Mathematics Shifts in Common Core State Standards

Please read pages 1-2, and then make notes on the following prompt (to be discussed during the live session):

• What were the short-comings of the old standards relevant to …
  – Focus
  – Coherence
  – Rigor

1. Focus

The goal is to focus strongly where the standards focus. Rather than racing to cover topics in a mile-wide, inch-deep curriculum, significantly narrow and deepen the way time and energy are spent in the mathematics classroom. The standards 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 mathematics they know to solve problems inside and outside the mathematics classroom.

2. Coherence

Coherence is connecting ideas across grades, and linking to major topics within grades. The standards are designed around coherent progressions from grade to grade. Carefully connect the learning across grades so that students can build new understanding onto foundations built in previous years. Each standard is not a new event, but an extension of previous learning. Instead of allowing additional or supporting topics to detract from the focus of the grade, these topics can serve the grade-level focus.

3. Rigor

In major topics, conceptual understanding, procedural skill and fluency, and application are pursued with equal intensity.

• Emphasize conceptual understanding of key concepts, such as place value and ratios. Teachers support students’ ability to access concepts from a number of perspectives so that students are able to see math as more than a set of mnemonics or discrete procedures.
• Help students build 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 have access to more complex concepts and procedures.
• Use math flexibly for applications. Teachers provide opportunities for students to apply math in context. Teachers in content areas outside of math, particularly science, ensure that students are using math to make meaning of and access content.
Changes in Focus and Instruction for Arizona’s Common Core Standards in Mathematics

Key Advances

Emphasis throughout on problem-solving, quantitative reasoning, and modeling

- K-5: Focus on number and operations
- K-7: Graded ramp up to algebra, through fractions, ratios, and proportional reasoning
- 6-8: Rich hands-on work with ratios, geometry, statistics, and probability
- High School: Rigorous algebra, geometry, modeling, statistics and probability

Changes by Grade Bands: Grades K-5

Numeration and operation intensified and introduced earlier

- Early place value foundations in Kindergarten
- Regrouping as composing/decomposing in Gr. 2
- Decimals to hundredths in Gr. 4
- All 3 types of measurement introduced simultaneously (Non-standard, English, and Metric)
- Emphasis on fractions as numbers
- Emphasis on number line as visualization and structure

Changes by Grade Bands: Grades 6-8

- Ratio and proportion emphasized in Gr. 6 (Ratio, unit rates, converting measurement, tables of values, graphing, missing value problems)
- Percents introduced in Gr. 6
- Statistics introduced in Gr. 6 (Statistic variability (measures of central tendency, distributions, interquartile range, mean and absolute deviation, data shape)
- Rational numbers emphasized in Gr. 7
- More rigorous algebraic understanding in Gr. 8

Changes by Grade Bands: High School

- Supports both/either continuing an integrated approach or a traditional approach or new models that synthesize these two
- All students must master some topics traditionally from Algebra 2 or beyond
  - Simple periodic functions
  - Polynomials
  - Radicals
  - More probability and statistics
  - Introduction to mathematical modeling