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

2nd Grade Mathematics ● Unpacked Content

For the new Common Core State Standards that will be effective in all North Carolina schools in the 2012-13.

This document is designed to help North Carolina educators teach the Common Core (Standard Course of Study). NCDPI staff are continually updating and improving these tools to better serve teachers.

What is the purpose of this document?
To increase student achievement by ensuring educators understand specifically what the new standards mean a student must know, understand and be able to do.

What is in the document?
Descriptions of what each standard means a student will know, understand and be able to do. The "unpacking" of the standards done in this document is an effort to answer a simple question "What does this standard mean that a student must know and be able to do?" and to ensure the description is helpful, specific and comprehensive for educators.

How do I send Feedback?
We intend the explanations and examples in this document to be helpful and specific. That said, we believe that as this document is used, teachers and educators will find ways in which the unpacking can be improved and made ever more useful. Please send feedback to us at feedback@dpi.state.nc.us and we will use your input to refine our unpacking of the standards. Thank You!

Just want the standards alone?
You can find the standards alone at http://corestandards.org/the-standards

Mathematical Vocabulary is identified in bold print. These are words that students should know and be able to use in context.

Critical Areas and Changes in Grade 2 from 2003 NCSCOS

Critical Areas:

1. Extending understanding of base-ten system
2. Building fluency with addition and subtraction within 100
3. Understanding need for and appropriate use of standard units of measure
4. Describing and analyzing shapes

New to 2nd Grade:

- Addition with rectangular array (2.OA.4)
- Count within 1,000 by 5s, 10s, 100s (2.NBT.2)
- Mentally add and subtract by 10 & 100 (2.NBT.8)
- Measurement concepts (2.MD.2, 2.MD.4, 2.MD.5, 2.MD.6,)
- Money (2.MD.8)
- Line Plots, Picture graphs, bar graphs (2.MD.9, 2.MD.10)

Moved from 2nd Grade:

- Estimation while computing (1.01e, 1.04b)
- Temperature (2.01b)
- Cut and rearrange 2-D and 3-D figures (3.02)
- Symmetric and congruent figures (3.03a, 3.03b)
- Venn diagrams and pictographs (4.01)
- Probability (4.02)
- Repeating and growing patterns (5.01)

Note:

Topics may appear to be similar between the CCSS and the 2003 NCSCOS; however, the CCSS may be presented with a higher cognitive with a focus on the CCSS Standards for Mathematical Practice.

Standards for Mathematical Practice in Grade 2

The Common Core State Standards for Mathematical Practice are practices expected to be integrated into every mathematics lesson for all students Grades K-12. Below are a few examples of how these Practices may be integrated into tasks that Grade 2 students complete.

1) **Make Sense and Persevere in Solving Problems.** Mathematically proficient students in Grade 2 examine problems (tasks), can make sense of the meaning of the task and find an entry point or a way to start the task. Grade 2 students also develop a foundation for problem solving strategies and become independently proficient on using those strategies to solve new tasks. In Grade 2, students' work still relies on concrete manipulatives and pictorial representations as students solve tasks unless the CCSS refers to the word fluently, which denotes mental mathematics. Grade 2 students also are expected to persevere while solving tasks; that is, if students reach a point in which they are stuck, they can reexamine the task in a different way and continue to solve the task. Lastly, mathematically proficient students complete a task by asking themselves the question, "Does my answer make sense?"

2) **Reason abstractly and quantitatively.** Mathematically proficient students in Grade 2 make sense of quantities and the relationships while solving tasks. This involves two processes- decontexualizing and contextualizing. In Grade 2, students represent situations by decontextualizing tasks into numbers and symbols. For example, in the task, "There are 25 children in the cafeteria and they are joined by 17 more children. Then, if 19 of those children then leave, how many are still there?" Grade 2 students are expected to translate that situation into the equation: 25 + 17 – 19 = __ and then solve the task. Students also contextualize situations during the problem solving process. For example, while solving the task above, students can refer to the context of the task to determine that they need to subtract 19 since 19 children leave. The processes of reasoning also apply to Grade 2 as students begin to measure with standard measurement units by determining the length of quantities based on particular units of measure.

3) **Construct viable arguments and critique the reasoning of others.** Mathematically proficient students in Grade 2 accurately use definitions and previously established solutions to construct viable arguments about mathematics. In Grade 2 during discussions about problem solving strategies, students constructively critique the strategies and reasoning of their classmates. For example, while solving 74 + 18 – 37, students may use a variety of strategies, and after working on the task, can discuss and critique each others' reasoning and strategies, citing similarities and differences between strategies.

4) **Model with mathematics.** Mathematically proficient students in Grade 2 model real-life mathematical situations with a number sentence or an equation, and check to make sure that their equation accurately matches the problem context. Grade 2 students still will rely on concrete manipulatives and pictorial representations while solving problems, but the expectation is that they will also write an equation to model problem situations. Likewise, Grade 2 students are expected to create an appropriate problem situation from an equation. For example, students are expected to create a story problem for the equation 24 + 17 – 13 = ___.

5) Use appropriate tools strategically. Mathematically proficient students in Grade 2 have access to and use tools appropriately. These tools may include place value (base ten) blocks, hundreds number boards, number lines, and concrete geometric shapes (e.g., pattern blocks, 3-d solids). Students should also have experiences with educational technologies, such as calculators and virtual manipulatives that support

conceptual understanding and higher-order thinking skills. During classroom instruction, students should have access to various mathematical tools as well as paper, and determine which tools are the most appropriate to use. For example, while solving 28+17, students can explain why place value blocks are more appropriate than counters.

6) **Attend to precision.** Mathematically proficient students in Grade 2 are precise in their communication, calculations, and measurements. In all mathematical tasks, students in Grade 2 communicate clearly, using grade-level appropriate vocabulary accurately as well as giving precise explanations and reasoning regarding their process of finding solutions. For example, while measuring objects iteratively (repetitively), students check to make sure that there are no gaps or overlaps. During tasks involving number sense, students check their work to ensure the accuracy and reasonableness of solutions.

7) **Look for and make use of structure.** Mathematically proficient students in Grade 2 carefully look for patterns and structures in the number system and other areas of mathematics. While solving addition and subtraction problems students can apply the patterns of the number system to skip count by 10s off the decade. For example, Grade 2 students are expected to mentally reason that 33 + 21 is 33 plus 2 tens, which equals 53 and then an addition one which equals 54. While working in the Numbers in Base Ten domain, students work with the idea that 10 ones equals a ten, and 10 tens equals 1 hundred. Further, Grade 2 students also make use of structure when they work with subtraction as missing addend problems, such as 50- 33 = __ can be written as 33+ __ = 50 and can be thought of as how much more do I need to add to 33 to get to 50?

8) **Look for and express regularity in repeated reasoning**. Mathematically proficient students in Grade 2 begin to look for regularity in problem structures when solving mathematical tasks. For example, after solving two digit addition problems by decomposing numbers by place (33+ 25 = 30 + 20 + 3 +5), students may begin to generalize and frequently apply that strategy independently on future tasks. Further, students begin to look for strategies to be more efficient in computations, including doubles strategies and making a ten. Lastly, while solving all tasks, Grade 2 students accurately check for the reasonableness of their solutions during, and after completing the task.

Operations and Algebraic Thinking 2.0A

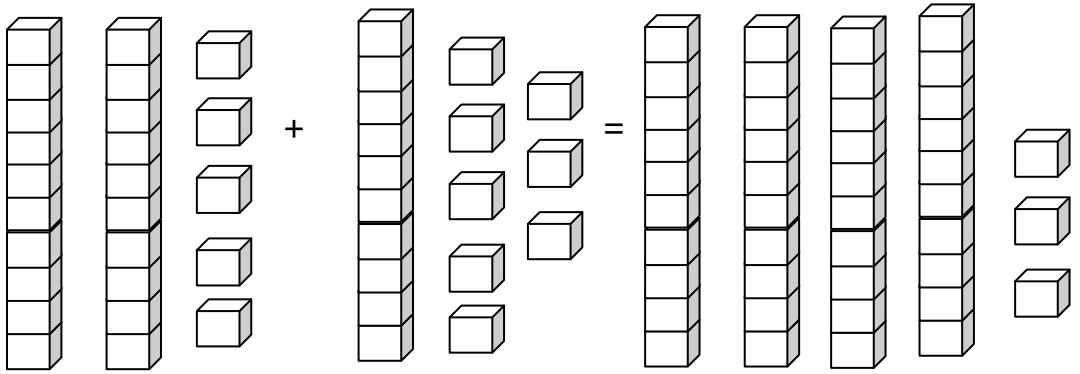
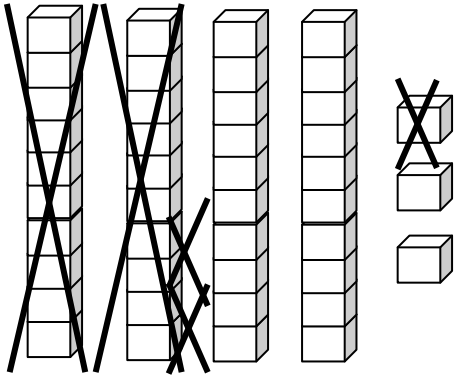
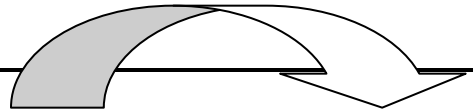
Common Core Cluster

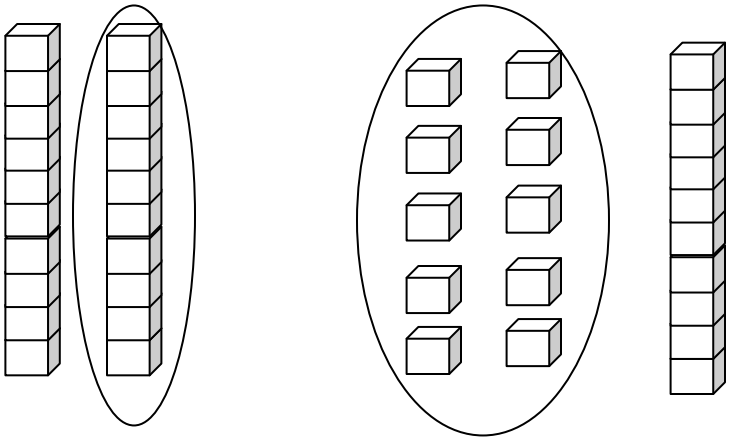
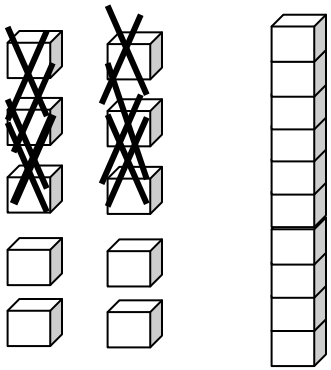
Represent and solve problems involving addition and subtraction.

Common Core Standard	Unpacking What do these standards mean a child will know and be able to do?
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.[1] [1] See Glossary, Table 1.	**2.OA.1** calls for students to add and subtract numbers within 100 in the context of one and two step word problems. Students should have ample experiences working on various types of problems that have unknowns in all positions, including: Addition Examples: Result Unknown: There are 29 students on the playground. Then 18 more students showed up. How many students are there now? *(29+18 = __)* Change Unknown: There are 29 students on the playground. Some more students show up. There are now 47 students. How many students came? *(29+ __ = 47)* Start Unknown: 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)* See Glossary, Table 1 for more addition examples as well as subtraction examples. 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. Examples of one-step problems with unknowns in different places are provided in Glossary, Table 1. Two step-problems include situations where students have to add and subtract within the same problem. 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

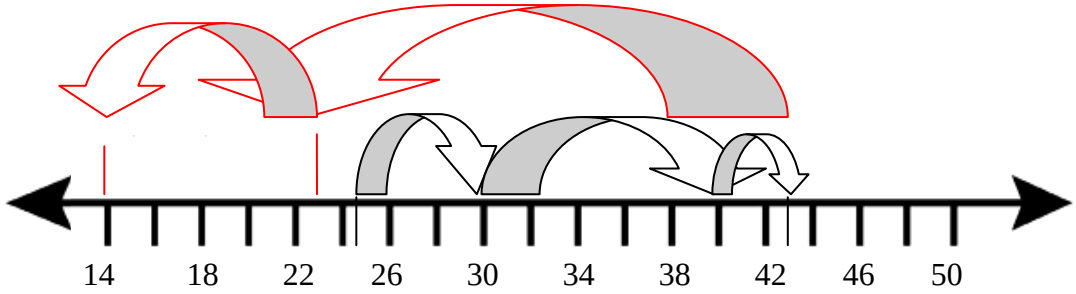
Step 1	I used place value blocks and made a group of 25 and a group of 18. When I counted them I had 3 tens and 13 ones which is 43. 
Step 2	I then wanted to remove blocks until there were only 14 left. I removed blocks until there were 20 left. 
Step 3	Since I have two tens I need to trade a ten for 10 ones. 

	
Step 4	After I traded it I removed blocks until there were only 14 remaining. 
Step 5	My answer was the number of blocks that I removed. I removed 2 tens and 9 ones. That's 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 were 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



Student 3

(Step 1) I used a hundreds board. I started at 25. I moved down one row which is 10 more 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

(Step 2) Now starting at 43, I know I have to get to the number14 which represents the number of students left in the cafeteria so I moved up 2 row 10 23 which is 20 less then moved to the left until I land on 14, 9 spaces. I moved back a total of 29 spots. That means that 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

(Step 3) My equation to represent this situation is 25 + 18 -__ = 14.

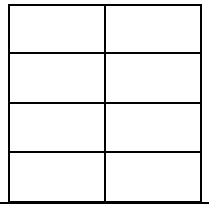
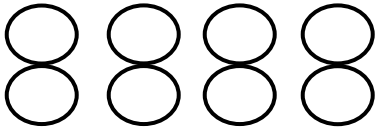
Common Core Cluster

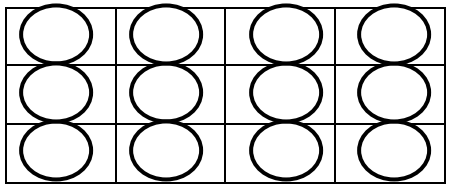
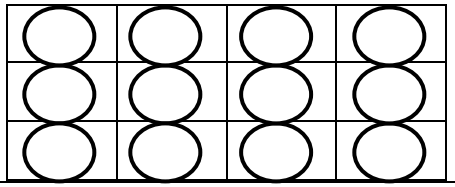
Add and subtract within 20.

Common Core Standard	Unpacking What do these standards mean a child will know and be able to do?
2.OA.2 Fluently **add** and **subtract** within 20 using mental strategies.[2] By end of Grade 2, know from memory all **sums** of two one-digit numbers.	**2.OA2** 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,

[2]See standard 1.OA.6 for a list of mental strategies.	rather than repetitive timed tests. Example: 9 + 5= __ Student 1 Counting On I started at 9 and then counted 5 more. I landed on 14. Student 2 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 gets me to 14. Example: 13 - 9 = __ Student 1 Using the Relationship between Addition and Subtraction: I know that 9 plus 4 equals 13. So 13 minus 9 equals 4. Student 2 Creating an Easier Problem: Instead of 13 minus 9, I added 1 to each of the numbers to make the problem 14 minus 10. I know the answer is 4. So 13 minus 9 is also 4.

Common Core Cluster	
Work with equal groups of objects to gain foundations for multiplication.	
Common Core Standard	**Unpacking** What do these standards mean a child will know and be able to do?

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.	**2.OA.3** 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 two 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 match 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.
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**	**2.OA.4** 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 below: Find the total number of objects below. Student 1 I see 3 counters in each column and there Student 2 I see 4 counters in each row and there are 3

	are 4 columns. So I added 3 + 3 + 3 + 3. That equals 12. 	rows. So I added 4 + 4 + 4. That equals 12. 

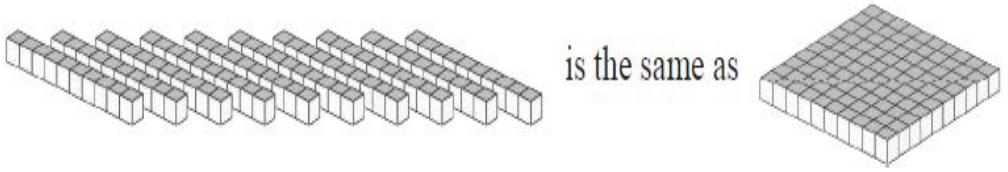
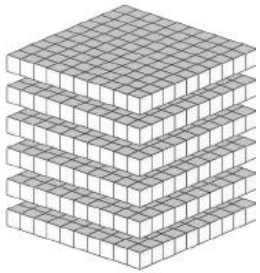
Number & Operations in Base Ten 2.NBT

Common Core Standard and Cluster

Understand place value.

Students extend their understanding of the base-ten system. This includes ideas of counting in fives, tens, and multiples of hundreds, tens, and ones, as well as number relationships involving these units, including comparing. Students understand multi-digit numbers (up to 1000) written in base-ten notation, recognizing that the digits in each place represent amounts of thousands, hundreds, tens, or ones (e.g., 853 is 8 hundreds + 5 tens + 3 ones).

Common Core Standard	Unpacking What do these standards mean a child will know and be able to do?
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).	**2.NBT.1** calls for students to work on decomposing numbers by place. Students should have ample experiences with concrete materials and pictorial representations examining that numbers all 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. Use 10 as a benchmark number to compose and decompose when adding and subtracting whole numbers. **2.NBT.1a** calls for students to extend their work from 1st Grade by exploring a hundred as a unit (or bundle) of ten tens. **2.NBT.1b** builds on the work of **2.NBT.2a.** Students should explore the idea that numbers such as 100, 200, 300, etc., are groups of hundreds that have no tens or ones. Students can represent this with place value (base 10) blocks.

	 6 hundreds are the same as 600 
2.NBT.2 Count within 1000; **skip-count** by 5s, 10s, and 100s.	**2.NBT.2** calls for students to count within 1,000. This means that students are expected to "count on" from any number and say the next few numbers that come afterwards. Understand that counting by 2s, 5s and 10s is counting groups of items by that amount. Example: 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.* This standard also introduces skip counting by 5s and 100s. Students are introduced to skip counting by 10s in First Grade. 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.
2.NBT.3 Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.	**2.NBT.3** calls for students to read, write and represent a number of objects with a written numeral (number form or standard form). These representations can include place value (base 10) blocks, pictorial representations or other concrete materials. Please be cognizant that when reading and writing whole numbers, the word "and" should not be used. Example: 235 is written as two hundred thirty-five.
2.NBT.4 Compare two three-digit numbers based on meanings of the **hundreds, tens**, and **ones digits**, **using >, =, and < symbols** to record the	**2.NBT.4** 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 First Grade, and use them in Second Grade with numbers within 1,000. Students should have ample experiences communicating their comparisons in words before using only symbols in this

results of comparisons.	standard. Example: 452 __ 455 Student 1 452 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. Student 2 452 is less than 455. I know this because when I count up I say 452 before I say 455.

Common Core Cluster

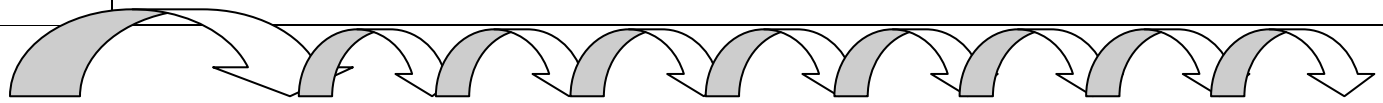
Use place value understanding and properties of operations to add and subtract.

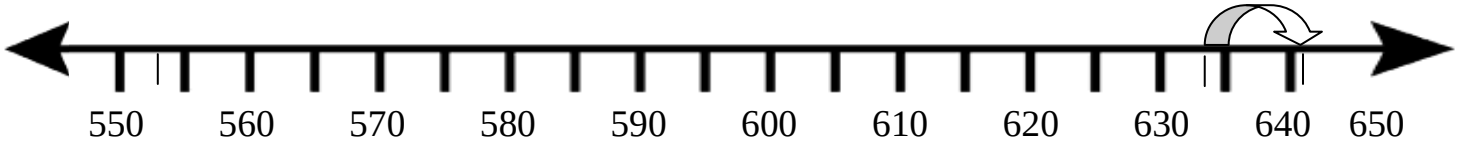
Students use their understanding of addition to develop fluency with addition and subtraction within 100. They solve problems within 1000 by applying their understanding of models for addition and subtraction, and they develop, discuss, and use efficient, accurate, and generalizable methods to compute sums and differences of whole numbers in base-ten notation, using their understanding of place value and the properties of operations. They select and accurately apply methods that are appropriate for the context and the numbers involved to mentally calculate sums and differences for numbers with only tens or only hundreds.

Common Core Standard	Unpacking What do these standards mean a child will know and be able to do?
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.	**2.NBT.5** 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). This standard calls for students to use pictorial representations or strategies to find the solution. Students who are struggling may benefit from further work with concrete objects (e.g., place value blocks). 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. Counting On and Decomposing a Number Leading to a Ten: I wanted to start with 67 and then break 25 apart. I started with 67 and counted on to my next ten. 67 plus 3 gets me to 70. I then added 2 more to get to 72. I then added my 20 and got to 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 = __ Relationship between Addition and Subtraction: I broke apart both 63 and 32 into tens and ones. I know that 2 plus 1 equals 3, so I have 1 left in the ones place. I know that 3 plus 3 equals 6, 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.
2.NBT.6 Add up to four two-digit numbers using strategies based on place value and properties of operations.	**2.NBT.6** calls for students to add a string of two-digit numbers (up to four numbers) by applying place value strategies and properties of operations. Example: 43 + 34 + 57 + 24 = __ 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 Student 4 Then I added up the ones. 3 + 4 + 7 + 4. I changed the order of the numbers

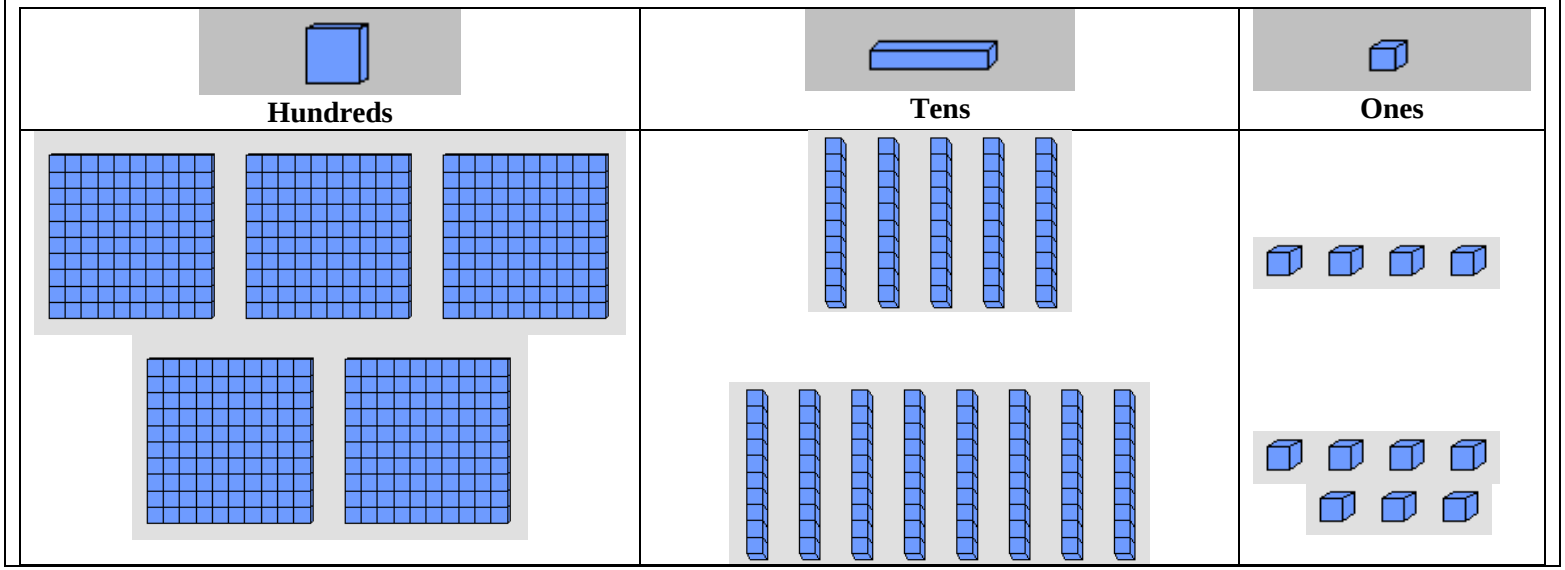
	I broke up all the numbers into tens and ones. First I added up the tens. 40 + 30 + 50 + 20. I changed the order of the numbers to make adding easier. I know that 30 plus 20 equals 50 and 50 more equals 100. Then I added the 40 and got 140.	to make adding easier. I know that 3 plus 7 equals 10 and 4 plus 4 equals 8. 10 plus 8 equals 18. I then combined my tens and my ones. 140 plus 18 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.	**2.NBT.7** 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. Example: 354 + 287 = __ Student 1 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 7 and landed on 641.	





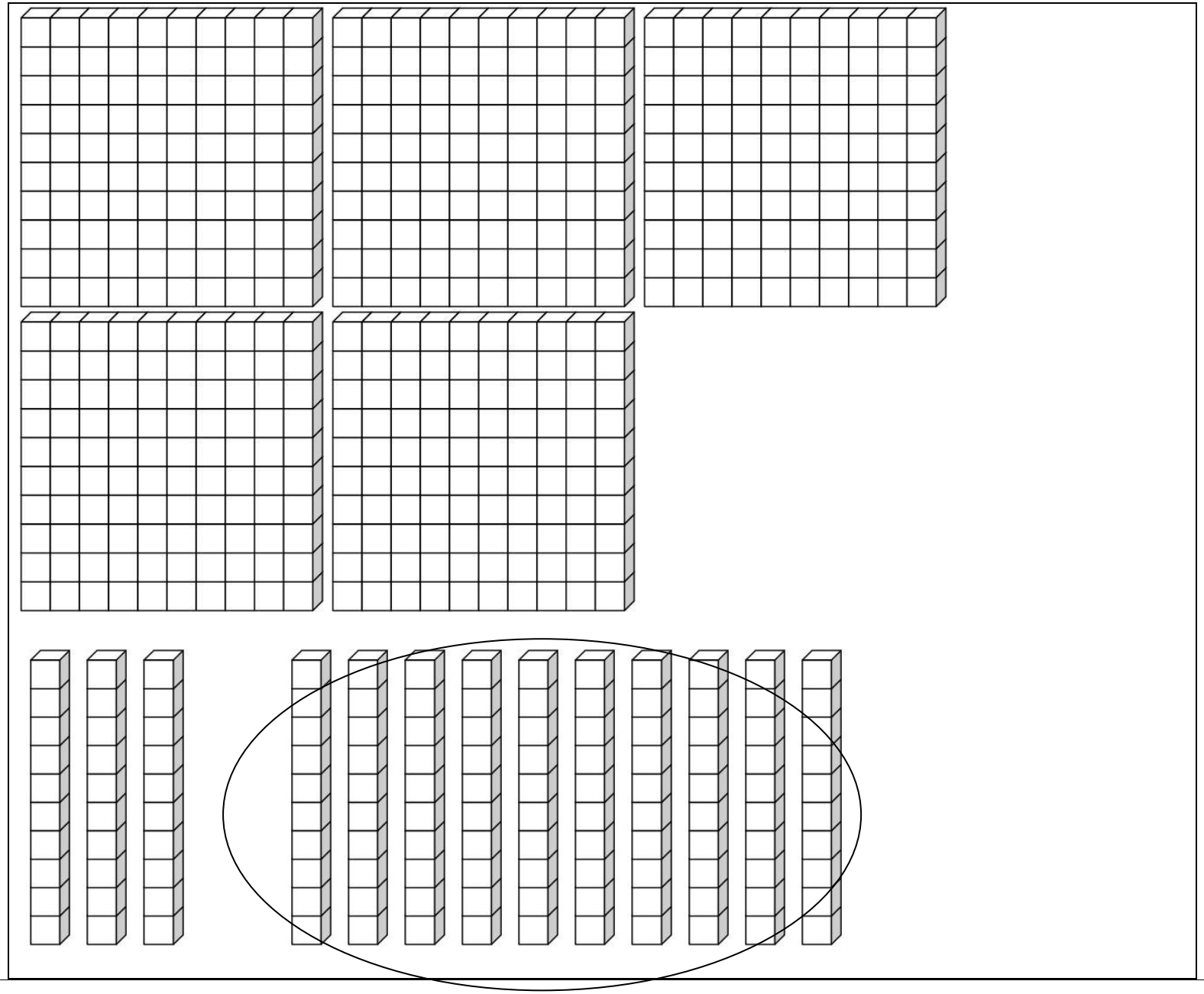
Student 2

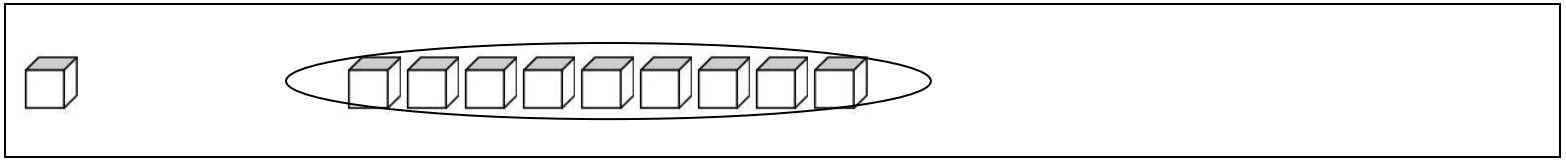
I broke all of the numbers up by place using a place value chart.
I first added the ones.4 + 7 = 11.
I then added the tens. 50 + 80 = 130.
I then added the hundreds. 300 + 200 = 500.
I then combined my answers. 500 + 130 = 630. 630 + 11= 641.



Student 3

I used place value blocks. I made a pile of 354. I then added 287. That gave me 500 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 11 ones. (model below)



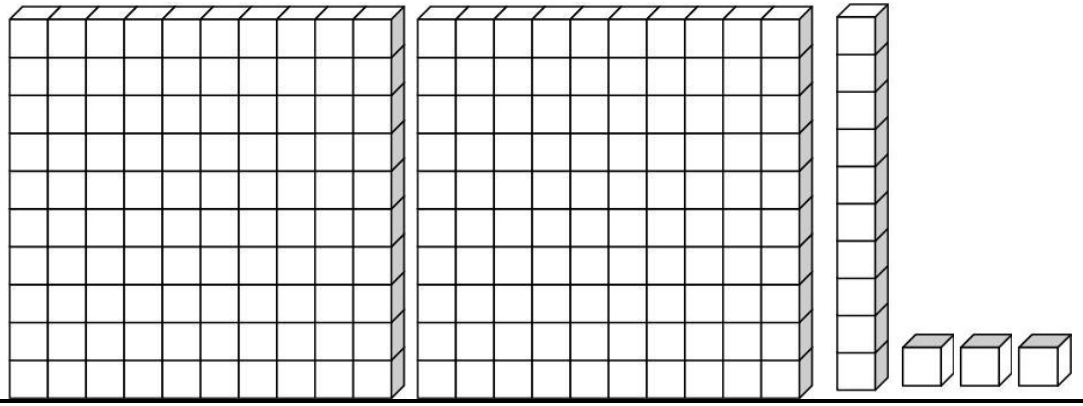


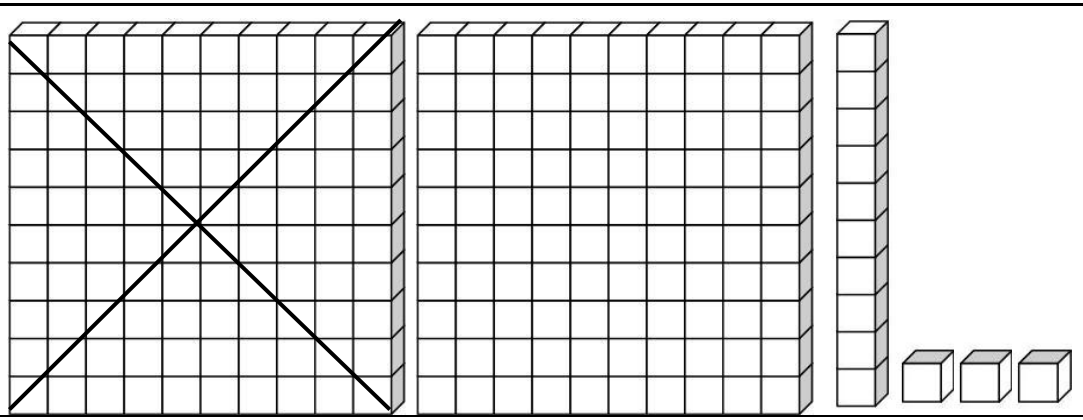
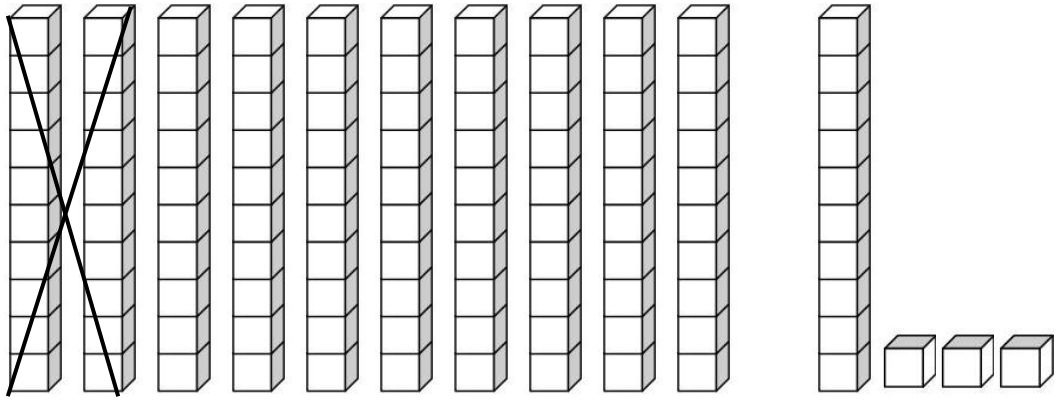
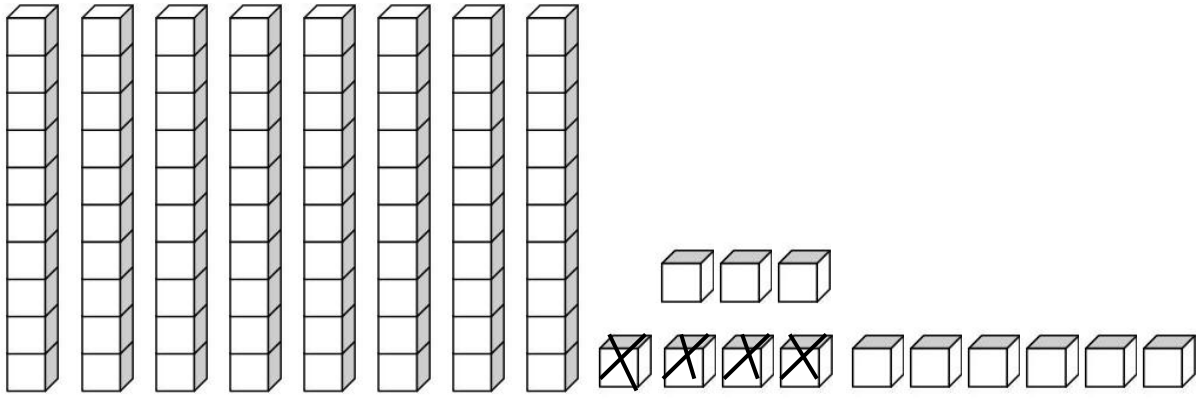
Example: 213 - 124 = __

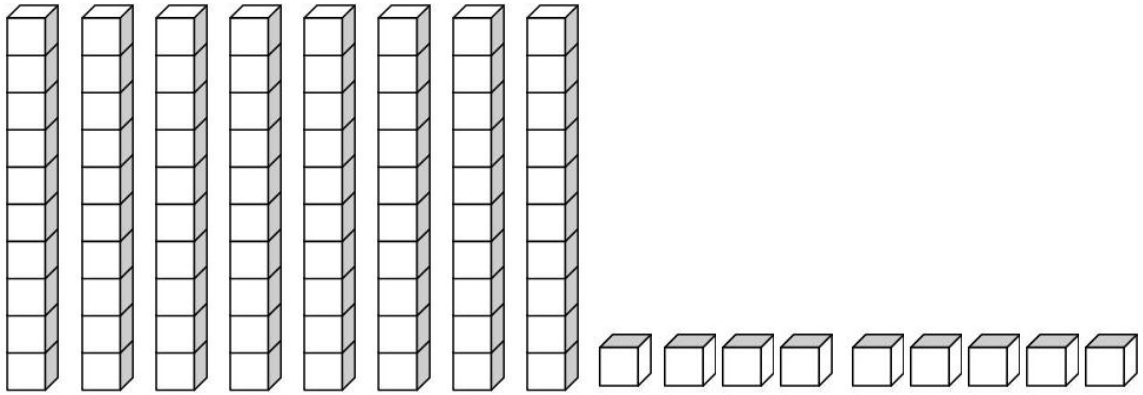
Student 1
I used place value blocks. I made a pile of 213. I then started taking away blocks.
First, I took away a hundred which left me with 1 hundred and thirteen.
I need to take away 2 tens but I only had 1 ten so I traded in my last hundred for 10 tens. Then I took two tens away leaving me with no 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.

Step 1

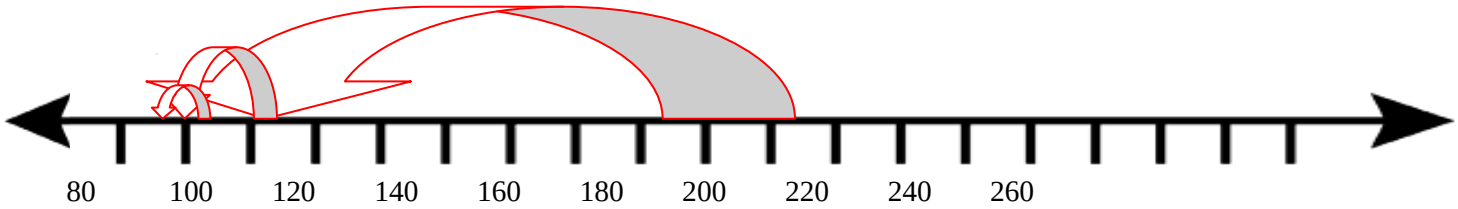
212



	Step 2 **113**	
	Step 3 **93**	
	Step 4 **89**	

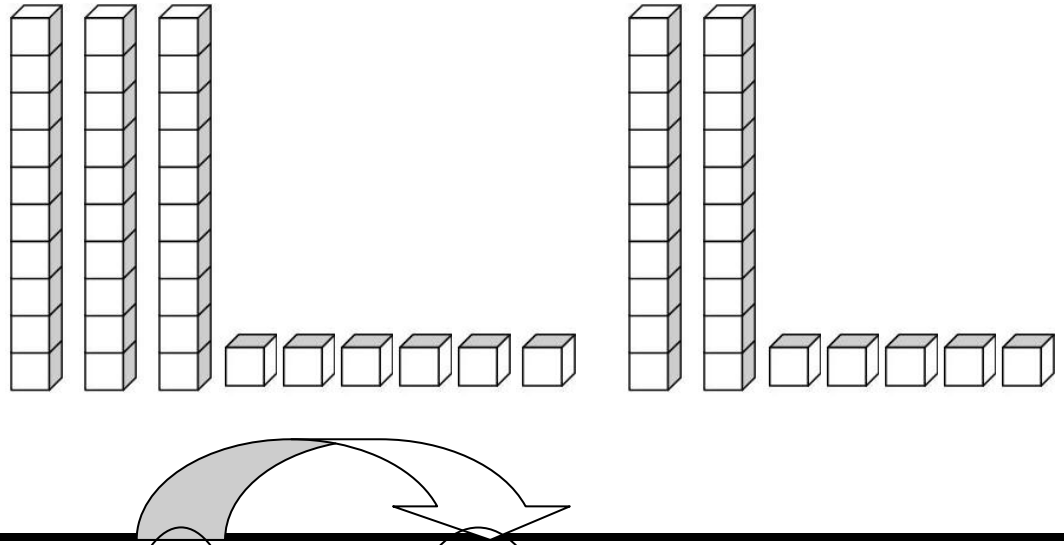
	Final Solution **89**	

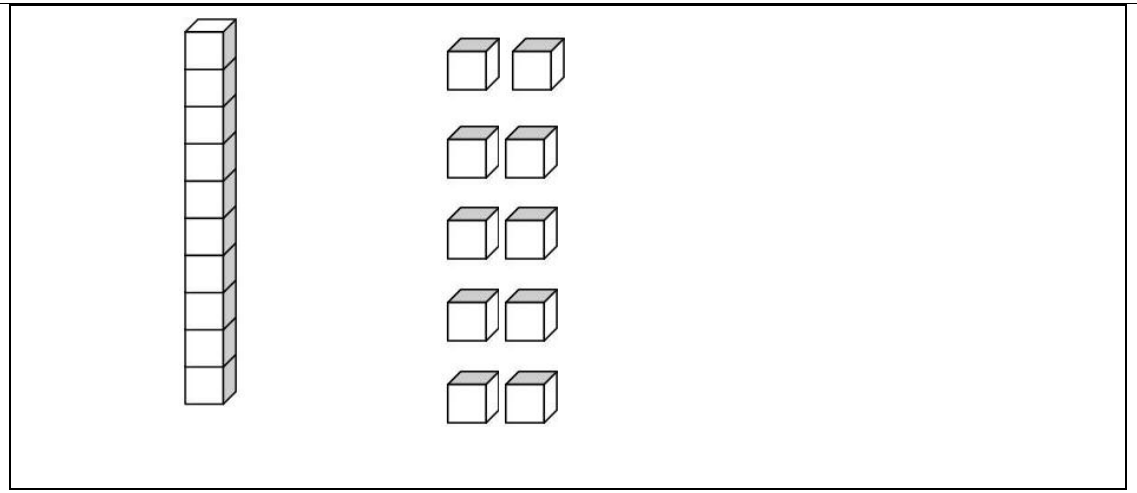
Student 2
I started at 213 and moved backwards 100 and landed on 113. I then moved back 2 jumps of ten and landed on 93. I then moved back 4 and landed on 89.



Student 3
I noticed that I was taking 124 away from 213. I changed 213 into 224 by adding 11. That made my problem 224-124. I know the answer to that problem is 100. Then I had to take away the 11 that I added. 100 - 11 = 89. My answer is 89.

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.	**2.NBT.8** 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.

2.NBT.9 Explain why addition and subtraction strategies work, using place value and the properties of operations.[1] [1] Explanations may be supported by drawings or objects.	**2.NBT.9** calls for students to explain using concrete objects, pictures and words (oral or written) to explain why addition or subtraction strategies work. The expectation is that students apply their knowledge of place value and the properties of operations in their explanation. Students should have the opportunity to solve problems and then explain why their strategies work. Example: There are 36 birds in the park. 25 more birds arrive. How many birds are there? Solve the problem and show your work. Student 1 I broke 36 and 25 into tens and ones and then added them. 30 + 6 + 20 + 5. I can change the order of my numbers, so I added 30+20 and got 50. Then I added on 6 to get 56. Then I added 5 to get 61. This strategy works because I broke all the numbers up by their place value. Student 2 I used place value blocks and made a pile of 36. Then I added 25. I had 5 tens and 11 ones. I had to trade 10 ones for a 10. Then I had 6 tens and 1 one. That makes 61. This strategy works because I added up the tens and then added up the ones and traded if I had more than 10 ones. 



Students could also have experiences examining strategies and explaining why they work. Also include incorrect examples for students to examine.

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 20 to get to 50. So, the answer is 22." Is their strategy correct? Explain why or why not?
Example:
One of your classmates solved the problem 25 + 35 by adding 20 + 30 + 5 + 5. Is their strategy correct? Explain why or why not?

Measurement & Data 2.MD

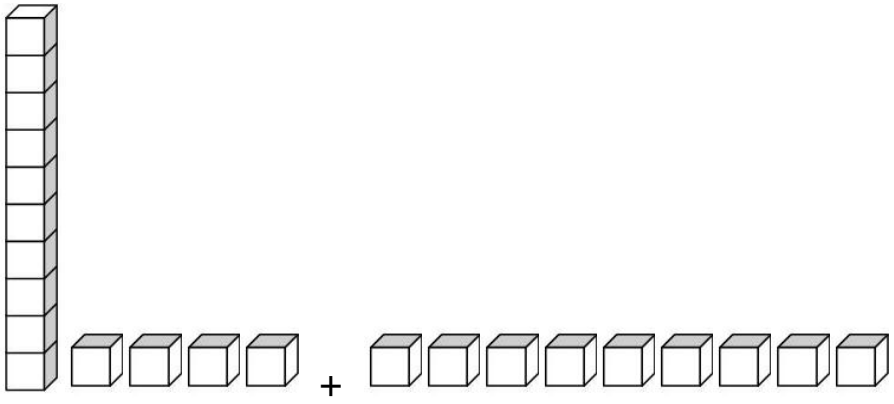
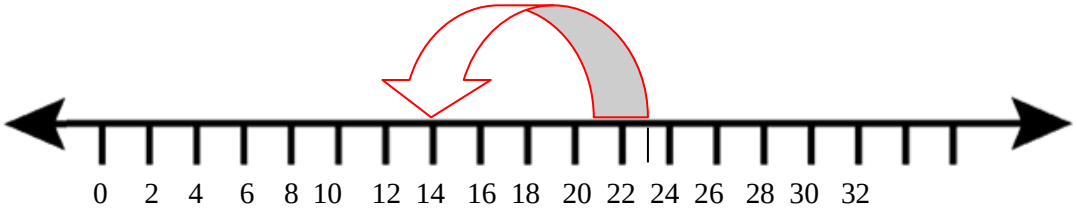
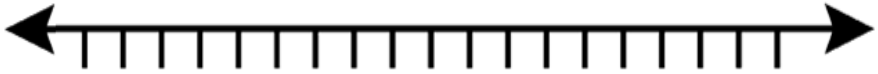
Common Core Cluster

Measure and estimate lengths in standard units.
Students recognize the need for standard units of measure (centimeter and inch) and they use rulers and other measurement tools with the understanding that linear measure involves an iteration of units. They recognize that the smaller the unit, the more iterations they need to cover a given length.

Common Core Standard	Unpacking What do these standards mean a child will know and be able to do?
2.MD.1 Measure the **length** of an object by selecting and using	**2.MD.1** 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

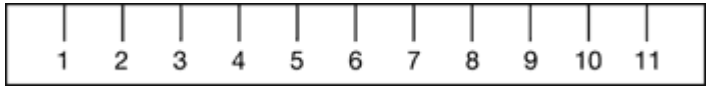
appropriate tools such as **rulers, yardsticks, meter sticks**, and **measuring tapes**.	tool and unit, and then measuring the object. The teacher should allow students to determine which tools and units to use. Foundational understandings to help with measure concepts: Understand that larger units can 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.	**2.MD.2** calls for students to measure an object using two units of different lengths. 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.
2.MD.3 Estimate lengths using units of **inches, feet, centimeters,** and **meters**.	**2.MD.3** calls for students to estimate the lengths of objects using inches, feet, centimeters, and meters. 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.
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.**	**2.MD.4** calls for students to determine the difference in length between two objects. Students should choose objects, identify appropriate tools and units, measure both objects, and then determine the differences in lengths.

Common Core Cluster	
Relate addition and subtraction to length.	
Common Core Standard	**Unpacking** What do these standards mean a child will know and be able to do?
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	**2.MD.5** apply the concept of length to solve addition and subtraction word problems with numbers within 100. Students should use the same unit in these problems. Example: In P.E. class Kate jumped 14 inches. Mary jumped 23 inches. How much farther did Mary jump than Kate? Write

equations with a symbol for the unknown number to represent the problem.	an equation and then solve the problem. Student 1 My equation is 14 + __ = 23 since I am trying to find out the difference between Kate and Mary's jump. I used place value blocks and counted out 14. I then added blocks until I got to 23. I needed to add 9 blocks. Mary jumped 9 more inches than Kate.  Student 2 My equation is 23 - 14 = __. I drew a number line. I started at 23. I moved back to 14 and counted how far I moved. I moved back 9 spots. Mary jumped 9 more inches than Kate 
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	**2.MD.6** calls for students to create number lines using numbers within 100 to solve addition and subtraction problems. Students should create the number line with evenly spaced points corresponding to the numbers. 

differences within 100 on a number line diagram.	

Common Core Cluster	
Work with time and money.	
Common Core Standard	**Unpacking** What do these standards mean a child will know and be able to do?
2.MD.7 Tell and write **time** from analog and digital clocks to the nearest five **minutes,** using **a.m**. and **p.m.**	**2.MD.7** calls for students to tell (orally and in writing) and write time after reading analog and digital clocks. Time should be to 5 minute intervals, and students should also use the terms a.m. and p.m. Teachers should help students make the connection between skip counting by 5s (2.NBT.2) and telling time on an analog clock. 
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?*	**2.MD.8** calls for students to solve word problems involving either dollars or cents. Since students have not been introduced to decimals, problems should either have only dollars or only cents. Example: What are some possible combinations of coins (pennies, nickels, dimes, and quarters) that equal 37 cents?  Example: What are some possible combinations of dollar bills ($1, $5 and $10) that equal 12 dollars?

Common Core Standard and Cluster	
Represent and interpret data.	
Common Core Standards	**Unpacking** What do these standards mean a child will know and be able to do?
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.	**2.MD.9** calls for students to represent the length of several objects by making a line plot. Students should round their lengths to the nearest whole unit. 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?  Example: Students measure a number of objects to the nearest inch and then display the data in a line plot. Objects: Pencil- 6 inches, Pen- 4 inches, Width of book- 4 inches, Book shelf- 10 inches, Width of paper- 9 inches Width of pencil box- 6 inches, book, 6 inches

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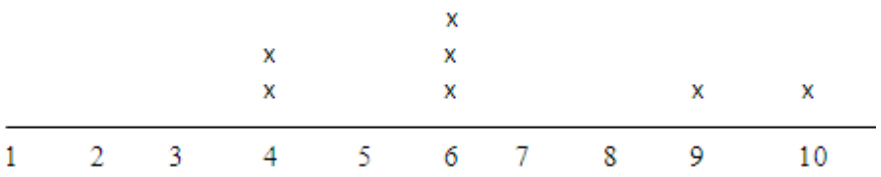
<td> 
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<td>2.MD.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems[4] using information presented in a bar graph.

[4] See Glossary, Table 1.</td>
<td>2.MD.10 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.
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.
Students organize their data by totaling each category in a chart or table. Picture and bar graphs are introduced in Second Grade.
<table>
<tr><th>Flavor</th><th>Number of People</th></tr>
<tr><td>Chocolate</td><td>12</td></tr>
<tr><td>Vanilla</td><td>5</td></tr>
<tr><td>Strawberry</td><td>6</td></tr>
<tr><td>Cherry</td><td>9</td></tr>
</table>
Students display their data using a picture graph or bar graph using a single unit scale.
Students answer simple problems related to addition and subtraction that ask them to put together, take apart, and compare numbers. See Glossary, Table 1 for examples of these.</td>
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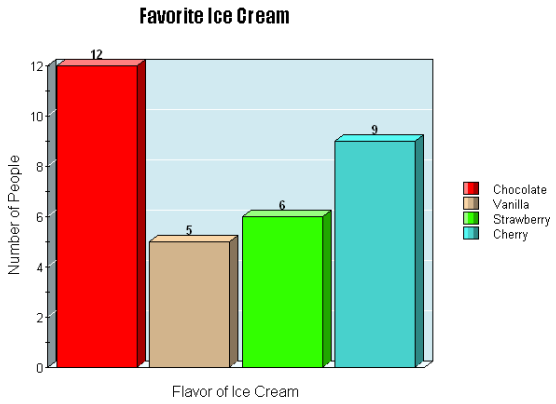


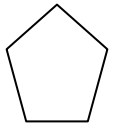
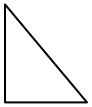
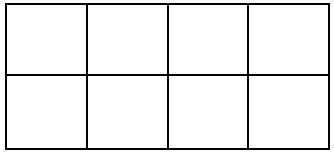
Favorite Ice Cream	
Chocolate	
Vanilla	
Strawberry	
Cherry	

represents 1 student

Geometry 2.G

Common Core Cluster

Reason with shapes and their attributes.
Students describe and analyze shapes by examining their sides and angles. Students investigate, describe, and reason about decomposing and combining shapes to make other shapes. Through building, drawing, and analyzing two- and three-dimensional shapes, students develop a foundation for understanding area, volume, congruence, similarity, and symmetry in later grades.

Common Core Standard	Unpacking What do these standards mean a child will know and be able to do?
2.G.1 Recognize and draw shapes having specified attributes, such as a given **number of angles** or a given **number of equal faces**.[5] Identify **triangles, quadrilaterals, pentagons, hexagons,** and **cubes.** [5] Sizes are compared directly or visually, not compared by measuring.	**2.G.1** 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. Example: Draw a closed shape that has five sides. What is the name of the shape?  Student 1: I drew a shape with 5 sides. It is called a pentagon. Student 2: I drew a shape with 3 angles. It is called a triangle. 
2.G.2 Partition a **rectangle** into **rows** and **columns** of same-size squares and count to find the total number of them.	**2.G.2** calls for students to partition a rectangle into squares (or square-like regions) and then determine the total number of squares. This relates to the standard 2.OA.4 where students are arranging objects in an array of rows and columns. Example: Split the rectangle into 2 rows and 4 columns. How many small squares did you make? 

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.	**2.G.3** calls for students to partition (split) 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. Example: Divide each rectangle into fourths a different way.