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

1st Grade Mathematics ● Unpacked Contents
For the new Standard Course of Study that will be effective in all North Carolina schools in the 2018-19 School Year.

This document is designed to help North Carolina educators teach the 1st Grade 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?
Please send feedback to us at feedback@dpi.state.nc.us and we will use your input to refine our unpacking of the standards. Thank You!

Just want the standards alone?
You can find the standards alone at http://www.ncpublicschools.org/curriculum/mathematics/scos/.

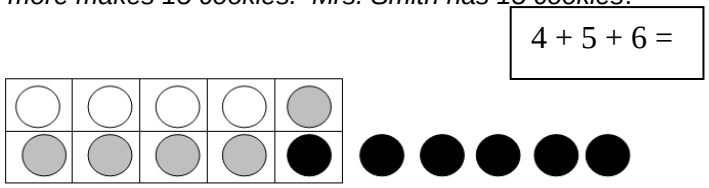
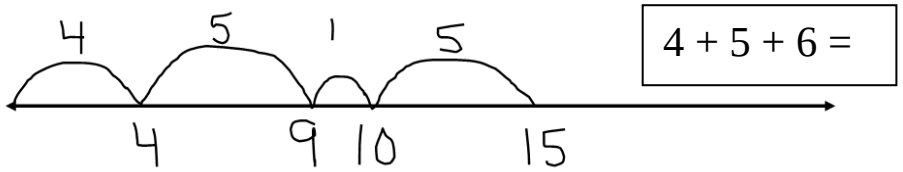
Standards for Mathematical Practice

Practice	Explanation and Example
1. Make sense of problems and persevere in solving them.	Mathematically proficient students in First Grade continue to develop the ability to focus attention, test hypotheses, take reasonable risks, remain flexible, try alternatives, exhibit self-regulation, and persevere (Copley, 2010). As the teacher uses thoughtful questioning and provides opportunities for students to share thinking, First Grade students become conscious of what they know and how they solve problems. They make sense of task-type problems, find an entry point or a way to begin the task, and are willing to try other approaches when solving the task. They ask themselves, "Does this make sense?" First Grade students' conceptual understanding builds from their experiences in Kindergarten as they continue to rely on concrete manipulatives and pictorial representations to solve a problem, eventually becoming fluent and flexible with mental math as a result of these experiences.
2. Reason abstractly and quantitatively.	Mathematically proficient students in First Grade recognize that a number represents a specific quantity. They use numbers and symbols to represent a problem, explain thinking, and justify a response. For example, when solving the problem: "*There are 60 children on the playground. Some children line up. There are 20 children still on the playground. How many children lined up?"* first grade students may write 20 + 40 = 60 to indicate a Think-Addition strategy. Other students may illustrate a counting-on by tens strategy by writing 20 + 10 + 10 + 10 + 10 = 60. The numbers and equations written illustrate the students' thinking and the strategies used, rather than how to simply compute, and how the story is decontextualized as it is represented abstractly with symbols.
3. Construct viable arguments and critique the reasoning of others.	Mathematically proficient students in First Grade continue to develop their ability to clearly express, explain, organize and consolidate their math thinking using both verbal and written representations. Their understanding of grade appropriate vocabulary helps them to construct viable arguments about mathematics. For example, when justifying why a particular shape isn't a square, a first grade student may hold up a picture of a rectangle, pointing to the various parts, and reason, "It can't be a square because, even though it has 4 sides and 4 angles, the sides aren't all the same size." In a classroom where risk-taking and varying perspectives are encouraged, mathematically proficient students are willing and eager to share their ideas with others, consider other ideas proposed by classmates, and question ideas that don't seem to make sense.
4. Model with mathematics.	Mathematically proficient students in First Grade model real-life mathematical situations with a number sentence or an equation, and check to make sure that their equation accurately matches the problem context. They also use tools, such as tables, to help collect information, analyze results, make conclusions, and review their conclusions to see if the results make sense and revising as needed.
5. Use appropriate tools strategically.	Mathematically proficient students in First Grade have access to a variety of concrete (e.g. 3-dimensional solids, ten frames, number balances, number lines) and technological tools (e.g., virtual manipulatives, calculators, interactive websites) and use them to investigate mathematical concepts. They select tools that help them solve and/or illustrate solutions to a problem. They recognize that multiple tools can be used for the same problem- depending on the strategy used. For example, a child who is in the counting stage may choose connecting cubes to solve a problem. While, a student who understands parts of number, may solve the same problem using ten-frames to decompose numbers rather than using individual connecting cubes. As the teacher provides numerous opportunities for students to use educational materials, first grade students' conceptual understanding and higher-order thinking skills are developed.
6. Attend to precision.	Mathematically proficient students in First Grade attend to precision in their communication, calculations, and measurements. They are able to describe their actions and strategies clearly, using grade-level appropriate vocabulary accurately. Their explanations and reasoning regarding their process of finding a solution becomes more precise. In varying types of mathematical tasks, first grade students pay attention to details as they work. For example, as students' ability to attend to position and direction develops, they begin to notice reversals of numerals and self-correct when appropriate. When measuring an object, students check to make sure that there are not any gaps or overlaps as they carefully place each unit end to end to measure the object (iterating length units). Mathematically proficient first grade students understand the symbols they use (=, >,<) and use clear explanations in discussions with others. For example, for the sentence 4 > 3, a proficient student who is able to attend to precision states, "Four is more than 3" rather than "The alligator eats the four. It's bigger."

7. Look for and make use of structure.	Mathematically proficient students in First Grade carefully look for patterns and structures in the number system and other areas of mathematics. For example, while solving addition problems using a number balance, students recognize that regardless whether you put the 7 on a peg first and then the 4, or the 4 on first and then the 7, they both equal 11 (commutative property). When decomposing two-digit numbers, students realize that the number of tens they have constructed 'happens' to coincide with the digit in the tens place. When exploring geometric properties, first graders recognize that certain attributes are critical (number of sides, angles), while other properties are not (size, color, orientation).
8. Look for and express regularity in repeated reasoning.	Mathematically proficient students in First Grade begin to look for regularity in problem structures when solving mathematical tasks. For example, when adding three one-digit numbers and by making tens or using doubles, students engage in future tasks looking for opportunities to employ those same strategies. Thus, when solving 8+7+2, a student may say, "I know that 8 and 2 equal 10 and then I add 7 more. That makes 17. It helps to see if I can make a 10 out of 2 numbers when I start." Further, students use repeated reasoning while solving a task with multiple correct answers. For example, in the task "There are 12 crayons in the box. Some are red and some are blue. How many of each could there be?" First Grade students realize that the 12 crayons could include 6 of each color (6+6 = 12), 7 of one color and 5 of another (7+5 = 12), etc. In essence, students repeatedly find numbers that add up to 12.

Return to Standards

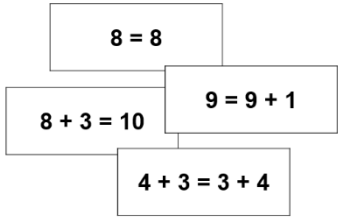
Represent and solve problems.
NC.1.OA.2 Represent and solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, by using objects, drawings, and equations with a symbol for the unknown number.

Clarification	**Checking for Understanding**
Students solve multi-step word problems by adding (joining) three numbers whose sum is less than or equal to 20, using a variety of mathematical representations. Standard NC.1.OA.2 builds the groundwork for NC.1.OA.6, where students develop computation strategies such as near doubles (e.g., 5+6 can be solved by adding 5+5+1) and making ten (e.g., 9+6 can be solved by adding 1 to 9, then adding 5. Explicit connections to the properties of addition (commutative and associative properties) should be made to provide students with opportunities to develop strategies for addition including making 10, using open number lines, and counting up. Students should have numerous experiences with concrete models and pictures before moving to writing equations.	Mrs. Smith has 4 oatmeal raisin cookies, 5 chocolate chip cookies, and 6 gingerbread cookies. How many cookies does Mrs. Smith have? *Possible responses:* Student A: *I put 4 counters on the Ten Frame for the oatmeal raisin cookies. Then, I put 5 different color counters on the ten frame for the chocolate chip cookies. Then, I put another 6 color counters out for the gingerbread cookies. Only one of the gingerbread cookies fit, so I had 5 leftover. Ten and five more makes 15 cookies. Mrs. Smith has 15 cookies.*  Student B*:* *I used a number line. First, I jumped to 4, and then I jumped 5 more. That's 9. I broke up 6 into 1 and 5 so I could jump 1 to make 10. Then, I jumped 5 more and got 15. Mrs. Smith has 15 cookies.*  Student C: *I wrote: 4 + 5 + 6 = ☐. I know that 4 and 6 equals 10, so the oatmeal raisin and gingerbread equals 10 cookies. Then I added the 5 chocolate chip cookies. 10 and 5 is 15. So, Mrs. Smith has 15 cookies.*

Return to Standards

Analyze addition and subtraction equations within 20.

NC.1.OA.7 Apply understanding of the equal sign to determine if equations involving addition and subtraction are true.

Clarification	**Checking for Understanding**
In this standard, students develop an understanding of the meaning of the equal sign and apply their understanding in order to determine whether an equation is true. This is developed as students in Kindergarten and First Grade solve numerous joining and separating situations with mathematical tools, rather than symbols. Once the concepts of joining, separating, and "the same amount/quantity as" are developed concretely, First Graders are ready to connect these experiences to the corresponding symbols (+, -, =). Students learn that the equal sign does not mean "the answer comes next", but that the symbol signifies an equivalent relationship that the left side 'has the same value as' the right side of the equation. When students understand that an equation needs to "balance", with equal quantities on both sides of the equal sign, they understand various representations of equations, such as: • operation on left side of the equal sign, and answer on right side (5+8=13) • operation on right side of the equal sign and answer on left side (13=5+8) • numbers on both sides of the equal sign (6=6) • operations on both sides of the equal sign (5+2 = 4+3). Once students understand the meaning of the equal sign, they are able to determine if an equation is true (9 = 9) or not true (9 = 8).	Put these cards into two piles: True and Not True. Use objects, drawings, or words to explain your thinking.  *Possible responses:* 9 = 9 + 1  *The equal sign means both sides have the same amount. The one side has nine, and the other side has ten. Nine and ten aren't equal.* 4 + 3 = 3 + 4 *It's like a balance. Both sides are balanced because they have the same amount. The numbers are flipped around, but both sides have seven.*

Analyze addition and subtraction equations within 20.

NC.1.OA.8 Determine the unknown whole number in an addition or subtraction equation involving three whole numbers.

Clarification	**Checking for Understanding**
In this standard, students use their understanding of strategies related to addition and subtraction to solve equations with an unknown. Rather than letters, the unknown symbols are boxes or pictures. Students should begin writing equations with unknowns to solve problems. Given an equation with an unknown, students should be able to explain their reasoning as they find the unknown value.	Five cookies were on the table. I ate some cookies. Then there were 3 cookies. How many cookies did I eat? Student A: *What goes with 3 to make 5? 2 and 3 make 5. 2 cookies were eaten.* Student B: *Fiiivee, four, three (holding up 1 finger for each count). 2 cookies were eaten (showing 2 fingers).* Student C: *We ended with 3 cookies. Threeeee, four, five (holding up 1 finger for each count). 2 cookies were eaten (showing 2 fingers).* Find the unknown number that makes the equation true: 5–□=2 Student: *5 minus something is the same amount as 2. Hmmm. 2 and what makes 5? 3! So, 5 minus 3 equals 2. Now it's true!*

Return to Standards

Number and Operations in Base Ten

Understand place value. **NC.1.NBT.3** Compare two two-digit numbers based on the value of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.	
Clarification	**Checking for Understanding**
In this standard, students use their understanding of groups and order of digits to compare two numbers by examining the amount of tens and ones in each number. After numerous experiences verbally comparing two sets of objects using comparison vocabulary (e.g., 42 is more than 31. 23 is less than 52, 61 is the same amount as 61.), first grade students connect the vocabulary to the symbols: greater than (>), less than (<), equal to (=).	Compare these two numbers. 42 __ 45 Possible responses: Student A *42 has 4 tens and 2 ones. 45 has 4 tens and 5 ones. They have the same number of tens, but 45 has more ones than 42. So, 42 is less than 45.* 42 < 45 Student B *42 is less than 45. I know this because when I count up I say 42 before I say 45.* 42 < 45

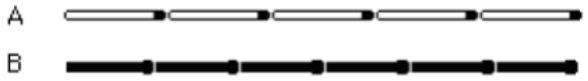
Return to Standards

Measurement and Data

Measure lengths. **NC.1.MD.1** Order three objects by length; compare the lengths of two objects indirectly by using a third object.	
Clarification	**Checking for Understanding**
In this standard, students build on their understanding of direct comparison to compare lengths. Students will understand that length is measured from one endpoint to another, and that by aligning objects it is possible to determine which object is longer/shorter or taller/shorter. Students also are expected to apply the concept of transitivity in two ways. First, students can look at the direct relationship of objects to compare the relationship between 3 objects. For example, the blue crayon is longer than the red crayon, and the red crayon is longer than the yellow crayon. Based on the relationships the student also can conclude that the blue crayon is longer than the yellow crayon. Second, students are expected to apply transitivity to order two objects that may not be able to be moved. For example, to compare the length of a bookshelf to the length of a desk, you could cut a string that is the same length as the bookshelf. You can then compare the piece of string with the desk. If	The pet store owner is trying to put the hamsters in order- from shortest to longest. She knows that the black hamster is longer than the gray hamster and the gray hamster is longer than the brown hamster. *Possible response:* *Since the black hamster is longer than the gray hamster and the gray hamster is longer than the brown hamster, the brown hamster is the shortest. Then the next shortest is the gray hamster. The longest hamster is the black hamster. So, it is black hamster, gray hamster, brown hamster.* Juanita needs to decide whether Mrs. Lopez can put a new desk in a space on the wall before moving the desk. How can Juanita use a piece of string to help Mrs. Lopez? *Possible response:* *Juanita can cut the string so that it is the same as the desk. Then she can take the string to the space on the wall to see if the string will fit. If*

Measure lengths. **NC.1.MD.1** Order three objects by length; compare the lengths of two objects indirectly by using a third object.	
Clarification	**Checking for Understanding**
the string is longer than the desk, then you know that the bookshelf is longer than the desk.	*she stretches out the string out straight across and fits then the desk will fit. If it doesn't fit then it won't fit.*

Return to Standards

Measure lengths. **NC.1.MD.2** Measure lengths with non-standard units. • Express the length of an object as a whole number of non-standard length units. • Measure by laying multiple copies of a shorter object (the length unit) end to end (iterating) with no gaps or overlaps	
Clarification	**Checking for Understanding**
This standard focuses on using non-standard units such as paper clips or cubes to determine the length of an object. In this standard, they learn to measure with iterations of non-standard units, using multiple copies of one object to measure the length of a larger object. These can be labeled length-units. Students will understand that when measuring an object, there should be no gaps between length units and the length units should not overlap. Students should already have an understanding of direct comparison. Students will also understand then when different sized units are used to measure the same object, the sizes of the units must be considered rather than relying solely on the amount of objects counted.	Measure this pencil using non-standard units  *Possible Response: I carefully placed paper clips end to end. The pencil is 5 paper clips long. I thought it would take about 6 paperclips.* Which row is longer? Explain how you know.  Student Incorrect Response: *The row with 6 sticks is longer. Row B is longer.* Student Correct Response: *They are both the same length. See, they match up end to end.*

Return to Standards