common Core State Standards for Mathematics: *Focus*

Grade 3

Essential Questions

- How and why were the Common Core State Standards developed and by whom?

- What are the 3 shifts in math instruction in the CCSS?

- Why the need for Focus?

- How is Focus reflected in the classroom?

- What are the next steps in implementing Focus?

Overview of the
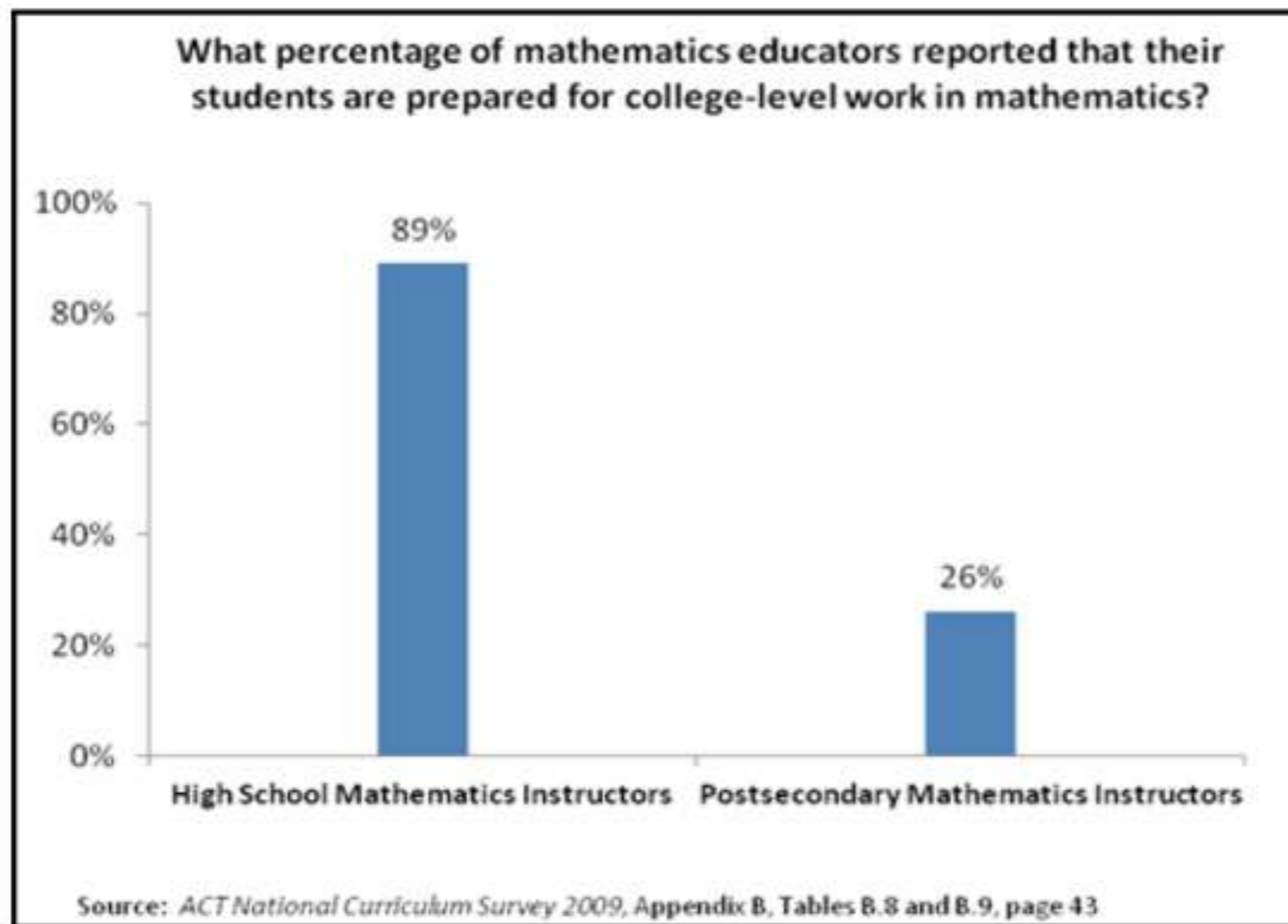# Common Core State Standards

Rationale for CCSS

- Declining US competitiveness with other developed countries

- NAEP performance that is largely flat over the past 40 years in 8th grade

- Slight improvement on NAEP performance at the 4th grade level

- Slight decline on NAEP performance at the high school level

- High rates of college remediation

Background of CCSS

- Initiated by the National Governor's 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 (greater DOK), and clearer standards

College Math Professors Feel HS Students Today are Not Prepared for College Math

What percentage of mathematics educators reported that their students are prepared for college-level work in mathematics?

Source: *ACT National Curriculum Survey 2009*, Appendix B, Tables B.8 and B.9, page 43

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.

- Need to set the agenda in high school math to prepare more students for postsecondary education and training.

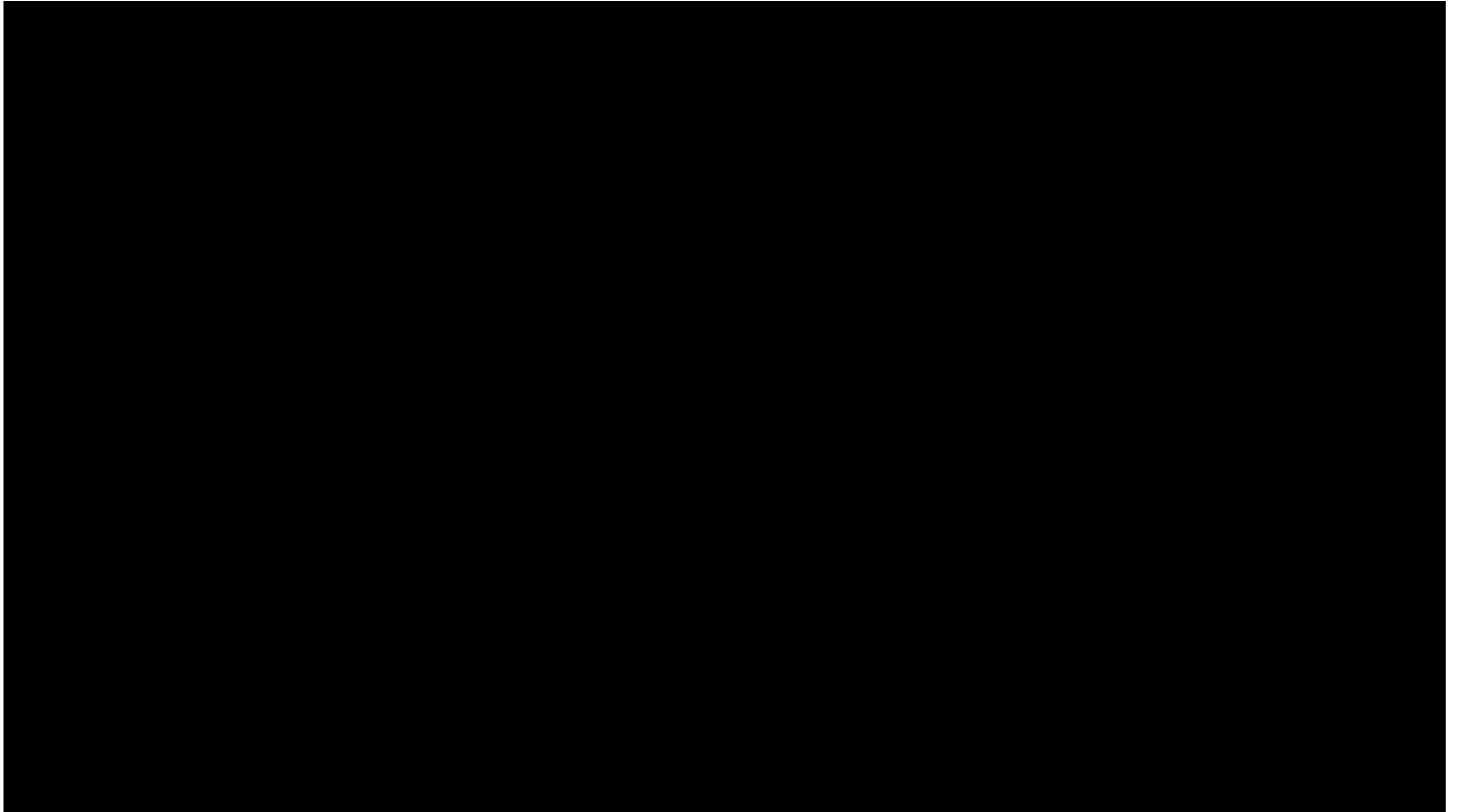# The Common Core State Standards Require Three Instructional Shifts in Mathematics

- **Focus:** Focus strongly where the standards focus.

- **Coherence:** Think across grades and link to major topics.

- **Rigor:** In major topics, pursue conceptual understanding, procedural skill and fluency, and application.

Shift 1: Focus Strongly where the Standards Focus

The Standards call for a greater focus in mathematics. Rather than racing to cover topics in today's mile-wide, inch-deep curriculum, teachers use the power of the eraser and significantly narrow and deepen the way time and energy is spent in the math classroom. They focus deeply on the major work of each grade so that students can gain strong foundations: solid conceptual understanding, a high degree of procedural skill and fluency, and the ability to apply the math they know to solve problems inside and outside the math classroom.

Jason Zimba on Focus

Why Such A Need For Focus in the U.S?

Mathematics topics intended at each grade by at least two-thirds of A+ countries

Mathematics topics intended at each grade by at least two-thirds of 21 U.S. states
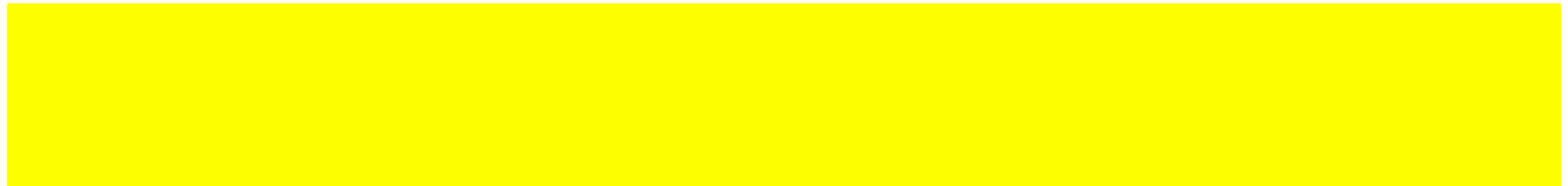
Traditional U.S. Approach
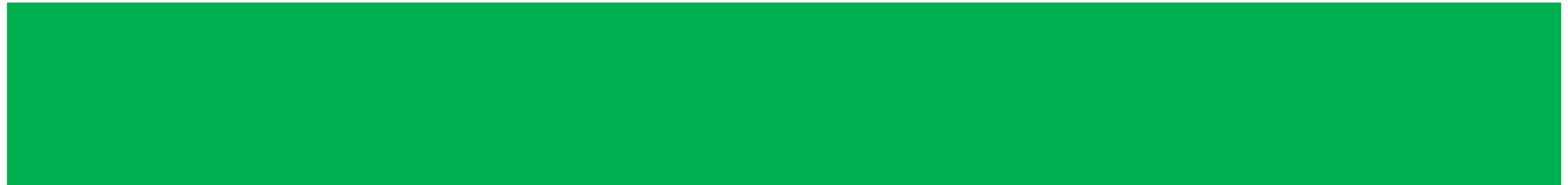
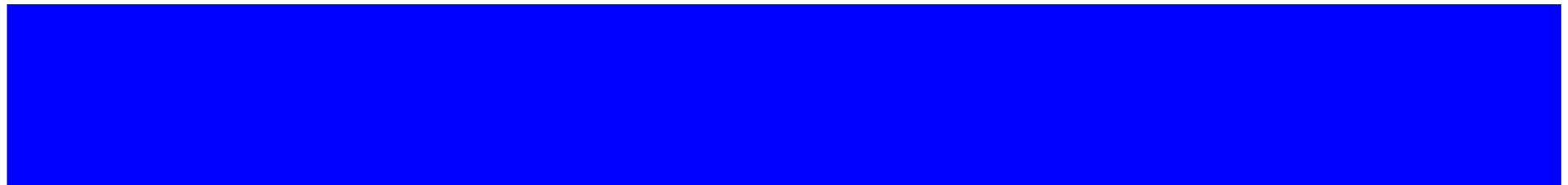K   12
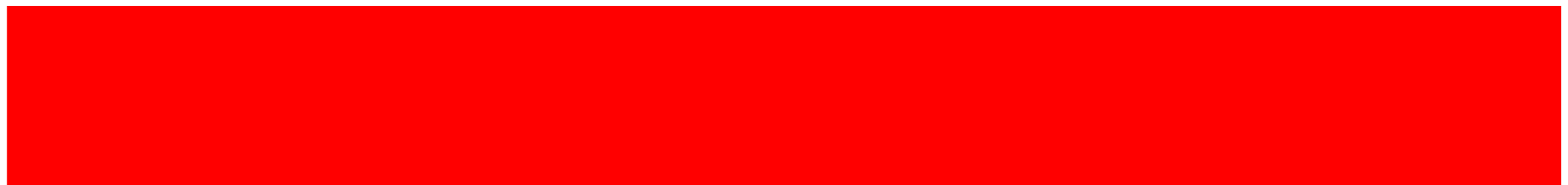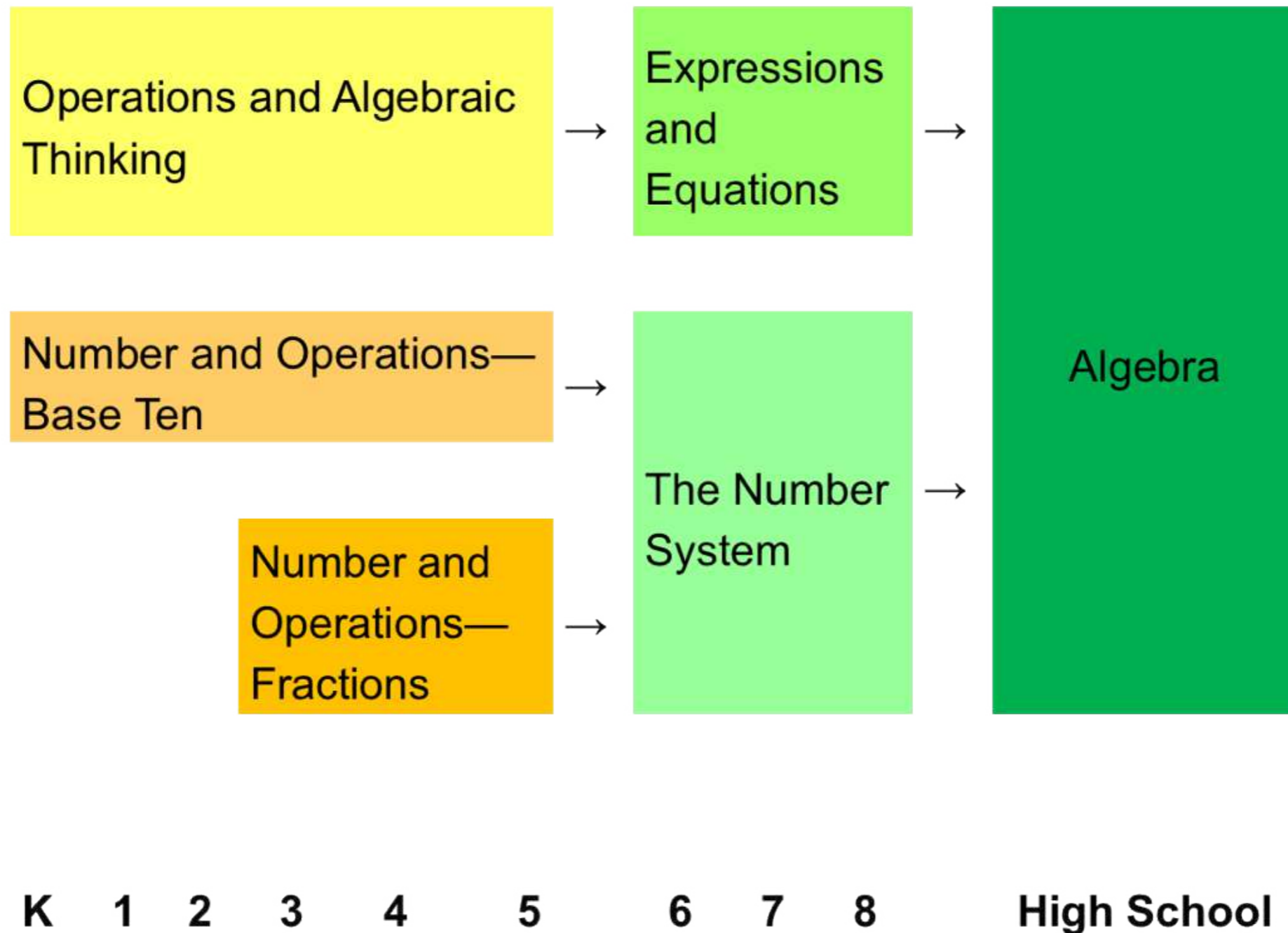
Number and Operations

Measurement and Geometry

Algebra and Functions

Statistics and Probability

Focusing Attention Within Number and Operations

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

Grade 2 Content Focus

Key: ■ Major Clusters; ☐ Supporting Clusters; ○ Additional Clusters

Operations and Algebraic Thinking
- ■ Represent and solve problems involving addition and subtraction.
- ■ Add and subtract within 20.
- ☐ Work with equal groups of objects to gain foundations for multiplication.

Number and Operations in Base Ten
- ■ Understand place value.
- ■ Use place value understanding and properties of operations to add and subtract.

Measurement and Data
- ■ Measure and estimate lengths in standard units.
- ■ Relate addition and subtraction to length.
- ☐ Work with time and money.
- ☐ Represent and interpret data.

Geometry
- ○ Reason with shapes and their attributes.

Grade 3 Content Focus

Key: ■ Major Clusters; ☐ Supporting Clusters; ○ Additional Clusters

Operations and Algebraic Thinking

■ Represent and solve problems involving multiplication and division.

■ Understand properties of multiplication and the relationship between multiplication and division.

■ Multiply and divide within 100.

■ Solve problems involving the four operations, and identify and explain patterns in arithmetic.

Number and Operations in Base Ten

○ Use place value understanding and properties of operations to perform multi-digit arithmetic.

Number and Operations—Fractions

■ Develop understanding of fractions as numbers.

Measurement and Data

■ Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.

☐ Represent and interpret data.

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

○ Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.

Geometry

☐ Reason with shapes and their attributes.

Grade 4 Content Focus

Key: ■ Major Clusters; □ Supporting Clusters; ○ Additional Clusters

Operations and Algebraic Thinking
- ■ Use the four operations with whole numbers to solve problems.
- □ Gain familiarity with factors and multiples.
- ○ Generate and analyze patterns.

Number and Operations in Base Ten
- ■ Generalize place value understanding for multi-digit whole numbers.
- ■ Use place value understanding and properties of operations to perform multi-digit arithmetic.

Number and Operations--Fractions
- ■ Extend understanding of fraction equivalence and ordering.
- ■ Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
- ■ Understand decimal notation for fractions, and compare decimal fractions.

Measurement and Data
- □ Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
- □ Represent and interpret data
- ○ Geometric measurement: understand concepts of angle and measure angles.

Geometry
- ○ Draw and identify lines and angles, and classify shapes by properties of their lines and angles.

Opportunities for In-Depth Focus

3.OA.3 - Word problems involving equal groups, arrays, and measurement quantities can be used to build students' understanding of and skill with multiplication and division, as well as to allow students to demonstrate their understanding of and skill with these operations.

Illustrative Mathematics

3.OA Analyzing Word Problems Involving Multiplication

Alignment 1: 3.OA.A.3

Many problems can be solved in different ways. Decide if the following word problems can be solved using multiplication. Explain your thinking.

a. Liam is cooking potatoes. The recipe says you need 5 minutes for every pound you are cooking. How many minutes will it take for Liam to cook 12 pounds of potatoes?

b. Mel is designing cards. She has 4 different colors of paper and 7 different pictures she can glue on the paper. How many different cards can she make with one color of paper and one picture?

c. Nina can practice a song 6 times in an hour. If she wants to practice the song 30 times before the recital, how many hours does she need to practice?

d. Owen is building a rectangular tile patio that is 4 tiles wide and 6 tiles long. How many tiles does he need?

Opportunities for In-Depth Focus

3.NF.2 - Developing an understanding of fractions as numbers is essential for future work with the number system. It is critical that students at this grade are able to place fractions on a number line diagram and understand them as a related component of their ever-expanding number system.

a. Draw a point on the number line for 1. Label the point. Be as exact as possible.

b. Draw a point on the number line for 1. Label the point. Be as exact as possible.
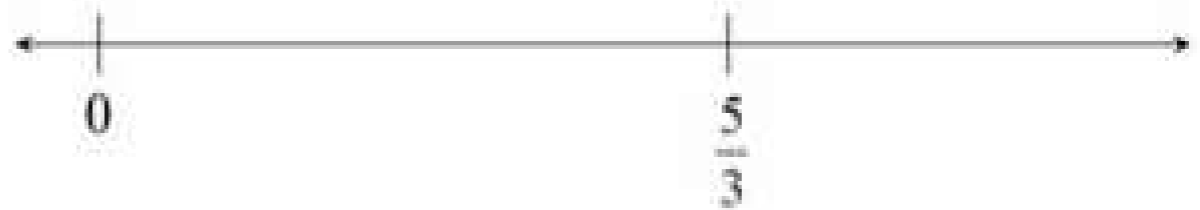
Engaging with the shift: What do you think belongs in the major work of each grade?

Grade	Which two of the following represent areas of major focus for the indicated grade?		
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

Group Discussion

Math Shifts	What is this shift? Why this shift?	Opportunities	Challenges
1.Focus: Focus strongly where the Standards focus.			