Sacramento City Unified School District

CCSS-M Teacher Professional Learning

Session #1, October 2014

Grade 2

Packet Contents

(Selected pages relevant to session work)

2 Grade 2

Operations and Algebraic Thinking 2.OA

Represent and solve problems involving addition and subtraction.

1. Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.[1]

Add and subtract within 20.

2. Fluently add and subtract within 20 using mental strategies.[2] By end of Grade 2, know from memory all sums of two one-digit numbers.

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

3. Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.
4. Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.

Number and Operations in Base Ten 2.NBT

Understand place value.

1. Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:
    a. 100 can be thought of as a bundle of ten tens — called a "hundred."
    b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).
2. Count within 1000; skip-count by **2s**, 5s, 10s, and 100s. **CA**
3. Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.
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.

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

5. Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
6. Add up to four two-digit numbers using strategies based on place value and properties of operations.
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.

7.1 Use estimation strategies to make reasonable estimates in problem solving. CA

8. Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.

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[1] See Glossary, Table 1.
[2] See standard 1.OA.6 for a list of mental strategies.

Common Core State Standards - Mathematics
Standards for Mathematical Practices – 2nd Grade

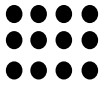
Standard for Mathematical Practice	2nd Grade
1: Make sense of problems and persevere in solving them. Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, "Does this make sense?" They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.	In second grade, students realize that doing mathematics involves solving problems and discussing how they solved them. Students explain to themselves the meaning of a problem and look for ways to solve it. They may use concrete objects or pictures to help them conceptualize and solve problems. They may check their thinking by asking themselves, -Does this make sense? They make conjectures about the solution and plan out a problem-solving approach.
2: Reason abstractly and quantitatively. Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to *decontextualize*-to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents-and the ability to *contextualize*, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.	Younger students recognize that a number represents a specific quantity. They connect the quantity to written symbols. Quantitative reasoning entails creating a representation of a problem while attending to the meanings of the quantities. Second graders begin to know and use different properties of operations and relate addition and subtraction to length.

3: Construct viable arguments and critique the reasoning of others. Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and-if there is a flaw in an argument-explain what it is. Elementary students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions. Such arguments can make sense and be correct, even though they are not generalized or made formal until later grades. Later, students learn to determine domains to which an argument applies. Students at all grades can listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.	Second graders may construct arguments using concrete referents, such as objects, pictures, drawings, and actions. They practice their mathematical communication skills as they participate in mathematical discussions involving questions like -How did you get that? -Explain your thinking, and -Why is that true? They not only explain their own thinking, but listen to others' explanations. They decide if the explanations make sense and ask appropriate questions.
4: Model with mathematics. Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. In early grades, this might be as simple as writing an addition equation to describe a situation. In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community. By high school, a student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another. Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.	In early grades, students experiment with representing problem situations in multiple ways including numbers, words (mathematical language), drawing pictures, using objects, acting out, making a chart or list, creating equations, etc. Students need opportunities to connect the different representations and explain the connections. They should be able to use all of these representations as needed.

5: Use appropriate tools strategically. Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. For example, mathematically proficient high school students analyze graphs of functions and solutions generated using a graphing calculator. They detect possible errors by strategically using estimation and other mathematical knowledge. When making mathematical models, they know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. Mathematically proficient students at various grade levels are able to identify relevant external mathematical resources, such as digital content located on a website, and use them to pose	In second grade, students consider the available tools (including estimation) when solving a mathematical problem and decide when certain tools might be better suited. For instance, second graders may decide to solve a problem by drawing a picture rather than writing an equation.
6: Attend to precision. Mathematically proficient students try to communicate precisely to others. They try to use clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They are careful about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context. In the elementary grades, students give carefully formulated explanations to each other. By the time they reach high school they have learned to examine claims and make explicit use of definitions.	As children begin to develop their mathematical communication skills, they try to use clear and precise language in their discussions with others and when they explain their own reasoning.

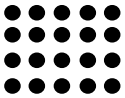
7: Look for and make use of structure. Mathematically proficient students look closely to discern a pattern or structure. Young students, for example, might notice that three and seven more is the same amount as seven and three more, or they may sort a collection of shapes according to how many sides the shapes have. Later, students will see 7 × 8 equals the well remembered 7 × 5 + 7 × 3, in preparation for learning about the distributive property. In the expression $x2 + 9x + 14$, older students can see the 14 as 2 × 7 and the 9 as 2 + 7. They recognize the significance of an existing line in a geometric figure and can use the strategy of drawing an auxiliary line for solving problems. They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects. For example, they can see $5 – 3(x – y)2$ as 5 minus a positive number times a square and use that to realize that its value cannot be more than 5 for any real numbers x and y.	Second graders look for patterns. For instance, they adopt mental math strategies based on patterns (making ten, fact families, doubles).
8: Look for and express regularity in repeated reasoning. Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. Upper elementary students might notice when dividing 25 by 11 that they are repeating the same calculations over and over again, and conclude they have a repeating decimal. By paying attention to the calculation of slope as they repeatedly check whether points are on the line through (1, 2) with slope 3, middle school students might abstract the equation $(y – 2)/(x – 1) = 3$. Noticing the regularity in the way terms cancel when expanding $(x – 1)(x + 1)$, $(x – 1)(x2 + x + 1)$, and $(x – 1)(x3 + x2 + x + 1)$ might lead them to the general formula for the sum of a geometric series. As they work to solve a problem, mathematically proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.	Students notice repetitive actions in counting and computation, etc. When children have multiple opportunities to add and subtract, they look for shortcuts, such as rounding up and then adjusting the answer to compensate for the rounding. Students continually check their work by asking themselves, -Does this make sense?

commutative property of multiplication, students add either the rows or the columns and arrive at the same solution (**MP.2**). Students write equations that represent the total as the sum of equal addends as shown in the following example.



4 + 4 + 4 = 12

3 + 3 + 3 + 3 = 12



5 + 5 + 5 + 5 = 20

4 + 4 + 4 + 4 + 4 = 20

The first example will support student understanding that 3 × 4 = 4 × 3, while the second example supports the fact that 4 × 5 = 5 × 4.

(Adapted from Arizona 2012, N. Carolina 2013, Georgia 2011, and KATM 2nd FlipBook 2012)

[Note: Sidebar]

Focus, Coherence, and Rigor:

Student work in this cluster reinforces addition skills and understandings and is connected to major work in the earlier clusters "Represent and solve problems involving addition and subtraction" and "Add and subtract within 20." (**2.OA.1-2▲**). Also, as students work with odd and even groups (**2.OA.3**) they build a conceptual understanding of equal groups, which supports their introduction to multiplication and division in grade 3.

Domain: Number and Operations in Base Ten

In first grade, students viewed two-digit numbers as amounts of tens and ones. A critical area of instruction in grade two is to extend students' understanding of base-ten notation. Second grade students understand multi-digit numbers (up to 1000). They add and subtract within 1000 and become fluent with addition and subtraction within 100. (Adapted from Progressions K-5 NBT 2011).

Number and Operations in Base Ten	2.NBT
Understand place value.	

1. Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:
    a. 100 can be thought of as a bundle of ten tens — called a "hundred."
    b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).
2. Count within 1000; skip-count by **2s**, 5s, 10s, and 100s. **CA**
3. Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.
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.

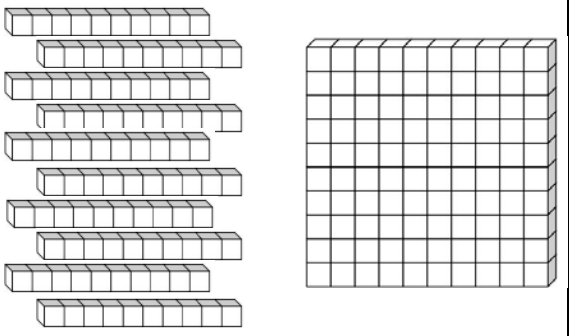
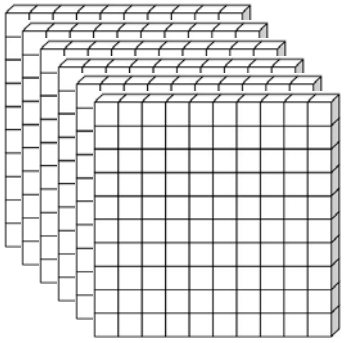
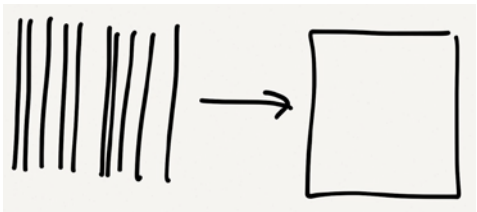
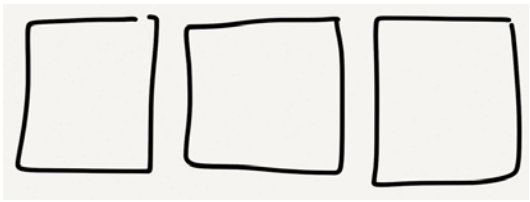
Second grade students understand that the digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones (**2.NBT.1▲**). They understand the following as special cases:

a. 100 can be thought of as a bundle of ten "tens" — called a "hundred."

b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).

Second grade students build on their previous work with groups of tens to make bundles of 100s, with or without leftovers, using base-ten blocks, cubes in towers of 10, ten frames, etc. and math drawings that initially show the ten tens within one hundred but then move to a quick-hundred version that is a drawn square in which students visualize ten tens. Bundling hundreds will support students' discovery of place value patterns (**MP.7**). Students explore the idea that numbers such as 100, 200, 300, etc., are groups of hundreds that have "0" in the tens and ones places. Students might represent numbers using place value (base ten) blocks (**MP.1**).

Examples: Recognizing 10 tens as 1 hundred.
Using Base-Ten Blocks:

<table>
<tr><td>These have the same value:
  </td><td>Six hundreds is the same as 600:
  </td></tr>
<tr><td colspan="2">Using Math Drawings:</td></tr>
<tr><td>When I bundle 10 “ten-sticks” I get 1 “hundred-flat.”
  </td><td>The picture shows 3 hundreds, or 300.
  </td></tr>
</table>

As students represent various numbers, they associate number names with number quantities (**MP.2**). For example, 243 can be expressed as both “2 groups of hundred, 4 groups of ten and 3 ones” and “24 tens and 3 ones.” Students can read number names as well as place value concepts to say a number. For example, 243 should be read as “two hundred forty-three” as well as “2 hundreds, 4 tens, and 3 ones.” Flexibility with seeing a number like 240 as “2 hundreds and 4 tens” as well as “24 tens” is an important indicator of place-value understanding.

In kindergarten, students were introduced to counting by tens. In second grade they extend this to skip count by **2s**, 5s, 10s and 100s **(2.NBT.2▲)**. Exploring number patterns can help students skip count. For example, when skip counting by 5s, the ones digit alternates between 5 and 0, and when skip counting by 10s and 100s, only the tens and hundreds digits change, increasing by one each time. In this way, skip counting can reinforce students’ place value understanding. Work with skip counting lays a foundation for multiplication;

however, since students do not keep track of the number of groups they have counted they are not yet learning true multiplication. The ultimate goal is for second graders to count in multiple ways without visual support.

Focus, Coherence, and Rigor:
As students explore number patterns to skip-count they also develop mathematical practices such the meaning of written quantities (**MP.2**) and number patterns and structures in the number system (**MP.7**).

Grade two students need opportunities to read and represent numerals in various ways **(2.NBT.3▲).** For example:

- Standard form (e.g., 637)
- Base-ten numerals in standard form (e.g., 6 hundreds, 3 tens and 7 ones)
- Number names in word form (e.g., six hundred thirty seven)
- Expanded form (e.g., 600 + 30 + 7)
- Equivalent representations (e.g., 500 + 130 + 7; 600 + 20 + 17; 30 + 600 + 7)

When students read the expanded form for a number, they might say “6 hundreds plus 3 tens plus 7 ones” or “600 plus 30 plus 7.” Expanded form is a valuable skill when students use place value strategies to add and subtract large numbers (see also **2.NBT.7**).

Second grade students use the symbols for greater than (>), less than (<) and equal to (=) to compare numbers within 1000 **(2.NBT.4▲)**. Students build on work in standards (**2.NBT.1▲**) and (**2.NBT.3▲**) by examining the amounts of hundreds, tens, and ones in each number. To compare numbers, students apply their understanding of place value. The goal is for students to understand they look at the numerals in the hundreds place first, then the tens place, and if necessary the ones place. Students should have experience communicating their

303 comparisons in words before using only symbols to indicate greater than, less
304 than, and equal to.
305

Example: Compare 452 and 455.
Student 1: Student might explain 452 has 4 hundreds 5 tens and 2 ones and 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. So, 452 is less than 455 or 452 < 455.
Student 2: Student might think 452 is less than 455. I know this because when I count up I say 452 before I say 455.

306
307 As students compare numbers they also develop mathematical practices such as
308 making sense of quantities (**MP.2**), understanding the meaning of symbols
309 (**MP.6**), and making use of number patterns and structures in the number system
310 (**MP.7**).
311

Number and Operations in Base Ten 2.NBT
Use place value understanding and properties of operations to add and subtract. 5. Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. 6. Add up to four two-digit numbers using strategies based on place value and properties of operations. 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. **7.1 Use estimation strategies to make reasonable estimates in problem solving. CA** 8. Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900. 9. Explain why addition and subtraction strategies work, using place value and the properties of operations.[3]

312
313 Standards **(2.NBT.5-7▲)** are crucial for attaining one of the four critical areas of
314 instruction in grade four. It is here that students apply models of addition and
315 subtraction to develop, discuss and later use efficient, accurate, and

[3] Explanations may be supported by drawings or objects.

Cluster: Understand place value.

Standard: **2.NBT.1**. Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:

a. 100 can be thought of as a bundle of ten tens—called a "hundred."
b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).

Standards for Mathematical Practices (MP) to be emphasized:

MP.2. Reason abstractly and quantitatively.
MP.7. Look for and make use of structure.
MP.8. Look for and express regularity in repeated reasoning.

Connections:

This cluster is connected to the Second Grade Critical Area of Focus #1, **Extending understanding of base-ten notation**.

This cluster is connected to *Extend the counting sequence* and *Understand place value* in Grade 1, to *Work with equal groups of objects to gain foundations for multiplication* in Grade 2, and to *Use place value understanding and properties of operations to perform multi-digit arithmetic* in Grade 3.

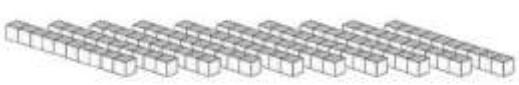
Explanations and Examples: (2.NBT.1-4)

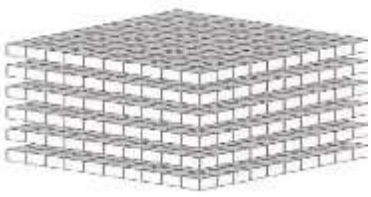
2.NBT.1 calls for students to work on decomposing numbers by place value. Students should have ample experiences with concrete materials and pictorial representations examining that numbers all numbers between 100 and 999 can be decomposed into hundreds, tens, and ones. Interpret the value of a digit (1-9 and 0) in a multi-digit numeral by its position within the number with models, words and numerals.

Use 10 as a benchmark number to compose and decompose when adding and subtracting whole numbers.

2.NBT.1a calls for students to extend their work from 1st Grade by exploring a hundred as a unit (or bundle) of ten tens.

2.NBT.1b builds on the work of **2.NBT.2a.** Students should explore the idea that numbers such as 100, 200, 300, etc., are groups of hundreds that have no tens or ones. Students can represent this with place value (base 10) blocks.





6 hundreds are the same as 600

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Understanding that 10 ones make one ten and that 10 tens make one hundred is fundamental to students' mathematical development. Students need multiple opportunities counting and "bundling" groups of tens in first grade. In second grade, students build on their understanding by making bundles of 100s with or without leftovers using base ten blocks, cubes in towers of 10, ten frames, etc. This emphasis on bundling hundreds will support students' discovery of place value patterns.

As students are representing the various amounts, it is important that emphasis is placed on the language associated with the quantity. For example, 243 **can be expressed in multiple ways** such as 2 groups of hundred, 4 groups of ten and 3 ones, as well as 24 tens and 3 ones. When students read numbers, they should read in standard form as well as using place value concepts. For example, 243 should be read as "two hundred forty-three" as well as two hundreds, 4 tens, 3 ones. (A document camera or interactive whiteboard can also be used to demonstrate "bundling" of objects. This gives students the opportunity to communicate their thinking).

Instructional Strategies: (2.NBT.1-4)

The understanding that 100 is 10 tens or 100 ones is critical to the understanding of place value. Using proportional models like base-ten blocks and bundles of tens along with numerals on place-value mats provides connections between physical and symbolic representations of a number. These models can be used to compare two numbers and identify the value of their digits.

Model three-digit numbers using base-ten blocks in multiple ways. For example, 236 can be 236 ones, or 23 tens and 6 ones, or 2 hundreds, 3 tens and 6 ones, or 20 tens and 36 ones. Use activities and games that have students match different representations of the same number.

Provide games and other situations that allow students to practice skip-counting. Students can use nickels, dimes and dollar bills to skip count by 5, 10 and 100. Pictures of the coins and bills can be attached to models familiar to students: a nickel on a five-frame with 5 dots or pennies and a dime on a ten-frame with 10 dots or pennies.

On a number line, have students use a clothespin or marker to identify the number that is ten more than a given number or five more than a given number.

Have students create and compare all the three-digit numbers that can be made using numbers from 0 to 9. For instance, using the numbers 1, 3, and 9, students will write the numbers 139, 193, 319, 391, 913 and 931. When students compare the numerals in the hundreds place, they should conclude that the two numbers with 9 hundreds would be greater than the numbers showing 1 hundred or 3 hundreds. When two numbers have the same digit in the hundreds place, students need to compare their digits in the tens place to determine which number is larger.

Common Misconceptions: (2.NBT.1-4)

Some students may not move beyond thinking of the number 358 as 300 ones plus 50 ones plus 8 ones to the concept of 8 singles, 5 bundles of 10 singles or tens, and 3 bundles of 10 tens or hundreds. Use base-ten blocks to model the collecting of 10 ones (singles) to make a ten (a rod) or 10 tens to make a hundred (a flat). It is important that students connect a group of 10 ones with the word *ten* and a group of 10 tens with the word *hundred.*

Domain: **Number and Operations in Base Ten (NBT)**

Cluster: Understand place value.

Standard: **2.NBT.2.** Count within 1000; skip-count by 5s, 10s, and 100s.

Standards for Mathematical Practices (MP) to be emphasized:

MP.2. Reason abstractly and quantitatively.
MP.6. Attend to precision.
MP.7. Look for and make use of structure.
MP.8. Look for and express regularity in repeated reasoning.

Connections:

See 2.NBT.1

Explanations and Examples:

2.NBT.2 calls for students to count within 1,000. This means that students are expected to "count on" from any number and say the next few numbers that come afterwards.

Understand that counting by 2s, 5s and 10s is counting groups of items by that amount.

Example:
What are the next 3 numbers after 498? *499, 500, 501*.
When you count back from 201, what are the first 3 numbers that you say? *200, 199, 198*.
This standard also introduces skip counting by 5s and 100s. Students are introduced to skip counting by 10s in First Grade. Students should explore the patterns of numbers when they skip count. When students skip count by 5s, the ones digit alternates between 5 and 0. When students skip count by 100s, the hundreds digit is the only digit that changes, and it increases by one number.

Students need many opportunities counting, up to 1000, from different starting points. They should also have many experiences skip counting by 5s, 10s, and 100s to develop the concept of place value.

Examples:

- The use of the 100s chart may be helpful for students to identify the counting patterns.
- The use of money (nickels, dimes, dollars) or base ten blocks may be helpful visual cues.
- The use of an interactive whiteboard may also be used to develop counting skills.

The ultimate goal for second graders is to be able to count in multiple ways with no visual support.

Domain: **Number and Operations in Base Ten (NBT)**
Cluster: Understand place value.
Standard: **2.NBT.3**. Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.
Standards for Mathematical Practices (MP) to be emphasized: MP.2. Reason abstractly and quantitatively. MP. 6 Attend to precision. MP.7. Look for and make use of structure. MP.8. Look for and express regularity in repeated reasoning.
Connections: See 2.NBT.1
Explanations and Examples: **2.NBT.3** calls for students to read, write and represent a number of objects with a written numeral (number form or standard form). These representations can include place value (base 10) blocks, pictorial representations or other concrete materials. Remember that when reading and writing whole numbers, the word "and" should **not** be used. **Example**: 235 is written as two hundred thirty-five. Students need many opportunities reading and writing numerals in multiple ways. **Examples**: • Base-ten numerals 637 (standard form) • Number names six hundred thirty seven (written form) • Expanded form 600 + 30 + 7 (expanded notation) When students say the expanded form, it may sound like this: "6 hundreds plus 3 tens plus 7 ones" OR 600 plus 30 plus 7."

Domain: **Number and Operations in Base Ten (NBT)**

Cluster: Understand place value.

Standard: **2.NBT.4**. Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons.

Standards for Mathematical Practices (MP) to be emphasized:

MP.2. Reason abstractly and quantitatively.
MP.6. Attend to precision.
MP.7. Look for and make use of structure.
MP.8. Look for and express regularity in repeated reasoning.

Connections:

See 2.NBT.1

Explanations and Examples:

2.NBT.4 builds on the work of **2.NBT.1** and **2.NBT.3** by having students compare two numbers by examining the amount of hundreds, tens and ones in each number. Students are introduced to the symbols greater than (>), less than (<) and equal to (=) in First Grade, and use them in Second Grade with numbers within 1,000. Students should have ample experiences communicating their comparisons in words before using only symbols in this standard.

Example: 452 __ 455

Student 1
452 has 4 hundreds 5 tens and 2 ones. 455 has 4 hundreds 5 tens and 5 ones. They have the same number of hundred and the same number of tens, but 455 has 5 ones and 452 only has 2 ones. 452 is less than 455. 452<455

Student 2
452 is less than 455. I know this because when I count up I say 452 before I say 455.

Students may use models, number lines, base ten blocks, interactive whiteboards, document cameras, written words, and/or spoken words that represent two three-digit numbers. To compare, students apply their understanding of place value. They first attend to the numeral in the hundreds place, then the numeral in tens place, then, if necessary, to the numeral in the ones place.

Comparative language includes but is not limited to: more than, less than, greater than, most, greatest, least, same as, equal to and not equal to. Students use the appropriate symbols to record the comparisons.

2.NBT. 1-4

SEQUENCE OF LEARNING OUTCOMES FROM CURRICULUM MAP

1.) Understand that a three-digit number represents amounts of hundreds, tens, and ones. **2.NBT.1**

2.) Represent numbers within 1000 in multiple ways, (e.g., 103 = 10 tens and 3 ones, 103 = 9 tens and 13 ones). **2.NBT.1**

3.) Understand that 100 = 1 hundred and no tens and no ones, 200 = 2 hundreds and no tens and no ones… **2.NBT.1b**

4.) Count within 1000 by 1s, 2s, s, 10s, and 100s. **2NBT.2**

5.) Read and write numbers to 1000 including number names. **2.NBT.3**

6.) Read and write numbers to 1000 using expanded form. **2.NBT.3**

7.) Compare three-digit numbers within 1000 based on place-value, including the use of comparison symbols. **2.NBT.4**

2.NBT. 1-4

LEARNING OUTCOMES FROM envision TOPIC 5

LESSON:

5-1 Group objects into tens and ones to show two-digit numbers. **2.NBT.1a**

5-2 Read and write number words for numbers 0 – 99. **2.NBT.3**

5-3 Compare two-digit numbers using symbols. **2.NBT.4**

5-4 Identify and write numbers that are one before and one after given numbers. **2.NBT.2**

5- 7 Use data from a chart to solve problems. **2.NBT.1a, 2.NBT.4**

2.NBT. 1-4

LEARNING OUTCOMES FROM envision TOPIC 10

LESSON:

10-1 Count by hundreds to 1000. **2.NBT.1a, 2.NBT.1b, 2.NBT.2**

10-2 Use place value models to show numbers up to 1000. **2.NBT.1a, 2.NBT.1b, 2.NBT.3**

10-3 Identify and record three-digit numbers in expanded form, standard form, and number word form. **2.NBT.1a, 2.NBT.1b, 2.NBT.3**

10-5 Find, identify, and apply number patterns to numbers on a hundred chart. **2.NBT.2** (This lesson also addresses content from 2.NBT.8.)

10-6 Skip count by different amounts on the number line and use the patterns to identify the numbers that come next. **2.NBT.2**

10-7 Compare three-digit numbers using the symbols <, =, >. **2.NBT.4**

10-8 Solve problems by finding number patterns. **2.NBT.2, 2.NBT.4**

Name _____

Topic **5**
Test

Mark the best answer.

1. What number is one before 83?

Ⓐ 13

Ⓑ 48

Ⓒ 82

Ⓓ 88

2. Which number is thirty-seven?

Ⓐ 73

Ⓑ 37

Ⓒ 17

Ⓓ 13

3. Which shows how to compare 50 and 25?

Ⓐ $50 < 25$

Ⓑ $50 > 25$

Ⓒ $25 > 50$

Ⓓ $25 = 50$

4. What number is one after 68?

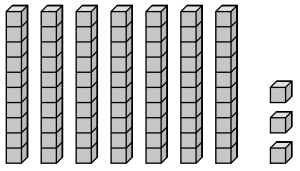
Ⓐ 67

Ⓑ 69

Ⓒ 86

Ⓓ 87

5. What number does the picture show?



Ⓐ 13

Ⓑ 37

Ⓒ 73

Ⓓ 70

Name _____

6. What number is 10 more than 52?

_____

7. What number is 10 less than 39?

_____

8. Is 10 an even number? Explain.

_____

_____

_____

9. Circle all the odd numbers.

19 15 10 16 17 8

Use the clues to find the secret number.

10. It is less than 42.
It is greater than 35.
It has 9 ones.

_____

31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60

CULMINATING TASK: Carol's Numbers

Approximately 2 Days (Adopted from NYC Department of Education)

This is the culminating task which incorporates all four standards in this unit.

STANDARDS FOR MATHEMATICAL CONTENT:

MCC2.NBT.1 Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:

a. 100 can be thought of as a bundle of ten tens — called a "hundred."
b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).

MCC2.NBT.2 Count within 1000; skip-count by 5s, 10s, and 100s.

MCC2.NBT.3 Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.

MCC2.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.

STANDARDS FOR MATHEMATICAL PRACTICE

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

BACKGROUND KNOWLEDGE

By this point in the unit, students have had experience:

- understanding the value placed on the digits within a three-digit number
- recognizing that a hundred is created from ten groups of ten
- using skip counting strategies to skip count by 5s, 10s, and 100s within 1,000
- representing numbers to 1,000 by using numbers, number names, and expanded form
- comparing multi-digit numbers using >, =, <

ESSENTIAL QUESTIONS

- How can place value help us tell which of two or more numbers is greater?
- Why should you understand place value?
- What are different ways we can show or make (represent) a number?
- What is the difference between place and value?

MATERIALS

- Carol's Number's

GROUPING

Individual

TASK DESCRIPTION, DEVELOPMENT AND DISCUSSON

This culminating task represents the level of depth, rigor, and complexity expected of all second grade students to demonstrate evidence of learning of standards stated above. Students will show their understanding of manipulating digits in each place value position. Skip counting is then addressed, if your students have not had adequate practice skip counting by any number refer back to the Number Hop task. Finally, students will be comparing numbers and writing numbers in expanded form, refer back to the Base Ten Pictures task and What's my Number for students that need more clarification on these skills.
(Task adopted from New York Department of Education, Common Core Aligned Task with Instructional Supports, http://schools.nyc.gov/NR/rdonlyres/CAC1375E-6DF9-475D-97EE-E94BAB0BEFAB/0/NYCDOEG2MathCarolsNumbers_Final_020112.pdf)

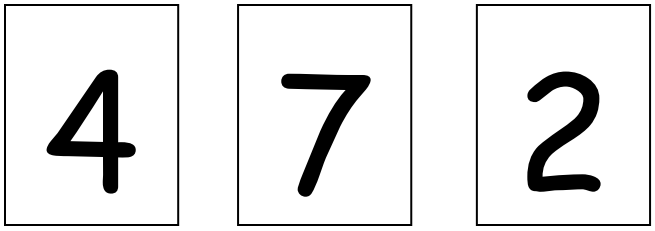
Assessment should be administered on two separate days.

For examples of scored student work, please visit: http://www.scboces.org/17621092392658243/lib/17621092392658243/2nd_Grade_-_Carols_Numbers.pdf

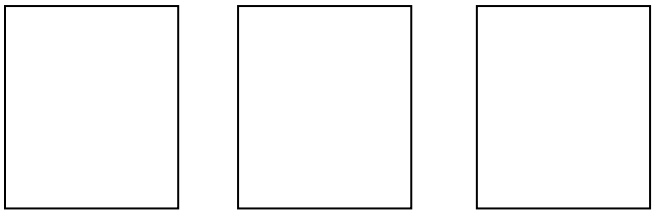
Name _____ **Date:** _____

CAROL'S NUMBERS - Part I – NBT1

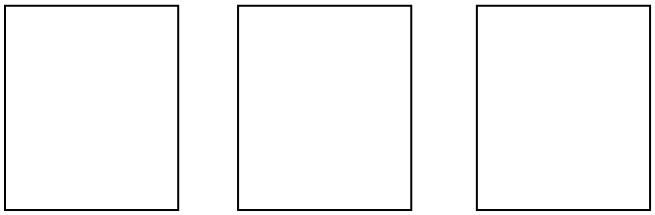
Carol has three number cards.



1. What is the largest three-digit number Carol can make with her cards?



2. What is the smallest three-digit number Carol can make with her cards?



3. Explain to Carol how she can make the smallest possible number using her three cards.

_____

_____

_____

_____

4. Carol's teacher asked her what the value of the 7 is in 472. She answered that it was in the tens place.

Did she answer his teacher's question? If yes, explain why. If no, what is the correct answer?

Carol's Numbers - Part II – NBT 1, NBT 2

Carol likes to jump rope. When she jumps, she likes to skip count by 5's, 10's and 100's.

5. This time Carol skip-counts by 5's. She stopped at 45. Draw her jumps.

6. How many jumps will it take to reach 45? _____

7. How do you know? _____

8. Carol decided to start counting at 28 because that was the date today.

She counted by tens this time. What comes next?

28, _____, _____, _____, _____, _____, _____

9. Carol jumped rope five times. She skip counted by 100 as she jumped. Think about the numbers she called out. Which place changes and which places stay the same? Explain your answer. (NBT.1)

_____

_____

_____

Carol's Numbers - Part 3 – NBT 3

10 – 12. Help Carol write in expanded notation. Write the following numbers in expanded form. (ex. 496 = 400 + 90 + 6)

672 = _____

999 = _____

205 = _____

13. Write 500 + 5 in standard form. _____

14. How would you write 205 with words?

_____

Carol's Numbers - Part 4 – NBT 4

15 – 17. Carol and Mya collect stickers. They each have three books of stickers. They wrote down the number of stickers they had in each book.

Use the symbols <, >, and = to compare the number of stickers that they have.

CAROL'S STICKERS	>, <, or =	MYA'S STICKERS
345		342
99		102
580		508