Louisiana STUDENT STANDARDS MATHEMATICS

Grade 2

Louisiana Student Standards: Companion Document for Teachers 2.0

This document is designed to assist educators in interpreting and implementing Louisiana's new mathematics standards. It contains descriptions of each grade 2 math standard to answer questions about the standard's meaning and how it applies to student knowledge and performance. Version 2.0 has been updated to include information from LDOE's Grade 2 Remediation and Rigor documents. Some examples have been added, deleted or revised to better reflect the intent of the standard. Examples are samples only and should not be considered an exhaustive list.

This companion document is considered a "living" document as we believe that teachers and other educators will find ways to improve the document as they use it. Please send feedback to classroomsupporttoolbox@la.gov so that we may use your input when updating this guide.

Additional information on the Louisiana Student Standards for Mathematics, including how to read the standards' codes, a listing of standards for each grade or course, and links to additional resources, is available at http://www.louisianabelieves.com/resources/library/k-12-math-year-long-planning.

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DEPARTMENT of EDUCATION
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How-to-Read Guide

The diagram below provides an overview of the information found in all companion documents. Definitions and more complete descriptions are provided on the next page.

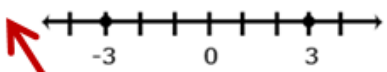
Domain Name and Abbreviation

Cluster Letter and Description

The Number System (NS)

A. Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.

In this cluster, the terms students should learn to use with increasing precision are **rational numbers, integers,** and **additive inverse.**

★ **7.NS.A.1** Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. a. Describe situations in which opposite quantities combine to make 0. *For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.* b. Understand $p + q$ as the number located a distance $\|q\|$ from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing	**Component(s) of Rigor:** Conceptual Understanding(1,1a, 1b, 1c, 1d) **Remediation - Previous Grade(s) Standards:** 5.NF.A.1, 6.NS.C.5 **7th Grade Standard Taught in Advance:** none **7th Grade Standard Taught Concurrently:** none Students add and subtract rational numbers. Visual representations may be helpful as students begin this work; they become less necessary as students become more fluent with these operations. In sixth grade, students found the distance of horizontal and vertical segments on the coordinate plane. In seventh grade, students build on this understanding to recognize subtraction is finding the distance between two numbers on a number line. Standard allows for adding and subtracting of negative fractions and decimals and interpreting solutions in given context. **Examples:** • Use a number line to illustrate: ○ $p - q$ ○ $p + (-q)$ ○ If this equation is true: $p - q = p + (-q)$ • -3 and 3 are shown to be opposites on the number line because they are equal distance from zero and therefore have the same absolute value and the sum of the number and its opposite is zero. 

Component(s) of Rigor

Previous grade(s) standards. Click hyperlink to access standard's text.

Current grade standards taught prior to or with this standard.

Text of Standard

Information and samples to exemplify standard

★ **Shading of Standard Codes: Major Work of Grade, Supporting Work, Additional Work**

Codes for previous grade standards and standards taught prior to or with this standard are hyperlinked to the text of the standard.

1. **Domain Name and Abbreviation:** A grouping of standards consisting of related content that are further divided into clusters. Each domain has a unique abbreviation and is provided in parentheses beside the domain name.
2. **Cluster Letter and Description:** Each cluster within a domain begins with a letter. The description provides a general overview of the focus of the standards in the cluster.
3. **Previous Grade(s) Standards:** One or more standards that students should have mastered in previous grades to prepare them for the current grade standard. If students lack the pre-requisite knowledge and remediation is required, the previous grade standards provide a starting point.
4. **Standards Taught in Advance:** These current grade standards include skills or concepts on which the target standard is built. These standards are best taught before the target standard.
5. **Standards Taught Concurrently:** Standards which should be taught with the target standard to provide coherence and connectedness in instruction.
6. **Component(s) of Rigor:** See full explanation on components of rigor below.
7. **Sample Problem:** The sample provides an example how a student might meet the requirements of the standard. Multiple examples are provided for some standards. However, sample problems should not be considered an exhaustive list. Explanations, when appropriate, are also included.
8. **Text of Standard:** The complete text of the targeted Louisiana Student Standards of Mathematics is provided.

Classification of Major, Supporting, and Additional Work

Students should spend the large majority of their time on the major work of the grade. Supporting work and, where appropriate, additional work can engage students in the major work of the grade. Each standard is color-coded to quickly and simply determine how class time should be allocated. Furthermore, standards from previous grades that provide foundational skills for current grade standards are also color-coded to show whether those standards are classified as major, supporting, or additional in their respective grades.

Components of Rigor

The K-12 mathematics standards lay the foundation that allows students to become mathematically proficient by focusing on conceptual understanding, procedural skill and fluency, and application.

Conceptual Understanding refers to understanding mathematical concepts, operations, and relations. It is more than knowing isolated facts and methods. Students should be able to make sense of why a mathematical idea is important and the kinds of contexts in which it is useful. It also allows students to connect prior knowledge to new ideas and concepts.

Procedural Skill and Fluency is the ability to apply procedures accurately, efficiently, and flexibly. It requires speed and accuracy in calculation while giving students opportunities to practice basic skills. Students' ability to solve more complex application tasks is dependent on procedural skill and fluency.

Application provides a valuable content for learning and the opportunity to solve problems in a relevant and a meaningful way. It is through real-world application that students learn to select an efficient method to find a solution, determine whether the solution makes sense by reasoning, and develop critical thinking skills.

Standards for Mathematical Practices

The Louisiana Standards for Mathematical Practice are expected to be integrated into every mathematics lesson for all students in grades K–12. Below are a few examples of how these practices may be integrated into tasks that students in grade 2 complete.

Louisiana Standards for Mathematical Practice (MP)	
Louisiana Standard	**Explanations and Examples**
2.MP.1 Make sense of problems and persevere in solving them.	In second grade, students realize that doing mathematics involves solving problems and discussing how they solved them. Students explain to themselves the meaning of a problem and look for ways to solve it. They may use concrete objects or pictures to help them conceptualize and solve problems. They may check their thinking by asking themselves, "Does this make sense?" They make conjectures about the solution and plan out a problem-solving approach.
2.MP.2 Reason abstractly and quantitatively.	Younger students recognize that a number represents a specific quantity. They connect the quantity to written symbols. Quantitative reasoning entails creating a representation of a problem while attending to the meanings of the quantities. Second graders begin to know and use different properties of operations and relate addition and subtraction to length.
2.MP.3 Construct viable arguments and critique the reasoning of others.	Second graders may construct arguments using concrete referents, such as objects, pictures, drawings, and actions. They practice their mathematical communication skills as they participate in mathematical discussions involving questions like "How did you get that?" "Explain your thinking," and "Why is that true?" They not only explain their own thinking, but listen to others' explanations. They decide if the explanations make sense and ask appropriate questions.
2.MP.4 Model with mathematics.	In early grades, students experiment with representing problem situations in multiple ways, including numbers, words (mathematical language), drawing pictures, using objects, acting out, making a chart or list, creating equations, etc. Students need opportunities to connect the different representations and explain the connections. They should be able to use all of these representations as needed.
2.MP.5 Use appropriate tools strategically.	In second grade, students consider the available tools (including estimation) when solving a mathematical problem and decide when certain tools might be better suited. For instance, second graders may decide to solve a problem by drawing a picture rather than writing an equation.
2.MP.6 Attend to precision.	As children begin to develop their mathematical communication skills, they try to use clear and precise language in their discussions with others and when they explain their own reasoning.
2.MP.7 Look for and make use of structure.	Second graders look for patterns. For instance, they adopt mental math strategies based on patterns (making ten, fact families, doubles).
2.MP.8 Look for and express regularity in repeated reasoning.	Students notice repetitive actions in counting and computation, etc. When children have multiple opportunities to add and subtract, they look for shortcuts, such as rounding up and then adjusting the answer to compensate for the rounding. Students continually check their work by asking themselves, "Does this make sense?"

Operations and Algebraic Thinking (OA)

A. Represent and solve problems involving addition and subtraction.

In this cluster, the terms students should learn to use with increasing precision are **add, subtract**, **more, less, equal, equation, putting together, taking from, taking apart, addend, total, comparing,** and **unknown**.

Notes on vocabulary:

1. While some standards use the term "sum," the term "total" is used in the student examples. "Sum" sounds the same as "some," but has the opposite meaning. "Some" is used to describe problem situations with one or both addends unknown, so it is better in the earlier grades to use "total" rather than "sum." Formal vocabulary for subtraction ("minuend" and "subtrahend") is not needed for kindergarten, grade 1, and grade 2, and may inhibit students seeing and discussing relationships between addition and subtraction. At these grades, the recommendation is to use the terms "total" and "addend" as they are sufficient for classroom discussion. This recommendation does not prohibit students from learning the term "sum" in grade 2; however, teachers will need to be aware of the misconceptions that its use may create.
2. Subtraction names a missing part. Therefore, the minus sign should be read as "minus" or "subtract" but not as "take away." Although "take away" has been a typical way to define subtraction, it is a narrow and incorrect definition. (*Fosnot & Dolk, 2001; Van de Walle & Lovin, 2006)

Louisiana Standard	Explanations and Examples
2.OA.A.1 Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.* * See Table 1 at the end of this document.	**Component(s) of Rigor:** Application **Remediation - Previous Grade(s) Standard:** 1.OA.A.1, 1.NBT.C.4, 1.NBT.C.5, 1.NBT.C.6 **2nd Grade Standard Taught in Advance:** none **2nd Grade Standard Taught Concurrently:** 2.NBT.B.5, 2.MD.B.5, 2.MD.C.8, 2.MD.D.10 Word problems that are connected to students' lives can be used. Students represent and solve word problems within 100, building upon their previous work to 20. In addition, they represent and solve one- and two-step word problems of all three types (*Result Unknown, Change Unknown, Start Unknown*). See Table 1 at end of document for examples of all problem types. 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. Brittany put some more stickers on the page. There are now 22 stickers on the page. How many stickers did Brittany 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 = ☐

2.OA.A.1 *continued*

As second-grade students solve one- and two-step problems, they use manipulatives, such as snap cubes, place value materials (groupable and pre-grouped), 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. By solving a variety of addition and subtraction word problems, second-grade students determine 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.

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

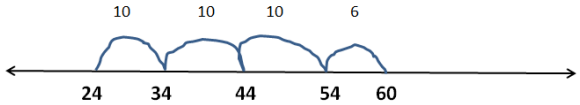
Second graders use a range of methods, often mastering more complex strategies such as making tens and using doubles and near doubles for problems involving addition and subtraction within 20. Moving beyond counting and counting-on, second-grade students apply their understanding of place value to solve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

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

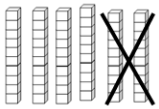
Possible solutions:

Student 1: I read the equation and thought about how to write it with numbers. I thought, "What number and 24 makes 60?" So, my equation for the problem 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.

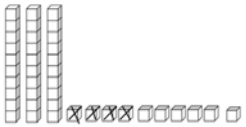


Student 2: I read the equation and thought about how to write it with numbers. I thought, "There are 60 total. I know about the 24. So, what is 60 – 24?" So, my equation for the problem is 60 – 24 = □. I used place value blocks to solve it.
I started with 60 and took 2 tens away.



2.OA.A.1 *continued*

I needed to take 4 more away. So, I broke up a ten into ten ones. Then, I took 4 away.



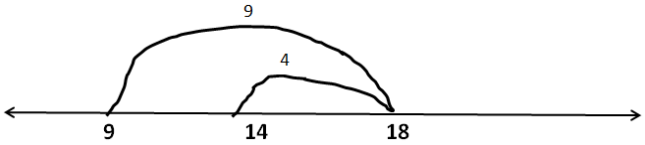
So there were 36 students in the cafeteria to start with.

Two-Step Problems: Because second grade students are still developing proficiency with the most difficult subtypes (*Add To/Start Unknown; Take From/Start Unknown; Compare/Bigger Unknown; and Compare/Smaller Unknown*), two-step problems do **not** involve these subtypes. Most two-step problems should focus on single-digit addends since the primary focus of the standard is the problem type.

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 1

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 2

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. That means 4 students left the cafeteria to have 14 still in the cafeteria.

Operations and Algebraic Thinking (OA)

B. Add and subtract within 20.

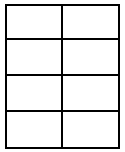
In this cluster, the terms students should learn to use with increasing precision are **add, subtract, total, more, less, equal, equation, putting together, taking from, taking apart,** and **addend**.

Louisiana Standard	Explanations and Examples
2.OA.B.2 Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.	**Component(s) of Rigor:** Procedural Skill and Fluency **Remediation - Previous Grade(s) Standard:** 1.OA.C.6 **2nd Grade Standard Taught in Advance:** none **2nd Grade Standard Taught Concurrently:** none This standard is strongly connected to all the standards in this domain. It focuses on students being able to fluently add and subtract numbers to 20. Adding and subtracting fluently refers to knowledge of procedures and strategies, knowledge of when and how to use them appropriately, and skill in performing them flexibly, accurately, and efficiently. Mental strategies help students make sense of number relationships as they are adding and subtracting within 20. The ability to calculate mentally with efficiency is very important for all students. Mental strategies may include the following: • Counting on • Making tens (9 + 7 = 10 + 6) • Decomposing a number leading to a ten (14 – 6 = 14 – 4 – 2 = 10 – 2 = 8) • Fact Families (8 + 5 = 13 is the same as 13 – 8 = 5) • Doubles • Doubles plus one (7 + 8 = 7 + 7 + 1) Research indicates that teachers can best support students' memory of the sums of two one-digit numbers through varied experiences, including making 10, breaking numbers apart, and working on mental strategies. These strategies replace the use of repetitive timed tests in which students try to memorize operations as if there were not any relationships among the various facts. When teachers teach facts for automaticity, rather than memorization, they encourage students to think about the relationships among the facts. (Fosnot & Dolk, 2001) **Developing Fluency for Addition and Subtraction within 20** **Example:** 9 + 5 = __ **Student A** *Counting On* I started at 9 and then counted 5 more. I landed on 14. **Student B** *Decomposing a Number-Leading to a Ten* I know that 9 and 1 is 10, so I broke 5 into 1 and 4. 9 plus 1 is 10. Then I have to add 4 more, which is 14.

Operations and Algebraic Thinking (OA)

C. Work with equal groups of objects to gain foundations for multiplication.

In this cluster, the terms students should learn to use with increasing precision are **odd, even, row, column, rectangular array, equal, addend, equation,** and **total**.

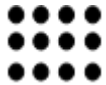
Louisiana Standard	Explanations and Examples
2.OA.C.3 Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.	**Component(s) of Rigor:** Conceptual Understanding **Remediation - Previous Grade(s) Standard:** 1.OA.D.7 **2nd Grade Standard Taught in Advance:** none **2nd Grade Standard Taught Concurrently:** 2.NBT.A.2 The focus of this standard is placed on the conceptual understanding of even and odd numbers. Second graders apply their work with doubles to the concept of odd and even numbers. Students should have ample experiences exploring the concept that if a number can be decomposed (broken apart) into two equal addends or doubles addition facts (e.g., 10 = 5 + 5), then that number (10 in this case) is an even number. Students should explore this concept with concrete objects (e.g., counters, cubes) before moving toward pictorial representations, such as circles or arrays. An even number is an amount that can be made of two equal parts with no leftovers. An odd number is one that is not even or cannot be made of two equal parts. The number endings of 0, 2, 4, 6, and 8 are only an interesting and useful pattern or observation and should not be used as the definition of an even number. (Van de Walle & Lovin, 2006, p. 292) **Example:** Is 8 an even number? Justify your thinking. **Student A** I grabbed 8 counters. I paired counters up into groups of 2. Since I didn't have any counters left over, I know that 8 is an even number. **Student B** I grabbed 8 counters. I put them into 2 equal groups. There were 4 counters in each group, so 8 is an even number. **Student C** I drew 8 boxes in a rectangle that had two columns. Since every box on the left matches a box on the right, I know that 8 is even.  **Student D** I drew 8 circles. I matched one on the left with one on the right. Since they all match up I know that 8 is an even number. **Student E** I know that 4 plus 4 equals 8. So 8 is an even number.

2.OA.C.4 Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.

Component(s) of Rigor: Conceptual Understanding
Remediation - Previous Grade(s) Standard: 1.OA.D.7
2nd Grade Standard Taught in Advance: none
2nd Grade Standard Taught Concurrently: none

Second graders use rectangular arrays to work with repeated addition, a building block for multiplication in third grade. A rectangular array is any arrangement of things in rows and columns, such as a rectangle of square tiles. Students explore this concept with concrete objects (e.g., counters, bears, square tiles) as well as pictorial representations on grid paper or other drawings. Due to the commutative property of multiplication, students can add either the rows or the columns and still arrive at the same solution.

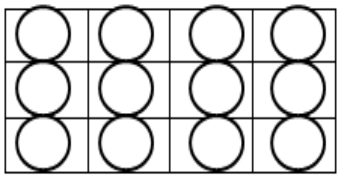
- Geoboards can be used to demonstrate rectangular arrays



4 + 4 + 4 = 12

5 + 5 + 5 + 5 = 20

- What is the total number of circles below?

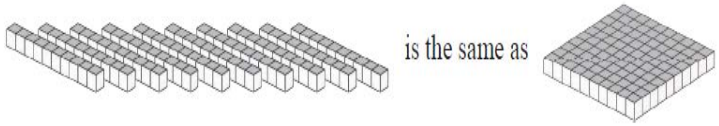


Student A	Student B
I see 3 counters in each column and there are 4 columns. So I added 3 + 3 + 3 + 3. That equals 12.	I see 4 counters in each row and there are 3 rows. So I added 4 + 4 + 4. That equals 12.
3 + 3 + 3 + 3 = 12	4 + 4 + 4 = 12

Number and Operations in Base Ten (NBT)

A. Understand place value.

In this cluster, the terms students should learn to use with increasing precision are **hundreds, tens, ones, skip count, base-ten, *number names to 1,000* (e.g., one, two, thirty, etc.), expanded form, greater than (>), less than (<), equal to (=), digit,** and **compare**.

Louisiana Standard	Explanations and Examples
2.NBT.A.1 Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases: a. 100 can be thought of as a bundle of ten tens—called a "hundred." b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).	**Component(s) of Rigor:** Conceptual Understanding (1, 1a, 1b) **Remediation - Previous Grade(s) Standard:** 1.NBT.B.2 **2nd Grade Standard Taught in Advance:** 2.NTB.A.2 **2nd Grade Standard Taught Concurrently:** none Second-grade students extend their base-ten understanding to hundreds as they view 10 tens as a unit called a "hundred." They use manipulative materials and pictorial representations to help make a connection between the written three-digit numbers and hundreds, tens, and ones.  Second graders' understanding about hundreds also moves through several stages: **Counting by Ones; Counting by Groups & Singles;** and **Counting by Hundreds, Tens, and Ones**. **Counting by Ones:** At first, even though second graders will have grouped objects into hundreds, tens, and leftovers, they rely on counting all of the individual cubes by ones to determine the final amount. It is seen as the only way to determine how many. **Counting by Groups and Singles:** While students are able to group objects into collections of hundreds, tens, and ones and now tell how many groups of hundreds, tens, and leftovers there are, they still rely on counting by ones to determine the final amount. They are unable to use the groups and leftovers to determine how many. **Teacher**: How many blocks do you have? **Student**: I have 3 hundreds, 4 tens, and 2 leftovers. **Teacher**: Does that help you know how many? How many do you have? **Student**: Let me see. 100, 200, 300… ten, twenty, thirty, forty. So that's 340 so far. Then 2 more is 342. **Counting by Hundreds, Tens, and Ones:** Students are able to group objects into hundreds, tens, and ones; tell how many groups and leftovers there are; and now use that information to tell how many. Occasionally, as this stage becomes fully developed, second graders rely on counting to "really" know the amount, even though they may have just counted the total by groups and leftovers.

2.NBT.A.1 *continued*	**Teacher**: How many blocks do you have? **Student**: I have 3 hundreds, 4 tens, and 2 leftovers. **Teacher**: Does that help you know how many? How many do you have? **Student**: Yes. That means that I have 342. **Teacher**: Are you sure? **Student**: Um. Let me count just to make sure. 100, 200, 300,… 340, 341, 342. Yes. I was right. There are 342 blocks. Applying the understanding that "100" is the same amount as 10 groups of ten as well as 100 ones lays the groundwork for the structure of the base-ten system in future grades. Students can represent this with both groupable (cubes, links) and pre-grouped (place value blocks) materials to explore the idea that numbers such as 100, 200, 300, etc., are groups of hundreds with zero tens and ones.
2.NBT.A.2 Count within 1000; skip-count by 5s, 10s, and 100s	**Component(s) of Rigor:** Procedural Skill and Fluency **Remediation - Previous Grade(s) Standard:** none **2nd Grade Standard Taught in Advance:** none **2nd Grade Standard Taught Concurrently:** 2.OA.C.3 Students need many opportunities counting up to 1,000 from different starting points. Students who have difficulty counting within 1000 may need more experience counting on with concrete, pictorial, and number line representations. **What are the next 3 numbers after 498?** 499, 500, 501 **When you count back from 201, what are the first 3 numbers that you say?** 200, 199, 198 Students should also have many experiences skip counting by 5s, 10s, and 100s to begin to work toward multiplication concepts. 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 2s, 5s, and 10s they are counting groups of items with that amount in each group. The use of the 100s chart may be helpful for students to identify the counting patterns. For example, students learn that the ones digit alternates between 5 and 0 when skip-counting by 5s. When students skip-count by 100s, they learn that the hundreds digit is the only digit that changes and that it increases by one number.

<table>
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<td>2.NBT.A.3 Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.</td>
<td>
Component(s) of Rigor: Conceptual Understanding, Procedural Skill and Fluency
Remediation - Previous Grade(s) Standard: none
2nd Grade Standard Taught in Advance: 2.NBT.A.1
2nd Grade Standard Taught Concurrently: none

Students need many opportunities reading and writing numerals in multiple ways. They should connect the place value understanding built with 2.NBT.A.1 to written numerals, expanded form, and finally the reading of the number names.

Examples:
• Base-ten numerals 637 (standard form)
• Number names six hundred thirty-seven (written form)
• Expanded form 600 + 30 + 7 (expanded form)
When students say the expanded form, it may sound like this: “6 hundreds plus 3 tens plus 7 ones” OR “600 plus 30 plus 7.”
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</tr>
<tr>
<td>2.NBT.A.4 Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons.</td>
<td>
Component(s) of Rigor: Conceptual Understanding
Remediation - Previous Grade(s) Standard: none
2nd Grade Standard Taught in Advance: 2.NBT.A.1
2nd Grade Standard Taught Concurrently: none

Students build on the work of 2.NBT.A.1 and 2.NBT.A.3 by examining the amount of hundreds, tens, and ones in each number. When comparing numbers, students draw on the understanding that 1 hundred (the smallest three-digit number) is actually greater than any amount of tens and ones represented by a two-digit number. When students truly understand this concept, it makes sense that one would compare three-digit numbers by looking at the hundreds place first.

Students should have ample experiences communicating their comparisons in words before using symbols. Students were introduced to the symbols greater than (>), less than (<), and equal to (=) in first grade and continue to use them in second grade with numbers within 1,000.
Example: Compare these two numbers using the correct symbol: 452 __ 455
<table>
<tr>
<td>Student A
Place Value
452 has 4 hundreds, 5 tens, and 2 ones. 455 has 4 hundreds, 5 tens, and 5 ones. They have the same number of hundreds and the same number of tens, but 455 has 5 ones and 452 only has 2 ones. 452 is less than 455.
452 < 455</td>
<td>Student B
Counting
452 is less than 455. I know this because when I count up I say 452 before I say 455.
452 < 455
452 is less than 455.</td>
</tr>
</table>
While students may have the skills to order more than 2 numbers, this standard focuses on comparing two numbers and using reasoning about place value to support the use of the various symbols.
</td>
</tr>
</table>

Number and Operations in Base Ten (NBT)

B. Use place value understanding and properties of operations to add and subtract.

In this cluster, the terms students should learn to use with increasing precision are **fluent, compose, decompose, place value, digit, ten more, ten less, one hundred more, one hundred less, add, subtract, total, equal, addition,** and **subtraction**.

Louisiana Standard	Explanations and Examples
2.NBT.B.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.	**Component(s) of Rigor:** Procedural Skill and Fluency **Remediation - Previous Grade(s) Standard:** 1.NBT.C.4, 1.NBT.C.5, 1.NBT.C.6 **2nd Grade Standard Taught in Advance:** 2.OA.B.2 **2nd Grade Standard Taught Concurrently:** 2.OA.A.1 Adding and subtracting fluently refers to knowledge of procedures, knowledge of when and how to use them appropriately, and skill in performing them flexibly, accurately, and efficiently. They need to communicate their thinking and be able to justify their strategies both verbally and with paper and pencil. Addition strategies based on place value for 48 + 37 may include: • Adding by place value: 40 + 30 = 70 and 8 + 7 = 15 and 70 + 15 = 85. • Incremental adding (breaking one number into tens and ones); 48 + 10 = 58, 58 + 10 = 68, 68 + 10 = 78, 78 + 7 = 85 • Compensation (making a friendly number): 48 + 2 = 50, 37 – 2 = 35, 50 + 35 = 85 Subtraction strategies based on place value for 81 – 37 may include: • Adding up (from smaller number to larger number): 37 + 3 = 40, 40 + 40 = 80, 80 + 1 = 81, and 3 + 40 + 1 = 44. • Incremental subtracting: 81 -10 = 71, 71 – 10 = 61, 61 – 10 = 51, 51 – 7 = 44 • Subtracting by place value: 81 – 30 = 51, 51 – 7 = 44 Although students are not required to know a property's name, students should use these properties: • Commutative property of addition (Example: 3 + 5 = 5 + 3) • Associative property of addition (Example: (2 + 7) + 3 = 2 + (7+3)) • Identity property of 0 (Example: 8 + 0 = 8) Students in second grade need to communicate their understanding of why some properties work for some operations and not for others. • Commutative Property: In first grade, students investigated whether the commutative property works with subtraction. The intent was for students to recognize that taking 5 from 8 is not the same as taking 8 from 5. Students should also understand that they will be working with numbers in later grades that will allow them to subtract larger numbers from smaller numbers. This exploration of the commutative property continues in second grade. • Associative Property: Recognizing that the associative property does not work for subtraction is difficult for students to consider at this grade level as it is challenging to determine all the possibilities.

2.NBT.B.5 *continued*

Example: 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 equals 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 2 is 92. So, 67 + 25 = 92

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.

Example: 63 – 32 = __

Decomposing into Tens:
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

Think Addition:
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

2.NBT.B.6 Add up to four two-digit numbers using strategies based on place value and properties of operations.	**Component(s) of Rigor:** Conceptual Understanding, Procedural Skill and Fluency **Remediation - Previous Grade(s) Standard:** none **2nd Grade Standard Taught in Advance:** 2.NBT.A.1, 2.NBT.B.7 **2nd Grade Standard Taught Concurrently:** none Students demonstrate addition strategies with up to four two-digit numbers, with or without regrouping. Regrouping numbers does not indicate using a specific strategy. **Example:** 43 + 34 + 57 + 24 = __ **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. Then I added 24 and had 158. 43 + 57 + 34 + 24 = 158 **Student B** *Place Value Strategies* I broke up all of the numbers into tens and ones. First I added the tens. 40 + 30 + 50 + 20 = 140. Then I added the ones. 3 + 4 + 7 + 4 = 18. That meant I had 1 ten and 8 ones. So, 140 + 10 is 150. 150 and 8 more is 158. So, 43 + 34 + 57 + 24 = 158 **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 + 20. I changed the order of the numbers to make adding easier. I know that 30 plus 20 equals 50 and 50 more equals 100. Then I added the 40 and got 140. Then I added up the ones. 3 + 4 + 7 + 4. I changed the order of the numbers to make adding easier. I know that 3 plus 7 equals 10 and 4 plus 4 equals 8. 10 plus 8 equals 18. I then combined my tens and my ones. 140 plus 18 (1 ten and 8 ones) equals 158.

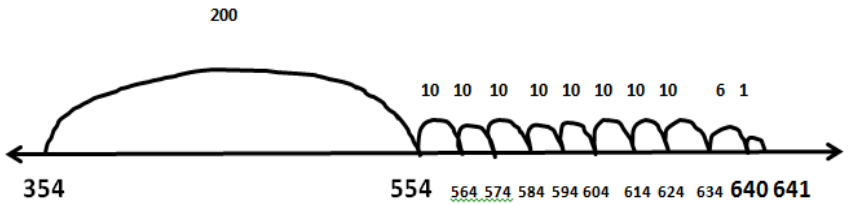
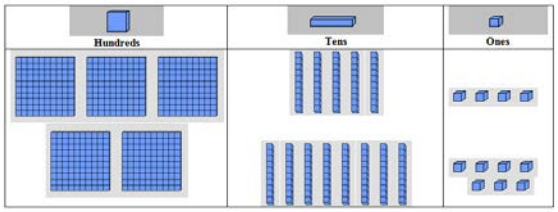
2.NBT.B.7 Add and subtract within 1000 using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; justify the reasoning used with a written explanation. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.

Component(s) of Rigor: Conceptual Understanding, Procedural Skill and Fluency
Remediation - Previous Grade(s) Standard: none
2nd Grade Standard Taught in Advance: 2.NBT.A.1
2nd Grade Standard Taught Concurrently: 2.NBT.B.8, 2.NBT.B.9

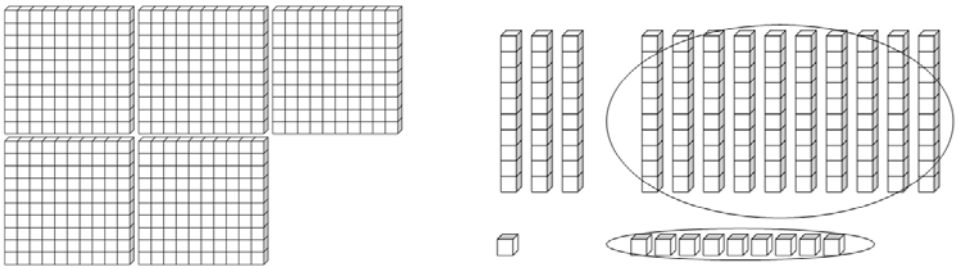
There is a strong connection between this standard and place value understanding with addition and subtraction of smaller numbers. Students should have ample experience using concrete models or drawings to support their addition or subtraction of larger numbers. Strategies are similar to those stated in 2.NBT.B.5, as students extend their learning to two 3-digit numbers.

This standard also references composing and decomposing a ten. This work should include strategies such as making a 10, making a 100, breaking apart a 10, or creating an easier problem. The standard algorithm of carrying or borrowing is not an expectation in second grade. **Students are not expected to add and subtract whole numbers using a standard algorithm until fourth grade.**

Example: 354 + 287 = __

Student A	I started at 354 and jumped 200. I landed on 554. I then made 8 jumps of 10 and landed on 634. I then jumped 6 to land on 640. Then I jumped 1 more and landed on 641. 354 + 287 = 641 
Student B	I used place value blocks and a place value mat. I broke all of the numbers and placed them on the place value mat. I first added the ones. 4 + 7 = 11. I then added the tens. 50 + 80 = 130. I then added the hundreds. 300 + 200 = 500. I then combined my answers. 500 + 130 = 630. 630 + 11= 641. 

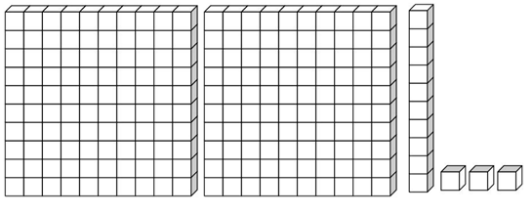
2.NBT.B.7 *continued*

Student C	I used place value blocks. I made a pile of 354. I then added 287. That gave me 5 hundreds, 13 tens and 11 ones. I noticed that I could trade some pieces. I had 11 ones, and traded 10 ones for a ten. I then had 14 tens, so I traded 10 tens for a hundred. I ended up with 6 hundreds, 4 tens, and 1 one. So, 354 + 287 = 641 

Example: 213 - 124 = __

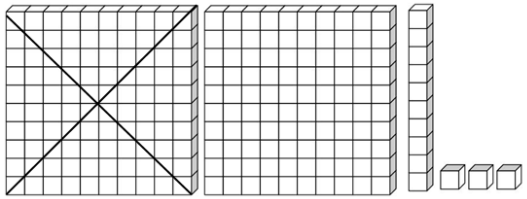
Student A

I used place value blocks. I made a pile of 213.



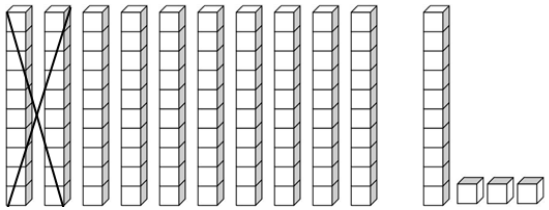
I then started taking away blocks.

First, I took away a hundred which left me with 1 hundred and thirteen.

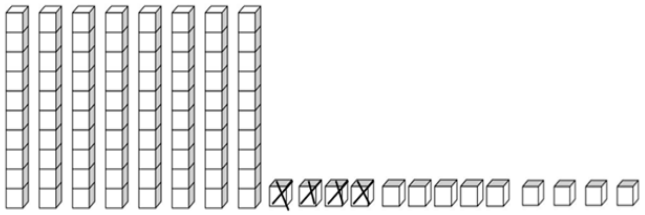


2.NBT.B.7 *continued*

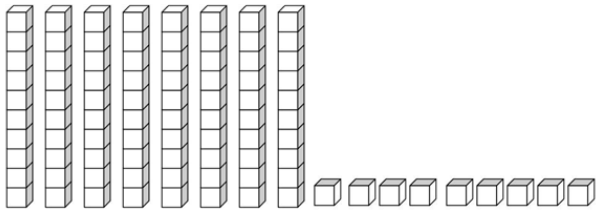
Now, I only need to take away 24.
I need to take away 2 tens but I only had 1 ten so I traded in my last hundred for 10 tens. Then I took two tens away leaving me with no hundreds and 9 tens and 3 ones.



I then had to take 4 ones away but I only have 3 ones. I traded in a ten for 10 ones. I then took away 4 ones.



This left me with no hundreds, 8 tens, and 9 ones. My answer is 89. **213 – 124 = 89**



2.NBT.B.8 Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.	**Component(s) of Rigor:** Conceptual Understanding **Remediation - Previous Grade(s) Standard:** none **2nd Grade Standard Taught in Advance:** 2.NBT.A.1 **2nd Grade Standard Taught Concurrently:** 2.NBT.B.7, 2.NBT.B.9 Students need many opportunities to practice mental math by adding and subtracting multiples of 10 and 100 up to 900 using different starting points. They can practice this by counting and thinking aloud, finding missing numbers in a sequence, and finding missing numbers on a number line or hundreds chart to include looking for relevant patterns. This standard focuses only on adding and subtracting 10 or 100. Multiples of 10 or multiples of 100 can be explored; however, the focus of this standard is to ensure that students are proficient with adding and subtracting 10 and 100 mentally. Mental math strategies may include: • counting on; 300, 400, 500, etc. • counting back; 550, 450, 350, etc. **Examples**: • 100 more than 653 is _____ (753) • 10 less than 87 is _____ (77) • "Start at 248. Count up by 10s until I tell you to stop."

2.NBT.B.9 Explain why addition and subtraction strategies work, using place value and the properties of operations.*

*Explanations may be supported by drawings or objects.

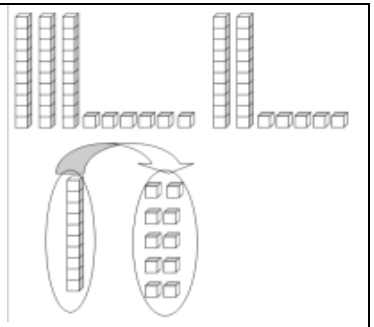
Component(s) of Rigor: Conceptual Understanding
Remediation - Previous Grade(s) Standard: 1.OA.B.3, 1.OA.B.4
2nd Grade Standard Taught in Advance: 2.NBT.A.1
2nd Grade Standard Taught Concurrently: 2.NBT.B.7, 2.NBT.B.8

Students need multiple opportunities explaining their addition and subtraction thinking. Students should be able to connect different representations and explain the connections. Representations can include numbers, words (including mathematical language), pictures, number lines, and/or physical objects. Students should be able to use any/all of these representations as needed.

Example: Show and explain how to add 36 and 25.

Student 1
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 make 10 and added it to the 50. So, 50 and 10 more is 60. I really needed to add 11, so I added one more and got 61.

Student 2
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.



Example: 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.

Measurement and Data (MD)

A. Measure and estimate lengths in standard units.

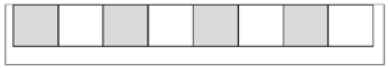
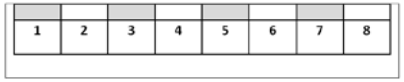
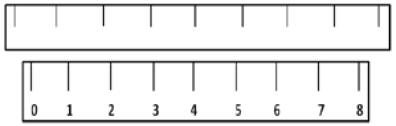
In this cluster, the terms students should learn to use with increasing precision are **measure, about, a little less than, a little more than, longer, shorter, standard units, inch, foot, metric units, centimeter, meter, tools, ruler, yardstick, meter stick, measuring tape, estimate, total,** and **difference**.

Louisiana Standard	Explanations and Examples
2.MD.A.1 Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter	**Component(s) of Rigor:** Procedural Skill and Fluency **Remediation - Previous Grade(s) Standard:** 1.MD.A.2 **2nd Grade Standard Taught in Advance:** none **2nd Grade Standard Taught Concurrently:** none

Students in second grade will build upon what they learned in first grade from measuring length with non-standard units to the new skill of measuring length in metric and U.S. Customary with standard units of measure. They should have many experiences measuring the length of objects with rulers, yardsticks, meter sticks, and tape measures. These foundational understandings of measurement are to be developed:

- Understand that larger units (e.g., yard) can be subdivided into equivalent units (e.g., inches) (partition).
- Understand that the same object or many objects of the same size such as paper clips can be repeatedly used to determine the length of an object (iteration).
- Understand the relationship between the size of a unit and the number of units needed (compensatory principal). Thus, the smaller the unit, the more units it will take to measure the selected attribute.

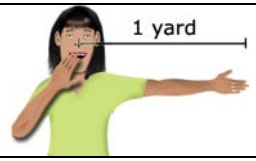
When second-grade students are provided with opportunities to create and use a variety of rulers, they can connect their understanding of non-standard units from first grade to standard units in second grade.

By helping students progress from a "ruler" that is blocked off into colored units (no numbers)…	
…to a "ruler" that has numbers along with the colored units…	
…to a "ruler" that has inches (centimeters) with and without numbers, students develop the understanding that the numbers on a ruler do not count the individual marks but indicate the spaces (distance) between the marks. This is a critical understanding students need when using such tools as rulers, yardsticks, meter sticks, and measuring tapes.	

While not a requirement of the standard, second-grade students provided with sufficient practice may learn specific measurement facts as a result of their work:

- There are 12 inches in a foot.
- There are 3 feet in a yard.
- There are 100 centimeters in a meter.

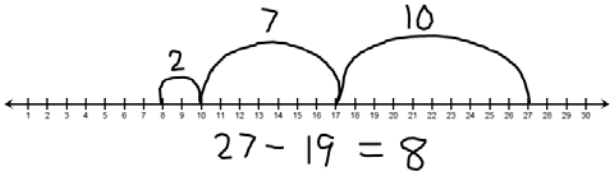
2.MD.A.2 Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.	**Component(s) of Rigor:** Conceptual Understanding, Procedural Skill and Fluency **Remediation - Previous Grade(s) Standard:** none **2nd Grade Standard Taught in Advance:** 2.MD.A.1, 2.MD.A.3 **2nd Grade Standard Taught Concurrently:** none Students measure the length of the same object using different tools (ruler with inches, ruler with centimeters, a yardstick, or meter stick). This will help students learn which tool is more appropriate for measuring a given object. They describe the relationship between the size of the measurement unit and the number of units needed to measure something. For instance, a student might say, "The longer the unit, the fewer I need." Multiple opportunities to explore relating within customary (inches to feet to yards) and within metric (centimeters to meters) should be provided. **Example**: A student measured the length of a desk in both feet and inches. She found that the desk was 3 feet long. She also found out that it was 36 inches long. **Teacher**: Why do you think you have two different measurements for the same desk? **Student**: It only took 3 feet because the feet are so big. It took 36 inches because an inch is a whole lot smaller than a foot.
2.MD.A.3 Estimate lengths using units of inches, feet, centimeters, and meters.	**Component(s) of Rigor:** Conceptual Understanding **Remediation - Previous Grade(s) Standard:** none **2nd Grade Standard Taught in Advance:** 2.MD.A.1 **2nd Grade Standard Taught Concurrently:** none Estimation helps develop familiarity with the specific unit of measure being used. To measure the length of a shoe, knowledge of an inch or a centimeter is important so that the student can approximate the length in inches or centimeters. Students should begin practicing estimation with items which are familiar to them (length of desk, pencil, favorite book, etc.). Once a student has made an estimate, the student then measures the object and reflects on the accuracy of the estimate made and considers this information for the next measurement. **Example**: **Teacher**: How many inches do you think this string is if you measured it with a ruler? **Student**: An inch is pretty small. I'm thinking it will be somewhere between 8 and 9 inches. **Teacher**: Measure it and see. **Student**: It is 9 inches. I thought that it would be somewhere around there. Teachers may want to work with students to develop useful body benchmarks such as the ones below, recognizing that body benchmarks may need to be adjusted for some students. • Width of pinky finger is about a centimeter • First joint to the tip of a thumb is about an inch • Length from your elbow to your wrist is about a foot

	• If your arm is held out perpendicular to your body, the length from your nose to the tip of your fingers is about a yard 
2.MD.A.4 Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.	**Component(s) of Rigor:** Procedural Skill and Fluency **Remediation - Previous Grade(s) Standard:** none **2nd Grade Standard Taught in Advance:** 2.MD.A.3 **2nd Grade Standard Taught Concurrently:** none Second graders should be familiar enough with inches, feet, yards, centimeters, and meters to be able to compare the differences in lengths of two objects. They can make direct comparisons by measuring the difference in length between two objects by laying them side by side and selecting an appropriate standard length unit of measure. Students should use comparative phrases such as "It is longer by 2 inches" or "It is shorter by 5 centimeters" to describe the difference between two objects. **Example:** **Teacher**: Choose two pieces of string to measure. How many inches do you think each string is? **Student**: I think string A is about 8 inches long. I think string B is only about 4 inches long. It's really short. **Teacher**: Measure to see how long each string is. *Student measures.* What did you notice? **Student**: String A is 10 inches long. String B is 6 inches long. **Teacher**: How much longer is string A than string B? **Student**: Hmmm. String B is 6 inches. It would need 4 more inches to be 10 inches. So string A is 4 inches longer.

Measurement and Data (MD)

B. Relate addition and subtraction to length.

In this cluster, the terms students should learn to use with increasing precision are **inch, foot, yard, centimeter, meter, ruler, yardstick, meter stick, measuring tape, estimate, length, equation, number line, equally spaced, point, addition, subtraction, unknown, totals, differences, measure, standards units, customary, metric, units,** and **differences**.

Louisiana Standard	Explanations and Examples
2.MD.B.5 Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.	**Component(s) of Rigor:** Application **Remediation - Previous Grade(s) Standard:** none **2nd Grade Standard Taught in Advance:** 2.MD.A.4 **2nd Grade Standard Taught Concurrently:** 2.OA.A.1, 2.MD.B.6 Students need experience working with addition and subtraction to solve word problems which include measures of length. It is important that word problems stay within the same unit of measure. Counting on and/or counting back on a number line will help tie this concept to previous knowledge. Some representations students can use include drawings, rulers, pictures, and/or physical objects. **Examples**: • Mary is making a dress. She has 5 yards of fabric. She uses some of the fabric and has 2 yards left. How many yards did Mary use? 5 – ? = 2 • The length of Tracy's desk is 23 inches. The teacher's desk measures 60 inches. How much longer is the teacher's desk than Tracy's desk? 23 + ? = 60 or 60 – 23 = ?
2.MD.B.6 Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, …, and represent whole-number sums and differences within 100 on a number line diagram.	**Component(s) of Rigor:** Conceptual Understanding **Remediation - Previous Grade(s) Standard:** none **2nd Grade Standard Taught in Advance:** none **2nd Grade Standard Taught Concurrently:** 2.MD.B.5, 2.MD.D.9 Students represent their thinking when adding and subtracting within 100 by using a number line. **Example:** There were 27 students on the bus. 19 got off the bus. How many students stayed on the bus? **Student**: I used a number line. I started at 27. I broke 19 into 10 and 9. That way, I could take a jump of 10. I landed on 17. Then I broke the 9 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. 

Measurement and Data (MD)

C. Work with time and money.

In this cluster, the terms students should learn to use with increasing precision are **clocks, hand, hour hand, minute hand, hour, minute, a.m., p.m., o'clock, *multiples of 5*** (**e.g., five, ten, fifteen, etc.**), **analog clock, digital clock, quarter 'til, quarter after, half past, quarter hour, half hour, thirty minutes before, 30 minutes after, 30 minutes until, 30 minutes past, quarter, dime, nickel, dollar, cent(s), $, ¢, heads,** and **tails**.

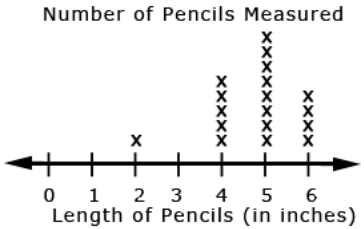
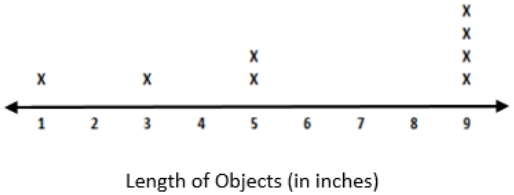
Louisiana Standard	Explanations and Examples
2.MD.C.7 Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.	**Component(s) of Rigor:** Conceptual Understanding, Procedural Skill and Fluency **Remediation - Previous Grade(s) Standard:** 1.MD.B.3 **2nd Grade Standard Taught in Advance:** none **2nd Grade Standard Taught Concurrently:** none In first grade, students learned to tell time to the nearest hour and half-hour. Students build on this understanding in second grade by skip-counting by 5 (2.NBT.A.2) to recognize 5-minute intervals on the clock. They need exposure to both digital and analog clocks. It is important that they can recognize time in both formats and communicate their understanding of time using both numbers and language. Students should understand that there are 2 cycles of 12 hours in a day—a.m. and p.m. Recording their daily actions in a journal would be helpful for making real-world connections and understanding the difference between these two cycles. Learning to tell time is challenging for second-grade students. In order to read an analog clock, they must be able to read a dial-type instrument. Furthermore, they must realize that the hour hand indicates broad, approximate time while the minute hand indicates the minutes in between each hour. As students experience clocks with only hour hands, they begin to realize that when the time is two o'clock, two-fifteen, or two forty-five, the hour hand looks different, but is still considered "two." Discussing time as "about 2 o'clock," "a little past 2 o'clock," and "almost 3 o'clock" helps build vocabulary to use when introducing time to the nearest 5 minutes. All of these clocks indicte the hour of "two," although they look slightly different. This is an important idea for students as they learn to tell time.

2.MD.C.8 Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately. *Example: If you have 2 dimes and 3 pennies, how many cents do you have?*	**Component(s) of Rigor:** Application **Remediation - Previous Grade(s) Standard:** none **2nd Grade Standard Taught in Advance:** none **2nd Grade Standard Taught Concurrently:** 2.OA.A.1 Students should solve story problems connecting the different representations. These representations may include objects, pictures, charts, tables, words, and/or numbers. **Because students have no understanding of place values associated with decimals, problems should focus on whole dollar amounts or cents.** Students should communicate their mathematical thinking and justify their answers. First-grade students are expected to determine the value of a set of same-type coins. In grade 2, students should extend this to finding the value of a set of different-type coins. Solving problems with money can be a challenge for young children because it builds on prerequisite number and place value skills and concepts. Many times money is introduced before students have the necessary number sense to work with money successfully. > For these values to make sense, students must have an understanding of 5, 10, and 25. More than that, they need to be able to think of these quantities without seeing countable objects… A child whose number concepts remain tied to counts of objects [one object is one count] is not going to be able to understand the value of coins. (Van de Walle & Lovin, p. 150, 2006) Just as students learn that a number (38) can be represented different ways (3 tens and 8 ones; 2 tens and 18 ones) and still remain the same amount (38), students can apply this understanding to money. For example, 25 cents can look like a quarter, two dimes and a nickel, and it can look like 25 pennies, and still all remain 25 cents. This concept of equivalent worth takes time and requires numerous opportunities to create different sets of coins, count sets of coins, and recognize the "purchase power" of coins (a nickel can buy the same things as 5 pennies). **Examples**: • Sandra went to the store and received 76¢ in change. What are three different sets of coins she could have received? • Katie spent $3 at the store. She gave the cashier a $5 bill. How much change should Katie get back? • How many different ways can you make $12 using $1, $5, and $10 bills? • What is the value of 2 quarters, 3 dimes, 4 nickels, and 3 pennies in cents?

Measurement and Data (MD)

D. Represent and interpret data.

In this cluster, the terms students should learn to use with increasing precision are **collect, organize, display, show, data, attribute, sort, line plot, picture graph, bar graph, category, chart, table, most, least, more than, less than, about, same, different, measure, inch, foot, yard, centimeter, meter,** and **length**.

Louisiana Standard	Explanations and Examples
2.MD.D.9 Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.	**Component(s) of Rigor:** Procedural Skill and Fluency **Remediation - Previous Grade(s) Standard:** none **2nd Grade Standard Taught in Advance:** none **2nd Grade Standard Taught Concurrently:** 2.MD.B.6 This standard emphasizes representing data using a line plot. Students will use the measurement skills learned in other measurement standards to measure objects, rounding lengths to the nearest whole unit. Line plots are first introduced in this grade level. A line plot can be thought of as plotting data on a number line.  **Example:** Measure the 8 objects in the basket on your desk to the nearest inch. Then, display your data on a line plot.  The student creates the above line plot and the teacher follows up with questions for the student. **Teacher**: What do you notice about your data? **Student**: Most of the objects I measured were 9 inches. Only 2 objects were smaller than 4 inches. I was surprised that none of my objects measured more than 9 inches! **Teacher**: Do you think that if you chose all new objects from the basket that your data would look the same? Different? Why do you think so?

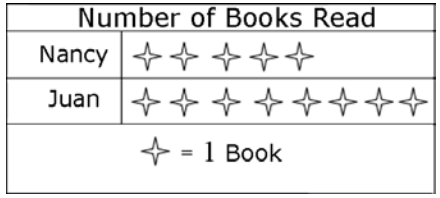
2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems* using information presented in a bar graph.

* See Table 1 at the end of this document.

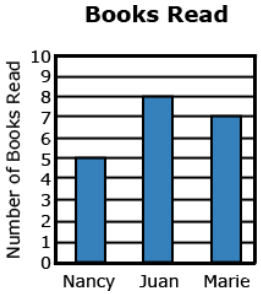
Component(s) of Rigor: Procedural Skill and Fluency, Application
Remediation - Previous Grade(s) Standard: 1.MD.C.4
2nd Grade Standard Taught in Advance: none
2nd Grade Standard Taught Concurrently: 2.OA.A.1

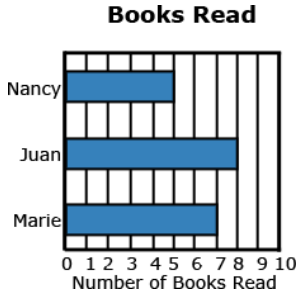
Students should draw both picture and bar graphs representing data that can be sorted up to four categories using single unit scales (e.g., scales should count by ones). This is an extension from first grade in which students were limited to three categories. The data should be used to solve put-together, take-apart, and compare problems as listed in Table 1 found at the end of this document.

In second grade, picture graphs (pictographs) include symbols that represent single units. Pictographs should include a title, categories, category label, key, and data.



Second graders should draw both horizontal and vertical bar graphs. Bar graphs include a title, scale, scale label, categories, category label, and data.





Example:
The second-grade students were responsible for purchasing ice cream for an Open House event at school. They decided to collect data to determine which flavors to buy for the event. As a group, the students decided on the question, “What is your favorite flavor of ice cream?” and 4 likely responses, “chocolate,” “vanilla,” “strawberry,” and “cherry.”

The students then divided into teams and collected data from different classes in the school. Each team decided how to keep track of the data. Most teams used tally marks to keep up with the responses. A few teams used a table and check marks.

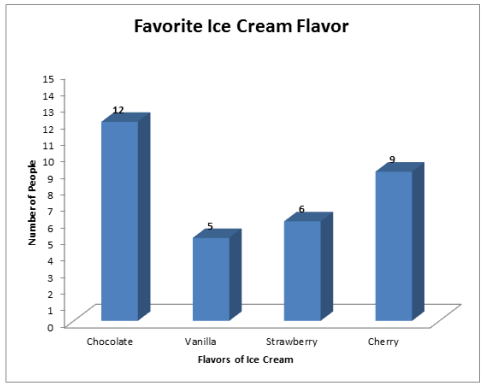
2.MD.D.10 *continued*

When back in the classroom, each team organized their data by totaling each category in a chart or table. Team A's data was as follows:

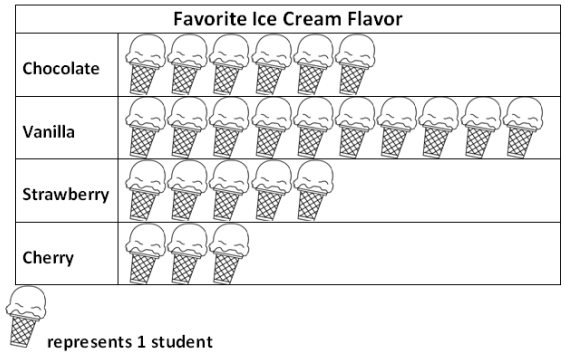
Flavor	Number of People
Chocolate	12
Vanilla	5
Strawberry	6
Cherry	9

Each team selected either a picture graph or a bar graph to display their data and created it using either paper or the computer. Team A and Team B graphs are provided here:

Team A: Bar Graph



Team B: Picture Graph



Teams then analyzed and recorded observations made from the data. The teacher posed simple problems:

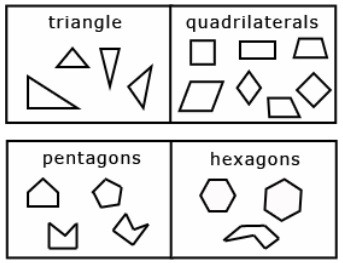
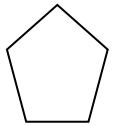
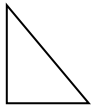
- The total number of chocolate votes for Team A was 12 and the total number of chocolate votes for Team B was 6. How many chocolate votes are there altogether?
- Right now, with data from Team A, Team B, and Team C, vanilla has 45 votes and chocolate has 34 votes. How many more votes would we need from Team D so that chocolate had the same number of votes as vanilla?
- Right now, cherry has a total of 22 votes. What if eleven people came and wanted to change their vote from cherry to another choice. How many votes would cherry have?

Geometry (G)

A. Reason with shapes and their attributes.

In this cluster, the terms students should learn to use with increasing precision are **attribute[1], feature[1] angle, side, triangle, quadrilateral, square, rectangle, trapezoid, pentagon, hexagon, cube, face, edge, vertex, surface, figure, shape, closed, open, partition, equal size, equal shares, half, halves, thirds, half of, a third of, whole, two halves, three thirds, four fourths, rows, columns, circle, sphere, half-circle, quarter-circle, cone, prism, cylinder,** and **trapezoid**.

[1] "**Attributes**" and "**features**" are used interchangeably to indicate any characteristic of a shape, including properties, and other defining characteristics (e.g., straight sides) and non-defining characteristics (e.g., "right-side up").

Louisiana Standard	Explanations and Examples
2.G.A.1 Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces.* Identify triangles, quadrilaterals, pentagons, hexagons, and cubes. *Sizes are compared directly or visually, not compared by measuring.	**Component(s) of Rigor:** Conceptual Understanding, Procedural Skill and Fluency **Remediation - Previous Grade(s) Standard:** 1.G.A.1 **2nd Grade Standard Taught in Advance:** none **2nd Grade Standard Taught Concurrently:** none Students identify, describe, and draw triangles, quadrilaterals, pentagons, and hexagons. Pentagons, triangles, and hexagons should appear as both regular (equal sides and equal angles) and irregular. Students recognize all four-sided shapes as quadrilaterals. Students use the vocabulary word "angle" in place of "corner" but they do not need to name angle types. Shapes should be presented in a variety of orientations and configurations.  **Example:** **Teacher**: Draw a closed shape that has five sides. What is the name of the shape? **Student**: I drew a shape with 5 sides. It is called a pentagon.  **Example:** **Teacher:** I have 3 sides and 3 angles. What am I? **Student**: A triangle. See, 3 sides, 3 angles. 

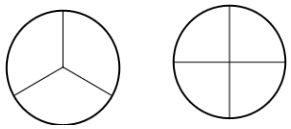
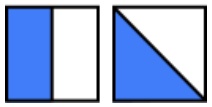
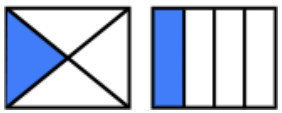
2.G.A.2 Partition a rectangle into rows and columns of same-size squares and count to find the total number of them	**Component(s) of Rigor:** Conceptual Understanding, Procedural Skill and Fluency **Remediation - Previous Grade(s) Standard:** none **2nd Grade Standard Taught in Advance:** none **2nd Grade Standard Taught Concurrently:** none This standard is a precursor to learning about the area of a rectangle and using arrays for multiplication. An interactive whiteboard or manipulatives such as square tiles, cubes, or other square-shaped objects can be used to help students partition rectangles. Students should learn that rows are horizontal and columns are vertical. **Example:** **Teacher**: Partition the rectangle into 2 rows and 4 columns. How many small squares did you make? **Student**: There are 8 squares in this rectangle. See… 2, 4, 6, 8. I folded the paper to make sure that they were all the same size.
2.G.A.3 Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words *halves*, *thirds*, *half of*, *a third of*, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.	**Component(s) of Rigor:** Conceptual Understanding, Procedural Skill and Fluency **Remediation - Previous Grade(s) Standard:** 1.G.A.3 **2nd Grade Standard Taught in Advance:** **2.G.A.2** **2nd Grade Standard Taught Concurrently:** none Second-grade students partition circles and rectangles into 2, 3, or 4 equal shares (regions). Students should be given ample experiences to explore this concept with paper strips and pictorial representations. Students should also work with the vocabulary terms halves, thirds, half of, third of, and fourth (or quarter) of. While students are working on this standard, teachers should help them to make the connection that a "whole" is composed of two halves, three thirds, or four fourths. This standard also addresses the idea that equal shares of identical wholes may not have the same shape. • For example, students should recognize that when they cut a circle into three equal pieces, each piece will equal one-third of its original whole. In this case, students should describe the whole as three thirds. If a circle is cut into four equal pieces, each piece will equal one-fourth of its original whole and the whole is described as four fourths.  Students should see circles and rectangles partitioned in multiple ways so they learn to recognize that equal shares can be different shapes within the same whole. An interactive whiteboard may be used to show partitions of shapes. halves  fourths 

Table 1. Common addition and subtraction situations.[1]

	Result Unknown	Change Unknown	Start Unknown
Add to	Two bunnies sat on the grass. Three more bunnies hopped there. How many bunnies are on the grass now? 2 + 3 = ?	Two bunnies were sitting on the grass. Some more bunnies hopped there. Then there were five bunnies. How many bunnies hopped over to the first two? 2 + ? = 5	Some bunnies were sitting on the grass. Three more bunnies hopped there. Then there were five bunnies. How many bunnies were on the grass before? ? + 3 = 5
Take from	Five apples were on the table. I ate two apples. How many apples are on the table now? 5 – 2 = ?	Five apples were on the table. I ate some apples. Then there were three apples. How many apples did I eat? 5 – ? = 3	Some apples were on the table. I ate two apples. Then there were three apples. How many apples were on the table before? ? – 2 = 3
	Total Unknown	**Addend Unknown**	**Both Addends Unknown[3]**
Put Together / Take Apart[2]	Three red apples and two green apples are on the table. How many apples are on the table? 3 + 2 = ?	Five apples are on the table. Three are red and the rest are green. How many apples are green? 3 + ? = 5, 5 – 3 = ?	Grandma has five flowers. How many can she put in her red vase and how many in her blue vase? 5 = 0 + 5, 5 = 5 + 0 5 = 1 + 4, 5 = 4 + 1 5 = 2 + 3, 5 = 3 + 2
	Difference Unknown	**Bigger Unknown**	**Smaller Unknown**
Compare[4]	(“How many more?” version): Lucy has two apples. Julie has five apples. How many more apples does Julie have than Lucy? (“How many fewer?” version): Lucy has two apples. Julie has five apples. How many fewer apples does Lucy have than Julie? 2 + ? = 5, 5 – 2 = ?	(Version with “more”): Julie has three more apples than Lucy. Lucy has two apples. How many apples does Julie have? (Version with “fewer”): Lucy has 3 fewer apples than Julie. Lucy has two apples. How many apples does Julie have? 2 + 3 = ?, 3 + 2 = ?	(Version with “more”): Julie has three more apples than Lucy. Julie has five apples. How many apples does Lucy have? (Version with “fewer”): Lucy has 3 fewer apples than Julie. Julie has five apples. How many apples does Lucy have? 5 – 3 = ?, ? + 3 = 5

[1]Adapted from Box 2-4 of Mathematics Learning in Early Childhood, National Research Council (2009, pp. 32, 33).
[2]These take apart situations can be used to show all the decompositions of a given number. The associated equations, which have the total on the left of the equal sign, help children understand that the = sign does not always mean makes or results in but always does mean is the same number as.
[3]Either addend can be unknown, so there are three variations of these problem situations. Both Addends Unknown is a productive extension of this basic situation, especially for small numbers less than or equal to 10.
[4]For the Bigger Unknown or Smaller Unknown situations, one version directs the correct operation (the version using more for the bigger unknown and using less for the smaller unknown). The other versions are more difficult.

Grade 1 Standards

1.OA.A.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. *Return to* 2.OA.A.1

1.OA.B.3 Apply properties of operations to add and subtract. Examples: If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known. (Commutative property of addition.) To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12. (Associative property of addition.) *Return to* 2.NBT.B.9

1.OA.B.4 Understand subtraction as an unknown-addend problem. *For example, subtract 10 – 8 by finding the number that makes 10 when added to 8.* *Return to* 2.NBT.B.9

1.OA.C.6 Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a ten (e.g., 13 – 4 = 13 – 3 – 1 = 10 – 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 – 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13). *Return to* 2.OA.B.2

1.OA.D.7 Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. *For example, which of the following equations are true and which are false? 6 = 6, 7 = 8 – 1, 5 + 2 = 2 + 5, 4 + 1 = 5 + 2.* *Return to* 2.OA.C.3, 2.OA.C.4

1.NBT.B.2 Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:

a. 10 can be thought of as a bundle of ten ones — called a "ten."
b. The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.

The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).
Return to 2.NBT.A.1

1.NBT.C.4 Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10.

a. Use concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a number sentence; justify the reasoning used with a written explanation.
b. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.

Return to 2.OA.A.1, 2.NBT.B.5

1.NBT.C.5 Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.
Return to 2.OA.A.1, 2.NBT.B.5

1.NBT.C.6 Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. *Return to* 2.OA.A.1, 2.NBT.B.5

1.MD.A.2 Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps. *Return to* 2.MD.A.1

1.MD.B.3 Tell and write time in hours and half-hours using analog and digital clocks. *Return to* 2.MD.C.7

1.MD.C.4 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another. *Return to* 2.MD.D.10

1.G.A.1 Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes. *Return to* 2.G.A.1

1.G.A.3 Partition circles and rectangles into two and four equal shares, describe the shares using the words halves, fourths, and quarters, and use the phrases half of, fourth of, and quarter of. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares. *Return to* 2.G.A.3