MATHEMATICALLY POWERFUL STUDENTS KNOW NUMBERS AND RECOGNIZE RELATIONSHIPS. DO YOURS?

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CCSS- Kindergarten

Students

- choose, combine, and apply effective strategies for answering quantitative questions
- quickly recognize the cardinalities of small sets of objects
- count and produce sets of given sizes
- count the number of objects in combined sets, or
- count the number of objects that remain in a set after some are taken away
- find the number that makes 10 when added to the given number (1-9, using objects, drawings, or equations)
- fluently add and subtract within 5

CCSS- First Grade

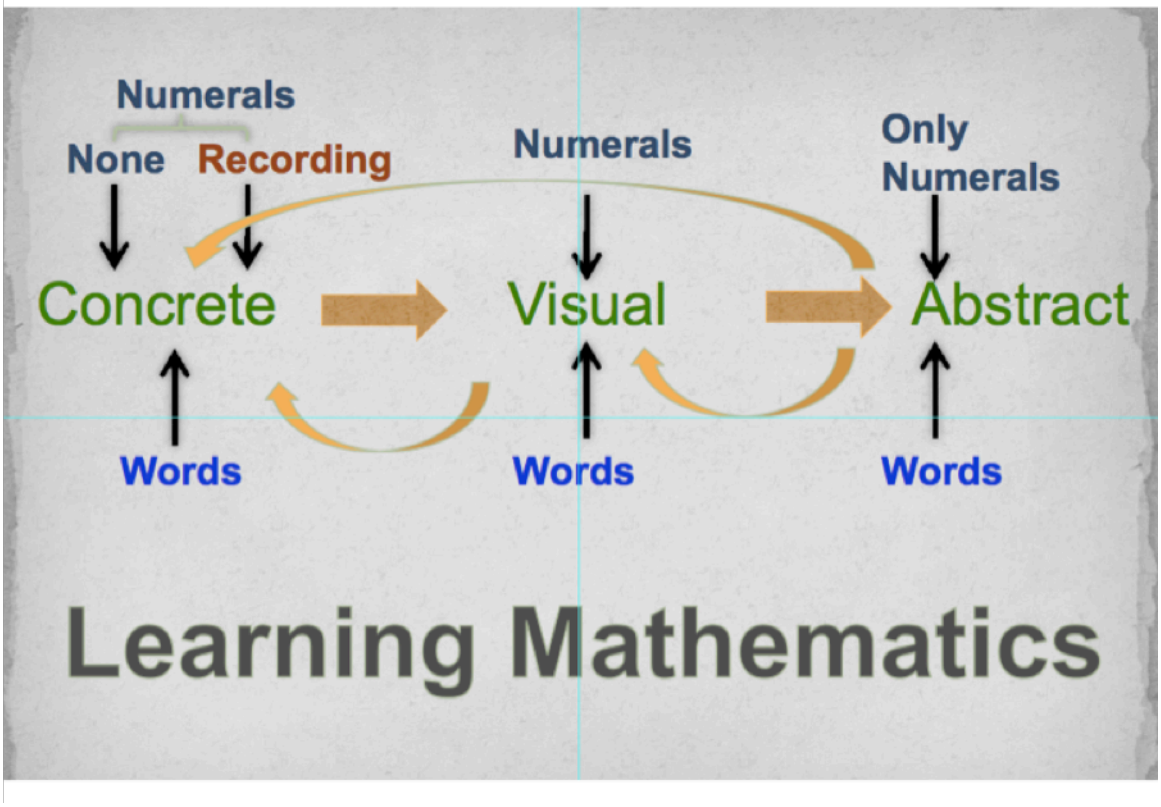
Students

- develop strategies for adding and subtracting whole numbers based on their prior work with small numbers
- use a variety of models, including discrete objects and length-based models
- understand connections between counting and addition and subtraction
- use increasingly sophisticated strategies based on properties (e.g., "making tens") to solve addition and subtraction problems within 20
- develop, discuss, and use efficient, accurate, and generalizable methods to add within 100 and subtract multiples of 10

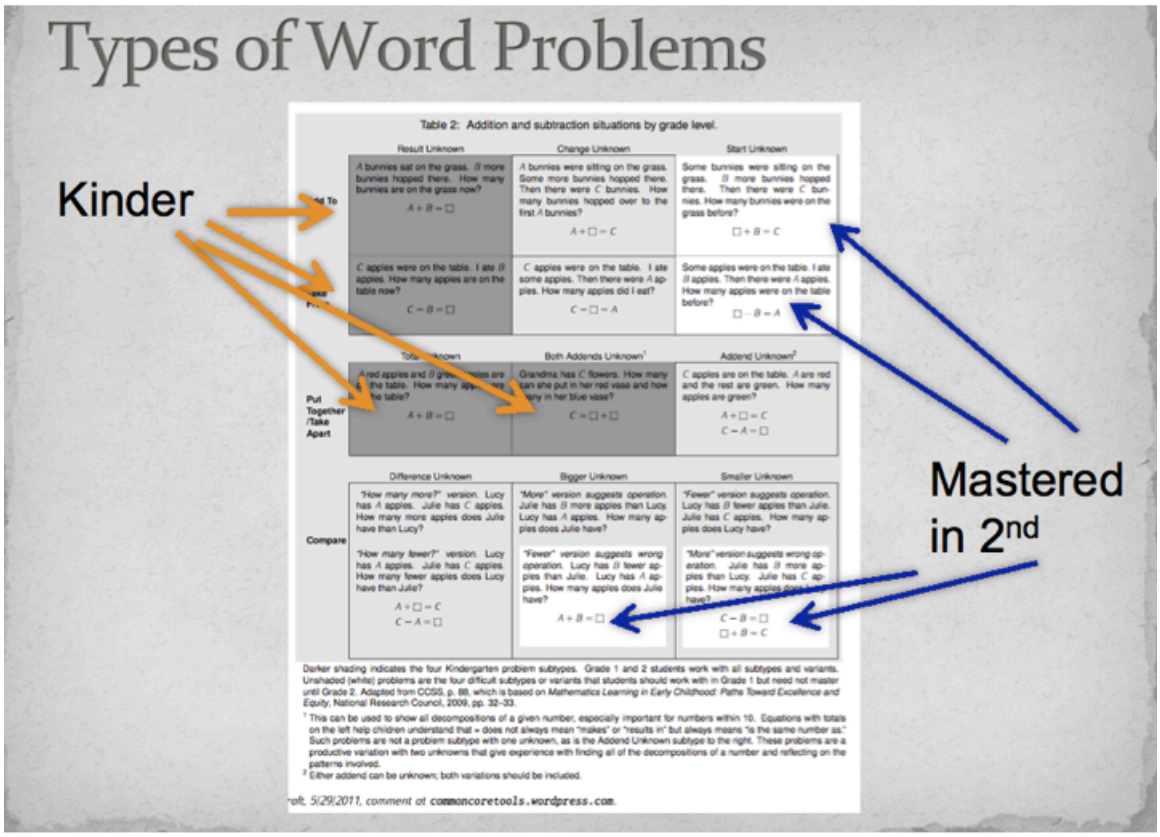
CCSS- Second Grade

Students

- develop fluency with addition and subtraction within 100
- develop, discuss, and use efficient, accurate, and generalizable methods to solve problems that require computation of sums and differences of whole numbers
- use their understanding of place value and the properties of operations
- select and accurately apply methods that are appropriate for the context and the numbers involved to mentally calculate sums and differences for numbers with only tens or only hundreds.



Types of Word Problems



Counting Collections

Count, count and count some more

Children need lots of experience with counting to learn which number comes next, how this number sequence is related to the objects in front of them, and how to keep track of which ones have been counted and which still need to be counted (Fuson 1988).

Experience with counting provides a solid foundation for future experience with addition, subtraction, multiplication, and division (National Research Council 2001).

Schwerdtfeger, J.K and A. Chan (2007, March) Counting collections. *Teaching Children Mathematics*.

Counting Collections

Count, count and count some more

Kinder – cadence, number names, one more concept, last name is total, keep track of tracking, teens as 10 ones plus some more, one-to-one correspondence

First – learn one more and ten more, count different units (ones and tens), teens (1 ten plus more), grouping to count

Second – count different units (1s, 10s, 100s), attend to place value

There is more to subitizing!

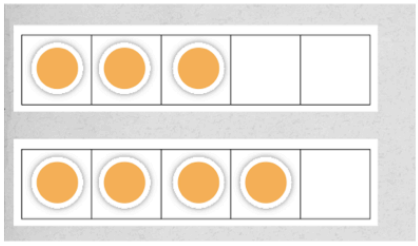
Perceptual → **Conceptual**

Instantly seeing how many — Seeing a composite of parts

Clements, Doug (1999,March). Subitizing: What it is. Why teach it. *Teaching Children Mathematics*

Using 2 Five-Frames

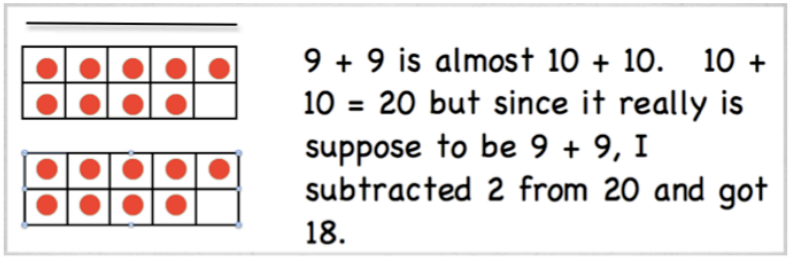
7 = _____



3 + 4 = 5 + 2
3 + 4 = 3 + 3 + 1
3 + 4 = 6 + 1

1.OA.7 Understand the meaning of the equal sign . . .

Jae had 9 cards. Then his friend, Sara, gave him 9 more cards. How many cards does he have now?



Resources

Schwerdtfeger, J.K and A. Chan (2007, March) Counting collections. *Teaching Children Mathematics*.

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http://illuminations.nctm.org
K-2 activities using 5 and 10 frames

Ten Frame Train by Didax

Book: It Makes Sense: Using Ten-Frames to Build Number Sense