



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 2017-18 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 [here](#) 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 <https://www.dpi.nc.gov/teach-nc/curriculum-instruction/standard-course-study/mathematics>.

North Carolina Course of Study – 1st Grade Standards

Standards for Mathematical Practice

Represent and solve problems.

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[NC.1.OA.2](#)

Understand and apply the properties of operations.

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[NC.1.G.2](#)

[NC.1.G.3](#)

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: “ <i>There are 60 children on the playground. Some children line up. There are 20 children still on the playground. How many children lined up?</i> ” 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](#)

Operations and Algebraic Thinking

Represent and solve problems.

NC.1.OA.1 Represent and solve addition and subtraction word problems, within 20, with unknowns, by using objects, drawings, and equations with a symbol for the unknown number to represent the problem, when solving:

- Add to/Take from-Change Unknown
- Put together/Take Apart-Addend Unknown
- Compare-Difference Unknown

Clarification

In this standard, students extend their work from NC.K.OA.1 to solve addition and subtraction problems within 20. In addition to continuing work with the problem types introduced in Kindergarten, standard NC.1.OA.1 calls for first graders to work additional problem types, including:

- add to/take from – change unknown
- put together/take apart – addend unknown
- compare – difference unknown

		Result Unknown	Change 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? $2 + 3 = ?$ <div style="text-align: right;">K</div>	Two birds sat in a tree. Some more birds flew there. Then there were five birds in the tree. How many birds flew over to the first two? $2 + ? = 5$ <div style="text-align: right;">1</div>
	Take From	Five birds were in a tree. Two birds flew away. How many birds are in the tree now? $5 - 2 = ?$ <div style="text-align: right;">K</div>	Five birds were in a tree. Some flew away. Then there were three birds in the tree. How many birds flew away? $5 - ? = 3$ <div style="text-align: right;">1</div>

		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? $3 + 2 = ?$ <div style="text-align: right;">K</div>	Five birds are in a tree. Three are red and the rest are blue. How many birds are blue? $3 + ? = 5$ $5 - 3 = ?$ <div style="text-align: right;">1</div>	Five birds are in a tree. They could either be blue birds or red birds. How many birds could be red and how many could be blue? $5 = 0 + 5$ $5 = 5 + 0$ $5 = 1 + 4$ $5 = 4 + 1$ $5 = 2 + 3$ $5 = 3 + 2$ <div style="text-align: right;">K</div>

As students develop strategies for solving a variety of problem situations, they build meaning for the operations of addition and subtraction.

Checking for Understanding

Nine bunnies were sitting on the grass. Some more bunnies hopped there. Now, there are 13 bunnies on the grass. How many bunnies hopped over there?

Possible response:

Counting On: Niiinnneee.... holding a finger for each next number counted 10, 11, 12, 13. Holding up her four fingers, 4! 4 bunnies hopped over there."

13 apples are on the table. 6 of them are red and the rest are green. How many apples are green?

Possible response:

Doubles +/- 1 or 2: I know that 6 and 6 is 12. So, 6 and 7 is 13. There are 7 green apples.

Joe has 8 red balloons and some blue balloons. Joe has a total of 15 balloons. How many blue balloons does Joe have?

Possible response:

15	
8	?

Represent and solve problems.

NC.1.OA.1 Represent and solve addition and subtraction word problems, within 20, with unknowns, by using objects, drawings, and equations with a symbol for the unknown number to represent the problem, when solving:

- Add to/Take from-Change Unknown
- Put together/Take Apart-Addend Unknown
- Compare-Difference Unknown

Clarification

Change unknown and addend unknown problems allow students to begin to see subtraction as the opposite of addition. Developing the understanding of subtraction as an unknown addend addition problem is an essential goal for later mathematics. As students work with change unknown and addend unknown problems, 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).

In a Compare situation, two amounts are compared to find “How many more” or “How many less/fewer”. Students build on their understanding of equal to, more than, and less than for two groups of objects or two numbers. Strategies for determining which the difference in quantities include matching and counting.

	Difference 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? $2 + ? = 5$ $5 - 2 = ?$

As First Graders work with a variety of problem types, they extend the sophistication of addition and subtraction methods used in Kindergarten (counting). Now, students use methods of counting on, making ten, and doubles +/- 1 or +/- 2 to solve problems. Students also use a variety of models, including discrete objects and length-based models (e.g., cubes connected to form lengths).

In order for students to read and use equations to represent their thinking, they need extensive experiences with addition and subtraction situations in order to connect the experiences with symbols (+, -, =) and equations ($5=3+2$). In Kindergarten, students demonstrated the understanding of how objects can be joined (addition) and separated (subtraction) by representing addition and subtraction situations using objects, pictures and words. In First Grade, students extend this understanding of addition and subtraction situations to use the addition symbol (+) to represent joining situations, the subtraction symbol (-) to represent separating situations, and the equal sign (=) to represent a relationship regarding quantity between one side of the equation and the other. When solving comparison problems, students may write various equations to represent comparisons.

For a complete chart of problem types see page 30.

Checking for Understanding

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

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.

Checking for Understanding

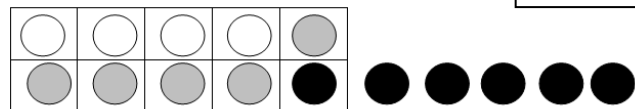
Mrs. Smith has 4 oatmeal raisin cookies, 5 chocolate chip cookies, and 6 gingerbread cookies. How many cookies does Mrs. Smith have?

Possible responses:

Student A:

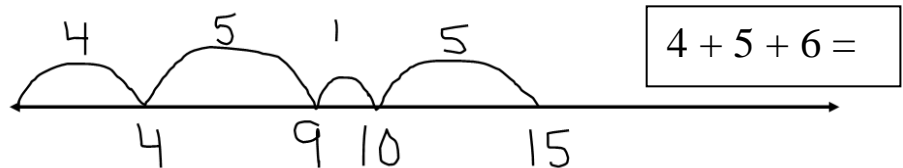
I put 4 counters on the Ten Frame for the oatmeal raisin cookies. Then, I put 5 different color counters on the ten frame for the chocolate chip cookies. Then, I put another 6 color counters out for the gingerbread cookies. Only one of the gingerbread cookies fit, so I had 5 leftover. Ten and five more makes 15 cookies. Mrs. Smith has 15 cookies.

$$4 + 5 + 6 =$$



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: $4 + 5 + 6 = \square$. 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.

Understand and apply the properties of operations.

NC.1.OA.3 Apply the commutative and associative properties as strategies for solving addition problems.

Clarification

This standard calls for students to notice properties of operations as they work with numbers, and apply their understandings of the commutative and associative property to solve addition problems. Students use mathematical tools and representations (e.g., cubes, counters, number balance, number line, 100 chart) to model these ideas.

Students in first grade do not use the formal terms “commutative” and “associative”.

Commutative Property of Addition	Associative Property of Addition
<p>The order of the addends does not change the sum.</p> <p>For example, if $8 + 2 = 10$ is known, then $2 + 8 = 10$ is also known.</p>	<p>The grouping of the 3 or more addends does not affect the sum.</p> <p>For example, when adding $2 + 6 + 4$, the sum from adding the first two numbers first ($2 + 6$) and then the third number (4) is the same as if the second and third numbers are added first ($6 + 4$) and then the first number (2). The student may note that $6 + 4$ equals 10 and add those two numbers first before adding 2. Regardless of the order, the sum remains 12.</p>

Checking for Understanding

Commutative Property Examples:

Cubes:

A student uses 2 colors of cubes to make as many different combinations of 8 as possible. When recording the combinations, the student records that 3 green cubes and 5 blue cubes equals 8 cubes in all. In addition, the student notices that 5 green cubes and 3 blue cubes also equals 8 cubes.



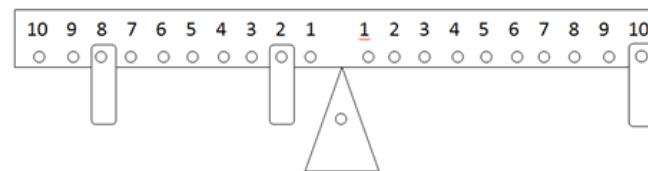
$$3 + 5 = 8$$



$$5 + 3 = 8$$

Number Balance:

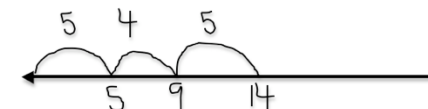
A student uses a number balance to investigate the commutative property. “If 8 and 2 equals 10, then I think that if I put a weight on 2 first this time and then on 8, it’ll also be 10.”



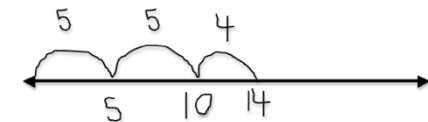
Associative Property Examples: There are 5 red jelly beans, 4 green jelly beans, and 5 black jelly beans. How many jelly beans are there in all?

Number Line:

Student A: First I jumped to 5. Then, I jumped 4 more, so I landed on 9. Then, I jumped 5 more and landed on 14.



Student B: I got 14, too, but I did it a different way. First, I jumped to 5. Then, I jumped 5 again. That’s 10. Then, I jumped 4 more. See, 14!



Mental Math:

Student: I started by adding 5 and 5 because I know that makes 10. Then, I added 4. That’s 14.

Return to [Standards](#)

Understand and apply the properties of operations.**NC.1.OA.4** Solve an unknown-addend problem, within 20, by using addition strategies and/or changing it to a subtraction problem.**Clarification**

In this standard, students find the solution to a problem based on the meaning in the story. Therefore, when faced with an unknown addend problem, students may associate the problem with either addition or subtraction, depending on the context.

This standard calls for students to make sense of unknown addend problems and demonstrate flexibility in solving. Through experiences, students will notice the relationship between addition and subtraction, and apply this relationship when problem solving (i.e., by changing an unknown addend problem so a subtraction problem).

Additionally, students should develop flexibility when solving unknown addend problems, using strategies such as:

- direct modeling
- count on/count back
- use derived facts
- make a ten
- think addition
- think subtraction
- subtract through ten

Checking for Understanding

Francisco was making cards for his 12 friends. He already made 4 cards. How many cards does Francisco still need to make?

Student A: *I started at 4 and added up to 12 ($4 + \underline{\quad} = 12$)*

Student B: *I thought about subtraction problem ($12 - 4 = \underline{\quad}$).*

Think Addition

$$2 + \square = 10$$

$$10 - 2 = \square$$

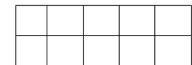
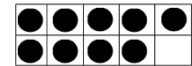
Student: *2 and what make 10? I know that 8 and 2 make 10. So, $10 - 2 = 8$.*

Build Up Through 10

$$15 - 9 = \square$$

Student A: *I'll start with 9. I need one more to make 10. Then, I need 5 more to make 15. That's 1 and 5- so it's 6. $15 - 9 = 6$.*

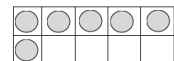
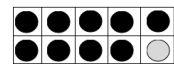
Student B: *I put 9 counters on the 10 frame. Just looking at it I can tell that I need 1 more to get to 10. Then I need 5 more to get to 15. So, I need 6 counters.*

**Back Down Through 10**

$$16 - 7 = \square$$

Student A: *I'll start with 16 and take off 6. That makes 10. I'll take one more off and that makes 9. $16 - 7 = 9$.*

Student B: *I used 16 counters to fill one ten frame completely and most of the other one. Then, I can take these 6 off from the 2nd ten frame. Then, I'll take one more from the first ten frame. That leaves 9 on the ten frame.*



Return to [Standards](#)

Add and subtract within 20.**NC.1.OA.9** Demonstrate fluency with addition and subtraction within 10.**Clarification**

In this standard, students learn about and use a variety of strategies to solve addition and subtraction problems (See strategies listed in NC.1.OA.6). As these strategies are repeatedly used in ways that make sense to the students, they begin to understand and internalize the relationships that exist between and among numbers. This leads to fluency. When students develop fluency within 10, they display accuracy, efficiency, and flexibility. First Graders then apply similar strategies for solving problems within 20, building the foundation for fluency to 20 in Second Grade.

Traditional flash cards or timed tests have not been proven as effective instructional strategies for developing fluency. Often, when children think of each “fact” as an individual item that does not relate to any other “fact”, they are attempting to memorize separate bits of information that can be easily forgotten. Numerous experiences with breaking apart actual sets of objects and developing relationships between numbers help children internalize parts of number and develop efficient strategies for fact retrieval.

Checking for Understanding

Two frogs were sitting on a log. 6 more frogs hopped there. How many frogs are sitting on the log now?

Possible responses:

Counting- On

I started with 6 frogs and then counted up, Sixxxx.... 7, 8. So there are 8 frogs on the log.

$$6 + 2 = 8$$

Internalized Fact

There are 8 frogs on the log. I know this because 6 plus 2 equals 8.

$$6 + 2 = 8$$

Return to [Standards](#)

Add and subtract within 20.

NC.1.OA.6 Add and subtract, within 20, using strategies such as:

- Counting on
- Making ten
- Decomposing a number leading to a ten
- Using the relationship between addition and subtraction
- Using a number line
- Creating equivalent but simpler or known sums.

Clarification

In this standard, students develop increasingly sophisticated strategies to become more efficient with addition and subtraction. Students are flexible as they decide when each strategy is the most efficient. Students should be able to explain their thinking and the strategy they have chosen to use.

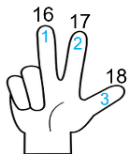
Examples of Strategies:

Counting On

Counting on can be used to add (find a total) or subtract (find an unknown addend). Students see the first addend as part of the total and count on the find the other part. This may be accompanied with fingers or mental images. Counting on is meant to be a thinking strategy, not a rote method.

Example: $15 + \underline{\quad} = 18$

"I put 15 in my head and counted on until I got to 18. I said 3 numbers so I know the missing part is 3."



Making Ten

This strategy makes a problem friendlier by taking 1 or more from one addend and adding it to the other addend, making 10.

Example:

When solving $9+6$, a student moves 1 from the 6 to the 9. The new problem becomes $10+5$.

$$\begin{array}{r} 9 + 6 \\ (9 + 1) + 5 \end{array}$$

Decomposing a Number Leading to Ten

Here, part of the subtrahend is subtracted, getting a difference of 10. Then, the remaining part of the subtrahend is subtracted.

Example: $14 - 6$

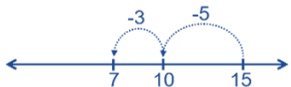
minuend subtrahend

"Instead of subtracting 6, I started by subtracting 4, getting a difference of 10. Then, I still had to subtract 2. That's 8."

Using a Number Line

A number line may be used to help keep track of work, especially when a student adds or subtracts in chunks.

Example:
 $15 - 8$



Here, the student first subtracts 5 to get to 10, then he subtracts the remaining 3.

Using the Relationship Between Addition and Subtraction

When students understand that any addition or subtraction equation has several related equations (i.e., fact families), this relationship may be used to solve problems.

Example: $19 - 11 = \underline{\quad}$

"I know the sum of 11 and 8 is 19. That helps me know that if I take away 11 from 19, I'm left with 8."

Creating an Equivalent Sum

Students recognize a close, easy fact to help them solve a trickier problem

Example:

" $6+5$ is tricky. Instead, I'll start with $5+5$, then add 1 more."

Checking for Understanding

Sam has 8 red marbles and 7 green marbles. How many marbles does Sam have in all?

Possible responses:

Make 10 and Decompose a Number

I know that 8 plus 2 is 10, so I broke up (decomposed) the 7 up into a 2 and a 5. First, I added 8 and 2 to get 10, and then added the 5 to get 15.

$$\begin{array}{l} 7 = 2 + 5 \\ 8 + 2 = 10 \\ 10 + 5 = 15 \end{array}$$

Create an Easier Problem with Known Sums

I broke up (decomposed) 8 into 7 and 1. I know that 7 and 7 is 14. I added 1 more to get 15.

$$\begin{array}{l} 8 = 7 + 1 \\ 7 + 7 = 14 \\ 14 + 1 = 15 \end{array}$$

There were 14 birds in the tree. 6 flew away. How many birds are in the tree now?

Possible responses:

Decomposing a Number Leading to Ten

I know that 14 minus 4 is 10. So, I broke the 6 up into a 4 and a 2. 14 minus 4 is 10. Then I took away 2 more to get 8.

$$\begin{array}{l} 6 = 4 + 2 \\ 14 - 4 = 10 \\ 10 - 2 = 8 \end{array}$$

Relationship between Addition & Subtraction

I thought, '6 and what makes 14?'. I know that 6 plus 6 is 12 and two more is 14. That's 8 altogether. So, that means that 14 minus 6 is 8.

$$\begin{array}{l} 6 + 8 = 14 \\ 14 - 6 = 8 \end{array}$$

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

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.

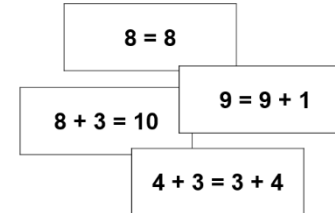
When students understand that an equation needs to “balance”, with equal quantities on both sides of the equal sign, they understand various representations of equations, such as:

- 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 ($5+2 = 4+3$).

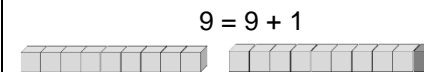
Once students understand the meaning of the equal sign, they are able to determine if an equation is true ($9 = 9$) or not true ($9 = 8$).

Checking for Understanding

Put these cards into two piles: True and Not True. Use objects, drawings, or words to explain your thinking.



Possible responses:



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

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.

Checking for Understanding

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).*

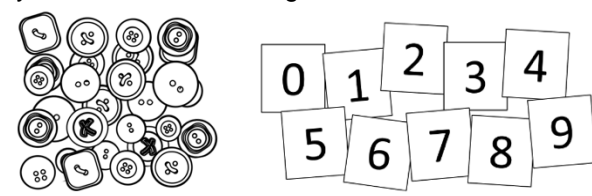
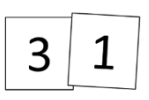
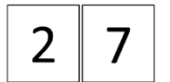
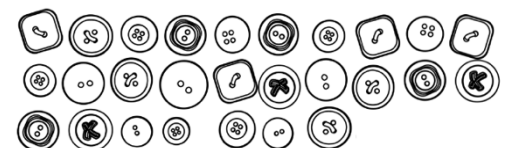
Student C: *We ended with 3 cookies. Threeeee, four, five (holding up 1 finger for each count). 2 cookies were eaten (showing 2 fingers).*

Find the unknown number that makes the equation true: $5 - \square = 2$

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!*

Number and Operations in Base Ten

Extend and recognize patterns in the counting sequence NC.1.NBT.1 Count to 150, starting at any number less than 150.	
Clarification	Checking for Understanding
<p>This standard calls for students to rote count from a given number without having to go back and start at one. Students should develop accurate counting strategies that build on the understanding of how the numbers in the counting sequence are related—each number is one more (or one less) than the number before (or after).</p> <p>This skill builds from counting work in Kindergarten, and serves as a prerequisite skill for counting on to add.</p> <p>The focus of this standard is rote counting only, and does not require recognition of numerals or writing numerals.</p>	<p>Sample Student Interview: Teacher: Begin at 88 and count up to 102 Student: 88, 89...umm...90, 91, 92, 93, 94, 95, 96, 97, 98, 99...umm...100, 101</p> <p>Teacher: I noticed you paused to think at 89. How did you figure out the next number? Student: <i>After each number that ends in 9, comes a number that ends in 0. So, I remembered the next number is 90.</i></p>

Extend and recognize patterns in the counting sequence NC.1.NBT.7 Read and write numerals, and represent a number of objects with a written numeral, to 100.	
Clarification	Checking for Understanding
<p>This standard calls for students to read and write numerals to represent a given amount.</p> <ul style="list-style-type: none"> When determining the quantity of a set within 100, students will select the appropriate number card/tile (numeral recognition) or write the numeral. When given a numeral or number card/tile, students will create a set of items that represents the numeral presented. <p>As students explore larger numbers and develop understanding of place value, they will recognize that the position of each digit in a number impacts the quantity of the number. They become more aware of the order of the digits when they write numbers.</p> <div style="background-color: #e0f0e0; padding: 10px; margin-top: 10px;"> <p>For example: a student may write “17” and mean “71”. Through teacher demonstration, opportunities to “find mistakes”, and questioning by the teacher (“I am reading this and it says seventeen. Did you mean seventeen or seventy-one? How can you change the number so that it reads seventy-one?”), students become precise as they write numbers to 100.</p> </div>	<p>Teacher: How many buttons are in this bag? Use the number cards to show the amount.</p> <div style="text-align: center;">  </div> <p>Student: <i>I counted 31. I used these number cards to make 31.</i></p> <div style="text-align: right;">  </div> <hr/> <p>Teacher: Use the buttons to make a set to match this number.</p> <div style="text-align: right;">  </div> <p>Student: <i>That's 27! Here are 27 buttons.</i></p> <div style="text-align: center;">  </div>

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Understand place value.**NC.1.NBT.2** Understand that the two digits of a two-digit number represent amounts of tens and ones.

- Unitize by making a ten from a collection of ten ones.
- Model the numbers from 11 to 19 as composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.
- Demonstrate that the numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens, with 0 ones.

Clarification

The focus of this standard is to build place value understanding through tens. First Grade students extend their work from Kindergarten when they composed and decomposed numbers from 11 to 19 into ten ones and some further ones. In Kindergarten, everything was thought of as individual units, “ones”. In First Grade, students are asked to unitize those ten individual ones as a whole unit: “one ten”. Students are introduced to the idea that a bundle of ten ones is called “a ten”. This is known as unitizing. Students in first grade explore the idea that the teen numbers (11 to 19) can be expressed as one ten and some leftover ones.

When students unitize a group of ten ones as a whole unit (“a ten”), they are able to count groups as though they were individual objects. For example, 4 trains of ten cubes each have a value of 10 and would be counted as 40 ones or as 4 tens. This can often be challenging for young children to consider a group of something as “one” when all previous experiences have been counting single objects. This is the foundation of the place value system and requires time and rich experiences with concrete manipulatives to develop.

In addition, when learning about forming groups of 10, students learn that a numeral can stand for many different amounts, depending on its position or place in a number. This is an important realization as young children begin to work through reversals of digits, particularly in the teen numbers.

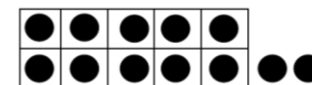
Students apply their understanding of groups of ten to decade numbers (e.g. 10, 20, 30, 40). As they work with groupable objects, students understand that 10, 20, 30...80, 90 are comprised of a certain amount of groups of tens with none left-over.

A deep understanding of place value is developed over time as students have ample experiences with a variety of groupable materials (i.e., materials that can be grouped, snapped, or connected to make a ten). Pre-grouped materials (i.e., materials like base ten blocks and bean sticks, which must be traded to make a ten) are not introduced until a student has a firm understanding of composing and decomposing ten. Additionally, students should have access to proportional manipulatives, meaning the size of “ten” is ten times bigger than one single manipulative. Coins could cause a misconception with regards to developing an understanding of place value.

Checking for Understanding

Here is a pile of 12 cubes. Do you have enough to make a ten? Would you have any leftover? If so, how many leftovers would you have?

Student A:
I filled a ten frame to make a ten and had two counters left over. The number 12 has 1 ten and 2 ones.



Student B:
I counted out 12 cubes. I had enough to make 10. I now have 1 ten and 2 cubes left over. The number 12 has 1 ten and 2 ones.



Are the number 19 and 91 the same or different? **(19 91)**

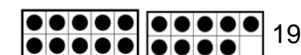
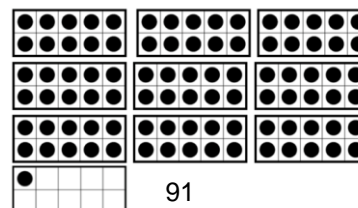
Teacher: Are these numbers the same or different?

Students: *Different!*

Teacher: Why do you think so?

Student A: *Even though they both have a one and a nine, I know the 1 in 19 represents one group of ten. The 1 in 91 represents 1 one.*

Student B: *I know the 9 in 91 represents nine groups of tens. The 9 in 19 represents 9 ones.*



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 ($=$).	<p>Compare these two numbers. 42 ___ 45</p> <p>Possible responses:</p> <table border="1"> <tr> <td> <p>Student A</p> <p>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.</p> <p>42 < 45</p> </td><td> <p>Student B</p> <p>42 is less than 45. I know this because when I count up I say 42 before I say 45.</p> <p>42 < 45</p> </td></tr> </table>	<p>Student A</p> <p>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.</p> <p>42 < 45</p>	<p>Student B</p> <p>42 is less than 45. I know this because when I count up I say 42 before I say 45.</p> <p>42 < 45</p>
<p>Student A</p> <p>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.</p> <p>42 < 45</p>	<p>Student B</p> <p>42 is less than 45. I know this because when I count up I say 42 before I say 45.</p> <p>42 < 45</p>		

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Use place value understanding and properties of operations.

NC.1.NBT.4 Using concrete models or drawings, strategies based on place value, properties of operations, and explaining the reasoning used, add, within 100, in the following situations:

- A two-digit number and a one-digit number
- A two-digit number and a multiple of 10

Clarification

In this standard, students use concrete materials, models, drawings and place value strategies to add within 100. Students move beyond basic facts and draw on their understanding of the base-ten system (i.e., composing groups of ten from ten ones, and recognizing that a digit's value is determined by its place) to begin developing strategies for adding one and two digit numbers.

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

Checking for Understanding

24 red apples and 8 green apples are on the table. How many apples are on the table?

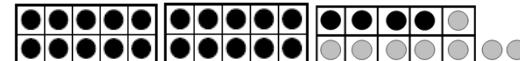
Possible responses:

Student A:

I used ten frames. I put 24 chips on 3 ten frames. Then, I counted out 8 more chips. 6 of them filled up the third ten frame. That meant I had 2 left over. 3 tens and 2 left over. That's 32. So, there are 32 apples on the table.

$$24 + 6 = 30$$

$$30 + 2 = 32$$

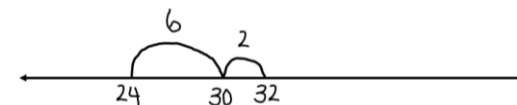


Student B:

I used an open number line. I started at 24. I knew that I needed 6 more jumps to get to 30. So, I broke apart 8 into 6 and 2. I took 6 jumps to land on 30 and then 2 more. I landed on 32. So, there are 32 apples on the table.

$$24 + 6 = 30$$

$$30 + 2 = 32$$



Student C:

I turned 8 into 10 by adding 2 because it's easier to add. So, 24 and ten more is 34. But, since I added 2 extra, I had to take them off again. 34 minus 2 is 32. There are 32 apples on the table.

$$8 + 2 = 10$$

$$24 + 10 = 34$$

$$34 - 2 = 32$$

Use place value understanding and properties of operations.

NC.1.NBT.4 Using concrete models or drawings, strategies based on place value, properties of operations, and explaining the reasoning used, add, within 100, in the following situations:

- A two-digit number and a one-digit number
- A two-digit number and a multiple of 10

Clarification

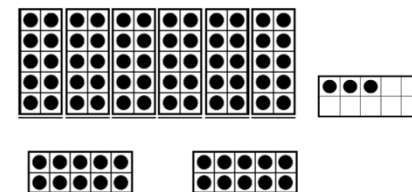
Checking for Understanding

63 apples are in the basket. Mary put 20 more apples in the basket. How many apples are in the basket?

Possible responses:

Student A:

I used ten frames. I picked out 6 filled ten frames. That's 60. I got the ten frame with 3 on it. That's 63. Then, I picked one more filled ten frame for part of the 20 that Mary put in. That made 73. Then, I got one more filled ten frame to make the rest of the 20 apples from Mary. That's 83. So, there are 83 apples in the basket.



$$63 + 10 = 73$$

$$73 + 10 = 83$$

Student B:

I used a hundreds chart. I started at 63 and jumped down one row to 73. That means I moved 10 spaces. Then, I jumped down one more row (that's another 10 spaces) and landed on 83. So, there are 83 apples in the basket.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

$$63 + 10 = 73$$

$$73 + 10 = 83$$

Student C:

I knew that 10 more than 63 is 73. And 10 more than 73 is 83. So, there are 83 apples in the basket.

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Use place value understanding and properties of operations.

NC.1.NBT.5 Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.

Clarification

In this standard, students build on their counting by tens work in Kindergarten by mentally adding ten more and ten less than any number less than 100. First graders are not expected to compute differences of two-digit numbers other than multiples of ten.

Using representations that allow students to think about groups of ten leads them to moving beyond rote counting and into being able to solve these problems mentally. Students should be able to explain their reasoning using manipulatives, pictures, numbers, or words.

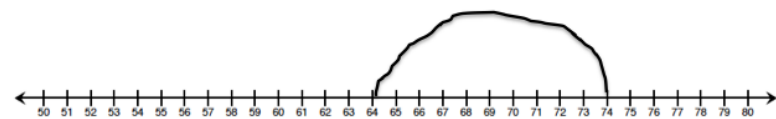
Checking for Understanding

There are 74 birds in the park. 10 birds fly away. How many birds are in the park now?

Possible responses:

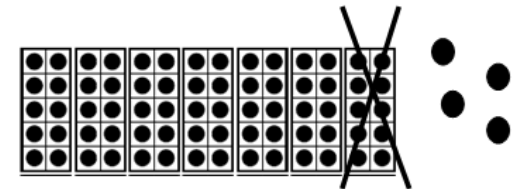
Student A

I thought about a number line. I started at 74. Then, because 10 birds flew away, I took a leap of 10. I landed on 64. So, there are 64 birds left in the park.



Student B

I pictured 7 ten frames and 4 left over in my head. Since 10 birds flew away, I took one of the ten frames away. That left 6 ten frames and 4 left over. So, there are 64 birds left in the park.



Student C

I know that 10 less than 74 is 64. So, there are 64 birds in the park.

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Use place value understanding and properties of operations.

NC.1.NBT.6 Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90, explaining the reasoning, using:

- Concrete models and drawings
- Number lines
- Strategies based on place value
- Properties of operations
- The relationship between addition and subtraction

Clarification

This standard calls for students to move beyond determining “10 less” to work with multiples of 10. Students use concrete models, drawings, place value strategies, and the relationship between addition and subtraction to subtract multiples of 10 from decade numbers (e.g., 30, 40, 50).

First graders are not expected to compute differences of two-digit numbers other than multiples of ten. Students are expected to explain their reasoning using pictures, numbers, or words.

Checking for Understanding

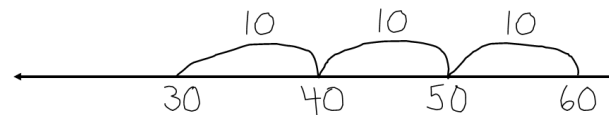
There are 60 students in the gym. 30 students leave. How many students are still in the gym?

Possible responses:

Student A

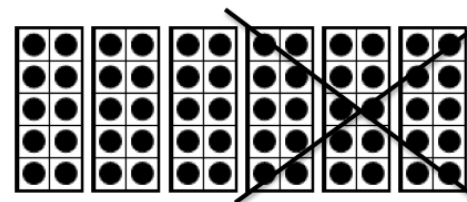
I used a number line. I started at 60 and moved back 3 jumps of 10 and landed on 30. There are 30 students left.

$$\begin{aligned} 60 - 10 &= 50 \\ 50 - 10 &= 40 \\ 40 - 10 &= 30 \end{aligned}$$



Student B

I used ten frames. I had 6 ten frames- that's 60. I removed three ten frames because 30 students left the gym. There are 30 students left in the gym.



$$60 - 30 = 30$$

Student C

I thought, “30 and what makes 60?”. I know 3 and 3 is 6. So, I thought that 30 and 30 makes 60. There are 30 students still in the gym.

$$30 + 30 = 60$$

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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
<p>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.</p> <p>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.</p> <p>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 string is longer than the desk, then you know that the bookshelf is longer than the desk.</p>	<p>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.</p> <p><i>Possible response:</i> <i>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.</i></p> <hr/> <p>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?</p> <p><i>Possible response:</i> <i>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 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.</i></p>

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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

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.

Checking for Understanding

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.

Build understanding of time and money.**NC.1.MD.3** Tell and write time in hours and half-hours using analog and digital clocks.**Clarification**

In this standard, students will be expected to determine the time when given an analog clock. Students will be able to correctly notate the time. Students may be asked to draw hands on a clock. Students will read both analog (numbers and hands) and digital clocks, orally tell the time, and write the time to the hour and half-hour.

Checking for Understanding

Write the times shown on each of the clocks below:



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Represent and interpret data**NC.1.MD.4** Organize, represent, and interpret data with up to three categories.

- Ask and answer questions about the total number of data points.
- Ask and answer questions about how many in each category.
- Ask and answer questions about how many more or less are in one category than in another.

Clarification

In this standard, students collect and use categorical data (e.g., eye color, shoe size, age) to answer a question. The data collected are organized in a chart or table. Once the data are collected, students interpret the data to answer a question. Students are also expected to describe the data noting particular aspects such as the total number of answers, which category had the most/least responses, and interesting differences/similarities between the categories.

New to Grade 1, students are expected to answer questions about how many more and how many less are in one category than in another. These should all be one-step problems limited to numbers within 20.

Checking for Understanding

The question, "What is your favorite flavor of ice cream?" is posed.

The categories chocolate, vanilla and strawberry are determined as anticipated responses and written down on the recording sheet. When asking each classmate about their favorite flavor, the student's name is written in the appropriate category.

Once the data are collected, the student counts up the amounts for each category and records the amount. The student then analyzes the data by carefully looking at the data and writes 3 sentences about what they notice about the data.

Possible response:

Name Barbara

What is your favorite flavor of ice cream?	
Chocolate	Amy Ethan Dylan Emma Ryan Elijah Ava Emily Aiden Brittany THOMAS Nathan 12
Vanilla	Sarah Maria Brian Katie KITTY 5
Strawberry	Rodney Brandon Darrell Mia Tonya Jose 6

12 people liked chocolate. Chocolate has the most votes. Vanilla has 5 votes. 1 more vote and it can tie with strawberry.

Build understanding of time and money.**NC.1.MD.5** Identify quarters, dimes, and nickels and relate their values to pennies.**Clarification**

In this standard, students should be able to name coins as penny, dime, nickel, and quarter. Students will be expected to tell the value of each coin and explain how many pennies are equal to that value. For example, a student should be able to say that a quarter is 25 cents and is made up of 25 pennies. Students are not expected to compose values from combinations of coins. The expectation is only to relate coin values to pennies.

Checking for Understanding

Give the students a handful of pennies, nickels, dimes, and quarters.

Possible questions to ask:

- Can you hand me the nickel?
- Can you hand me the coin that has a value of 5 cents?
- Can you hand me the coin that has the same value as 10 pennies?

Geometry

Reason with shapes and their attributes

NC.1.G.1 Distinguish between defining and non-defining attributes and create shapes with defining attributes by:

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

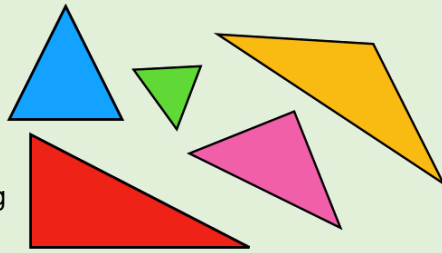
Clarification

In this standard, students use defining and non-defining attributes of shapes to identify, name, build and draw shapes. Students understand that defining attributes are always present features that classify a particular object such as number of sides, lengths of sides, and number of angles. They also understand that non-defining attributes are features that may be present, but do not identify what the shape is called (e.g., color, size, orientation, etc.).

For Example:

All triangles must be closed figures and have 3 straight sides. These are defining attributes.

Triangles can be different colors, sizes and be turned in different directions. These are non-defining attributes.



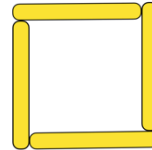
In this standard, students apply their understanding of defining attributes of shapes in order to create, by building or drawing, given shapes.

Students should be able to describe the two-dimensional shapes they build by telling the number of sides and vertices it has. Students should be able to identify the vertex (corner) as the location where two sides meet; however, it is not necessary for 1st grade students to use the term vertex. Through analysis, students should recognize that the length of sides is an important attribute when naming shapes. First grade students should be able to identify the two-dimensional shapes that are the faces of three-dimensional shapes. Identifying the number of edges and vertices on a three-dimensional shape is not an expectation of first grade.

Note: North Carolina has adopted the exclusive definition for a trapezoid. A trapezoid is a quadrilateral with *exactly* one pair of parallel sides.

Checking for Understanding

Build a shape from these popsicle sticks. What shape did you make? How do you know?



I used popsicle sticks to build a square. I know it's a square because all 4 sides are the same length and it has 4 right corners.



I built a rectangle. I know this is a rectangle because it has 4 sides and 4 square corners.

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Reason with shapes and their attributes

NC.1.G.2 Create composite shapes by:

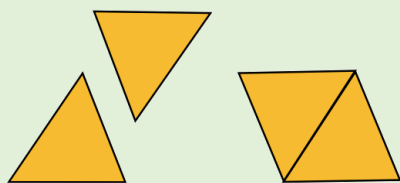
- Making a two-dimensional composite shape using rectangles, squares, trapezoids, triangles, and half-circles naming the components of the new shape.
- Making a three-dimensional composite shape using cubes, rectangular prisms, cones, and cylinders, naming the components of the new shape.

Clarification

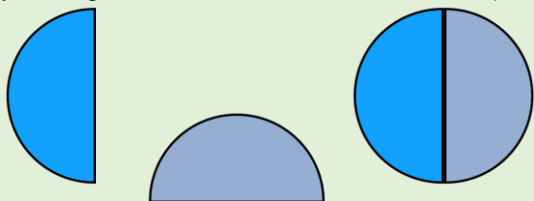
In this standard, students create composite two- and three-dimensional shapes, and are able to identify the name of the composite shape as well as the identify the shapes that form it. As first graders create composite two- and three-dimensional shapes they should begin to see how shapes fit together to create a new shape, and notice shapes within an already existing shape.

For example:

Recognizing that two isosceles triangles can be combined to make a rhombus, and simultaneously seeing the rhombus and the two triangles



Recognizing that two half-circles can be combined to make a circle, and simultaneously seeing the circle and the two half circles)



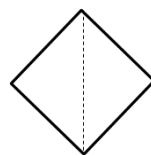
This standard calls for students to solve shape puzzles, construct designs with shapes, and create and maintain a shape as a unit. Students also continue to describe attributes and properties of shapes.

Checking for Understanding

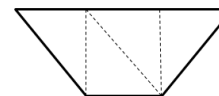
What shapes can you create with triangles?

Possible responses:

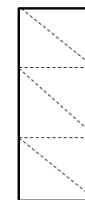
Student A: *I made a square. I used 2 triangles.*



Student B: *I made a trapezoid. I used 4 triangles.*



Student C: *I made a tall skinny rectangle. I used 6 triangles.*



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Reason with shapes and their attributes**NC.1.G.3** Partition circles and rectangles into two and four equal shares.

- Describe the shares as halves and fourths, as half of and fourth of.
- Describe the whole as two of, or four of the shares.
- Explain that decomposing into more equal shares creates smaller shares.

Clarification

In this standard, students will be able to partition rectangles and circles of various sizes into halves and fourths. Students should recognize that when something is cut into two equal pieces, each piece will equal one-half of its original whole. Students should also recognize that halves of two different wholes are not necessarily the same size, and they should understand that decomposing equal shares into more equal shares results in smaller equal shares.

Students should partition regions into equal shares using a context (e.g., cookies, pies, pizza). Through experiences with multiple representations, students should use the words, *halves* and *fourths*, and the phrases *half of* and *fourth of* to describe their thinking and solutions. Working with the “the whole”, students understand that “the whole” is composed of two halves or four fourths.

Checking for Understanding

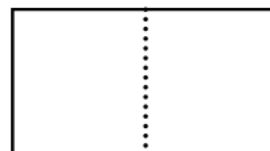
How can you and a friend share equally (partition) this piece of paper so that you both have the same amount of paper to paint a picture?



Possible responses:

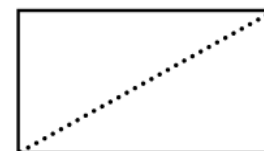
Student A

I would split the paper right down the middle. That gives us 2 halves. I have half of the paper and my friend has the other half of the paper.

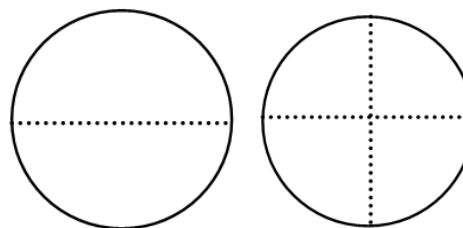


Student B

I would split it from corner to corner (diagonally). She gets half of the paper and I get half of the paper. See, if we cut on the line, the parts are the same size.



You can have only one slice of pizza. Which pizza should you pick your slice from if you want the biggest piece of pizza? The pizzas are the same size and are each divided into equal pieces. Explain how you know.



Possible response:

I would get more pizza if I took a slice from the pizza that is cut into two equal parts. The more equal slices there are, the smaller the pieces get. I wouldn't get as much pizza if I only got a fourth of the pizza instead of half of the pizza.

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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? "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