



## Math Content by Strand<sup>1</sup>

### Number and Operations: Whole Numbers Counting and the Number System

#### Kindergarten

A main focus in Kindergarten is counting, which is the basis for understanding the number system and for almost all the number work in the primary grades. Students hear and use the counting sequence (the number names, in order) in a variety of contexts. They have many opportunities to connect the number names with the written numbers and with the quantities they represent. They have repeated experiences counting sets of objects, and matching and making sets of a given size. As students count sets of objects and make equal sets they begin to see the importance of counting each object once and only once, and of having a system for keeping track of what has been counted and what still remains to be counted. Students engage in repeated practice with counting and develop visual images for quantities to 10.



*This student used pictures, numbers and words to show that he counted 13 nuts. He drew a circle for each nut and wrote both the number and the word – '13 nts.' When he recounted his circles to check, he realized he had one too many, so he scribbled out one circle.*

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<sup>1</sup> This document applies to the 2nd edition of *Investigations* (2008, 2012). See <http://investigations.terc.edu/CCSS/> for changes when implementing *Investigations and the Common Core Standards*.

As students are developing accurate counting strategies they are also building an understanding of how the numbers in the counting sequence are related: Each number is one more (or one less) than the number before (or after) it. Students develop an understanding of the concepts of greater than, fewer than, and equal to, and develop language for describing quantitative comparisons (e.g. bigger, more, smaller, fewer, less, same, equal) as they count and compare quantities.

**Example:** Write the names of the people in your home. Circle the name with the most letters.

Daniel	Matt	Kaitlyn
Sara	Mom	Dad

## Emphases

### *Counting and Quantity*

- Developing strategies for accurately counting a set of objects by ones
- Developing an understanding of the magnitude and position of numbers

## Benchmarks

- Count a set of up to 10 objects
- Compare two quantities up to 10 to see which is greater
- Count a set of up to 15 objects
- Figure out what is one more or one fewer than a number
- Write the numbers up to 10
- Count a set of up to 20 objects

## Grade 1

Throughout first grade, students work on developing strategies for accurately counting a group of up to 50 objects. They have repeated practice with the counting sequence, both forwards and backward, and with counting and keeping track of sets of objects. They also connect the number names with the written numbers and the quantities that they represent.

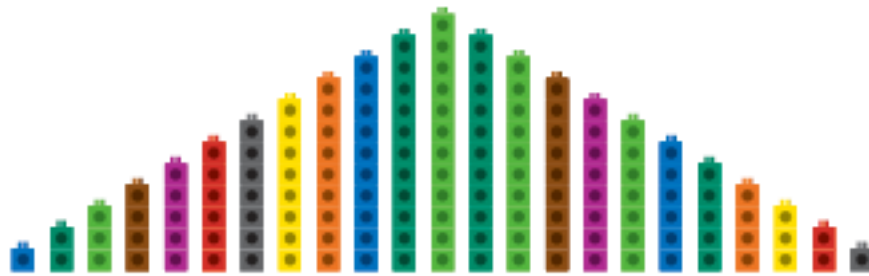
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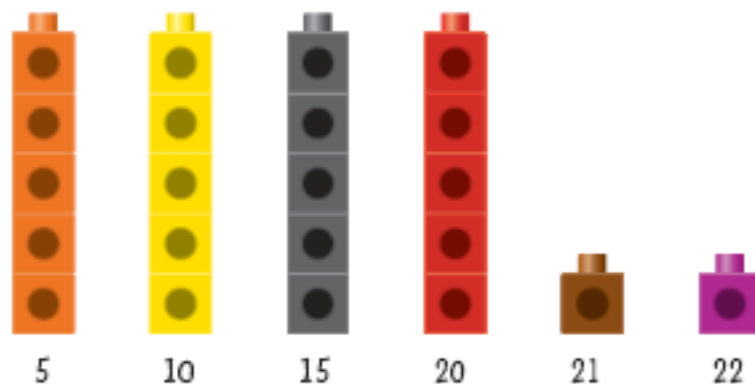


As students are developing accurate counting strategies they are also building an understanding of how the numbers in the counting sequence are related—each number is one more (or one less) than the

number before (or after) it. As students build this understanding, they compare and order quantities and develop a sense of the relative size of numbers and the quantities they represent.



Students also make sense of counting by numbers other than 1. They connect the number sequence of counting by 2s, 5s, and 10s to the quantities they represent. As they work on activities that involve multiple groups of the same amount, they build an understanding that as they say each number in the counting sequence, they are adding 2, 5 or 10 more things. This leads to more efficient and accurate counting.



## Emphases

### *Counting and Quantity*

- Developing strategies for accurately counting a set of objects by ones
- Developing an understanding of the magnitude and position of numbers

## Benchmarks

- Count a set of up to 20 objects
- Compare and order quantities up to 12
- Count a set of 40 to 50 objects
- Rote count, read, and write numbers up to 65
- Begin to use groups in meaningful ways
- Identify, read, write, and sequence numbers up to 105

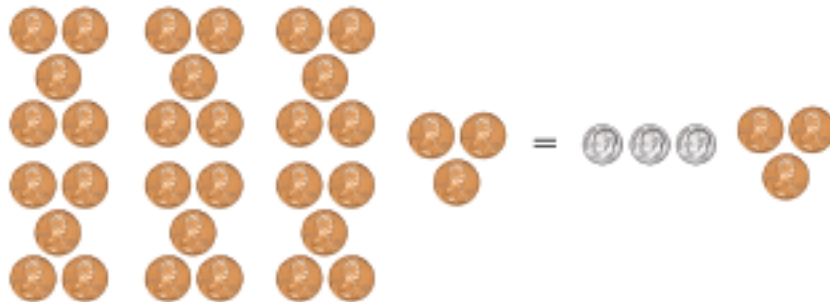
## Grade 2

At the beginning of the school year, students have varied opportunities to count sets of objects by ones, write the number sequence, and explore and compare representations of the counting numbers on the number line and the 100 chart. As the school year progresses, most second graders shift from thinking and working primarily with ones to thinking and working with groups of ones. To help them make this shift, students have many opportunities to develop strategies for grouping and for counting by groups. The focus is first on contexts that encourage counting by groups of 2, 5, or 10 and then specifically on groups of 10 and the base ten structure of our number system.

**Example:** There are 6 people in our classroom. How many legs are there?



**Example:** If I have 33 pennies and I trade them for as many dimes as I can, how many dimes will I have? How many pennies?



3 groups of 10 pennies and 1 group of 3 pennies equals 3 dimes and 3 pennies.

In Grade 2, students work extensively with contexts and models that represent the place value structure of our base-ten number system. They use these contexts to build and visualize how two-digit numbers are composed. For example, 33 cents can be composed of 3 dimes and 3 pennies or 2 dimes and 13 pennies or 1 dime and 23 pennies.

As an extension of their work with number composition, students investigate even and odd numbers through the context of partners (groups of two) and teams (two equal groups) and then develop definitions of even and odd numbers.

**Example:** If there are 12 students, can everyone have a partner?



Can there be two equal teams?



Is 2 even or odd? Why do you think so?

A student might respond: “Even because everyone would have a partner, and there would be two teams with no leftovers.”

## Emphases

### *Counting and Quantity:*

- Developing strategies for accurately counting a set of objects by ones and groups
- Developing an understanding of the magnitude and sequence of numbers up to 100
- Counting by equal groups

### *The Base Ten Number System*

- Understanding the equivalence of one group and the discrete units that comprise it

## Benchmarks

- Count a set of objects up to 60 in at least one way
- Define even and odd numbers in terms of groups of two or two equal groups
- Recognize and identify coins and their values
- Interpret and solve problems about the number of tens and ones in a quantity
- Know coin equivalencies for nickel, dime, and quarter
- Count by 2s, 5s, and 10s, up to a number