North Carolina Department of Public Instruction
INSTRUCTIONAL SUPPORT TOOLS
FOR ACHIEVING NEW STANDARDS

Kindergarten Mathematics ● Unpacked Contents
For the new Standard Course of Study that will be effective in all North Carolina schools in the 2017-18 School Year.

This document is designed to help North Carolina educators teach the Kindergarten Mathematics Standard Course of Study. NCDPI staff are continually updating and improving these tools to better serve teachers and districts.

What is the purpose of this document?
The purpose of this document is to increase student achievement by ensuring educators understand the expectations of the new standards. This document may also be used to facilitate discussion among teachers and curriculum staff and to encourage coherence in the sequence, pacing, and units of study for grade-level curricula. This document, along with on-going professional development, is one of many resources used to understand and teach the NC SCOS.

What is in the document?
This document includes a detailed clarification of each standard in the grade level along with a *sample* of questions or directions that may be used during the instructional sequence to determine whether students are meeting the learning objective outlined by the standard. These items are included to support classroom instruction and are not intended to reflect summative assessment items. The examples included may not fully address the scope of the standard. The document also includes a table of contents of the standards organized by domain with hyperlinks to assist in navigating the electronic version of this instructional support tool.

How do I send Feedback?
Link for: Feedback for NC's Math Unpacking Documents We will use your input to refine our unpacking of the standards. Thank You!

Just want the standards alone?
Link for: NC Mathematics Standards

North Carolina Course of Study – Kindergarten Standards

Standards for Mathematical Practice

Counting and Cardinality	Operations and Algebraic Thinking	Number and Operations in Base Ten	Measurement and Data	Geometry
Know number names and the counting sequence. NC.K.CC.1 NC.K.CC.2 NC.K.CC.3 *Count to tell the number of objects.* NC.K.CC.4 NC.K.CC.5 *Compare numbers.* NC.K.CC.6 NC.K.CC.7	*Understand addition and subtraction.* NC.K.OA.1 NC.K.OA.2 NC.K.OA.3 NC.K.OA.4 NC.K.OA.5 NC.K.OA.6	*Build foundation for place value.* NC.K.NBT.1	*Describe and compare measurable attributes.* NC.K.MD.1 NC.K.MD.2 *Classify objects and count the number of objects in each category.* NC.K.MD.3	*Identify and describe shapes.* NC.K.G.1 NC.K.G.2 NC.K.G.3 *Analyze, compare, create, and compose shapes.* NC.K.G.4 NC.K.G.5 NC.K.G.6

Standards for Mathematical Practice

Practice	Explanation and Example
1. Make sense of problems and persevere in solving them.	Mathematically proficient students in Kindergarten begin to develop effective dispositions toward problem solving. In rich settings in which informal and formal possibilities for solving problems are numerous, young children develop the ability to focus attention, test hypotheses, take reasonable risks, remain flexible, try alternatives, exhibit self-regulation, and persevere (Copley, 2010). Using both verbal and nonverbal means, kindergarten students begin to explain to themselves and others the meaning of a problem, look for ways to solve it, and determine if their thinking makes sense or if another strategy is needed. As the teacher uses thoughtful questioning and provides opportunities for students to share thinking, kindergarten students begin to reason as they become more conscious of what they know and how they solve problems.
2. Reason abstractly and quantitatively.	Mathematically proficient students in Kindergarten begin to use numerals to represent specific amount (quantity). For example, a student may write the numeral "11" to represent an amount of objects counted, select the correct number card "17" to follow "16" on the calendar, or build a pile of counters depending on the number drawn. In addition, kindergarten students begin to draw pictures, manipulate objects, use diagrams or charts, etc. to express quantitative ideas such as a joining situation (Mary has 3 bears. Juanita gave her 1 more bear. How many bears does Mary have altogether?), or a separating situation (Mary had 5 bears. She gave some to Juanita. Now she has 3 bears. How many bears did Mary give Juanita?). Using the language developed through numerous joining and separating scenarios, kindergarten students begin to understand how symbols (+, -, =) are used to represent quantitative ideas in a written format.
3. Construct viable arguments and critique the reasoning of others.	In Kindergarten, mathematically proficient students begin to clearly express, explain, organize and consolidate their math thinking using both verbal and written representations. Through opportunities that encourage exploration, discovery, and discussion, kindergarten students begin to learn how to express opinions, become skillful at listening to others, describe their reasoning and respond to others' thinking and reasoning. They begin to develop the ability to reason and analyze situations as they consider questions such as, "Are you sure…?" , "Do you think that would happen all the time…?", and "I wonder why…?"
4. Model with mathematics.	Mathematically proficient students in Kindergarten begin to experiment with representing real-life problem situations in multiple ways such as with numbers, words (mathematical language), drawings, objects, acting out, charts, lists, and number sentences. For example, when making toothpick designs to represent the various combinations of the number "5", the student writes the numerals for the various parts (such as "4" and "1") or selects a number sentence that represents that particular situation (such as 5 = 4 + 1)*. *Kindergarten students should see addition and subtraction equations, but it is not required".
5. Use appropriate tools strategically.	In Kindergarten, mathematically proficient students begin to explore various tools and use them to investigate mathematical concepts. Through multiple opportunities to examine materials, they experiment and use both concrete materials (e.g. 3-dimensional solids, connecting cubes, ten frames, number balances) and technological materials (e.g., virtual manipulatives, calculators, interactive websites) to explore mathematical concepts. Based on these experiences, they become able to decide which tools may be helpful to use depending on the problem or task. For example, when solving the problem, "There are 4 dogs in the park. 3 more dogs show up in the park. How many dogs are in the park?", students may decide to act it out using counters and a story mat; draw a picture; or use a handful of cubes.
6. Attend to precision.	Mathematically proficient students in Kindergarten begin to express their ideas and reasoning using words. As their mathematical vocabulary increases due to exposure, modeling, and practice, kindergarteners become more precise in their communication, calculations, and measurements. In all types of mathematical tasks, students begin to describe their actions and strategies more clearly, understand and use grade-level appropriate vocabulary accurately, and begin to give precise explanations and reasoning regarding their process of finding solutions. For example, a student may use color words (such as blue, green, light blue) and descriptive words (such as small, big, rough, smooth) to accurately describe how a collection of buttons is sorted.

7. Look for and make use of structure.	Mathematically proficient students in Kindergarten begin to look for patterns and structures in the number system and other areas of mathematics. For example, when searching for triangles around the room, kindergarteners begin to notice that some triangles are larger than others or come in different colors- yet they are all triangles. While exploring the part-whole relationships of a number using a number balance, students begin to realize that 5 can be broken down into sub-parts, such as 4 and 1 or 4 and 2, and still remain a total of 5.
8. Look for and express regularity in repeated reasoning.	In Kindergarten, mathematically proficient students begin to notice repetitive actions in geometry, counting, comparing, etc. For example, a kindergartener may notice that as the number of sides increase on a shape, a new shape is created (triangle has 3 sides, a rectangle has 4 sides, a pentagon has 5 sides, a hexagon has 6 sides). When counting out loud to 100, kindergartners may recognize the pattern 1-9 being repeated for each decade (e.g., Seventy-ONE, Seventy-TWO, Seventy-THREE… Eighty-ONE, Eighty-TWO, Eighty-THREE…). When joining one more cube to a pile, the child may realize that the new amount is the next number in the count sequence.

Return to Standards

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 discovering patterns in the number sequence to count. While this standard, does not involve the recognition of numerals or writing numerals, students who are not yet able to independently demonstrate these skills may benefit from visuals with numbers printed on them such as a number path or a hundreds board (chart).	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. While this standard, does not involve the recognition of numerals or writing numerals, students who are not yet able to independently demonstrate these skills may benefit from visuals with numbers printed on them such as a number path or a hundreds board (chart).	Start at 18 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. 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

Know number names and the counting sequence.

NC.K.CC.3 Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20, with 0 representing a count of no objects.

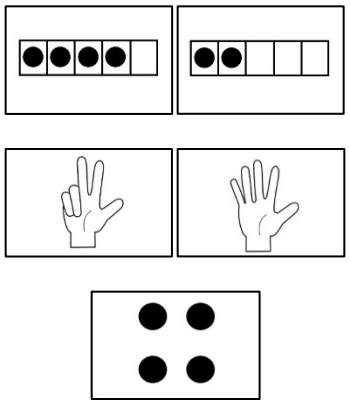
Clarification	**Checking for Understanding**
This standard calls for students to recognize and write numerals 0-20. • When shown a set with 20 or fewer objects, students count the objects (NC.K.CC.5) and then record the quantity by writing the numeral • If students are not yet able to write the numeral, students may select the appropriate number card/tile (numeral recognition). • When given a numeral, students create a set of items to represent the numeral presented. Due to variations in the development of students' fine motor and visual skills, the reversal of numerals is anticipated and acceptable as long as it does not affect place value. While reversals should be pointed out to students and the correct formation of numbers should be integrated into math activities, the emphasis of this standard is on the use of numerals to represent quantities rather than the correct handwriting formation of the actual numeral itself. This standard places emphasis on numbers 0-20 and number writing should focus on that number range. The writing of teen numbers is naturally integrated in work the NC.K.NBT.1 as students compose and decompose teen numbers.	As the teacher says a number aloud, the student records the written numeral:  After counting a set of 19 objects, the student is asked to record the numeral that represents the quantity. The student records the written numeral "19".

Return to Standards

Count to tell the number of objects.

NC.K.CC.4 Understand the relationship between numbers and quantities.

- 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 (one-to-one correspondence).
- Recognize that the last number named tells the number of objects counted regardless of their arrangement (cardinality).
- State the number of objects in a group, of up to 5 objects, without counting the objects (perceptual subitizing).

Clarification	**Checking for Understanding**
This standard calls for students to demonstrate the relationship between numbers and a set of objects. Embedded within this standard are foundational concepts that teachers should attend to and look for as they provide frequent opportunities for kindergarten students to count. Pair each object with one and only one number name and only one number name and each number name with one and only one object (one-to-one correspondence). Students implement correct counting behaviors by moving or pointing to one object at a time (one-to-one correspondence) and using one counting word for every object (synchrony/ one-to-one tagging). Recognize that the last number named tells the number of objects (cardinality): Students demonstrate the cardinality principle by counting objects in a set and understanding that the last number stated (…8, 9, **10**) represents the total number of objects: "There are **10** bears in this pile." Since an important goal for children is to count with meaning, it is important to have children answer the question, "How many?" after they count. Often, children who have not developed cardinality will count the amount again, not realizing that the **10** they stated means 10 objects in all. One-to-one correspondence and cardinality are higher-level skills, which require students to analyze, reason about, and explain relationships between numbers and sets of objects. The expectation is that students are proficient with these skills (with numbers 1-20) by the end of kindergarten. State the number of objects in a group, up to 5 objects, without counting (perceptual subitizing): This standard expects students to quickly tell how many objects are in a group by looking at an arrangement of dots, counters, or objects in a set of 5 or fewer objects. Perceptual subitizing is a crucial early skill. It strengthens students' ability to efficiently and flexibly determine "how many" when working with larger sets and supports work with composing and decomposing quantities. Perceptual subitizing is also a precursor to place value (e.g., groupings of tens) as it gives students the opportunity to see a collection of items as a unit, rather than individual items. There are two types of subitizing: perceptual and conceptual. This standard focuses on perceptual subitizing. See standard NC.K.OA.6 for information about conceptual subitizing.	One-to-one correspondence and cardinality: Student is given a tray of buttons and asked to count the set by pointing to each button and counting aloud. After counting, the teacher says, "How many buttons are in this set?" Then, the teacher rearranges the buttons (without adding to or taking from the set). The student is asked, "How many buttons are in the set now?" Perceptual subitizing: Student is shown a "quick image" card for 2-3 seconds and asked to tell "how many" without counting. Student instantly recognizes the quantity and states the number (perceptual subitizing). Steps are repeated with additional cards. 

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**
This standard intersects with NC.K.CC.4 since NC.K.CC.4 describes the foundational concepts and skills related to counting while NC.K.CC.5 provides the number range and specifics about the arrangement of objects that they will count. Every time that students count a set of objects, they will have the opportunity to demonstrate the concepts from NC.K.CC.4: • one-to-one correspondence- moving or pointing to only one object at a time • tagging/synchrony- using only one counting word for each object • cardinality- stating the total number of objects in a group. Students should have ample opportunities to count manipulatives. <u>Given a number 1-20, count out that many objects</u> This aspect of the standard calls for students to be producers of a set, meaning that they hear or read a number between 1-20 and create a set of objects that matches the number. Initially, this work could happen on a number path or a ten frame to provide structure and support for students. Kathy Richardson established research-based benchmarks of 7, 12, 21, and 31 to help teachers design learning experiences for students (Richardson, 2012). Specifically, students should first be working on counting on sets to 7 until they are independently proficient before moving onto later benchmarks. While the expectation by the end of kindergarten is 20, Richardson established 31 as the final benchmark in order to provide additional counting experiences for learners. Students are expected to check the number of counters in their set by counting them after they have created a set. The process of checking or recounting is a way to help students correct misconceptions Place value and the focus on tens and ones is addressed in NC.K.NBT.1. While students are not focusing on place value with this standard it may help some students to organize their objects in groups of 10 as they count. <u>Given up to 20 objects, name the next successive number when an object is added, recognizing the quantity is one more/greater</u>	<u>"Producing a Set" Task (Given a number, count out that many objects):</u> • The teacher places a bowl of objects on table and asks student to count out a set of 15 objects. • The student removes 15 objects from the bowl and places them on the table while counting aloud. <u>Name the Next Successive Number:</u> • The 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. <u>"Counting a Set" Task (Given a set, identify how many):</u> The teacher makes a set of 15 objects in a line. Teacher, "How many do you think there are?" Student estimates. Teacher, "Can you count them for me by touching them?" *Note: If students need to move them while counting, they can.*

Count to tell the number of objects.

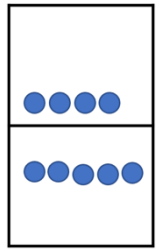
NC.K.CC.5 Count to answer "How many?" in the following situations:

- 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.

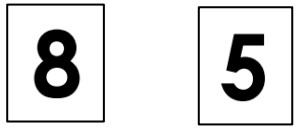
Clarification	Checking for Understanding
This aspect of the standard calls for students to first determine how many objects are in a set. Then, when asked, "how many would there be if we added one more?" students are expected to orally tell or write that number. Initially, a number path to 20 or the first 2 rows of a hundreds chart (20s chart) may provide a visual of the numbers to help students. This aspect of the standard intersects NC.K.CC.2 since students are asked to count on from a given number. As a result, the expectation is for students to eventually mentally name or write the number that would come next if one more object were added to a set. This aspect of the standard is also foundational to addition (NC.K.OA.1) as students begin adding 1 to an existing set of objects. <u>The Arrangement of Objects that Students Count</u> The last two aspects of this standard call for students to be counters, which means that students are given a set of objects and must determine how many there are. Developmentally, it is easier for students to touch objects and move them to a different location regardless of the arrangement (Richardson, 2012). When students are only touching (and not moving) objects it is easier if objects are arranged in a line or circle. The next easiest arrangement is a rectangular array. In kindergarten, students are expected to accurately count a set of up to 20 objects arranged in a line, rectangular array, and circle without moving the objects. Teachers should attend to students' individual counting behaviors and use that data to provide meaningful counting experiences. It is more challenging if students count by only touching (and not moving) objects that are in a scattered arrangement. As a result, kindergarten students are only expected to count up to 10 objects that are in a scattered 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 to use their counting skills (NC.K.CC.4, NC.K.CC.5) to count two sets and then compare them to determine if one set is greater than, less than, or equal to the number of objects in the other group. Similar to NC.K.CC.4 and NC.K.CC.5, students should have ample opportunities to count and compare concrete objects and manipulatives. 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 not expected to know and use the symbols >, <, and = until first grade.	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.* Grab a handful of counters and place them above the line. Put five counters below the line. Is the number of counters above the line greater than, less than, or equal to 5? How do you know? *This task should be repeated multiple times. *Possible Responses:* *Student A: (see picture)* *I grabbed 4 counters. When I lined them up the line of 5 was longer so that means that the number 4 is less than 5.* *Student B:* *When I count forward I say 4 before 5 so 4 is less than 5.* 

Return to Standards

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.  Note: This task should be repeated multiple times with different numbers. *Possible Responses:* *Student A: I say 8 after I say 5 when I count forward so 8 is greater than 5.* *Student B: 8 is close to 10 and 5 is farther away. So 8 is greater than 5.* *Student C: 5 is closer to 0 than 8 so 8 is greater than 5.*

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

This standard focuses on how students represent addition and subtraction problems, which includes word problems. Research strongly suggests that students benefit from exploring, representing (NC.K.OA.1), and solving (NC.K.OA.2) word problems together when developing an understanding of addition and subtraction (van de Walle et al., 2019).

This standard calls for students to show their work and represent addition and subtraction situations in multiple ways with a focus on the use of concrete objects (manipulatives). Addition should be seen as an extension of counting forward as two sets are joined together. Meanwhile subtraction should be seen as an extension of counting backwards as an object or objects are removed from an existing set. These ideas can even be explored by students early in the year with counting activities (Richardson, 2012). The table below describes connections between the counting standards and addition and subtraction concepts.

Connections between Counting, Addition and Subtraction

	Addition	**Subtraction**
	Teacher says, *"There are 4 dogs in the park. Can you show that with your counters?"* Teacher says, *"Then 1 more dog shows up. How many dogs there now?*	Teacher says, *"There are 4 dogs in the park. Can you show that with your counters?"* Teacher says, *"Then 1 of the dogs leaves. How many dogs are there now?"*
NC.K.CC.4 and NC.K.CC.5	Students represent the start number (4) correctly. Students correctly count the answer correctly.	
NC.K.OA.1	Students represent the problem correctly with counters.	
NC.K.OA.2	Students find the answer with an accurate representation.	

Checking for Understanding

Lilly has two pieces of red candy and three pieces of green candy. How many pieces of candy does Lilly have?

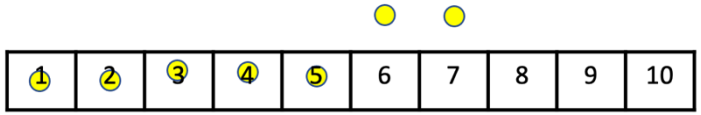
Possible response:

Teacher: How did you solve this problem?
Student: I drew two red candies and three green candies. I put them together to see how many pieces of candy Lilly has (Student representation and explanation is NC.K.OA.1).
Teacher: What was your answer?
Student states: My answer was 5 since I joined 2 and 3 together (NC.K.OA.2).

Ana had 7 hair bows. She gave 2 of them to Lisa. How many does she now have?

Possible Response:

Student A: I put 7 counters on a number path. I then took 2 of them away and noticed that the last counter is on 5 (NC.K.OA.2). So, the answer is 5 (NC.K.OA.1)



Student B: I put 7 fingers up. I took 2 away and counted the 5 that were left. (NC.K.OA.1) The answer is 5 (NC.K.OA.2)

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
<u>Uses a variety of representations</u> In kindergarten students should begin this work with ample opportunities representing joining (addition) and taking away (subtraction) situations with concrete objects. Visual structures such as a number path or a ten frame may support this work. Students can also initially represent addition and subtraction situations using their fingers and acting out situations. Students' work should transition towards paper-based representations such as drawings. 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). <u>Making Connections Among Representations</u> This aspect of the standard calls for students to make connections among various representations for the same problem. For example, students may solve the problem, "There are 6 birds in the tree and 2 fly away. How many are there now?" If students have the opportunity to choose their strategy and representation, a follow-up discussion with a class or a small group table may include opportunities for students to compare and contrast the various representations to explain how they are similar and how they are different.	

Return to Standards

Understand addition and subtraction.

NC.K.OA.2 Solve addition and subtraction word problems, within 10, using objects or drawings to represent the problem, when solving:

- Add to/Take From-Result Unknown
- Put Together/ Take Apart (Total Unknown and Two Addends Unknown)

Clarification

In this standard, students apply their work from NC.K.OA.1. As students solve addition and subtraction word problems (NC.K.OA.2), they create representations (NC.K.OA.1). Research strongly suggests that students benefit from exploring, representing (NC.K.OA.1), and solving (NC.K.OA.2) word problems together when developing an understanding of addition and subtraction (van de Walle et al., 2019). Students should always create representations of word problems.

Types of Word Problems

Kindergarten students work with four problem types (see chart: *Kindergarten Problem Types*). The first two problem types involve an action where something is physically added to or taken from the starting amount. The last two problem types do not involve an action. Instead, students work with part-part-whole relationships.

Kindergarten Problem Types

Action	**Add To-Result Unknown**	Two bunnies sat on the grass. Three more bunnies hopped there. How many bunnies are on the grass now? 2 + 3 = ?
	Take From-Result Unknown	Five apples were on the table. I ate two apples. How many apples are on the table now? 5 – 2 = ?
No Action	**Put Together/Take Apart-Total Unknown**	Three red apples and two green apples are on the table. How many apples are on the table? 3 + 2 = ?
	Put Together/Take Apart-Both Addends Unknown	Grandma has five flowers. How many can she put in her red vase and how many in her blue vase? 5 = 0 + 5, 5 = 5 + 0 5 = 1 + 4, 5 = 4 + 1 5 = 2 + 3, 5 = 3 + 2

Checking for Understanding

Take From – Result Unknown Problem (Scaffolded with Multiple Reads Strategy)**:**

Teacher: I am going to read a word problem to you. Here is the beginning of the problem:

Nine grapes were in a bowl. Tom ate 3 grapes.

Teacher: Turn and talk to your partner/table and tell them what this problem is about.

Students talk for 30-45 seconds.

Teacher: I am going to reread the problem to you.

Nine grapes were in a bowl. Tom ate 3 grapes.

Teacher: What are some numbers that we heard? (9 and 3)

Teacher: What does the 9 mean? (We had 9 grapes in a bowl)

Teacher: What does the 3 mean? (Tom ate 3 grapes)

Teacher: What is a math question that we can explore? (How many grapes are left?)

Teacher: Use your math tools and work with your partner/table and find out how many grapes are left? Make sure you can explain what you did with your math tools.

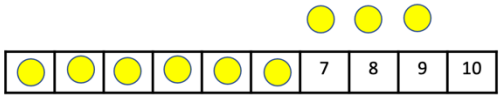
Note: Math tools could include manipulatives with support from number paths or ten frames or drawings on paper. Students should have freedom to choose how to represent and solve these problems without teacher-directed instruction.

Possible Responses:

Student A:

Teacher: *How did you solve the problem?*

Student: *I put 9 counters on a number path. Then I took 3 off. I then counted the ones left and there was 6.*



Teacher: *How many grapes are left?*

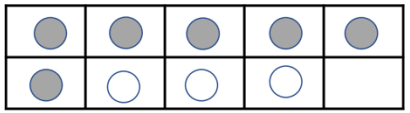
Student: *There are 6 grapes left since 9 take away 3 is 6.*

Student B:

Teacher: How did you solve the problem?

Student: I put 9 counters on a ten frame. I then flipped 3 from red to yellow to show the ones that he ate.

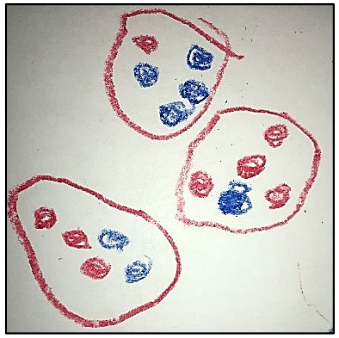
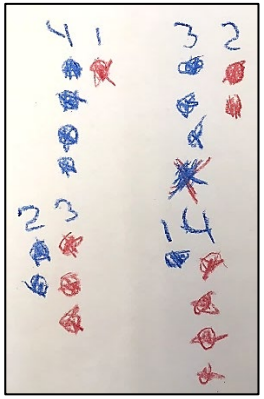
Teacher: How many grapes are left?



Understand addition and subtraction.

NC.K.OA.2 Solve addition and subtraction word problems, within 10, using objects or drawings to represent the problem, when solving:

- Add to/Take From-Result Unknown
- Put Together/ Take Apart (Total Unknown and Two Addends Unknown)

Clarification	**Checking for Understanding**
Similar to NC.K.OA.1, initial work should focus on students representing and solving word problems with concrete objects (manipulatives). Visuals such as a number path or a ten frame can help provide a structure to support students. Eventually, students will transition to using drawings, numbers, and words to represent their work. Avoid keyword strategies Students should be asked to explain how they know why they are adding or subtracting based on the action of the word problem. Keyword strategies should not be used at any time in elementary school since they cause a dependence on specific words that do not always line up to that operation in second grade and later grades. As a result, teachers should consistently ask, "What is the action in this problem?" and "What number are we trying to find out?" For a complete chart of problem types, see page 33.	*Student: There are 6 red counters which means there are 6 grapes left.* *Student C:* *Teacher: How did you solve the problem?* *Student: I drew 9 grapes and crossed out 3 of them. There are 6 grapes left.*  Put Together/Take Apart – Both Addends Unknown Problem: Bobby Bear is missing 5 buttons on his jacket. How many ways can you use blue and red buttons to give Bobby Bear his 5 buttons? Use your math tools to show your work. *Possible responses:* *I made five with one red button and four blue buttons. Then I did two blue and three red. Then I did one blue and four red.*  *I put four blue buttons and one red button. I took one away from the blue and put one with the red. This makes three blue and two red. I kept doing this.* 

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

In this standard, students decompose (break apart) numbers less than or equal to 10 into two addends in multiple ways. All of this work should be done with objects or drawings, and each decomposition should be represented with either drawings, a verbal expression, or when students are ready, a written expression. The focus of this standard is that a number can be broken into different pairs of two smaller numbers. For example, 5 can be decomposed into 5 and 0, 4 and 1, or 3 and 2. In this standard, students see the total (or whole) and both of the parts. Any activity that involves a hidden or missing part aligns to NC.K.OA.4.

<u>Benefit of Objects (Manipulatives) and Contextualized Word Problems</u>

Students should create representations with objects (manipulatives) or drawings of their problems. Students should have multiple experiences exploring how a number can be broken into two smaller numbers using objects such as 2-color counters or breaking up snap cubes.

This standard intersects with NC.K.OA.2 and the both addends unknown problem type. Research strongly suggests that students benefit from exploring, representing (NC.K.OA.1), and solving (NC.K.OA.2) word problems together when developing an understanding of composing (NC.K.OA.4) or decomposing numbers (NC.K.OA.3) (van de Walle et al., 2019).

<u>Relationship between Decomposing Numbers and Fluency</u>

By the end of the year kindergarten students are expected to fluently add or subtract within 5 (NC.K.OA.5), which means that they should be to able to recall from memory all of the ways to decompose numbers that are 5 or less into 2 equal addends within 5 seconds. Students do not need to demonstrate fluency with numbers between 5 and 10 until the end of Grade 1.

When developing students' fluency, flashcards and other activities, such as the repetitive writing of number bonds and equations, are not as effective as math games and activities that promote students' work with the relationships between numbers (Kling & Bay-Williams, 2020). As students use concrete objects and drawings to explore these relationships, they discover all of the pairs or "partners" that compose a number. Through these experiences, students discover number relationships and begin to internalize addition/subtraction facts and develop fluency.

<u>Learning and Writing Symbols and Equations</u>

Checking for Understanding

There are 9 books. Some of them are on the shelf on the left and some are on the shelf on the right. How could the books be arranged? Use a drawing or numbers to show your work.

Possible responses:

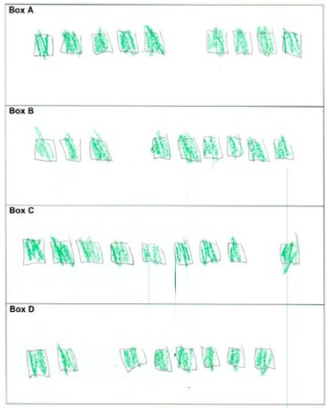
Student A:

Creates a list of partners of 9

- *1 and 8*
- *2 and 7*
- *3 and 6*
- *4 and 5*
- *5 and 4*
- *6 and 3*
- *7 and 2*
- *8 and 1*

Note: Since this problem is in context reversals (1+8 and 8+1) are different. If the problem is not in context reversals are essentially the same equation

Student B:



There are 8 flowers in the vase. Some are pink and some are purple. How many of each color flower could there be? Find at least 4 correct answers.

Possible Responses:

Student A:

I used 2 color counters and put a pile of 8 out that were all red. That is 8 and 0. I then flipped 1 from red to yellow to get 7 and 1. I flipped 1 more from red to yellow to get 6 and 2. I flipped one more to get 5 and 3.

Teacher: How would you write those as expressions?

Student writes: :

8 = 8 + 0

8 = 7 + 1

8 = 6 + 2

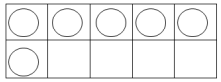
8 = 5 + 3

Student B:

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 kindergarten, students need ample experiences breaking apart numbers and using the vocabulary “and,” “joined with” 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.	*I drew 8 flowers on paper. I made 5 purple and 3 pink. Then I thought about making 1 more purple which would make 6 purple and 2 pink and then 7 purple and 1 pink and then 8 purple and 0 pink.*  *Note: Since this problem is in context, reversals (5+3 and 3+5) count as different solutions since it could be 5 purple and 3 pink OR 3 purple and 5 pink.*

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.

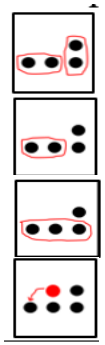
Clarification	**Checking for Understanding**
This standard calls for students to make a group of 10 when given a number between 0 and 10. Similar to NC.K.OA.3, all of students' work should be done with objects or drawings, and each decomposition should be shown with either drawings or a verbal expression or when students are ready, an equation. While NC.K.OA.3 provided students with knowledge of the total and both addends, NC.K.OA.4 is often thought of as a "missing part" or "missing addend" situation since students are given the total (10) and one of the parts <u>Benefit of Objects (Manipulatives) and Contextualized Word Problems</u> Students should always create representations with objects (manipulatives) or drawings of their problems. Students should have multiple experiences exploring how a number can be broken into two smaller numbers using objects such as 2-color counters or snap cubes. Similar to NC.K.OA.3 this standard should be contextualized in word problems. Research strongly suggests that students benefit from exploring, representing (NC.K.OA.1), and solving (NC.K.OA.2) word problems together when developing an understanding of composing (NC.K.OA.4) or decomposing numbers (NC.K.OA.3) (van de Walle et al., 2019).	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.*  How Many Yellow Counters? Task Materials: 10 Counters Teacher provides students with a group of two-color counters. The group should have 10 counters. Teacher says, "Drop your counters onto this paper." Teacher says, " I want you to gather and count all of the red counters while I get all of the yellow counters." Teacher gathers the yellow counters. Teacher asks, "How many red counters did you count? Teacher asks, "How many yellow counters do we have?" Teacher asks, "Explain how you found the number of yellow counters." Note: If students need to count the yellow counters, give the student access to them. *Teacher should attend to how students found the number of yellow counters:* *a. knew it without hesitation* *b. mental strategies within 7 seconds* *c. counted forward from number of red counters to 10 to find the number of yellow counters* *d. counted backward from 10 to the number of red colors to find the number of yellow counters* *e. counted the yellow counters* f. *other strategy.*

Return to Standards

Understand addition and subtraction. **NC.K.OA.5** Demonstrate fluency with addition and subtraction within 5.	
Clarification	**Checking for Understanding**
This standard calls for students to demonstrate fluency in addition and subtraction with all numbers 5 or less. Students who are fluent display accuracy (correct answer), efficiency (a reasonable amount of steps in about 3-5 seconds without resorting to counting), and flexibility (using strategies such as the commutative property) (Kling & Bay-Williams, 2020). In kindergarten, fluency with addition and subtraction combinations within 5 and the work with this standard intersects work where students decompose numbers (NC.K.OA.3) and conceptually subitize to look at multiple ways to quickly count and decompose a set into two groups (NC.K.OA.6). In order to fluently add and subtract, children must first be able to see subparts within a number (inclusion) and be able to decompose 5 in multiple ways. Fluency is best developed through multiple experiences with combinations of numbers within 5 focused on the concepts embedded in NC.K.OA.3 and NC.K.OA.6. When developing students' fluency, flashcards and other activities such as the repetitive writing of number bonds and equations are not as effective as math games and activities that promote students' work with the relationships between numbers (Kling & Bay-Williams, 2020). As students use concrete objects and drawings to explore these relationships, they discover all of the pairs or "partners" that compose a number. Through these experiences, students discover number relationships and begin to internalize addition/subtraction facts and develop fluency.	*Note: Fluency should be assessed by giving students the opportunity to orally answer questions given to them by the teacher. Since equations are not expected to be mastered in kindergarten, students should not be asked to demonstrate fluency on written assessments that include equations.* What is the answer when 3 is joined with 2? What is the answer when 4 is taken away from 5?

Return to Standards

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 groups of objects where the total number of objects is 5 or less. This standard is connected to, yet different from 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 the arrangements and 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. Students' skills and understanding related to conceptual subitizing develops from frequent and varied experiences counting sets of objects and noticing the patterns and arrangements within sets. Since this work is focused on the combining of groups to compose a number, this standard along with NC.K.OA.3 provide foundational skills for addition and subtraction.	"Quick Image" Task: Teacher displays a dot card for 4-5 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

Build foundation for place value.

NC.K.NBT.1 Compose and decompose numbers from 11 to 19 into ten ones and some further ones by:

- Using objects or drawings.
- Recording each composition or decomposition by a drawing or expression.
- Understanding that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.

Clarification

This standard calls for students to compose (build) and decompose (break apart) numbers from 11-19 into tens and some further ones using objects and drawings.

Use of objects or drawings
Students should create their own representations using materials such as counters or snap cubes with the support of a ten frame or a double ten frame (two ten frames on the same piece of paper). Students should not use worksheets with printed pictures or representations already created.

Recording each composition or decomposition by a drawing or expression
In kindergarten it is acceptable for students' work with this standard to focus on students drawing pictures of teen numbers with the structure of a ten frame or by using oral expressions such as "10 and 5 more" or "10 joined with 5" to show their understanding that a teen number is a group of 10 with some more ones.

Students can be introduced to equations but should not be expected to use number bonds or equations to demonstrate the mastery of this Standard.

Understanding that these numbers are composed of ten ones and some additional ones
In kindergarten students should only be working with groupable manipulatives such as counters or snap cubes that can be combined or broken apart to show both 10 individual ones and a group of ten. Research shows that developmentally students are not able to independently demonstrate and explain that a group of 10 ones has the same value of a pre-grouped manipulative such as a base ten block until they have had multiple experiences with grouping individual objects in kindergarten and Grade 1. As a result, students' work with this standard should focus exclusively on using counters and cubes on a ten frame to adequately build a foundation for their work in Grade 1 (NC.1.NBT.2).

Checking for Understanding

Sample Student Interview:
Teacher: "I have some chips here. Do you think they will fit on our ten frame? Why? Why Not? Use your ten frame to investigate."
Student A: *"There are too many to fit on the ten frame. Only 10 will fit!"*

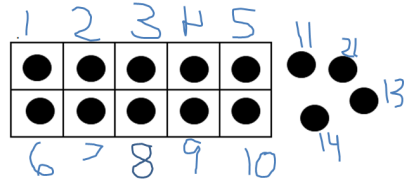
Teacher: "So you have some leftovers?"
Student A: *"Yes. I'll put them over here next to the ten frame."*

Teacher: "How many do you have in all?"
Student A: *"One, two, three, four, five… ten, eleven, twelve, thirteen, fourteen. I have fourteen. Ten fit on and four didn't."*

Student B: *Pointing to the ten frame, "See, that's 10… 11, 12, 13, 14. There's fourteen."*

Teacher: Use your recording sheet (or number sentence cards) to show what you found out.

Sample Student Recording Sheets:

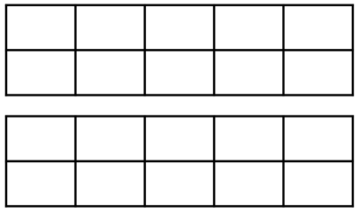


14 is 10 on and 4 off.

All	On	Off
14	10	4

Based on the following phrases build the number on the double ten frame and tell me what number you just built.

a. 10 and 6 more
b. 10 and 3 more
c. 4 more than 10
d. 10 and 7 more

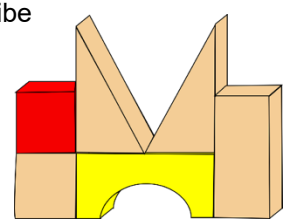


Possible Response:

Build foundation for place value. **NC.K.NBT.1** Compose and decompose numbers from 11 to 19 into ten ones and some further ones by: • Using objects or drawings. • Recording each composition or decomposition by a drawing or expression. • Understanding that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.	
Clarification	**Checking for Understanding**
	Students have pictures that include 1 full ten frame and the remaining ones in the other ten frame. a. 16 b. 13 c. 14 d. 17

Return to Standards

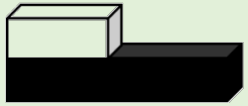
Describe and compare measurable attributes.
NC.K.MD.1 Describe measurable attributes of objects; and describe several different measurable attributes of a single object.

Clarification	**Checking for Understanding**
This standard calls for students to describe an object's measurable attributes such as length, weight, and size. Students are expected to use words such as heavy/light, long/short, and big/small to describe these attributes. Additionally, students will describe a single object using more than one measurable attribute. For example, a student may describe a shoe with one attribute, "My shoe is heavy!", or more than one attribute, "This shoe is heavy and it is really long." Initially, students may not have developed undifferentiated views about the size of objects; for example, a student may believe that an object is "bigger" or "smaller" based on a single attribute. Additionally, a student may state that one book is bigger than another because it is longer. In reality, the other book may be wider and heavier. Through experiences and conversations about those experiences, students will learn to discriminate and name these specific measurable attributes. Kindergarten students are not expected to measure objects with standard or non-standard units.	Show student a feather and a heavy book (e.g., dictionary). Allow student to examine each object. Say: Tell me about the weight of the feather. Tell me about the weight of the book. Student: *The feather is light. It's easy to lift. The book is heavy. I need my muscles to lift it.* Display two block towers. Say: We've been using measurement words to describe objects in our classroom. Use some measurement words to tell me about this tower (point to bigger tower). Student A: *This tower is tall and big.* Student B: *That tower is long, and it looks heavy!* 

Return to Standards

Describe and compare measurable attributes.

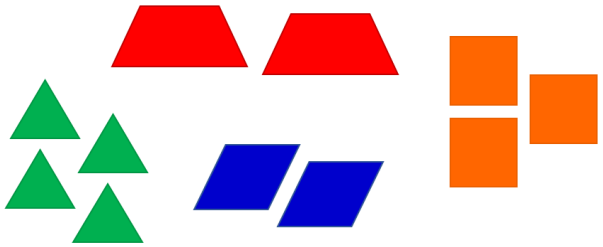
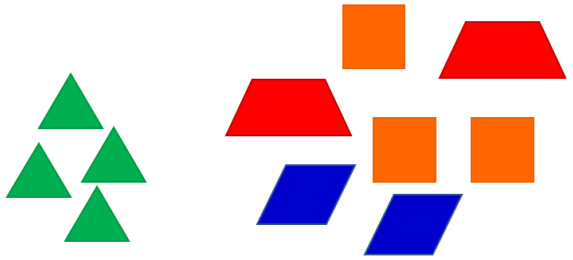
NC.K.MD.2 Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference.

Clarification	**Checking for Understanding**
In this standard, students will make direct comparisons of attributes that can be measured, such as length, weight, and size. Direct comparisons are made when objects are put next to each other (e.g., the height of two children, the length or width of two books, the length of two pencils). Students must be able to move the objects next to each other to compare their lengths or hold them to compare weights. As kindergarten students continually compare objects by length, they discover the importance of lining up the ends of objects in order to have an accurate measurement. **For example**: A student lines up two blocks and says, "The black block is a lot longer than the white one."  A student picks up two books and says, "The red book is heavier than the blue book," or "The red book is bigger than the blue book."	Find an object in our classroom that is shorter than this straw. Find an object that is longer than this straw. *Possible responses:* Student A: *A crayon is shorter than the straw, and a pencil is longer. I know because I lined their ends up. The crayon didn't stick out as much as the straw, so it's shorter. The pencil stuck out more than the straw, so it's longer.*   Student B: *This block is shorter than the straw. I know because I stood the straw up next to the block. The straw was longer, so the block is shorter.*

Return to Standards

Classify objects and count the number of objects in each category.

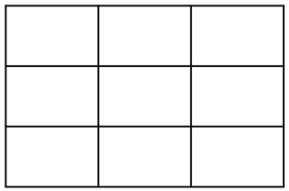
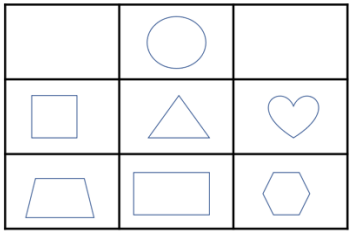
NC.K.MD.3 Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.

Clarification	**Checking for Understanding**
This standard calls for students to integrate sorting and data analysis and counting (NC.K.CC.4 and NC.K.CC.5). Students are expected to first sort and classify objects into distinct categories (e.g., colors, size, shape, etc.) and then count the number of objects in each category. The sets in each category should be limited to less than or equal to 10. The process of sorting objects into categories is a foundational aspect of data which will be extended in future years. Students should sort concrete objects (manipulatives), such as pattern blocks, snap cubes, or other objects. **For example:** A student separates buttons into different piles based on color (all the blue buttons are in one pile, all the orange buttons are in a different pile, etc.). Then the student counts the number of buttons in each pile: blue (5), green (4), orange (3), purple (4). Finally, the student organizes the groups by the quantity. "I put the purple buttons next to the green buttons because purple also had (4). Blue has 5 and orange has 3. There aren't any other colors that have 5 or 3. So they are sitting by themselves."	Give the student a set of pattern blocks. Can you sort the pattern blocks? *Possible response:* *A student chooses to sort the pattern blocks by putting all of the hexagons in one pile and non-hexagons in a different pile. "I put the hexagons together and there were 6 of them. I put the triangles, trapezoids, and rhombuses together. There were 3 triangles, 2 trapezoids, and 2 rhombuses so there were 7 in that pile. There were 13 objects total."* Provide student with a set of pattern blocks. Say: Here is a set of blocks. Sort these blocks into groups. Tell me how you sorted them. Student A: *I put the colors together. I put the green shapes here, the blue shapes here, the red shapes here, and the orange shapes over here.*  Student B: *I put the shapes with 3 points in one group, and the shapes with 4 points in the other group.* 

Return to Standards

Identify and describe shapes.

NC.K.G.1 Describe objects in the environment using names of shapes, and describe the relative positions of objects using positional terms.

Clarification	Checking for Understanding
In this standard, students describe objects in the environment using the names of shapes mentioned in NC.K.G.2 and NC.K.G.3. Students are expected to describe the relative positions of objects using positional terms such as above, below, beside, in front of, behind and next to. Students are not expected to master the concept of "to the left" and "to the right" in kindergarten.	Look around the classroom. • Where do you see a cone? • Show an example of a square? • What shape is the door? • Do you see a shape next to the door? Teacher- "Let's fill out the grid with some shapes." • Put a circle in the top middle box. • Put a triangle under the circle. • Put a square next to the triangle. • Put a trapezoid under the square. • Put a rectangle next to the trapezoid. • Put a hexagon next to the rectangle. • Put a heart above the hexagon.  *Possible Response:* 

Return to Standards

Identify and describe shapes.

NC.K.G.2 Correctly name squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres regardless of their orientations or overall size.

Clarification

In this standard, students correctly name two-dimensional and three-dimensional shapes that are specifically listed in the standard. Students are expected to name shapes based on what they look like regardless of their orientation.

In Grade 1 students more formalize their understanding of attributes that define shapes. In kindergarten, students may begin to talk about shapes in terms of the number of sides, the number of points (vertices), as well as the description of what shapes look like. For example, students may say that a cube is solid and three-dimensional (NC.K.G.3) and the surfaces are all squares.

Specific Notes about Vocabulary and Definitions

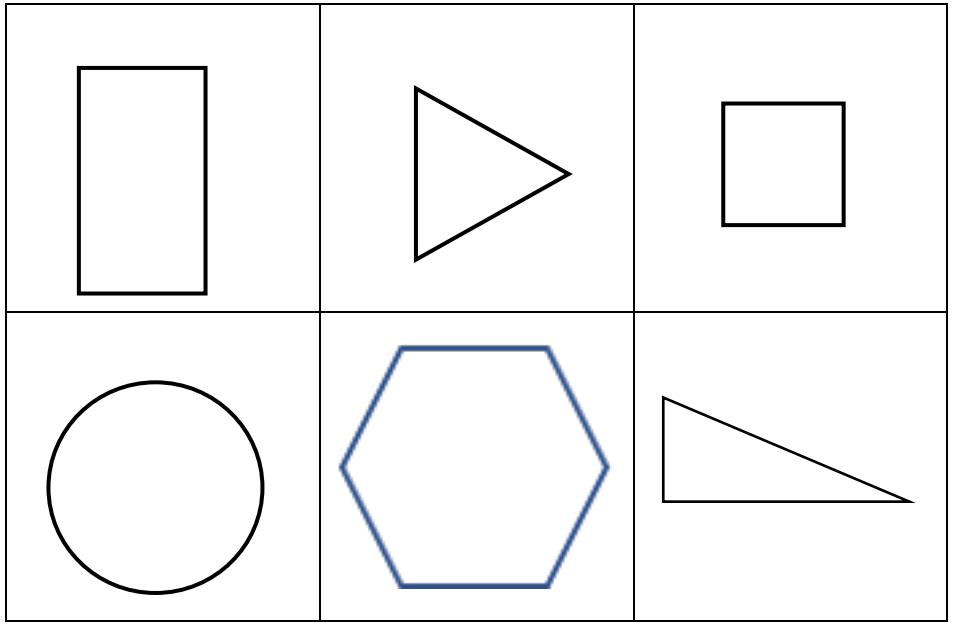
The table below provides specific notes about the vocabulary and definitions related to shapes in kindergarten. This information is for teachers. Remember that the standard only expects students to name shapes and informally describe what they look like.

Shape	Note for Teachers
Two-Dimensional Shapes	
Squares	Squares are rectangles in which all four sides are the same length. Squares, like rectangles, have four corners that look like an uppercase L (square corners)
Circles	Circles have 1 curved surface and look "round." Circles are different from ovals. In Grade 1 students learn that all of the points on the curve of a circle are the same distance from the center of the circle which is not the case for an oval.
Triangles	Triangles have three straight sides and three corners (vertices). In kindergarten students should see triangles with different orientations and different size angles. Developmentally, many children in kindergarten have the misconception that a triangle must look like the traditional triangle with a corner (vertex) at the top and a horizontal line at the bottom.

Checking for Understanding

Two-Dimensional Shape Task:

Identify each of these shapes:



Three-Dimensional Shape Task:

The teacher has a cube, cone, cylinder, and sphere.

The teacher says, "Please pick up the cube."

The student picks up the cube.

The teacher asks, "How do you know that is a cube?"

Note: In Kindergarten students are only expected to informally describe characteristics of three-dimensional shapes.

Identify and describe shapes.

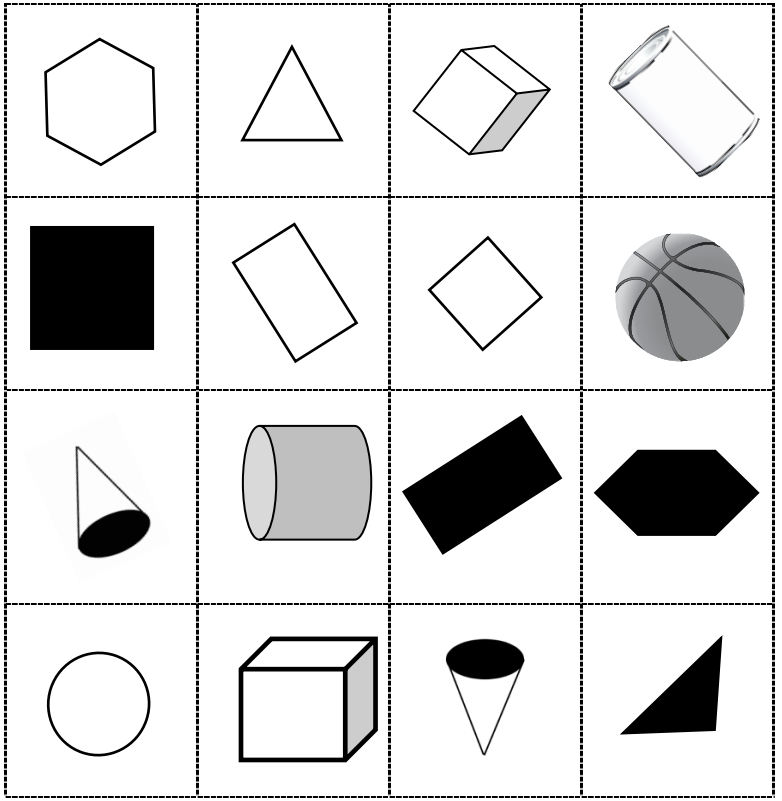
NC.K.G.2 Correctly name squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres regardless of their orientations or overall size.

Clarification		**Checking for Understanding**
Rectangles	Rectangles and squares both have four straight sides and four corners that look like an uppercase L or as they are called in Grades 1-3 “square corners.” The opposite sides are always the same length. Avoid saying “2 long sides and 2 short sides” since that is not always true.	
Hexagons	Hexagons have six straight sides.	
Three-Dimensional Shapes		
Cubes	Cubes are three-dimensional shapes that have 6 squares in them. No matter how a cube is oriented it will always slide.	
Cones	Cones are three-dimensional shapes that have 1 circle in them (face) and at the other end there is a point (vertex). If the circle is touching the table it will slide. If the curved surface is touching the table it will roll.	
Cylinders	Cylinders are three-dimensional shapes that have 2 circles in them (faces). If a circle is at the bottom of the shape it will slide. If the curved surface is at the bottom of the shape, then it will roll.	
Spheres	Spheres are three-dimensional shapes that look “round” no matter which way you look at it. Spheres roll.	

Return to Standards

Identify and describe shapes.

NC.K.G.3 Identify squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres as two-dimensional or three-dimensional.

Clarification	**Checking for Understanding**
In this standard, students differentiate between two-dimensional and three-dimensional shapes for specific shapes that are listed in the standard. This includes sorting two- and three-dimensional shapes into different piles and explaining why specific shapes are in either the two- or the three-dimensional category.	The teacher gives some of these two-dimensional and three-dimensional shapes to students. Sort these figures in two categories: two-dimensional and three-dimensional. The teacher selects one shape from the two-dimensional and the three-dimensional group. Ask students, “Is this two-dimensional or three-dimensional? Explain why.” 

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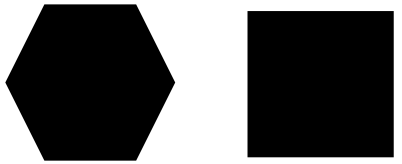
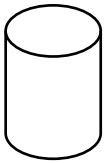
Analyze, compare, create, and compose shapes.

NC.K.G.4 Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, attributes and other properties.

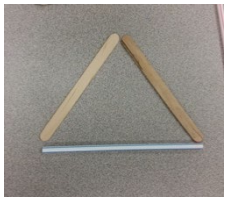
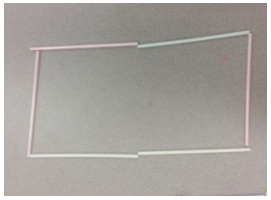
Clarification	**Checking for Understanding**
In this standard, students are expected to compare two-dimensional shapes to each other and three-dimensional shapes to each other using informal language. Teachers should reference the table provided in NC.K.G.2. <u>Two-dimensional shapes</u> In kindergarten students are expected to count the number of sides and corners (vertices) that each shape has. Students should be able to point to the corner (vertex) as the point where two sides meet each other. Students should also be able to distinguish between shapes that are squares compared to rectangles where a square has four sides that are always the same length and rectangles have opposite sides that are always the same length. <u>Three-dimensional shapes</u> Faces of three-dimensional shapes can be identified as specific two-dimensional shapes. Identifying the number of edges and vertices on a three-dimensional shape is not an expectation of kindergarten.	Compare these two shapes. How are they alike and how are they different? *Possible response:* *Both shapes have straight sides. They both have corners and they are both two-dimensional. The hexagon has 6 sides. The square only has 4 sides.*  What do you notice about these three-dimensional shapes? *Possible response:* *The sides of the cube are squares. I can tell it's a square because it has four sides that are the same size and four corners.*  *I can see that the top and bottom of the cylinder are circles.* 

Return to Standards

Analyze, compare, create, and compose shapes.

NC.K.G.5 Model shapes in the world by:

- Building and drawing triangles, rectangles, squares, hexagons, circles.
- Building cubes, cones, spheres, and cylinders.

Clarification	**Checking for Understanding**
In this standard, students are expected to build and draw two-dimensional shapes and build three-dimensional shapes. This standard aligns with NC.K.G.4, allowing opportunities for students to build or draw shapes (NC.K.G.5) and then describe them using informal language (NC.K.G.4) <u>Two-dimensional shapes</u> Triangles, rectangles, squares, and hexagons all have straight sides. Teachers should use discretion with kindergarten students about drawings that may have curved sides due to fine motor development. Students should be able to identify and point out the number of sides and corners (vertices) in these shapes. Students may use materials, such as toothpicks, popsicle sticks or Q-tips to create these shapes. <u>Three-dimensional shapes</u> Students are expected to use materials to build these shapes. Modeling clay, toothpicks with gummy bears or marshmallows, or other materials can be made.	Using the materials in front of you, build or draw a triangle (NC.K.G.5). The teacher follows up and asks, “How do you know that this shape is a triangle?” (NC.K.G.4) *Possible response:*   Using the materials in front, of you, build or draw a rectangle. (NC.K.G.5) The teacher follows up and asks, “How do you know that this shape is a rectangle?” (NC.K.G.4) *Possible response:*   Using the clay, create a sphere. (NC.K.G.5) The teacher follows up and asks, “How do you know that this shape is a sphere?” (NC.K.G.4) *Possible response:* 

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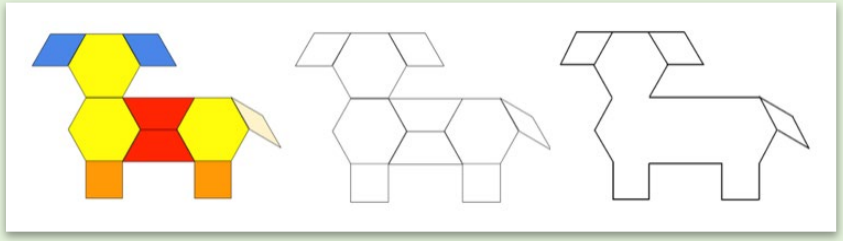
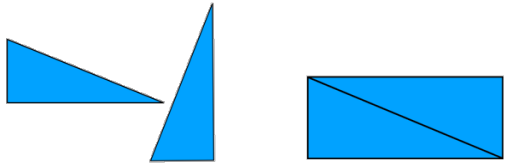
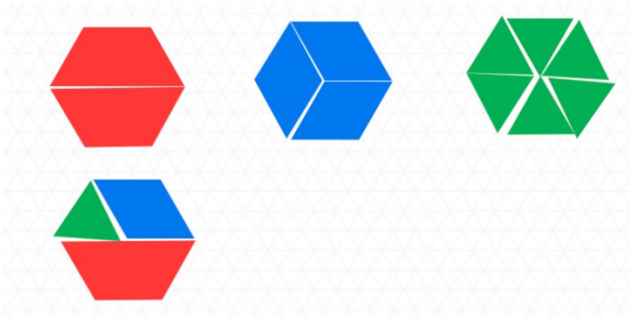
Analyze, compare, create, and compose shapes.
NC.K.G.6 Compose larger shapes from simple shapes.

Clarification	**Checking for Understanding**
In this standard, students form larger composite shapes from two or more simple shapes. The intent of this standard is to provide opportunities for students to create recognizable shapes that are listed in the kindergarten geometry standards. However, the use of shapes to solve shape puzzles or creatively make shape designs is also beneficial in kindergarten. Students should be able to describe the shapes they have composed using informal geometric terminology. Students also combine shapes to build pictures. Pictures should be described using informal geometric terminology. Students should informally explore geometric motions (slides, flips, and turns) to create pictures and solve shape puzzles. **For example:** A student may build this figure starting with a color pattern, then a shape outline, and finally a figure outline. 	Using these triangles, can you create a different shape? *Possible response:* *While exploring with triangles, a student flips and turns the triangles to make a rectangle.*  Cover a Hexagon Materials: Pattern blocks (hexagon, triangle, rhombus, trapezoid) What are the different ways that you can use these pattern blocks to make a hexagon? Teacher follows up, “Can you describe how you made this hexagon?” *Possible Response:* Student: *I used six triangles. I had to turn a few of them to make them fit.* 

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Addition/Subtraction Problem Types

The grade level in the right corner of each problem type indicates the grade in which proficiency is expected.

		Result Unknown	Change Unknown	Start Unknown
Action	Add To	Two birds sat in a tree. Three more birds fly to the tree. How many birds are in the tree now? 2 + 3 = ? K	Two birds sat in the tree. Some more birds flew there. Then there were five birds in the tree. How many birds flew over to the first two? 2 + ? = 5 1	In the morning, some birds were sitting in a tree. At lunch time, three more birds flew there. Then there were five birds. How many birds were in the tree in the morning? ? + 3 = 5 2
	Take From	Five birds were in a tree. Two birds flew away. How many birds are in the tree now? 5 - 2 = ? K	Five birds were in a tree. Some flew away. Then there were three birds in the tree. How many birds flew away? 5 - ? = 3 1	In the morning, some birds were in a tree. At lunch time, two birds flew away. Then there were three birds left. How many birds were in the tree in the morning? ? - 2 = 3 2

		Total Unknown	Addend Unknown	Both Addends Unknown
No Action	Put Together/ Take Apart	Three red birds and two blue birds are in a tree. How many birds are in the tree? 3 + 2 = ? K	Five birds are in a tree. Three are red and the rest are blue. How many birds are blue? 3 + ? = 5 5 - 3 = ? 1	Five birds are in a tree. They could either be blue birds or red birds. How many birds could be red and how could be blue? 5 = 0 + 5 5 = 5 + 0 5 = 1 + 4 5 = 4 + 1 5 = 2 + 3 5 = 3 + 2 K

		Difference Unknown	Bigger Unknown	Smaller Unknown
	Compare	***"How many more?" version:*** Lara has two stickers. Jade has five stickers. How many more stickers does Jade have than Lara?	***Version with "more":*** Jade has three more stickers than Lara. Lara has two stickers. How many stickers does Jade have?	***Version with "more":*** Jade has three more stickers than Lara. Jade has five stickers. How many stickers does Lara have?
		"How many less?" version: Lara has two stickers. Jade has five stickers. How many fewer stickers does Lara have than Jade? 2 + ? = 5 5 - 2 = ? 1	***Version with "less":*** Lara has three fewer stickers than Jade. Lara has two stickers. How many stickers does Jade have? 2 + 3 = ? 3 + 2 = ? 2	***Version with "fewer":*** Lara has three fewer stickers than Jade. Jade has five stickers. How many stickers does Lara have? 5 - 3 = ? 2