Teacher Guide to Clarification

Instructional Math Materials

**K.CC.4**

**Count to tell the number of objects**

K.CC.4 Understand the relationship between numbers and quantities; connect counting to cardinality.

1. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.
2. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.
3. Understand that each successive number name refers to a quantity that is one larger.

**Cardinality**

**Cardinality** of a set is the measure of elements in the set.

 Example 1: Set A = {1,3,8,17,22}, the cardinality is 5 because there are 5 elements in the set.

Example 2: The cardinality is 3.

The alphabet is taught in a specific order and references letters and pictures that begin with that letter. Counting should be taught similarly.

Example 3: The cardinality is 8.

**Coherence and Connections: Need to Know**

Students will need a basic ability to count before asking questions specific to cardinality. However, this connection should be made early in their work with counting.

For students to truly develop fluency with cardinality, objects should be moved around, spaced apart in different arrangements, and compared. This also connects directly to K.CC.5.

Students understand that the last number name said in counting tells the number of objects counted. Prior to reaching this understanding, a student who is asked “How many kittens?” may regard the counting performance itself as the answer, instead of answering with the cardinality of the set.

Students expand their work in addition and subtraction from within 5 to within 10. They use Level 1 methods developed from smaller totals as they represent and solve problems with objects, their fingers, and math drawings. Patterns such as “adding one is just the next counting word (**K.CC.4c**)” and “adding zero gives the same number” become more visible and useful for all the numbers from 1 to 9. Patterns such as the 5+n pattern used widely around the world play an important role in learning particular additions and subtractions, and later as patterns in steps in the Level 2 and 3 methods. Fingers can be used to show the same 5-patterns, but students should be asked to explain these relationships explicitly because they may not be obvious to all students (MP.3). As the school year progresses, students internalize their external representations and solution actions, and mental images become important in problem representation and solution.



Common Core Standards Writing Team. (2013, September 19). *Progressions for the Common
 Core State Standards in Mathematics(draft). K-5 Counting and Cardinality and
 Operations and Algebraic Thinking.* Tucson, AZ: Institute for Mathematics and
 Educations, University of Arizona.

Teachers should be careful to always use proper terminology when counting items. That is to say, “1,2,3…n. There are a total of n objects.” Or “1,2,3..,n. There are n objects.” This clear separation between the count itself and the total count, or cardinality, is necessary for students to develop a clear distinction between the two.

This idea of cardinality will help students develop fluency in subitizing later in the year. Subitizing leads to students developing strong understandings of strategies for adding, subtracting, multiplying and dividing.

“Much of the learning in kindergarten – K.CC.6, all of K.OA and K.NBT, and K.MD.3 – depends on the foundational ability to count to answer “how many?” (K.CC.6), which itself is grounded in **K.CC.4**.”

*PARCC Draft Model Content Frameworks: Mathematics Grades K-2* (2013, December).
 Retrieved May 10, 2014, from <http://parcconline.org/sites/parcc/files/PARCCMCFMathematicsNovember2012V3_FINAL_0.pdf>

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| --- | --- |
| Grade-Level | Grade Above |
| K.CC.1K.CC.2**K.CC.4**K.CC.5K.CC.6 | 1.OA.5 |

Show the first PowerPoint several times to help students learn to count in order. Then use the animals section to begin work on cardinality. You can mix up the slides when students start getting proficient.

**Classroom Resource**

 K.CC.4.pptx

There are a few slides at the end that help begin students’ abilities to answer “How many?” without reviewing counting in sequence. It is alright for students to count out the objects, but important to help students realize that the last number they say in counting is the total number of objects. If students count 5 puppies in the first picture, one at a time, then make sure they are phrasing a complete answer. For example, “There are 1, 2, 3, 4, 5 puppies. There are 5 puppies in the picture.”

The last two slides address K.CC.4c specifically: Understand that each successive number name refers to a quantity that is one larger.

**Consider taking pictures of items in the classroom or around the school to increase student engagement.**

**HOT Questions**

1. Show students a set of objects and ask them how many there are. Mix up the order of the objects and ask again. Change the number of objects and ask again. Listen for students to articulate the difference in answering “how many” and them counting objects
2. Show a picture of objects and give the incorrect number. Ask if the number correctly shows the number of objects. Tell students to find the total number of object. Standard for Mathematical Practice 3

**Additional Resources**

Illustrative Mathematics
<http://www.illustrativemathematics.org/illustrations/1113>

<http://www.illustrativemathematics.org/illustrations/1209>

<http://www.illustrativemathematics.org/illustrations/1149>

Illinois Math Shift Kit Task <http://education.illinoisstate.edu/downloads/casei/math/6.%20K%20Rolling%20a%20Number%20Cube%20Task.pdf>

Hawaii Tasks
<http://standardstoolkit.k12.hi.us/1-10-counting-k-cc-3-k-cc-4/>

<http://standardstoolkit.k12.hi.us/0-20-counting-k-cc-3-k-cc-4/>