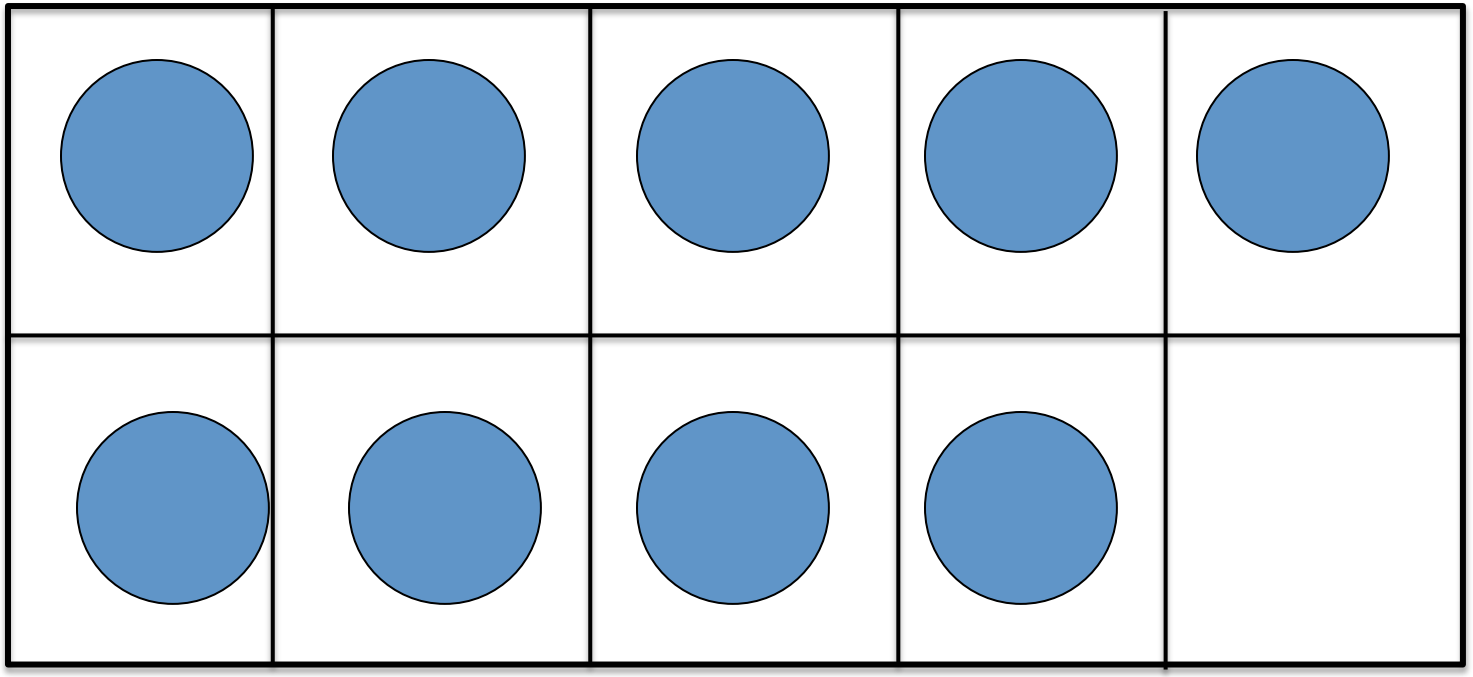
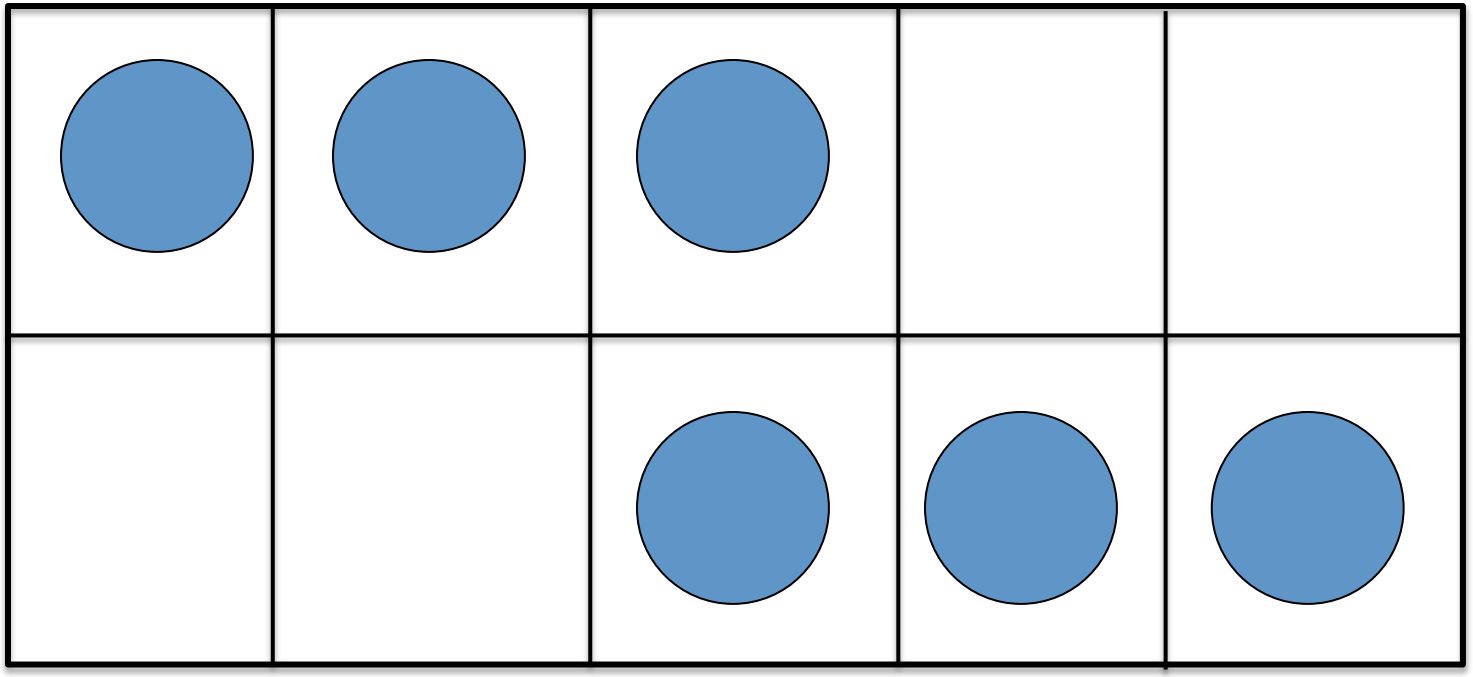
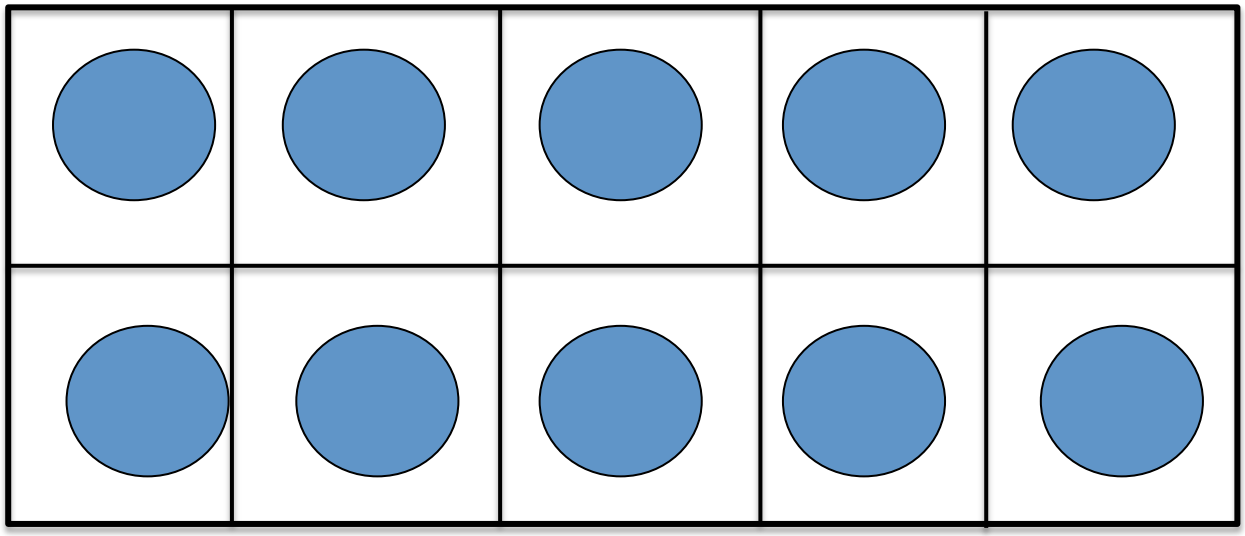
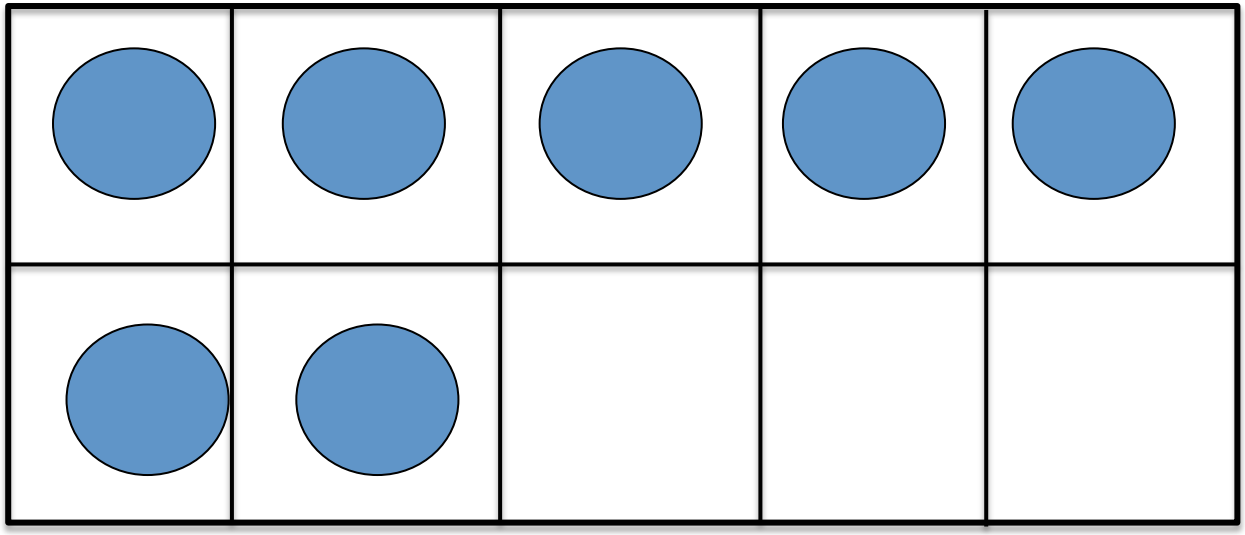
Quick Images

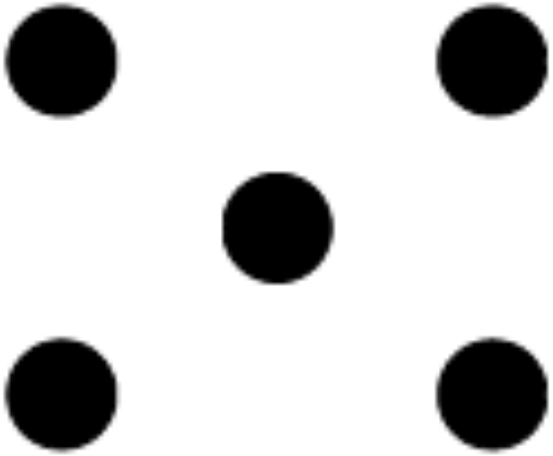
- How many dots?
- What did you see?

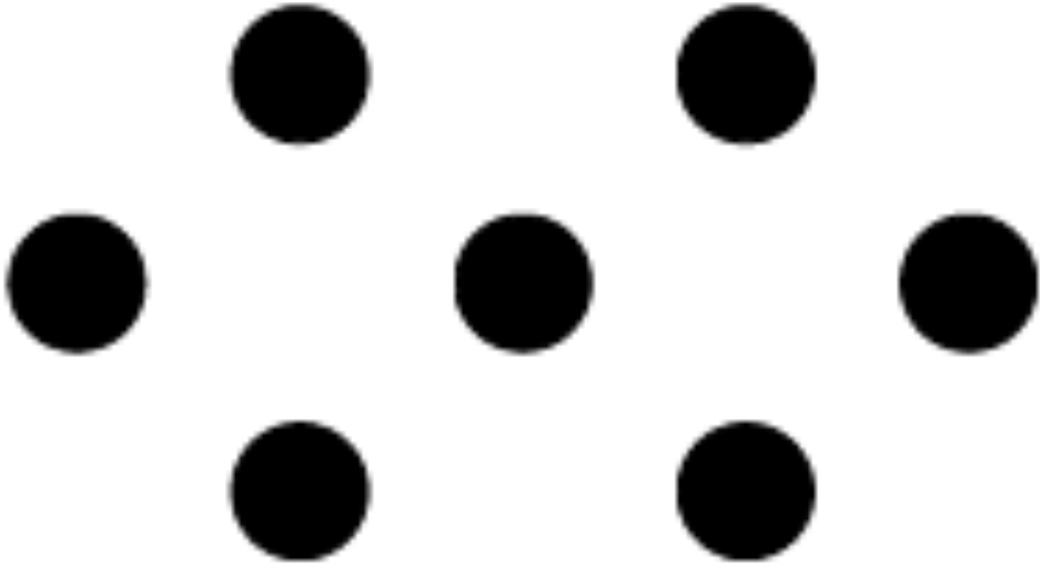


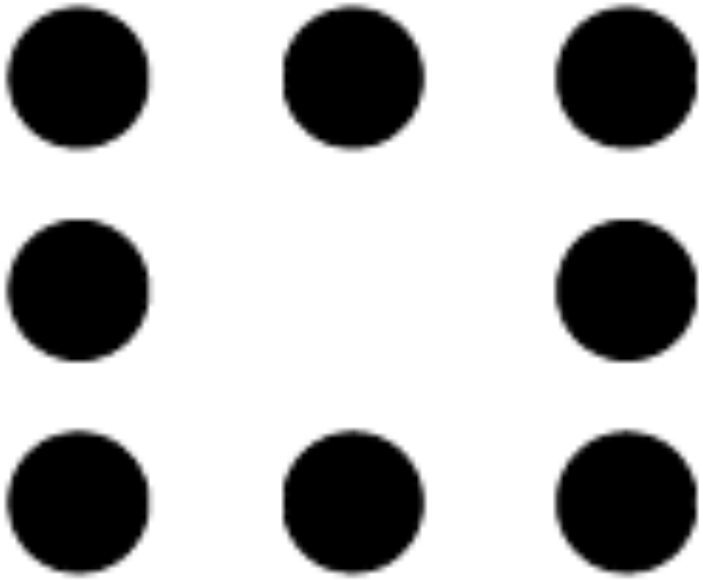


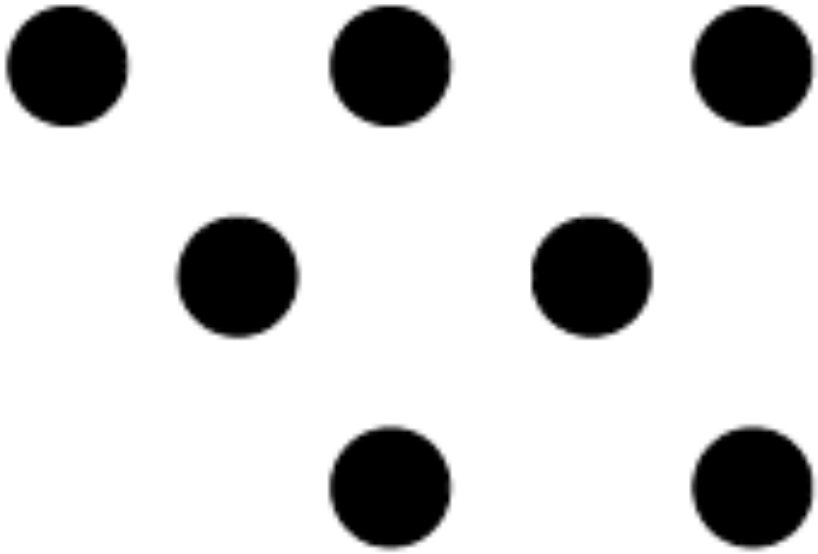


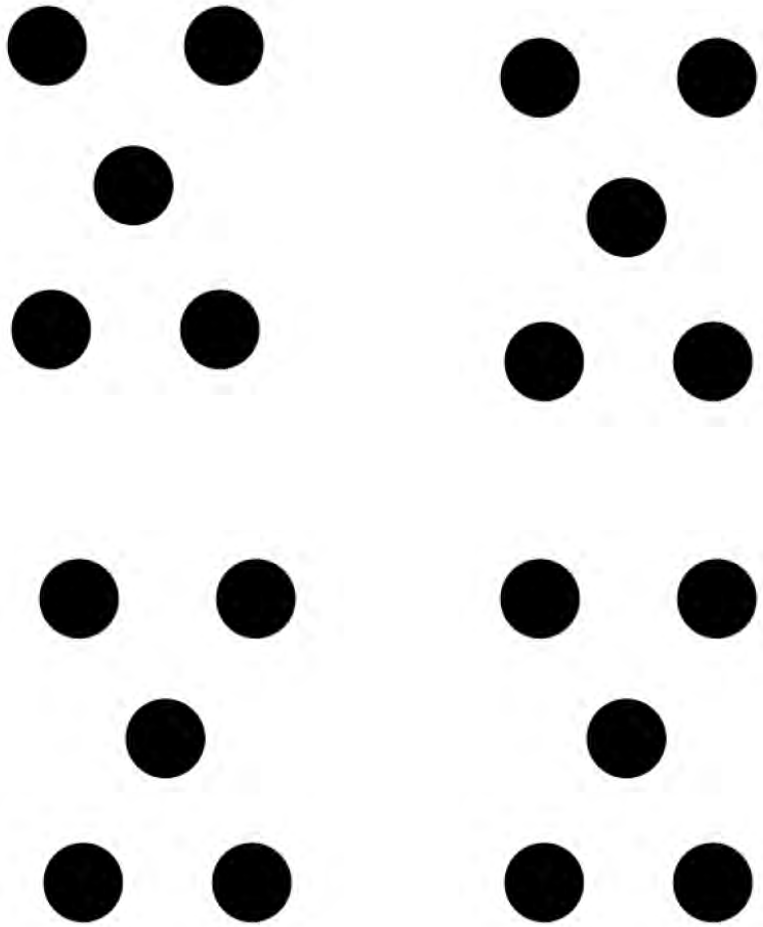












So we are all together….

- Our goal for this workshop is to get you familiar and comfortable with the mathematical processes and content of the CCSSM through providing you with some rich tasks that reflect the CCSSM practices and content.

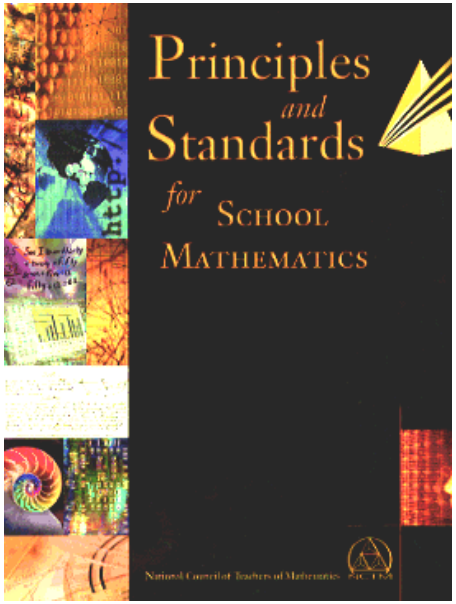
Journal Quick Write

- What do you know about the Common Core State Standards for Mathematics (CCSSM)?

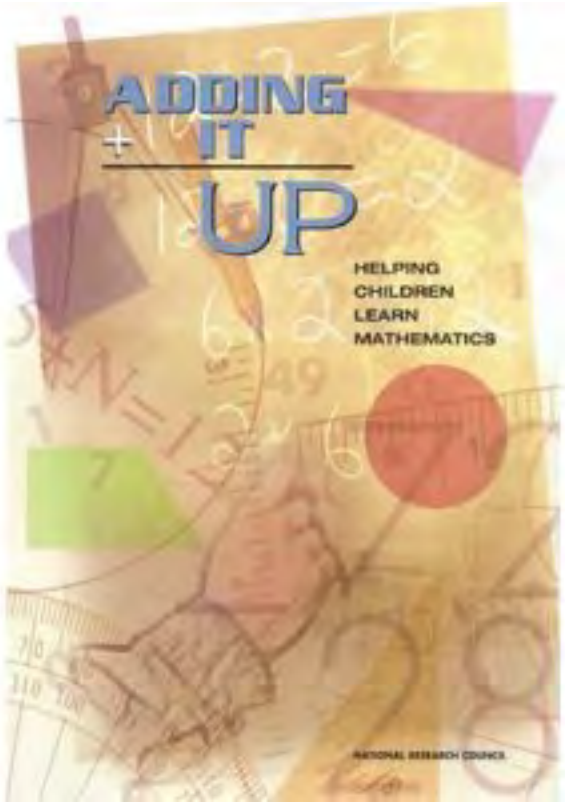
- What do you want to know more about?

Brief History

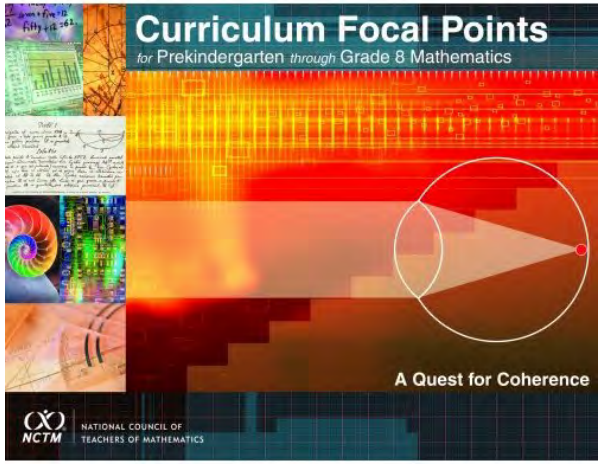
1989 NCTM Curriculum and Evaluation Standards



2000 NCTM Principles and Standards for School Mathematics

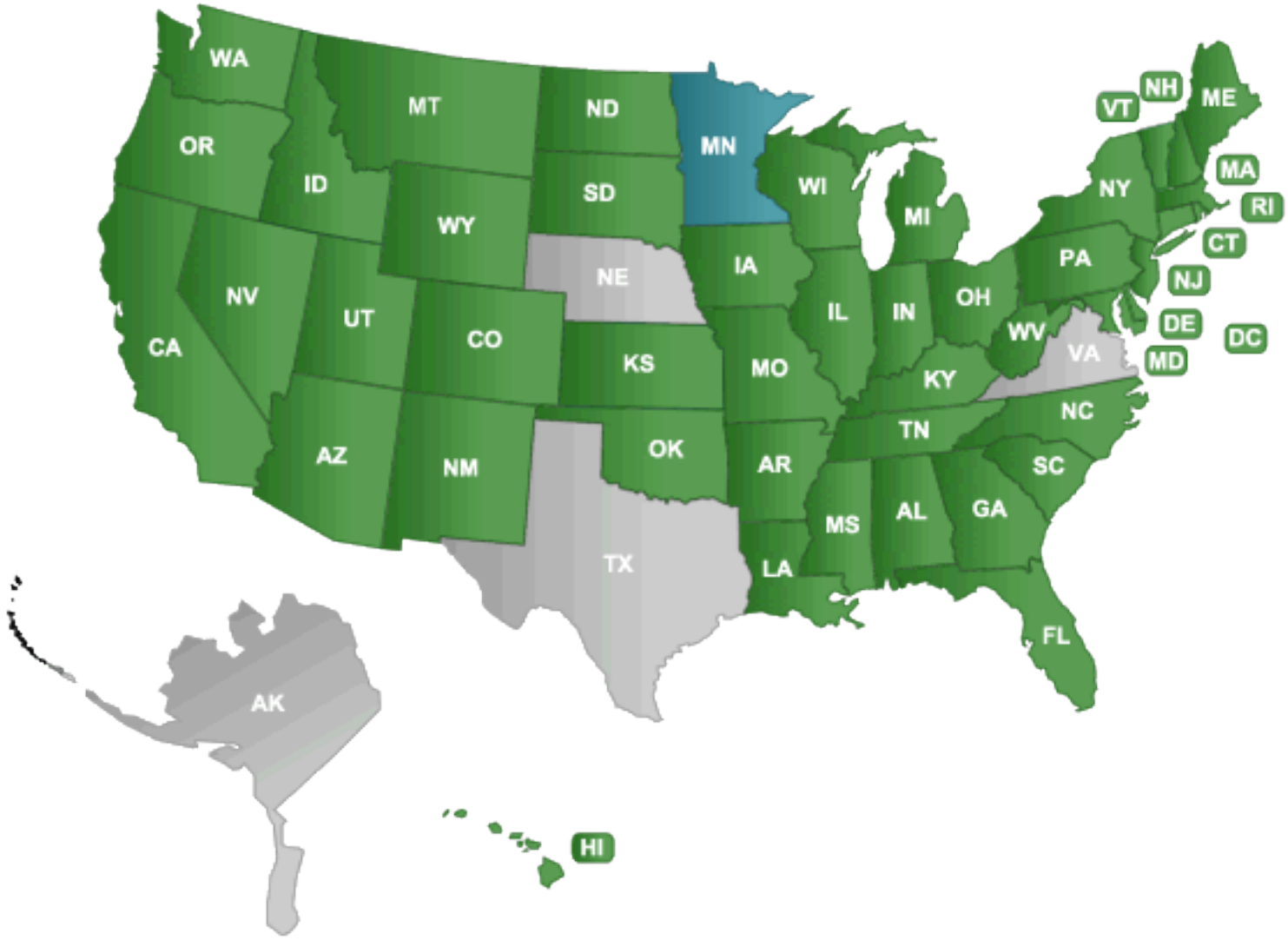


2001 National Research Council
www.nap.edu



2006 NCTM

A Call for Coherence



Why you need to know….

Characteristics

- Fewer and more rigorous.
- Aligned with college and career expectations
- Internationally benchmarked
- Rigorous content *and* application of higher-order skills.
- Builds on strengths and lessons of current state standards.
- Research based

Instructional Shifts expected in the Common Core

- Focus
- Coherence
- Rigor

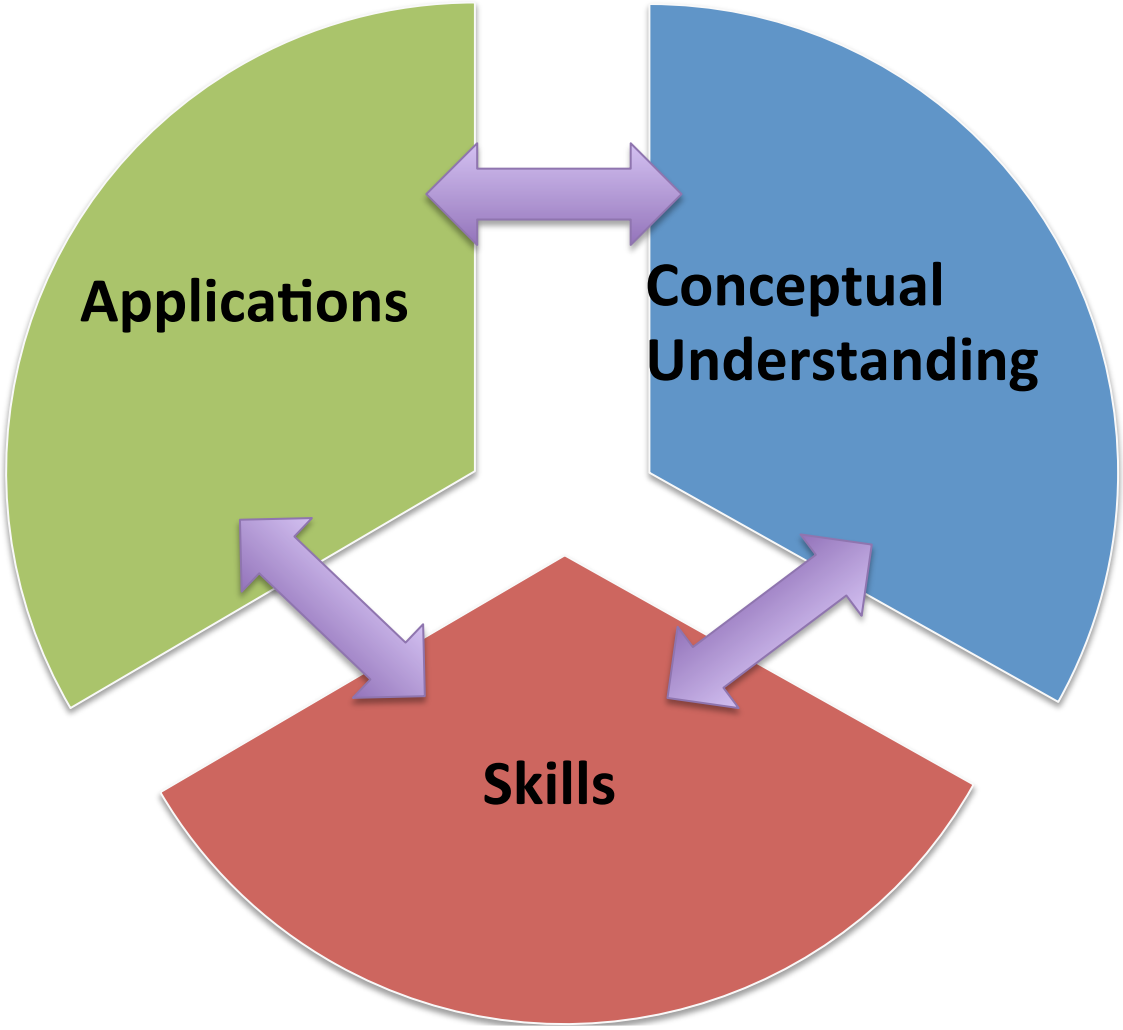
- Significantly narrow the scope of content and deepen how time and energy is spent on identified topics in the math classroom.
- Move away from "mile wide, inch deep" curricula identified in TIMSS.
- Teach less, learn more.
- “Less topic coverage can be associated with higher scores on those topics covered because students have more time to master the content that is taught.”

Shift 2: Coherence

- Carefully connect the learning within and across grades so that students can build new understanding on foundations built in previous years.

- Begin to count on solid conceptual understanding of core content and build on it. Each standard is not a new event, but an extension of previous learning.

Shift 3 Rigor



Conceptual understanding in mathematics means a student can

- Explain it to someone else
- Represent it in multiple ways
- Apply it to solve simple and complex problems
- Reverse givens and unknowns
- Compare and contrast it to other concepts

The Common Core Word Wall

- CCSSM
- Standards for Mathematical Practice
- Domain
- Cluster
- Standard
- Learning Progressions

CCSSM

Common Core State Standards for Mathematics

Standards

- Content Standards
  - What we want students to know and be able to do.

- Standards for Mathematical Practice
  - Habits of mind that students should develop.

Grade Level Big Ideas

Cross-cutting themes

Mathematics | Grade 2

In Grade 2, instructional time should focus on four critical areas: (1) extending understanding of base-ten notation; (2) building fluency with addition and subtraction; (3) using standard units of measure; and (4) describing and analyzing shapes.

(1) Students extend their understanding of the base-ten system. This includes ideas of counting in fives, tens, and multiples of hundreds, tens, and ones, as well as number relationships involving these units, including comparing. Students understand multi-digit numbers (up to 1000) written in base-ten notation, recognizing that the digits in each place represent amounts of thousands, hundreds, tens, or ones (e.g., 853 is 8 hundreds + 5 tens + 3 ones).

Critical Area

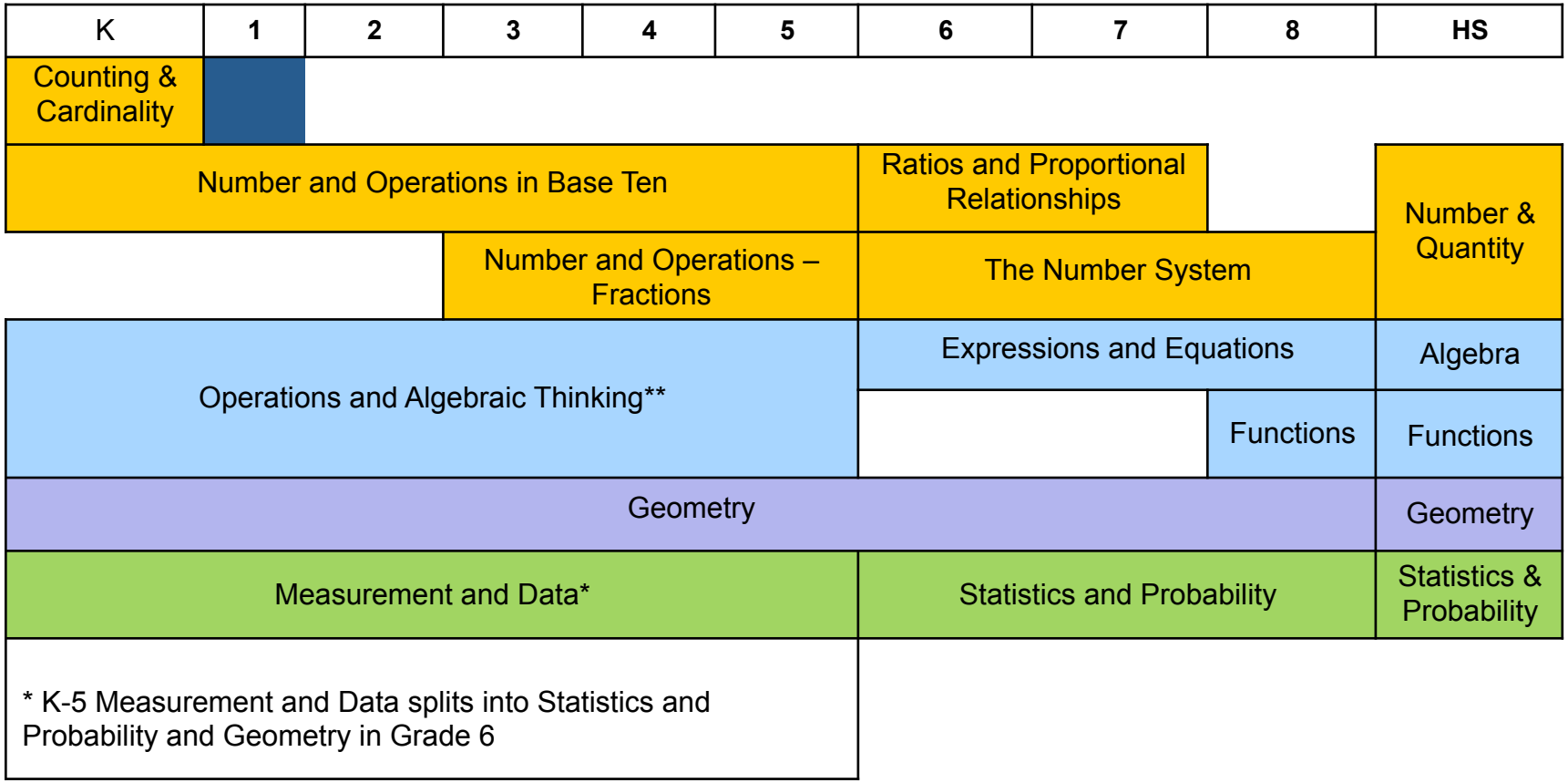
(2) Students use their understanding of addition to develop fluency with addition and subtraction within 100. They solve problems within 1000

Domains

- **Large** groups of related standards.

- Big Ideas that connect topics across grade levels

CCSS Learning Progression Framework



** Operations and Algebraic Thinking is foundation for Grade 6 Expressions and Equations and The Number System

Format of K-8 Standards

Grade Level

Domain

Operations and Algebraic Thinking 1.OA

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.[2]
2. Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

Understand and apply properties of operations and the relationship between addition and subtraction.

3. Apply properties of operations as strategies to add and subtract.[3] *Examples: If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known. (Commutative property of addition.) To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12. (Associative property of addition.)*
4. Understand subtraction as an unknown-addend problem. *For example, subtract 10 – 8 by finding the number that makes 10 when added to 8.*

Clusters

- Groups of related standards. Standards from different clusters may sometimes be closely related, because mathematics is a connected subject.
- May appear in multiple grade levels in the K-8 Common Core. There is increasing development as the grade levels progress
- What students should know and be able to do at each grade level
- Reflect both mathematical understandings and skills, which are equally important

Format of K-8 Standards

Operations and Algebraic Thinking 1.OA

Represent and solve problems involving addition and subtraction.

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Cluster

Understand and apply properties of operations and the relationship between addition and subtraction.

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Cluster

Standards

- Define what students should be able to understand and be able to do – part of a cluster.

- Content statements

- Progressions across grade levels

Format of K-8 Standards

Operations and Algebraic Thinking 1.OA

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.[2]
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Standard

Standard

Standard

Standard

Format of K-8 Standards

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Standard

Cluster

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Standard

Cluster

CCSSM Mathematical Practices

- The Common Core proposes a set of Mathematical Practices that all teachers should develop in their students. These practices are similar to NCTM's Mathematical Processes from the *Principles and Standards for School Mathematics*.

A common core scavenger hunt

- Work with partners from your grade level to complete the scavenger hunt by looking at the CCSSM in your binder.

8 Mathematical Practices

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.

8 CCSSM Mathematical Practices

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.

Practice 1:

Make sense of problems and persevere in solving them.

In your journal write 1 or 2 sentences describing what this standard means for your students.

Practice One: Math Solutions.com

Read the description of this standard for your grade level. Underline or highlight important ideas.

What new ideas do you have?

Counting and Cardinality

- First domain (Kindergarten)
- Number sense foundation
  - Leads to Numbers and Operations in Base ten as well as Operations and Algebraic Thinking in later grades
- Broken into seven standards
  - K.CC.1 – K.CC.7

Know number names and the count sequence

- K.CC.1 Count to 100 by ones and tens
- K.CC.2 Count forward from any given number within the known sequence (instead of beginning at 1).
- K.CC.3 Write/Represent the numbers 0-20

Count to tell the number of objects

- K.CC.4 Understand the relationship between numbers and quantities; connect counting to cardinality
  a. When counting objects, pair each object with one number name and vice versa.
  b. Understand that the last number name said tells the number of objects counted. The number is the same regardless of arrangement or order counted.
  c. Understand that each successive number name refers to a quantity that is one larger.

Count to tell the number of objects

- K.CC.5 Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1–20, count out that many objects.

Count to tell the number of objects
K.CC.4 – K.CC.5

- Children need to know that as they count, each object has a particular name.

- Counting involves knowing that the last number named represents the last object and the last number counted represents the total number of objects.

- Counting is knowing that the number of objects does not change when the objects are rearranged, moved or concealed

Compare Numbers

- K.CC.6 Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.

- K.CC.7 Compare two numbers between 1 and 10 presented as written numerals.

Domain: Operations and Algebraic Thinking K-5

Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from. ***K***

1. Represent addition and subtraction with objects, fingers, mental images, drawings[2], sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.

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

Represent and solve problems involving addition and subtraction *Grade One*

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.[2]

2. Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

Represent and solve problems involving addition and subtraction *Grade Two*

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.[2]

Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from. **K**

3. Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1).

4. For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.

5. Fluently add and subtract within 5.

Understand and apply properties of operations and the relationship between addition and subtraction Gr 1

3. Apply properties of operations as strategies to add and subtract.[3] *Examples: If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known. (Commutative property of addition.) To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12. (Associative property of addition.)*

4. Understand subtraction as an unknown-addend problem. *For example, subtract 10 – 8 by finding the number that makes 10 when added to 8.*

Add and subtract within 20 Gr 1

5. Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).

6. Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten

(e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14);

decomposing a number leading to a ten

(e.g., 13 – 4 = 13 – 3 – 1 = 10 – 1 = 9);

using the relationship between addition and subtraction

(e.g., knowing that 8 + 4 = 12, one knows 12 – 8 = 4);

and creating equivalent but easier or known sums

(e.g., adding 6 + 7 by creating the known equivalent

6 + 6 + 1 = 12 + 1 = 13).

Add and subtract within 20 *Gr 2*

2. Fluently add and subtract within 20 using mental strategies.[2] By end of Grade 2, know from memory all sums of two one-digit numbers.

Work with addition and subtraction equations Gr 1

7. Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. *For example, which of the following equations are true and which are false? 6 = 6, 7 = 8 – 1, 5 + 2 = 2 + 5, 4 + 1 = 5 + 2.*

8. Determine the unknown whole number in an addition or subtraction equation relating to three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations*

8 + ? = 11, 5 = *– 3, 6 + 6 =* *.*

Work with equal groups of objects to gain foundations for multiplication *Gr 2*

3. Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.

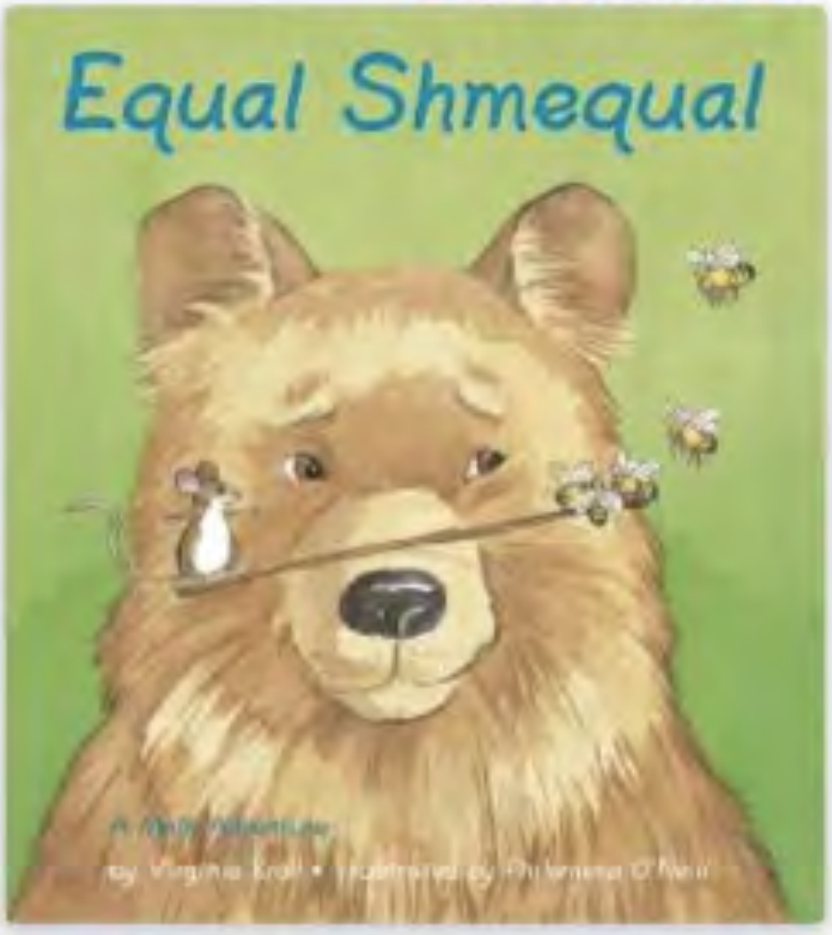
4. Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.

$$8 + 4 = \square + 5$$

TABLE 1

Percent of children offering various solutions to 8 + 4 = □ + 5

Grade	Answers Given					Number of Children
	7	12	17	12 and 17	Other	
1	0	79	7	0	14	42
1 and 2	6	54	20	0	20	84
2	6	55	10	14	15	174
3	10	60	20	5	5	208
4	7	9	44	30	11	57
5	7	48	45	0	0	42
6	0	84	14	2	0	145


Equal Shmequal

Homework:

- Read: Student Centered Mathematics K-2 Chapter 9, complete reflection sheet