Counting and Cardinality

Know number names and the counting sequence. **NC.K.CC.1** Know number names and recognize patterns in the counting sequence by: • Counting to 100 by ones. • Counting to 100 by tens.	
Clarification	**Checking for Understanding**
In this standard, students rote count by starting at one and counting to 100. • When counting by ones, students need to understand that the next number in the sequence is one more. • When students count by tens they are only expected to master counting on the decade (0, 10, 20, 30, 40 …). Students need to understand that the next number in the sequence is "ten more" (or one more group of ten). The focus of this standard is on using patterns in the number sequence to count. It does not require recognition of numerals or writing numerals.	Start at 1 and count by ones. Students should be able to count correctly to 100 by ones without skipping numbers, repeating numbers, or hesitating. Start at 10 and count by tens. Students should be able to count correctly to 100 by tens without skipping numbers, repeating numbers, or hesitating.

Know number names and the counting sequence. **NC.K.CC.2** Count forward beginning from a given number within the known sequence, instead of having to begin at 1.	
Clarification	**Checking for Understanding**
In this standard, students count forward within 100 from a number other than one without having to go back and start at one. This skill is a prerequisite skill for counting on when students begin to work with addition. The standard does not require recognition of numerals or writing numerals. It is focused on the patterns in the number sequence.	Start at 42 and count by ones until I tell you to stop. Students should be able to count correctly starting at the given number without skipping numbers, repeating numbers or hesitating.

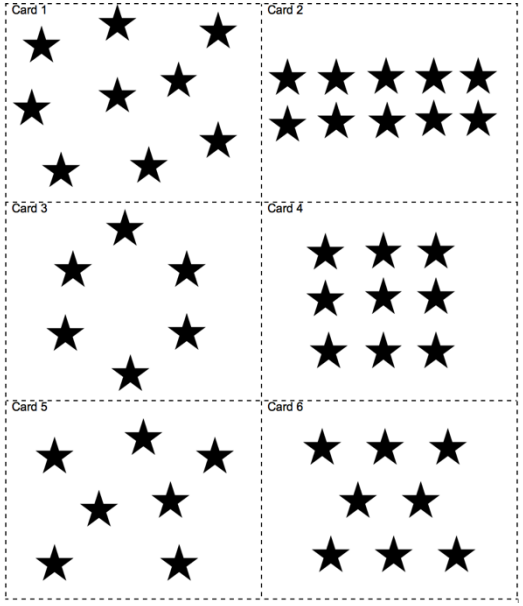
Return to Standards

Count to tell the number of objects.

NC.K.CC.5 Count to answer "How many?" in the following situations:

- Given a number from 1–20, count out that many objects.
- Given up to 20 objects, name the next successive number when an object is added, recognizing the quantity is one more/greater.
- Given 20 objects arranged in a line, a rectangular array, and a circle, identify how many.
- Given 10 objects in a scattered arrangement, identify how many.

Clarification	**Checking for Understanding**

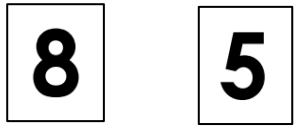
When counting to answer "how many", students employ two big understandings from NC.K.CC.4: one-to-one correspondence and cardinality. They say one number for each item counted (one-to-one correspondence) and know the last number counted tells the quantity of the set (cardinality).
• This standard asks that students are both counters and producers.
  ○ **Producer**: When given a number, a student counts out a set of objects or draw a picture to match.
  ○ **Counter**: When given a set of objects or drawings, a student counts to determine "how many".
• After numerous experiences with counting objects, along with the developmental understanding that a group of objects counted multiple times will remain the same amount, students recognize the need for keeping track in order to determine "how many". Some arrangements, such as a line or rectangular array, are easier to count. However, they may limit students' flexibility with developing meaningful tracking strategies, so providing multiple arrangements help children learn how to keep track. Since scattered arrangements are the most challenging, this standard specifies that students only count up to 10 objects in a scattered arrangement and count up to 20 objects in a line, rectangular array, or circle. Depending on the amount of objects to be counted, and students' confidence with counting a set of objects, students may move the objects as they count each, point to each object as counted, look without touching when counting, or use a combination of these strategies.
• An important component of this standard is that of naming the next successive number when an object is added to a set, which is based on the idea of inclusion. Inclusion is the understanding that numbers build by exactly one each time and that they nest within each other by this amount. A set of three objects is nested within a set of 4 objects; within this same set of 4 objects is also a set of two objects and a set of one. Using this understanding, if a student has four objects and wants to have 5 objects, the student is able to add one more- knowing that four is within, or a sub-part of, 5 (rather than removing all 4 objects and starting over to make a new set of 5). This concept is critical for the later development of part/whole relationships.
	"Producing a Set" Task:
	• Teacher places a bowl of objects on table and asks student to count out a set of 15 objects.
	• Student removes 15 objects from the bowl and places them on the table while counting aloud.
	• Teacher adds one more object to the set of 15, and asks, "How many are there now?"
	Rather than re-counting the entire set, the student says the next number in the counting sequence…16.
	
	"Counting a Set" Task: Given a set of cards, students count the quantity of stars in each arrangement.
	 

Return to Standards

Compare numbers.
NC.K.CC.6 Identify whether the number of objects, within 10, in one group is greater than, less than, or equal to the number of objects in another group, by using matching and counting strategies.

Clarification	**Checking for Understanding**
This standard calls for students use their counting ability to compare two sets of concrete objects (0 to 10). Early comparisons involve matching objects from each set in order to see if a group has extras, or repeatedly removing one object from each group until only one group is left with extra objects. Later, students apply their knowledge of number to count the objects in each group, determining which group has more/less. An important goal of this standard is to develop comparison language: more/greater, less/fewer, and equal/same amount. This language supports standards in successive grades where students are asked, "How many more?" and "How many less?"	Students are given a set of triangles and a set of squares. They are asked to find which set has more. *Possible responses:* Student A Matching *I lined up one square and one triangle. Since there is one extra triangle, there are more triangles than squares.*  Student B Equal Shares *I put them in a pile. I then took away objects. Every time I took a square, I also took a triangle. When I had taken almost all the shapes away, there was still a triangle left. That means that there are more triangles than squares.* Student C Compare Counts *I counted the squares and I got 4. Then I counted the triangles and got 5. Since 5 is bigger than 4, there are more triangles than squares.*

Compare numbers
NC.K.CC.7 Compare two numbers, within 10, presented as written numerals

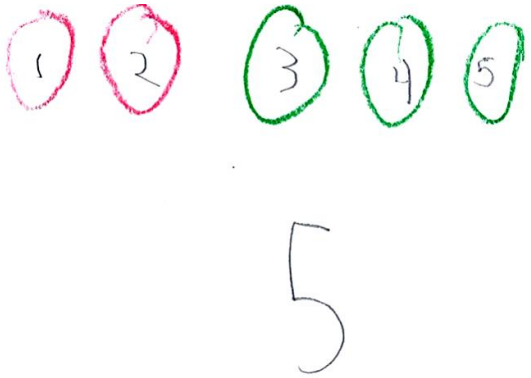
Clarification	**Checking for Understanding**
Students apply their understanding of numerals 1 to 10 to compare one numeral to another. For example, looking at the numerals 8 and 10, a student can recognize that the numeral 10 represents a larger amount than the numeral 8. Students need ample experiences with actual sets of objects (NC.K.CC.3 and NC.K.CC.6) before completing this standard with only numerals.	When shown two numerals, student determines which is greater or if they are both equal. 

Return to Standards

Understand addition and subtraction.

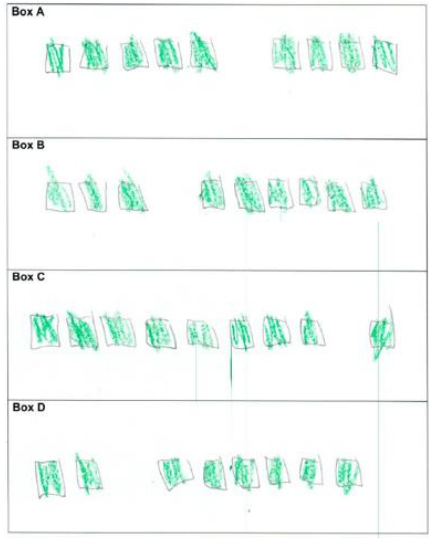
NC.K.OA.1 Represent addition and subtraction, within 10:

- Use a variety of representations such as objects, fingers, mental images, drawings, sounds, acting out situations, verbal explanations, or expressions.
- Demonstrate understanding of addition and subtraction by making connections among representations.

Clarification	**Checking for Understanding**
In this standard, students demonstrate understanding of how objects can be put together (composed) and taken apart (decompose) by modeling addition and subtraction of up to 10 objects in various ways. This standard develops the understanding that addition and subtraction of whole numbers is based on sequential counting with whole numbers. Situations that can be represented by addition or subtraction can be considered as basic applications of counting forward or back. Within this standard, students build on their counting skills and continue to establish one-to-one correspondence by moving, touching, or pointing to concrete objects that they are counting as they say corresponding number words (NCTM). This standard is focused on understanding the concept of addition and subtraction, rather than reading and solving addition and subtraction number sentences (equations). Therefore, before introducing symbols (+, -, =) and equations, kindergarteners require numerous experiences using addition and subtraction vocabulary in order to attach meaning to the various symbols. For example, when explaining a solution, kindergartens may state, "*Three and* two *is the same amount as* 5." While the meaning of the equal sign is not introduced as a standard until First Grade, if equations are going to be modeled and used in Kindergarten, students must connect the symbol (=) with its meaning (is the same amount/quantity as).	Lilly has two pieces of red candy and three pieces of green candy. How many pieces of candy does Lilly have? *Possible response:* *I drew two red candies and three green candies. I put them together to see how many pieces of candy Lilly has.* 

Return to Standards

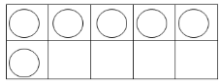
Understand addition and subtraction.
NC.K.OA.3 Decompose numbers less than or equal to 10 into pairs in more than one way using objects or drawings, and record each decomposition by a drawing or expression.

Clarification	**Checking for Understanding**
In this standard, students develop an understanding of part-whole relationships as they recognize that a given group of objects (up to 10) can be decomposed into sub-groups while remaining equivalent to the total amount. For example, a set of 6 cubes can be separated into a set of 2 cubes and a set of 4 cubes while remaining 6 total cubes. Additionally, this standard asks students to recognize that a group can be decomposed (broken apart) in multiple ways. As students use concrete objects and drawings to explore this concept, they search for all partners that compose a number, noticing patterns as they work. Through these experiences, students discover number relationships and begin to internalize addition/subtraction facts. In Kindergarten, students need ample experiences breaking apart numbers and using the vocabulary "and" & "same amount as" before symbols (+, =) and equations (5= 3 + 2) are introduced. If equations are used, a mathematical representation (picture, objects) needs to be present as well.	How many ways can you break 9 into two parts? Use a drawing or numbers to show your work. *Possible responses:* *Student A:* *Creates a list of partners of 9* • *1 and 8* • *2 and 7* • *3 and 6* • *4 and 5* *Student B:* 

Return to Standards

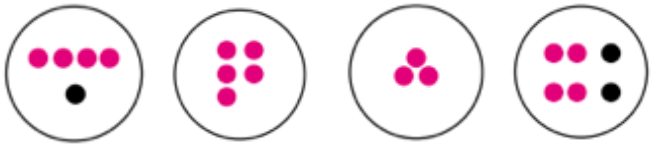
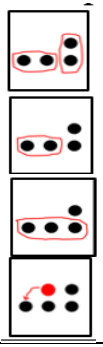
Understand addition and subtraction.

NC.K.OA.4 For any number from 0 to 10, find the number that makes 10 when added to the given number using objects or drawings, and record the answer with a drawing or expression.

Clarification	**Checking for Understanding**
This standard builds on the work of NC.K.OA.3, where students developed an understanding that a number, less than or equal to 10, can be decomposed into parts. Standard NC.K.OA.4 calls for students to find the number that makes ten when added to a given number. Through numerous concrete experiences, kindergarteners will model the various sub-parts of ten and find the missing part of 10.	John has 6 beans. How many more beans does he need to have 10 beans?  *"I have 6 beans. I need 4 more beans to have 10 in all."* A full case of juice boxes has 10 boxes. There are only 6 boxes in this case. How many juice boxes are missing? *Possible responses:* Student A: *Using a Ten-Frame* *I used a ten frame for the case. Then, I put on 6 counters for juice still in the case. There's no juice in these 4 spaces. So, 4 are missing.*  Student B: *Think Addition* *I counted out 10 counters because I knew there needed to be ten. I pushed these 6 over here because they were in the container. These are left over. So, there's 4 missing.* 

Understand addition and subtraction.

NC.K.OA.6 Recognize and combine groups with totals up to 5 (conceptual subitizing).

Clarification	**Checking for Understanding**
This standard calls for students to conceptually subitize a group of objects (up to 5). Conceptual subitizing involves recognizing a number pattern as a group composed of subgroups. Students visually see subgroups of quantities within a larger quantity and learn that the subgroups can be combined to compose a whole. This standard is connected to NC.K.CC.4 where students perceptually subitize, as they "instantly see" a set of up to five objects without using other mental processes. Standard NC.K.OA.6 extends the work of NC.K.CC.4 as students notice patterns of dots (subgroups) within the whole set and use other mental processes to determine the whole quantity. For example, a student may instantly see part of the set and count on, or they may see two parts of the set and know the total amount. Conceptual subitizing develops from frequent and varied experiences counting sets of objects and noticing patterning within sets. It helps develop number sense and is the basis for addition and subtraction.	"Quick Image" Task: Teacher displays a dot card for 3-4 seconds and asks students to find the quantity without counting each dot individually.  Student A: *I see two and one. I know that makes three.* Student B: *I saw two. Then, I said "three" because that's one more.* Steps are repeated with additional dot cards.  Task: The teacher displays a dot card and asks students to find "how many" without counting each individual dot. Students explain how they found the quantity. *Possible responses:*  *"I saw 2 and 2. I know that makes 4."* *"I saw 2. Then, I counted 3, 4."* *"I saw 3. One more makes 4."* *"It looked like 4 on a die/dice, but one dot fell down."*

Return to Standards