Delaware's
Common Core State Standards for Mathematics
Grade 2 Assessment Examples

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September 2012

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Delaware's Common Core State Standards for 2nd Grade Mathematics

Overview

Operations and Algebraic Thinking (OA)
- Represent and solve problems involving addition and subtraction.
- Add and subtract within 20.
- Work with equal groups of objects to gain foundations for multiplication.

Number and Operations in Base Ten (NBT)
- Understand place value.
- Use place value understanding and properties of operations to add and subtract.

Measurement and Data (MD)
- Measure and estimate lengths in standard units.
- Relate addition and subtraction to length.
- Work with time and money.
- Represent and interpret data.

Geometry (G)
- Reason with shapes and their attributes.

Mathematical Practices (MP)
1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Grade 2 Mathematics – Unpacking the Delaware Common Core State Standards

This document is designed to help understand the Common Core State Standards (CCSS) in providing examples that show a range of format and complexity. It is a work in progress, and it does not represent all aspects of the standards.

What Is the Purpose of This Document?

This document may be used to facilitate discussion among teachers and curriculum staff and to encourage coherence in the expectations. This document, along with ongoing professional development, is one of many resources used to understand and teach the Delaware Common Core State Standards.

This document contains descriptions of what each standard means and what a student is expected to know, understand, and be able to do. This is meant to eliminate misinterpretation of the standards.

References

This document contains explanations and examples that were obtained from State Departments of Education for Kansas, Arizona, North Carolina, and Ohio with permission.

How Do I Send Feedback?

This document is helpful in understanding the CCSS but is an evolving document where more comments and examples might be necessary. Please feel free to send feedback to the Delaware Department of Education via rfry@doe.k12.de.us, and we will use your input to refine this document.

Operations and Algebraic Thinking (OA)

Represent and solve problems involving addition and subtraction.

Standard
2.OA.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.

Explanation:

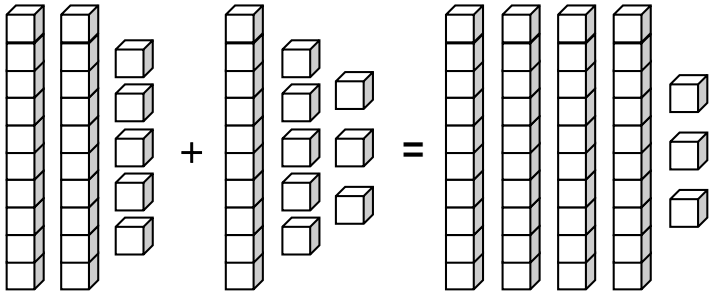
- Word problems that are connected to students' lives can be used to develop fluency with addition and subtraction. The table in the Appendix describes the four different addition and subtraction situations and their relationship to the position of the unknown.
- Second graders should work on ALL problem types regardless of the level of difficulty. Mastery is expected in second grade.
- This standard focuses on developing an algebraic representation of a word problem through addition and subtraction—the intent is not to introduce traditional algorithms or rules. This standard also calls for students to solve one- and two-step problems using drawings, objects, and equations. Students can use place value blocks or hundreds charts, or create drawings of place value blocks or number lines to support their work.

Example:

- In the morning, there are 25 students in the cafeteria. 18 more students come in. After a few minutes, some students leave. If there are 14 students still in the cafeteria, how many students left the cafeteria? Write an equation for your problem.

  Student 1:

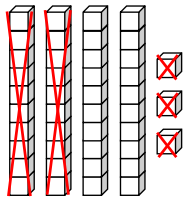
  - Step 1 – I used place value blocks and made a group of 25 and a group of 18. When I counted them, I had 3 tens and 13 ones, which is 43.



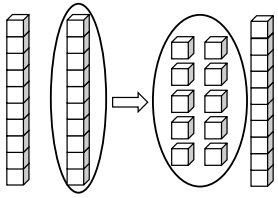
Standard

2.OA.1 Example continued:

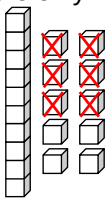
- Step 2 – I then wanted to remove blocks until there were only 14 left. I removed blocks until there were 20 left.



- Step 3 – Since I have 2 tens, I need to trade 1 ten for 10 ones.



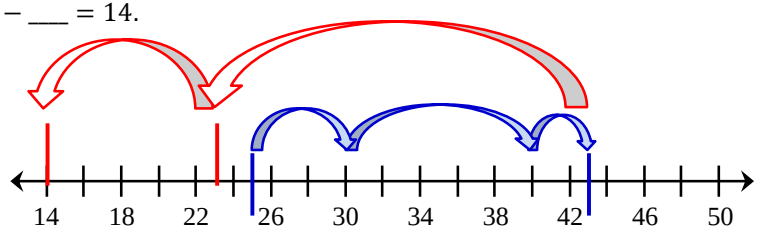
- Step 4 – After I traded it, I removed blocks until there were only 14 remaining.



- Step 5 – My answer is the number of blocks that I removed. I removed 2 tens and 9 ones, and that is 29. My equation is $25 + 18 - ___ = 14$.

Student 2:

- I used a number line. I started at 25 and needed to move up 18 spots, so I started by moving up 5 spots to 30, and then 10 spots to 40, and then 3 more spots to 43. Then, I had to move backwards (red arrows) until I got to 14, so I started by first moving back 20 spots until I got to 23. Then I moved to 14, which was an additional 9 places. I moved back a total of 29 spots. Therefore, there were a total of 29 students left in the cafeteria. My equation is $25 + 18 - ___ = 14$.



Standard

Student 3:

- I used a hundreds board. I started at 25. I moved down one row which is 10 more and then moved to the right 8 spots and landed on 43. This represented the 18 more students coming into the cafeteria.

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

- I then moved back to 14.

  $43 \rightarrow 33\ (10)$

  $33 \rightarrow 23\ (10)$

  $23 \rightarrow 13\ (10)$

  $13 \rightarrow 14\ (1 \text{ extra})$

  $30 - 1 = 29$

  So, 29 students left the cafeteria.

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

Add and Subtract within 20.

Standard
2.OA.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. (See standard 1.OA.6 for a list of mental strategies.)

Explanation: This standard mentions the word fluently when students are adding and subtracting numbers within 20. Fluency means accuracy (correct answer), efficiency (within 4-5 seconds), and flexibility (using strategies such as making 10 or breaking apart numbers). Research indicates that teachers' can best support students' memorization of sums and differences through varied experiences making 10, breaking numbers apart, and working on mental strategies, rather than repetitive timed tests. Mental strategies may include the following:

- Counting on
- Making tens ($3 + 7$; $8 + 2$, etc.)
- Using 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 ($6 + 8$ can be turned into a doubles fact when 8 is giving 1 to 6 to result in $7 + 7$)
- Using doubles ($7 + 8 = 7 + 7 = 1$)

Example:

- $8 + 7 =$
  - Student 1: *Making 10 and Decomposing a Number* – I know that 8 plus 2 is 10, so I decomposed (broke) the 7 up into a 2 and a 5. First I added 8 and 2 to get 10, and then I added the 5 to get 15.
    $8 + 7 = (8 + 2) + 5 = 10 + 5 = 15$
  - Student 2: *Creating an Easier Problem with Known Sums* – I know 8 is 7 plus 1. I also know that 7 plus 7 equal 14, and then I added 1 more to get 15.
    $8 + 7 = (7 + 7) + 1 = 15$
- $14 - 6 =$
  - *Decomposing the Number You Subtract:* 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 take away 2 more to get 8.
    $14 - 6 = (14 - 4) - 2 = 10 - 2 = 8$

Instructional Resources: Resources for teaching the strategies and making tens and using tens.

- Blank Ten Frames
- Little Ten Frames (10s)
- Little Ten Frames (1s-9s)

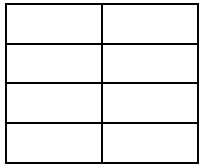
Work with equal groups of objects to gain foundations for multiplication.

Standard
2.OA.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.

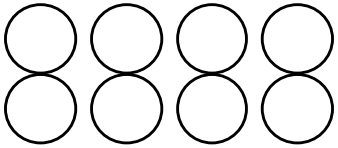
Explanation: This standard calls for students to apply their work with doubles addition facts to the concept of odd or even numbers. Students should have ample experiences exploring the concept that if a number can be decomposed (broken apart) into two equal addends (e.g., $10 = 5 + 5$), then that number (10 in this case) is an even number. Students should explore this concept with concrete objects (e.g., counters, place value cubes, etc.) before moving towards pictorial representations such as circles or arrays.

Example:

- Is 8 an even number? Prove your answer.
  - Student 1: 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 2: 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 3: I drew 8 boxes in a rectangle that had 2 columns. Since every box on the left matches a box on the right, I know that 8 is even.



  - Student 4: I drew 8 circles. I matched one on the left with one on the right. Since they all matched up, I know that 8 is an even number.



  - Student 5: I know that 4 plus 4 equals 8. So, 8 is an even number.

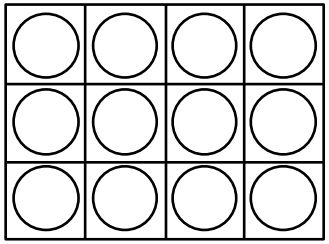
Standard

2.OA.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.

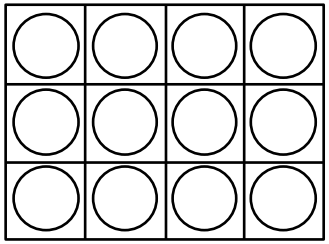
Explanation: This standard calls for students to use rectangular arrays to work with repeated addition. This is a building block for multiplication in 3rd grade. Students should explore this concept with concrete objects (e.g., counters, bears, square tiles, etc.) as well as pictorial representations on grid paper or other drawings. Based on the commutative property of addition, students can add either the rows or the columns and still arrive at the same solution.

Example:

- Find the total number of objects below:
  - Student 1: I see 3 counters in each column and there are 4 columns. So, I added $3 + 3 + 3 + 3$. That equals 12.



  - Student 2: I see 4 counters in each row and there are 3 rows. So, I added $4 + 4 + 4$. That equals 12.



Number and Operations in Base Ten (NBT)

Understand place value.

Standard
2.NBT.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). ***Explanations:*** • This standard calls for students to work on decomposing numbers by place. Students should have ample experiences with concrete materials and pictorial representations examining that numbers between 100 and 999 can be decomposed into hundreds, tens, and ones. • Interpret the value of a digit (1-9 and 0) in a multi-digit numeral by its position within the number with models, words, and numerals. • As students are representing the various amounts, it is important that emphasis is placed on the language associated with the quantity. For example, 243 can be expressed in multiple ways such as 2 groups of hundred, 4 groups of ten, and 3 ones as well as 24 tens and 3 ones. When students read numbers, they should read in standard form as well as using place value concepts. For example, 243 should be read as “two hundred forty-three” as well as 2 hundreds, 4 tens, 3 ones. ***Examples:*** • Ask students to make these equations true: ▪ 14 tens = _____ hundreds + 4 tens ▪ 14 tens = _____ ones • Find at least three different ways to make 241 using hundreds, tens, and ones. ***Instructional Resources:*** • Online resource for base-ten blocks • Online resource for hundreds chart – use for counting by any number starting at any number • Online place value number line

Standard
2.NBT.2 – Count within 1000; skip-count by 5s, 10s, and 100s. ***Explanation:*** Students need many opportunities counting, up to 1000, from different starting points. They should have many experiences skip counting by 5s, 10s, and 100s to develop the concept of place value. They should also understand that counting by 2s, 5s and 10s is counting groups of items by that amount. ***Examples:*** ▪ The use of the 100s chart may be helpful for students to identify the counting patterns. ▪ The use of money (nickels, dimes, dollars) or base-ten blocks may be helpful visual cues. • Students should explore the patterns of numbers when they skip count. When students skip count by 5s, the ones digit alternates between 5 and 0. When students skip count by 100s, the hundreds digit is the only digit that changes, and it increases by one number. • The ultimate goal for 2nd graders is to be able to count in multiple ways with no visual support.
2.NBT.3 – Read and write numbers to 1000 using base-ten numerals, number names, and expanded form. ***Explanation:*** Students need many opportunities reading and writing numerals in multiple ways. These representations can include place value (base-ten) blocks, pictorial representations, or other concrete materials. ***Examples:*** Standard form | base-ten numerals | 637 Written form | number names | six hundred thirty seven Expanded notation | expanded form | $600 + 30 + 7$ • 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.”

Standard
2.NBT.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. ***Explanation:*** • Builds on the work of 2.NBT.1 and 2.NBT.3 by having students compare two numbers by examining the amount of hundreds, tens, and ones in each number. Students are introduced to the symbols greater than (>), less than (<), and equal to (=) in 1st grade, and use them in 2nd grade with numbers within 1,000. Students should have ample experiences communicating their comparisons in words before using only symbols in this standard. • Comparative language includes but is not limited to more than, less than, most, greatest, least, same as, equal to, and not equal to. Students use the appropriate symbols to record the comparisons. ***Examples:*** • Compare the number sentences (expressions) ▪ 926 ____ 726 + 100 + 10 ▪ 6 ones + 4 hundreds _____ 460 ▪ 5 tens + 9 ones _____ 2 hundreds + 3 ones ▪ 1 one + 2 tens + 3 hundreds _____ 321

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

Standard
2.NBT.5 – Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. ***Explanation:*** This standard mentions the word fluently when students are adding and subtracting numbers within 100. Fluency means *accuracy* (correct answer), *efficiency* (basic facts computed within 4-5 seconds), and *flexibility* (using strategies such as making 10 or breaking numbers apart). • 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: $81 - 30 = 51$, $51 - 7 = 44$ • Properties that students should know and use are: ▪ 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 2nd grade need to communicate their understanding of why some properties work for some operations and not for others. ▪ Commutative Property: In 1st grade, students investigate whether the commutative property works with subtraction. The intent is 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 2nd 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. ***Resources:*** Place-value mat with ten frames

Standard
2.NBT.6 – Add up to four two-digit numbers using strategies based on place value and properties of operations. ***Explanation:*** This standard calls for students to add a string of two-digit numbers (up to four numbers) by applying place value strategies and properties of operations. ***Examples:*** $43 + 34 + 57 + 24 = 158$ • Student 1: Associative Property I saw the 43 and 57 and added them first, since I know 3 plus 7 equals 10. When I added them, 100 was my answer. Then, I added 34 and had 134. Then, I added 24 and had 158. • Student 2: 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 $3 + 4 + 7 + 4 = 18$. Then, I combined the tens and ones and had 158 as my answer. • Student 3: Place Value Strategies and Associative Property I broke up all the numbers into tens and ones. First, I added up the tens $40 + 30 + 50 + 20 = 140$. 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 and 10 plus 8 equals 18. I then combined my tens and my ones 140 plus 18 equals 158.
2.NBT.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; relate the strategy to a written method. 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. ***Explanation:*** • This standard builds on the work from 2.NBT.5 by increasing the size of numbers (two, 3-digit numbers). Students should have ample experiences to use concrete materials (place value blocks) and pictorial representations to support their work. • 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. While the standard algorithm could be used here, students' experiences should extend beyond only working with the algorithm.

Standard
2.NBT.8 – Mentally add 10 or 100 to a given number 100-900, and mentally subtract 10 or 100 from a given number 100-900. ***Explanation:*** • This standard calls for students to mentally add or subtract multiples of 10 or 100 to any number between 100 and 900. Students should have ample experiences working with the concept that when you add or subtract multiples of 10 or 100 that you are only changing the tens place (multiples of ten) or the digit in the hundreds place (multiples of 100). • In this standard, problems in which students cross centuries should also be considered—example: $273 + 60 = 333$. 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. Explorations should include looking for relevant patterns. • 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.9 – Explain why addition and subtraction strategies work, using place value and the properties of operations. (Explanations may be supported by drawings or objects.) ***Explanation:*** Students need multiple opportunities explaining their addition and subtraction thinking. Operations embedded within a meaningful context promote development of reasoning and justification. ***Example:*** • Mason read 473 pages in June. He read 227 pages in July. How many pages did Mason read altogether? ▪ Karla's explanation: $473 + 227 =$_____. I added the ones together $(3 + 7)$ and got 10. Then I added the tens together $(70 + 20)$ and got 90. I knew that $400 + 200$ was 600. So I added $10 + 90$ for 100 and added $100 + 600$ and found out that Mason had read 700 pages altogether. ▪ Debbie's explanation: $473 + 227 =$_____. I started by adding 200 to 473 and got 673. Then, I added 20 to 673 and I got 693, and finally I added 7 to 693, and I knew that Mason had read 700 pages altogether. ▪ Becky's explanation: I used base-ten blocks on a base-ten mat to help me solve this problem. I added 3 ones (units) plus 7 ones and got 10 ones, which made one ten. I moved the 1 ten to the tens place. I then added 7 tens rods plus 2 tens rods plus 1 tens rod and got 10 tens or 100. I moved the 1 hundred to the hundreds place. Then I added 4 hundreds plus 2 hundreds plus 1 hundred and got 7 hundreds or 700. So, Mason read 700 pages. 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.

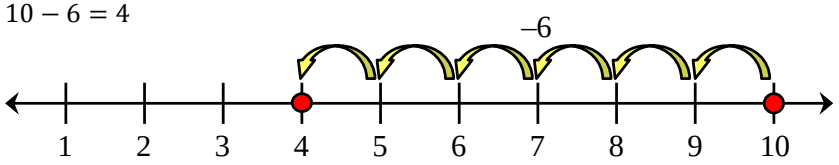
Measurement and Data (MD)

Measure and estimate lengths in standard units.

Standard
2.MD.1 – Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes. ***Explanations:*** • This standard calls for students to measure the length of objects in both customary (inches and feet) and metric (centimeters and meters). Students should have ample experiences choosing objects, identifying the appropriate tool and unit, and then measuring the object. The teacher should allow students to determine which tools and units to use. • Foundational understandings to help measure concepts: ▪ Understand that larger units can be subdivided into equivalent units (partition). ▪ Understand that the same unit can be repeated to determine the measure (iteration). ▪ Understand the relationship between the size of a unit and the number of units needed (compensatory principal). ▪ Understand the measuring of two-dimensional space (area) using non-standard units.
2.MD.2 – Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen. ***Explanation:*** Students need multiple opportunities to measure using different units of measure. They should not be limited to measuring within the same standard unit. Students should have access to tools, both U.S. Customary and metric. The more students work with a specific unit of measure, the better they become at choosing the appropriate tool when measuring. ***Example:*** • A student measures the length of their desk and finds that it is 3 feet and 36 inches. Students should explore the idea that the length of the desk is larger in inches than in feet, since inches are smaller units than feet. This concept is referred to as the compensatory principle. Note: this standard does not specify whether the units have to be within the same system.

Standard
2.MD.3 – Estimate lengths using units of inches, feet, centimeters, and meters. ***Explanation:*** This standard calls for students to estimate the lengths of objects using inches, feet, centimeters, and meters. Estimation helps develop familiarity with the specific unit of measure being used. Students should make estimates after seeing a benchmark unit, such as the length of one inch, before making their estimate. ***Example:*** • Look at your ruler to see how long one inch is. Now, estimate the length of this paper in inches. • Some useful benchmarks for measurement are: ▪ 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.4 – Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit. ***Explanation:*** 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.

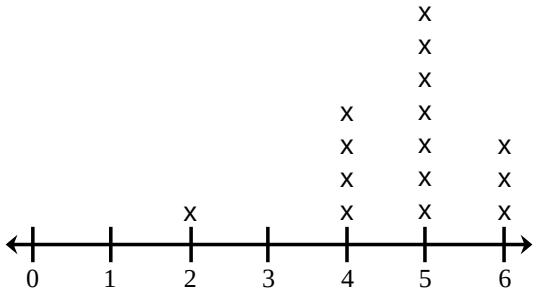
Relate addition and subtraction to length.

Standard
2.MD.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. ***Explanation:*** • 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. Equations include: ▪ $20 + 35 = c$ ▪ $c - 20 = 35$ ▪ $c - 35 = 20$ ▪ $20 + b = 55$ ▪ $35 + a = 55$ ▪ $55 = a + 35$ ▪ $55 = 20 + b$ ***Example:*** • A word problem for $5 - n = 2$ could be: 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?
2.MD.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. ***Explanation:*** Students represent their thinking when adding and subtracting within 100 by using a number line. ***Example:*** • $10 - 6 = 4$    (Start at 10 and count backward 6 units.)

Work with time and money.

Standard
3.MD.7 – Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m. ***Explanations:*** • In 1st grade, students learned to tell time to the nearest hour and half-hour. Students build on this understanding in 2nd grade by skip counting by 5 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. Common time phrases include the following: quarter till ___, quarter after ___, ten till ___, ten after ___, and half past ___. • 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. ***Resource:*** Time Match Clocks
2.MD.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?* ***Explanations:*** • Since money is not specifically addressed in kindergarten, 1st grade, or 3rd grade, students should have multiple opportunities to identify, count, recognize, and use coins and bills in and out of context. They should also experience making equivalent amounts using both coins and bills. "Dollar bills" should include denominations up to one hundred ($1.00, $5.00, $10.00, $20.00, $100.00). • Students should solve story problems connecting the different representations. These representations may include objects, pictures, charts, tables, words, and/or numbers. Students should communicate their mathematical thinking and justify their answers. ***Example:*** • Sandra went to the store and received $ 0.76 in change. What are three different sets of coins she could have received? ***Resource:*** Coin Box

Represent and interpret data.

Standard
2.MD.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. ***Explanation:*** This standard emphasizes representing data using a line plot. Students will use the measurement skills learned in earlier standards to measure objects. Line plots are first introduced in this grade level. A line plot can be thought of as plotting data on a number line. **Number of Pencils Measured**    ***Example:*** • Measure objects in your desk to the nearest inch, display data collected on a line plot. How many objects measured 2 inches? 3 inches? Which length had the most number of objects? How do you know?
2.MD.10 – Draw a picture graph and a bar graph (with single-unit & multi-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 (refer to the Appendix Table). ***Explanation:*** This standard calls for students to work with categorical data by organizing, representing, and interpreting data. Students should have experiences posing a question with 4 possible responses and then work with the data that they collect.

Standard

2.MD.10 Example:

Example:

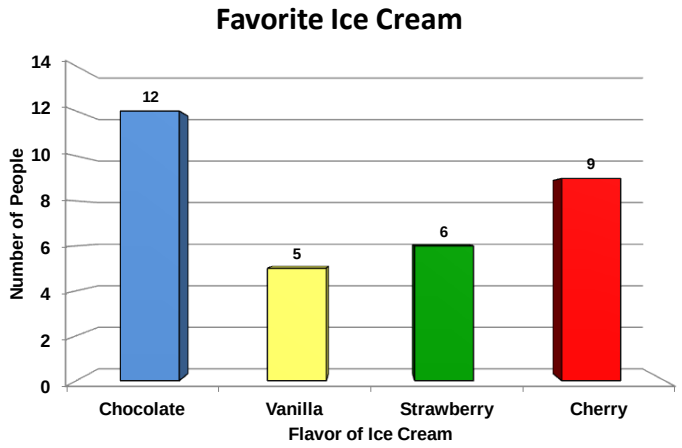
- Students pose a question and the 4 possible responses. Which is your favorite flavor of ice cream? Chocolate, vanilla, strawberry, or cherry? Students collect their data by using tallies or another way of keeping track.

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

- In 2nd grade, picture graphs (pictographs) include symbols that represent single units. Pictographs should include a title, categories, category label, key, and data.
- Students in 2nd grade should draw both horizontal and vertical bar graphs. Bar graphs include a title, scale, scale label, categories, category label, and data.

Favorite Ice Cream	
Chocolate	
Vanilla	
Strawberry	
Cherry	

= 1 student



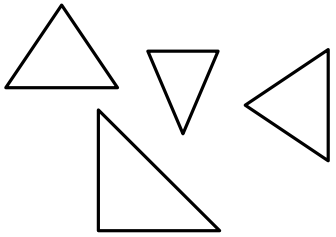
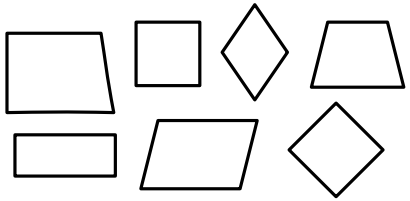
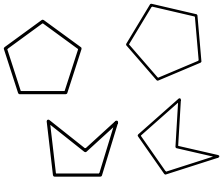
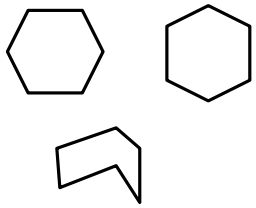
Students answer simple problems related to addition and subtraction that ask them to put together, take apart, and compare numbers. See Appendix for examples of these.

Geometry (G)

Reason with shapes and their attributes.

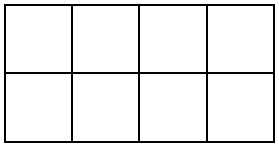
Standard
2.G.1 – Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes. (Sizes are compared directly or visually, not compared by measuring.)

Explanation: This standard calls for students to identify (recognize) and draw shapes based on a given set of attributes. These include triangles, quadrilaterals (squares, rectangles, and trapezoids), pentagons, hexagons, and cubes. 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.

Triangles	**Quadrilaterals**
	
Pentagons	**Hexagons**
	

Example:

- Draw a closed shape that has five sides. What is the name of the shape?
  - Student 1 – I drew a shape with five sides. It is called a pentagon.

Standard
2.G.2 – Partition a rectangle into rows and columns of same-size squares and count to find the total number of them. ***Explanation:*** This standard calls for students to partition a rectangle into squares (or square-like regions) and then determine the total number of squares. It 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. ***Example:*** • Split the rectangle into 2 rows and 4 columns. How many small squares did you make?  Note: Rows are horizontal, and columns are vertical.

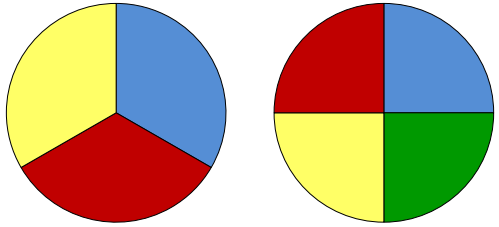
Standard

2.G.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.

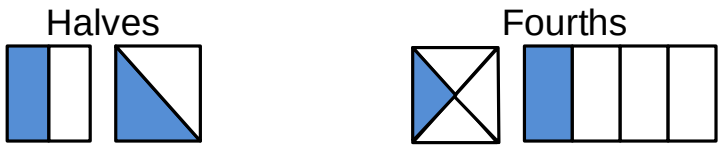
Explanation:

- This standard introduces fractions in an area model. Students need experiences with different sizes, circles, and rectangles. 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. 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.

Note: $\frac{3}{3}$ is a whole



- This standard also addresses the idea that equal shares of identical wholes may not have the same shape. 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.



Appendix – 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[2]**
Put Together/ Take Apart[3]	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.