Second Grade - Mathematics

Kentucky Core Academic Standards with Targets

Student Friendly Targets

Pacing Guide

College and Career Readiness Anchor Standards for Math

The K-5 standards on the following pages define what students should understand and be able to do by the end of each grade. They correspond to eight mathematical practices: 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, and 8) Look for express regularity in repeated reasoning.

Mathematics is divided into five domains: 1) Counting and Cardinality (CC), 2) Operations and Algebraic Thinking (OA), 3) Number and Operations in Base Ten (NBAT), 4) Measurement and Data (MD), and 5) Geometry (G).

Development of Pacing Document

During the summer 2011, Anderson County teachers and administrators developed learning targets for each of the Kentucky Core Content Standards. In winter 2012, curriculum resource teachers verified the congruency of the standards and targets and recommended revisions. Teachers refined the work and began planning the development of common assessments to ensure students learn the intended curriculum. Anderson County Schools would like to thank each of our outstanding teachers and administrators who contributed to this important math curriculum project. Special thanks to Robin Arnzen, Stephanie Barnes, Traci Beasley, Julie Bowen, Tony Calvert, Linda Dadisman, Amanda Ellis, Leslie Fields, Amy Gritton, Lauren Hamel, Linda Hill, Sharon Jackman, Lesley Johnson, Steve Karsner, Chris Kidwell, Joel Maude, Melissa Montgomery, Matt Ogden, Kim Penn, Wayne Reese, Monica Rice, Chrystal Rowland, Kim Ruble, Jennifer Sallee, Amy Satterly, Krista Sawyer, Francine Sloan, Jeanna Slusher, Shayla Smith, T.J. Spivey, Rebecca Stevens, Emily Thacker, Lori Wells, Shannon Wells, Tim Wells, and Jamie White. Thanks also to Tony Calvert (EBW), Brian Edwards (ACHS), and Alex Hunter (ACMS) for providing comments to the work.

North Carolina State Board of Education created a most helpful document entitled "Common Core Instructional Support Tools - Unpacking Standards". The document answers the question "What do the standards mean that a student must know and be able to do?" The "unpacking" is included in our "What Does This Standard Mean?" section. The complete North Carolina document can be found at http://www.dpi.state.nc.us/docs/acre/standards/common-core-tools/unpacking/math/2nd.pdf

Coding for Math Document

Domain

Grade Level

Standard Number

KY Core Academic Standard (KCAS) Bold, 14 pt

3.OA.7 fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 x 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers

Target Type

Knowledge Targets:

☐ Know from memory all products of two one-digit numbers.

I can define "round or rounding in relation to place value.

KDE Target Regular, 12 pt

Reasoning Targets:

☐ Analyze a multiplication or division problem in order to choose an appropriate strategy to fluently multiply or divide within 10.

I can analyze a multiplication or division problem so that can choose a strategy to help me fluently multiply or divide within 10.

Level Standard is Assessed Highlighted

AC Target *Bold, Italics, 12 pt*

Anderson County Elementary
Pacing Guide

Math
Grade 2

Numbers To 1000			
Standard	**Materials**	**Materials and Vocabulary**	**Dates Taught**
<u>Numbers and Operations in Base Ten</u> **<u>Understand Place Value</u>** **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:** **Knowledge Targets:** ☐ Explain the value of each digit in a 3-digit number. ***I can explain the value of the digits in a 3-digit number.*** **Reasoning Targets:** ☐ Represent a three-digit number with hundreds, tens, and ones. ***I can show a three-digit number using hundreds, tens and ones (base ten blocks).*** ☐ Represent 200, 300, 400, 500, 600, 700, 800, 900 with one, two, three, four, five, six, seven, eight, or nine hundreds and 0 tens and 0 ones.	Second Grade students extend their base-ten understanding to hundreds as they view 10 tens as a unit called a “hundred”. They use manipulative materials and pictorial representations to help make a connection between the written three-digit numbers and hundreds, tens, and ones.  As in First Grade, Second Graders’ understanding about hundreds also moves through several stages: Counting By Ones; Counting by Groups & Singles; and Counting by Hundreds, Tens and Ones. Counting By Ones: At first, even though Second Graders will have grouped objects into hundreds, tens and left-overs, they rely on counting all of the individual cubes by ones to determine the final amount. It is seen as the only way to determine how many. Counting By Groups and Singles: While students are able to group objects into collections of hundreds, tens and ones and now tell how many groups of hundreds, tens and left-overs there are, they still rely on counting by ones to determine the final amount. They are unable to use the groups and left-overs to determine how many.	Singapore Math Ch 1 Ch 2 Ch 3 Odd/Even Place Value Mental math Time Money Word problems Shapes	First Nine Weeks 3 weeks

***I can show 200, 300, 400, 500, 600, 700, 800, and 900 with hundreds and 0 tens* and 0 ones (base ten blocks).**	Example: Teacher: How many blocks do you have? Student: I have 3 hundreds, 4 tens and 2 left-overs. Teacher: Does that help you know how many? How many do you have? Student: Let me see. 100, 200, 300…ten, twenty, thirty, forty. So that's 340 so far. Then 2 more. 342. **Counting by Hundreds, Tens & Ones**: Students are able to group objects into hundreds, tens and ones, tell how many groups and left-overs there are, and now use that information to tell how many. Occasionally, as this stage becomes fully developed, second graders rely on counting to "really" know the amount, even though they may have just counted the total by groups and left-overs. Example: Teacher: How many blocks do you have? Student: I have 3 hundreds, 4 tens and 2 left-overs. Teacher: Does that help you know how many? How many do you have? Student: Yes. That means that I have 342. Teacher: Are you sure? Student: Um. Let me count just to make sure. 100, 200, 300…340, 341, 342. Yes. I was right. There are 342 blocks. Understanding the value of the digits is more than telling the number of tens or hundreds. Second Grade students who truly understand the position and place value of the digits are also able to confidently model the number with some type of visual representation. Others who seem like they know, because they can state which number is in the tens place, may not truly know what each digit represents. Example: Student Mastered	Fact families Skip counting	

	Teacher: What is this number? 716 **Student**: Seven hundred sixteen. **Teacher**: Make this amount using your place value cards. **Student**: *Uses 7 hundreds card, 1 ten card and 6 singles.* **Teacher**: *Pointing to the 6*, Can you show me where you have this? **Student**: *Points to the 6 singles.* **Teacher**: *Pointing to the 1*, Can you show me where you have this? **Student**: *Points to the one ten.* **Teacher**: *Pointing to the 7*, Can you show me where you have this? **Student**: *Points to the 7 hundreds.* Example: Student Not Yet Mastered **Teacher:** What is this number? 716 **Student**: Seven hundred sixteen. **Teacher**: Make this amount using your place value cards. **Student**: *Uses 7 hundreds card, 1 ten card and 6 singles.* **Teacher**: *Pointing to the 6*, Can you show me where you have this? **Student**: *Points to the 6 singles.* **Teacher**: *Pointing to the 1*, Can you show me where you have this? **Student**: *Points to one of the 6 singles (rather than a ten).*		
a. 100 can be thought of as a bundle of ten tens — called a "hundred."	Second Graders extend their work from first grade by applying the understanding that "100" is the same amount as 10 groups of ten as well as 100 ones. This lays the groundwork for the structure of the base-ten system in future grades. Example: **Teacher**: I have a pile of base-ten rods. Count out 12 please. **Student:** Student gathers 12 ten-rods. **Teacher**: How many cubes do you think you have? **Student**: Makes an estimate. **Teacher**: Count them to see.		

	Student: 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120. There's 120 here. **Teacher**: So, do you think you have enough to make a 100? **Student**: Yes. **Teacher**: Go ahead and trade some in to make a 100. **Student**: Student trades 10 rods for a 100 flat and leaves 2 tens remaining. **Teacher**: What do you have now? **Student**: I have 1 hundred and 2 tens. **Teacher**: Does that help you know how many you have in all? **Student:** Yes. 1 hundred and 2 tens is 120. There are 120 cubes here in all.		
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).	Second Grade students build on the work of **2.NBT.2a.** They explore the idea that numbers such as 100, 200, 300, etc., are groups of hundreds with zero tens and ones. Students can represent this with both groupable (cubes, links) and pregrouped (place value blocks) materials.		
2.NBT.2: Count within 1000; skip-count by 5s, 10s, and 100s. **Knowledge Targets:** ☐ Count within 1000. ***I can count within 1000, starting at any number.*** ☐ Skip-count by 5s. ***I can skip count by 5s (to 1000).*** ☐ Skip-count by 10s. ***I can skip count by 10s (to 1000).*** ☐ Skip-count by 100s. ***I can skip count by 100s (to 1000).***	Second Grade students count within 1,000. Thus, students "count on" from any number and say the next few numbers that come afterwards. 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*. Second grade students also begin to work towards multiplication concepts as they skip count by 5s, by 10s, and by 100s. Although skip counting is not yet true multiplication because students don't keep track of the number of groups they have counted, they can explain that when they count by 2s, 5s, and 10s they are counting groups of items with that amount in each group. As teachers build on students' work with skip counting by 10s in Kindergarten, they explore and discuss with students the patterns of numbers when they skip count. For example, while using a 100s board or number line, students learn that the ones digit alternates between 5 and 0 when skip counting by 5s. When students skip		

	count by 100s, they learn that the hundreds digit is the only digit that changes and that it increases by one number.		
2.NBT.3: Read and write numbers to 1000 using base-ten numerals, number names, and expanded form. **Knowledge Targets:** ☐ Know what expanded form means. ***I can explain what expanded form means.*** ☐ Recognize that the digits in each place represent amounts of thousands, hundreds, tens, or ones. ***I can explain what the digits in each place represent.*** ☐ Read numbers to 1000 using base ten numerals. ***I can read numbers to 1000 using base ten numerals.*** ☐ Read numbers to 1000 using number names. ***I can read numbers to 1000 using number names.*** ☐ Read numbers to 1000 using expanded form. ***I can read numbers to 1000 using expanded form.*** ☐ Write numbers to 1000 using base ten numerals. ***I can write numbers to 1000 using base ten numerals***. ☐ Write numbers to 1000 using number names. ***I can write numbers to 1000 using word form.*** ☐ Write numbers to 1000 using expanded form. ***I can write numbers to 1000 using expanded form.***	Second graders read, write and represent a number of objects with a written numeral (number form or standard form). These representations can include snap cubes, 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 (e.g., 235 is stated and written as "two hundred thirty-five). Expanded form (125 can be written as 100 + 20 + 5) is a valuable skill when students use place value strategies to add and subtract large numbers in 2.NBT.7.		
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. **Knowledge Targets:** ☐ Know the value of each digit represented in the	Second Grade students build on the work of **2.NBT.1** and **2.NBT.3** by examining the amount of hundreds, tens and ones in each number. When comparing numbers, students draw on the understanding that 1 hundred (the smallest three-digit number) is actually greater than any amount of tens and ones represented by a two-digit number. When students truly understand this concept, it makes sense that one would compare three-digit numbers by looking at the hundreds place		

<table>
<tr>
<td>three-digit number.
I can tell the value of each digit in a three-digit number.
☐ Know what each symbol represents >, <, and =.
I can explain what each symbol means (>, <, and =).

Reasoning Targets:
☐ Compare two three-digit numbers based on place value of each digit.
I can compare two three-digit numbers using place value of each digit.
☐ Use >, <, and = symbols to record the results of comparisons.
I can use >, <, and = to record the comparisons of numbers.</td>
<td>first.

Students should have ample experiences communicating their comparisons in words before using symbols. Students were introduced to the symbols greater than (>), less than (<) and equal to (=) in First Grade and continue to use them in
Second Grade with numbers within 1,000.

Example: Compare these two numbers. 452 __ 455
<table>
<tr><th>Student A
Place Value</th><th>Student B
Counting</th></tr>
<tr><td>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 numbers of tens, but 455 has 5 ones and 452 only has 2 ones. 452 is less than 455.

452 < 455</td><td>452 is less than 455. I know this because when I count up 1 say 452 before I say 455.

452 < 455
452 is less than 455.</td></tr>
</table>
While students may have the skills to order more than 2 numbers, this Standard focuses on comparing two numbers and using reasoning about place value to support the use of the various symbols.</td>
<td></td>
<td></td>
</tr>
<tr><td colspan="4">Addition and Subtraction</td></tr>
<tr>
<td><u>Use place value understanding and properties of operations to add and subtract.</u>
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.</td>
<td>There are various strategies that Second Grade students understand and use when adding and subtracting within 100 (such as those listed in the standard). By using various strategies that make sense to the student, the student begins to internalize facts, thus becoming fluent.

Therefore, when students are able to demonstrate fluency, they are accurate (answer correctly), efficient (within 4-5 seconds) and flexible (use strategies such as</td>
<td></td>
<td>6 weeks</td>
</tr>
</table>

Knowledge Targets: ☐ Know strategies for adding and subtracting based on place value. ***I can use place value strategies to add and subtract.*** ☐ Know strategies for adding and subtracting based on properties of operations. ***I can use strategies to add and subtract.*** ☐ Know strategies for adding and subtracting based on the relationship between addition and subtraction. ***I can use fact families (the relationship between addition and subtraction) to add and subtract.*** **Reasoning Targets:** ☐ Choose a strategy (place value, properties of operations, and/or the relationship between addition and subtraction) to fluently add and subtract within 100. ***I can choose a strategy to add and subtract fluently (within 100). (Place value, properties of operations, and/or the relationship between addition and subtraction)***	decomposing numbers to make ten). Students must have efficient strategies in order for facts to become fluent. **Example:** 67 + 25 = __ ***Place Value Strategy:*** I broke both 67 and 25 into tens and ones. 6 tens plus 2 tens equals 8 tens. Then I added the ones. 7 ones plus 5 ones equals 12 ones. I then combined my tens and ones. 8 tens plus 12 ones equals 92. ***Decomposing into Tens:*** I decided to start with 67 and break 25 apart. I knew I needed 3 more to get to 70, so I broke off a 3 from 25. I then added my 20 from the 22 left and got to 90. I had 2 left. 90 plus 2 is 92. So, 67 + 25 = 92 ***Commutative Property:*** I broke 67 and 25 into tens and ones so I had to add 60 + 7 + 20 + 5. I added 60 + 20 first to get 80. Then I added 7 to get 87. Then I added 5 more. My answer is 92. **Example:** 63 – 32 = __ ***Decomposing into Tens:*** I broke apart both 63 and 32 into tens and ones. I know that 3 minus 2 is 1, so I have 1 left in the ones place. I know that 6 tens minus 3 tens is 3 tens, so I have a 3 in my tens place. My answer has a 1 in the ones place and 3 in the tens place, so my answer is 31. 63 – 32 = 31 ***Think Addition:*** I thought, '32 and what makes 63?'. I know that I needed 30, since 30 and 30 is 60. So, that got me to 62. I needed one more to get to 63. So, 30 and 1 is 31. 32 + 31 = 63 Students use pictorial representations, concrete objects, and general and special strategies to solve a problem.

2.NBT.6: Add up to four two-digit numbers using strategies based on place value and properties of operations.

Knowledge Targets:

- ☐ Know strategies for adding two digit numbers based on place value and properties of operations.

I can add up to four two-digit numbers using place value and properties of operations strategies. (That means I can explain how to use place value and properties of operations.)

Reasoning Targets:

- ☐ Use strategies to add up to four two-digit numbers.

I can use strategies to add up to four two-digit numbers.

Second Grade students 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 A *Associative Property*	**Student B** *Place Value Strategies*
I saw the 43 and 57 and added them first. I know 3 plus 7 equals 10, so when I added them 100 was my answer. Then I added 34 and had 134. Then I added 24 and had 158. 43 + 57 + 34 + 24 =158	I broke up all of the numbers into tens and ones. First I added the tens. 40 + 30 + 50 + 20 = 140. Then I added the ones. 3 + 4 + 7 + 4 = 18. That meant I had 1 ten and 8 ones. So, 140 + 10 is 150. 150 and 8 more is 158. So, 43 + 34 + 57 + 24 = 158

Student C

Place Value Strategies and Associative Property

I broke up all the numbers into tens and ones. First I added up the tens. 40 + 30 + 50 + 20. I changed the order of the numbers to make adding easier. I know that 30 plus 20 equals 50 and 50 more equals 100. Then I added the 40 and got 140. Then I added up the ones. 3 + 4 + 7 + 4. I changed the order of the numbers to make adding easier. I know that 3 plus 7 equals 10 and 4 plus 4 equals 8. 10 plus 8 equals 18. I then combined my tens and my ones. 140 plus 18 (1 ten and 8 ones) equals 158.

2.NBT.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.

Knowledge Targets:

☐ Understand place value within 1000.
I can explain place value within 1000.
☐ Decompose any number within 1000 into hundred(s), ten(s), and one(s).
I can break apart (decompose) a number less than 1000 into hundred(s), ten(s), and one(s).

Reasoning Targets:

☐ Choose an appropriate strategy for solving an addition or subtraction problem within 1000.
I can write an equation that matches my chosen strategy.
☐ Relate the chosen strategy (using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction) to a written method (equation) and explain the reasoning used.
I can explain why I chose the strategy I used.
☐ Use composition and decomposition of hundreds and tens when necessary to add and subtract within 1000.

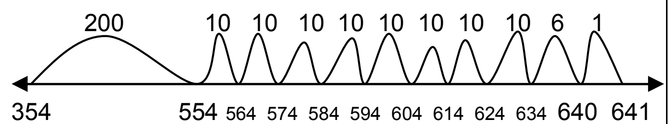
Second graders extend the work from 2.NBT. to two 3-digit numbers. Students should have ample experiences using concrete materials and pictorial representations to support their work.

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. The standard algorithm of carrying or borrowing is not an expectation in Second Grade. Students are not expected to add and subtract whole numbers using standard algorithms until the end of Fourth Grade.

Example**: 354 + 287 = __**

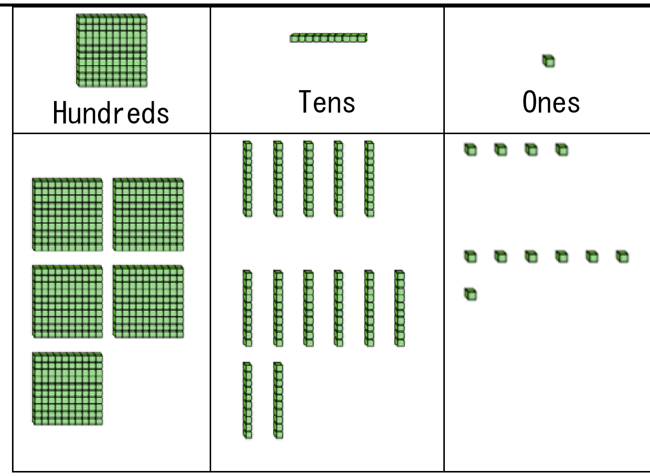
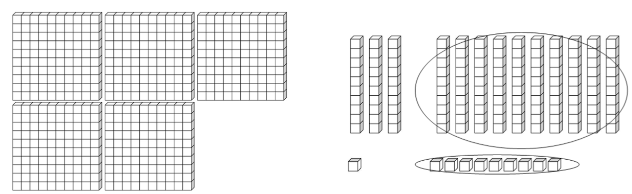
Student A

I started at 354 and jumped 200. I landed on 554. I then made 8 jumps of 10 and landed on 634. I then jumped 6 to land on 640. Then I jumped 1 more and landed on 641. 354 + 287 = 641



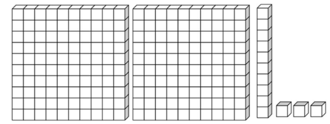
Student B

I used place value blocks and a place value mat. I broke all of the numbers and placed them on the place value mat.
I first added the ones. 4 + 7 = 11.
I then added the tens. 50 + 80 = 130.
I then added the hundreds. 300 + 200 = 500.
I then combined my answers. 500 + 130 = 630.
630 + 11= 641.

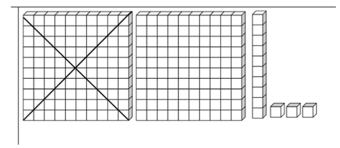
I can choose a strategy to add and subtract within 1000. (concrete models, drawings, place value strategies, properties of operations, relationship between addition and subtraction) ***I can put together and break apart (decompose) hundreds and tens to add and subtract within 1000.***	 Student C I used place value blocks. I made a pile of 354. I then added 287. That gave me 5 hundreds, 13 tens and 11 ones. I noticed that I could trade some pieces. I had 11 ones, and traded 10 ones for a ten. I then had 14 tens, so I traded 10 tens for a hundred. I ended up with 6 hundreds, 4 tens and 1 one. So, 354 + 287 = 641 		

Example: 213 - 124 = __
Student A

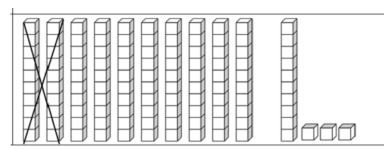
I used place value blocks. I made a pile of 213.



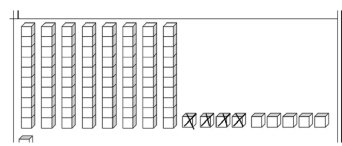
I then started taking away blocks.



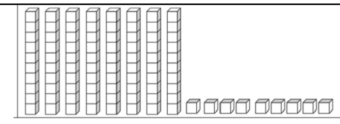
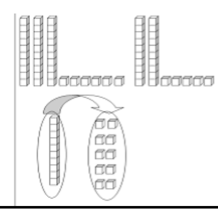
Now, I only need to take away 24. I need to take away 2 tens but I only had 1 ten so I traded in my last hundred for 10 tens. Then I took two tens away leaving me with no hundreds and 9 tens and 3 ones.



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



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

			
2.NBT.9: Explain why addition and subtraction strategies work, using place value and the properties of operations. **Knowledge Targets:** ☐ Know addition and subtraction strategies using place value and properties of operations related to addition and subtraction. ***I can explain the addition and subtraction strategies I used to add and subtract (place value and properties of operations).*** **Reasoning Targets:** ☐ Explain why addition and subtraction strategies based on place value and properties of operations work. ***I can explain why place value strategies work with addition and subtraction.*** ***I can explain why properties of operations work with addition and subtraction.***	Second graders explain why addition or subtraction strategies work as they apply their knowledge of place value and the properties of operations in their explanation. They may use drawings or objects to support their explanation. Once students have had an opportunity to solve a problem, the teacher provides time for students to discuss their strategies and why they did or didn't 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 A I broke 36 and 25 into tens and ones 30 + 6 + 20 + 5. I can change the order of my numbers, since it doesn't change any amounts, so I added 30+ 20 and got 50. Then I added 5 and 5 to make10 and added it to the 50. So, 50 and 10 more is 60. I added the one that was left over and got on 6 to get 61. So there are 61 birds in the park. Student B I used place value blocks and made a pile of 36 and a pile of 25. Altogether, I had 5 tens and 11 ones. 11 ones is the same as one ten and one left over. So, I really had 6 tens and 1 one. That makes 61. 		

	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? Student: I see what they did. Yes. I think the strategy is correct. They thought, '34 and what makes 56?' So they thought about adding 2 to the 4 to get 6. Then, they had 36 and needed 56. So, they added 20 more. That means that they added 2 and 20 which is 22. I think that it's right. 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? Student: Well, 20 + 30 is 50. And 5 + 5 is 10. So, 50 + 10 is 60. I got 60 too, but I did it a different way. I added 25 and 25 to make 50. Then I added 5 more and got 55. Then, I added 5 more and got 60. We both have 60. I think that it doesn't matter if you add the 20 first or last. You still get the same amount.		

Addition & Subtraction Mental Math

Standards	What Does This Standard Mean?	Materials	Dates Taught
Operations and Algebraic Thinking **Represent and solve problems involving addition and subtraction** **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,**	Second Grade students extend their work with addition and subtraction word problems in two major ways. First, they represent and solve word problems within 100, building upon their previous work to 20. In addition, they represent and solve one and two-step word problems of all three types (Result Unknown, Change Unknown, Start Unknown). Please see **Table 1** at end of document for examples of all problem types. One-step word problems use one operation. Two-step word problems use two operations which may include the	Ch 4 Ch 10	Second Nine Weeks 4 weeks

with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. (Note: See Glossary, Table 1.)

Knowledge Targets:

☐ Identify the unknown in an addition or subtraction word problem.
I can identify the missing number an addition or subtraction word problem.
☐ Write an addition and subtraction equation with a symbol for the unknown.
I can write an addition and subtraction equation with a symbol for the missing number.

Reasoning Targets:

☐ Use drawings or equations to represent one- and two-step word problems.
I can use drawings or equations to show one- and two-step word problems.
☐ Add and subtract within 100 to solve one-step word problems with unknowns in all positions.
I can add and subtract within 100 to solve one-step word problems with missing numbers in all positions. 3 + 1 = x; 3 + x = 4; x + 1 = 4)
☐ Add and subtract within 100 to solve two-step word problems with unknowns in all positions.
I can add and subtract within 100 to solve two-step word problems with missing numbers.
☐ Determine operation needed to solve addition and subtraction problems in situations including add to, take from, put together, take apart, and compare.
I can choose strategies (operations) needed to solve addition and subtraction problems in real world situations. (add to, take from, put together, take

same operation or opposite operations.

One Step Word Problem One Operation	**Two-Step Word Problem** Two Operations, Same	**Two-Step Word Problem** Two Operations, Opposite
There are 15 stickers on the page. Brittany put some more stickers on the page. There are now 22 stickers on the page. How many stickers did Brittany put on the page? 15 + ☐ = 22 22 – 15 = ☐	There are 9 blue marbles and 6 red marbles in the bag. Maria put in 8 more marbles. How many marbles are in the bag now? 9 + 5 + 7 = ☐	There are 39 peas on the plate. Carlos ate 25 peas. Mother put 7 more peas on the plate. How many peas are on the plate now? 39 - 25 + 7 = ☐

Two-Step Problems: Because Second Graders are still developing proficiency with the most difficult subtypes (shaded in white in Table 1 at end of the glossary): *Add To/Start Unknown; Take From/Start Unknown; Compare/Bigger Unknown; and Compare/Smaller Unknown*, two-step problems do **not** involve these sub-types (Common core Standards Writing Team, May 2011). Furthermore, most two-step problems should focus on single-digit addends.

As second grade students solve one- and two-step problems they use manipulatives such as snap cubes, place value blocks or hundreds charts; create drawings of manipulatives to show their thinking; or use number lines to solve and describe their strategies. They then relate their drawings and materials to equations. By solving a variety of addition and subtraction word problems, second grade students determine the unknown in all positions (*Result* unknown, *Change* unknown, and *Start* unknown). Rather than a letter ("*n*"), boxes or

apart, and compare)

pictures are used to represent the unknown number. For example:

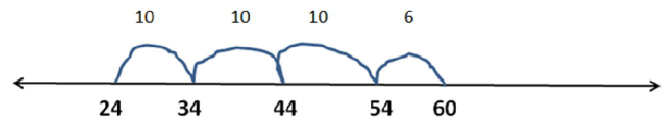
Problem Type: Add To		
<u>Result Unknown:</u> There are 29 students on the playground. Then 18 more students showed up. *How many students are there now*? 29 + 18 = ☐	<u>Change Unknown</u> There are 29 students on the playground. *Some more students show up.* There are now 47 students. How many students came? 29 + ☼ = 47	<u>Start Unknown</u> 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 additional examples (found at end of document).

Second Graders use a range of methods, often mastering more complex strategies such as making tens and doubles and near doubles for problems involving addition and subtraction within 20. Moving beyond counting and counting-on, second grade students apply their understanding of place value to solve problems. One-Step Example: **Some students are in the cafeteria. 24 more students came in. Now there are 60 students in the cafeteria. How many were in the cafeteria to start with?** Use drawings and equations to show your thinking.

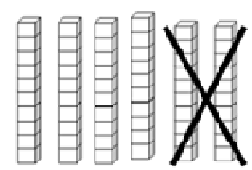
Student A: I read the equation and thought about how to write it with numbers. I thought, "What and 24 makes 60?" So, my equation for the problem is □ + 24 = 60. I used a number line to solve it.

I started with 24. Then I took jumps of 10 until I got close to 60. I landed on 54. Then, I took a jump of 6 to get to 60. So, 10 + 10 + 10 + 6 = 36. So, there were 36 students in the cafeteria to start with.

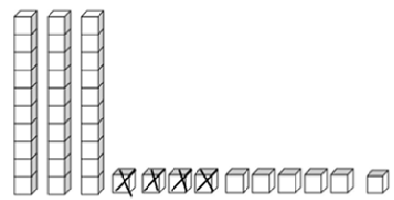


Student B: I read the equation and thought about how to write it with numbers. I thought, "There are 60 total. I know about the 24. So, what is 60 – 24?" So, my equation for the problem is 60 – 24 = □ I used place value blocks to solve it.

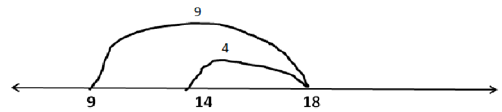
I started with 60 and took 2 tens away.



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



That left me with 36. So, 36 students were in the cafeteria at the beginning. 60 – 24 = 36 Two-Step Example: There are 9 students in the cafeteria. 9 more students come in. After a few minutes, some students leave. There are now 14 students in the cafeteria. How many students left the cafeteria? Use drawings and equations to show your thinking.
Student A
I read the equation and thought about how to write it with numbers: 9 + 9 - □ = 14. I used a number line to solve it. I

	started at 9 and took a jump of 9. I landed on 18. Then, I jumped back 4 to get to 14. So, overall, I took 4 jumps. 4 students left the cafeteria.  Student B I read the equation and thought about how to write it with numbers: 9 + 9 - □ = 14. I used doubles to solve it. I thought about double 9s. 9 + 9 is 18. I knew that I only needed 14. So, I took 4 away, since 4 and 4 is eight. So, 4 students left the cafeteria.		
<u>Add and subtract within 20.</u> **2.OA.2: Fluently add and subtract within 20 using mental strategies. (Note: See standard 1.OA.6 for a list of mental strategies). By end of Grade 2, know from memory all sums of two one-digit numbers.** **Knowledge Targets:** ☐ Know mental strategies from addition and subtraction. ***I can use mental strategies to add and subtract.*** ☐ Know from memory all sums of two one-digit numbers. ***I can add two one-digit numbers fluently.*** **Reasoning Targets:** ☐ **Apply mental strategies to add and subtract fluently within 20.** ***I can use mental strategies to add and subtract fluently within 20.***	Building upon their work in First Grade, Second Graders use various addition and subtraction strategies in order to fluently add and subtract within 20: **1.OA.6** Mental Strategies • Counting on • Making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14 • Decomposing a number leading to a ten (e.g., 13 – 4 = 13 – 3 – 1 = 10 – 1 = 9) • Using the relationship between addition and Subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 – 8 = 4) • Creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13) Second Graders internalize facts and develop fluency by repeatedly using strategies that make sense to them. When students are able to demonstrate fluency they are accurate, efficient, and flexible. Students must have efficient strategies in order to know sums from memory. Research indicates that teachers can best support students' memory of the sums of two one-digit numbers through varied experiences including making 10, breaking numbers apart, and working on mental strategies. These strategies replace the use of repetitive timed tests in which students try to memorize operations as if there were not any relationships among the various		

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facts. When teachers teach facts for automaticity, rather than memorization, they encourage students to think about the relationships among the facts. (Fosnot & Dolk, 2001)

It is no accident that the standard says “know from memory” rather than “memorize”. The first describes an outcome, whereas the second might be seen as Describing a method of achieving that outcome. So no, The standards are not dictating timed tests.(McCallum, October 2011)

Developing Fluency for Addition & Subtraction within 20
Example: 9 + 5 = __
<table>
<tr>
<td>Student A
Counting On

I started at 9 and then counted 5 more. I landed on 13</td>
<td>Student B
Decomposing a Number-Leading to a Ten

I know that 9 and 1 is 10, so I broke 5 into 1 and 4. 9 plus 1 is 10. Then I have to add 4 more, which is 14.</td>
</tr>
</table>
Example: 13 – 9 = __
<table>
<tr>
<td>Student A
Using the Relationship between Addition and Subtraction

I know that 9 plus 4 equals 13. So 13 minus 9 is 4.</td>
<td>Student B
Creating an Easier Problem

Instead of 13 minus 9, I added 1 to each of the numbers to make the problem 13 minus 10. I know the answer is 4. So 13 minus 9 is also 4.</td>
</tr>
</table>
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</tr>
<tr>
<td><u>Work with equal groups of objects to gain foundations for multiplication.</u>
2.OA.3: Determine whether a group of objects</td>
<td>Second graders apply their work with doubles to the concept of odd and even numbers. Students should have ample experiences exploring the concept that if a number can be decomposed (broken apart) into two equal</td>
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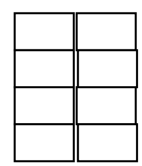
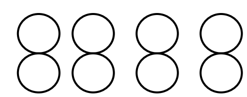
</table>

(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. **Knowledge Targets:** ☐ Count a group of objects up to 20 by 2s. ***I can count a group of objects by 2s (up to 20).*** ☐ Recognize in groups that have even number objects will pair up evenly. ***I can identify groups that have an even number of objects (will pair up evenly.)*** ☐ Recognize in groups of odd number objects will not pair up evenly. ***I can identify groups that have an odd number of objects (will not pair up evenly.)*** **Reasoning Targets:** ☐ Determine whether a group of objects is odd or even, using a variety of strategies. ***I can identify whether a group of objects is odd or even using a variety of strategies.*** ☐ Generalize the fact that all even numbers can be formed from the addition of 2 equal addends. ***I can draw a conclusion that all even numbers are formed from the addition of 2 equal addends. (That means I can decide.) (1 + 1 = 2; 2 + 2 = 4; 3 + 3 = 6, etc.)*** ☐ Write an equation to express a given even number as a sum of two equal addends. ***I can write an equation to show an even number is the sum of two equal addends. (1 + 1 = 2; 2 + 2 = 4; 3 + 3 = 6, etc.)***	addends or doubles addition facts (e.g., 10 = 5 +5), then that number (10 in this case) is an even number. Students should explore this concept with concrete objects (e.g., counters, cubes, etc.) before moving towards pictorial representations such as circles or arrays. Example: Is 8 an even number? Prove your answer. **Student A** I grabbed 8 counters. I paired counters up into groups of 2. Since I didn't have any counters left over, I know that 8 is an even number. **Student B** I grabbed 8 counters. I put them into 2 equal groups. There were 4 counters in each group, so 8 is an even number. **Student C** I drew 8 boxes in rectangle that had two columns. Since every box on the left matches a box on the right, I know that 8 is even.  **Student D** I drew 8 circles. I matched one on the left with one on the right. Since they all match up I know that 8 is an even number.  **Student E** I know that 4 plus 4 equals 8. So 8 is an even number.		

2.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.

Knowledge Targets:

☐ Understand place value within 1000.
I can explain place value within 1000.

☐ Decompose any number within 1000 into hundred(s), ten(s), and one(s).
I can break apart a number less than 1000 into hundred(s), ten(s), and one(s).

Reasoning Targets:

☐ Choose an appropriate strategy for solving an addition or subtraction problem within 1000.
I can choose a strategy to add and subtract within 1000. (concrete models, drawings, place value strategies, properties of operations, relationship between addition and subtraction)

☐ Relate the chosen strategy (using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction) to a written method (equation) and explain the reasoning used.
I can write an equation that matches my chosen strategy.

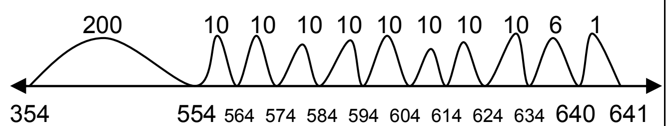
Second graders extend the work from 2.NBT. to two 3-digit numbers. Students should have ample experiences using concrete materials and pictorial representations to support their work.

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. The standard algorithm of carrying or borrowing is not an expectation in Second Grade. Students are not expected to add and subtract whole numbers using standard algorithms until the end of Fourth Grade.

Example: **354 + 287 = __**

Student A

I started at 354 and jumped 200. I landed on 554. I then made 8 jumps of 10 and landed on 634. I then jumped 6 to land on 640. Then I jumped 1 more and landed on 641. 354 + 287 = 641



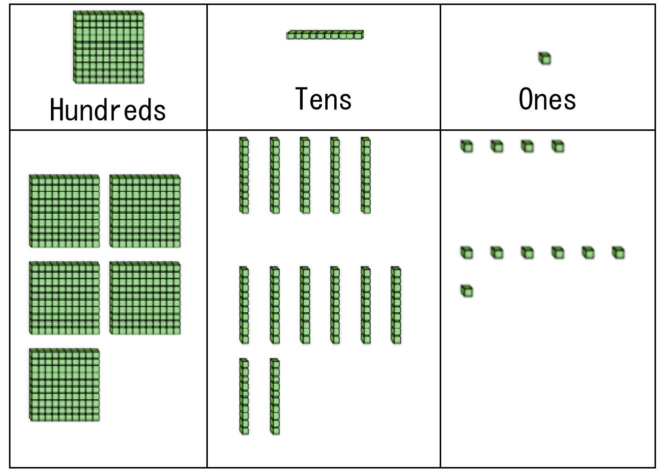
Student B

I used place value blocks and a place value mat. I broke all of the numbers and placed them on
the place value mat.
I first added the ones. 4 + 7 = 11.
I then added the tens. 50 + 80 = 130.
I then added the hundreds. 300 + 200 = 500.
I then combined my answers. 500 + 130 = 630.
630 + 11= 641.

I can explain why I chose the strategy I used.

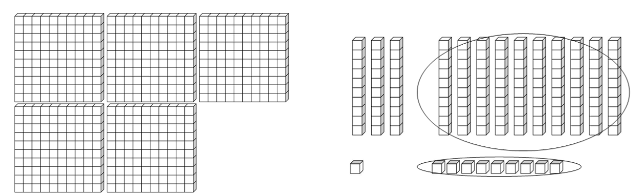
☐ Use composition and decomposition of hundreds and tens when necessary to add and subtract within 1000.

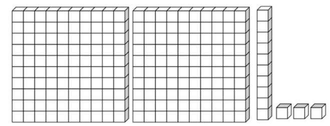
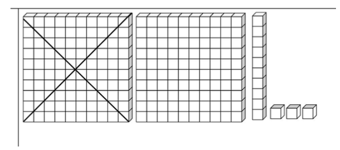
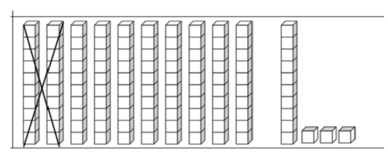
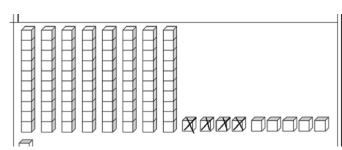
I can put together and break apart hundreds and tens to add and subtract within 1000.

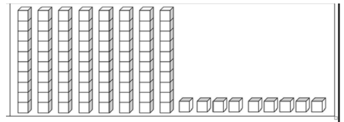


Student C

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



	Example: 213 - 124 = __ Student A I used place value blocks. I made a pile of 213.  I then started taking away blocks.  Now, I only need to take away 24. I need to take away 2 tens but I only had 1 ten so I traded in my last hundred for 10 tens. Then I took two tens away leaving me with no hundreds and 9 tens and 3 ones.  I then had to take 4 ones away but I only have 3 ones. I traded in a ten for 10 ones. I then took away 4 ones.  This left me with no hundreds, 8 tens and 9 ones. My		

	answer is 89. 213 - 124 = 89 		
2.NBT.8: Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900. **Knowledge Targets:** ☐ Know place value within 1000. ***I can explain place value within 1000.*** **Reasoning Targets:** ☐ Apply knowledge of place value to mentally add or subtract 10 or 100 to/from a given number 100-900. ***I can use what I know about place value to add 10 or 100 to a given number (100-900).*** ***I can use what I know about place value to subtract 10 or 100 from a given number (100-900).***	Second Grade students mentally add or subtract either 10 or 100 to any number between 100 and 900. As teachers provide ample experiences for students to work with pre-grouped objects and facilitate discussion, second graders realize that when one adds or subtracts 10 or 100 that only the tens place or the digit in the hundreds place changes by 1. As the teacher facilitates opportunities for patterns to emerge and be discussed, students notice the patterns and connect the digit change with the amount changed. Opportunities to solve problems in which students cross hundreds are also provided once students have become comfortable adding and subtracting within the same hundred. Example: *Within the same hundred* What is 10 more than 218? What is 241 – 10? Example: *Across hundreds* 293 + 10 = ☐ What is 10 less than 206? This standard focuses only on adding and subtracting 10 or 100. Multiples of 10 or multiples of 100 can be explored; however, the focus of this standard is to ensure that students are proficient with adding and subtracting 10 and 100 mentally.		

2.NBT.9: Explain why addition and subtraction strategies work, using place value and the properties of operations. (Note: Explanations may be supported by drawings or objects.)

Knowledge Targets:

☐ Know addition and subtraction strategies (using place value and properties of operations) related to addition and subtraction.
I can describe the addition and subtraction strategies that are related to addition and subtraction. (Underpinning)

Reasoning Targets:

☐ Explain why addition and subtraction strategies based on place value and properties of operations work.
I can explain why addition and subtraction strategies work. (That means, place value and properties of operations).

Second graders explain why addition or subtraction strategies work as they apply their knowledge of place value and the properties of operations in their explanation. They may use drawings or objects to support their explanation.

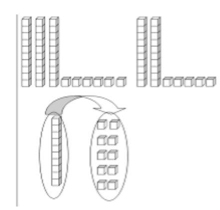
Once students have had an opportunity to solve a problem, the teacher provides time for students to discuss their strategies and why they did or didn't work.

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 A

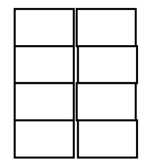
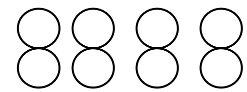
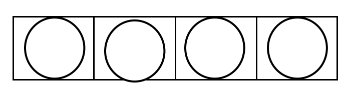
I broke 36 and 25 into tens and ones 30 + 6 + 20 + 5. I can change the order of my numbers, since it doesn't change any amounts, so I added 30+ 20 and got 50. Then I added 5 and 5 to make10 and added it to the 50. So, 50 and 10 more is 60. I added the one that was left over and got on 6 to get 61. So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

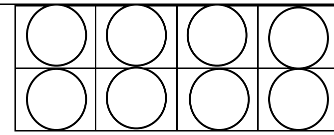
Student B
I used place value blocks and made a pile of 36 and a pile of 25. Altogether, I had 5 tens and 11 ones. 11 ones is the same as one ten and one left over. So, I really had 6 tens and 1 one. That makes 61.

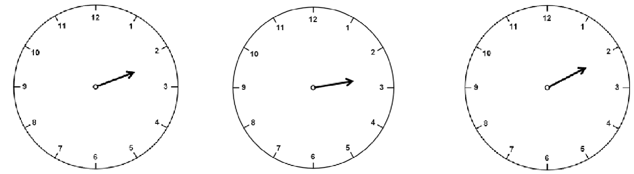


Example: One of your classmates solved the problem 56 - 34 = __ by writing "I know that I need to add 2 to the number 4 to get 6. I also know that I need to add 20 to 30

	to get 20 to get to 50. So, the answer is 22." Is their strategy correct? Explain why or why not? Student: I see what they did. Yes. I think the strategy is correct. They thought, '34 and what makes 56?' So they thought about adding 2 to the 4 to get 6. Then, they had 36 and needed 56. So, they added 20 more. That means that they added 2 and 20 which is 22. I think that it's right. 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? Student: Well, 20 + 30 is 50. And 5 + 5 is 10. So, 50 + 10 is 60. I got 60 too, but I did it a different way. I added 25 and 25 to make 50. Then I added 5 more and got 55. Then, I added 5 more and got 60. We both have 60. I think that it doesn't matter if you add the 20 first or last. You still get the same amount.		
Multiplication and Division			
<u>Work with equal groups of objects to gain foundations for multiplication.</u> **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.** **Knowledge Targets:** ☐ Count a group of objects up to 20 by 2s. ***I can count a group of objects by 2s (up to 20).*** ☐ Recognize in groups that have even number objects will pair up evenly. ***I can identify groups that have an even number of***	Second graders apply their work with doubles to the concept of odd and even numbers. Students should have ample experiences exploring the concept that if a number can be decomposed (broken apart) into two equal addends or doubles addition facts (e.g., 10 = 5 +5), then that number (10 in this case) is an even number. Students should explore this concept with concrete objects (e.g., counters, cubes, etc.) before moving towards pictorial representations such as circles or arrays. Example: Is 8 an even number? Prove your answer. **Student A** I grabbed 8 counters. I paired counters up into **Student B** I grabbed 8 counters. I put them into 2 equal	Ch 5 Ch 6 Ch 15	4 weeks

objects (will pair up evenly.) ☐ Recognize in groups of odd number objects will not pair up evenly. ***I can identify groups that have an odd number of objects (will not pair up evenly.)*** **Reasoning Targets:** ☐ Determine whether a group of objects is odd or even, using a variety of strategies. ***I can identify whether a group of objects is odd or even using a variety of strategies.*** ☐ Generalize the fact that all even numbers can be formed from the addition of 2 equal addends. ***I can draw a conclusion that all even numbers are formed from the addition of 2 equal addends. (That means I can decide.) (1 + 1 = 2; 2 + 2 = 4; 3 + 3 = 6, etc.)*** ☐ Write an equation to express a given even number as a sum of two equal addends. ***I can write an equation to show a given even number is the sum of two equal addends. (1 + 1 = 2; 2 + 2 = 4; 3 + 3 = 6, etc.)***	groups of 2. Since I didn't have any counters left over, I know that 8 is an even number. groups. There were 4 counters in each group, so 8 is an even number. **Student C** I drew 8 boxes in rectangle that had two columns. Since every box on the left matches a box on the right, I know that 8 is even.  **Student D** I drew 8 circles. I matched one on the left with one on the right. Since they all match up I know that 8 is an even number.  **Student E** I know that 4 plus 4 equals 8. So 8 is an even number.		
2.OA.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. **Knowledge Targets:** ☐ Write an equation with repeated equal addends from an array. ***I can write an equation with repeated addition that matches a given array.***	Second graders use rectangular arrays to work with repeated addition, a building block for multiplication in third grade. A rectangular array is any arrangement of things in rows and columns, such as a rectangle of square tiles. Students explore this concept with concrete objects (e.g., counters, bears, square tiles, etc.) as well as pictorial representations on grid paper or other drawings. Due to the commutative property of addition, students can add either the rows or the columns and still arrive at the same solution. Example: **What is the total number of circles below?** 		

Reasoning Targets: ☐ Generalize the fact that arrays can be written as repeated addition problems. ***I can draw a conclusion that arrays can be written as repeated addition problems.*** ☐ Solve repeated addition problems to find the number of objects using rectangular arrays. ***I can solve repeated addition problems to find the the number of objects using rectangular arrays.***	 Student A I see 3 counters in each column and there are 4 columns. So I added 3 + 3 + 3 + 3. That equals 12. 3 + 3 + 3 + 3 = 12 Student B I see 4 counters in each row and there are 3 rows. So I added 4 + 4+ 4. That equals 12. 4 + 4 + 4 = 12		
Time and Money			
<u>Work with time and money.</u> **2.MD.7: Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.** **Knowledge Targets:** ☐ Tell time using analog clocks to the nearest 5 minutes ***I can tell time to the nearest 5 minutes on an analog clock.*** ☐ Tell time using digital clocks to the nearest 5 minutes. ***I can tell time to the nearest 5 minutes on a digital clock.*** ☐ Write time using analog clocks and digital clocks. ***I can write time using an analog clock and digital clock.*** ☐ Identify the hour and minute hand on an analog clock. ***I can identify the hour and minute hands on an analog clock.*** (Underpinning Target)	Second Grade students extend their work with telling time to the hour and half-hour in First Grade in order to tell (orally and in writing) the time indicated on both analog and digital clocks to the nearest five minutes. Teachers help students make connections between skip counting by 5s (2.NBT.2) and telling time to the nearest five minutes on an analog clock. Students also indicate if the time is in the morning (a.m.) or in the afternoon/evening (p.m) as they record the time. Learning to tell time is challenging for children. In order to read an analog clock, they must be able to read a dial-type instrument. Furthermore, they must realize that the hour hand indicates broad, approximate time while the minute hand indicates the minutes in between each hour. As students experience clocks with only hour hands, they begin to realize that when the time is two o'clock, two-fifteen, or two forty-five, the hour hand looks different- but is still considered "two". Discussing time as "about 2 o'clock", "a little past 2 o'clock", and "almost 3 o'clock" helps build vocabulary to use when introducing time to the nearest 5 minutes.	Ch 11 Ch 14	Third Nine Weeks 4 weeks

☐ Identify and label when a.m and p.m occur. ***I can write time using a.m. and p.m.*** **Reasoning Targets:** ☐ Determine what time is represented by the combination of the number on the clock face and the position of the hands. ***I can tell time by looking at the number on the clock face and the position of the hands.***	 All of these clocks indicate the hour of "two", although they look slightly different. This is an important idea for students as they learn to tell time.		
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?* **Knowledge Targets:** ☐ Identify and recognize the value of dollar bills, quarters, dimes, nickels, and pennies. ***I can identify a dollar, quarter, dime, nickel and penny. (Underpinning Target)*** ***I can tell the value of a dollar, quarter, dime, nickel, penny. (Underpinning Target)*** ☐ Identify the $ and ***I can identify $ and ¢ symbols. (Underpinning Target)*** **Reasoning Targets:** ☐ Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies using $ and ¢ symbols appropriately. ***I can solve word problems with dollar bills, quarters, dimes, nickels, and pennies using the symbols $ and ¢.***	In Second Grade, students solve word problems involving either dollars or cents. Since students have not been introduced to decimals, problems focus on whole dollar amounts or cents. This is the first time money is introduced formally as a standard. Therefore, students will need numerous experiences with coin recognition and values of coins before using coins to solve problems. Once students are solid with coin recognition and values, they can then begin using the values coins to count sets of coins, compare two sets of coins, make and recognize equivalent collections of coins (same amount but different arrangements), select coins for a given amount, and make change. Solving problems with money can be a challenge for young children because it builds on prerequisite number and place value skills and concepts. Many times money is introduced before students have the necessary number sense to work with money successfully. For these values to make sense, students must have an understanding of 5, 10, and 25. More than that, they need to be able to think of these quantities without seeing countable objects… A child whose number concepts remain tied to counts of objects [one object is one count] is not going to be able to understand the value of coins. *Van de Walle & Lovin, p. 150, 2006* Just as students learn that a number (38) can be		

	represented different ways (3 tens and 8 ones; 2 tens and 18 ones) and still remain the same amount (38), students can apply this understanding to money. For example, 25 cents can look like a quarter, two dimes and a nickel, and it can look like 25 pennies, and still all remain 25 cents. This concept of equivalent worth takes time and requires numerous opportunities to create different sets of coins, count sets of coins, and recognize the "purchase power" of coins (a nickel can buy the same things a 5 pennies). As teachers provide students with sufficient opportunities to explore coin values (25 cents) and actual coins (2 dimes, 1 nickel), teachers will help guide students over time to learn how to mentally give each coin in a set a value, place the random set of coins in order, and use mental math, adding on to find differences, and skip counting to determine the final amount. Example: How many different ways can you make 37¢ using pennies, nickels, dimes, and quarters? Example: How many different ways can you make 12 dollars using $1, $5, and $10 bills?		
Measurement **Measurement and Data** **Measure and estimate lengths in standard units**			
2.MD.1: Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes. **Knowledge Targets:** ☐ Identify tools that can be used to measure length. (Underpinning) ***I can identify tools that can be used to measure length.***	Second Graders build upon their non-standard measurement experiences in First Grade by measuring in standard units for the first time. Using both customary (inches and feet) and metric (centimeters and meters) units, Second Graders select an attribute to be measured (e.g., length of classroom), choose an appropriate unit of measurement (e.g., yardstick), and determine the number of units (e.g., yards). As teachers provide rich tasks that ask students to perform real measurements, these foundational understandings of measurement are developed: • Understand that larger units (e.g., yard) can be subdivided into equivalent units (e.g., inches)	Ch 7 Ch 13	4 weeks

☐ Identify the unit of length for the tool used (inches, centimeters, feet, meters). (Underpinning)
I can identify the unit of length for the tool I used (inches, centimeters, feet, meters).

Reasoning Targets:

☐ Determine which tool to use to measure the length of an object.
I can choose the appropriate tool to measure the length of an object. (rulers, yardsticks, meter sticks, and measuring tapes.)

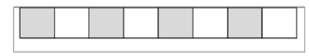
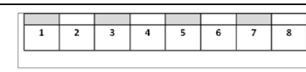
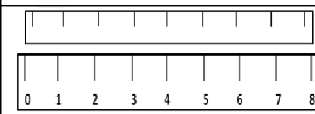
Performance Skill Targets:

☐ Measure the length of objects by using appropriate tools.
I can measure the length of objects using appropriate tools. (rulers, yardsticks, meter sticks, and measuring tapes.)
☐

(partition).

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

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

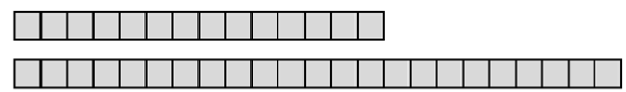
By helping students progress from a "ruler" that is blocked off into colored units (no numbers),	
to a "ruler" that has numbers along with the colored units,	
To a "ruler" that has inches (centimeters) with and without numbers, students develop the understanding that the numbers on a ruler do not count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

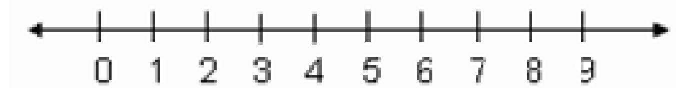
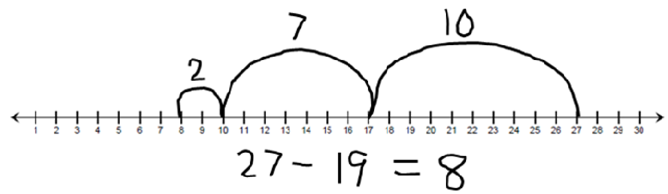
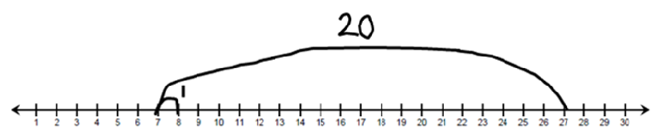
By the end of Second Grade, students will have also learned specific measurements as it relates to feet, yards and meters:

- There are 12 inches in a foot.

	• There are 3 feet in a yard. • There are 100 centimeters in a meter.		
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. **Knowledge Targets:** ☐ **Know how to measure the length of objects with different units. (Underpinning Target)** ***I can measure the length of an object with different units. (Underpinning Target)*** **Reasoning Targets:** ☐ Compare measurements of an object taken with two different units. ***I can compare measurements of an object with different units. (That means, I can compare the measurements of a pencil measured in inches and the same pencil measured in centimeters.)*** ☐ Describe why the measurements of an object taken with two different units are different. ***I can explain why the measurements of an object measured with two different units are different.*** ☐ Explain the length of an object in relation to the size of the units used to measure it. **I can explain the length of an object in relations to the size of the units used to measure it.**	Second Grade students measure an object using two units of different lengths. This experience helps students realize that the unit used is as important as the attribute being measured. This is a difficult concept for young children and will require numerous experiences for students to predict, measure, and discuss outcomes. Example: A student measured the length of a desk in both feet and centimeters. She found that the desk was 3 feet long. She also found out that it was 36 inches long. Teacher: Why do you think you have two different measurements for the same desk? Student: It only took 3 feet because the feet are so big. It took 36 inches because an inch is a whole lot smaller than a foot.		
2.MD.3: Estimate lengths using units of inches, feet, centimeters, and meters.	Second Grade students estimate the lengths of objects using inches, feet, centimeters, and meters prior to measuring. Estimation helps the students focus on the attribute being measured and the measuring process. As		

Knowledge Targets: ☐ Know strategies for estimating length. ***I can identify strategies for estimating length. (Underpinning)*** ☐ Recognize the size of inches, feet, centimeters, and meters. ***I can identify the size of inches, feet, centimeters, and meters. (Underpinning)*** **Reasoning Targets:** ☐ Estimate lengths in units of inches, feet, centimeters, and meters. **I can estimate lengths in units of inches, feet, centimeters, and meters.** ☐ Determine if estimate is reasonable. **I can tell whether my estimate is reasonable.**	students estimate, the student has to consider the size of the unit- helping them to become more familiar with the unit size. In addition, estimation also creates a problem to be solved rather than a task to be completed. Once a student has made an estimate, the student then measures the object and reflects on the accuracy of the estimate made and considers this information for the next measurement. Example: Teacher: How many inches do you think this string is if you measured it with a ruler? Student: An inch is pretty small. I'm thinking it will be somewhere between 8 and 9 inches. Teacher: Measure it and see. Student: It is 9 inches. I thought that it would be somewhere around there.		
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. **Knowledge Targets:** ☐ Name standard length units. **I can name standard length units. (inches, feet, centimeters, and meters) (Underpinning)** **Reasoning Targets:** ☐ Compare lengths of two objects. **I can compare lengths of two objects.** ☐ Determine how much longer one object is than another in standard length units. **I can determine how much longer one object is than another object in standard length units.**	Second Grade students determine the difference in length between two objects by using the same tool and unit to measure both objects. Students choose two objects to measure, identify an appropriate tool and unit, measure both objects, and then determine the differences in lengths. Example: **Teacher**: Choose two pieces of string to measure. How many inches do you think each string is? **Student**: I think String A is about 8 inches long. I think string B is only about 4 inches long. It's really short. **Teacher**: Measure to see how long each string is. *Student measures.* What did you notice? **Student**: String A is definitely the longest one. It is 10 inches long. String B was only 5 inches long. I was close! **Teacher**: How many more inches does your short string need to be so that it is the same length as your long string? **Student**: Hmmm. String B is 5 inches. It would need 5 more inches to be 10 inches. 5 and 5 is 10.		

<u>**Relate addition and subtraction to length.**</u> **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.** **Knowledge Targets:** ☐ Add and subtract lengths within 100. **I can add and subtract lengths within 100.** **Reasoning Targets:** ☐ Solve word problems involving lengths that are given in the same units. ***I can solve word problems involving lengths with the same units.*** ☐ Solve word problems involving length that have equations with a symbol for the unknown number. ***I can solve word problems involving lengths (with the same units) by using a drawing of a ruler.*** ***I can solve word problems involving lengths (with the same units) by using equations with a missing number.***	Second Grade students apply the concept of length to solve addition and subtraction word problems with numbers within 100. Students should use the same unit of measurement in these problems. Equations may vary depending on students' interpretation of the task. Notice in the examples below that these equations are similar to those problem types in Table 1 at the end of this document. Example: In P.E. class Kate jumped 14 inches. Mary jumped 23 inches. How much farther did Mary jump than Kate? Write an equation and then solve the problem. My equation is 14 + ___ = 23 since I thought, "14 and what makes 23?". I used Unifix cubes. I made a train of 14. Then I made a train of 23. When I put them side by side, I saw that Kate would need 9 more cubes to be the same as Mary. So Mary jumped 9 more inches than Kate. 14 + 9 = 23  My equation is 23 – 14 = ___ since I thought about what the difference was between Kate and Mary. I broke up 14 into 10 and 4. I know that 23 minus 10 is 13. Then, I broke up the 4 into 3 and 1. 13 minus 3 is 10. Then, I took one more away. That left me with 9. So, Mary jumped 9 more inches than Kate. That seems to make sense since 23 is almost 10 more than 14. 23 – 14 = 9. 23 – 10 = 13 13 – 3 = 10 10 – 1 = 9		
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	Building upon their experiences with open number lines, Second Grade students create number lines with evenly spaced points corresponding to the numbers to solve addition and subtraction problems to 100. They recognize the similarities between a number line and a ruler.		

differences within 100 on a number line diagram. **Knowledge Targets:** ☐ Represent whole numbers from 0 on a number line with equally spaced points. ***I can show whole numbers from 0 on a number line with equally spaced points.*** **Reasoning Targets:** ☐ Explain length as the distance between zero and another mark on the number line diagram. ***I can explain length as the distance between zero and another mark on a number line.*** ☐ Use a number line to represent whole-number sums and differences (within 100). ***I can use a number line to show whole number sums and differences (within 100).***	 Example: There were 27 students on the bus. 19 got off the bus. How many students are on the bus? Student A: I used a number line. I started at 27. I broke up 19 into 10 and 9. That way, I could take a jump of 10. I landed on 17. Then I broke the 9 up into 7 and 2. I took a jump of 7. That got me to 10. Then I took a jump of 2. That's 8. So, there are 8 students now on the bus.  **Student B**: I used a number line. I saw that 19 is really close to 20. Since 20 is a lot easier to work with, I took a jump of 20. But, that was one too many. So, I took a jump of 1 to make up for the extra. I landed on 8. So, there are 8 students on the bus. 27 - 20 = 7 7 + 1 = 8 		
Fractions			
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	Second Grade students partition circles and rectangles into 2, 3 or 4 equal shares (regions). Students should be given ample experiences to explore this concept with paper strips and pictorial representations. Students should also work with the vocabulary terms halves, thirds, half of, third of, and fourth (or quarter) of. While students are working on this standard, teachers should	Ch 12	Fourth Nine Weeks Two weeks

shares of identical wholes need not have the same shape.

Knowledge Targets:

- ☐ Divide circles and rectangles into two, three and four equal shares.
  I can divide circles and rectangles into two, three and four equal shares.
- ☐ Identify two, three and four equal shares of a whole.
  I can identify two, three and four equal shares of a whole.
- ☐ Describe equal shares using vocabulary: halves, thirds, fourths half of, third of, etc.
  I can describe equal shares using halves, thirds, fourths half of, third of, etc.
- ☐ Describe a whole as two halves, three thirds, four fourths, etc.
  I can describe a whole as two halves, three thirds, four fourths, etc.

Reasoning Targets:

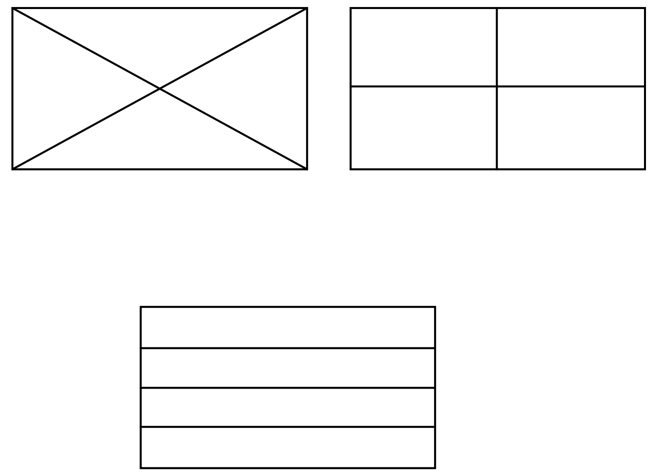
- ☐ Justify why equal shares of identical wholes need not have the same shape.
  I can justify why equal shares of identical wholes do not need to have the same shape.

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:

Teacher: Partition each rectangle into fourths a different way.

Student A: I partitioned this rectangle 3 different ways. I folded the paper to make sure that all of the parts were the same size.

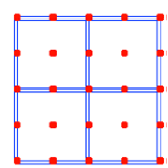


: In your 3 pictures, how do you know that each part is a fourth?

Student: There are four equal parts. Therefore, each part is one-fourth of the whole piece of paper.

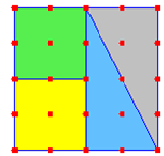
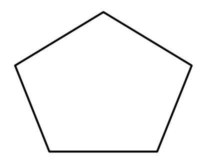
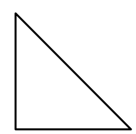
Example: **How many different ways can you partition this 4 by 4 geoboard into fourths?**

Student A: I partitioned the geoboard into four equal sized squares.



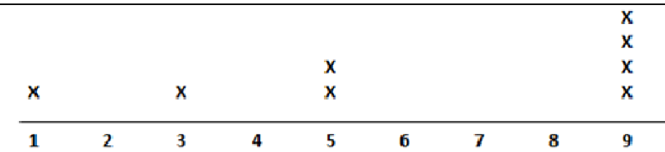
Teacher: How do you know that each section is a fourth?

Student B: Because there are four equal sized squares.

	That means that each piece is a fourth of the whole geoboard. **Student B**: I partitioned the geoboard in half down the middle. The section on the left I divided into two equal sized squares. The other section I partitioned into two equal sized triangles.  **Teacher**: How do you know that each section is a fourth? **Student A**: Each section is a half of a half, which is the same as a fourth		
	Geometry		
<u>Reason with shapes and their attributes.</u> **2.G.1: Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. (Note: Sizes are compared directly or visually, not compared by measuring.) Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.** **Knowledge Targets:** ☐ Identify the attributes of triangles, quadrilaterals, pentagons, hexagons, and cubes (e.g. faces, angles, sides, vertices, etc.). ***I can identify the attributes of triangles, quadrilaterals, pentagons, hexagons, and cubes (e.g. faces, angles, sides, vertices, etc.).*** ☐ Identify triangles, quadrilaterals, pentagons, hexagons, and cubes based on the given attributes. ***I can identify triangles, quadrilaterals, pentagons,***	Second Grade students identify (recognize and name) shapes and draw shapes based on a given set of attributes. These include triangles, quadrilaterals (squares, rectangles, and trapezoids), pentagons, hexagons and cubes. Example: **Teacher**: Draw a closed shape that has five sides. What is the name of the shape? **Student**: I drew a shape with 5 sides. It is called a pentagon.  Example: **Teacher:** I have 3 sides and 3 angles. What am I? **Student: A triangle. See, 3 sides, 3 angles.** 	Ch 18 Ch 19	2 weeks

hexagons, and cubes based on the given attributes. **Reasoning Targets:** ☐ Describe and analyze shapes by examining their sides and angles, not by measuring. **I can describe shapes by examining their sides and angles, not by measuring.** ☐ Compare shapes by their attributes (e.g. faces, angles). **I can compare shapes by examining their sides and angles, not be measuring.** **Product Targets:** ☐ Draw shapes with specified attributes. **I can draw shapes with specified attributes.**			
2.G.2: Partition a rectangle into rows and columns of same-size squares and count to find the total number of them. **Knowledge Targets:** ☐ Count to find the total number of same-size squares. ***I can count to find the total number of same-size squares.*** ☐ Define partition. ***I can define partition. (Underpinning)*** ☐ Identify a row. ***I can identify row. (Underpinning)*** ☐ Identify a column. ***I can identify column (Underpinning)*** **Reasoning Targets:** ☐ Determine how to partition a rectangle into same-size squares. ***I can divide a rectangle into same-size squares.***	Second graders partition a rectangle into squares (or square-like regions) and then determine the total number of squares. This work connects to the standard 2.OA.4 where students are arranging objects in an array of rows and columns. Example: **Teacher**: Partition the rectangle into 2 rows and 4 columns. How many small squares did you make? **Student**: There are 8 squares in this rectangle. See- 2, 4, 6, 8. I folded the paper to make sure that they were all the same size. 		

Graphing			
<u>**Represent and interpret data.**</u> **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.** **Knowledge Targets:** ☐ Read tools of measurement to the nearest unit. ***I can read tools of measurement to the nearest unit. (Underpinning)*** **Reasoning Targets:** ☐ Represent measurement data on a line plot.	Second Graders use measurement data as they move through the statistical process of posing a question, collecting data, analyzing data, creating representations, and interpreting the results. In second grade students represent the length of several objects by making a line plot. Students should round their lengths to the nearest whole unit. Example: Measure 8 objects in the basket to the nearest inch. Then, display your data on a line plot. **Teacher:** What do you notice about your data? **Student:** Most of the objects I measured were 9 inches. Only 2 objects were smaller than 4 inches. I was surprised that none of my objects measured more than 9 inches! **Teacher:** Do you think that if you chose all new objects from the basket that your data would look the same? Different? Why do you think so?	Ch 17 bar graph line plot	2 weeks

I can show measurement data on a line plot. **Performance Skills Targets:** ☐ Measure lengths of several objects to the nearest whole unit. ***I can measure lengths of several objects to the nearest whole unit. (Underpinning)*** ☐ Measure lengths of objects by making repeated measurements of the same object. ***I can measure lengths of objects by making repeated measurements of the same object. (Underpinning).*** **Product Targets:** ☐ Create a line plot with a horizontal scale marked in whole numbers using measurements. ***I can create a line plot with a horizontal scale, marked in whole numbers.***			
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 using information presented in a bar graph. (Note: See Glossary, Table 1.) **Knowledge Targets:** ☐ Identify picture graphs and bar graphs. ***I can identify picture graphs and bar graphs. (Underpinning)*** ☐ Identify and label the components of a picture graph and bar graph. ***I can identify and label the components of a picture graph and bar graph. (Underpinning)***	In Second Grade, students pose a question, determine up to 4 categories of possible responses, collect data, represent data on a picture graph or bar graph, and interpret the results. This is an extension from first grade when students organized, represented, and interpreted data with up to three categories. They are able to use the graph selected to note particular aspects of the data collected, including the total number of responses, which category had the most/least responses, and interesting differences/similarities between the four categories. They then solve simple one-step problems using the information from the graph. Example: The Second Graders were responsible for purchasing ice cream for an Open House event at school. They decided to collect data to determine which flavors to buy for the event. As a group, the students decided on the question, “What is your favorite flavor of ice cream?” and 4 likely responses, “chocolate”, “vanilla”, “strawberry”, and		

Reasoning Targets:

☐ Solve problems relating to data in graphs by using addition and subtraction.

☐ Make comparisons between categories in the graph using more than, less than, etc.

I can solve problems using simple addition, subtraction and comparison problems using a bar graph.

Product Targets:

☐ Draw a single-unit scale picture graph to represent a given set of data with up to four categories.

I can draw a single-unit scale picture graph to show data with up to four categories.

☐ Draw a single-unit sale bar graph to represent a given set of data with up to four categories.

I can draw a single-unit scale bar graph to show data with up to four categories.

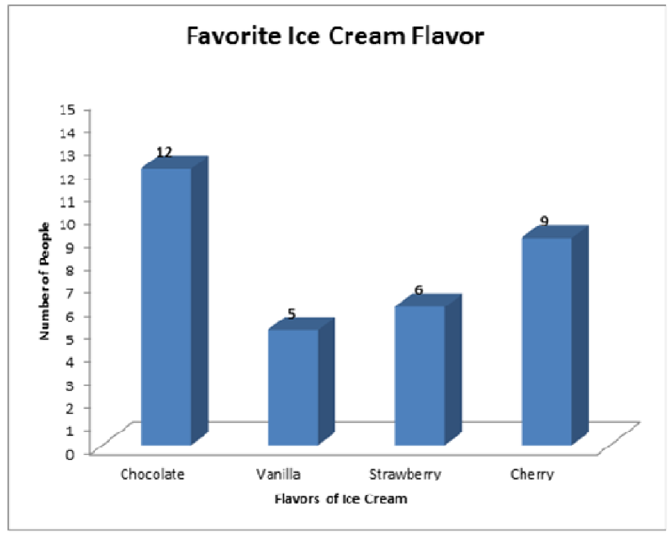
"cherry".

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

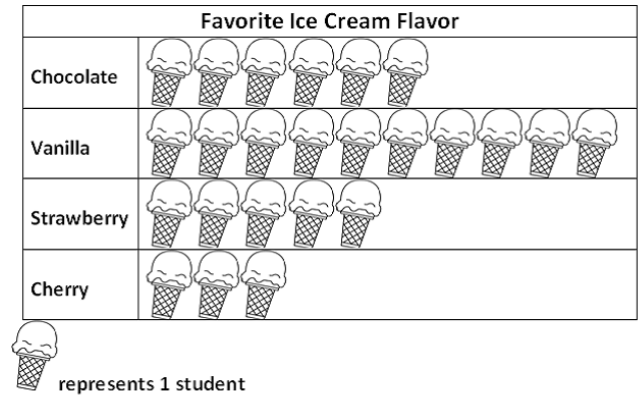
When back in the classroom, each team organized their data by totaling each category in a chart or table. Team A's data was as follows:

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

Team A: Bar Graph



Team B: Picture Graph



Once the data were represented on a graph, the teams then analyzed and recorded observations made from the data. Statements such as, “Chocolate had the most votes” and “Vanilla had more votes than strawberry and cherry votes combined” were recorded.
The teacher then facilitated a discussion around the combination of the data collected to determine the overall data of the school. Simple problems were posed:

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

After a careful study of the data, students determined that Vanilla was the most preferred flavor. Chocolate was the second most popular. The class decided that more vanilla should be purchased than chocolate, but that both should be purchased. The teacher then asked the class,

	"If each gallon of ice cream served 20 children, how many gallons of ice cream would we need to buy for 460 students? How many of those total gallons should be chocolate? How many should be vanilla? Why?" The students were off solving the next task.		

Some examples used in this document are from the Arizona Mathematics Education Department

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

Math Accountable Talk

Teach students to use one of the following when discussing each other's math work.

I agree with _____________ because ________________.

I like the way ___________ used ____________ because as his/her reader, it helps me _______________.

I disagree with _____________ because __________________.

I got a different answer than _______________ because ___________________.

I can add to ___________________'s thoughts: ____________________

I got the same answer as _____________________ but my strategy was different.

I have a question for ___________________________.

I don't understand why _________________ got the answer of ________________ because ________________.

Glossary

Table 1 Common addition and subtraction situations **(adapted from Box 2-4 of Mathematics Learning in Early Childhood, National Research Council (2009, pp.32-33.)**

	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 = ? **(K)**	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 **(1st)**	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 **(2nd)**
Take from	Five apples were on the table. I ate two apples. How many apples are on the table now? 5 – 2 = ? **(K)**	Five apples were on the table. I ate some apples. Then there were three apples. How many apples did I eat? 5 – ? = 3 **(1st)**	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 **(2nd)**
	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 = ? **(K)**	Five apples are on the table. Three are red and the rest are green. How many apples are green? 3 + ? = 5, 5 – 3 = ? **(K)**	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 **(1st)**
	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? **(1st)** ("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 = ? **(1st)**	(Version with "more") Julie has three more apples than Lucy. Lucy has two apples. How many apples does Julie have? **(1st)** (Version with "fewer"): Lucy has 3 fewer apples than Julie. Lucy has two apples. How many apples does Julie have? 2 + 3 = ?, 3 + 2 = ? **(1st)**	(Version with "more"): Julie has three more apples than Lucy. Julie has five apples. How many apples does Lucy have? **(1st)** (Version with "fewer"): Lucy has 3 fewer apples than Julie. Julie has five apples. How many apples does Lucy have? 5 – 3 = ?, ? + 3 = 5 **(2nd)**

K: Problem types to be mastered by the end of the Kindergarten year.
1st: Problem types to be mastered by the end of the First Grade year, including problem types from the previous year(s). However, first grade students should have experiences with all 12 problem types.
2nd: Problem types to be mastered by the end of the second grade year, including problem types from the previous year(s).

[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.