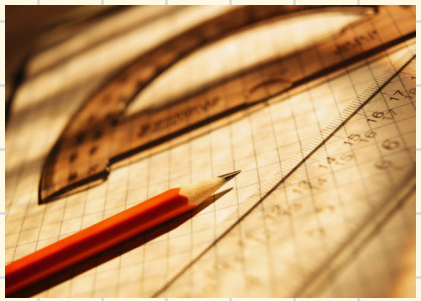


Understanding and Implementing the Common Core for Mathematics Grades K-8

Standards Solution, LLC

Goals and Objectives

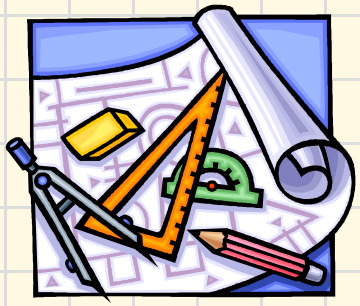
- Present Criteria for CCSS- Mathematics
- Discuss Organization of Standards – K-8
- Check for Understanding
- Travel Along an Algebra Domain from K-Grade 4

Purpose of CCSS

The K-12 CCSS in Mathematics were created to allow students to become increasingly more proficient in the understanding and use of mathematics through a steady progression leading to college and career readiness by the end of high school.

Criteria for the Standards

- Fewer, clearer, and higher
- Develop procedural fluency as well as conceptual understanding
- Provide coherence through a meaningful structure that suggests a logical progression of content and skills over the years
- Provide a focus on appropriate balance in conceptual understanding, procedures and problem solving through application and modeling
- Teachable within a school year or across 4 years of high school
- Include rigorous content and application of knowledge through high-order skills
- Aligned with college and work expectations
- Based on evidence and research



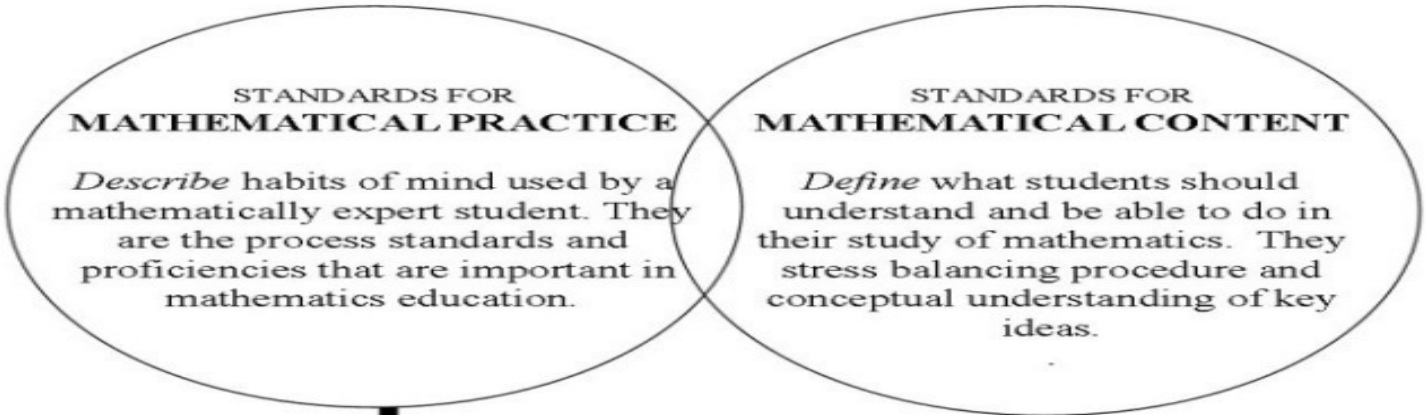
CCSS in Mathematics

3 Components:

- Standards for Mathematical Practice
- Standards for Mathematical Content
  - K-8 Grade Level Domains
  - High School Conceptual Categories
- Glossary

COMMON CORE STATE STANDARDS FOR

Mathematics



MATHEMATICAL PRACTICES

K-12

1. Make sense of problems and persevere in solving them
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of structure
8. Look for and express regularity in repeated reasoning

DOMAINS AND CONCEPTUAL CATEGORIES

K-5 Domains	6-8 Domains	HS Conceptual Categories
Counting and Cardinality (K only) Operations and Algebraic Thinking (K-5) Number and Operations in Base Ten (K-5) Number and Operations—Fractions (3-5) Measurement and Data (K-5) Geometry(K-5)	Ratios and Proportional Relationships (6-7) The Number System (6-8) Expressions and Equations (6-8) Functions (8 only) Geometry (6-8) Statistics and Probability (6-8)	Number and Quantity Algebra Functions Modeling Geometry Statistics and Probability

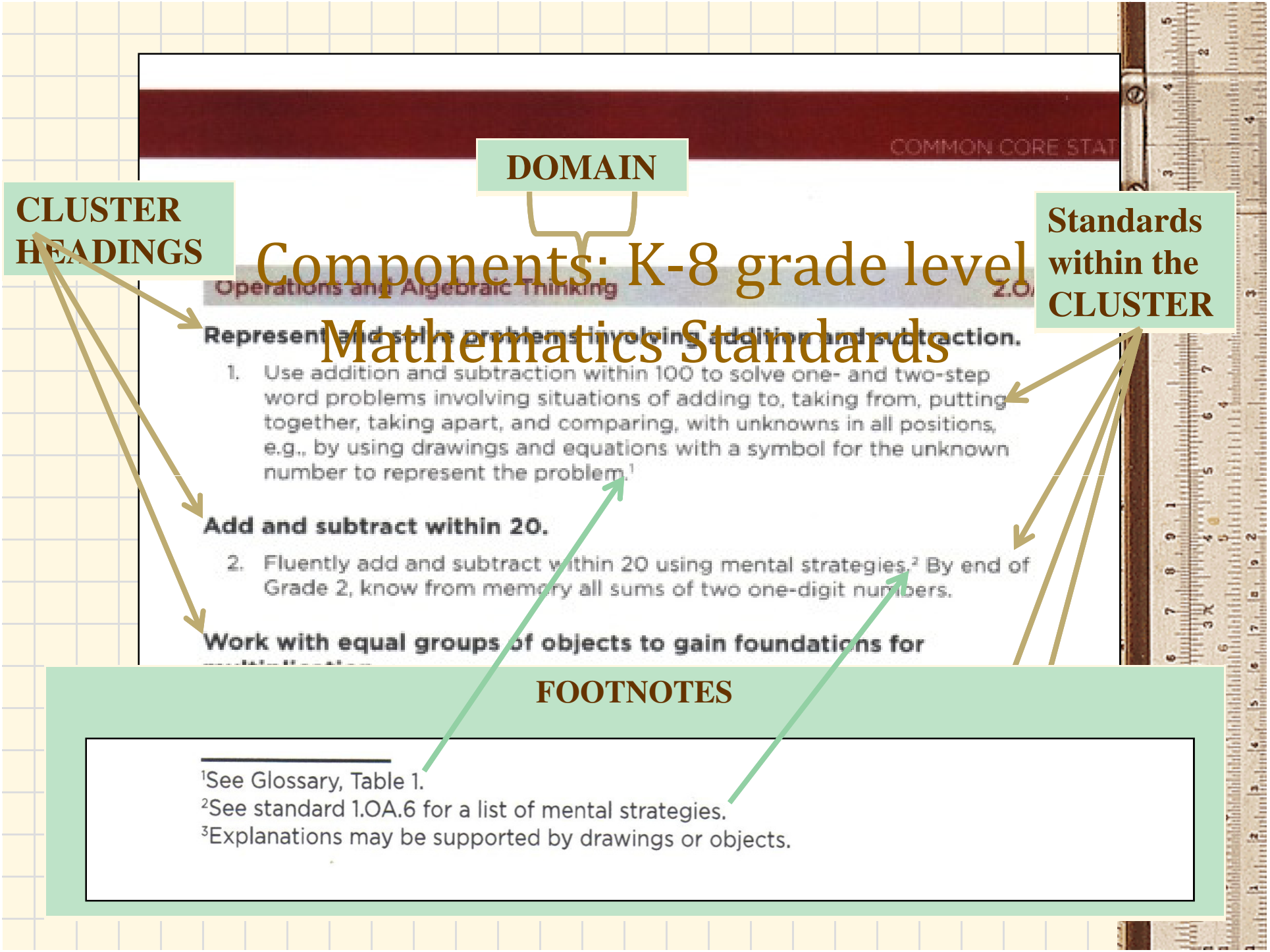
Standards for Mathematical Practice

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Mathematics K-8 : Design & Organization

- **Introduction Page**
  - Highlights: 3-4 Critical Areas
  - Provides: Emphasis of Content
- **Overview Page**
  - Provides:
    - Domains
    - Cluster Headings
    - Mathematical Practices

Components: K-8 grade level Mathematics Standards



Components: K-8 grade level Mathematics Standards

Domains: larger groups of related standards

Cluster Headings: overview & quick summary of the mathematical ideas within a domain

Clusters: groups of related standards

Standards: define what students should understand and be able to do

Standards for Mathematical Content K-8

K – 5

- Counting and Cardinality
- Operations and Algebraic Thinking
- Number and Operations in Base Ten
- Number and Operations – Fractions
- Measurement and Data
- Geometry

6-8

- Ratios and Proportional Relationships
- The Number System
- Expressions and Equations
- Functions
- Geometry
- Statistics and Probability

Key to the Codes – K-8

Grades K – 5

Counting and Cardinality	CC
Operations and Algebraic Thinking	OA
Number and Operations in Base Ten	NBT
Number and Operations – Fractions	NF
Measurement and Data	MD
Geometry	G

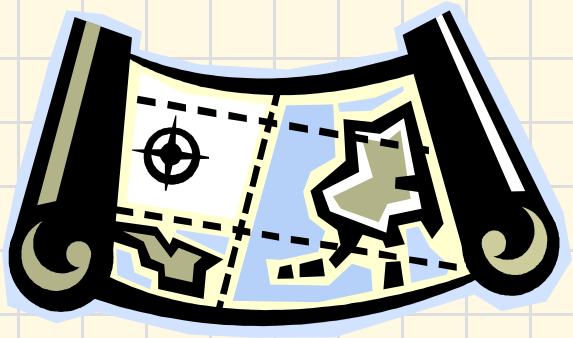
Grades 6-8

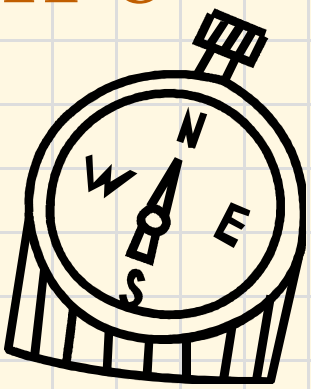
Ratios and Proportional Relationships	RP
The Number System	NS
Expressions and Equations	EE
Functions	F
Geometry	G
Statistics and Probability	SP

Check for Understanding

Group Activity

Navigating through the Common Core State Standards in Mathematics K-8





Navigating Through the CCSS in Mathematics K-8

1.) What are the three components of the K-8 CCSS found on page 5.

Standards

Clusters

Domains

2.) What are the 8 Standards for Mathematical Practice? (Pgs. 6-8)

1.) Make sense of problems and persevere in solving them.

2.) Reason abstractly and quantitatively.

3.) Construct viable arguments and critique the reasoning of others.

4.) Model with mathematics.

5.) Use appropriate tools strategically.

6.) Attend to precision.

7.) Look for and make use of structure.

8.) Look for and express regularity in repeated reasoning.

3.) What are the 5 domains for Kindergarten? (Pg. 10)

Counting and Cardinality

Operations and Algebraic Thinking

Number and Operations in Base Ten

Measurement and Data

Geometry

4.) What are the four critical areas of Grade 1? (Pg. 13)

Developing understanding of addition, subtraction and strategies for addition within 20

Developing understanding of whole number relationships and place value including grouping in tens and ones

Developing understanding of linear measurement and measuring lengths as iterating length units

Reasoning about attributes of, and composing and decomposing geometric shapes.

5.) What domain was added to Grade 3 that was not a domain in Grades K-2? (Pg.22)

Number and Operations - Fractions

6.) What are the five domains for Grade 6 and what are their codes? (Pg. 41)

Ratios and Proportional Relationships	6.RP
The Number System	6.NS
Expressions and Equations	6.EE
Geometry	6.G
Statistics and Probability	6.SP

7.) How do the five domains in Grade 8 differ from the domains in Grades 6 & 7? (Pg. 53)

Grade 8 has Functions instead of Ratios and Proportional Relationships

8.) What grade introduces fractions as a critical area? (Pg. 21)

Grade 3

9.) Operations and Algebraic Thinking begins in Kindergarten. By what year is it assumed that the "Operations" part of the domain is mastered. (Pg. 41)

Grade 6

10.) What year does Ratio and Proportions become a domain? (Pg. 41)

Grade 6

11.) What is the last year that Measurement is part of a domain? (Pg. 34)

Grade 5

12.) The first standard in domain 1.OA has a footnote. What information does the footnote provide? (Pg. 15)

See Glossary – Table 1

13.) Domain 3.NF has a footnote. What information does the footnote provide? (Pg. 24)

Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6 and 8.

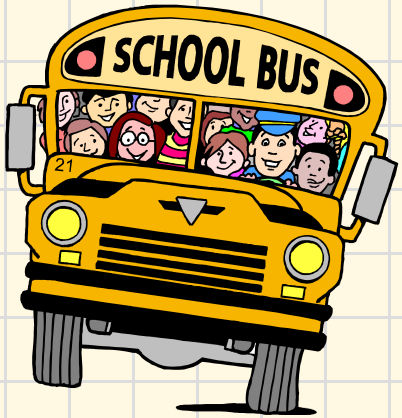
14.) What are some differences between the Standards that you have been using and the new CCSS?

Discussion

A Journey through Time

Activity

An Algebraic Journey from Kindergarten to Eighth Grade - A Hands-On Approach



Kindergarten – Operations and Algebraic Thinking

K.OA – Operations and Algebraic Thinking

Understand addition as putting together and adding to, and understanding subtraction as taking apart and taking from.

2. Solve addition and subtraction word problems, and add and subtract within 10, e.g. by using objects or drawings to represent the problem.

Activity: Match Expressions





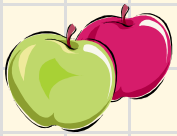
Grade 1- Operations and Algebraic Thinking

1.OA – Operations and Algebraic Thinking

Represent and solve problems involving addition and subtraction.

1. Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g. by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

Activity: Expression Word Problems





Grade 2 – Operations and Algebraic Thinking

2.OA – Operations and Algebraic Thinking

Represent and solve problems involving addition and subtraction.

1. Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g. by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

Activity: Expression Word Problems





Grade 3 – Operations and Algebraic Thinking

3.OA – Operations and Algebraic Thinking

Represent and solve problems involving multiplication and division.

4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations 8 x ? = 48, 5 = □ ÷ 3, 6 x 6 = ?.*

Activity: Determine the Unknown in a Multiplication and Division Equation

x ÷ x ÷ x ÷

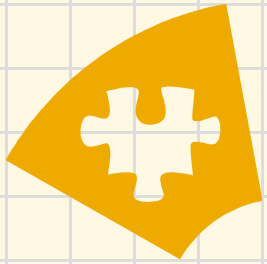
Grade 4 – Operations and Algebraic Thinking

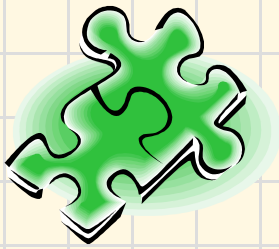
4.OA – Operations and Algebraic Thinking

Use the four operations with whole numbers to solve problems.

1. Interpret a multiplication equation as a comparison, e.g. interpret 35 = 5 x 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.

Activity: Interpret a Multiplication Equation – Puzzle Activity





Questions and Comments

- CCSS Mathematics - K-4
- Hands-on Algebraic Activities

Thank You

It has been a pleasure working with you today. Please let me know if I can be of further assistance in the future.

Debra Hancock

Educational Consultant

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