2nd Grade

2018-2019 Curriculum Guide

February 4, 2019- April 18, 2019

Math in Focus

Unit 3: Measurement & Adding and Subtracting within 200

ORANGE PUBLIC SCHOOLS

OFFICE OF CURRICULUM AND INSTRUCTION

OFFICE OF MATHEMATICS

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Unit 3 Overview

- Children are taught the meaning of sum and difference, and mental addition and subtraction using the basic add or subtract the ones, tens, or hundreds strategy, as well as the more advance add 10 then subtract the extra ones and add 100 then subtract the extra tens strategies.
- Children are taught to recognize the $1 bill, $5 bill, $10 bill, and $20 bill. Using bills and coins, children learn to show and count money up to $20. Money provides a natural introduction to decimal notation.
- Children will be taught how to model and name halves, thirds, and fourths based on the number of equal parts a whole is divided into. Bar model drawings learned earlier in Grade 2 can also be used to show fractional parts in different ways.
- Children will learn to read time based on the position of the minute hand on the clock, and that the minute hand tells the number of minutes after the hour. They will learn to use the key terms, A.M and P.M to show morning , afternoon, or night.

Unit 3: Money, Time, Fractions, Add/ Subtract within 1000		
Topic	**Activity**	**Standard**
MIF Chapter 11 Money	Chapter Opener	2.MD.8
	Lesson 1: Coins and Bills (Day 1)	2.MD.8
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MIF Chapter 12 Fractions	Lesson 1: Understanding Fractions	2.G.2-3
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Module 5: Addition and Subtraction within 1000 Word problems to 100		
Topic	**Lesson**	**Student Lesson Objective/ Supportive Videos**
	Lesson 1	Relate 10 more, 10 less, 100 more, and 100 less to addition and subtraction of 10 and 100 https://www.youtube.com/watch?v=0XgypTAkALk
	Lesson 2	Add and subtract multiples of 100, including counting on to subtract https://www.youtube.com/watch?v=JSk-G1h4rr4
	Lesson 3	Add multiples of 100 and some tens within 1,000. https://www.youtube.com/watch?v=HD5FBBWkdGs

Topic A: Strategies for Adding and Subtracting within 1000	Lesson 4	Subtract multiples of 100 and some tens within 1,000 https://www.youtube.com/watch?v=Dpv7iU_Vk-s&list=PLvolZqLMhJmlZvsia322089wv3dAEcFNr&index=4
	Lesson 5	Use the associative property to make a hundred in one addend https://www.youtube.com/watch?v=Yi4lZklvFYY&list=PLvolZqLMhJmlZvsia322089wv3dAEcFNr&index=5
	Lesson 6	Use the associative property to subtract from three-digit numbers and verify solutions with addition https://www.youtube.com/watch?v=Q3C2CJ8zn4M&list=PLvolZqLMhJmlZvsia322089wv3dAEcFNr&index=6
	Lesson 7	Share and critique solution strategies for varied addition and subtraction problems within 1,000. https://www.youtube.com/watch?v=SQPZZ_Qb1lQ&index=7&list=PLvolZqLMhJmlZvsia322089wv3dAEcFNr
Topic B: Strategies for Composing Tens and Hundreds within 1000	Lesson 8 & 9	Relate manipulative representations to the addition algorithm. Lessons. https://www.youtube.com/watch?v=yy4_zRD8Hi8&index=8&list=PLvolZqLMhJmlZvsia322089wv3dAEcFNr https://www.youtube.com/watch?v=_vhuYofwY74&index=9&list=PLvolZqLMhJmlZvsia322089wv3dAEcFNr
	Lesson 10-11	Use math drawings to represent additions with up to two compositions and relate drawings to the addition algorithm https://www.youtube.com/watch?v=Dk0LE2Cuk_w&index=10&list=PLvolZqLMhJmlZvsia322089wv3dAEcFNr https://www.youtube.com/watch?v=W5bz__KDj8A&list=PLvolZqLMhJmlZvsia322089wv3dAEcFNr&index=11
	Lesson 12	Choose and explain solution strategies and record with a written addition method https://www.youtube.com/watch?v=qFXgCN9F-LI&list=PLvolZqLMhJmlZvsia322089wv3dAEcFNr&index=12
Topic C: Strategies for Decomposing Tens and Hundreds within 1000	Lesson 13	Relate manipulative representations to the subtraction algorithm, and use addition to explain why the subtraction method works. https://www.youtube.com/watch?v=JLL6Ms9IXJA&index=13&list=PLvolZqLMhJmlZvsia322089wv3dAEcFNr
	Lesson 14-15	Use math drawings to represent subtraction with up to two decompositions, relate drawings to the algorithm, and use addition to explain why the subtraction method works. https://www.youtube.com/watch?v=6XuBczEZORw&index=14&list=PLvolZqLMhJmlZvsia322089wv3dAEcFNr https://www.youtube.com/watch?v=NnanXV20MmU&index=15&list=PLvolZqLMhJmlZvsia322089wv3dAEcFNr
	Lesson	Subtract from multiples of 100 and from numbers with zero in the tens place https://www.youtube.com/watch?v=5jEt9ZpMh5g&list=PLvolZqLMhJmlZvsia

	16 &17	322089wv3dAEcFNr&index=16 https://www.youtube.com/watch?v=7arB474_W-I&index=17&list=PLvolZqLMhJmlZvsia322089wv3dAEcFNr
	Lesson 18	Apply and explain alternate methods for subtracting from multiples of 100 and from numbers with zero in the tens place. https://www.youtube.com/watch?v=CX2JRjFnoMM&list=PLvolZqLMhJmlZvsia322089wv3dAEcFNr&index=18
Topic D: Student Explanations for Choice of Solution Methods	Lesson 19 & 20	Choose and explain solution strategies and record with a written addition or subtraction method. https://www.youtube.com/watch?v=0oVFN2wIjGE&list=PLvolZqLMhJmlZvsia322089wv3dAEcFNr&index=19 https://www.youtube.com/watch?v=og0jQ1MZDdw&list=PLvolZqLMhJmlZvsia322089wv3dAEcFNr&index=20

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: Numbers and Operations in Base Ten	
2.NBT.6	Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.

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

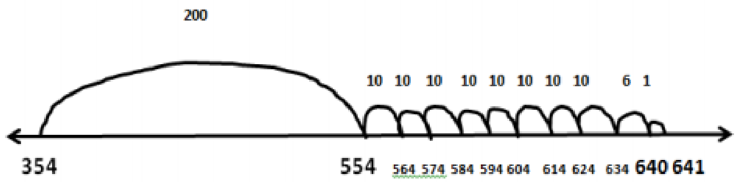
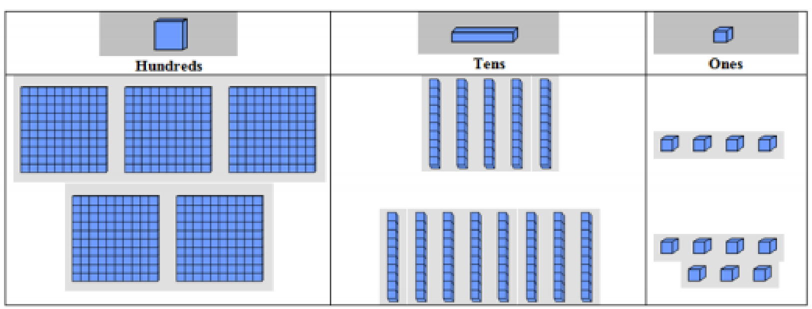
Student C
Place Value Strategies and Associative Property
I broke up all the numbers into tens and ones. First I added up the tens.
40 + 30 + 50 + 20. I changed the order of the numbers to make adding easier. I know that 30 plus 20 equals 50 and 50 more equals 100. Then I added the 40 and got 140.
Then 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	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 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.

<u>Example:</u> **354 + 287 = __**

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

2.NBT.8	Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

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

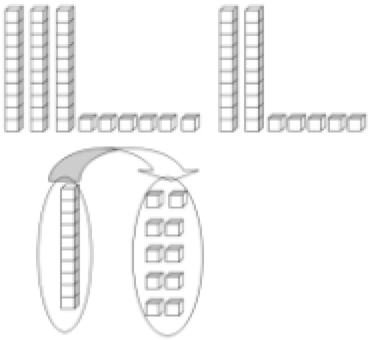
Second graders explain why addition or subtraction strategies work as they apply their knowledge of place value and the properties of operations in their explanation. They may use drawings or objects to support their explanation.

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.

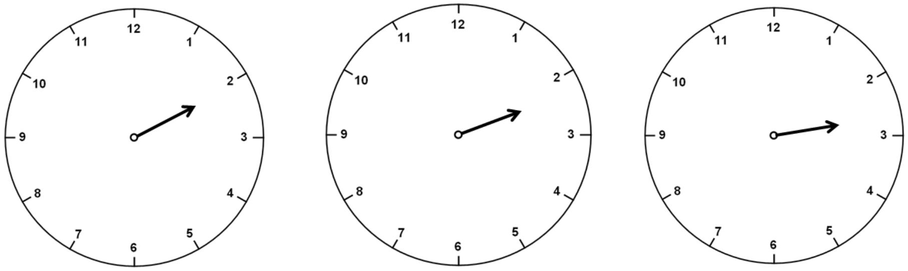
Student B
I used place value blocks and made a pile of 36 and a pile of 25. Altogether, I had 5 tens and 11 ones. 11 ones is the same as one ten and one left over. So, I really had 6 tens and 1 one. That makes 61.



2.MD. 7	Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.

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.  All of these clocks indicte the hour of "two", although they look slightly different. This is an important idea for students as they learn to tell time

2.MD.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?*

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?**

2.G.2	Partition a rectangle into rows and columns of same-size squares and count to find the total number of them

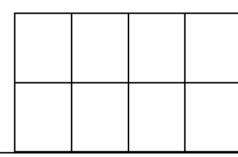
Second graders partition a rectangle into squares (or square-like regions) and then determine the total number of squares. This work connects to the standard 2.OA.4.

Where students are arranging objects in an array of rows and columns. This standard is a precursor to learning about the area of a rectangle and using arrays for multiplication

Example:

Teacher: Partition the rectangle into 2 rows and 4 columns. How many small squares did you make?

= **Student**: There are 8 squares in this rectangle. See- 2, 4, 6, 8. I folded the paper to make sure that they were all the same size.



2.G.3	Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape

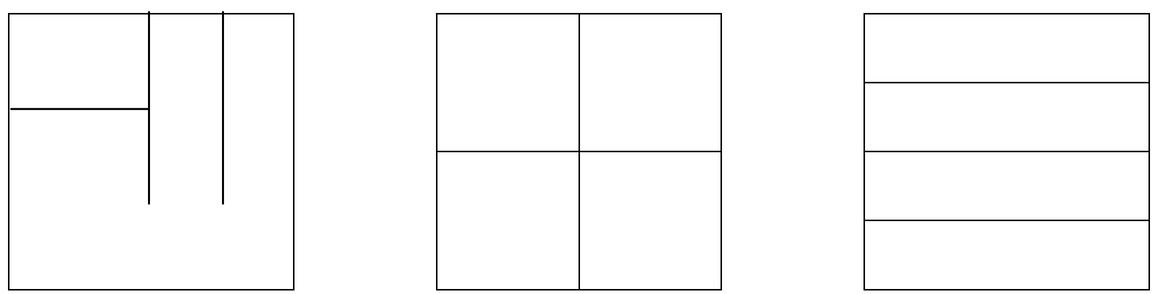
Second Grade students partition circles and rectangles into 2, 3 or 4 equal shares (regions). Students should be given ample experiences to explore this concept with paper strips and pictorial representations. Students should also work with the vocabulary terms halves, thirds, half of, third of, and fourth (or quarter) of. While students are working on this standard, teachers should help them to make the connection that a "whole" is composed of two halves, three thirds, or four fourths.

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

Example:

Teacher: Partition each rectangle into fourths a different way.

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



Teacher: 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.

NOTE: It is important for students to understand that fractional parts may not be symmetrical. The only criteria for equivalent fractions is that the area is equal, as illustrated in the first example above. It is important for students to see circles and rectangles partitioned in multiple ways so they learn to recognize that equal shares can be different shapes within the same whole.

	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:

- Children learned the different types of coins and their respective values in Grade 1: pennies, nickels, dimes, and quarters. With knowledge of the values of the coins, children learned how to exchange them.

- Students learned how to use objects to model addition and subtraction facts.

- Children learned how to skip-count and deduce numbers in a pattern by adding and subtracting while using key vocabulary such as more than or less than in Grade 1. Children also learned the basics of telling time to the hour and half hour by looking at the hour hand or the short hand of an analog clock.

- 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.

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.***

- Students who struggle with adding strings of numbers should begin with three addends with no regrouping. They can use physical models to help keep track of the sums.

- Be sure that all students have ample experience with adding physical models on place valie charts, using benchmark numbers on an open number line.

- Second graders should see the pattern of adding or subtracting 1 to the bigit in the tens place when adding 10. Using a numbe rline or portions of a hundred chart will help them to visualize what happens when they are working with these numbers.

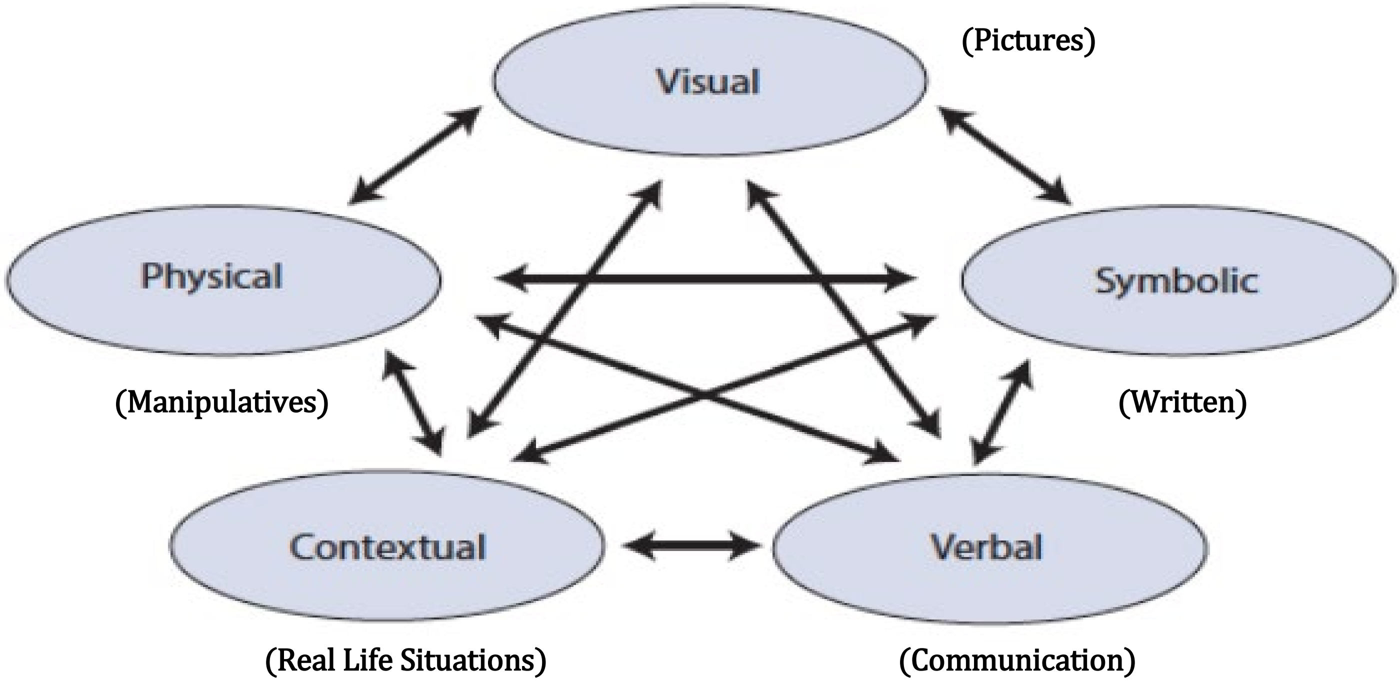
- Some students will likely be confused with the hour and minute hands. For the time 3:45, they may tell the time as 9:15. To address the confusion, make sure they understanding telling time to the hour using the smaller hand on an analog closk before focusing on time to the nearest five minute.

- When counting coins, some second graders may ignore the coins' values and want to count each coin as an individual object, such as a dime and penny are two coins.

- Some students may believe the value of a coin is directly related to its size, such as a nickel is bigger than a dime and is worth more, or a penny is bigger than a dime, so it must also be note worthy.

PARCC Assessment Evidence/Clarification Statements			
CCSS	**Evidence Statement**	**Clarification**	**Math Practices**
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.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	• Tasks have “thin context” or no context	MP 7,8

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:

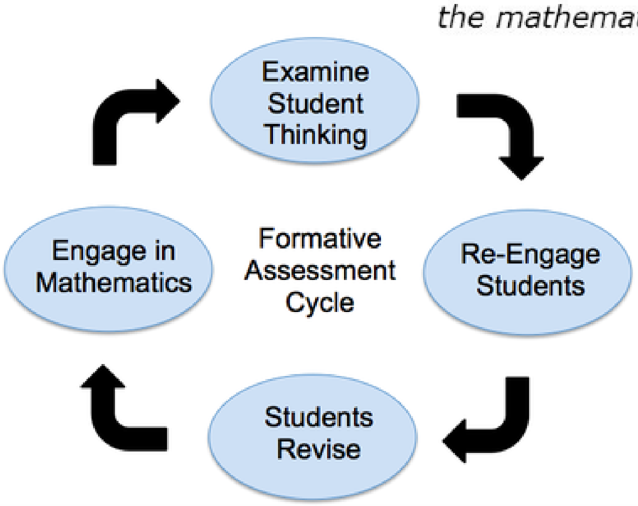
- <u>Conceptual understanding</u>: comprehension of mathematical concepts, operations, and relations;
- <u>Procedural fluency</u>: skill in carrying out procedures flexibly, accurately, efficiently, and appropriately;
- <u>Strategic competence</u>: ability to formulate, represent, and solve mathematical problems;
- <u>Adaptive reasoning</u>: capacity for logical thought, reflection, explanation, and justification;
- <u>Productive disposition</u>: 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 lesson

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 2 Assessment / Authentic Assessment Framework			
Assessment	**CCSS**	**Estimated Time**	**Format**
Chapter 11			
Optional Chapter 11 Test/ Performance Task	2.MD.8	1 block	Individual
Authentic Assessment: Show Money Amounts	2.MD.8	½ block	Individual
Chapter 12			
Optional Chapter 12 Test/ Performance Task	2.G.2-3	1 block	Individual
Chapter 14			
Optional Chapter 14 Test/ Performance Task	2.MD.7	1 block	Individual
Authentic Assessment: Christian's Homework	2.MD.7	1 block	Individual
Optional Module Eureka Math Module 5 Assessment	2.NBT.6-9	1 block	Individual
Grade 2 Interim Assessment 2	2.NBT.6-9 2.G.2-3 2.MD.7-8	1 Block	Individual

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

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 develop in their students.	
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 the task and find an entry point or a way to start the task. Second Grade students also develop a foundation for problem solving strategies and become independently proficient on using those strategies to solve new tasks. In Second Grade, students' work continues to use concrete manipulatives and pictorial representations as well as mental mathematics. Second Grade students also are expected to persevere while solving tasks; that is, if students reach a point in which they are stuck, they can reexamine the task in a different way and continue to solve the task. Lastly, mathematically proficient students complete a task by asking themselves the question, "Does my answer make sense?"
2	**Reason abstractly and quantitatively**
	Mathematically proficient students in Second Grade make sense of quantities and relationships while solving tasks. This involves two processes- decontextualizing and contextualizing. In Second Grade, students represent situations by decontextualizing tasks into numbers and symbols. For example, in the task, "There are 25 children in the cafeteria and they are joined by 17 more children. How many students are in the cafeteria? " Second Grade students translate that situation into an equation, such as: $25 + 17 = \_\_$ and then solve the problem. Students also contextualize situations during the problem solving process. For example, while solving the task above, students can refer to the context of the task to determine that they need to subtract 19 since 19 children leave. The processes of reasoning also other areas of mathematics such as determining the length of quantities when measuring with standard units.
3	**Construct viable arguments and critique the reasoning of others**

	Mathematically proficient students in Second Grade accurately use definitions and previously established solutions to construct viable arguments about mathematics. During discussions about problem solving strategies, students constructively critique the strategies and reasoning of their classmates. For example, while solving 74 - 18, students may use a variety of strategies, and after working on the task, can discuss and critique each other's reasoning and strategies, citing similarities and differences between strategies.
4	**Model with mathematics**
	Mathematically proficient students in Second Grade model real-life mathematical situations with a number sentence or an equation, and check to make sure that their equation accurately matches the problem context. Second Grade students use concrete manipulatives and pictorial representations to provide further explanation of the equation. Likewise, Second Grade students are able to create an appropriate problem situation from an equation. For example, students are expected to create a story problem for the equation 43 + 17 = ___ such as "There were 43 gumballs in the machine. Tom poured in 17 more gumballs. How many 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 include snap cubes, place value (base ten) blocks, hundreds number boards, number lines, rulers, and concrete geometric shapes (e.g., pattern blocks, 3-d solids). Students also have experiences with educational technologies, such as calculators and virtual manipulatives, which support conceptual understanding and higher-order thinking skills. During classroom instruction, students have access to various mathematical tools as well as paper, and determine which tools are the most appropriate to use. For example, while measuring the length of the hallway, students can explain why a yardstick is more appropriate to use than a ruler.
6	**Attend to precision**
	Mathematically proficient students in Second Grade are precise in their communication, calculations, and measurements. In all mathematical tasks, students in Second Grade communicate clearly, using grade-level appropriate vocabulary accurately as well as giving precise explanations and reasoning regarding their process of finding solutions. For example, while measuring an object, care is taken to line up the tool correctly in order to get an accurate measurement. During tasks involving number sense, students consider if their answer is reasonable and check their work to ensure the accuracy of solutions.
7	**Look for and make use of structure**
	Mathematically proficient students in Second Grade carefully look for patterns and structures in the number system and other areas of mathematics. For example, students notice number patterns within the tens place as they connect skip count by 10s off the decade to the corresponding numbers on a 100s chart. While working in the Numbers in Base Ten domain, students work with the idea that 10 ones equal a ten, and 10 tens equals 1 hundred. In addition, Second Grade students also make use of structure when they work with subtraction as missing addend problems, such as 50- 33 = __ can be written as 33+ __ = 50 and can be thought of as," How much more do I need to add to 33 to get to 50?"
8	**Look for and express regularity in repeated reasoning**

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

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 Rubric

<table>
<tr><th colspan="2">Got It
Evidence shows that the student essentially has the target concept or big math idea.</th><th colspan="3">Not There Yet
Student shows evidence of a major misunderstanding, incorrect concepts or procedure, or a failure to engage in the task.</th></tr>
<tr><td>PLD Level 5: 100%
Distinguished command</td><td>PLD Level 4: 89%
Strong Command</td><td>PLD Level 3: 79%
Moderate Command</td><td>PLD Level 2: 69%
Partial Command</td><td>PLD Level 1: 59%
Little Command</td></tr>
<tr>
<td>Student work shows distinguished levels of understanding of the mathematics.

Student constructs and communicates a complete response based on explanations/reasoning using the:
• Tools:
  o Manipulatives
  o Five Frame
  o Ten Frame
  o Number Line
  o Part-Part-Whole Model
• Strategies:
  o Drawings
  o Counting All
  o Count On/Back
  o Skip Counting
  o Making Ten
  o Decomposing Number
• Precise use of math vocabulary
Response includes an efficient and logical progression of mathematical reasoning and understanding.</td>
<td>Student work shows strong levels of understanding of the mathematics.

Student constructs and communicates a complete response based on explanations/reasoning using the:
• Tools:
  o Manipulatives
  o Five Frame
  o Ten Frame
  o Number Line
  o Part-Part-Whole Model
• Strategies:
  o Drawings
  o Counting All
  o Count On/Back
  o Skip Counting
  o Making Ten
  o Decomposing Number
• Precise use of math vocabulary

Response includes a logical progression of mathematical reasoning and understanding.</td>
<td>Student work shows moderate levels of understanding of the mathematics.

Student constructs and communicates a complete response based on explanations/reasoning using the:
• Tools:
  o Manipulatives
  o Five Frame
  o Ten Frame
  o Number Line
  o Part-Part-Whole Model
• Strategies:
  o Drawings
  o Counting All
  o Count On/Back
  o Skip Counting
  o Making Ten
  o Decomposing Number
• Precise use of math vocabulary

Response includes a logical but incomplete progression of mathematical reasoning and understanding.
Contains minor errors.</td>
<td>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:
  o Manipulatives
  o Five Frame
  o Ten Frame
  o Number Line
  o Part-Part-Whole Model
• Strategies:
  o Drawings
  o Counting All
  o Count On/Back
  o Skip Counting
  o Making Ten
  o Decomposing Number
• Precise use of math vocabulary

Response includes an incomplete or illogical progression of mathematical reasoning and understanding.</td>
<td>Student work shows little understanding of the mathematics.

Student attempts to constructs and communicates a response using the:
• Tools:
  o Manipulatives
  o Five Frame
  o Ten Frame
  o Number Line
  o Part-Part-Whole Model
• Strategies:
  o Drawings
  o Counting All
  o Count On/Back
  o Skip Counting
  o Making Ten
  o Decomposing Number
• Precise use of math vocabulary

Response includes limited evidence of the progression of mathematical reasoning and understanding.</td>
</tr>
<tr><td>5 points</td><td>4 points</td><td>3 points</td><td>2 points</td><td>1 point</td></tr>
</table>

2nd Grade Authentic Assessment: Show Money Amounts

Draw each amount of money in two different ways.

Use (P) or (1) for penny. Use (N) or (5) for nickel.

Use (D) or (10) for dime. Use (Q) or (25) for dime.

78¢		
47¢		

.2.MD.C.8: Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately. Example: If you have 2 dimes and 3 pennies, how many cents do you have?

Students may draw pictures (i.e. a circle with a d or a 10 inside for a dime) or use numbers to find the total amount.

Some students may need money manipulatives.

Some students may think that bigger coins are worth more (i.e. they may think the penny is a dime and worth 10 cents).

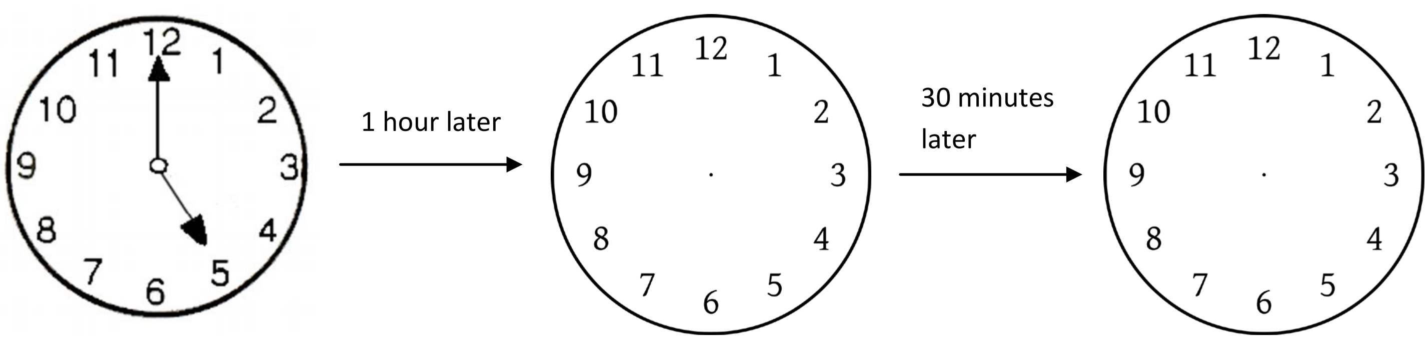
Students who demonstrate partial mastery may show each money amount only one way, or they may show the same way twice.

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: • Strategies based on place value, counting on, making a ten, mental math strategies • Understanding of money Response includes an **efficient** and logical progression of steps.	**Student can at least 3 parts correctly.** Clearly constructs and communicates a complete response for at least one part based on explanations/ reasoning using the: • Strategies based on place value, counting on, making a ten, mental math strategies • Understanding of money Response includes a logical progression of steps	**Student can at least 2 parts correctly.** Constructs and communicates a complete response based on explanations/reasoning using the: • Strategies based on place value, counting on, making a ten, mental math strategies • Understanding of money Response includes a logical but incomplete progression of steps. Minor calculation errors	**Student can at least 1 parts correctly.** Constructs and communicates an incomplete response based on explanations/ reasoning using the: • Strategies based on place value, counting on, making a ten, mental math strategies • Understanding of money Response includes an incomplete or Illogical progression of steps.	**Student cannot respond.** The student shows no work or justification.

2nd Grade Performance Task : Christian's Homework

What time did Christian finish his homework? Use the clues below to find out. Fill in the clocks and times.

Christian spent 1 hour on his science project.
He took another 30 minutes to finish his reading log.
Christian started his homework at 5:00 P.M.



5:00 P.M.

2.MD.7 Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.				
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: • Skip counting, number line, A.M./P.M, Response includes an **efficient** and logical progression of steps.	**Student can at least 3 parts correctly.** Clearly constructs and communicates a complete response for at least one part based on explanations/ reasoning using the: • Skip counting, Number line, A.M./P.M Response includes a logical progression of steps	**Student can at least 2 parts correctly.** Constructs and communicates a complete response based on explanations/reasoning using the: • Skip counting, number line, A.M./P.M Response includes a logical but incomplete progression of steps. Minor calculation errors	**Student can at least 1 parts correctly.** Constructs and communicates an incomplete response based on explanations/reasoning using the: • Skip counting, number line, A.M./P.M, Response includes an incomplete or Illogical progression of steps.	**Student cannot respond.** The student shows no work or justification.

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.com