Sums and Differences to 1000

Math in Focus

Unit 1 Curriculum Guide:
September 10 – November 7th ,2018

ORANGE PUBLIC SCHOOLS

OFFICE OF CURRICULUM AND INSTRUCTION

OFFICE OF MATHEMATICS

Table of Contents

Second Grade Unit I
Chapter 1-4

In this Unit Students will:

2.OA.1:

- Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of:
  - Adding to,
  - Taking from,
  - Putting Together,
  - Taking Apart, and
  - Comparing with unknowns in all positions

2.O.A.2:

- Fluently add and subtract within 20 using mental strategies:
  - Count On/ Count Back
  - Making Ten/Decomposing (Ten)
  - Addition and Subtraction Relationship
  - Doubles +/-
- Know from memory all sums of two one digit numbers.

2.NBT.1-9

- Extend their concept of numbers
- Gain knowledge of how to count, read, and write up to 1,000
- Use Base-ten blocks, place-value charts, and number lines to develop the association between the physical representation of the number, the number symbol, and the number word
- Compose and decompose numbers through place value, number bonds
- Apply place value in addition with and without regrouping in numbers up to 1000
- Use multiple strategies: concrete, pictorial and abstract representations.

Mathematical Practices

- Make sense of persevere in solving them.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Model with mathematics.
- Use appropriate mathematical tools.
- Attend to precision.
- Look for and make use of structure.
- Look for and express regularity in repeated reasoning.

Activities	NJSLS
Math In Focus Ch. 1 Opener Recall Prior Knowledge	2.NBT.1 2.NBT.2 2.NBT.3
Math In Focus Ch. 1 Lesson 1 Day 1 Counting	
Math In Focus Ch. 1 Lesson 1 Day 2 Counting	
Math In Focus Ch. 1 Lesson 2 Day 1 Place Value	
Math In Focus Ch. 1 Lesson 2 Day 2 Place Value	
Math In Focus Ch. 1 Lesson 3 Day 1 Comparing Numbers	
Math In Focus Ch. 1 Lesson 3 Day 2 Comparing Numbers	
Math In Focus Ch. 1 Lesson 4 Day 1 Order and Pattern	
Math In Focus Ch. 1 Lesson 4 Day 2 Order and Pattern	
Math In Focus Ch. 1 Problem Solving: Put On Your Thinking Cap Chapter Wrap Up	
Math In Focus Ch. 1 Test Prep **Math In Focus Ch. 1 Performance Task**	
Math In Focus Ch. 2 Opener Recall Prior Knowledge	2.NBT.5 2.NBT.6 2.NBT.7 2.NBT.9 2.OA.2
Math In Focus Ch. 2 Lesson 1 Addition and Subtraction Facts Within 20	
Math In Focus Ch. 2 Lesson 2 Day 1 Addition Without Regrouping	
Math In Focus Ch. 2 Lesson 2 Day 2 Addition Without Regrouping	
Math In Focus Ch. 2 Lesson 3 Day 1 Addition Without Regrouping in Ones	
Math In Focus Ch. 2 Lesson 3 Day 2 Addition Without Regrouping in Ones	
Math In Focus Ch. 2 Lesson 4 Addition With Regrouping In Tens	

Math In Focus Ch. 2 Lesson 5 Addition With Regrouping In Ones and Tens	
Math In Focus Ch. 2 Problem Solving: Put On Your Thinking Cap Chapter Wrap Up	
Math In Focus Ch. 2 Test Prep **Math In Focus Ch. 2 Performance Task**	
Math In Focus Ch. 3 Opener Recall Prior Knowledge	2.NBT.5 2.NBT.7 2.NBT.9
Math In Focus Ch. 3 Lesson 1 Subtracting Without Regrouping	
Math In Focus Ch. 3 Lesson 2 Subtracting With Regrouping Tens and Ones	
Math In Focus Ch. 3 Lesson 3 Subtracting With Regrouping Hundreds and Tens	
Math In Focus Ch. 3 Lesson 4 Subtracting With Regrouping Hundreds, Tens and Ones	
Math In Focus Ch. 3 Lesson 5 Subtracting Across Zeros	
Math In Focus Ch. 3 Problem Solving: Put On Your Thinking Cap Chapter Wrap Up	
Math In Focus Ch. 3 Test Prep **Math In Focus Ch. 3 Performance Task**	
Math In Focus Ch. 4 Opener Recall Prior Knowledge **Ch. 4 Pre-Test**	2.OA.1 2.NBT.5 2.NBT.7 2.NBT.9
Math In Focus Ch. 4 Lesson 1 Day 1 Using Part-Part-Whole in Addition and Subtraction	
Math In Focus Ch. 4 Lesson 1 Day 2 Using Part-Part-Whole in Addition and Subtraction	
Math In Focus Ch. 4 Lesson 2 Day 1 Adding On and Taking Away Sets	
Math In Focus Ch. 4 Lesson 2 Day 2 Adding On and Taking Away Sets	
Math In Focus Ch. 4 Lesson 3 Day 1 Comparing Two Sets	
Math In Focus Ch. 4 Lesson 3 Day 2 Comparing Two Sets	
Math In Focus Ch. 4 Lesson 4 Real World Two Step Problems	

Math In Focus Ch. 4 Problem Solving: Put On Your Thinking Cap Chapter Wrap Up	
Math In Focus Ch. 4 Test Prep **Math In Focus Ch. 4 Performance Task**	

New Jersey Student Learning Standards: Operations and Algebraic Thinking	
2.OA.1	Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

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 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? $15 + \square = 22$ $22 - 15 = \square$	There are 9 blue marbles and 6 red marbles in the bag. Maria put in 8 more marbles. How many marbles are in the bag now? $9 + 6 + 8 = \square$	There are 9 peas on the plate. Carlos ate 5 peas. Mother put 7 more peas on the plate. How many peas are on the plate now? $9 - 5 + 7 = \square$

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 since the primary focus of the standard is the problem-type.

Table 1 Common addition and subtraction situations[1]

	Result Unknown	Change Unknown	Start Unknown
Add to	Two bunnies sat on the grass. Three more bunnies hopped there. How many bunnies are on the grass now? $2 + 3 = ?$ **(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? $? + 3 = 5$ **One-Step Problem** **(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? $? – 2 = 3$ **One-Step Problem** **(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)**	(Version with "more"): Julie has three more apples than Lucy. Lucy has two apples. How many apples does Julie have? **One-Step Problem** **(1st)**	(Version with "more"): Julie has 3 more apples than Lucy. Julie has five apples. How many apples does Lucy have? $5 – 3 = ?$ $? + 3 = 5$ **One-Step Problem** **(2nd)**
	("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 "fewer"): Lucy has 3 fewer apples than Julie. Lucy has two apples. How many apples does Julie have? $2 + 3 = ?, 3 + 2 = ?$ **One-Step Problem** **(2nd)**	(Version with "fewer"): Lucy has three fewer apples than Julie. Julie has five apples. How many apples does Lucy have? **One-Step Problem** **(1st)**

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).

New Jersey Student Learning Standards: Operations and Algebraic Thinking	
2.OA.2	Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers. See standard 1.OA.6 for a list of mental strategies.

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/Counting Back
- 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, 12 + 1 = 13

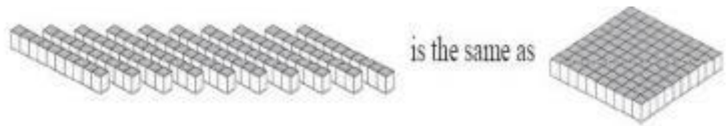
Second Graders internalize facts and develop fluency by repeatedly using strategies that make sense to them. When students are able to demonstrate fluency they are accurate, efficient, and flexible. Students must have efficient strategies in order to know sums from memory.

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 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)

New Jersey Student Learning Standards: Numbers and Operations in Base Ten	
2.NBT.1	Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and 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.



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.

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.

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.

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.

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 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

Student A *Place Value*	**Student B** *Counting*
452 has 4 hundreds 5 tens and 2 ones. 455 has 4 hundreds 5 tens and 5 ones. They have the same number of hundreds and the same number of tens, but 455 has 5 ones and 452 only has 2 ones. 452 is less than 455. 452 < 455	452 is less than 455. I know this because when I count up I say 452 before I say 455. 452 < 455 452 is less than 455.

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.

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.

There are various strategies that Second Grade students understand and use when adding and subtracting within 100 (such as those listed in the standard). The standard algorithm of carrying or borrowing is neither an expectation nor a focus in Second Grade. Students use multiple strategies for addition and subtraction in Grades K-3. By the end of Third Grade students use a range of algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction to fluently add and subtract within 1000. Students are expected to fluently add and subtract multi-digit whole numbers using the standard algorithm by the end of Grade 4.

Example: **67 + 25 = __**

Place Value Strategy:	*Decomposing into Tens:*	*Commutative Property:*
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.	I decided to start with 67 and break 25 apart. I knew I needed 3 more to get to 70, so I broke off a 3 from the 25. I then added my 20 from the 22 left and got to 90. I had 2 left. 90 plus 2 is 92. So, 67 + 25 = 92	I broke 67 and 25 into tens and ones so I had to add 60+7+20+5. I added 60 and 20 first to get 80. Then I added 7 to get 87. Then I added 5 more. My answer is 92.

Example: **63 – 32 = __**

Decomposing into Tens:	*Think Addition:*
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	I thought, '32 and what makes 63?'. I know that I needed 30, since 30 and 30 is 60. So, that got me to 62. I needed one more to get to 63. So, 30 and 1 is 31. 32 + **31** = 63

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

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
I saw the 43 and 57 and added them first. I know 3 plus 7 equals 10, so when I added them 100 was my answer. Then I added 34 and had 134. Then I added 24 and had 158.
43 + 57 + 34 + 24 = 158

Student B
Place Value Strategies
I broke up all of the numbers into tens and ones. First I added the tens. 40 + 30 + 50 + 20 = 140.
Then I added the ones. 3 + 4 + 7 + 4 = 18. That meant I had 1 ten and 8 ones. So, 140 + 10 is 150. 150 and 8 more is 158. So, 43 + 34 + 57 + 24 = 158

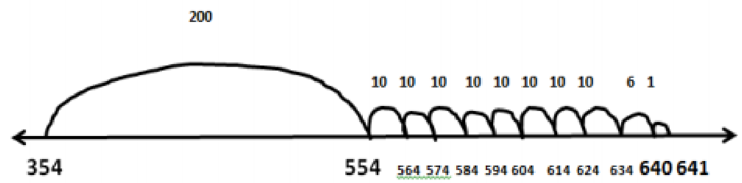
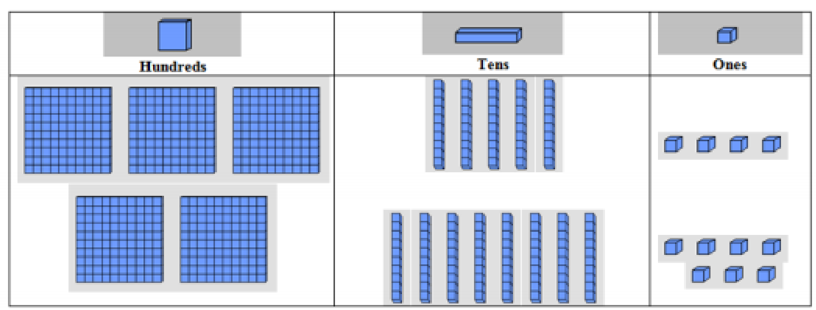
Student C
Place Value Strategies and Associative Property
I broke up all the numbers into tens and ones. First I added up the tens.
40 + 30 + 50 + 20. I changed the order of the numbers to make adding easier. I know that 30 plus 20 equals 50 and 50 more equals 100. Then I added the 40 and got 140.
Then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

2.NBT.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.

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 a standard algorithm until the end of Fourth Grade.

Example: **354 + 287 = __**

<table>
<tr><td>Student A</td><td>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

</td></tr>
<tr><td>Student B</td><td>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.

</td></tr>
</table>

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.

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.

<u>Example:</u> *Within the same hundred*
What is 10 more than 218?
What is 241 – 10?

<u>Example:</u> *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.

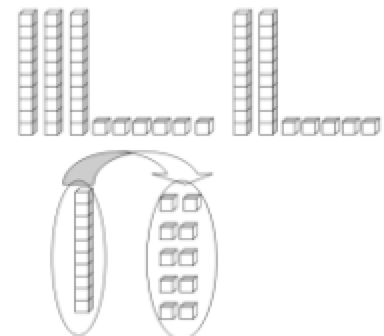
Second graders explain why addition or subtraction strategies work as they apply their knowledge of place value and the properties of operations in their explanation. They may use drawings or objects to support their explanation.

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.



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

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.

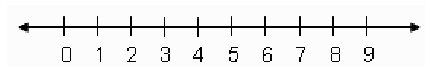
Example: **A student measured the length of a desk in both feet and inches. She found that the desk was 3 feet long. She also found out that it was 36 inches long.**

Teacher: Why do you think you have two different measurements for the same desk?

Student: It only took 3 feet because the feet are so big. It took 36 inches because an inch is a whole lot smaller than a foot.

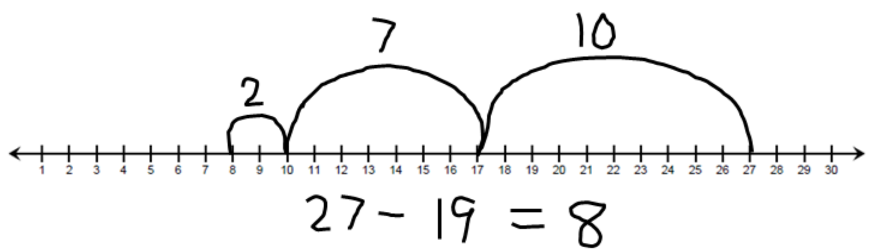
2.MD.6	Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a number line diagram.

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.



Example: **There were 27 students on the bus. 19 got off the bus. How many students are on the bus?**

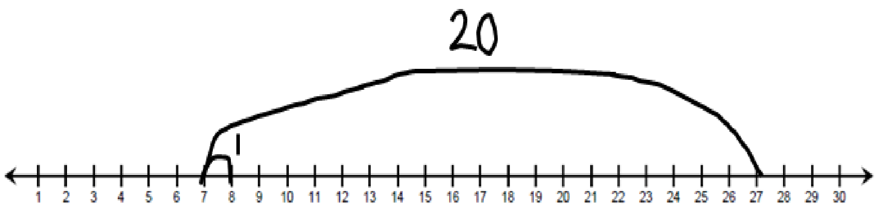
Student A: I used a number line. I started at 27. I broke up 19 into 10 and 9. That way, I could take a jump of 10. I landed on 17. Then I broke the 9 up into 7 and 2. I took a jump of 7. That got me to 10. Then I took a jump of 2. That's 8. So, there are 8 students now on the bus.



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


20
1
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

	LESSON STRUCTURE	RESOURCES	COMMENTS
PRE TEST	**Chapter Opener** Assessing Prior Knowledge *The Pre Test serves as a diagnostic test of readiness of the upcoming chapter*	**Teacher Materials** Quick Check Pretest (Assessm't Bk) Recall Prior Knowledge **Student Materials** Student Book (Quick Check); Copy of the Pre Test; Recall prior Knowledge	Recall Prior Knowledge (RPK) can take place just before the pre-tests are given and can take 1-2 days to front load prerequisite understanding Quick Check can be done in concert with the RPK and used to repair student misunderstandings and vocabulary prior to the pre-test ; Students write Quick Check answers on a separate sheet of paper Quick Check and the Pre Test can be done in the same block *(See Anecdotal Checklist; Transition Guide)* Recall Prior Knowledge – Quick Check – Pre Test
DIRECT ENGAGEMENT	**Direct Involvement/Engagement** Teach/Learn *Students are directly involved in making sense, themselves, of the concepts – by interacting the tools, manipulatives, each other, and the questions*	**Teacher Edition** 5-minute warm up Teach; Anchor Task **Technology** Digi **Other** Fluency Practice	• The Warm Up activates prior knowledge for each new lesson • Student Books are CLOSED; Big Book is used in Gr. K • Teacher led; Whole group • Students use concrete manipulatives to explore concepts • A few select parts of the task are explicitly shown, but the majority is addressed through the hands-on, constructivist approach and questioning • Teacher facilitates; Students find the solution
GUIDED LEARNING	**Guided Learning and Practice** Guided Learning	**Teacher Edition** Learn **Technology** Digi **Student Book** Guided Learning Pages Hands-on Activity	Students-already in pairs /small, homogenous ability groups; Teacher circulates between groups; Teacher, anecdotally, captures student thinking **Small Group w/Teacher circulating among groups** Revisit Concrete and Model Drawing; Reteach Teacher spends majority of time with struggling learners; some time with on level, and less time with advanced groups Games and Activities can be done at this time

INDEPENDENT PRACTICE	**Independent Practice** *A formal formative assessment*	**Teacher Edition** Let's Practice **Student Book** Let's Practice **Differentiation Options** All: Workbook Extra Support: Reteach On Level: Extra Practice Advanced: Enrichment	**Let's Practice** determines readiness for Workbook and small group work and is used as formative assessment; Students not ready for the Workbook will use Reteach. The Workbook is continued as Independent Practice. Manipulatives **CAN** be used as a communications tool as needed. Completely Independent On level/advance learners should finish all workbook pages.
ADDITIONAL PRACTICE	**Extending the Lesson**	Math Journal Problem of the Lesson Interactivities Games	
	Lesson Wrap Up	Problem of the Lesson Homework (Workbook , Reteach, or Extra Practice)	Workbook or Extra Practice Homework is only assigned when students fully understand the concepts (as additional practice) Reteach Homework (issued to struggling learners) should be checked the next day
POST TEST	**End of Chapter Wrap Up and Post Test**	**Teacher Edition** Chapter Review/Test Put on Your Thinking Cap **Student Workbook** Put on Your Thinking Cap **Assessment Book** Test Prep	Use Chapter Review/Test as "review" for the End of Chapter Test Prep. Put on your Thinking Cap prepares students for novel questions on the Test Prep; Test Prep is graded/scored. The Chapter Review/Test can be completed • Individually (e.g. for homework) then reviewed in class • As a 'mock test' done in class and doesn't count • As a formal, in class review where teacher walks students through the questions Test Prep is completely independent; scored/graded Put on Your Thinking Cap (green border) serve as a capstone problem and are done just before the Test Prep and should be treated as Direct Engagement. By February, students should be doing the Put on Your Thinking Cap problems on their own.

Math Background:

- In Grade 1, childrean learned to read, write, count, and compare numbers up to 100. Children will extend their concept of numbers and learn how to count, read, and write up to 1,000. Base-ten blocks, place-value charts, and number lines are used to develop the assciation between the physical representation of the number, the number symbol, and the number word.

- The concept of place value of ones and tens is reinforced and children are now taught the hundreds place value. Children are encouraged to compare and verbally describe more than two numbers in a set using the terms least and greatest.

- Children have been intrioduced to the Commutative Property of Addition, Associative Property of Addition, and the Identity Property of Addition. Students will continue to utilize these skills with numbers upto 1000. They are taught multiple regroupings by using base-ten blocks and a place value chart as concrete representations, allowing them to visualize addition and subtraction with regrouoping in the ones and tens place. The same strategy is applied in regraouoing in the tens and hundreds place.

- Students will learn the part-part whole concpet illustarted in bar models which teaches children to represent vaules in a single bar model by dividing the model into appropiate parts. Bar models provide a useful pictorial representation of sets as parts making up a whole. Children label the parts with numbers and words so that they can use bar models to illustrate a problem indicating on the model the known and unknown parts of the whole. This model is used consistently throughout the Grade 2 Curriculum.

Misconceptions:

- ***Second grade students do not need to have facility using the standard algorithm adding and subtracting. They should focus their work on developing and using efficient strategies that make sense to them and their understanding of place value.***

- Some children may forget to write zeros if there are no groups of tens, such as 308. Some may reverse the digits and require more opportunituies to decompose numbers into groups of hundreds, tens, and ones and put them in the correct place in the place value chart.

- Watch for studnets who do not have the conceptual understanidng that the place in which a digit is located determines the value of that digit. For example, a student reads 134 as one hundred thirty-five but when writing in expanded form writes 1+3+4.

- Display number word charts so that student who struggle with reading and writing can refernce.

- Some student may struggle to order numbers with the same digits, such as 555 and 553. Suggest that students cross out digits, startying with the hundreds place.

- Some children may not line up the numbers correctky when adding a two- and –three digit number. Utilize graph paper and place value charts to assist.

- Some students will see regrouping as adding and continue to ass throughout the problem. Circle the operation symbol and remind children whether they are subtracting or adding. Explain to students that when they are regrouoiung they are not changing the value of numbers, but rearranging the numbers, or writing numbers in a different form.

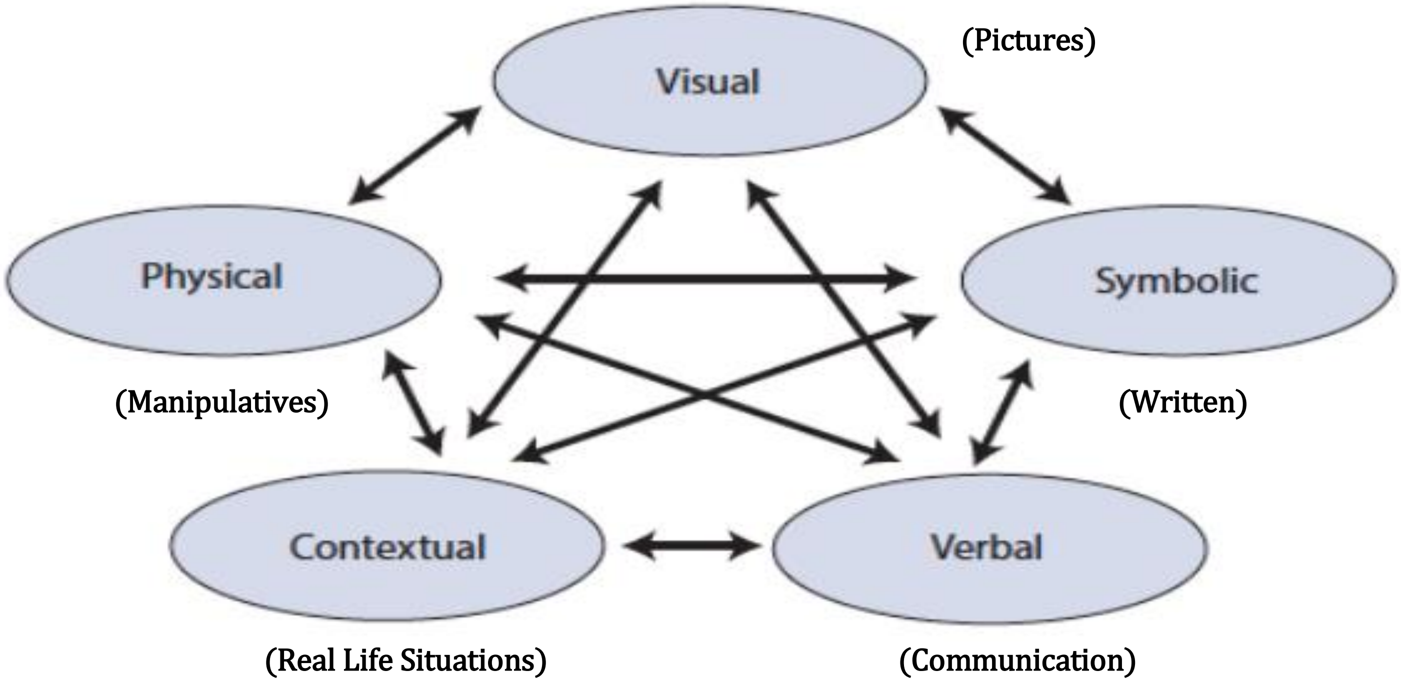
- Students who do not know basic facts may be inaccurate in computaion. Although those students should continue to work on facts, physical models will help in accurate addition and subtraction.

PARCC Assessment Evidence/Clarification Statements			
CCSS	**Evidence Statement**	**Clarification**	**Math Practices**
2.NBT.1a	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: 100 can be thought of as a bundle of ten tens — called a "hundred."	• Tasks have "thin context" or no context.	MP 7, 8
2.NBT.1b	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: 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).	• Tasks have "thin context" or no context.	MP 7, 8
2.NBT.2	Count within 1000; skip-count by 5s, 10s, and 100s.	• Skip-counting may start at any multiple of 5, 10 or 100 within 1000.	MP 7, 8
2.NBT.3	Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.	• At least 75% of the tasks involve a 3-digit number.	MP 7,8
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.	• Tasks do not have a context. • Only the answer is required (strategies, representations, etc. are not assessed here).	MP 7, 8
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.	• Tasks do not have a context. • Sums and differences beyond 20 but within 100 should be emphasized in 75% of the tasks. • Only the answer is required (strategies, representations, etc. are not assessed here).	MP 7,8

2.NBT.6	Add up to four two-digit numbers using strategies based on place value and properties of operation	• Tasks do not have a context. • Only the answer is required (strategies, representations, etc. are not assessed here)	MP 7,8
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 hundred	• Emphasis is on adding and subtracting hundreds. • Tasks do not have a context.	MP 7,8
2.OA.1-1	Use addition and subtraction within 100 to solve one- step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.	• All problem situations and all of their subtypes and language variants are included but 40% of tasks should include the most difficult problem subtypes and language variants. • Addition and subtraction is emphasized beyond 20 but within 100 • For more information see CCSS Table 1, p. 88 and the OA Progression	MP 1, 4
2.OA.1-2	Use addition and subtraction within 100 to solve two- step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.	• The majority of problems (75%) involve single-digit addends. • The most difficult problem subtypes and language variants should not be included in these problems. • For more information see CCSS Table 1, p. 88 and the OA Progression.	MP 1, 4

2.OA.2	Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.	• Tasks do not have a context. • Only the answer is required (strategies, representations, etc. are not assessed here). • Tasks require fluent (fast and accurate) finding of sums and related differences.	

Use and Connection of Mathematical Representations



The Lesh Translation Model

Each oval in the model corresponds to one way to represent a mathematical idea.

Visual: When children draw pictures, the teacher can learn more about what they understand about a particular mathematical idea and can use the different pictures that children create to provoke a discussion about mathematical ideas. Constructing their own pictures can be a powerful learning experience for children because they must consider several aspects of mathematical ideas that are often assumed when pictures are pre-drawn for students.

Physical: The manipulatives representation refers to the unifix cubes, base-ten blocks, fraction circles, and the like, that a child might use to solve a problem. Because children can physically manipulate these objects, when used appropriately, they provide opportunities to compare relative sizes of objects, to identify patterns, as well as to put together representations of numbers in multiple ways.

Verbal: Traditionally, teachers often used the spoken language of mathematics but rarely gave students opportunities to grapple with it. Yet, when students do have opportunities to express their mathematical reasoning aloud, they may be able to make explicit some knowledge that was previously implicit for them.

Symbolic: Written symbols refer to both the mathematical symbols and the written words that are associated with them. For students, written symbols tend to be more abstract than the other representations. I tend to introduce symbols after students have had opportunities to make connections among the other representations, so that the students have multiple ways to connect the symbols to mathematical ideas, thus increasing the likelihood that the symbols will be comprehensible to students.

Contextual: A relevant situation can be any context that involves appropriate mathematical ideas and holds interest for children; it is often, but not necessarily, connected to a real-life situation.

The Lesh Translation Model: Importance of Connections

As important as the ovals are in this model, another feature of the model is even more important than the representations themselves: The arrows! The arrows are important because they represent the connections students make between the representations. When students make these connections, they may be better able to access information about a mathematical idea, because they have multiple ways to represent it and, thus, many points of access.

Individuals enhance or modify their knowledge by building on what they already know, so the greater the number of representations with which students have opportunities to engage, the more likely the teacher is to tap into a student's prior knowledge. This "tapping in" can then be used to connect students' experiences to those representations that are more abstract in nature (such as written symbols). Not all students have the same set of prior experiences and knowledge. Teachers can introduce multiple representations in a meaningful way so that students' opportunities to grapple with mathematical ideas are greater than if their teachers used only one or two representations.

Concrete Pictorial Abstract (CPA) Instructional Approach

The CPA approach suggests that there are three steps necessary for pupils to develop understanding of a mathematical concept.

Concrete: “Doing Stage”: Physical manipulation of objects to solve math problems.

Pictorial: “Seeing Stage”: Use of imaged to represent objects when solving math problems.

Abstract: “Symbolic Stage”: Use of only numbers and symbols to solve math problems.

CPA is a gradual systematic approach. Each stage builds on to the previous stage. Reinforcement of concepts are achieved by going back and forth between these representations and making connections between stages. Students will benefit from seeing parallel samples of each stage and how they transition from one to another.

Read, Draw, Write Process

READ the problem. Read it over and over…. And then read it again.

DRAW a picture that represents the information given. During this step students ask themselves: Can I draw something from this information? What can I draw? What is the best model to show the information? What conclusions can I make from the drawing?

WRITE your conclusions based on the drawings. This can be in the form of a number sentence, an equation, or a statement.

Students are able to draw a model of what they are reading to help them understand the problem. Drawing a model helps students see which operation or operations are needed, what patterns might arise, and which models work and do not work. Students must dive deeper into the problem by drawing models and determining which models are appropriate for the situation.

While students are employing the RDW process they are using several Standards for Mathematical Practice and in some cases, all of them.

Mathematical Discourse and Strategic Questioning

Discourse involves asking strategic questions that elicit from students both how a problem was solved and why a particular method was chosen. Students learn to critique their own and others' ideas and seek out efficient mathematical solutions.

While classroom discussions are nothing new, the theory behind classroom discourse stems from constructivist views of learning where knowledge is created internally through interaction with the environment. It also fits in with socio-cultural views on learning where students working together are able to reach new understandings that could not be achieved if they were working alone.

Underlying the use of discourse in the mathematics classroom is the idea that mathematics is primarily about reasoning not memorization. Mathematics is not about remembering and applying a set of procedures but about developing understanding and explaining the processes used to arrive at solutions.

Asking better questions can open new doors for students, promoting mathematical thinking and classroom discourse. Can the questions you're asking in the mathematics classroom be answered with a simple “yes” or “no,” or do they invite students to deepen their understanding?

Albert Einstein

To help you encourage deeper discussions, here are 100 questions to incorporate into your instruction by Dr. Gladis Kersaint, mathematics expert and advisor for Ready Mathematics.

100 questions that promote Mathematical Discourse

Help students **work together** to make sense of mathematics

1. What **strategy** did you use?
2. Do you **agree**?
3. Do you **disagree**?
4. Would you **ask the rest of the class** that question?
5. Could you **share your method** with the class?
6. What part of what he said **do you understand**?
7. Would someone like to **share** ___?
8. Can you **convince the rest of us** that your answer makes sense?
9. **What do others think** about what [student] said?
10. Can someone **retell or restate** [student]'s explanation?
11. Did you **work together**? In what way?
12. Would anyone like to **add to what was said**?
13. Have you **discussed** this with your group? With others?
14. Did anyone get a **different answer**?
15. **Where** would you go for **help**?
16. **Did everybody get a fair chance** to talk, use the manipulatives, or be the recorder?
17. How could you help another student **without telling them the answer**?
18. **How would you explain** ___ to someone who missed class today?

Help students **rely more on themselves** to determine whether something is mathematically correct

19. Is this a **reasonable answer**?
20. Does that make **sense**?
21. **Why** do you think that? Why is that true?
22. Can you **draw a picture or make a model** to show that?
23. **How** did you reach that conclusion?
24. Does anyone want to **revise** his or her answer?
25. **How were you sure** your answer was right?

Ready

Help students learn to **reason mathematically**

- 26 **How did you begin** to think about this problem?
- 27 What is **another way** you could solve this problem?
- 28 How could you **prove** ______?
- 29 Can you **explain how your answer is different from or the same as** [student]'s answer?
- 30 Let's **break the problem into parts**. What would the parts be?
- 31 Can you **explain this part more specifically**?
- 32 Does that **always work**?
- 33 Can you think of a case where that **wouldn't work**?
- 34 How did you **organize** your information? Your thinking?

Help students **evaluate their own processes** and engage in productive peer interaction

- 35 What do you need to do **next**?
- 36 What have you **accomplished**?
- 37 What are your **strengths and weaknesses**?
- 38 Was your **group participation appropriate and helpful**?

Help students with **problem comprehension**

- 39 What is this problem about? What can you **tell me about it**?
- 40 Do you need to **define or set limits** for the problem?
- 41 How would you **interpret** that?
- 42 Could you **reword that in simpler terms**?
- 43 Is there something that can be **eliminated** or that is **missing**?
- 44 Could you **explain** what the problem is asking?
- 45 What **assumptions** do you have to make?
- 46 What do you **know** about this part?
- 47 Which words were **most important**? Why?

Help students learn to **conjecture, invent, and solve** problems

48 **What would happen if ___?**

49 Do you see a **pattern**?

50 What are some **possibilities** here?

51 Where could you find the **information** you need?

52 How would you **check your steps** or your answer?

53 What **did not work**?

54 How is your solution method the **same as or different from** [student]'s method?

55 Other than retracing your steps, **how can you determine** if your answers are appropriate?

56 How did you **organize** the information? Do you have a **record**?

57 How could you solve this using **tables, lists, pictures, diagrams**, etc.?

58 What have you tried? What **steps** did you take?

59 How would it look if you used this **model** or these **materials**?

60 How would you draw a **diagram or make a sketch** to solve the problem?

61 Is there **another possible answer**? If so, explain.

62 Is there **another way to solve** the problem?

63 Is there **another model** you could use to solve the problem?

64 Is there anything you've **overlooked**?

65 **How did you think** about the problem?

66 What was your **estimate or prediction**?

67 How **confident** are you in your answer?

68 **What else** would you like to know?

69 What do you think comes **next**?

70 Is the solution **reasonable**, considering the context?

71 Did you have a **system**? Explain it.

72 Did you have a **strategy**? Explain it.

73 Did you have a **design**? Explain it.

Help students learn to **connect mathematics, its ideas, and its application**

74 What is the **relationship** between ___ and ___?

75 Have we ever solved a problem **like this before**?

76 What uses of mathematics did you find in the **newspaper** last night?

77 What is the **same**?

78 What is **different**?

79 Did you use skills or build on concepts that were **not necessarily mathematical**?

80 Which **skills or concepts** did you use?

81 What **ideas** have we explored before that were useful in solving this problem?

82 Is there a **pattern**?

83 **Where else** would this strategy be useful?

84 How does this **relate** to ___?

85 Is there a **general rule**?

86 Is there a **real-life situation** where this could be used?

87 How would your method work with **other problems**?

88 What other problem does this seem to **lead to**?

Help students **persevere**

89 Have you tried making a **guess**?

90 **What else** have you tried?

91 Would **another method** work as well or better?

92 Is there **another way** to draw, explain, or say that?

93 Give me another **related problem**. Is there an easier problem?

94 How would you **explain** what you know right now?

Help students focus on the mathematics from **activities**

95 What was **one thing you learned** (or two, or more)?

96 Did you **notice any patterns**? If so, describe them.

97 What **mathematics topics** were used in this investigation?

98 What were the **mathematical ideas** in this problem?

99 What is mathematically **different about these two situations**?

100 What are the **variables** in this problem? What stays **constant**?

Conceptual Understanding

Students demonstrate conceptual understanding in mathematics when they provide evidence that they can:

- recognize, label, and generate examples of concepts;
- use and interrelate models, diagrams, manipulatives, and varied representations of concepts;
- identify and apply principles; know and apply facts and definitions;
- compare, contrast, and integrate related concepts and principles; and
- recognize, interpret, and apply the signs, symbols, and terms used to represent concepts.

Conceptual understanding reflects a student's ability to reason in settings involving the careful application of concept definitions, relations, or representations of either.

Procedural Fluency

Procedural fluency is the ability to:

- apply procedures accurately, efficiently, and flexibly;
- to transfer procedures to different problems and contexts;
- to build or modify procedures from other procedures; and
- to recognize when one strategy or procedure is more appropriate to apply than another.

Procedural fluency is more than memorizing facts or procedures, and it is more than understanding and being able to use one procedure for a given situation. Procedural fluency builds on a foundation of conceptual understanding, strategic reasoning, and problem solving (NGA Center & CCSSO, 2010; NCTM, 2000, 2014). Research suggests that once students have memorized and practiced procedures that they do not understand, they have less motivation to understand their meaning or the reasoning behind them (Hiebert, 1999). Therefore, the development of students' conceptual understanding of procedures should precede and coincide with instruction on procedures.

Math Fact Fluency: Automaticity

Students who possess math fact fluency can recall math facts with automaticity. Automaticity is the ability to do things without occupying the mind with the low-level details required, allowing it to become an automatic response pattern or habit. It is usually the result of learning, repetition, and practice.

K-2 Math Fact Fluency Expectation
K.OA.5 Add and Subtract within 5.
1.OA.6 Add and Subtract within 10.
2.OA.2 Add and Subtract within 20.

Math Fact Fluency: Fluent Use of Mathematical Strategies

First and second grade students are expected to solve addition and subtraction facts using a variety of strategies fluently.

1.OA.6 Add and subtract within 20, demonstrating fluency for addition and subtraction within 10.
Use strategies such as:

- counting on; making ten (e.g., $8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$);
- decomposing a number leading to a ten (e.g., $13 - 4 = 13 - 3 - 1 = 10 - 1 = 9$);
- using the relationship between addition and subtraction; and
- creating equivalent but easier or known sums.

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;

Evidence of Student Thinking

Effective classroom instruction and more importantly, improving student performance, can be accomplished when educators know how to elicit evidence of students' understanding on a daily basis. Informal and formal methods of collecting evidence of student understanding enable educators to make positive instructional changes. An educators' ability to understand the processes that students use helps them to adapt instruction allowing for student exposure to a multitude of instructional approaches, resulting in higher achievement. By highlighting student thinking and misconceptions, and eliciting information from more students, all teachers can collect more representative evidence and can therefore better plan instruction based on the current understanding of the entire class.

Mathematical Proficiency

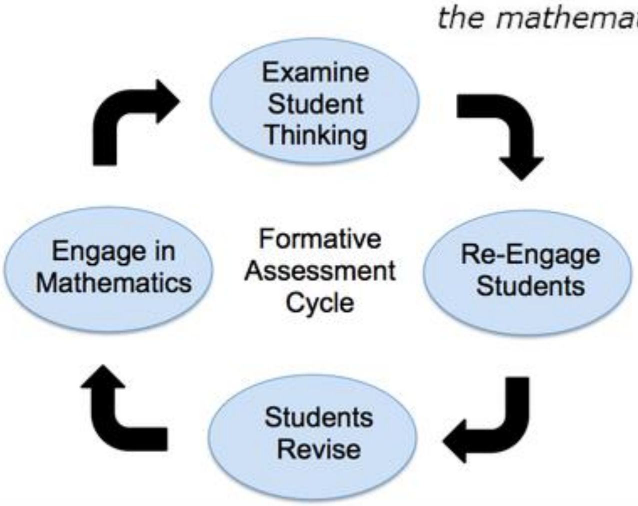
To be mathematically proficient, a student must have:

- Conceptual understanding: comprehension of mathematical concepts, operations, and relations;
- Procedural fluency: skill in carrying out procedures flexibly, accurately, efficiently, and appropriately;
- Strategic competence: ability to formulate, represent, and solve mathematical problems;
- Adaptive reasoning: capacity for logical thought, reflection, explanation, and justification;
- Productive disposition: habitual inclination to see mathematics as sensible, useful, and worthwhile, coupled with a belief in diligence and one's own efficacy.

Evidence should:

- Provide a window in student thinking;
- Help teachers to determine the extent to which students are reaching the math learning goals; and
- Be used to make instructional decisions during the lesson and to prepare for subsequent lesso

> *Formative assessment is an essentially interactive process, in which the teacher can find out whether what has been taught has been learned, and if not, to do something about it. Day-to-day formative assessment is one of the most powerful ways of improving learning in the mathematics classroom.*
>
> (Wiliam 2007, pp. 1054; 1091)



Unit 1 Assessment / Authentic Assessment Framework			
Assessment	**CCSS**	**Estimated Time**	**Format**
Diagnostic Assessment (IREADY)		1-2 blocks	Individual
Chapter 1			
Optional Pre Test1		½ block	Individual
Optional Chapter 1 Test/ Performance Task	2.NBT.1-4	1 block	Individual
Authentic Assessment #1	2.NBT.1-4	½ block	Individual
Chapter 2			
Optional Pre Test 2	2.OA.2 2.NBT.5-7,9	½ block	Individual
Optional Chapter 2 Test/ Performance Task	2.OA.2 2.NBT.5-7,9	1 block	Individual
Authentic Assessment #2	2.NBT5.7,9	1 block	Individual
Chapter 3			
Optional Pre-Test 3	2.NBT.7,9	½ block	Individual
Optional Chapter 3 Test/ Performance Task	2.NBT.7,9	1 block	Individual
Chapter 4			
Optional Pre-Test 4	2.NBT.5,7 2.OA.1	½ block	Individual
Optional Chapter 4 Test/ Performance Task	2.NBT.5,7 2.OA.1	1 block	Individual
Grade 2 Interim Assessment 1	2.NBT.1-7,9 2.OA.1-2	1 Block	Individual

	PLD	**Genesis Conversion**
Rubric Scoring	PLD 5	100
	PLD 4	89
	PLD 3	79
	PLD 2	69
	PLD 1	59

Party Favors

Pia was having a party. She put 10 stickers in each party bag.

a. On the first day she made 10 bags. How many stickers were in her 10 bags all together?

b. On the second day she made 3 more bags with ten stickers in each one. How many stickers total were in her 10 bags plus 3 more bags?

c. On the third day she made 7 more bags with ten stickers in each one. How many stickers total are in her 20 bags of ten?

d. On the fourth day, she made another 10 bags with ten stickers in each one. How many stickers are in her 30 bags of ten?

e. After one week, she had made a total of 50 bags with ten stickers in each one. How many stickers total are in her 50 bags of ten?

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:
CCSS.MATH.CONTENT.2.NBT.A.1.A
100 can be thought of as a bundle of ten tens — called a "hundred."
Mathematical Practice 1,2,3,4,7,8
Individual

SOLUTION

a. With the help of a picture, can count by tens to see that ten groups of ten prizes is one-hundred prizes.

b. There are two main possible approaches. One can either add three bags to the picture above and continue to count. Or one can notice that the three new bags constitute 30 prizes, and since there were already 100 that would make 130 prizes.

c. Since we counted that ten boxes of ten is one hundred, twice that would be two hundreds, or 200.

d. Ten boxes of ten is 100 more. Since we had 200 – or two hundreds – before, adding one more hundred will give three hundreds, or 300.

e. Fifty boxes of ten can be broken up into five collections of ten boxes of ten. Since ten boxes of ten is 100, five of those is five hundreds, or 500.

Level 5: Distinguished Command	Level 4: Strong Command	Level 3: Moderate Command	Level 2: Partial Command	Level 1: No Command
Student can answer all parts correctly. Clearly constructs and communicates a complete response based on explanations/ reasoning using the: • properties of operations • relationship between addition and subtraction relationship Response includes an **efficient** and logical progression of steps.	**Student can at least 4 parts correctly.** Clearly constructs and communicates a complete response for at least one part based on explanations/ reasoning using the: • properties of operations • relationship between addition and subtraction Response includes a logical progression of steps	**Student can at least 3 parts correctly.** Constructs and communicates a complete response based on explanations/reasoning using the: • properties of operations • relationship between addition and subtraction Response includes a logical but incomplete progression of steps. Minor calculation errors	**Student can at least 2 parts correctly.** Constructs and communicates an incomplete response based on explanations/reasoning using the: • properties of operations • relationship between addition and subtraction Response includes an incomplete or Illogical progression of steps.	**Student cannot respond.** The student shows no work or justification.

Peanuts and Ducks

Lee bought a bag of 15 peanuts to feed the ducks. When he got to the lake he saw 6 ducks and 6 more came. He wants to give each duck one peanut.

Part 1:

Does he have enough to give each duck a peanut?

Show how you found the answer using words, numbers, or pictures

Part 2:

How many will be leftover?

Explain your answer using words, numbers, or pictures.

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.
Mathematical Practice 2,6
Individual

SOLUTION: **Part A: Yes** **Correct explanation such as matching peanuts to ducks** **or 6+8 =13** **or 13 + 2 =15** **or 15-2= 13**	**Part 2:** **15-13=2** **Or 15-2= 13** **Or 13+2 =15**

Level 5: Distinguished Command	**Level 4: Strong Command**	**Level 3: Moderate Command**	**Level 2: Partial Command**	**Level 1: No Command**
Student can answer both parts correctly. Clearly constructs and communicates a complete response based on explanations/reasoning using the: • properties of operations • relationship between addition and subtraction relationship Response includes an **efficient** and logical progression of steps.	**Student can answer both parts correctly.** Clearly constructs and communicates a complete response for at least one part based on explanations/ reasoning using the: • properties of operations • relationship between addition and subtraction Response includes a logical progression of steps	**Student can only answer one part correctly.** Constructs and communicates a complete response based on explanations/reasoning using the: • properties of operations • relationship between addition and subtraction Response includes a logical but incomplete progression of steps. Minor calculation errors	**Student can only answer one part correctly.** Constructs and communicates an incomplete response based on explanations/reasoning using the: • properties of operations • relationship between addition and subtraction Response includes an incomplete or Illogical progression of steps.	**Student cannot respond.** The student shows no work or justification.

Connections to the Mathematical Practices

Student Friendly Connections to the Mathematical Practices

1. I can solve problems without giving up.
2. I can think about numbers in many ways.
3. I can explain my thinking and try to understand others.
4. I can show my work in many ways.
5. I can use math tools and tell why I choose them.
6. I can work carefully and check my work.
7. I can use what I know to solve new problems.
8. I can discover and use short cuts.

The **Standards for Mathematical Practice** describe varieties of expertise that mathematics educators at all levels should seek to	
1	**Make sense of problems and persevere in solving them** Mathematically proficient students in Second Grade examine problems and tasks, can make sense of the meaning of t new tasks. In Second Grade, students' work continues to use concrete manipulatives and pictorial representations as continue to solve the task. Lastly, mathematically proficient students complete a task by asking themselves the questi
2	**Reason abstractly and quantitatively** Mathematically proficient students in Second Grade make sense of quantities and relationships while solving tasks. T children in the cafeteria and they are joined by 17 more children. How many students are in the cafeteria? " Second G task above, students can refer to the context of the task to determine that they need to subtract 19 since 19 children l
3	**Construct viable arguments and critique the reasoning of others** Mathematically proficient students in Second Grade accurately use definitions and previously established solutions t 74 - 18, students may use a variety of strategies, and after working on the task, can discuss and critique each other's r
4	**Model with mathematics** Mathematically proficient students in Second Grade model real-life mathematical situations with a number sentence

	explanation of the equation. Likewise, Second Grade students are able to create an appropriate problem situation fro gumballs are now in the machine?"
5	**Use appropriate tools strategically** Mathematically proficient students in Second Grade have access to and use tools appropriately. These tools may inclu Students also have experiences with educational technologies, such as calculators and virtual manipulatives, which su During classroom instruction, students have access to various mathematical tools as well as paper, and determine wh
6	**Attend to precision** Mathematically proficient students in Second Grade are precise in their communication, calculations, and measureme In all mathematical tasks, students in Second Grade communicate clearly, using grade-level appropriate vocabulary a For example, while measuring an object, care is taken to line up the tool correctly in order to get an accurate measure
7	**Look for and make use of structure** Mathematically proficient students in Second Grade carefully look for patterns and structures in the number system a in the Numbers in Base Ten domain, students work with the idea that 10 ones equal a ten, and 10 tens equals 1 hundr In addition, Second Grade students also make use of structure when they work with subtraction as missing addend p
8	**Look for and express regularity in repeated reasoning** Mathematically proficient students in Second Grade begin to look for regularity in problem structures when solving m independently on future tasks. Further, students begin to look for strategies to be more efficient in computations, including doubles strategies and m Lastly, while solving all tasks, Second Grade students accurately check for the reasonableness of their solutions durin

Effective Mathematics Teaching Practices
Establish mathematics goals to focus learning. Effective teaching of mathematics establishes clear goals for the mathematics that students are learning, situates goals within learning progressions, and uses the goals to guide instructional decisions.
Implement tasks that promote reasoning and problem solving. Effective teaching of mathematics engages students in solving and discussing tasks that promote mathematical reasoning and problem solving and allow multiple entry points and varied solution strategies.
Use and connect mathematical representations. Effective teaching of mathematics engages students in making connections among mathematical representations to deepen understanding of mathematics concepts and procedures and as tools for problem solving.
Facilitate meaningful mathematical discourse. Effective teaching of mathematics facilitates discourse among students to build shared understanding of mathematical ideas by analyzing and comparing student approaches and arguments.
Pose purposeful questions. Effective teaching of mathematics uses purposeful questions to assess and advance students' reasoning and sense making about important mathematical ideas and relationships.
Build procedural fluency from conceptual understanding. Effective teaching of mathematics builds fluency with procedures on a foundation of conceptual understanding so that students, over time, become skillful in using procedures flexibly as they solve contextual and mathematical problems.
Support productive struggle in learning mathematics. Effective teaching of mathematics consistently provides students, individually and collectively, with opportunities and supports to engage in productive struggle as they grapple with mathematical ideas and relationships.
Elicit and use evidence of student thinking. Effective teaching of mathematics uses evidence of student thinking to assess progress toward mathematical understanding and to adjust instruction continually in ways that support and extend learning.

5 Practices for Orchestrating Productive Mathematics Discussions	
Practice	Description/ Questions
1. Anticipating	What strategies are students likely to use to approach or solve a challenging high-level mathematical task? How do you respond to the work that students are likely to produce? Which strategies from student work will be most useful in addressing the mathematical goals?
2. Monitoring	Paying attention to what and how students are thinking during the lesson. Students working in pairs or groups Listening to and making note of what students are discussing and the strategies they are using Asking students questions that will help them stay on track or help them think more deeply about the task. (Promote productive struggle)
3. Selecting	This is the process of deciding the *what* and the *who* to focus on during the discussion.
4. Sequencing	What order will the solutions be shared with the class?
5. Connecting	Asking the questions that will make the mathematics explicit and understandable. Focus must be on mathematical meaning and relationships; making links between mathematical ideas and representations.

1st & 2nd Grade Ideal Math Block

Essential Components

FLUENCY: Partner/Small Group
5 min.

CONCRETE, PICTORIAL, and **ABSTRACT** approaches to support **ARITHMETIC FLUENCY** and **FLUENT USE OF STRATEGIES.**

LAUNCH: Whole Group
15-20 min.

Anchor Task: Math In Focus Learn

EXPLORATION: Partner / Small Group

Math In Focus Hands-On, Guided Practice, Let's Explore

INDEPENDENT PRACTICE: Individual

Math In Focus Let's Practice, Workbook, Reteach, Extra Practice, Enrichment

MATH WORKSTATIONS: Pairs / Small Group/ Individual
15-20 min.

DIFFERENTIATED activities designed to **RETEACH, REMEDIATE, ENRICH** student's understanding of concepts.

Small Group Instruction	Technology Lab	Problem Solving Lab	Fluency Lab	Math Journal Lab

SUMMARY: Whole Group

Lesson Closure: Student Reflection; Real Life Connections to Concept

EXIT TICKET (DOL): Individual
5 min.

Students complete independently; Used to guide instructional decisions; Used to set instructional goals for students;

Note:

- Place emphasis on the flow of the lesson in order to ensure the development of students' conceptual understanding.
- Outline each essential component within lesson plans.
- Math Workstations may be conducted in the beginning of the block in order to utilize additional support staff.
- Recommended: 5-10 technology devices for use within **TECHNOLOGY** and **FLUENCY** workstations.

Second Grade PLD

Got It Evidence shows that the student essentially has the target concept or big math idea.		**Not There Yet** Student shows evidence of a major misunderstanding, incorrect concepts or procedure, or a failure to engage in the task.		
PLD Level 5: 100% **Distinguished command**	**PLD Level 4: 89%** **Strong Command**	**PLD Level 3: 79%** **Moderate Command**	**PLD Level 2: 69%** **Partial Command**	**PLD Level 1: 59%** **Little Command**
Student work shows **distinguished levels of understanding** of the mathematics. Student **constructs** and **communicates** a **complete response** based on explanations/reasoning using the: • Tools: ○ Manipulatives ○ Five Frame ○ Ten Frame ○ Number Line ○ Part-Part-Whole Model • Strategies: ○ Drawings ○ Counting All ○ Count On/Back ○ Skip Counting ○ Making Ten ○ Decomposing Number • Precise use of math vocabulary Response includes an **efficient and logical progression** of mathematical reasoning and understanding.	Student work shows **strong levels of understanding** of the mathematics. Student **constructs** and **communicates** a **complete response** based on explanations/reasoning using the: • Tools: ○ Manipulatives ○ Five Frame ○ Ten Frame ○ Number Line ○ Part-Part-Whole Model • Strategies: ○ Drawings ○ Counting All ○ Count On/Back ○ Skip Counting ○ Making Ten ○ Decomposing Number • Precise use of math vocabulary Response includes a **logical progression** of mathematical reasoning and understanding.	Student work shows **moderate levels of understanding** of the mathematics. Student **constructs** and **communicates** a **complete response** based on explanations/reasoning using the: • Tools: ○ Manipulatives ○ Five Frame ○ Ten Frame ○ Number Line ○ Part-Part-Whole Model • Strategies: ○ Drawings ○ Counting All ○ Count On/Back ○ Skip Counting ○ Making Ten ○ Decomposing Number • Precise use of math vocabulary Response includes a **logical but incomplete progression** of mathematical reasoning and understanding. Contains **minor errors.**	Student work shows **partial understanding** of the mathematics. Student **constructs** and **communicates** an **incomplete response** based on student's attempts of explanations/ reasoning using the: • Tools: ○ Manipulatives ○ Five Frame ○ Ten Frame ○ Number Line ○ Part-Part-Whole Model • Strategies: ○ Drawings ○ Counting All ○ Count On/Back ○ Skip Counting ○ Making Ten ○ Decomposing Number • Precise use of math vocabulary Response includes an **incomplete or illogical progression** of mathematical reasoning and understanding.	Student work shows **little understanding** of the mathematics. Student **attempts** to **constructs** and **communicates** a response using the: • Tools: ○ Manipulatives ○ Five Frame ○ Ten Frame ○ Number Line ○ Part-Part-Whole Model • Strategies: ○ Drawings ○ Counting All ○ Count On/Back ○ Skip Counting ○ Making Ten ○ Decomposing Number • Precise use of math vocabulary Response includes **limited evidence of the progression** of mathematical reasoning and understanding.
5 points	**4 points**	**3 points**	**2 points**	**1 point**

21st Century Career Ready Practices

CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.
CRP5. Consider the environmental, social and economic impacts of decisions.
CRP6. Demonstrate creativity and innovation.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP10. Plan education and career paths aligned to personal goals.
CRP11. Use technology to enhance productivity.
CRP12. Work productively in teams while using cultural global competence.

For additional details see **21st Century Career Ready Practices** .

Resources

Engage NY
http://www.engageny.org/video-library?f[0]=im_field_subject%3A19

Common Core Tools
http://commoncoretools.me/
http://www.ccsstoolbox.com/
http://www.achievethecore.org/steal-these-tools

Achieve the Core
http://achievethecore.org/dashboard/300/search/6/1/0/1/2/3/4/5/6/7/8/9/10/11/12

Manipulatives
http://nlvm.usu.edu/en/nav/vlibrary.html
http://www.explorelearning.com/index.cfm?method=cResource.dspBrowseCorrelations&v=s&id=USA-000
http://www.thinkingblocks.com/

Illustrative Math Project :http://illustrativemathematics.org/standards/k8

Inside Mathematics: http://www.insidemathematics.org/index.php/tools-for-teachers

Sample Balance Math Tasks: http://www.nottingham.ac.uk/~ttzedweb/MARS/tasks/

Georgia Department of Education:https://www.georgiastandards.org/Common-Core/Pages/Math-K-5.aspx
Gates Foundations Tasks:http://www.gatesfoundation.org/college-ready-education/Documents/supporting-instruction-cards-math.pdf

Minnesota STEM Teachers' Center: http://www.scimathmn.org/stemtc/frameworks/721-proportional-relationships

Singapore Math Tests K-12: http://www.misskoh.com

Mobymax.com: http://www.mobymax.c