2nd 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 2nd 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 Second Grade examine problems and tasks, can make sense of the meaning of the task and find an entry point or a way to start the task. Second Grade students also develop a foundation for problem solving strategies and become independently proficient on using those strategies to solve new tasks. In Second Grade, students' work continues to use concrete manipulatives and pictorial representations as well as mental mathematics. Second Grade students also are expected to persevere while solving tasks; that is, if students reach a point in which they are stuck, they can reexamine the task in a different way and continue to solve the task. Lastly, mathematically proficient students complete a task by asking themselves the question, "Does my answer make sense?"
2. Reason abstractly and quantitatively.	Mathematically proficient students in Second Grade make sense of quantities and relationships while solving tasks. This involves two processes- decontexualizing and contextualizing. In Second Grade, students represent situations by decontextualizing tasks into numbers and symbols. For example, in the task, "There are 25 children in the cafeteria and they are joined by 17 more children. How many students are in the cafeteria? " Second Grade students translate that situation into an equation, such as: 25 + 17 = __ and then solve the problem. Students also contextualize situations during the problem solving process. For example, while solving the task above, students can refer to the context of the task to determine that they need to subtract 19 since 19 children leave. The processes of reasoning also other areas of mathematics such as determining the length of quantities when measuring with standard units.
3. Construct viable arguments and critique the reasoning of others.	Mathematically proficient students in Second Grade accurately use definitions and previously established solutions to construct viable arguments about mathematics. During discussions about problem solving strategies, students constructively critique the strategies and reasoning of their classmates. For example, while solving 74 - 18, students may use a variety of strategies, and after working on the task, can discuss and critique each others' reasoning and strategies, citing similarities and differences between strategies.
4. Model with mathematics.	Mathematically proficient students in Second 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. Second Grade students use concrete manipulatives and pictorial representations to provide further explanation of the equation. Likewise, Second Grade students are able to create an appropriate problem situation from an equation. For example, students are expected to create a story problem for the equation 43 + 17 = ___ such as "There were 43 gumballs in the machine. Tom poured in 17 more gumballs. How many gumballs are now in the machine?"
5. Use appropriate tools strategically.	Mathematically proficient students in Second Grade have access to and use tools appropriately. These tools may include snap cubes, place value (base ten) blocks, hundreds number boards, number lines, rulers, and concrete geometric shapes (e.g., pattern blocks, 3-d solids). Students also have experiences with educational technologies, such as calculators and virtual manipulatives, which support conceptual understanding and higher-order thinking skills. During classroom instruction, students have access to various mathematical tools as well as paper, and determine which tools are the most appropriate to use. For example, while measuring the length of the hallway, students can explain why a yardstick is more appropriate to use than a ruler.
6. Attend to precision.	Mathematically proficient students in Second Grade are precise in their communication, calculations, and measurements. In all mathematical tasks, students in Second Grade communicate clearly, using grade-level appropriate vocabulary accurately as well as giving precise explanations and reasoning regarding their process of finding solutions. For example, while measuring an object, care is taken to line up the tool correctly in order to get an accurate measurement. During tasks involving number sense, students consider if their answer is reasonable and check their work to ensure the accuracy of solutions.
7. Look for and make use of structure.	Mathematically proficient students in Second Grade carefully look for patterns and structures in the number system and other areas of mathematics. For example, students notice number patterns within the tens place as they connect skip count by 10s off the decade to the corresponding numbers on a 100s chart. While working in the Numbers in Base Ten domain, students work with the idea that 10 ones equals a ten, and 10 tens equals 1 hundred. In addition, Second Grade students also make use of structure when they work with subtraction as missing addend problems, such as 50- 33 = __ can be written as 33+ __ = 50 and can be thought of as," How much more do I need to add to 33 to get to 50?"

| 8. Look for and express regularity in repeated reasoning. | Mathematically proficient students in Second Grade begin to look for regularity in problem structures when solving mathematical tasks. For example, after solving two digit addition problems by decomposing numbers (33+ 25 = 30 + 20 + 3 +5), students may begin to generalize and frequently apply that strategy independently on future tasks. Further, students begin to look for strategies to be more efficient in computations, including doubles strategies and making a ten. Lastly, while solving all tasks, Second Grade students accurately check for the reasonableness of their solutions during and after completing the task. |

Operations and Algebraic Thinking

Represent and solve problems.

NC.2.OA.1 Represent and solve addition and subtraction word problems, within 100, with unknowns in all positions, by using representations and equations with a symbol for the unknown number to represent the problem, when solving:

- One-Step problems:
  - Add to/Take from-Start Unknown
  - Compare-Bigger Unknown
  - Compare-Smaller Unknown
- Two-Step problems involving single digits:
  - Add to/Take from- Change Unknown
- Add to/Take From- Result Unknown

Clarification	Checking for Understanding

In this standard, students extend their previous work with addition and subtraction word problems in two ways. First, they represent and solve word problems within 100, building upon their previous work to 20 (NC.1.OA.1). Second, they represent and solve one and two-step word problems.

One-step word problems use one operation. Two-step word problems use two operations which may include the same operation or opposite operations.

One Step Word Problem *One Operation*	Two-Step Word Problem *Two Operations, Same*	Two-Step Word Problem *Two Operations, Opposite*
There are 15 stickers on the page. Cindy put some more stickers on the page. There are now 22 stickers on the page. How many stickers did Cindy put on the page? 15 + □ = 22 22 – 15 = □	There are 9 blue marbles and 6 red marbles in the bag. Maria put in 8 more marbles. How many marbles are in the bag now? 9 + 6 + 8 = □	There are 9 peas on the plate. Carlos ate 5 peas. Mother put 7 more peas on the plate. How many peas are on the plate now? 9 – 5 + 7 = □

Second graders work with <u>all</u> addition and subtraction problem types, with unknowns in <u>all</u> positions. As students work with various problem types, they will record situation equations (equations in which the operation and order of numbers matches the situation of the problem). Eventually, students notice that a problem may be solved with other solution equations (equations that lead to the answer, but do not match the situation of the story).

Students continue working with problem types introduced in Kindergarten and First Grade, and are introduced to the four remaining problem types:

- *Add To/Start Unknown*
- *Take From/Start Unknown*
- *Compare/Bigger Unknown*
- *Compare/Smaller Unknown*

Checking for Understanding

One-Step Example: Some students are in the cafeteria. 24 more students came in. Now there are 60 students in the cafeteria. How many were in the cafeteria to start with? Use drawings and equations to show your thinking.

Student A: *I read the equation and thought about how to write it with numbers. I asked, "What and 24 makes 60?" So, my equation is □ + 24 =60. I used a number line to solve it.*

I started with 24. Then I took jumps of 10 until I got close to 60. I landed on 54. Then, I took a jump of 6 to get to 60. So, 10 + 10 + 10 + 6 = 36. So, there were 36 students in the cafeteria to start with.
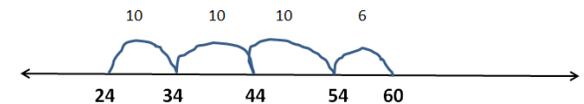
Student B: *I read the equation and thought about how to write it with numbers. First, I wrote an equation that showed me what the question is asking. I wrote □ + 24 = 60. Then, I thought, "There are 60 total. If I take away the part that I know (24), I'm left with the other part. So, what is 60 – 24?" My equation for the solution is 60 – 24 = □. I used place value blocks to solve it.*
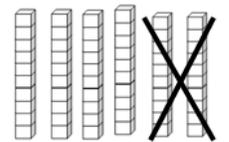
I started with 60 and took 2 tens away.

I needed to take 4 more away. So, I broke up a ten into ten ones. Then, I took 4 away.
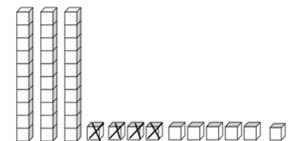
That left me with 36. So, 36 students were in the cafeteria at the beginning. 60 – 24 = 36

Represent and solve problems.
NC.2.OA.1 Represent and solve addition and subtraction word problems, within 100, with unknowns in all positions, by using representations and equations with a symbol for the unknown number to represent the problem, when solving:
- One-Step problems:
  - Add to/Take from-Start Unknown
  - Compare-Bigger Unknown
  - Compare-Smaller Unknown
- Two-Step problems involving single digits:
  - Add to/Take from- Change Unknown
- Add to/Take From- Result Unknown

Clarification	Checking for Understanding
Since Second Graders are just beginning their work with these four new problem types, they should **not** be included in two-step word problems. Additionally, two-step problems should involve single-digit addends so the primary focus is on understanding the problem situation and finding strategies to solve the problem. As second grade students solve one- and two-step problems they use manipulatives such as snap cubes, place value materials, ten frames, etc.; create drawings of manipulatives to show their thinking; or use number lines to solve and describe their strategies. They then relate their drawings and materials to equations. Students solve a variety of addition and subtraction word problems, determining the unknown in all positions (*Result* unknown, *Change* unknown, and *Start* unknown). Rather than a letter ("*n*"), boxes or pictures are used to represent the unknown number.	Two-Step Example: There are 9 students in the cafeteria. 9 more students come in. After a few minutes, some students leave. There are now 14 students in the cafeteria. How many students left the cafeteria? Use drawings and equations to show your thinking. Student A *I read the equation and thought about how to write it with numbers: 9 + 9 - □ = 14. I used a number line to solve it. I started at 9 and took a jump of 9. I landed on 18. Then, I jumped back 4 to get to 14. So, overall, I took 4 jumps. 4 students left the cafeteria.*

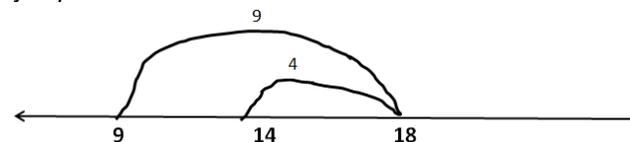|	**Add To**	
Result Unknown: There are 29 students on the playground. Then 18 more students showed up. *How many students are there now?* 29 + 18 = □ K	*Change* Unknown: There are 29 students on the playground. *Some more students show up.* There are now 47 students. How many students came? 29 + ☼ = 47 1	*Start* Unknown: *There are some students on the playground.* Then 18 more students came. There are now 47students. How many students were on the playground at the beginning? □ + 18 = 47 2

Second Graders use a range of methods, often mastering more complex strategies such as making tens and doubles and near doubles for problems involving addition and subtraction within 20. Moving beyond counting and counting-on, second grade students apply their understanding of place value to solve problems.

Student B
I read the equation and thought about how to write it with numbers: 9 + 9 - □ = 14. I used doubles to solve it. I thought about double 9s. 9 + 9 is 18. I knew that I only needed 14. So, I took 4 away, since 4 and 4 is eight. So, 4 students left the cafeteria.

Represent and solve problems.

NC.2.OA.1 Represent and solve addition and subtraction word problems, within 100, with unknowns in all positions, by using representations and equations with a symbol for the unknown number to represent the problem, when solving:

- One-Step problems:
  - Add to/Take from-Start Unknown
  - Compare-Bigger Unknown
  - Compare-Smaller Unknown
- Two-Step problems involving single digits:
  - Add to/Take from- Change Unknown
- Add to/Take From- Result Unknown

	Result Unknown	Change Unknown	Start Unknown
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
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? *"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 "more":* Jade has three more stickers than Lara. Lara has two stickers. How many stickers does Jade have? *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 "more":* Jade has three more stickers than Lara. Jade has five stickers. How many stickers does Lara have? *Version with "fewer":* Lara has three fewer stickers than Jade. Jade has five stickers. How many stickers does Lara have? $5 - 3 = ?$ — 2

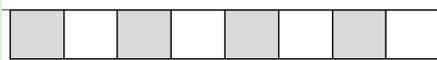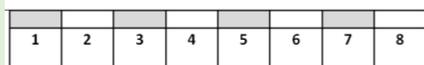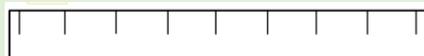| *Measure and estimate lengths*	
NC.2.MD.1 Measure the length of an object in standard units by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.	
Clarification	**Checking for Understanding**
In this standard, students build upon their non-standard measurement experiences in first grade by measuring in standard units. Students will apply their understanding of iteration to determine the length of an object using standard units. Using both customary (inches and feet) and metric (centimeters and meters) units, students select an attribute to be measured (e.g., length of classroom), choose an appropriate unit of measurement (e.g., yardstick), and determine the number of units (e.g., yards). Students will understand that larger units (e.g., yard) can be partitioned into equivalent units (e.g., feet or inches). Students should connect their understanding of non-standard units from first grade to standard units in second grade. By helping students progress from a "ruler" that is blocked off into colored units (no numbers)… …to a "ruler" that has numbers along with the colored units… …to a "ruler" that has inches (centimeters) with and without numbers, students develop the understanding that the numbers on a ruler do not count the individual marks but indicate the spaces (distance) between the marks. This is a critical understanding students need when using such tools as rulers, yardsticks, meter sticks, and measuring tapes.	Use a ruler to measure the width of the doorway in inches and in centimeters. Explain how you found how wide the doorway was. --- Would it more appropriate to use a ruler or a yard stick to measure the length of a book? Explain why.

Return to

Measure and estimate lengths

NC.2.MD.2 Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.

Clarification	Checking for Understanding
In this standard, students measure an object using two units of different lengths. Students will understand the relationship between the size of a unit and the number of units needed (compensatory principal). Students should understand that the smaller the unit, the more units it will take to measure the selected attribute.	Measure the height of the table with a yard stick. How tall is the table in feet? How tall is the table in inches? Explain how the measurements can both be used to describe the height of the table. *Possible response:* *The table is a little bit more than 2 feet tall. When I measured it in inches, it was 26 inches. Both 2 feet and 26 inches can be used to describe the height since the units feet and inches are different. The measurement has more inches than feet since inches are a smaller unit than feet.*

Measure and estimate lengths

NC.2.MD.3 Estimate lengths in using standard units of inches, feet, yards, centimeters, and meters.

Clarification	Checking for Understanding
In this standard, students estimate the lengths of objects using inches, feet, centimeters, and meters prior to measuring. Estimation helps the students focus on the attribute being measured and the measuring process. As students estimate, the student considers the size of the unit-helping them to become more familiar with the unit size. Once a student has made an estimate, the student measures the object and reflects on the accuracy of the estimate made and considers this information for the next measurement.	How many inches do you think this string is if you measured it with a ruler? *Possible response:* *An inch is pretty small. I'm thinking it will be somewhere between 8 and 9 inches. If I measure it with a ruler, it is 9 inches. I thought that it would be somewhere around there.*

Measure and estimate lengths

NC.2.MD.4 Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.

Clarification	Checking for Understanding
In this standard, students choose two objects to measure, identify an appropriate tool and unit, measure both objects, and then determine the differences in lengths. Students should make comparative statements to describe difference between two objects such as "This object is shorter by 2 inches" or "It is longer by 4 centimeters."	Choose two pieces of string to measure. How many inches do you think each string is? *I think String A is about 8 inches long. I think string B is only about 4 inches long. It's really short.* Measure to see how long each string is. What did you notice? *String A is definitely the longest one. It is 10 inches long. String B was only 5 inches long. I was close!* How many more inches does your short string need to be so that it is the same length as your long string? *String B is 5 inches. It would need 5 more inches to be 10 inches. 5 and 5 is 10.*

Relate addition and subtraction to length.
NC.2.MD.5 Use addition and subtraction, within 100, to solve word problems involving lengths that are given in the same units, using equations with a symbol for the unknown number to represent the problem.

Clarification	Checking for Understanding
In this standard, students apply their understanding of length to solve addition and subtraction word problems with numbers within 100. Within a problem, the same unit of measurement should be used. Equations may vary depending on students' interpretation of the task. Students are expected to solve word problems related to all of the problem types for addition and subtraction.	In P.E. class Kate jumped 14 inches. Mary jumped 23 inches. How much farther did Mary jump than Kate? Write an equation and then solve the problem. *Possible responses:* Student A *My equation is 14 + __ = 23 since I thought, "14 and what makes 23?". I used cubes. I made a train of 14. Then I made a train of 23. When I put them side by side, I saw that Kate would need 9 more cubes to be the same as Mary. So, Mary jumped 9 more inches than Kate. 14 + 9 = 23.* Student B *My equation is 23 - 14 = __ since I thought about what the difference was between Kate and Mary. I broke up 14 into 10 and 4. I know that 23 minus 10 is 13. Then, I broke up the 4 into 3 and 1. 13 minus 3 is 10. Then, I took one more away. That left me with 9. So, Mary jumped 9 more inches than Kate. That seems to make sense since 23 is almost 10 more than 14. 23 – 14 = 9.* $$23 - 10 = 13$$ $$13 - 3 = 10$$ $$10 - 1 = 9$$

Return to Standards