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

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.

Return to Standards

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

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:

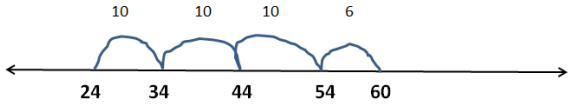
- *Add To/Start Unknown*
- *Take From/Start Unknown*
- *Compare/Bigger Unknown*
- *Compare/Smaller Unknown*

Checking for Understanding

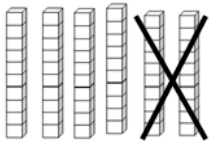
<u>One-Step Example:</u> Some students are in the cafeteria. 24 more students came in. Now there are 60 students in the cafeteria. How many were in the cafeteria to start with? Use drawings and equations to show your thinking.

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.

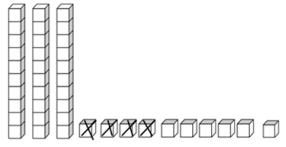


Student B: *I read the equation and thought about how to write it with numbers. First, I wrote an equation that showed me what the question is asking. I wrote ☐ + 24 = 60. Then, I thought, "There are 60 total. If I take away the part that I know (24), I'm left with the other part. So, what is 60 – 24?" 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

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.

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

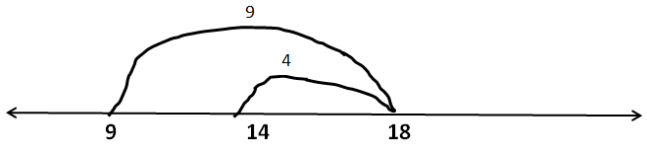
Second Graders use a range of methods, often mastering more complex strategies such as making tens and doubles and near doubles for problems involving addition and subtraction within 20. Moving beyond counting and counting-on, second grade students apply their understanding of place value to solve problems.

Checking for Understanding

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.



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**

Return to Standards

Return to Standards

Understand place value. **NC.2.NBT.2** Count within 1,000; skip-count by 5s, 10s, and 100s.	
Clarification	**Checking for Understanding**
In this standard, students count within 1,000, including counting on from a given number without having to go back and start at one. In Kindergarten, students skip counted by 10 up to 100. In second grade, students build on this work as they skip count by 5s, 10s, and 100s, laying groundwork for third grade's multiplication standards. Although skip counting is not yet true multiplication because students don't keep track of the number of groups they have counted, they can explain that when they count by 5s, 10s, and 100s they are counting groups of items with that amount in each group. As Second Graders skip count, they notice patterns within the counting sequence. When skip counting by 5s using a 100s board or number line, students learn that the ones digit alternates between 5 and 0. When students skip count by 100s, they learn the hundreds digit is the only digit that changes and that it increases by one number.	Destiny was skip-counting the fruit roll ups by 5s. She already counted 490 fruit roll ups. As she continues to skip-count by 5s, what are the next six numbers she will count? 480, 485, 490, _____, _____, _____, _____, _____, _____ Cassandra was skip-counting the fruit roll ups by 10s. She already counted 178 fruit roll ups. As she skip-counts by 10s, what are the next six numbers she will count? 158, 168, 178, _____, _____, _____, _____, _____, _____

Return to Standards

Use place value understanding and properties of operations. **NC.2.NBT.5** Demonstrate fluency with addition and subtraction, within 100, by: • Flexibly using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. • Comparing addition and subtraction strategies, and explaining why they work. • Selecting an appropriate strategy in order to efficiently compute sums and differences.			
Clarification	**Checking for Understanding**		
When adding and subtracting within 100, students flexibly use strategies based on place value, properties of operations, and the relationship between addition and subtraction. Students are fluent when they display accuracy, efficiency, and flexibility. Students develop fluency by understanding and internalizing the relationships that exist between and among numbers. By studying patterns and number relationships, students can internalize strategies for efficiently solving problems. Students explain why addition or subtraction strategies work as they apply their knowledge of place value and the properties of operations in their explanation. Students may use drawings or objects to support their explanation.	67 + 25 = __		
	Place Value Strategy: *I broke both 67 and 25 into tens and ones. 6 tens plus 2 tens equals 8 tens. Then I added the ones. 7 ones plus 5 ones equal 12 ones. I then combined my tens and ones. 8 tens plus 12 ones equals 92.*	*Decomposing into Tens:* *I decided to start with 67 and break 25 apart. I knew I needed 3 more to get to 70, so I broke off a 3 from the 25. I then added my 20 from the 22 left and got to 90. I had 2 left. 90 plus*	*Commutative Property:* *I broke 67 and 25 into tens and ones so I had to add 60+7+20+5. I added 60 and 20 first to get 80. Then I added 7 to get 87. Then I added 5 more. My answer is 92.*

The standard algorithm of carrying or borrowing is neither an expectation nor a focus in Second Grade. Students develop strategies for addition and subtraction in Grades K-3.

	2 is 92. So, 67 + 25 = 92	

63 – 32 = __

Decomposing into Tens:	*Think Addition:*
I broke apart both 63 and 32 into tens and ones. I know that 3 minus 2 is 1, so I have 1 left in the ones place. I know that 6 tens minus 3 tens is 3 tens, so I have a 3 in my tens place. My answer has a 1 in the ones place and 3 in the tens place, so my answer is 31. 63 – 32 = 31	*I thought, '32 and what makes 63?'. I know that I needed 30, since 30 and 30 is 60. So, that got me to 62. I needed one more to get to 63. So, 30 and 1 is 31. 32 + 31 = 63*

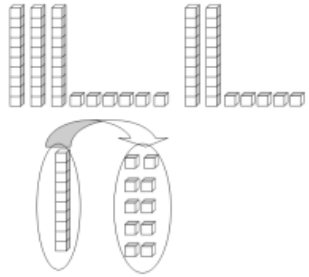
There are 36 birds in the park. 25 more birds arrive. How many birds are there? Solve the problem and explain your thinking.

Student A

I broke 36 and 25 into tens and ones 30 + 6 + 20 + 5. I can change the order of my numbers, since it doesn't change any amounts, so I added 30+ 20 and got 50. Then I added 5 and 5 to make10 and added it to the 50. So, 50 and 10 more is 60. I added the one that was left over and got on 6 to get 61. So, there are 61 birds in the park.

Student B

I used place value blocks and made a pile of 36 and a pile of 25. Altogether, I had 5 tens and 11 ones. 11 ones is the same as one ten and one left over. So, I really had 6 tens and 1 one. That makes 61.



One of your classmates solved the problem 56 - 34 = __ by writing "I know that I need to add 2 to the number 4 to get 6. I also know that I need to add 20 to 30 to get to 50. So, the answer is 22." Is their strategy correct? Explain why or why not?

Student: *I see what they did. Yes. I think the strategy is correct. They thought, '34 and what makes 56?' So, they thought about adding 2 to the*

	4 to get 6. Then, they had 36 and needed 56. So, they added 20 more. That means that they added 2 and 20 which is 22. I think that it's right. One of your classmates solved the problem 25 + 35 by adding 20 + 30 + 5 + 5. Is their strategy correct? Explain why or why not? Student: *Well, 20 + 30 is 50. And 5 + 5 is 10. So, 50 + 10 is 60. I got 60 too, but I did it a different way. I added 25 and 25 to make 50. Then I added 5 more and got 55. Then, I added 5 more and got 60. We both have 60. I think that it doesn't matter if you add the 20 first or last. You still get the same amount.*

Return to Standards

Use place value understanding and properties of operations. **NC.2.NBT.6** Add up to three two-digit numbers using strategies based on place value and properties of operations.	
Clarification	**Checking for Understanding**
This standard builds upon NC.2.NBT.5 as students apply their understanding of place value and the properties of operations to add a string of up to three two-digit numbers. Students recognize that numbers may be grouped and added in any order (associative property), and combine numbers in ways that make adding easier. Students explain why strategies work as they apply their knowledge of place value and the properties of operations in their explanation. Students may use drawings or objects to support their explanation. The standard algorithm of carrying or borrowing is neither an expectation nor a focus in Second Grade. Students develop strategies for addition and subtraction in Grades K-3.	43 + 34 + 57 = __ Student A *Associative Property* *I saw the 43 and 57 and added them first. I know 3 plus 7 equals 10, so when I added them 100 was my answer. Then I added 34 and had 134.* *So, 43 + 57 + 34 = 134* Student B *Place Value Strategies* *I broke up all of the numbers into tens and ones. First, I added the tens. 40 + 30 + 50 = 120. Then I added the ones. 3 + 4 + 7 = 14. That meant I had 1 ten and 4 ones. So, 120 + 10 is 130. 130 and 4 more is 134.* *So, 43 + 34 + 57 = 134* Student C *Place Value Strategies and Associative Property* *I broke up all the numbers into tens and ones. First, I added up the tens.*

	40 + 30 + 50. I changed the order of the numbers to make adding easier. I know that 40 + 50 equals 90. I took 10 from the 30, so that 90 + 10 equals 100. I added the 20 that was left to get 120. *Then I added up the ones. 3 + 4 + 7. I changed the order of the numbers to make adding easier. I know that 3 plus 7 equals 10. 10 plus 4 equals 14.* *I then combined my tens and my ones. 120 plus 14 (1 ten and 4 ones) equals 134.*

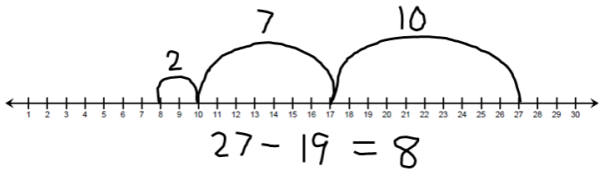
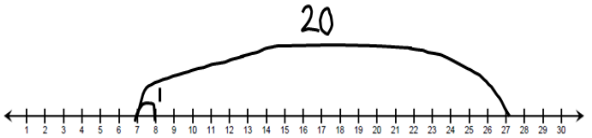
Return to Standards

Use place value understanding and properties of operations. **NC.2.NBT.8** Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.	
Clarification	**Checking for Understanding**
In this standard, students build on the work from NC.1.NBT.5 where they mentally found 10 more and 10 less than any two-digit number. Standard NC.2.NBT.8 builds on this work as students mentally add and subtract 10 or 100 from a given number between 100 and 900. As students engage in various experiences with concrete objects and representations, they realize that when one adds or subtracts 10 or 100 that only the tens place or the digit in the hundreds place changes by 1. Students discover patterns and connect the digit change with the amount changed, which leads into solving problems mentally. Opportunities to solve problems in which students cross hundreds are also provided once students have become comfortable adding and subtracting within the same hundred.	<u>Within the same hundred:</u> What is 10 more than 218? What is 241 – 10? <u>Across hundreds:</u> 293 + 10 = ☐ What is 10 less than 206?

Return to Standards

Relate addition and subtraction to length.

NC.2.MD.6 Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points and represent whole-number sums and differences, within 100, on a number line.

Clarification	**Checking for Understanding**
In this standard, students build upon their experiences with open number lines. Students create number lines with evenly spaced points corresponding to the numbers to solve addition and subtraction problems to 100. Students should recognize the similarities between a number line and a ruler.	There were 27 students on the bus. 19 got off the bus. How many students are on the bus? Possible responses: *Student A: I used a number line. I started at 27. I broke up 19 into 10 and 9. That way, I could take a jump of 10. I landed on 17. Then I broke the 9 up into 7 and 2. I took a jump of 7. That got me to 10. Then I took a jump of 2. That's 8. So, there are 8 students now on the bus.*  *Student B: I used a number line. I saw that 19 is really close to 20. Since 20 is a lot easier to work with, I took a jump of 20. But, that was one too many. So, I took a jump of 1 to make up for the extra. I landed on 8. So, there are 8 students on the bus.* *27 - 20 = 7* *7 + 1 = 8* 

Return to Standards