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Common Core State Standards— Supporting Instruction

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Common Core Mission Statement

- The Common Core State Standards provide a consistent, clear understanding of what students are expected to learn, so teachers and parents know what they need to do to help them. The standards are designed to be robust and relevant to the real world, reflecting the knowledge and skills that our young people need for success in college and careers. With American students fully prepared for the future, our communities will be best positioned to compete successfully in the global economy.

“All young Americans must learn to think mathematically, and they must think mathematically to learn.”

National Research Council. 2001. *Adding It Up: Helping Children Learn Mathematics*. J. Kilpatrick, J. Swafford, and B. Findell, eds., p. 1. Mathematics Learning Study Committee, Center for Education, Division of Behavioral and Social Sciences and Education. Washington, DC: National Academy Press.

Standards for Mathematical Practice

These processes and proficiencies, which all educators should seek to develop in their students, were influenced by:

- NCTM process standards
- National Research Council standards of mathematical proficiency
 - *Adding It Up* strands include: adaptive reasoning, strategic competence, conceptual understanding, procedural fluency, productive disposition

8 Standards for Mathematical Practice

- Make sense of problems and persevere in solving them
- Reason abstractly and quantitatively
- Construct viable arguments and critique the reasoning of others
- Model with mathematics
- Use appropriate tools strategically
- Attend to precision
- Look for and make use of structure
- Look for and express regularity in repeated reasoning

General Differences Between State Standards & CCSS K–12

- **K–8 is organized into domains, not strands, that progress over several grades.**

Example: Number and Operations—Fractions

Fraction Progression, Grades 3–6

- 3: Develop an understanding of fractions as numbers
- 4: Extend understanding of fraction equivalence and ordering
- 4: Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers
- 4: Understand decimal notation for fractions, compare decimal fractions
- 5: Use equivalent fractions as a strategy to add and subtract fractions
- 5: Apply and extend previous understandings of multiplication and division to multiply and divide fractions
- 6: Apply and extend previous understandings of multiplication and division to divide fractions by fractions

General Differences (continued)

- **K–5 provides a solid grounding in number and operations, geometry, measurement, and data:**
 - Prepares for rich experiences in middle school with ratio and proportion, hands-on experiences with geometry, and a serious exposure to statistics and probability
- **Operations in K–5 has been split into three domains:**
 - Number and Operations in Base Ten; Number and Operations—Fractions; Operations and Algebraic Thinking
- **K–7 is a ramp up to Algebra in Grade 8:**
 - Properties of Operations; Similarity; Ratio and Proportional Relationships; Rational Number System
- **9–12 is organized in concept categories :**
 - Number and Quantity; Algebra; Functions; Modeling; Geometry; Statistics and Probability

What we will do in this session

- Compare and contrast a selected current state standard with a related standard from the Common Core.
- Experience an activity that promotes what Common Core standards require.
- Observe classroom instruction to see how instruction and student learning are aligned.

Comparing Standards

New York – 3rd grade

Use a variety of strategies to add and subtract three-digit numbers (with and without regrouping).

CCSS – 3rd grade

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

- Fluently add and subtract within 1,000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

Standards include...

- Apply properties of operations: Commutative Property; Associative Property; Distributive Property.
- Apply the relationship between addition and subtraction; multiplication and division.
- Use place value understanding in solving problems.
- Use strategies and algorithms based on place value, properties of operations, and /or relationships between addition and subtraction or multiplication and division.

True or False

True or False

In pairs:

1. Turn one card over, determine if it is true or false.
2. State what makes it true or what makes it false.
Record your thinking.
3. How did you use what you know about properties, place value, or how operations relate to each other to determine if the statement was true or false?

How does an activity like this help us think about how:

- Properties can help us to solve problems;
- Understanding place value can help us solve problems;
- Relationships between operations can help us solve problems?

From the Classroom

- Grade 3 class from South Shades Crest Elementary in Hoover, AL
- Number Talk about:

$$38 + 37$$

From Number Talks: Helping Children Build Mental Math and Computation Strategies—A Multimedia Professional Learning Resource, Math Solutions 2010

Focus for Viewing Video

What evidence do you find that the teacher offers instructional experiences to support students in developing:

- fluency in adding using strategies based on place value, properties of operations, and/or
- the relationship between addition and subtraction?



Focus for Discussing Content

What evidence did you find that the teacher provided instructional experiences to support students in developing:

- fluency in adding using strategies based on place value, properties of operations, and/or
- the relationship between addition and subtraction?

From the Classroom

Grade 5 class from South Shades Crest Elementary in Hoover, AL

Number Talk about:

$$496 \div 8$$

From Number Talks Helping Children Build Mental Math and Computation Strategies—A Multimedia Professional Learning Resource, Math Solutions 2009

Video Clip

Grade 5 Number Talk: $496 \div 8$

What evidence did you find that the teacher provided instructional experiences to support students in:

- Using relationships among numbers and operations to solve a problem?
- Using properties to solve a problem?

What is the role of teacher planning in this lesson?



Video Clip

Grade 5 Number Talk: $496 \div 8$

What evidence did you find that the teacher provided instructional experiences to support students in:

- Using relationships among numbers and operations to solve a problem?
- Using properties to solve a problem?

What is the role of teacher planning in this lesson?

Conclusion

The promise of standards:

These Standards are not intended to be new names for old ways of doing business. They are a call to take the next step. It is time for states to work together to build on lessons learned from two decades of standards based reforms. It is time to recognize that standards are not just promises to our children, but promises we intend to keep.

Common Core State Standards for Mathematics (p. 5).
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Resources

www.corestandards.org

www.edexcellence.net

www.achieve.org

www.mathsolutions.com/commoncore

Reflection

What is the most important insight you've had during this session regarding the Common Core and your plans for supporting teachers in implementing the Common Core?



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Watch Video Clip

Grade 5 Number Talk: 12×15

What evidence did you find that the teacher provided instructional experiences to support students in:

- Seeing and using relationships among numbers to solve a problem?
- Using properties to solve a problem?

What is the role of teacher planning in this lesson?

Watch Video Clip

Grade 3 Number Talk: $38 + 37$

Watch the following video clip to see an example of instruction that addresses the grade-level standards outlined on the previous slide.

From the Classroom

- Grade 5 class from South Shades Crest Elementary in Hoover, AL
- Number Talk about:

$$12 \times 15$$

From Number Talks Helping Children Build Mental Math and Computation Strategies—A Multimedia Professional Learning Resource, Math Solutions 2009

Comparing Standards

New York – 5th grade

Use a variety of strategies to divide three-digit numbers by one- and two-digit numbers.

CCSS – 5th grade

Perform operations with multi-digit whole numbers and with decimals to hundredths.

- Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division.
- Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Highlights From Content

- Specificity in content standards:
 - use of properties
 - relationship between addition and subtraction
 - use of place value