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GRADE 2 • MODULE 3
Place Value, Counting, and Comparison of Numbers to 1,000

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Grade 2 • Module 3
Place Value, Counting, and Comparison of Numbers to 1,000

OVERVIEW

In Module 2, students added and subtracted measurement units within 100 (2.MD.5, 2.MD.6), a meaningful application of their work from Module 1 (2.NBT.5) and a powerful bridge into the base ten units of Grade 2.

In this 25-day Grade 2 module, students expand their skill with and understanding of units by bundling ones, tens, and hundreds up to a thousand with straws. Unlike the length of 10 centimeters in Module 2, these bundles are discrete sets. One unit can be grabbed and counted just like a banana—1 hundred, 2 hundred, 3 hundred, etc. (2.NBT.1). A number in Grade 1 generally consisted of two different units, tens and ones. Now, in Grade 2, a number generally consists of three units: hundreds, tens, and ones (2.NBT.1). The bundled units are organized by separating them largest to smallest, ordered from left to right. Over the course of the module, instruction moves from physical bundles that show the proportionality of the units to non-proportional place value disks and to numerals on the place value chart (2.NBT.3).

Furthermore, in this module instruction includes a great deal of counting: by ones, tens, and hundreds (2.NBT.2). Counting up using the centimeter tape or a classroom number line shows movement from left to right as the numbers increase. Counting up on the place value chart shows movement from right to left as the numbers increase. For example, as 10 ones are renamed as 1 ten, the larger unit is housed in the place directly to the left. The goal is for students to move back and forth fluidly between these two models, the number line and the place value chart, using either to rename units and compare numbers (2.NBT.4).

In this module, the place value story has advanced. Instead of changing 10 ones to 1 ten, students now are also changing 10 tens for 1 hundred. This changing leads to using counting strategies to solve word problems (2.OA.1). In the next module, this change leads to mental math and the formal algorithms for addition and subtraction. Comparison extends into finding 100 more and 100 less, 10 more and 10 less, etc. Just as in Grade 1, more and less translate into formal addition and subtraction at the onset of Module 4 (2.NBT.8).

The module includes a sequence of engaging problems in which students are asked to change 1 hundred for 10 units of ten and to change 10 units of ten for 1 hundred. The assessment task following Topic G culminates this series with variations on the following problem: “Mrs. Ortiz has 21 students in her second grade class. All of them have 10 fingers and 10 toes. Write the total number of toes of the students using hundreds, tens and ones. Explain using words, pictures or numbers.” In order to explain, students must recognize that each child in the problem represents a group of 10 toes. They then count by tens, changing units of ten for 1 hundred as appropriate to find the solution. This transitions into the coming module where students bring their skill with making and breaking larger and apply it to work with addition and subtraction.

How is this module’s learning foundational to later grades? 3 tens or 3 units of 10 leads to an understanding of 3 fours or 3 units or groups of four (Grade 3 OA standards), 3 fourths or 3 units of one-fourth (Grade 3 NF standards). Learning that 12 tens = 120 leads to an understanding of 12 tenths = 1.2, 4 thirds = 4/3 = 1 1/3, or...
even 4 threes = 12. Counting up and down by ones, tens, and hundreds, both with the number line and place value chart, is essential from Grade 3 forward to rounding and mental math (Grade 3 NBT standards), to meaningful understanding of all operations with base ten whole numbers (Grade 4 NBT standards), and to understanding place value’s extension into decimal fractions and operations (Grade 5 NBT standards).

Focus Grade Level Standards

Understand place value.

2.NBT.1 Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:
   a. 100 can be thought of as a bundle of ten tens – called a “hundred.”
   b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).

2.NBT.2 Count within 1000; skip-count by 5s1, 10s and 100s.

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

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.

Foundational Standards

(No standards have direct application as foundational in this section.)

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1 Use analog clock to provide a context for skip-counting by 5s.
Focus Standards for Mathematical Practice

**MP.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 6 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 (exemplified in Topic D).

**MP.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 argument (exemplified in Topics A and E).

**MP.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 and 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 (exemplified in Topics C and F).

**MP.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 $7 \times 8$ equals the well remembered $7 \times 5 + 7 \times 3$, in preparation for learning about the distributive property. In the expression $x^2 + 9x + 14$, older students can see the 14 as $2 \times 7$ 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 $y$ (exemplified in Topic B).

**MP.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 $(x - 1)(x + 1)$, $(x - 1)(x^2 + x + 1)$, and $(x - 1)(x^3 + x^2 + x + 1)$ 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 (exemplified in Topic G).
### Overview of Module Topics and Lesson Objectives

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<th>Topics and Objectives</th>
<th>Days</th>
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| 2.NBT.1   | **A** Forming Base Ten Units of Ten, a Hundred, and a Thousand  
Lesson 1: Bundle and count ones, tens, and hundreds to 1,000. | 1 |
| 2.NBT.2²  | **B** Understanding Place Value Units of One, Ten, and a Hundred  
Lesson 2: Count up and down between 100 and 220 using ones and tens.  
Lesson 3: Count up and down between 90 and 1,000 using ones, tens, and hundreds. | 2 |
| 2.NBT.3   | **C** Three-Digit Numbers in Unit, Numeral, Expanded, and Word Forms  
Lesson 4: Count up to 1,000 on the place value chart.  
Lesson 5: Write base ten three-digit numbers in unit form; show the value of each digit.  
Lesson 6: Write base ten numbers in expanded form.  
Lesson 7: Write, read, and relate base ten numbers in all forms. | 4 |
| 2.NBT.2   | **D** Modeling Base Ten Numbers Within 1,000 with Money  
Lesson 8: Count the total value of $1, $10, and $100 bills up to $1,000.  
Lesson 9: Count from $10 to $1,000 on the place value chart and the empty number line.  
Lesson 10: Explore $1,000. How many $10 bills can we change for a thousand dollar bill? | 3 |
| 2.NBT.A   | **E** Modeling Numbers Within 1,000 with Place Value Disks  
Lesson 11: Count the total value of ones, tens, and hundreds with place value disks.  
Lesson 12: Change 10 ones for 1 ten, 10 tens for 1 hundred, and 10 hundreds for 1 thousand.  
Lesson 13: Read and write numbers within 1,000 after modeling with number disks.  
Lesson 14: Model numbers with more than 9 ones or 9 tens; write in expanded, unit, numeral, and word forms. | 5 |

² Use analog clock to provide a context for skip-counting by fives.
### Module Overview

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<td>2.NBT.2</td>
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<td>2.OA.1</td>
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<td>Lesson 18: Order numbers in different forms. (Optional.)</td>
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<tr>
<td>2.NBT.2</td>
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<td>3</td>
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<tr>
<td>2.OA.1</td>
<td>Lesson 19: Model and use language to tell about 1 more and 1 less, 10 more and 10 less, and 100 more and 100 less.</td>
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<td>2.NBT.8</td>
<td>Lesson 20: Model 1 more and 1 less, 10 more and 10 less, and 100 more and 100 less when changing the hundreds place.</td>
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<td></td>
<td>Lesson 21: Complete a pattern counting up and down.</td>
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<td>End-of-Module Assessment: Topics A–G (assessment ½ day, return ½ day, remediation or further applications 1 day)</td>
<td>2</td>
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<tr>
<td></td>
<td><strong>Total Number of Instructional Days</strong></td>
<td>25</td>
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### Terminology

**New or Recently Introduced Terms**

- Base ten numerals (e.g., a thousand is 10 tens, a hundred is 10 ones, starting in Grade 3 a one is 10 tenths, etc.)
- Expanded form (e.g., 500 + 70 + 6)
- Hundreds place (e.g., the 5 in 576; tells how many hundreds are in a number)
- One thousand (1,000)
- Place value or number disk (pictured to the right)
- Standard form (e.g., 576)
- Word form (e.g., five hundred seventy-six)

Unit form modeled with number disks:
7 hundreds 2 tens 6 ones = 72 tens 6 ones
Familiar Terms and Symbols

- =, <, > (equal, less than, greater than)
- Altogether (e.g., 59 centimeters and 17 centimeters; altogether there are 76 centimeters)
- Bundling, grouping (putting smaller units together to make a larger one, e.g., putting 10 ones together to make a ten or 10 tens together to make a hundred)
- How many more/less (the difference between quantities)
- How much more/less (the difference between quantities)
- More than/less than (e.g., 576 is more than 76; 76 is less than 576)
- Number sentence
- Ones place (e.g., the 6 in 576; tells how many ones are in a number)
- Place value (the unitary values of the digits in numbers)
- Renaming, changing (instead of “carrying” or “borrowing,” e.g., a group of 10 ones is “renamed” a ten when the ones are bundled and moved from the ones to the tens place; if using $1 bills, they may be “changed” for a $10 bill when there are enough)
- Tens place (e.g., the 7 in 576; tells how many tens are in a number)
- Unit form counting (unit form counting states the amount of hundreds, tens, and ones in each number, e.g., 11 is stated as 1 ten 1 one, 20 as 2 tens, 27 as 2 tens 7 ones, 100 as 1 hundred, and 146 as 1 hundred 4 tens 6 ones.)
- Units of ones, tens, hundreds, one thousand (a single one and groups of 10s, 100s, and 1,000)

Suggested Tools and Representations

- 2 boxes of 1,000 straws per class of 25
- 12 ones, 10 tens, and 10 hundreds per pair
- 18 ones, 18 tens and 18 hundreds, and 1 one thousand
- Ballpoint pens
- “Clock” number line with corresponding analog template (details in Topic A fluency)
- Dice, 1 per pair
- Dienes blocks or base ten materials: hundreds flats, tens rods, and ones cubes
- Meter strip black line master
- Number spelling black line master
- Paper meter strips (pictured in Topic A fluency)
- Personal boards and markers
- Place value “box” (details in Topic C Concept Development)
- Place value charts black line master
- Place value charts and mats: 1 each of the following per student

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3 These are terms and symbols students have seen previously.
Lesson Overview

**Module 3:** Place Value, Counting, and Comparison of Numbers to 1,000

**Date:** 8/7/13

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**Scaffolds**

The scaffolds integrated into *A Story of Units* give alternatives for how students access information as well as express and demonstrate their learning. Strategically placed margin notes are provided within each lesson elaborating on the use of specific scaffolds at applicable times. They address many needs presented by English language learners, students with disabilities, students performing above grade level, and students performing below grade level. Many of the suggestions are applicable to more than one population. The charts included in Module 1 provide a general overview of the lesson-aligned scaffolds, organized by Universal Design for Learning (UDL) principles. To read more about the approach to differentiated instruction in *A Story of Units*, please refer to “How to Implement *A Story of Units*.”

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**Assessment Summary**

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<th>Format</th>
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<td>Mid-Module Assessment Task</td>
<td>After Topic D</td>
<td>Constructed response with rubric</td>
<td>2.NBT.1, 2.NBT.2, 2.NBT.3</td>
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<tr>
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<td>After Topic G</td>
<td>Constructed response with rubric</td>
<td>2.NBT.1, 2.NBT.2, 2.NBT.3, 2.NBT.4</td>
</tr>
</tbody>
</table>

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4 Students with disabilities may require Braille, large print, audio, or special digital files. Please visit the website, www.p12.nysed.gov/specialed/aim, for specific information on how to obtain student materials that satisfy the National Instructional Materials Accessibility Standard (NIMAS) format.
Topic A

Forming Base Ten Units of Ten, a Hundred, and a Thousand

2.NBT.1

Focus 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 hundred (and 0 tens and 0 ones).

Instructional Days: 1
Coherence - Links from: G1–M6 Place Value, Comparison, Addition and Subtraction to 100
- Links to: G2–M4 Addition and Subtraction Within 200 with Word Problems to 100

When students gather on the carpet in a circle, the teacher pours out a box of 1000 straws. “How can we count these easily?” The students are led to suggest that bundles of 10 would make it much easier to count and recount the giant pile of straws. Students skip-count and experience that 1 hundred is equal to both 100 ones and 10 tens (2.NBT.1a). Likewise, 1 thousand is equal to both 100 tens and 10 hundreds (2.NBT.1b).

Just as students added and subtracted centimeter units in Module 2, in Module 3 they skip-count using bundles of straws as units. The efficiency of place value and base ten numbers comes to life as students repeatedly bundle 10 ones to make 1 ten and subsequently bundle 10 tens to make 1 hundred.

A Teaching Sequence Towards Mastery of Forming Base Ten Units of Ten, a Hundred, and a Thousand

Objective 1: Bundle and count ones, tens, and hundreds to 1,000.
(Lesson 1)
Lesson 1
Objective: Bundle and count ones, tens, and hundreds to 1,000.

Suggested Lesson Structure

- Fluency Practice (20 minutes)
- Concept Development (35 minutes)
- Student Debrief (5 minutes)
- Total Time (60 minutes)

Fluency Practice (20 minutes)

- Meter Strip Subtraction 2.NBT.5 (5 minutes)
- Skip-Count Up and Down by Fives 2.NBT.2 (11 minutes)
- Happy Counting 2.NBT.2 (2 minutes)
- Skip-Count by Tens 2.NBT.2 (2 minutes)

Meter Strip Subtraction: Taking Multiples of 10 from Numbers Within 10 to 100 (5 minutes)

Materials: (S) Meter strips (pictured below)

T: (Each student has a meter strip.) Put your finger on 0 to start. I’ll say the whole measurement. Slide up to that number. Then take away 10 centimeters and tell me how many centimeters your finger is from 0.

NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

The pace in meter strip subtraction may be too rapid for some groups of students. If necessary, adjust it by providing more practice with multiples of 10 before moving on to other numbers.

Students start with their fingers at 0 and slide to the whole amount each time. This step maintains their knowledge of the distance between 0 and a given measurement. It provides visual and kinesthetic reinforcement of number sequence and relationships between numbers on the number line for students who may need it.
Lesson 1

NYS COMMON CORE MATHEMATICS CURRICULUM

Lesson 1

NOTES ON MULTIPLE MEANS OF REPRESENTATION:

Students have just finished working with meter strips, which are concrete number lines. In this activity they move to working with an abstract number line: the clock. A clock is a circular number line. Visually demonstrate this for students by making the clock from a 24 inch ribbon marked off every 2 inches, similar to the one pictured with this activity.

You may want to measure the intervals in advance, making the marks very lightly so that they are hard for others to see. Then begin the activity by making the marks dark enough for all to see as students count along by ones to notice that there are 12 marks.

Lesson 1

Bundle and count ones, tens, and hundreds to 1,000.

Date: 8/7/13

T: Let’s try one. Fingers at 0 centimeters! (Pause.) 50 centimeters.
S: (Students slide their fingers to 50.)
T: Remember to take 10. (Pause.) How far is your finger from 0?
S: 40!
T: 40 what?
S: 40 centimeters!
T: Slide your finger back to 0. (Pause.) 85 centimeters.
T: (Pause) How far is your finger from 0?
S: 75 centimeters!
T: Good. Slide back to 0. (Pause) 49 centimeters.

Continue with examples as necessary.

T: Nice work. This time I’ll say the whole measurement, and you take 20 centimeters. Ready?
T: Slide back to 0. (Pause.) 65 centimeters.
S: 45 centimeters!

Continue with possible sequence: Slide from 0 to 32, then take 20; to 36, then take 30; to 78, then take 50; to 93, then take 40; to 67, then take 60, etc.

Skip-Count Up and Down by Fives on the Clock (11 minutes)

Materials: (T) A “clock” made from a 24 inch ribbon marked off at every 2 inches

T: (Display the ribbon as a horizontal number line – example pictured above.) Count by fives as I touch each mark on the ribbon.
S: (Starting with 0, students count by fives to 60.)
T: (Make the ribbon into a circle resembling a clock.) Now I’ve shaped my ribbon to look like a...
S: (Possible student responses) Circle! Clock!
T: Let’s call it a clock. Again, count by fives as I touch each mark on the clock.
NOTES ON MULTIPLE MEANS OF REPRESENTATION:

Partner Talk

Partner talk provides an opportunity for English language learners to rehearse language in a smaller, safer setting. It also provides an opportunity to pair children who can support one another with a shared first language. Balance pairings so that students feel supported, but also benefit from the peer modeling and individualized practice with English provided by structured partner talk.

Partner talk serves struggling and advanced students by allowing them to work at their own levels. It’s wise to consider students’ strengths as you assign who will talk first. It can work well for Partner A to model strong language when partnered with ELLs or less verbally advanced students.

Questioning

If students have difficulty growing ideas or sustaining conversation, you might ask an advancing question: “Yes, you can count on both of them. What do you measure with each?”

This scaffold is especially relevant for students who have difficulty staying focused and students below grade level. It also provides scaffolding for ELL students who, to respond, may rely on the vocabulary you use in the question you ask.

S: (Starting with 0, students skip-count by fives to 60.)
T: This time, the direction my finger moves on the clock will show you whether to count up or down. (As you explain, demonstrate sliding your finger forward and backward around the clock.)
T: As I slide to the marks, you count them by fives. Starting at 12, slide forward to 4 as students count on. On a clock, 12 represents both 0 and 60. We are not stating 0 so that students count on effectively.
S: 5, 10, 15, 20.
T: How many minutes is that?
S: 20!
T: 20 ice cream cones? (Playfully help students remember to use precise language to identify units.)
S: No, silly! 20 minutes!
T: Oh! Okay. Let’s remember to say what we mean.
T: (Starting from 4 slide your finger forward to 9. Do not restate 20. Count on.)
S: 25, 30, 35, 40, 45.
T: How many minutes is that?
S: 45 minutes!
T: (Keep your finger at 9.) What if I slide back one mark, then how many minutes?
S: 40 minutes!
T: Good. What if I slide forward one mark, then how many minutes?
S: 45 minutes!
T: Nice job. Let’s count back from 50. (Start from 50 and slide back 5 times.)
S: 45, 40, 35, 30, 25.
T: How many minutes now?
S: 25 minutes!

Continue. Notice which switches or numbers your students find most difficult and use their cues to guide the practice you provide.
Lesson 1: Bundle and count ones, tens, and hundreds to 1,000.

Date: 8/7/13

**NOTES ON MULTIPLE MEANS OF ENGAGEMENT:**

“It’s true that we use both tools to measure. It’s true that clocks and meter strips both measure lengths.”

This is an example of telling rather than eliciting, a unifying way to follow partner sharing. The telling makes a certain fact common knowledge from which new ideas grow. It’s okay to tell rather than elicit. Strategically telling is a facilitation technique that keeps the conversation moving. Use it to correct misconceptions and set students up to go deeper along a line of reasoning.

**NOTES ON MULTIPLE MEANS OF REPRESENTATION:**

“Move the ribbon back into a horizontal line and present it to students near the meter strip for a visual comparison.”

Providing a visual representation allows English language learners to access the content while learning important vocabulary. In this case, a visual comparison also helps clarify the topic of discussion. Maximize the benefits of visual comparison by placing the ribbon alongside the meter strip before Partner A shares with Partner B.

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T: Let’s pause for a couple of minutes to think about the tools we’ve used so far today.

T: With your partner, compare the meter strip to the clock. How are they the same? How are they different?

For about 1 or 2 minutes, circulate and listen for responses. Use questioning strategies to support student communication and the level of their insights.

S: (What you might hear, from simple to complex.)

They’re both curly. Remember our paper meter strips were curly too? → They can both be a straight line.

→ The clock has 12 marks and the other one has a lot more. → You can count with both of them. → The clock goes to 60 and the meter strip goes to 100. → On one you skip-count by fives and on the other you can skip-count by twos or tens. → All the marks on the clock are the same space apart, and the marks on the meter strip are the same space apart. → You can use them both to measure. → One measures time and one measures length.

T: I hear some of you saying that we use both tools to measure. It’s true that clocks and meter strips both measure.

T: What makes them useful for measuring? Talk with your partner for 30 seconds.

S: They both have marks that are the same space apart. → The numbers go from smallest to biggest. → They’re both like rulers, but they have different units. → Clocks measure time. We can’t see that! → It’s like they both keep track of our counts. → And they both give us a place to count.

T: (After students have shared.) I used a ribbon to make our clock. What would happen if I moved it back into a horizontal line so that it looked more like a meter strip? Partner A, could I still use it to measure the length of time? Tell Partner B why or why not.

S: (Possible response.) I think so. You’re not changing the numbers on it. You can still count how many minutes. When you’ve counted the whole thing you know an hour went by.
Lesson 1:
Bundle and count ones, tens, and hundreds to 1,000.

Date: 8/7/13

NOTES ON MULTIPLE MEANS OF ENGAGEMENT:
As often as possible, create opportunities for every student to respond every time. The vignettes throughout the entire module facilitate this by continuously demonstrating varied response patterns and materials including choral response, partner talk, personal boards and individual tools like meter strips. Response patterns built on 100% student participation have powerful effects on student engagement and lesson pacing.

Choral response allows English language learner students to listen to correct pronunciation and language structure while practicing with the support of peer voices. Choral response that incorporates chanting like the counting activities presented to the left allows struggling students and those with auditory processing difficulty to be supported by the group as they pick up on language and patterns.

Wait time is an important component of choral response. It provides children with an opportunity to independently process the question and formulate an answer before speaking. This is a useful scaffold for ELL and struggling students. Wait time is built into many vignettes where dialogue says “pause” or when the teacher asks students to wait for a signal to respond.

**Happy Counting: Up and Down by Ones from 95 to 121** (2 minutes)

T: We’re going to play Happy Counting!
T: Watch my fingers to know whether to count up or down. A closed hand means stop. (Show signals as you explain.)
T: Let’s count by ones, starting at 95. Ready? (Teacher rhythmically points up until a change is desired. Show a closed hand then point down. Continue, mixing it up.)

**Skip-Count by Tens: Up and Down Crossing 100** (2 minutes)

T: This time let’s play Happy Counting, but skip-counting by tens!
T: Watch my fingers to know whether to count up or down. A closed hand means stop. (Show signals as you explain.)
T: Let’s count by tens, starting at 60. Ready? (Teacher rhythmically points up until a change is desired. Show a closed hand then point down. Continue, mixing it up.)
S: 60, 70, 80, 90, 100, 110, 120, 130, 140 (switch). 130, 120, 110, 100, 90 (switch). 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220 (switch). 210, 200, 190, 180, (switch), etc.
Concept Development (35 minutes)

Materials: (T) Box of 1,000 straws or sticks

Students are seated in a U shape or circle on the carpet. Quite dramatically empty the contents of the box onto the carpet.

T: Students, let’s count these straws! About how many do you think there might be? Discuss your ideas with your partner.

T: (After listening in for a few minutes.) Let’s see how many there really are.

T: How can we count them efficiently so that we can get to recess on time?

S: (Varied answers.) We could split them up into piles and share the work. → By twos! → By fives! → By tens. → By ones.

T: There are some very clear ideas. Discuss with your partner which method would be the most efficient, counting by ones, twos, fives or tens.

T: (After talking.) I hear most groups agreeing that counting by tens is the most efficient. Why is it more efficient to count by units of ten than units of two?

S: (Varied responses.) Because there will be more units of two so it will take longer. → The tens are the biggest so there are fewer of them to confuse us when we count.

T: Are you ready to get going? Let’s count 10 straws and then wrap them in a rubber band to make a new unit of ten. I will put a pile of straws and rubber bands in front of each group of 3 students. Try the “Next Steps” on the board if you finish early (explained to the right).

S: (Students work for about 8 minutes to finish bundling all the straws.)

T: (Students count.) Let’s make even larger units: Hundreds. It takes 10 tens to make a hundred. Count with me.

S: (Place a ten before each count.) 1 ten, 2 tens, 3 tens, 4 tens, 5 tens, 6 tens, 7 tens, 8 tens, 9 tens, 10 tens.

T: What is the value of 10 tens?

S: 1 hundred.

T: How many straws equal 1 ten?

S: 10 straws.

T: Now let’s count the number of straws in 10 tens or 1 hundred.

S: (Repeat the process.) 10, 20, 30, 40, 50, 60, 70, 80, 90, 100.

T: So how many straws are in 10 tens?

S: 100 straws.

T: What is another way to say 10 tens?

S: 1 hundred.

T: As a group, bundle 10 tens to make 1 hundred. Put the tens and ones you have left over to one side.

Students work.

T: Tell your neighboring group how many of each unit, ones, tens, and hundreds, you have. The single
Lesson 1: Bundle and count ones, tens, and hundreds to 1,000.

Date: 8/7/13

NOTES ON MULTIPLE MEANS OF ENGAGEMENT:
All through this module, students must pay attention to the units they are counting and use precise language to convey their knowledge. Hold them accountable: 6 tens + 4 tens is 10 tens.

straws are units of one.
S: (For example.) We have 1 hundred, 6 tens and 4 ones.
T: Let’s make the single straws into as many tens as we can. How many extra ones does your group have?
S: 3.
T: Students, at the signal, what do we need to add to 3 ones to make 10 ones?
S: (Signal.) 7 ones.
T: Which group has 7 ones? (Or, can we combine 2 groups’ straws to get 7 ones?) Pass them to group 1.

Repeat the make ten process with all the extra ones.
T: Now that we have made as many units of ten as possible, let’s make more units of one hundred.
T: Group 2, how many tens do you have that are not bundled as 1 hundred?
S: 6.
T: 6 what?
S: 6 tens.
T: Students, at the signal, what do we need to add to 6 tens to make 10 tens?
S: (Signal.) 4 tens.
T: 6 tens plus 4 tens is?
S: 10 tens.
T: What is another way to say 10 tens?
S: 1 hundred.
T: How can you prove that 10 tens is the same as 100?
S: I could unbundle the hundred and count all the tens. → I can skip-count by 10 and count how many times it takes to get to 100. → When I skip-count on my fingers it takes all 10 to get to 100.

Repeat the make 1 hundred process, bundling all the tens as hundreds.
T: Now that we have made as many hundreds as possible, let’s make units of one thousand.
T: Think about the structure and pattern of numbers as we’ve moved from ones to tens to hundreds. Then talk with your partner: How many hundreds do you think make 1 thousand? Be ready to explain why.
S: When we count, the numbers always go 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 and then we get a new unit. → There are 10 hundreds in 1 thousand because we always make one bigger group out of 10 smaller groups.
T: Yes, 10 of a smaller unit make 1 of the next largest unit. I like the way you both used what you’ve learned about the structure of numbers to figure out something new.
T: So how many hundreds are in 1 thousand? Give me a complete sentence.
Lesson 1

S: 10 hundreds are in 1 thousand!
T: Group 3, how many hundreds do you have?
S: 2 hundreds.
T: Students, at the signal, complete the sentence: 2 hundreds plus how many hundreds equals 10 hundreds?
S: (Signal.) 2 hundreds plus 8 hundreds equals 10 hundreds.
T: Hand all your hundreds over! (Bundle them up to make one thousand.)
T: Count the hundreds for me. I’ll listen.
S: 1 hundred, 2 hundreds.... etc.
T: How many hundreds do we have here?
S: 10 hundreds!
T: Another name for 10 hundreds is 1 thousand, a new unit!
T: At the signal, what is the largest unit we worked with today?
S: 1 thousand!
T: The next largest?
S: 1 hundred!
T: The next?
S: 1 ten!
T: The smallest?
S: 1 one!
T: (Give each pair 1 straw and a bundle of ten and 1 hundred.) Show and tell your partner our units in order from smallest to greatest and greatest to smallest.
T: (After they talk.) How many different units did we work with today?
S: 4 units!
T: Tell me the unit names from smallest to greatest.
S: Ones, tens, hundreds, and thousands.

Problem Set (10 minutes)

For some classes, it may be appropriate to modify the assignment by specifying which problems students should work on first. With this option, let the careful sequencing of the Problem Set guide your selections so that problems continue to be scaffolded. Balance word problems with other problem types to ensure a range of practice. Assign incomplete problems for homework or at another time during the day.

T: We used straws to show units of hundreds, tens,
Lesson 1

Lesson Objective: Bundle and count ones, tens, and hundreds to 1,000.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

T: Bring your Problem Set to the carpet.
T: Let’s read our first number by units.
S: 4 hundreds, 3 tens, 5 ones.
T: How do we say 3 tens 5 ones?
S: Thirty-five.
T: We read this number as four hundred thirty-five. Say it for me.
S: Four hundred thirty-five.
T: How do we say the next number down?
S: Six hundred seventy-three.
T: Excellent. Read the next numbers on your paper to your partner. (Allow time to do so.)
T: To begin our Problem Set, we drew two numbers. 435 is one number. 673 is another number.
T: What are the different units in the number 435, from largest to smallest?
S: Hundreds, tens, ones.
T: So we used three different units to make one number!
T: What is this unit called? (Hold up 1 hundred straws or sticks.)
S: 1 hundred.

Student Debrief (5 minutes)

T: (Draw a sample of each unit, as shown in the picture.)
T: Draw and label 4 hundreds. Whisper count as you draw.
S: (Students whisper count and draw as you model.)
T: Whisper count, draw, and label 3 tens.
T: Now whisper count, draw, and label 5 ones.
T: If you don’t have enough room in the box, use your eraser and try again.
T: Tell me the number of each unit in order from largest to smallest.
S: 4 hundreds, 3 tens, 5 ones.
T: The name of that number is?
S: 435!
T: Yes.
T: In the next box down, draw and label 6 hundreds, 7 tens, 3 ones.
T: (Students’ work.) When I say, “Show me your work,” hold up your paper so I can see your independent effort.

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T: Discuss with your partner three questions I will write on the board:
   1. How many units of 1 are in 1 ten?
   2. How many units of 10 are in 1 hundred?
   3. How many units of 100 are in 1 thousand?

T: I hear lots of intelligent answers. Show me what you know by completing your exit ticket. Return to your seat as soon as you have it. If you finish early, count by 10 on the back of your paper as high as you can go!

Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students’ understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.
Directions: Draw models of ones, tens, and hundreds. Your teacher will tell you which numbers to model.
Lesson 1 Exit Ticket

Name _____________________________ Date _____________

1. Draw lines to match and make each statement true.

   10 tens = 1 thousand

   10 hundreds = 1 ten

   10 ones = 1 hundred

2. Circle the largest unit. Box the smallest.

   4 tens  2 hundreds  9 ones

3. Draw models of each and label the following number:

   2 tens  7 ones  6 hundreds
Name ________________________________ Date ____________

1. 2 ones + _____ ones = 10

2. 6 tens + _____ tens = 1 hundred

    2 + _____ = 10

    60 + _____ = 100

3. Rewrite in order from largest to smallest units.

    6 tens Largest _________________________

    3 hundreds _________________________

    8 ones Smallest _________________________

4. Count each group. What is the total number of sticks in each group?


    _________________________    _________________________    _________________________

    What is the total number of sticks? _______

5. Draw and solve.

    Moses has 100 stickers. Jared has 60 stickers. Jared wants to have the same number of stickers as Moses. How many more stickers does Jared need?

    Jared needs _____ more stickers.
Topic B

Understanding Place Value Units of One, Ten, and a Hundred

2.NBT.2, 2.NBT.1

Focus Standard: 2.NBT.2 Count within 1000; skip-count by 5s, 10s, and 100s.
Instructional Days: 2
Coherence -Links from: G1–M6 Place Value, Comparison, Addition and Subtraction to 100
-Links to: G2–M4 Addition and Subtraction Within 200 with Word Problems to 100

In Topic B, students practice counting by ones and skip-counting by tens and hundreds. They start off with simple counting by ones and tens from 90 to 124 and 124 to 220. They then count by ones, tens, and hundreds from 200 to 432 and from 432 to 1,000 (2.NBT.2). They apply their new counting strategies to solve a change unknown word problem (2.OA.1). “Kinnear decided that he would bike 100 miles this year. If he has biked 64 miles so far, how much farther does he have to bike?”

In counting students make use of the structure provided by multiples of ten and a hundred. Students think in terms of getting to a ten or getting to a hundred. They also identify whether ones, tens, or hundreds are the appropriate unit to count efficiently and effectively. Making this determination requires knowing and understanding structures, similar to knowing the ground on which you are going to build a house and with what materials you want to build.

A Teaching Sequence Towards Mastery of Understanding Place Value Units of One, Ten, and a Hundred

Objective 1: Count up and down between 100 and 220 using ones and tens.
(Lesson 2)

Objective 2: Count up and down between 90 and 1,000 using ones, tens, and hundreds.
(Lesson 3)
Lesson 2

Objective: Count up and down between 100 and 220 using ones and tens.

Suggested Lesson Structure

- Fluency Practice (18 minutes)
- Application Problem (8 minutes)
- Concept Development (24 minutes)
- Student Debrief (10 minutes)
- Total Time (60 minutes)

Fluency Practice (18 minutes)

- Meter Strip Subtraction 2.MD.6, 2.NBT.5 (4 minutes)
- Measure and Compare 2.MD.4 (6 minutes)
- Skip-Count Up and Down by Fives on the Clock 2.NBT.2 (4 minutes)
- Counting with Ones, Tens, and Hundreds 2.NBT.8 (4 minutes)

Meter Strip Subtraction: Taking Multiples of 10 from Numbers 10–100 (4 minutes)

Materials: (S) Meter strips

Keep students challenged and engaged by adding a new layer of complexity to the game in this second round. The following are suggestions for how you might adapt the sequence demonstrated in Topic A, Lesson 1 to match your students’ ability. Suggestions are given in order from least to most complex.

- Subtract 9 and then 8 from multiples of 10 up to 100.
- Subtract any two-digit number from a multiple of 10 up to 100 (e.g., 30 – 13, 40 – 24, 60 – 45, etc.)
- Tell or write a number sentence describing sliding down from the whole amount (e.g., 50 – 10 = 40 cm)
- Create a sequence of change unknown slides. For example:
  - T: Start with your finger on 0. Slide up to 52 cm.
  - T: Now slide down to 49. How many centimeters did you slide down?
  - S: 3 cm!
- Tell or write a number sentence to describe the change unknown slide (e.g., 52 – ____ = 49 cm).
- State that change in a sentence, including the unit. “I slid down ____ centimeters.”
Lesson 2

NYS COMMON CORE MATHEMATICS CURRICULUM

Measure and Compare (6 minutes)

Materials: (S) Meter strips and personal white boards

T: (Students are seated at tables with materials. Write or post the sentence frame described in the box below.) I’ll name two objects, you measure their lengths. Your goal is to determine how much longer one object is than another. Write the lengths on your board so that you don’t forget, and be sure to state the unit when you compare lengths.

T: Partner A, compare the lengths using the sentence frame (point to the frame).

T: Partner B, confirm that you agree with Partner A’s statement. You might say “I agree” or “I disagree.” If you disagree, be sure to explain why. Each time we measure new things, switch roles.

T: Compare the length of your science book with the length of your crayon.

S: (For 1 minute, students measure, write lengths, and compare them in partnerships.)

T: Compare the length of your desk and the length of the seat on your chair.

S: (For 1 minute, students measure, write lengths and compare them in partnerships.)

T: (Continue, being mindful to select objects that lead to agreement about which is longer or shorter. One student’s pencil may very well be shorter than their crayon, while the other student’s might be much longer.)

Skip-Count Up and Down by Fives on the Clock (4 minutes)

Materials: (T) A “clock” made from a 24 inch ribbon marked off at every 2 inches

In this second round, add a new layer of complexity to the work to keep students challenged and engaged. The following is a suggestion for how you might adapt the vignette demonstrated in Topic A, Lesson 1.

T: Skip-count by 5 until my finger stops. (Slide your finger to 4.)

S: 5, 10, 15, 20.

T: (From 4, slide your finger forward to 9.) Keep counting as I move my finger.

S: 25, 30, 35, 40, 45.

T: How many minutes have passed in all?
Lesson 2: Count up and down between 100 and 220 using ones and tens.

Materials: (T) Bundle of one hundred, 1 ten, and a single straw from Lesson 1

T: Let’s play a game using what we know about counting by ones, tens, and hundreds. I’ll hold bundles to show you what to count by. A bundle of 100 means count by hundreds, a bundle of 10 means count by tens, and a single straw means count by ones. (Create visual support by writing the numbers on the board as students count.)

T: Let’s start at 0. Ready? (Hold up a bundle of 10 until students count to 130.)
S: 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130.

T: (Hold up a bundle of 100 until students count to 630.)
S: 230, 330, 430, 530, 630.

T: (Hold up a bundle of 10 until students count to 690.)

T: (Hold up a single one until students count to 702.)

T: (Isolate the numbers 698–702 by drawing a box around them.) Partner A, count these numbers up and down as fast as you can to Partner B. Then switch. If you both finish before one minute is up, try it again and see if you get faster!
Lesson 2: Count up and down between 100 and 220 using ones and tens.

Application Problem (8 minutes)

Ben and his dad have sold 60 chocolate chip cookies at the school bake sale. If they baked 100 cookies, how many cookies do they still need to sell?

T: (Pass out the story to each student.) Read this problem with me.

T: Close your eyes and picture what you see when you hear the story.

T: Now, talk with your partner about what you can draw to solve this problem.

S: I can draw circles and put 10 in each. It's like what we just did with the straws yesterday. I can draw tens and count on.

T: You have two minutes to draw your picture.

T: Explain to your partner how your drawing helps you answer the question.

T: Who would like to share their thinking?

S: I drew tens up to 100, then I crossed off 6 tens and there were 4 left. 4 tens equals 40. I drew 6 tens to show 60, then I counted on to 100 and that was 4 more tens, so 40. I drew a number bond and broke 100 into 60 and 40. I wrote 6 + 4 = 10, so 60 + 40 = 100. I drew a tape diagram. 100 is the whole and 60 is the part. Then I wrote 60 + 40 = 100, so 100 – 60 = 40.

T: Those are all very intelligent strategies for solving this problem! If anyone would like to add one of these strategies to their paper, please do so now.

T: So how many more cookies do Ben and his dad need to sell?

S: They need to sell 40 more cookies.

T: Let's write that statement on our paper.
Lesson 2

NYS COMMON CORE MATHEMATICS CURRICULUM

Concept Development (24 minutes)

Materials: (T) 9 bundles of hundreds, 10 bundles of tens, 10 ones

Part A: Counting from 100 to 110, 100 to 200, and 100 to 1,000

Materials: (T) 10 ones, 10 tens, 10 hundreds

T: How many straws are in this bundle?
S: 100.
T: (Place 1 straw to the students’ right of the hundred.) Now there are one hundred one straws.
T: (Place 1 more straw to the right.) Now?
S: 102.
T: Count for me as I place units of one. (Start the count again at 101. Omit your voice.)
T: What unit can I make with these 10 ones?
S: 1 ten. (Quickly bundle the 10 ones to make 1 ten.)
T: Skip-count for me as I place the units of ten. (Place tens one at a time as students count.)
S: 110, 120, 130, 140, 150, 160, 170, 180, 190, 200.
T: What unit can I make with these 10 tens?
S: 1 hundred. (Quickly bundle the 10 tens to make 1 hundred.)
T: Skip-count for me as I place units of 100. (Place hundreds down one at a time.)
S: 100, 200, 300, 400, 500, 600, 700, 800, 900, 1,000.
T: What unit can I make with these 10 hundreds?
S: 1 thousand. (Quickly bundle the 10 hundreds to make 1 thousand.)

Part B: Counting from 100 to 124 and 124 to 200

Materials: (T) 1 hundred, 2 tens, and 4 ones (S) 1 hundred, 2 tens, and 4 ones per pair

T: (Place 1 unit of 1 hundred on the carpet but do not give students straws.) With your partner, count from 100 up to 124 using both units of one and ten.
T: (Circulate and listen. Anticipate most students will count by ones.)
T: Try again using our units. (Give each pair 1 hundred, 2 tens, and 4 ones.) Model your counting. Which is the fastest way to reach 124?
T: (Circulate and listen for or guide students to notice how much faster it is to count by tens than by ones up to 124.)
Lesson 2: Count up and down between 100 and 220 using ones and tens.

Date: 8/7/13

T: Jeremy, would you stand and show us how you use both tens and ones?
S: 100, 110, 120, 121, 122, 123, 124.

T: Alejandra, would you stand and tell us how you used both tens and ones?
S: 100, 101, 102, 103, 104, 114, 124.

T: Marco?
S: 100, 110, 111, 112, 113, 114, 124.

T: There are other ways, too. Class, please count for me Jeremy’s way.
S: (Model with the bundles as they do so.) 100, 110, 120, 121, 122, 123, 124.

T: Show 124 with your straws. Count down from 124 to 100. Model by taking away one unit at a time.

Part C: Counting from 124 to 220 and 220 to 124

Materials: (S) 9 tens and 6 ones per pair

T: (Give each pair 9 tens and 6 ones.) With your partner, count from 124 up to 220. Model with your straws as you count.
T: (Circulate and listen.)

Repeat the process from the previous count. Have the students count up and down both with straws and without.

Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students solve these problems using the RDW approach used for Application Problems.

T: Draw, label, and box the following numbers. (Demonstrate to the least extent possible.)
   a) 100
   b) 124
   c) 85
   d) 120

T: Use both tens and ones to count up to the target numbers. Draw the tens and ones you used. Write the counting numbers.
   a) 100 to 124
   b) 124 to 220
   c) 85 to 120
   d) 120 to 193
Student Debrief (10 minutes)

Lesson Objective: Count up and down between 100 and 220 using ones and tens.

Materials: (S) Completed Problem Set, Exit Ticket, straws and bundles of tens and hundreds

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

T: I see that when Freddy counted from 124 to 220, he first used ones to get to 130. Freddy, could you explain your thinking?

S: It’s easy for me to skip-count by tens from 130 so I wanted to get to 130.

T: Freddy got to a benchmark number, 130, and then counted on. Good strategy. Share with your partner why you think I called it a benchmark number.

S: It’s a benchmark number because it’s helpful. → It makes it easier to count.

T: You’re exactly right! Benchmark numbers allow us to skip-count, which is faster than counting by ones. A bench is somewhere you sit comfortably, and so a benchmark number is something that is easy to remember and rest on.

T: Let’s practice looking for benchmark numbers. Talk with your partner. What benchmark number would help you count from 85 to 120?

S: (Students talk. Circulate, listen, support. Decide who to call on to report out to the class.)

T: Monica, could you please use the straws and bundles to demonstrate?

S: I used ones to count up to 90 and then counted by tens to 120.

T: What was the benchmark number Monica got to?

S: 90.

T: Let’s count as Monica shows us again.

S: 85, 86, 87, 88, 89, 90.

T: Stop. Why is 90 a benchmark number? How does 90

NOTES ON MATHEMATICAL PRACTICE 7:

Giving students opportunities to practice counting using ones and bundles of tens and hundreds while asking them to identify benchmark numbers will cue them to the ease and efficiency of skip-counting. It will accustom them to look for and make use of the structure provided by the base ten number system, not only to skip-count from multiples of ten but also multiples of 100, and later, larger units.
help us?
S: Now we can skip-count by 10, which is faster.
T: Yes!
T: Let’s try another one. What benchmark number would you use if you were counting from 156 to 200?
S: 160.
T: George, could you please show us with the straws as we count?
S: 156, 157, 158, 159, 160.
T: Now what unit will we count by?
S: Tens!
T: Let’s hear it!
S: 170, 180, 190, 200!
T: What benchmark number would you use if you were counting from 97 to 200?
S: 100.
T: Sometimes even a benchmark number needs help. If I’m counting from 70 to 200, what benchmark number do I want to get to? Talk to your partner.
S: 100!
T: What unit did you use to get to 100?
S: Tens.
T: What unit did you use to count from 100 to 200?
S: Hundreds!
T: What about if I’m counting from 76 to 200? What units would I use? Talk with your partner.
S: Ones, tens, and hundreds!
T: I’ll place the straws and bundles as you count. Go!
S: 76, 77, 78, 79, 80, 90, 100, 200.
T: Benchmark numbers are structures that help us count up and down. We can use both different units and benchmark numbers to make counting easier.

Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students’ understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.
Lesson 2: Count up and down between 100 and 220 using ones and tens.

Name ___________________________  Date ______________

A. Draw, label, and box 100. Draw pictures of the units you use to count from 100 to 124.

B. Draw, label, and box 124. Draw pictures of the units you use to count from 124 to 220.
Lesson 2: Count up and down between 100 and 220 using ones and tens.

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C. Draw, label, and box 85. Draw pictures of the units you use to count from 85 to 120.

D. Draw, label, and box 120. Draw pictures of the units you use to count from 120 to 193.
Name ________________________________ Date ________________

1. These are bundles of hundreds, tens, and ones. How many straws are in each group?

   __________ straws  
   __________ straws

2. Count from 96 to 140 with ones and tens. Use pictures to show your work.

3. Fill in the blanks to reach the benchmark numbers.

   35, ____, ____, ____, ____, 40, ____, ____, ____, ____, ____, 100, ____, 300
Lesson 2 Homework

Name ___________________________ Date ________________

1. How many in all?

★★ ★★ ★★ ★★ ______ ones = _____ tens

★★ ★★ ★★ ★★ ★★ ______ stars in all.

★★ ★★ ★★ ★★ ★★ ★★ ★★

2. These are bundles with 10 sticks in each.

a. How many tens are there? ______

b. How many hundreds? ______

C. How many sticks are there in all? ______

3. Sally did some counting. Look at her work. Explain why you think Sally counted this way.

177, 178, 179, 180, 190, 200, 210, 211, 212, 213, 214

4. Show a way to count from 68 to 130 using tens and ones. Explain why you chose to count this way.

5. Draw and solve.

In her classroom, Sally made 17 bundles of 10 straws. How many straws did she bundle in all?
Lesson 3

Objective: Count up and down between 90 and 1,000 using ones, tens, and hundreds.

Suggested Lesson Structure

- Fluency Practice (12 minutes)
- Concept Development (27 minutes)
- Application Problem (10 minutes)
- Student Debrief (11 minutes)
Total Time (60 minutes)

Fluency Practice (12 minutes)

- Sprint: Differences to 10 with Teen Numbers 2.OA.2 (8 minutes)
- Counting with Ones, Tens, and Hundreds from 0 to 1,000 2.NBT.8 (4 minutes)

Sprint: Differences to 10 with Teen Numbers (8 minutes)

Materials: (S) Differences to 10 with Teen Numbers Sprint

Counting with Ones, Tens, and Hundreds from 0 to 1,000 (4 minutes)

Materials: (T) Bundle of 1 hundred, 1 ten, and a single straw from Lesson 1

For this second round, you may want to change the partner share to have students rapidly count up and down a larger sequence of numbers. Students often need additional practice with crossing a hundred, as well as with the first 30 numbers that begin a new hundred (e.g., 100–130, 600–630, etc.).
Lesson 3: Count up and down between 90 and 1,000 using ones, tens, and hundreds.

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Concept Development (27 minutes)

Count Up and Down by Ones, Tens, and Hundreds (15 minutes)

Materials: (T) 9 units of 1 hundred, 10 units of ten, 10 ones (for Parts A, B, C, and D)

Part A

<table>
<thead>
<tr>
<th>Part A Sequence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count from</td>
</tr>
<tr>
<td>90 to 300</td>
</tr>
<tr>
<td>170 to 500</td>
</tr>
<tr>
<td>350 to 600</td>
</tr>
<tr>
<td>780 to 1,000</td>
</tr>
<tr>
<td>etc.</td>
</tr>
</tbody>
</table>

T: Today, let’s use units of ten and a hundred to count from 90 to 300. (Place 9 units of ten on the carpet.)
T: I’ll model. You count.
S: (Place bundles as they count.) 90, 100, 200, 300.
T: Now, let’s count down from 300 to 90.
S: (Remove bundles as they count.) 300, 200, 100, 90.
T: Talk to your partner about how we counted up and down.
S: (Possible response.) First put 1 ten to get to a benchmark number, 100. Then keep counting by hundreds. 200, 300.

Quickly do further examples in the chart, column A. The students will get very excited about the larger numbers.

T: Is it faster to count using tens or hundreds?
S: Hundreds.
T: Why?
S: They are bigger so you get there faster. → It’s like you don’t have to say as many numbers. → If you don’t know how to count by hundreds it might be faster to count by tens.

If necessary, have the students practice using their own bundles with small amounts such as 90 to 200, 80 to 200, 60 to 300, etc.

NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

Students above grade level may combine sets A and B, then C and D. Challenge students to count from 90 to 300 to 480.

For struggling students, adjust the task such that they may only complete sequence A and B. The rest can be practiced during fluency time throughout the year. To ease students into counting without physical units, model with the straws and then hide them under a sheet of paper. Prompt students to visualize as they count.
Lesson 3

Part B

<table>
<thead>
<tr>
<th>Part B Sequence</th>
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<tbody>
<tr>
<td>Count from</td>
</tr>
<tr>
<td>300 to 480</td>
</tr>
<tr>
<td>500 to 830</td>
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<tr>
<td>600 to 710</td>
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<tr>
<td>800 to 990</td>
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<td>etc.</td>
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</table>

Next, count between pairs of numbers starting with multiples of 100 and ending with numbers that have both hundreds and tens, such as 300 to 480 (exemplified in the chart).

Parts C and D

<table>
<thead>
<tr>
<th>Part C Sequence</th>
<th>Part D Sequence</th>
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</thead>
<tbody>
<tr>
<td>Count from</td>
<td>Count from</td>
</tr>
<tr>
<td>100 to 361</td>
<td>361 to 400</td>
</tr>
<tr>
<td>200 to 432</td>
<td>432 to 600</td>
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<tr>
<td>600 to 725</td>
<td>725 to 900</td>
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<tr>
<td>700 to 874</td>
<td>874 to 1,000</td>
</tr>
<tr>
<td>etc.</td>
<td>etc.</td>
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</tbody>
</table>

Advance to using 3 units while counting up and down between pairs of numbers. (Note the examples in the chart.)

Problem Set (12 minutes)

Students should do their personal best to complete the Problem Set within the allotted 12 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students solve these problems using the RDW approach used for Application Problems.

T: Draw, label, and box the following numbers (demonstrate to the least extent possible).

a. 90  
b. 300  
c. 428  
d. 600
T: Draw pictures of the units you use to count up to the target number. Use hundreds whenever you can or you won’t have room on your paper.

a. 90 to 300
b. 300 to 428
c. 428 to 600
d. 600 to 1,000

Application Problem (10 minutes)

Kinnear decided that he would bike 100 miles this year. If he has biked 64 miles so far, how much farther does he have to bike?

T: (Pass out the story problem to each student.) Let’s read the problem.

T: Talk with your partner: Do we know the parts, or do we know the whole and one part?

S: We know the whole and one part.

T: Which means we’re looking for…? (Signal)

S: The missing part!

T: Tell your partner the number sentence that goes with this story. Raise your hand when you know the answer.

S: 100 – 64 = blank.

T: Talk with your partner: What is a related addition fact?

S: 64 + blank = 100.

T: Draw a picture to show how you can use units of one and ten to find the answer. You have two minutes.

S: 70 was my benchmark number. I drew 6 ones to get to 70.

Then I drew 3 tens to make 1 hundred.

T: Let’s count using Jorge’s model.

S: 65, 66, 67, 68, 69, 70, 80, 90, 100.

T: Did anyone use a different counting strategy?

S: I counted by tens from 64 to 94 and that was 3 tens, then I added 6 ones to make 100.

T: So if we count Jorge’s way we add 6 ones and 3 tens, which equals…? (Signal)

S: 36.

T: And if we add Delilah’s way we add 3 tens and 6 ones, which equals…? (Signal)
S: 36.
T: Are both counting strategies correct?
S: Yes!
T: So how much farther does Kinnear have to bike?
S: Kinnear has to bike 36 more miles.
T: Add that sentence to your paper.

### Student Debrief (11 minutes)

**Lesson Objective:** Count up and down between 90 and 1,000 using ones, tens, and hundreds.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

Students bring their Problem Set and Application Problem solutions.

T: Let’s look at the first count you did from 90 to 300.
T: What was your first benchmark number?
S: 100.
T: How many tens did we count to get there?
S: 1 ten.
T: How many hundreds did we count to get from 100 to 300?
S: 2 hundreds.
T: So, in all how much did we count to get from 90 to 300?
S: 1 ten and 2 hundreds
T: How much is that in all?
T: Where is 210 on your Problem Set?
S: It’s the part that isn’t boxed right here.
T: So how many straws are in this part?
S: 90 straws.
T: How many straws are in this part?
S: 210 straws.
T: When you put them together, let’s count what we get.
(Touch and count.)

S: 90, 100, 200, 300.

S: 300 straws!

T: Talk to your partner. Can your counting help you to solve the problem about Kinnear?

S: (Circulate as students talk.) “I thought that every straw was 1 mile.” → “It was like counting up.” → “I started at 64 and added ones to get to 70.” → “65, 66, 67, 68, 69, 70. That is, 1, 2, 3, 4, 5, 6 ones.” → “80, 90, 100. That is 1, 2, 3 tens.” → “6 ones and 3 tens is 36.”

T: So what does 36 mean to Kinnear?

S: That’s how many miles he has to go.

T: Look at your Problem Set. Suppose Kinnear has gone 600 miles, like in row 4. How many miles does he have to go?

S: 400 miles!

T: What if Kinnear had only gone 90 miles, like on your Problem Set. How far would he still have to go? Talk to your partner.

S: (Model only the units necessary for the count.) 100, 200, 300, ....900, 1,000!

T: Work with your partner. How many straws do you see we counted? (Be sure they are easy to see.)

S: 910!

T: What units did you use?

S: A ten and 9 hundreds.

T: That is the part we needed to get from 90 to 1,000.

T: Tell me what unit or units to use: ones, tens, or hundreds. Wait for the signal.

T: To count from 36 to 40?

S: Ones!

T: To count from 36 to 100?

S: Ones and tens!

T: To count from 100 to 800?

S: Hundreds!

T: To count from 70 to 100?

S: Tens.

T: To get from 67 to 600?

S: Ones, tens and hundreds!

**Exit Ticket (3 minutes)**

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students’ understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.
### Lesson 3: Count up and down between 90 and 1,000 using ones, tens, and hundreds

Date: 8/7/13

#### A

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Lesson 3: Count up and down between 90 and 1,000 using ones, tens, and hundreds.

Date: 8/7/13

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</table>
A. Draw, label, and box 90. Draw pictures of the units you use to count from 90 to 300.

B. Draw, label, and box 300. Draw pictures of the units you use to count from 300 to 428.

C. Draw, label, and box 428. Draw pictures of the units you use to count from 428 to 600.

D. Draw, label, and box 600. Draw pictures of the units you use to count from 600 to 1,000.
1. Draw a line to match the numbers with the units you might use to count them.

- 300 to 900 ones, tens, and hundreds
- 97 to 300 ones and tens
- 484 to 1,000 ones and hundreds
- 743 to 800 hundreds

2. These are bundles of hundreds, tens, and ones. Draw to show how you would count to 1,000.
Name _______________________________ Date _________________

1. Fill in the blanks to reach the benchmark numbers.
   a. 14, ____, ____, ____, ____, ____, 20, ____, ____, ____, 50
   b. 73, ____, ____, ____, ____, ____, ____, ____, ____, ____, ____, ____, ____, ____, 320
   c. 65, ____, ____, ____, ____, ____, ____, ____, ____, ____, ____, ____, ____, ____, 100
   d. 30, ____, ____, ____, ____, ____, ____, ____, ____, ____, ____, ____, ____, ____, ____, 400

2. These are ones, tens, and hundreds. How many sticks are there in all?
   There are __________ sticks in all.

3. Show a way to count from 668 to 900 using ones, tens, and hundreds.
4. Sally bundled her sticks in hundreds, tens, and ones.

![Image of sticks bundled in hundreds, tens, and ones]

a. How many sticks does Sally have? ___________________

b. Draw 3 more hundreds and 3 more tens. Count and write how many sticks Sally has now.
In Topic C, the teaching sequence opens with students counting on the place value chart by ones from 0 to 124, bundling larger units as possible (2.NBT.1a). Next, they represent various counts in numerals, designating and analyzing benchmark numbers (e.g., multiples of 10) and numbers where they bundled to count by a larger unit (2.NBT.2).

Next, students work with base ten numerals representing modeled numbers with place value cards that reveal or hide the value of each place. They represent three-digit numbers as number bonds and gain fluency in expressing numbers in unit form (3 hundreds 4 tens 3 ones), in word form, and on the place value chart. Students then count up by hundreds, tens, and ones, leading them to represent numbers in expanded form (2.NBT.3). The commutative property or “switch around rule” allows them to change the order of the units. They practice moving fluidly between word form, unit form, and expanded form (2.NBT.3).

Students are held accountable for naming the unit they are talking about, manipulating, or counting. Without this precision, they run the risk of thinking of numbers as simply the compilation of numerals 0–9, keeping their number sense underdeveloped.

The final Application Problem involves a found suitcase full of money: 23 ten dollar bills, 2 hundred dollar bills, and 4 one dollar bills, in which students use both counting strategies and place value knowledge to find the total value of the money.
**A Teaching Sequence Towards Mastery of Three-Digit Numbers in Unit, Numeral, Expanded, and Word Forms**

<table>
<thead>
<tr>
<th>Objective</th>
<th>Description</th>
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<tbody>
<tr>
<td>Objective 1:</td>
<td>Count up to 1,000 on the place value chart. (Lesson 4)</td>
</tr>
<tr>
<td>Objective 2:</td>
<td>Write base ten three-digit numbers in unit form; show the value of each digit. (Lesson 5)</td>
</tr>
<tr>
<td>Objective 3:</td>
<td>Write base ten numbers in expanded form. (Lesson 6)</td>
</tr>
<tr>
<td>Objective 4:</td>
<td>Write, read, and relate base ten numbers in all forms. (Lesson 7)</td>
</tr>
</tbody>
</table>
Lesson 4

Objective: Count up to 1,000 on the place value chart.

Suggested Lesson Structure

- Fluency Practice (15 minutes)
- Application Problem (7 minutes)
- Concept Development (28 minutes)
- Student Debrief (10 minutes)

Total Time (60 minutes)

Fluency Practice (15 minutes)

- Sprint: Adding to the Teens **2.OA.2** (10 minutes)
- Exchange to Get to 50 **2.NBT.2** (5 minutes)

Sprint: Adding to the Teens (10 minutes)

Materials: (S) Adding to the Teens Sprint

Exchange to Get to 50 (5 minutes)

Materials: (S) Dienes blocks, 12 ones, 5 tens, and 1 hundred flat per student; 1 die per pair

(Suggestions for modifying this game are presented in Topic C, Lesson 5)

T: (Students are seated in pairs at tables with materials.) Our game is to make 50.

T: Partner A, roll the die. Take that number of ones cubes from your pile, and line them up in a row on your hundred flat on the first row.

T: Now Partner B takes a turn.

T: It's Partner A’s turn again. Start a new row if you need to.

T: Some of you may now have 10, 11, or 12 ones on your hundred flats. If you completed a ten with your last roll, exchange the row of 10 ones for a ten-rod. Be sure to leave your extra ones on your hundred-flat.

NOTES ON DIENES BLOCKS:

These are often called base ten blocks. Dienes blocks include hundreds flats, tens rods, and ones cubes. They have not been formally introduced in Grade 2, and many students find them difficult to use at first. It may be appropriate to briefly identify each type of block before starting the game. However, avoid taking time to teach to the manipulative. The game itself will provide students with the opportunity to explore the blocks and their relationship to one another.

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T: Remember to say your total the unit form way. Don’t forget your tens!
T: Now it’s Partner B’s turn. Keep taking turns until the first person reaches 50.

**Application Problem (7 minutes)**

At his birthday party, Joey got $100 from each of his two grandmothers, $40 from his dad, and $5 from his little sister. How much money did Joey get for his birthday?

T: Read this problem with me.
T: Take a minute to talk with your partner about what information this problem gives you and how you can draw it.
T: (Circulate and listen for sound reasoning but also for common misperceptions.)
S: I can show $100 and $40 and $5.
T: Does anyone disagree with what Susana said? If so, can you explain why?
S: Each grandma gave Joey $100 and Joey has 2 grandmas, so it’s $200, not $100.
T: Yes. It’s very important to read carefully. Now draw your pictures and solve.
T: (After a minute or two.) Let’s use Elijah’s drawing to count and find the answer.
T: 245 what?
S: 245 dollars!
T: Give me the statement.
S: Joey got $245 for his birthday.
T: Talk with your partner. What does counting money remind you of? It’s like counting…?
S: Hundreds, tens, and ones!
T: How many of each unit are in $245?
S: 2 hundreds, 4 tens, 5 ones.
T: Very well done. Please write the answer ‘Joey got $245 for his birthday’ on your paper.
Concept Development (28 minutes)

Count Up to 10 by Ones, to 100 by Tens, to 1,000 by Hundreds on the Place Value Chart (3 minutes)

Materials: (T) 3 shoebox lids joined to create a place value “box” labeled hundreds, tens, and ones; place value cards up to 1,000  (S) About 150 straws, 16 rubber bands, and a place value “chart” per pair

T: (Show 1 straw.) This is 1 one. (Put the place value card in front of the box.)
T: Let’s count more ones into my place value box. Count the ones with me.
S: 1 one, 2 ones, 3 ones, 4 ones, 5 ones, 6 ones, 7 ones, 8 ones, 9 ones...
T: Wait! If I put another one I can make a larger unit! What will that new larger unit be?
S: 1 ten.
T: Let’s make 1 ten. (Complete the ten, bundle it and place it into the second box.) Now how many ones are in my ones box?
S: 0 ones.
T: How many tens are in my tens box?
S: 1 ten.
T: (Show the corresponding place value card and point as you say...) 1 ten, 0 ones.
T: Let’s count more tens into my place value box. Count the tens with me.
S: 1 ten, 2 tens, 3 tens, 4 tens, 5 tens, 6 tens, 7 tens, 8 tens, 9 tens...
T: Wait! If I put another unit of ten I can make a larger unit! What will that new larger unit be?
S: 1 hundred!
T: Let’s make 1 hundred. (Complete the hundred, bundle it, and place it into the third box.) Now how many tens are there in my tens box?
S: 0 tens.
T: How many ones are in my ones box?
S: 0 ones!
T: (Show them the corresponding place value card and point.) 1 hundred, 0 tens, 0 ones. (Repeat the process with hundreds.)

Count 10 ones: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10
Count 10 tens: 10, 20, 30, 40, 50, 60, 70, 80, 90, 100
Count 10 hundreds: 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000

NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:
At first, it may be wise to post a chart such as that pictured above. Read each row from left to right so that students see the number form as you say the words...
Students Count by Ones from 0 to 124 While Bundling Units on the Place Value Chart (8 minutes)

T: Here is your place value chart and some straws. With your partner, I want you to count at least from 0 to 124 by ones. Whisper count while using your place value chart. Bundle a larger unit when you can.

T: What number will you show and say after 10?
S: 20.

T: No, that is what we did together. You are counting by units of one. What number will you show and say after 10?
S: 11!

T: Good. Change who places the straws each time you make ten. You have 5 minutes. (Circulate and encourage them to count out loud as they bundle tens and place them in the correct place. Work until each pair has at least counted to 124. Encourage them at times to count in unit form, at times with numerals.) Early finishers go beyond 124.

T: Now, count up to 124 on your place value chart using all three units: ones, tens and hundreds.

T: (Model.) 1 hundred, 1 hundred ten, 1 hundred twenty…

T: That was a lot faster!

T: Who remembers the word that means fast and accurate?
S: Efficient!

T: That’s right!

NOTES ON WHY 124?

Even older students often count incorrectly 119, 120, 200. Also, Grade 1 standards count up to 120. Be aware that the count to 124 will be used in the Debrief. Later in the lesson, students count from 476 to 600 and discover in the Debrief that the missing part is 124. They then compare the way they counted from 0 to 124 to the way they counted from 476 to 600.
Counting Up with the Place Value Chart (7 minutes)

T: Now, let's count today from 476 to 600 using my place value box. (Model 476 using the shoe boxes and bundles as illustrated.)

T: Let's analyze 476. How many hundreds do you see?
S: 4!
T: Tell me the unit.
S: 4 hundreds.
T: How many tens do you see?
S: 7 tens.
T: How many ones do you see?
S: 6 ones.
T: We want to count from 476 to 600. Let's not count by ones. Instead let's wisely use ones, tens, and hundreds.
T: Talk to your partner about what benchmark numbers to get to, and what units to use to get there.

S: Use ones to get to 480. Then use tens to get to 500. Use a hundred to get to 600. Count 1 hundred to get to 576. Then count ones to get to 580. Then count tens to reach 600. Count tens to get to 496. Count ones to get to 500. Then count 1 hundred to get to 600.

(Circulate and support students in targeting each benchmark number and each unit.)

T: Let's try it. What unit will I count first?
S: Ones.
T: Up to what benchmark number?
S: 80.
T: Really? This number is much larger than 80!
S: 480.
T: Count for me (place ones).
S: 477, 478, 479, 480.
T: What do I do now?
S: Bundle a ten.
T: Now what unit will I count by?
S: Tens!
T: Up to what benchmark number?
S: 500!
T: Count for me (place tens as students count).
Lesson 4: Count up to 1,000 on the place value chart.

Date: 8/7/13

S: 490, 500.
T: What do I do now?
S: Bundle 1 hundred made of your 10 tens.
T: Now what unit will I count by?
S: Hundreds.
T: Count for me (place 1 hundred).
S: 600!
T: Discuss with your partner how we counted from 476 to 600 on the place value chart. Be sure to talk about the units you used, your benchmark numbers, and your bundling.
T: (After partners share.) Can you write the numbers that tell the way you counted? Let’s start with 477.
S: 477, 478, 479, 480, 490, 500, 600.
T: Let’s underline where we bundled a larger number and where we got to a benchmark number.

Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students solve these problems using the RDW approach used for Application Problems.

Complete Row A on the Problem Set as a guided practice with the class before allowing students to continue with Rows B–D.

Row A 476 to 600 (guided practice)
Row B 47 to 300
Row C 188 to 510
Row D 389 to 801

Student Debrief (10 minutes)

Lesson Objective: Count up to 1,000 on the place value chart.

Materials: (T) 3 shoebox lids joined to create a place value “box” labeled hundreds, tens, and ones  (S) Completed Problem Set, Exit Ticket

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the
T: Bring your work to the carpet. Talk to your elbow partner. Where did you bundle a new unit in each count?
S: (Students share.)
T: Let’s prove your thoughts by modeling each count quickly on the place value chart. Let’s start with 47 to 200.
T: Count while I place the straws. Tell me what to bundle when necessary.
S: 48, 49, 50. Bundle a ten!! 60, 70, 80, 90, 100. Bundle a ten and bundle a hundred. 200!!
T: That is the trickiest, when we bundle a ten and that makes a hundred, too. First we bundle a ten and then a hundred or we could just bundle 1 hundred.
T: Next.
T: Next.
S: 498, 499, 500. Bundle a ten!! Bundle a hundred!
S: 600, 610 620, 622, 623, 624.
T: Good. Let’s take a look at something interesting.
T: (Place 476 to the side of your place value box.) Let’s count from 476 to 600 again but this time let’s only show what we are counting in our place value box.
T: What unit did we start our count with?
S: Ones.
T: Count for me.
S: 477, 478, 479, 480.
T: Keep going.
S: 490, 500.
T: Keep going.
S: 600.
T: What is the value of what I counted on from 476 to get to 600?
S: 124! That is the same number we counted before!
T: Yes! We did count from 0 to 124 first. Next we counted from 476 to 600.
T: Talk to your partner. How is counting from 0 to 124 different from this new 124 we found when we counted from 476 to 600?
S: We got to a much bigger number! → Before we started at 0. This time we started at 476. → We counted the hundred first before, but this time we counted the ones first. → Yeah, it’s like upside down. → Going to 124, our first benchmark number was 100. This time it was 480. → And we didn’t have to bundle counting to 124 but we did counting to 600. → It’s because the first time the 124, the ones came last. This time they came first. → It’s like this was the part that was missing to get from 476 to 600. → Yes, this is the missing part. We filled in the 24 first to get to 500 and then added the hundred.
T: I would like to hear some thoughts from the people I spoke to while you were partner sharing.
T: Jessica and Orlando, would you share?
S: We noticed that from 0 to 124 and from 476 to 600, there are 124 between both of them when you count up.
T: Who can rephrase that in their own words?
S: It takes as many straws to get from 0 to 124 as it takes to get from 476 to 600.
T: Yes. Can someone use the words “missing part” to restate the same idea?
S: It is the same missing part, 124, to count from 0 to 124 and from 476 to 600.
T: Turn and talk to your partner about what your friends noticed.
T: Do you think there are other pairs of numbers like 476 and 600 where the count is 124 between them?
S: Yes!!
T: Think about it during the week. On Friday, if anyone wants to share another pair of numbers, we would love to hear them. Talk to your family members about it, too.

**Exit Ticket (3 minutes)**

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students’ understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.
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Lesson 4: Count up to 1,000 on the place value chart.

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Directions: Work with your partner to imagine your place value chart. Write down how you might count from the first number up to the second number. Underline the numbers where you bundled to make a larger unit.

A. 476 to 600

B. 47 to 200

C. 188 to 510

D. 389 to 801
Name _________________________________ Date ________________

1. These are bundles of 10. If you put them together, which unit will you make?

   [Image of bundles]

   a) one   b) ten   c) hundred   d) thousand

2. These are bundles of hundreds, tens, and ones. How many sticks are there in all?

   [Image of bundles]

   ____________________________

3. Imagine the place value chart. Write the numbers that show a way to count from 187 to 222.
1. Marcos used the place value chart to count bundles. How many sticks does Marcos have in all?

Marcos has _____________ sticks.

2. Write the number:

   Hundreds  |  Tens  |  Ones  
   __________|_________|_________

3. These are hundreds. If you put them together, which unit will you make?

   a) one     b) hundred   c) thousand   d) ten
4. Analyze 585. How many hundreds, tens, and ones does it have?

______________  ______________  ______________
ones          tens           hundreds

5. Make the number sentence true.

12 ones = _____ ten _____ ones

6. Show a way to count from 170 to 410 using tens and hundreds. Circle at least 1 benchmark number.

7. Mrs. Sullivan’s students are collecting cans for recycling. Frederick collected 20 cans, Donielle collected 9 cans, and Mina and Charlie each collected 100 cans. How many cans did the students collect in all?
Lesson 5

Objective: Write base ten three-digit numbers in unit form; show the value of each digit.

Suggested Lesson Structure

- Fluency Practice  (12 minutes)
- Application Problem  (10 minutes)
- Concept Development  (28 minutes)
- Student Debrief  (10 minutes)

Total Time  (60 minutes)

Fluency Practice  (12 minutes)

- Exchange to Get to 100  2.NBT.1a  (5 minutes)
- Meter Strip Addition  2.NBT.5  (7 minutes)

Exchange to Get to 100  (5 minutes)

Materials: (S) Dienes blocks, 12 ones, 10 tens, and 1 hundred per student; 1 die per pair

To keep student engagement high, you might modify the game for the class or for individuals. These are some adjustment suggestions:

- Two pairs at a table can “race” against each other rather than compete individually. This provides support and may reduce anxiety for students below grade level or students with disabilities.
- Students below grade level or those with disabilities may benefit from writing the new total after each turn.
- Switch the game to become Exchange to Get to 0. Students start at 100 and subtract the number of ones rolled on the die, exchanging tens rods for ones cubes.

Meter Strip Addition: Using Two-Digit Numbers with Totals in the Ones Place that Are Less Than or Equal to 12  (7 minutes)

Materials: (S) Meter strips

T: (Each student has a meter strip.) We’re going to practice addition using our meter strips.
T: Put your finger on 0. Slide up to 20. (Wait.) Slide up 9 more.
T: How many centimeters did you slide up altogether?
Lesson 5

Write base ten three-digit numbers in unit form; show the value of each digit.

Date: 8/7/13

3.C

NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

Invite students to analyze different solution strategies. If you have the technical capability, project carefully selected student work two at a time. This is an argument for having word problems on half sheets of paper to facilitate comparison. Assign students the same problem for homework. This gives them the chance to try one of the new strategies.

Freddy is a student in this class. This is an obvious strategy for engaging students, using their names and culturally relevant situations within story problems.

S: 29 centimeters.
T: Tell your partner a number sentence describing sliding from 20 to 29.
S: $20 + 9 = 29$.
T: Put your finger on 0. Slide up to 34. (Wait.) Slide up 25 more.
T: How many centimeters did you slide up altogether?
S: 59 centimeters!
T: Whisper a number sentence describing sliding from 34 to 59.
S: $34 + 25 = 59$
T: (Continue with possible sequence: $46 + 32, 65 + 35, 57 + 23, 45 + 36, 38 + 24,$ etc.)

Application Problem (10 minutes)

Freddy has $250 in ten dollar bills.

a. How many ten dollar bills does Freddy have?
b. He gave 6 ten dollar bills to his brother. How many ten dollar bills does he have left?

T: Let’s read this problem together.
T: Talk with your partner about how you can draw the information given in the problem.
T: (Circulate. Listen for clear, concise explanations, as well as creative approaches to solving.)
S: I drew tens and skip-counted by 10 all the way up to 250. → I counted by tens up to $250 and kept track with a tally. → I skip-counted by tens to 100. That was 10 tens so then I just added 10 tens and then 5 tens. → I know 10 tens are in 100, so I drew 2 bundles of 100 and wrote 10 under each one. And I know 50 is 5 tens. So I counted 10, 20, 25 tens.
T: How many ten dollar bills does Freddy have?
S: Freddy has 25 ten dollar bills.
T: Please add that statement to your paper.
T: Now talk with your partner about Part B of this problem. Can you use your drawing to help you solve? (After a minute.)
S: I crossed off 6 tens and counted how many were left.
T: Raise your hand if you did the same thing? Who solved it another way? (Listen to at least two other strategies.)
S: I wrote a number sentence. $26 - 5 = \_\_\_\_. → I did it the other way. I wrote $6 + \_\_\_\_ = 25$. 
T: I hear very good thinking! So tell me, how many ten dollar bills does Freddy have left?
S: Freddy has 19 ten dollar bills!
T: Add that statement to your paper.

Concept Development (28 minutes)

Materials: (T) Base ten bundles of straws, place value “box”, and a full set of place value cards through 1,000
(S) Place value cards 1–5, 10–50, and 100–500 cut apart (as pictured) and in a baggie

T: (Have 4 ones, 3 tens, and 2 hundreds already in the place value “boxes.”) Count for me.
S: 1 one, 2 ones, 3 ones, 4 ones. 1 ten, 2 tens, 3 tens. 1 hundred, 2 hundreds.
T: Can I make larger units?
S: No!
T: In order from greatest to smallest, how many of each unit are there?
S: 2 hundreds, 3 tens, 4 ones.
T: What number does that represent?
S: 234.
T: What if we have 3 tens, 4 ones, and 2 hundreds—what number does that represent?
S: 234!
T: (Show 234 with place value cards. Pull the cards apart to show the value of each digit separately. Push them back together to unify the values as one number.) Open your bag. Build the number 234 with your place value cards.
S: (Students find the cards in their bags and build the number.)
T: Which of your cards shows this number of straws? (Hold up 2 hundreds.) This number of straws? (Hold up 4 ones.) Which has greater value, 2 hundreds or 4 ones?
S: 2 hundreds.
T: (Write on the board ___ hundreds ___ tens ___ ones.) Read the unit form for me to tell about this number (point to the number modeled in the place value box).
S: 2 hundreds 3 tens 4 ones.
T: That is called unit form.

NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:
Remember, not all students will complete the same amount of work. Provide extra examples for early finishers, adding to the number of ones, tens, and hundreds in their place value boxes. Provide more examples at a simpler level for students who need additional practice before moving on to numbers with zeros, such as those in the Problem Set below.
Lesson 5
Write base ten three-digit numbers in unit form; show the value of each digit.

Date: 8/7/13

T: We read this also as (write on board) two hundred thirty-four. This is the word form.

T: Work with your partner with your place value cards showing 234. Pull the cards apart and push them together. Read the number in unit form and in word form.

Guide students through the following sequence of activities.

- Model numbers in the place value boxes.
- Students represent them with their place value cards.
- Students say the number in word form and unit form.

A suggested sequence might be: 351, 252, 114, 144, 444, 250, 405. These examples include numbers that repeat a digit and those with zeros. Also, in most of the examples the numbers have digits that are smaller in the hundreds place than in the tens or ones. This is so that as you circulate and ask, “Which has more value this 4 or this 4? What is the meaning of the zero?”

Problem Set (12 minutes)

Students should do their personal best to complete the Problem Set within the allotted 12 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first.

The Problem Set advances to numbers not within the students’ set of place value cards. Have the students represent each number with number bonds where each part is shaped like a place value card. As needed, you can represent the numbers in the place value boxes. Hold all students accountable for saying each number in a whisper voice.

Student Debrief (10 minutes)

Lesson Objective: Write base ten three-digit numbers in unit form; show the value of each digit.

Materials: (T) Place value chart template (as pictured), place value “box,” bundles of straws for modeling
(S) Place value chart template (as pictured), personal white board, Exit Ticket

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.
T: Bring your Problem Set to our Debrief. (Post, draw, or project a place value chart.)
T: Whisper this number to me (point to 243 on the Problem Set).
S: 243.
T: (Model it with bundles in the place value box.)
   How many hundreds?
S: 2 hundreds.
T: (Replace the 2 hundreds with the digit 2.)
T: How many tens?
S: 4 tens.
T: (Replace the 4 tens with the digit 4.)
T: How many ones?
S: 3 ones.
T: (Replace the 3 ones with the digit 3.)
T: We now have represented 243 on the place value chart as a number. It is up to you to know the units represented and to remember that 2 hundreds has a different value than 2 ones.
T: I’ll show the next number from your Problem Set. Say the value in unit form. I’ll tap the number again. Say the number in word form.
T: (Write 416 in a place value chart.)
S: 4 hundreds 1 ten 6 ones.
T: (Tap 416.)
S: Four hundred sixteen.
T: (Write 605 in a place value chart.)
S: 6 hundreds 0 ten 5 ones.
T: (Tap the number.)
S: Six hundred five.
T: (Finish with 750.)

Students slide individual place value templates into personal boards. An example of a personal board with a template is to the right.

T: Turn to your partner. Partner A, write a number in your place value chart. Tap it. Partner B says the number in unit form and then word form. Then switch roles.

Circulate, listen, for 1 minute. Take notes as necessary. Students should speak with confidence. Note those that still have insecurity even if their answers are correct. This is evidence they simply need more practice.
Lesson 5

Write base ten three-digit numbers in unit form; show the value of each digit.

T: (Display a set of four numbers as to the right.)

What is the value of this 6?

Answer in a complete sentence using the sentence frame. “The value is ____.”

S: The value is 6 hundreds.

T: What is the value of this 6?

S: The value is 6 tens.

T: You knew the different values because you saw where I pointed. The place told you the value.

T: Tell your partner how you knew the value of each 6.

S: Because one was here and one was in the middle. → Because that is where we had bundles of tens and hundreds. → Because it says hundreds and tens there above. → Because this 6 was in the hundreds place and this 6 was in the tens place.

T: What is the first number on our chart?

S: 642.

T: Look, 264 has 2, 4, and 6 but in different places! The place tells us the value.

T: We call this a place value chart because each place (point to each place) has a value. We use 0–9 but their place tells us the unit represented.

T: Take turns telling your partner each of these numbers in unit form and in word form. If you finish early, write an interesting number for your partner to analyze.

T: (Students work.) Let’s close our lesson by having you explain to your partner what a place value chart is. Use the words value, unit, and place.

Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students’ understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.
Name _______________________________  Date ________________

Directions: Your teacher will tell you a number to write in each box. In a whisper voice, say each number in word form. Use number bonds to show how many ones, tens, and hundreds are in the number.
Lesson 5 Exit Ticket

1. Look at the place value cards. What is the value of the 6?

   \[
   \begin{array}{ccc}
   5 & 6 & 9 \\
   \end{array}
   \]

   a. 6  b. 600  c. 60

2. What is another way to write 5 ones 3 tens 2 hundreds?

   a. 325  b. 523  c. 253  d. 235

3. What is another way to write 6 tens 1 hundred 8 ones?

   a. 618  b. 168  c. 861  d. 681

4. Write 905 in unit form.
Name ___________________________________________ Date _____________

1. What is the value of the 7 in 764? ________________________

2. Make number bonds to show the hundreds, tens, and ones in each number. Then write the number in unit form.

   a. 333

      ___________________________________________

   b. 330

      ___________________________________________

   c. 303

      ___________________________________________
3. Draw a line to match unit form with number form.

1 hundred 1 one = 11

1 ten 1 one = 710

7 tens 1 one = 110

7 hundreds 1 one = 701

1 hundred 1 ten = 101

7 hundreds 1 ten = 71
Lesson 6
Objective: Write base ten numbers in expanded form.

Suggested Lesson Structure

- Fluency Practice (12 minutes)
- Application Problem (8 minutes)
- Concept Development (30 minutes)
- Student Debrief (10 minutes)
- Total Time (60 minutes)

Fluency Practice (12 minutes)

- Meter Strip Addition 2.NBT.5 (7 minutes)
- Unit Form Counting from 398 to 405 2.NBT.3 (3 minutes)
- Think 10 to Add 9 2.OA.2 (2 minutes)

Meter Strip Addition: With Two-Digit Numbers and Totals in the Ones that Are Greater Than 12 (7 minutes)

Materials: (S) Meter strips, personal white boards

T: (Each student has a meter strip.) We’re going to practice addition using our meter strips.
T: Put your finger on 0. Slide up to 27 centimeters. (Wait) Slide up 35 more centimeters. You might first skip-count by ten three times, then go up 5 ones.
T: How many centimeters did you slide up altogether?
S: 62 centimeters.
T: Tell your partner a number sentence describing sliding from 27 to 62.
S: 27 + 35 = 62.
T: Put your finger on 0 centimeters. Slide up to 38 centimeters. (Wait) Slide up 36 more centimeters.
T: How many centimeters did you slide up altogether?
S: 74 centimeters!
T: At the signal say a number sentence describing sliding from 38 to 74. (Pause, signal)
S: 38 + 36 = 74.
T: (Continue with possible sequence: 37 + 37, 45 + 28, 49 + 26, 68 + 28, 57 + 29, etc.)
T: In each of these problems we had more than 9 ones so we had to make a new ten. I will write a number sentence. Wait for the signal. Say “make ten” if you have more than 9 ones. Say, “you can’t
make ten,” if there are not enough ones.

T: 35 + 22.
S: You can’t make ten.
T: 63 + 16.
S: You can’t make ten.
T: 48 + 29.
S: Make ten.
T: 36 + 54.
S: Make ten.
T: 27 + 16.
S: Make ten.

T: Now, turn to your partner and on your personal board, write as many addition number sentences as you can solve on your meter strip that need to make ten. You have one minute. Take your mark, get set, go!

Unit Form Counting from 398 to 405 (3 minutes)

Materials: (T) Place value cards

T: Today we’re going to practice unit form counting. This time we’ll include hundreds! The unit form way to say 324 is “3 hundreds 2 tens 4 ones.” (Pull the cards apart to show the 300, 20, and 4.)

T: Try this number. (Show 398. Signal.)
S: 3 hundreds 9 tens 8 ones.
T: (Pull cards apart.) That’s right!
T: Let’s count on from 398 the unit form way. (Display 399–405 with place value cards as students count.)

S: 3 hundreds 9 tens 9 ones, 4 hundreds, 4 hundreds 1 one, 4 hundreds 2 ones, 4 hundreds 3 ones, 4 hundreds 4 ones, 4 hundreds 5 ones.

Think 10 to Add 9 (2 minutes)

T: Listen carefully! If I say, “9 + 5,” you say, “10 + 4.” Wait for my signal. Ready?
T: 9 + 5. (Signal)
S: 10 + 4.
T: 9 + 3.
S: 10 + 2.
T: 9 + 7.
S: 10 + 6.
T: 9 + 4.
S: 10 + 3.
T: 9 + 2.
Lesson 6
Write base ten numbers in expanded form.

Date: 8/7/13

S: 10 + 1.
T: 9 + 6.
S: 10 + 5.
T: 9 + 9.
S: 10 + 8.
T: 9 + 8.
S: 10 + 7.

**Application Problem (8 minutes)**

Timmy the monkey picked 46 bananas from the tree. When he was done, there were 50 bananas left. How many bananas were on the tree at first?

T: Read the problem with me.
T: Close your eyes and visualize Timmy the monkey and all those bananas.
T: Talk with your partner: What can you draw to show what you see?
S: I can draw the 46 bananas Timmy picked, and I can draw 50 bananas that are still on the tree.
T: What is the question asking? Read it again.
S: How many bananas were on the tree at first?
T: At first means at the very beginning of the story, before Timmy picked any bananas.
T: Work with your partner. How many different ways can you find the answer? (Circulate and listen for different strategies.)
T: Who would like to share their thinking?
S: At the beginning all the bananas were on the tree, so I drew 4 tens 6 ones and 5 tens and then I added and got 9 tens 6 ones, 96. → I know 50 is 5 tens so I counted on 5 tens from 46: 56, 66, 76, 86, 96. → I made a number bond of 46 as 40 and 6, and then I wrote 50, and 40 plus 50 is 90, plus 6 more is 96.
T: Such creative problem solving! And did we all get the same answer?
S: Yes!
T: So how many bananas were on the tree at first? Give me a complete sentence.
S: 96 bananas were on the tree at first!
T: Yes! Please add that statement to your paper.
Concept Development (30 minutes)

Materials: (T) Place value “box,” bundles of straws for modeling

Expanded Form in Unit Order (8 minutes)

T: (Have the number 243 both written and modeled in the place value boxes.) Read this number to me in unit form. (Point)
S: 2 hundreds 4 tens 3 ones.

T: Count for me up to 243 using the bundles in my place value box (Record their count numerically by unit on the board in a single line horizontally (as pictured to the right).

S: 1 hundred, 2 hundred, 2 hundred ten, 2 hundred twenty, etc....

T: Each time we count a new unit, we are adding it to what we had before. Let’s reread this putting in addition symbols.

T: (Write in the symbols as students read.)
S: \[100 + 100 + 10 + 10 + 10 + 1 + 1 + 1 = 243.\]

T: Explain to your partner why this is the same as 243.

T: (Point to 100 + 100.) The answer is?
S: 200. (Write it below.)

T: (Point to 10 + 10 + 10 + 10.) The answer is?
S: 40. (Write it below.)

T: (Point to 1 + 1 + 1.)

T: 100 + 100 + 10 + 10 + 10 + 1 + 1 + 1 = ?
T: Say the number in unit form.
S: 2 hundreds 4 tens 3 ones.

T: (Point to the number sentence.) Are there 2 hundreds? 4 tens? 3 ones?
S: Yes!

T: 200 + 40 + 3 is?
S: 243.

T: Show 243 with your place value cards.
T: 240 + 3 is?
S: 243.
T: 200 + 43 is?
S: 243.

T: There are different ways we can write our number. Now, let’s add the total value of each unit.

T: What is the total value of the hundreds in 243?
Lesson 6

Write base ten numbers in expanded form.

Date: 8/7/13

Problem Set Side 1 (7 minutes)

Students should do their personal best to complete the Problem Set within the allotted 7 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students solve these problems using the RDW approach used for Application Problems.

T: Excellent. Now you’ll practice that so you get really good at it. On your Problem Set, write each number as an addition sentence separating the total value of each of the units. Let’s do the first one together. (Guided practice.)

T: You have five minutes to do your personal best.

Guided Practice: Expanded Form out of Unit Order (10 minutes)

T: Let’s move the units around. (Pick up the 2 bundles of hundreds and move them to the end.)

T: (Write) 10 + 10 + 10 + 10 + 1 + 1 + 1 + 100 + 100 = ?

T: Explain to your partner why this is the same as 243.

T: (Point to the number sentence.) Are there 2 hundreds? 4 tens? 3 ones?

S: Yes!

T: 40 + 3 + 200 =?

S: 243.

T: Can someone explain what they understand about the order of the units and the total value? Talk about it with your partner first. (After a few moments.)

S: I notice that 3 and 40 and 200 is the same as 200 and 3 and 40. They’re both 243. → We can write
the units in any order but the total stays the same. \(\Rightarrow\) It doesn’t matter which unit we say first. It all adds up to the same amount.

T: Yes! It’s important to be on the lookout for patterns and structures you can use to make sense out of math!

T: You’ve discovered there are different ways we can write our units but the order does not affect the totals.

T: What is \(2 + 4 + 3?\)
S: 9.

T: What is \(3 + 4 + 2?\)
S: 9.

T: Explain to your partner why these totals are equal.
S: \(6 + 3\) is 9 and \(7 + 2\) is 9, too. \(\Rightarrow\) When you add it doesn’t matter if the parts are switched around. \(\Rightarrow\) You can make both problems \(5 + 4\) just by adding 2 and 3 first. \(\Rightarrow\) You can make both sides equal to \(7 + 2\) just by adding the 4 and 3 first.

T: Is the same true if our numbers are larger?

\[
\begin{align*}
2 + 4 + 3 &= 3 + 4 + 2 \\
9 &= 9
\end{align*}
\]

\[
\begin{align*}
200 + 40 + 3 &= 40 + 3 + 200 \\
243 &= 243
\end{align*}
\]

**Problem Set Side 2 (5 minutes)**

Excellent. Let’s practice that so you get really good at it. I have written some addition sentences that tell the total value of each unit. Please write the total value in numerals. Be careful because they are not in order from the largest to the smallest unit!

**Student Debrief (10 minutes)**

**Lesson Objective:** Write base ten numbers in expanded form.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the
Lesson 6: Write base ten numbers in expanded form.

Date: 8/7/13

NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

Not all students will finish copying the rows in the given time frame. Early finishers can generate their own examples of expanded form and trade papers with a partner to check their work.

T: Bring your Problem Set to our lesson Debrief. Check your answers for two minutes in your small groups of three.

S: (Students check.)

T: Now I’m going to read the answers. If you got it correct, whisper “yes.”

T: Letter A, 200 + 30 + 1 = 231.

S: Yes! (Continue through both sides of the Problem Set at a lively pace.)

T: Work out any mistakes you made for one minute. Ask your group for help if you need it.

S: (Work together.)

T: I have written up pairs of problems that I want you to compare. How are they the same? How are they different?

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<thead>
<tr>
<th>A and B</th>
<th>I and J</th>
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<tr>
<td>C and D</td>
<td>K and L</td>
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<td>C and G</td>
<td>P and G</td>
</tr>
<tr>
<td>D and H</td>
<td>Look for other connections, too.</td>
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</tbody>
</table>

T: When we write our numbers as addition sentences with parts representing the total value of each unit that is called expanded form. It helps us to see the value of each place.

T: Let’s write an example in our math journal. You have two minutes to do your personal best. Write Expanded Form and then write the following examples to help you. Start by copying the entire first row.

T: (Write Expanded Form on the board for students to copy.)

Examples:

- 200 + 40 + 9 = 249
- 900 + 10 + 3 = 913
- 400 + 3 = 403
- 200 + 50 = 250
- 9 + 40 + 200 = 249
- 913 = 3 + 900 + 10
- 3 + 400 = 403
- 250 = 200 + 50

Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students’ understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.
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<tr>
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<td>231</td>
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<tr>
<td>B.</td>
<td>312</td>
<td>F.</td>
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<tr>
<td>C.</td>
<td>527</td>
<td>G.</td>
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<td>D.</td>
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<td>H.</td>
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</table>
Write the answer.

<p>| | | |</p>
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<tr>
<td>I.</td>
<td>2 + 30 + 100 =</td>
<td>M.</td>
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<tr>
<td>J.</td>
<td>300 + 2 + 10 =</td>
<td>N.</td>
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<td>K.</td>
<td>50 + 200 + 7 =</td>
<td>O.</td>
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<tr>
<td>L.</td>
<td>70 + 500 + 2 =</td>
<td>P.</td>
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<tr>
<td>Write in number form.</td>
<td>Write in expanded form.</td>
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<tr>
<td>a. 10 + 10 + 1 + 1 + 100 + 100 = ________</td>
<td>a. 974 = ____________________</td>
<td></td>
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<tr>
<td>b. 400 + 70 + 6 = ___________</td>
<td>b. 435 = ____________________</td>
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<tr>
<td>c. __________ = 9 + 700 + 10</td>
<td>c. 35 = ____________________</td>
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<tr>
<td>d. __________ = 200 + 50</td>
<td>d. 310 = ____________________</td>
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<td>e. 2 + 600 = ___________</td>
<td>e. 703 = ____________________</td>
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<tr>
<td>f. 300 + 32 = ___________</td>
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</tbody>
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Write base ten numbers in expanded form.

Name ___________________________ Date _______________

Lesson 6 Exit Ticket

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Match the numerals with the number names.

A. Two hundred thirty
   - 230
B. Forty
   - 40
C. Nine hundred sixty
   - 960
D. Four hundred seventy
   - 470
E. Eight hundred fifty
   - 850
F. Five hundred nineteen
   - 519
G. Four hundred seventeen
   - 417
H. Fourteen
   - 14
I. Nine hundred thirteen
   - 913
J. Eight hundred fifteen
   - 815
K. Five hundred ninety
   - 590
L. Two hundred thirteen
   - 213
M. Nine hundred sixteen
   - 916
Write in number form.

a. \(1 + 1 + 1 + 1 + 10 + 10 + 10 + 10 + 100 + 100 = \) __________

b. \(300 + 90 + 9 = \) __________

c. __________ = \(5 + 100 + 20\)

d. __________ = \(600 + 50\)

e. \(3 + 400 = \) __________

f. \(900 + 76 = \) __________

Write in expanded form.

a. \(533 = \) ________________

b. \(355 = \) ________________

c. \(67 = \) ________________

d. \(460 = \) ________________

e. \(801 = \) ________________
Lesson 7

Objective: Write, read, and relate base ten numbers in all forms.

Suggested Lesson Structure

- Fluency Practice (15 minutes)
- Concept Development (27 minutes)
- Application Problem (8 minutes)
- Student Debrief (10 minutes)
- Total Time (60 minutes)

Fluency Practice (15 minutes)

- Write Numbers in Expanded Form 2.NBT.3 (4 minutes)
- Sprint: Expanded Form 2.NBT.3 (8 minutes)
- Skip-Count Up and Down by $10 Between 45 and 125 2.NBT.2, 2.NBT.8 (3 minutes)

Write Numbers in Expanded Form (4 minutes)

Materials: (T) Place value cards  (S) Personal white boards, template (pictured to the right)

T: (Each student slides a copy of the template pictured to the right into their personal white board.) I’ll show a number with place value cards. You’ll write it in expanded form. I’ll tell you which box to use by saying A, B, or C.

T: Notice Box C doesn’t have any words. I’ll say a special order when we use Box C. Ready?

T: (Show 145.) B. Show your board at the signal. (Pause, signal)

S: (Students use Box B and write 40 + 100 + 5.)

T: (Show 306.) A. Wait for the signal. (Pause. Signal.)

S: (Students use Box A and write 300 + 0 + 6.)

T: (Show 316.) C. Here’s the order: ones, hundreds, tens. (Pause. Signal.)

S: (Students use Box C and write 6 + 300 + 10.)

T: (Continue, varying the boxes and numbers shown.)

T: Now you’re warmed up for a Sprint!

NOTES ON THE TEMPLATE:

Variety keeps students’ attention focused on the units rather than habituation to a certain order. Each time you use Box C, vary the order. Box C requires slightly more demanding application, and the listening component heightens engagement.
Lesson 7: Write, read, and relate base ten numbers in all forms.

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Sprint: Expanded Form (8 minutes)
Materials: (S) Expanded Form Sprint

Skip-Count Up and Down by $10 Between 45 and 125 (3 minutes)
Materials: (T) 12 ten dollar bills, 1 five dollar bill

T: (Lay out $45 so that all students can see.) When I signal, tell the total value of the bills. (Pause, signal)
S: 45 dollars!
T: Good. Watch carefully as I change the total value. Count the new amount as I make it.
T: (Lay down ten dollar bills to make $55, $65, $75, $85, $95, $105, $115, $125.)
S: (Students respond in kind.)
T: (Take ten dollar bills to make $115, $105, $95, $85, $75.)
S: (Students respond in kind.)
T: (Lay down ten dollar bills to make $85, $95, $105, $115, $125.)
S: (Students respond in kind.)
T: (Take ten dollar bills to make $115, $105, $95.)
S: (Students respond in kind.)
T: (Continue alternating practice counting up and down, crossing back over numbers that your students demonstrate difficulty counting.)

Concept Development (27 minutes)

Word form, Unit Form, and Numerals (5 minutes)
Materials: (S) Practice Sheet (pictured)

T: From your spelling races (pictured to the right), I know you have worked hard to learn to read and spell numbers. You have two minutes to write as many numbers as you can once more, just as you have done since last year after the winter holiday.
S: (Students write.)
T: Stop. Show me your boards. (Review each one quickly.)
T: Check your work with your partner. Did you improve since the last time we did it? How many students spelled all the numbers to 10 correctly?
S: (Some students raise hands.)
T: Teen numbers. (Continue the process.)
T: Ok. I will show you a number in words. You write the number on your board.
T: (Write four hundred sixty-five.)
S: (Write 465 and show at the signal.)
T: (Write two hundred seventeen.)
S: (Write 217 and show at the signal.)
T: (Write nine hundred one.)
S: (Write 901 and show at the signal.)
T: (Write 2 tens 7 hundreds 3 ones.)
S: (Write 723 and show at the signal.)
T: (Write 13 tens 2 ones.)
S: (Write 132 and show at the signal.)

Continue with more examples. Alternate between word form and unit form unless your students need to focus on one type before moving on. We work towards mastery while avoiding predictable patterns that can lead to rigid thinking. The Problem Set provides a possible sequence to follow.

Problem Set 1 (5 minutes)

Students should do their personal best to complete the Problem Set within the allotted 5 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students solve these problems using the RDW approach used for Application Problems.

Materials: (S) Problem Set 1 (pictured)

A, B, C: Three non-zero digits in standard order.
D, E, G, L: Word or unit form in standard order but with no ones or tens.
H: Unit form with no tens.
F, I, J, K: Unit form out of order.
M: More than 9 units.
Lesson 7: Write, read, and relate base ten numbers in all forms.

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3.C.42

Higher performers can be released to work on the Problem Set while you might keep a group with you in order to give appropriate problems. Stay with a given type until they have it. Move on quickly when they do. Move students on to the Problem Set who have caught on. Early finishers might be provided with markers and sentence strips.

They can create examples of the word or unit form to be used in the Student Debrief. The final problem is meant to lead into the next segment of the lesson.

**More than 9 of a Unit (12 minutes)**

Materials: (S) 21 ones and 21 tens per pair, personal white boards

T: Partner A, with your straws, show me 12 ones.
T: (After students count out 12 ones.) Express 12 ones as tens and ones.
S: 1 ten 2 ones.
T: Tell the total value of 1 ten 2 ones.
S: 12.
T: Partner B, with your straws, show me 12 tens.
T: (After students count out 12 tens.) Express 12 tens as hundreds and tens.
S: 1 hundred 2 tens.
T: Tell the total value of 1 hundred 2 tens.
S: 120.
T: Turn to your partner and compare 12 ones to 12 tens.
T: Partner A, with your straws, show me 15 tens. Partner B, show me 15 ones.
T: Express to each other the value of your straws using the largest unit possible.
S: 1 ten 5 ones. 1 hundred 5 tens.
T: Tell the total value of 1 hundred 5 tens.
S: 150.
T: Compare 15 ones to 15 tens with your partner.
T: Partner A, show me 21 ones. Partner B, show me 21 tens.
T: Express 21 ones as tens and ones.
S: 2 tens 1 one.
T: Express 21 tens as hundreds and tens.
S: 2 hundreds 1 ten.
T: What is the total value of 2 hundreds 1 ten?
T: Compare 21 ones to 21 tens with your partner.
Lesson 7: Write, read, and relate base ten numbers in all forms.

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T: Put your straws away. On your personal boards, express 68 ones as tens and ones.
S: (Write and show at the signal 6 tens 8 ones.)
T: On your boards, express 68 tens as hundreds and ones.
S: 6 hundreds 8 tens.
T: Write the total value of 6 hundreds 8 tens.
S: (Write and show at the signal 680.)
T: Compare 68 ones with 68 tens.

Problem Set 2 (5 minutes)
Materials: (S) Problem Set 2 (pictured right)

Let those who are proficient work independently on the pictured Problem Set, while a group stays for guided “next questions.” You will notice that now the examples of unit form include addition. Let the students make this connection. It should be well within their reach to make the jump.

Application Problem (8 minutes)

Billy found a briefcase full of money. He counted up 23 ten dollar bills, 2 hundred dollar bills, and 4 one dollar bills. How much money was in the briefcase?

T: Let’s read this problem together.
T: Work with your partner to solve this problem. How can you pair how you solved the problem.
S: I drew all the money, then I counted it. 100, 200, 210, 220, 230, 240, 250 ... 430, 431, 432, 433, 434. I drew 23 circles to show 23 tens and counted up to 230 dollars. Then I skip-counted 200 more and got 430 dollars. Then I counted on 4 more dollars and got 434 dollars. I added 200 + 4. That’s just expanded form. Then I drew 23 tens and I skip-counted 2 hundreds and 2 tens from 204 and got 434. I know 20 tens equals 200, so I counted on 2 more hundreds and got 400. Then I added the 3 tens from the 23 tens plus the 4 ones. 400 + 30 + 4 is 434. I know 23 tens is 2 hundreds 3 tens. Add 2 more hundreds. That is 4 hundreds 3 tens, plus 4 ones makes 434. He had $434.
T: How many dollars were in the briefcase?
Lesson 7:
Write, read, and relate base ten numbers in all forms.

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Student Debrief (10 minutes)

Lesson Objective: Write, read, and relate base ten numbers in all forms.

Materials: (S) Problem Sets 1 and 2, Application Problem solution

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

T: Bring your Problem Sets and problem about Billy to our Debrief. Check your answers to the Problem Set with your partner for one minute. (Allow time for students to check.) I’ll show the answers now. If you got the correct answer, say, “yes.”

T: Problem A 234 matches to (write 234).
S: Yes!
T: Problem B 374 matches to (write 374).
S: Yes!
T: (Move through the rest of the problems quickly.) Take one minute to correct your mistakes.
T: Would anyone like to share a mistake?
S: I got J wrong.
T: Why?
S: Because I saw 123 really close by and didn’t read the words.
T: You didn’t read the units?
S: Yes.
T: Someone else?
S: I got F wrong for the same reason.
T: What reason is that?
S: I didn’t read the units so I chose 374.
T: We have to be precise or we make mistakes. The Mars Climate Orbiter disintegrated in 1999 due to the use of the wrong units. NASA lost millions of dollars! Always be precise about your units.
T: Now, I want you to compare the last Problem Set with the problem about Billy’s money. Share with
Lesson 7: Write, read, and relate base ten numbers in all forms.

Date: 8/7/13

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MP.6

S:  Billy has money but this is just hundreds, tens, and ones. → Billy’s ten dollar bills are like the tens. → The problems all have enough tens to make a hundred. → Yeah, Billy has 23 ten dollar bills. That means we can make 2 hundreds just like the problems have 43 tens and 12 tens so we can make a hundred. → 12 tens is 1 hundred 2 ones just like 23 ten dollar bills is 2 hundred dollar bills and 3 ten dollar bills. All the problems have more than 9 units of ten. That means we can make groups of 10 tens or hundreds.

T:  So when we write numbers in unit form, sometimes there are more than 9 of a unit. That means we can make a larger unit!

S:  Yes!

T:  Excellent.

Exit Ticket (3 minutes)

After the Debrief, instruct students to complete the Exit Ticket. A quick review of their work will help you assess the students’ understanding of the concepts that were presented in the lesson today. Students have two minutes to complete the Exit Ticket. You may read the questions aloud to the students.
Lesson 7 Practice Sheet

Name ____________________________ Date ______________

Number Spelling Practice Sheet

Spell Numbers: How many can you write correctly in 2 minutes?

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<td><strong>A1</strong></td>
<td>20 + 1 =</td>
<td>23 400 + 20 + 5 =</td>
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<tr>
<td>2</td>
<td>20 + 2 =</td>
<td>24 200 + 60 + 1 =</td>
</tr>
<tr>
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<td>20 + 3 =</td>
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<tr>
<td>10</td>
<td>10 + 7 =</td>
<td>32 100 + 10 + 7 =</td>
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<td>40 2 + 500 =</td>
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<td>19</td>
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<td>41 2 + 600 =</td>
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<td>400 + 50 + 6 =</td>
<td>42 2 + 40 + 600 =</td>
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<td>21</td>
<td>500 + 60 + 7 =</td>
<td>43 3 + 10 + 700 =</td>
</tr>
<tr>
<td>22</td>
<td>600 + 70 + 8 =</td>
<td>44 8 + 30 + 700 =</td>
</tr>
</tbody>
</table>

Lesson 7: Write, read, and relate base ten numbers in all forms.

Date: 8/7/13
## Lesson 7 Sprint

### Write, read, and relate base ten numbers in all forms.

**Name _________________________________  Date ________________

<p>| | | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td><strong>B1</strong></td>
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<td></td>
</tr>
<tr>
<td>1</td>
<td>10 + 1 =</td>
<td>23</td>
</tr>
<tr>
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<td>24</td>
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<td>3</td>
<td>10 + 3 =</td>
<td>25</td>
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<td>80 + 7 =</td>
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<td>17</td>
<td>600 + 70 =</td>
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</tr>
<tr>
<td>18</td>
<td>300 + 40 + 5 =</td>
<td>40</td>
</tr>
<tr>
<td>19</td>
<td>400 + 50 + 6 =</td>
<td>41</td>
</tr>
<tr>
<td>20</td>
<td>500 + 60 + 7 =</td>
<td>42</td>
</tr>
<tr>
<td>21</td>
<td>600 + 70 + 8 =</td>
<td>43</td>
</tr>
<tr>
<td>22</td>
<td>700 + 80 + 9 =</td>
<td>44</td>
</tr>
</tbody>
</table>
Name ________________________________  Date ________________

Match Part 1

Match the number names and numerals. Problem B is done for you as an example.

A. Two hundred thirty four  ●  204
B. Three hundred seventy four  ●  930
C. 7 hundreds 6 tens 3 ones  ●  470
D. Two hundred four  ●  763
E. Four hundred two  ●  650
F. 3 ones 7 hundreds 4 tens  ●  903
G. Four hundred seventy  ●  123
H. 9 hundreds 3 ones  ●  673
I. 3 ones 7 tens 6 hundreds  ●  234
J. 1 ten 2 hundreds 3 ones  ●  374
K. 5 tens 6 hundreds  ●  402
L. Nine hundred thirty  ●  743
M. 12 tens 3 ones  ●  213
Lesson 7: Write, read, and relate base ten numbers in all forms.

Date: 8/7/13

3.C.50

Lesson 7 Problem Set

Match Part 2

Match all the ways of expressing each number.

A. 500 + 9

B. 4 hundreds + 34 ones

C. 60 + 800 + 3

D. 9 + 500

E. Eight hundred sixty three

F. 9 ones + 50 tens

G. Four hundred thirty four

H. 86 tens + 3 ones

I. 400 + 4 + 30

J. 6 tens + 8 hundreds + 3 ones

K. Five hundred nine

L. 4 ones + 43 tens
<table>
<thead>
<tr>
<th>Write in number form</th>
<th>Write in expanded form</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. 10 + 10 + 1 + 1 + 100 + 100 + 100 = ________</td>
<td>a. 974 = ______________</td>
</tr>
<tr>
<td>b. 400 + 70 + 6 = ___________</td>
<td>b. 435 = ______________</td>
</tr>
<tr>
<td>c. ___________ = 9 + 700 + 10</td>
<td>c. 35 = _________________</td>
</tr>
<tr>
<td>d. ___________ = 200 + 50</td>
<td>d. 310 = _________________</td>
</tr>
<tr>
<td>e. 2 + 600 = ___________</td>
<td>e. 703 = _________________</td>
</tr>
<tr>
<td>f. 300 + 32 = ___________</td>
<td></td>
</tr>
</tbody>
</table>
These are bundles of hundreds, tens, and ones. Write the numeral, expanded form, and number name for each number shown.

1.
   a. Numeral ____________________________________________

   b. Expanded Form _______________________________________

   c. Number Name _________________________________________
Lesson 7 Homework

2. [Image of base ten blocks]

   a. Numeral
      _________________________________

   b. Expanded Form
      _________________________________

   c. Number Name
      _________________________________

3. What is the unit value of the 3 in 432? _________________________________

4. What is the unit value of the 6 in 216? _________________________________

5. Write 212, 221, 122 in order from greatest to least.
   ___________________   ___________________   ___________________
Topic D
Modeling Base Ten Numbers Within 1,000 with Money

2.NBT.2, 2.NBT.1, 2.NBT.3, 2.MD.8

Focus Standard: 2.NBT.2 Count within 1000; skip-count by 5s, 10s, and 100s.
Instructional Days: 3
Coherence -Links from: G1–M6 Place Value, Comparison, Addition and Subtraction to 100
-Links to: G2–M4 Addition and Subtraction Within 200 with Word Problems to 100
G2–M7 Problem Solving with Length, Money, and Data

Further building their place value understanding, students count by $1 bills up to $124, repeating the process done in Lesson 6 with bundles. Using bills, however, presents a new option. A set of 10 ten dollar bills can be traded or changed for 1 hundred dollar bill, driving home the equivalence of the two amounts, an absolutely essential Grade 2 place value understanding (2.NBT.1a).

Next, students see that 10 bills can have a value of $10 or $1,000 but appear identical aside from their printed labels (2.NBT.1, 2.NBT.3). A bill’s value is determined by what it represents. Students count by ones, tens, and hundreds (2.NBT.2) to figure out the values of different sets of bills.

As students move back and forth from money to numerals, they make connections to place value that help them see the correlations between base ten numerals and corresponding equivalent denominations of one, ten, and hundred dollar bills.

Word problems can be solved using both counting and place value strategies. For example: “Stacey has $154. She has 14 one dollar bills. The rest is in $10 bills. How many $10 bills does Stacey have?” (2.NBT.2). Lesson 10 is an exploration to uncover the number of $10 bills in a $1,000 bill discovered in great grandfather’s trunk in the attic. (Note that the 1,000 dollar bill is no longer in circulation.)
A Teaching Sequence Towards Mastery of Modeling Base Ten Numbers Within 1,000 with Money

| Objective 1: Count the total value of $1, $10, and $100 bills up to $1,000.  |
| (Lesson 8)                                                                     |
| Objective 2: Count from $10 to $1,000 on the place value chart and the empty number line. |
| (Lesson 9)                                                                     |
| Objective 3: Explore $1,000. How many $10 bills can we change for a thousand dollar bill? |
| (Lesson 10)                                                                   |
Lesson 8

Objective: Count the total value of $1, $10, and $100 bills up to $1,000.

Suggested Lesson Structure

- Fluency Practice (8 minutes)
- Application Problem (8 minutes)
- Concept Development (34 minutes)
- Student Debrief (10 minutes)

Total Time (60 minutes)

Fluency Practice (8 minutes)

- Mixed Counting with Ones, Tens, and Hundreds from 1,000 to 0  2.NBT.2 (5 minutes)
- Doubles  2.OA.2 (1 minute)
- Related Facts Within 20  2.OA.2 (2 minutes)

Mixed Counting with Ones, Tens, and Hundreds from 1,000 to 0 (5 minutes)

Materials: (T) Bundle of one hundred, one ten, and a single stick from Lesson 1

T: Let’s play Mixed Counting using what we know about counting by ones, tens, and hundreds. I’ll hold bundles to show you what to count by. A bundle of 100 means count by hundreds, a bundle of 10 means count by tens, and a single stick means count by ones.

T: Let’s start at 1,000 and count down. Ready? (Hold up a bundle of 10 until students count to 940. If necessary, create visual support with the difficult language of these numbers by writing them on the board as students count.)

S: 990, 980, 970, 960, 950, 940.

T: (Hold up a bundle of 100 until students count to 540.)

S: 840, 740, 640, 540.

T: (Hold up a bundle of 10 until students count to 500.)

S: 530, 520, 510, 500.

T: (Hold up a single one until students count to 495.)

S: 499, 498, 497, 496, 495.

T: (Hold up a ten until students count to 465.)

S: 485, 475, 465.

Continue, varying practice counting with ones, tens, and hundreds.
Doubles (1 minute)

T: I’ll say a doubles fact. You tell me the answer. Wait for my signal. Ready?
T: 5 + 5. (Signal.)
S: 10.
T: 3 + 3.
S: 6.
T: 6 + 6.
S: 12.
T: 1 + 1.
S: 2.
T: 4 + 4.
S: 8.
T: 9 + 9.
S: 18.
T: 2 + 2.
S: 4.
T: 10 + 10.
S: 20.
T: 8 + 8.
S: 16.
T: 7 + 7.
S: 14.

Related Facts Within 20 (2 minutes)

T: 8 – 3. (Signal.)
S: 3 + 5 = 8.
T: 13 – 7.
S: 7 + 6 = 13.
T: 11 – 8.
S: 8 + 3 = 11.
T: 15 – 9.
S: 9 + 6 = 15.

Continue in this manner for 2 minutes.
Application Problems (8 minutes)

Stacey has $154. She has 14 one dollar bills. The rest is in ten dollar bills. How many ten dollar bills does she have?

T: Let’s read this problem together.

T: Think for a moment then discuss with your partner: How does this problem relate to what we’ve been studying over the past several lessons? What similarities do you notice?

S: Money comes in tens and ones, too. → We’ve been learning about hundreds, tens, and ones, and money is just like that. → A ten dollar bill is like a bundle of ten. → It’s units of a hundred, ten and one just like with the straws. → It’s like the place value chart but with money instead of numbers.

T: How can making this connection help you solve the problem? Talk it over with your partner and use what you’ve learned to solve. (Circulate and listen for discussions that rely on unit form, expanded form, and exchanging units to solve.)

S: I know 154 is 1 hundred 5 tens 4 ones. Stacey has 14 ones, and that’s the same as 1 ten 4 ones. So she needs 10 tens to make the hundred and 4 tens to make 5 tens. She already has 4 ones. 10 tens plus 4 tens is 14 tens.

T: Outstanding reasoning, Valeria!

T: Pretend Partner A is the parent and Partner B is the child. Partner B, explain to your parent in your own words what Valeria just shared with the class. Use words, numbers, and pictures to help your parent understand. Then switch roles.

T: (After a few minutes.) How many ten dollar bills does Stacey have?

S: 140. → 14 ten dollar bills.

T: I like the way many of you said the unit as part of your answer. It helps us be clear about whether we’re answering the question correctly.

T: Reread the question.

S: How many ten dollar bills does she have?

T: Does Stacey have 140 ten dollar bills?

S: No.

T: Always check to be sure your answer makes sense. That’s why it’s important to answer the question with a statement. The question is not how much money does she have. It’s how many ten dollar bills...
Lesson 8:

Count the total value of $1, $10, and $100 bills up to $1,000.

Date: 8/7/13

Concept Development (34 minutes)

Materials: (S) Place value chart, 10 one dollar bills, 10 ten dollar bills and 10 hundred dollar bills (Put money in a “wallet” [plastic baggie]. The ones should be in the front, tens in the middle and hundreds in the back.)

Part A: Counting by 1 Dollar up to $124 (6 minutes)

Encourage students to place 10 bills above each column neatly.

Directions:

1. Count up to $124 by one dollar bills on your place value chart.
2. When you get 10 one dollar bills, change them for 1 ten dollar bill.
3. When you have 10 ten dollar bills, change them for 1 hundred dollar bill.
4. Whisper count the value of your money as you go.
5. Each time you make a change, let the other partner handle the money.

T: How is counting up to $124 with money bills different from counting up to 124 with bundles?
S: With straws, we could just get a rubber band. → With straws we bundled but with money we changed 10 ones for 1 ten. → Yeah, we got a different bill from our wallet. → The 10 ten dollar bills got changed for 1 hundred dollar bill. → It was a trade, 10 things for 1 thing. → The hundred dollar bill has a greater value but it doesn’t show.

Part B: Manipulating the Value of 10 Bills (6 minutes)

T: Partner A, put 5 one dollar bills in a row horizontally across your desk.

T: Partner B, express the value of the money using this sentence frame. “The value of ___ dollar bills is ______.”

S: The value of 5 one dollar bills is $5.

T: Partner B, put another row of 5 one dollar bills directly below the other row.

T: Partner A, express the new value of the money.

S: The value of 10 one dollar bills is $10.

T: Partner A, change the 2 one dollar bills on the far left for 2 ten dollar bills.
Lesson 8: Count the total value of $1, $10, and $100 bills up to $1,000.

Date: 8/7/13

NOTES ON MULTIPLE MEANS OF ENGAGEMENT:
Speaking and writing simultaneously is a powerful combination, giving students multi-modal input: oral, auditory, and kinesthetic. Whispering adds mystery and is therefore engaging. Circulate and listen intently to the math content in the students' speech. Encourage partners to listen intently, too.

Part C: Hundred, Ten, and One Dollar Bills (11 minutes)

T:  Partner B, express the value of the money.
S:  The value of 2 ten dollar bills and 8 one dollar bills is $28.
T:  Partner B, write the value of the money in expanded form on your personal board.
S:  (Writes $20 + $8 = $28.)
T:  Show me.
S:  (Shows the expanded form.)
T:  Partner B, change the next 2 one dollar bills on the left for 2 ten dollar bills.
T:  Partner A, express the value of the money.
S:  The value of 4 ten dollar bills and 6 one dollar bills is $46.
T:  Partner A, write the value of the money in expanded form.
S:  (Partner A writes $40 + $6 = $46.)
T:  Show me.
S:  (Shows the expanded form.)
T:  Partner A, change 6 one dollar bills to 6 ten dollar bills.
S:  (Partner B speaks) The value of 10 ten dollar bills is $100!

Continue as above using the following sequence:
- From $334, change 3 tens to 3 hundreds. (The new amount is $604.)
- From $604, change 4 ones to 4 tens. (The new amount is $640.)
Lesson 8: Count the total value of $1, $10, and $100 bills up to $1,000.

- From $640, change 2 tens to 2 hundreds. (The new amount is $820.)
- From $820, change 1 ten to 1 one. (The new amount is $811.)
- From $811, change 1 ten to 1 one. (The new amount is $802.)
- From $802, change 2 ones to 2 hundreds. (The new amount is $1,000.)

Problem Set (11 minutes)

Students should do their personal best to complete the Problem Set within the allotted 11 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students solve these problems using the RDW approach used for Application Problems.

Directions:
1. Represent each amount of money using 10 bills.
2. Write and whisper each amount of money in expanded form.
3. Write the total value of each set of bills as a number bond.

Student Debrief (10 minutes)

Lesson Objective: Count the total value of $1, $10, and $100 bills up to $1,000.

Materials: (T) One bundle of 100 straws (S) Completed Problem Set, Exit Ticket

The Student Debrief is intended to invite reflection and active processing of the total lesson experience. Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

T: Discuss with your partner: Using any combination of $1, $10, and $100 bills, what is the smallest amount of money you can show with 10 bills and what is the greatest amount of money you can show with 10 bills?

S: (As students discuss the question, circulate and listen.)

T: I heard many of you saying the smallest amount is...?  
S: $10.
T: The largest amount is...?
Lesson 8: Count the total value of $1, $10, and $100 bills up to $1,000.

Date: 8/7/13

S: $1,000.
T: So the value of the money changes, but what stays the same?
S: The size of the bills stays the same.
T: How do you know the value of the money?
S: By looking at it.
T: If you were blind, could you know its value?
S: No!
T: That’s true here in America, but it’s interesting to note that in other countries bills come in different sizes and even colors!
T: (Hold up a hundred bundle.) What about the value of this bundle? If you were blind would you know? Talk to your partner about that.
S: Yes, because you could feel it was big. → Yes, because you could count the sticks. → Yes because you could count the number of tens.
T: Somebody decided this bill had a value of $100! This bundle is 100 because it has 100 sticks. We counted.
T: Share your Problem Set with your partner. Compare answers and drawings for one minute.
T: I will read the answers now. If you got it correct, say, “Yes.”
S: (Read the answers). “Yes.”
T: Take a moment to analyze and talk about the problems on the left side of the Problem Set: $136, $190, and $109. What is different about the numbers?
S: $136 has 3 ten dollar bills and 6 one dollar bills. $190 has no one dollar bills and 9 ten dollar bills. → $109 is less than $190 because it has 9 ones and no tens. → Wow. That is a big difference. Hmmm, that’s 10, 20, 30, 40, 50, 60, 70, 80, 90. That’s $81 more!
T: Do the same thing with the three problems on the right side: $451, $460, and $406. What is different about the numbers?
S: $460 is 9 dollars more than $451. → $460 and $406 switched the number of tens and ones. There are 6 ten dollar bills in $460, but only 6 one dollar bills in $406.
T: When you counted to $124, what happened when you had 10 one dollar bills?
S: You could change them for 1 ten dollar bill.
T: What happened when you had 10 ten dollar bills?
S: You could change them for 1 hundred dollar bill.
T: Which has a greater value, 3 hundred dollar bills or 9 ten dollar bills?
S: 3 hundred dollar bills!
T: We counted the total value of many different amounts of money!

Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students’ understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.
Lesson 8: Count the total value of $1, $10, and $100 bills up to $1,000.

<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
</tr>
</thead>
</table>

Directions: Show each amount of money using 10 bills. Whisper and write each amount of money in expanded form. Write the total value of each set of bills as a number bond.

### 10 Bills

<table>
<thead>
<tr>
<th>10 Bills</th>
<th></th>
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<tbody>
<tr>
<td>a. 136 =</td>
<td></td>
</tr>
<tr>
<td>b. 190 =</td>
<td></td>
</tr>
<tr>
<td>c. 109 =</td>
<td></td>
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<tr>
<td>d. _______ = 451</td>
<td></td>
</tr>
<tr>
<td>e. _______ = 460</td>
<td></td>
</tr>
<tr>
<td>f. _______ = 406</td>
<td></td>
</tr>
</tbody>
</table>

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Lesson 8: Count the total value of $1, $10, and $100 bills up to $1,000.

Date: 8/7/13

3.D.11

550 = _____________________

j.

___________________ = 910

541 = _____________________

k.

___________________ = 1,000

901 = _____________________

l.

___________________ = 100
1. Write the total value of the money shown below in numeral and expanded form.

   **Numeral form**
   _______________________
   
   **Expanded form**
   _______________________

2. What is the value of 3 ten dollar bills and 9 one dollar bills? ________________

3. Draw money to show 2 different ways to make $142, using only $1, $10, and $100 bills.
1. Write the total value of the money.

   $10 \quad $10 \quad $10 \quad $10 \quad $10

   $10 \quad $10 \quad $10 \quad $10 \quad $1

2. Fill in the bills with $100, $10, or $1 to show the amount.

   $100 \quad $100 \quad $10 \quad $1 \quad $1

   $1 \quad $1 \quad $1 \quad $1 \quad $1

   $172

   $226
3. Draw and solve.

Brandon has 7 ten dollar bills and 8 one dollar bills. Joshua has 3 fewer ten dollar bills and 4 fewer one dollar bills than Brandon. What is the value of Joshua's money?
Lesson 9

Objective: Count from $10 to $1,000 on the place value chart and the empty number line.

Suggested Lesson Structure

- Fluency Practice (15 minutes)
- Application Problem (8 minutes)
- Concept Development (30 minutes)
- Student Debrief (7 minutes)

Total Time (60 minutes)

Fluency Practice (15 Minutes)

- Count and Change Coins to 30 Cents 2.MD.8 (3 minutes)
- Mixed Counting with Ones, Tens, and Hundreds from 1,000 to 0 2.NBT.2 (5 minutes)
- Skip-Count by Twos Beginning at 394 2.NBT.3 (7 minutes)

Count and Change Coins to 30 Cents (3 minutes)

Materials: (T) 11 pennies and 4 dimes

T: (Display and label a penny and a dime.) A penny has a value of 1 cent, or 1 one. A dime has a value of 10 cents, or 1 ten.

T: Let’s count pennies. We’ll count them by ones because they have a value of 1 cent. (Lay out 1 penny at a time as students count to 10.)

S: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.

T: A dime has the same value as 1 ten. At the signal, say how many pennies are in a dime. (Signal.)

S: 10 pennies are in 1 dime.

T: We’ve counted 10 pennies; let’s change them for 1 dime.

T: Let’s keep going, counting on from 10. (Point to the dime, then lay out pennies as students count to 20.)

S: 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20.

T: What is the value of our coins? Count from $10 to $1,000 on the place value chart and the empty number line.

NOTES ON MULTIPLE MEANS OF REPRESENTATION:

This simple activity is students’ first formal experience using coins. For this reason, it’s quite guided. In the next lesson students play again, counting higher and beginning and ending with numbers other than multiples of 10. The key is to promote gradual independence in working with coins: "I do, we do, you do."
S: 20 cents!
T: We’ve completed another ten (point to the pennies). What step can we take to reduce the number of coins, but keep the value of our 20 cents the same? Turn and whisper to your partner.
S: We can change our 10 pennies for another dime.
T: (Change the 10 pennies for another dime.) Thumbs up if this was your idea.
S: (Students give thumbs up.)
T: Let’s keep counting. Remember to count the dimes by tens and the pennies by ones.
(Continue until students have reached 30 cents and changed 10 pennies for 1 dime a third time.)

Mixed Counting with Ones, Tens, and Hundreds from 1,000 to 0 (5 minutes)

Materials: (T) Bundle of one hundred, one ten, and a single stick from Lesson 1

Vary numbers in this second round. You may also choose to isolate a sequence that your students find particularly challenging, and provide them with a minute of partner practice to count up and down the sequence as fast as possible.

Skip-Count by Twos Beginning at 394 (7 minutes)

Materials: (S) Blank piece of paper

Using a blank piece of paper and a pencil, students count by twos beginning at 394. They write numbers, counting as fast and as high as they can for 1 minute. “Skip-count by” follows the same energizing routine for administration as Sprints. Refer to the directions for administration of Sprints, which are in the appendix of G2–M3–Fluency Progressions.

Like Sprints, after animated correction, an extra minute for independent practice, sharing with a partner, and a brief kinesthetic exercise, students repeat the counting task. The vast majority of students immediately see improvement on the second effort. Celebrate improvement in the same way you do with a Sprint.

Application Problem (8 minutes)

Sarah earns $10 each week for weeding the garden. If she saves all of the money, how many weeks will it take her to save up $150?

T: Read the problem with me.
T: Work with your partner to come up with 2 different strategies to solve this problem. (Circulate and listen.)
S: I drew circles to be the tens and skip-counted up to 150. Then I counted and it was 15 circles. I wrote 150 = 1 hundred 5 tens. I know 1 hundred is the same as 10 tens, plus 5 tens. That’s 15 tens. I just know 15 tens is the same as 150, so she needs 15 weeks. I wrote 150 = 100 + 50. I know 100 equals 10 tens and 50 equals 5 tens, so the answer is 10 + 5, 15.
T: I like the way you’re using unit form and expanded form to solve. Now that you’ve heard other
strategies, talk with your partner about the one you like best and why.

T: (After a few minutes.) How many weeks will it take Sarah to save up $150? Give me a complete sentence.

S: It will take Sarah 15 weeks to save $150.

T: Please write that statement on your paper.

**Concept Development (30 minutes)**

**Counting from $776 to $900 (15 minutes)**

Materials: (S) Personal white board, place value chart and 10 one dollar bills, 10 ten dollar bills and 10 hundred dollar bills per pair (Put their money in a “wallet”.)

**Part A: Counting by One Dollar Bills from $776 to 900 (8 minutes)**

Directions:

1. Model $776 on your place value chart.
2. Model and whisper count up to $900 by ones.
3. Change 10 one dollar bills for 1 ten dollar bill and 10 ten dollar bills for 1 hundred dollar bill as you are able.
4. Each time you change 10 bills for 1 bill, let your partner handle the money.
5. If you finish before 5 minutes is up, continue counting to 1,000.

T: (After students work.) You have counted using ones. Partners, talk to your neighboring pair. When you were counting your money, when did you change 10 bills for 1 bill? Give at least two examples.

T: (After pairs have shared.) What unit were you just counting by?

S: Ones.
Lesson 9: Count from $10 to $1,000 on the place value chart and the empty number line.

Date: 8/7/13

3.D.18

**NOTES ON MULTIPLE MEANS OF ENGAGEMENT:**

Push comprehension to higher levels by inviting students to analyze alternate strategies for efficiency and ease of use. These are often sweet conversations to have with students as they line up, for example. “Which did you feel was the best way to count from 776 to 900 today?”

Some examples of ways to count from $776 to $900 using three units:

A. $776 → 777, 778, 779, 780, 790, 800, 900

B. $776 → 876, 886, 896, 897, 898, 899, 900

C. $776 → 876, 877, 878, 879, 880, 890, 900

**Part B: Counting by One Dollar, Ten Dollar, and Hundred Dollar Bills from $776 to 900 (7 minutes)**

T: Show $776 again. This time, count up to $900 on your place value chart with one, ten and hundred dollar bills. Work with your partner to use all three units of money. If you finish early, count back down to $776.

S: (Work for 2–3 minutes.)

T: How did you count from 776 to 900 (leave off the dollar amounts)?

S: (Record their responses as numerals as modeled to the right as they explain to the class.) Count by ones to 780. Skip-count by tens to 800. Count one hundred to get to 900. (See ways to count to the right.)

T: All (or both if you generate two ways) of these counts use three units, ones, tens and hundreds in different ways.

T: Turn and talk to your partner. What are the friendly numbers in count A?

S: (After students talk.) 780 and 800.

T: What did we count by first?

S: Ones.

T: How many ones?

S: 4 ones (count them if necessary).

T: (Draw an empty number line across the board below the counts.) We started at 776 (write) we counted up 4 ones. What number did our 4 ones get us to?

S: 780. (Write 4 ones and 780 on the number line as demonstrated above.)

T: Next what did we count by?

S: Tens.

T: How many tens did we skip-count?

S: 2 tens.

T: What number did 2 tens get us to?

S: 800 (Write 2 tens and 800.)

T: Next what did we count by?

S: Hundreds.

T: How many hundreds did we count?

S: 1 hundred.

T: What number did 1 hundred get us to?
Lesson 9: 

Count from $10 to $1,000 on the place value chart and the empty number line.

Date: 8/7/13

Problem Set (15 minutes)

Students should do their personal best to complete the Problem Set within the allotted 15 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students solve these problems using the RDW approach used for Application Problems.

Directions:

1. Model the count using your money on the place value chart. Use tens and hundreds for A–D.
2. Record your count on the empty number line Problem Set. Use our example to help you.
   A. 70 to 300.
   B. 300 to 450.
   C. 160 to 700.
   D. 700 to 870.
3. Use ones, tens, and hundreds for E–H.
   E. 68 to 200.
   F. 200 to 425.
   G. 486 to 700.
   H. 700 to 982.
Lesson 9: Count from $10 to $1,000 on the place value chart and the empty number line.

Date: 8/7/13

Lesson Objective: Count from $10 to $1,000 on the place value chart and the empty number line.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

T: Bring your Problem Sets with you. Go over the skip-counting you recorded on your number line. Show your partner your work and see if you counted the same way. Remember, the task was to use both tens and hundreds, no ones.

T: (Circulate, watch, and listen. Resume talking after students have had time to compare and share, about 1 minute.)

T: Were your number lines exactly the same?
S: No!
T: There is more than one way to count, just as we saw in our lesson today. However, the number of tens and hundreds should be the same. Let’s go over that.

T: Letter A, how many hundreds did you count?
S: 2 hundreds.
T: How many tens did you count?
S: 3 tens.
T: What is the value of 2 hundreds 3 tens?
S: 230.
T: (Circulate, watch, and listen.)

S: (After about 1 minute, call on students to share their thinking.) It means that we counted 2 hundred dollar bills and 3 ten dollar bills when we were skip-counting from 70 to 300. It means that on our number line first I went 3 tens and then 2 hundreds. It means that from 70 to 300 is 230. Yeah, it means that 300 is 230 more than 70. It means that 70 and 230 makes 300. Hey, it’s like addition.

T: Excellent. When we put these two parts together, 70 and 230 (point to the number line and then hold up the bills) we get $300.

T: Let’s go through the next one. Did you skip-count by tens or hundreds first?
S: I counted by 1 hundred first because it’s super easy to add 1 hundred to 3 hundred.
S: I skip-counted by tens first just to be different, to see what would happen.
T: How many hundreds did you count?
S: 1 hundred.
T: How many tens did you count?
S: 5 tens.
T: What is the value of 1 hundred 5 tens?
Lesson 9:

Count from $10 to $1,000 on the place value chart and the empty number line.

Date: 8/7/13

S: 150.

T: Talk to your partner about what that 150 represents.

S: (Talk for about a minute. The students have picked up some ideas now from the first example and will be chattier now. Have them briefly share out ideas.)

T: Let’s quickly go through the answers to the next two.

Repeat the process for C and D. Accept all number lines that make sense. It’s okay if students break 5 hundreds into 5 hops on the number line. Go quickly through some answers so that the pace does not slow.

T: Today we used a tool we are very familiar with, a number line. What number lines have we used before?

S: The meter strip. The clock. Our number line on the classroom wall. Our rulers are kind of like one, too.

T: How was the number line we used today, different from all those other number lines? Talk to your partner.

S: It didn’t have marks. It was empty. It didn’t tell us what to count by. We counted in different units, ones, tens and hundreds. It made me think because I had to guess where a jump of ten was or a hundred.

T: (Listen and circulate.) I’m hearing you say that this empty number line helps you think about numbers and which jumps on the number line are bigger and which are smaller. Did it help you to model first with your money and then do it?

S: Yes!

T: Excellent. Two different ways to count! We used the number line and the place value chart. When we counted and skip-counted on the number line, as the numbers got bigger we moved from left to right (point and demonstrate silently).

T: However, when we counted on the place value chart, as the numbers got bigger we moved from right to left (demonstrate by bundling silently).

T: Turn and tell your partner how counting on the place value chart is different than on the number line.

Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students’ understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.
Lesson 9

Count from $10 to $1,000 on the place value chart and the empty number line.

Name ___________________________ Date _______________

Directions: First model the count using tens and ones on your place value chart. Then record your count on the empty number line.

**Empty Number Lines**

a. 70 to 300

b. 300 to 450

c. 160 to 700

d. 700 to 870
Lesson 9 Problem Set

Directions: First model the count using tens and hundreds on your place value chart. Then record your count on the empty number line.

**Empty Number Lines**

e. 68 to 200

f. 200 to 425

g. 486 to 700

h. 700 to 982
Name ______________________________ Date ______________

1. Jeremy counted from $280 to $435. Use the number line to show a way that Jeremy could have used ones, tens, and hundreds to count.

2. Use the number line. Show another way that Jeremy could have counted from $280 to $435.

3. Use the number line to help you tell how many hundreds, tens and ones you use when you count from $776 to $900.

To count from $776 to $900 we used ____ hundreds ____ tens ____ ones.
1. Write the total amount of money shown in each group.

   a. $100 \quad $100
      $100 \quad $100
      $100 \quad $100
      $100 \quad $100
      $100 \quad $100

   b. $10 \quad $10
      $10 \quad $10
      $10 \quad $10
      $10 \quad $10
      $10 \quad $10

   c. $1 \quad $1
      $1 \quad $1
      $1 \quad $1
      $1 \quad $1
      $1 \quad $1

   d. $10 \quad $100
      $10 \quad $100
      $10 \quad $100
      $10 \quad $100
      $1 \quad $1

2. Show one way to count from $82 to $512.

3. Use each number line to show a different way to count from $580 to $994.

4. Draw and solve.
   Julia wants a bike that costs $75. She needs to save $25 more to have enough money to buy it. How much money does Julia already have?
   Julia already has $__________.
Lesson 10

Objective: Explore $1,000. How many $10 bills can we change for a thousand dollar bill?

Suggested Lesson Structure

- Fluency Practice (14 minutes)
- Application Problem (31 minutes)
- Student Debrief (15 minutes)
- Total Time (60 minutes)

Fluency Practice (14 minutes)

- Count and Change Coins from 85 to 132 Cents 2.NBT.8 (3 minutes)
- Sprint: More Expanded Form 2.NBT.3 (8 minutes)
- Skip-Count by Tens: Up and Down Between 0 and 1,000 2.NBT.2 (3 minutes)

Count and Change Coins from 85 to 132 Cents (3 minutes)

Materials: (T) 16 pennies and 13 dimes

T: (Display and label a penny and a dime.) At the signal say the answer. A penny is like 1 one, 1 ten or 1 hundred?
S: 1 one!
T: A dime is like 1 one, 1 ten or 1 hundred?
S: 1 ten!
T: Let’s count. (Quickly lay out 85 cents using 8 dimes and 5 pennies.)
S: 10, 20, 30, 40, 50, 60, 70, 80, 81, 82, 83, 84, 85.
T: (Lay out another dime.) Whisper the new value of our money to your partner.
S: 95 cents. (Take note of students who have difficulty with this.)
T: Let’s count on. (Lay out pennies as students count to 105.)
S: 96, 97, 98, 99, 100, 101, 102, 103, 104, 105.
T: The new value of our money is...
S: 105 cents!

NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

Coin names are important and take time for English language learners. It is wise to have a “classroom economy” (search online under classroom economies for children) using coins so that they are used again and again. Repetition is crucial for language acquisition. There are many suggestions online that meet the needs of diverse classroom cultures.
Lesson 10

Explore $1,000. How many $10 bills can we change for a thousand dollar bill?

Date: 8/7/13

T: Whisper to your partner how we can reduce the number of coins but keep the value the same.

S: Change 10 pennies for a dime. (Take note of students who are uncertain, possibly because 105 is not a multiple of 10.)

T: (Continue, mixing counting by ones and tens to 125. Vary your practice in response to where you noticed students having difficulty in the first counts. Remember to count from 125 to 132 using pennies.)

Sprint: More Expanded Form (8 minutes)

Materials: (S) More Expanded Form Sprint

Skip-Count by Tens: Up and Down Between 0 and 1,000 (3 minutes)

T: Let's play Happy Counting skip-counting by tens!

T: Watch my fingers to know whether to count up or down. A closed hand means stop. (Show signals as you explain.)

T: Let's count up by tens, starting at 560. Ready? (Teacher rhythmically points up until a change is desired. Show a closed hand then point down. Continue, mixing it up.)


Application Problem (31 minutes)

Materials: (S) Problem Set (If unable to project during the Debrief, perhaps have the students do their work on posters rather than 8 ½” x 11” paper.)

T: Read the following story:

Jerry is a second grader. He was playing in the attic and found an old, dusty trunk. When he opened it, he found things that belonged to his grandfather. There was a cool collection of old coins and bills in an album. One bill was worth $1,000. Wow! Jerry lay down and started daydreaming. He thought about how good it would feel to give as many people as he could a ten dollar bill. He thought about how he had felt on his birthday last year when he got a card from his uncle with a ten dollar bill inside.

But even more, he thought about how lucky he felt one snowy, cold day walking to school when he found a ten dollar bill in the snow. Maybe he could quietly hide the ten dollar bills so that lots of people could feel as lucky as he did on that cold day! He thought to himself, “I wonder how many ten dollar bills are equal to a thousand dollar bill? I wonder how many people I could bring a lucky day to?”

NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

To support understanding, the story can be acted out or illustrated. Never underestimate the increased comprehension offered by the simplest of illustrations. A hand-drawn thousand dollar bill would be a useful prop for acting out the story. Also, ask students questions such as, “What would you do if you found $1,000? Tell your partner.”
Lesson 10: Explore $1,000. How many $10 bills can we change for a thousand dollar bill?

Date: 8/7/13

T: Summarize the story to your partner from the beginning to the end the best you can.

T: (After students talk for about a minute you will know whether they can reconstruct the story. Invite them to listen once again to fill in missing details if necessary.)

T: You will work in pairs to answer Jerry’s question. What is his question?

S: To know how many people he can give a ten dollar bill to. → To find out how many ten dollar bills are the same as a thousand dollar bill, etc.

T: At the end of 20 minutes, you will put your work on your table and we will do a gallery walk so that you will have a chance to see everyone’s work.

T: (Pass out Problem Set.) Let’s go over the directions.

T: Answer Jerry’s question: “I wonder how many ten dollar bills are equal to a thousand dollar bill?” Use the RDW strategy and explain your solution using words, pictures, or numbers.

T: Work with your partner to solve the problem. Use a full sheet of paper. Remember to write your answer in a statement.

Note: As the students work, ask them to think about the tools and strategies they have learned and used thus far in the year. Much of MP1’s “Make sense of problems and persevere in solving them” and MP5’s “Use appropriate tools strategically” involves encouraging students to move through indecision and not knowing to make choices independently. Encourage them to try what comes. “Go for it.” “See if it works.” Often the way students start to strategize is to realize a choice is ineffective. This is a day to let that happen. Make an effort to sit back and watch your class objectively. Make notes on who is struggling. Notice what their partner does in response. Notice how they re-engage. If a student loses focus, consider some simple focus questions such as, “What is the problem asking you?” Or, “Is your pencil sharp enough?” Redirection can be quick and subtle but effective.

Do give students time signals. “You have 10 minutes.” “You have 5 minutes.” For students who succeed quickly, post a challenge problem, such as Jerry’s grandfather took the thousand dollar bill to the bank and changed it for some ten dollar and hundred dollar bills. If he gave Jerry and his sister each one hundred dollars, how much money will he have left?

Student Debrief (15 minutes)

Lesson Objective: Explore $1,000. How many $10 bills can we change for a thousand dollar bill?

Materials: (S) Completed Problem Sets, Exit Ticket

T: Let’s set up our gallery in order to allow everyone to see the each other’s work. Pair 1, place your work here. Pair 2, place your work here.
Lesson 10: Explore $1,000. How many $10 bills can we change for a thousand dollar bill?

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T: When I give the signal, advance to the next table to your right. Make note of the different strategies your friends have used to solve Jerry’s problem.

Keep this process moving. It will take about 5–7 minutes for 10 pairs to move through the “gallery.”

T: Bring your work to the carpet for our Debrief.

T: Do we all agree how many ten dollar bills Jerry will be able to share? Tell me at the signal.

S: 100 ten dollar bills!

T: Most groups were able to come up with that answer, but did everyone’s work look the same?

S: No!

T: You used different strategies. Let’s look more closely at some different ways of solving the problem.

Analysis of One Piece of Student Work

T: I would like to start out looking at Brandon, Petro, and Wanda’s work (post the student work).

T: When you look at their work, talk to your partner about what you see (circulate and listen).

S: (Students talk.) I see number bonds. I see that a number bond has hundreds sticking out. → I see the other number bond is different. It has 10 tens instead of hundreds.

T: Does anyone have a quick compliment for this team’s math?

S: I would like to compliment that you made it easy for us to see the number of tens.

S: A compliment is that you showed how you counted up the total number of tens. That was easy to understand.

T: Good compliments. Does anyone have a suggestion or a question?

S: A question I have is why did you draw two number bonds?

S: Well we didn’t know the answer but we knew that we could skip-count by hundreds up to one thousand. So we just started drawing and counting. Then Wanda said that we could make another one and that we could write the tens instead.

T: So they got going and got another idea. Excellent. Let’s remember that! Don’t get too stuck. Try something. Suggestions? Questions?

S: I think if the two bonds were the same size it would be even easier to see that 100 is 10 tens.

S: I have an idea. Maybe when you are counting up the tens, you could write 10 tens, 20 tens, 30 tens right inside the parts.
Comparison of Two Pieces of Student Work

T: Let’s look at the work of Sammy, Olga, and Marisela. Talk to your team again, what do you see?

S: (Students talk.) They made a number line. → I see they counted up to 1,000 by skip counting by 1 hundred. → I see that each hop has 10 tens written inside it. → There are 10 hops in all. → They have counted by ten under the number line right here. Maybe that’s where they were figuring out how many tens in all.

T: Let’s compare the number bond team and the number line team’s solutions. Talk to your partner, what is different about the way they represented the problem and what is the same?

S: Both of them got the right answer. → I like the number line better. → She didn’t say to talk about what we liked, just what was the same and different. → They both count by tens and 10 tens. → And they both skip-counted by hundreds.

T: So two different tools, a number bond and a number line. Now look at Freddy and Eva’s work. What tool did they use?

S: Ten-frames!

T: Compare the way they used the ten-frames with the way the other team used the number bonds.

Continue the math talk, asking students to compare the representations.

For example:

- Freddy, Vincent, and Eva used the ten-frame but only drew 5 of them. How did they get the right answer?
- Where on the number bond and number line work do you see the 5 ten-frames?
- What are the advantages of using the number line?
- What are the advantages of using the number bond?

Be sure to get students to realize that drawing all the bills takes a long time but that the idea of drawing half is wise.

Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students’ understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.
Jerry wonders, "How many $10 bills are equal to a $1,000 bill?"

Directions: Work with your partner to answer Jerry's question. Explain your solution using words, pictures or numbers. Ask yourselves: Can I draw something? What can I draw? What can I learn from my drawing? Remember to write your answer as a statement.
Think about the different strategies your classmates used to answer Jerry’s question. Explain a strategy you liked that is different from yours and explain why that strategy also works.
Name __________________________ Date ________________

Jerry wonders, "How many $10 bills are equal to a $1,000 bill?"

Directions: Think about the strategies your friends used to answer Jerry's question. Answer the problem again using a different strategy than the one you used with your partner. Explain your solution using words, pictures or numbers. Remember to write your answer as a statement.
Topic E

Modeling Numbers Within 1,000 with Place Value Disks

2.NBT.A

Focus Standard: 2.NBT.A Understand place value.

Instructional Days: 5

Coherence -Links from: G1–M6 Place Value, Comparison, Addition and Subtraction to 100

-Links to: G2–M4 Addition and Subtraction Within 200 with Word Problems to 100

G2–M7 Problem Solving with Length, Money, and Data

In Topic E, students transition to the more abstract number disks that will be used through Grade 5 when modeling very large and very small numbers. The foundation has been carefully laid for this moment since kindergarten when students first learned how much a number less than 10 needs to make ten. The students repeat the counting lessons of the bundles and money, but with place value disks (2.NBT.2).

The three representations: bundles, money, and disks, each play an important role in the students’ deep internalization of the meaning of each unit on the place value chart (2.NBT.1). Like bills, disks are “traded,” “renamed,” or “changed for” a unit of greater value (2.NBT.2).

Finally, students evaluate numbers in unit form with more than 9 ones or tens, for example, 3 hundreds 4 tens 15 ones and 2 hundreds 15 tens 5 ones. Topic E also culminates with a problem solving exploration in which students use counting strategies to solve problems involving pencils which happen to come in boxes of 10 (2.NBT.2).
### A Teaching Sequence Towards Mastery of Modeling Numbers Within 1,000 with Place Value Disks

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Lesson 11

Objective: Count the total value of ones, tens, and hundreds with place value disks.

Suggested Lesson Structure

Fluency Practice (12 minutes)

Application Problem (9 minutes)

Concept Development (25 minutes)

Student Debrief (14 minutes)

Total Time (60 minutes)

Fluency Practice (12 minutes)

- Rekenrek Counting: Numbers in Unit Form 2.NBT.1 (4 minutes)
- Sprint: Addition and Subtraction to 10 2.OA.2 (8 minutes)

Rekenrek Counting: Numbers in Unit Form Between 11 and 100 (4 minutes)

Materials: (T) Rekenrek

T: (Show 11.) What number is showing?
S: 11!
T: The unit form way?
S: 1 ten 1 one.
T: Good. Keep counting the unit form way. (Move beads to count by ones to 15.)
S: 1 ten 2 ones, 1 ten 3 ones, 1 ten 4 ones, 1 ten 5 ones.
T: This time say each number 2 ways. First the unit form way, then just as ones. Let’s do one together so you know what I mean. (Switch to counting by tens and show 25.)
T: Me first. 2 tens 5 ones is 25 ones. Your turn.
S: 2 tens 5 ones is 25 ones.
T: Good. Say the numbers that I show both ways. (Continue to count by tens to 55.)
S: 3 tens 5 ones is 35 ones, 4 tens 5 ones is 45 ones, 5 tens 5 ones is 55 ones.
T: This time say the ones first, then the unit form. (Switch to counting by ones to 61.)
S: 56 ones is 5 tens 6 ones, 57 ones is 5 tens 7 ones, 58 ones is 5 tens 8 ones, 59 ones is 5 tens 9 ones, 60 ones is 6 tens, 61 ones is 6 tens, 1 one.

Continue, adjusting to practice with the switches, numbers, or number form that students find most difficult.
Lesson 11: Count the total value of ones, tens, and hundreds with place value disks.

Sprint: Addition and Subtraction to 10 (8 minutes)

Materials: (S) Addition and Subtraction to 10 Sprint

Application Problem (9 minutes)

Samantha is helping the teacher organize the pencils in her classroom for the teacher. She finds 41 yellow pencils and 29 blue pencils. She threw away 12 that were too short. How many pencils are left in all?

T: When you read this story, what do you see?
S: Pencils. → Yellow and blue pencils. → 12 pencils that are too short?
T: Can you draw something to represent the pencils?
S: We can draw the pencils. → We can draw bundles. → We can draw boxes of 10 pencils.
T: I’m only giving you 2 minutes to draw, so would it be wiser to draw bundles, boxes or all of the pencils?
S: Bundles or boxes.
T: Go ahead and do that.
S: (Students draw.)
T: Go ahead and solve the problem.
T: (After students have solved and written their statements.) The answer is?
S: 68 pencils are left.
T: Thank you for answering in a complete statement.
T: What does your drawing show you? Talk with your partner.
S: We have two parts, the yellow and the blue pencils and one part, the ones that are too short, are being thrown away. → I could take the 12 away from the blue pencils. → I could add the yellow and blue pencils and take away the short ones from the total. → I could take the short ones away from the yellow pencils and then add the blue. → Yeah that’s true because even though it was maybe a mix of blue and yellow ones that were too short, it still will tell the right total in the end.
T: Let’s look at two different work samples that solved the problem in different ways.

Concept Development (25 minutes)

Materials: (T) Dienes blocks (9 hundreds, 9 tens, 9 ones), 1 place value chart without headings, number disks (9 hundreds, 9 tens, 9 ones) (S) Dienes blocks (2 hundreds, 9 tens, 9 ones) 1 place value chart without headings, number disks (6 hundreds, 9 tens, 9 ones)
Students work in partners.

T: With your blocks, show me this number. (Silently write 13 on the board.)
S: (Students show.)
T: Whisper the number first in in unit form, then in standard form.
S: 1 ten 3 ones, thirteen.
T: Show me the same number with your disks and whisper the unit form and standard form as you work.
S: (Students show and whisper.)
T: With your blocks, show the number to me. (Silently write 103 on the board.)
S: (Students show.)
T: Whisper the number first in unit form, then in standard form.
S: 1 hundred 3 ones, one hundred three.
T: Show me the same number with your disks and whisper as you work.
S: (Students show.)

Continue alternating between blocks and disks possibly with the following sequence. (For now, please resist using the words more or less.) 129, 130, 230, 203, 199, 200.

T: Talk with your partner about the difference between modeling your numbers with blocks and modeling your numbers with place value disks.
S: The blocks were yellow and the disks were different colors. → The blocks were bigger and smaller and the disks were all the same size. → The disks have the name on them. The blocks don’t. You just count.
T: Up to this point, we have been using bundles (hold up 1 hundred) and bills (hold up 1 hundred-dollar bill). Talk to your partner and compare the blocks and disks to the bundles and bills. How are they the same? How are they different?
S: The bills have the name on them like the disks. → With the bundles you can count the number of straws like the blocks. → The bundles and blocks both are bigger when you have a bigger number. → The bills and disks stay the same size. → They all represent hundreds, tens and ones. → The bills and the straws we see at home but these blocks and disks are just in math class. I’ve never seen them somewhere else.
T: Okay, as I am circulating and listening, I hear some very thoughtful insights.
T: Here is a question to discuss with your partner. Imagine you are a teacher. How would you use these tools to teach different things to your class? (Write or post each word with a small pictorial for each to support language use.)
- Bundles

NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:
In order to promote deeper discussion, vary the grouping in the classroom, such that students who speak the same native languages are grouped together. This works particularly well when the discussion is open-ended and invites students to reflect on their own learning through the context of a hypothetical situation. Importantly, it does not require translation. Key vocabulary is familiar and supported with visuals, and it is secondary in purpose to the thinking that students are asked to produce.
Lesson 11: Count the total value of ones, tens, and hundreds with place value disks.

Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students solve these problems using the RDW approach used for Application Problems.

Directions A–E: Model the numbers on your place value chart using the fewest number of blocks or disks possible.

1. Partner A use base ten blocks.
2. Partner B use place value disks.
3. Whisper each number in unit and standard form.

Directions F–O: Model the numbers on your place value chart using the fewest number of disks possible.

1. Partners A and B alternate using place value disks.
2. Whisper each number in unit and standard form.

Student Debrief (14 minutes)

Lesson Objective: Count the total value of ones, tens, and hundreds with place value disks.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience. Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

T: Come to the carpet with your partner and your Problem Set. Whisper skip-count down by tens from 300 as you transition to the carpet.

T: Let’s begin with questions F and G. Discuss with your partner how the numbers changed using this sentence frame (posted or written).
I changed ________ to ________.
I changed ________ to ________.
The value of my number changed from ________ to ________.

S: (You might hear students catch on quickly.) I changed 2 tens to 2 hundreds. I changed 5 ones to 5 tens. The value of my number changed from 25 to 250.

T: (If not, ask a student to model.) Let's have Alejandro use his words for us.

S: I changed 2 tens to 2 hundreds. I changed 5 ones to 5 tens. That changed the value of my number from 25 to 250.

T: Just as Alejandro demonstrated, tell your partner how the numbers changed from G to H.

S: I changed 2 hundreds to 5 hundreds. I changed 5 tens to 2 tens. The value of my number changed from 250 to 520.

T: You improved! Keep going through the Problem Set’s numbers using words to tell about the changes. (Continue for about 4 minutes as you circulate and support.)

T: Today we used a new tool, place value disks. Did you enjoy using them?

S: Yes!

T: We will keep our bundles of straws and our base ten blocks here in the math materials center. They will always help us remember the value of our units. I will hold up a unit, you show me the correct place value disk.

T: (Silently hold up a flat. Students hold up a hundred-disk. Hold up a bundle of 10 straws. Students hold up a ten-disk. Hold up a one dollar bill, etc.)

T: Quietly go back to your seats to complete your Exit Ticket.

Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students’ understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.
### Lesson 11: Count the total value of ones, tens, and hundreds with place value disks.

**Date:** 8/7/13

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Lesson 11 Problem Set

Name ____________________________ Date ______________

1. Directions: Model the numbers on your place value chart using the fewest number of blocks or disks possible.

   Partner A use base ten blocks.
   Partner B use place value disks.
   Compare the way your numbers look.
   Whisper the numbers in standard form and unit form.

   a. 12
   b. 124
   c. 104
   d. 299
   e. 200

2. Take turns using the number disks to model the following numbers using the fewest disks possible. Whisper the numbers in standard form and unit form.

   a. 25     f. 36
   b. 250    g. 360
   c. 520    h. 630
   d. 502    i. 603
   e. 205    j. 306
Name ___________________________________  Date ______________

1. Tell the value of the following numbers.

A. ______________________  B. ___________________

2. Fill in the sentences below to tell about the change from 36 to 360.

I changed ______________________ to ______________________.

I changed ______________________ to ______________________.
Name _________________________________ Date ________________

Model the numbers using the fewest disks possible.

Note: Students will need a set of paper place value disks to take home.

1. Use your place value disks to show your parent the following numbers.

   Whisper the numbers in standard form and unit form (1 hundred 3 tens 4 ones).

   a. 15
   b. 152
   c. 102
   d. 290
   e. 300

2. Use number disks to model the following numbers using the fewest disks possible.
   Whisper the numbers in standard form and unit form.

   a. 42    f. 53
   b. 420    g. 530
   c. 320    h. 520
   d. 402    i. 503
   e. 442    j. 55
Lesson 12

Objective: Change 10 ones for 1 ten, 10 tens for 1 hundred, and 10 hundreds for 1 thousand.

Suggested Lesson Structure

- Fluency Practice (10 minutes)
- Application Problem (10 minutes)
- Concept Development (30 minutes)
- Student Debrief (10 minutes)

Total Time (60 minutes)

Fluency Practice (10 minutes)

10 More/10 Less 2.NBT.2 (2 minutes)

- Sprint: Sums to 10 with Ten Numbers 2.OA.2 (8 minutes)

10 More/10 Less (2 minutes)

T: I’ll say a number. You say the number that is 10 more. Wait for my signal. Ready?
T: 50. (Signal after each number.)
S: 60!
T: 90.
S: 100!
T: 130.
S: 140!

Continue with 10 more, then switch to 10 less.

Sprint: Sums to 10 with Ten Numbers (8 minutes)

Materials: (S) Sums to 10 with Ten Numbers Sprint
Lesson 12:
Change 10 ones for 1 ten, 10 tens for 1 hundred, and 10 hundreds for 1 thousand.

Date: 8/7/13

Application Problem (10 minutes)

How many packages of 10 cookies can Collette make using 124 cookies? How many cookies does she need to complete another package of 10?

T: Let’s read this problem together.

T: Visualize. Close your eyes and see the number 124 in the different ways we’ve learned to represent numbers.

T: Discuss how you could solve this problem with your partner. Then draw a model and solve.

T: (After 2 or 3 minutes.) Who would like to share their thinking?

S: I drew place value disks to show 124. Then I changed the 100 disk for 10 tens and I saw that 10 tens and 2 tens make 12 tens. Then I drew 6 more ones disks to make another package of 10. → I knew that 100 is 10 tens and 20 is 2 tens so I drew 12 tens. And she needs 6 more cookies to make another ten. → I remember that 120 is 12 tens, so that’s the answer. And 6 ones plus 4 ones equals another ten.

T: Excellent reasoning! So how many packages of 10 cookies can Collette make?

S: She can make 12 packages of 10 cookies. (Write the statement on the board.)

T: As I walked around I noticed that most of you drew place value disks. Is it easier to draw place value disks than bundles?

S: Yes.

T: Why?

S: It’s faster!

T: Yes. We want to be efficient.

T: Please add the statement to your paper if you haven’t already.
Concept Development (30 minutes)

Materials: (S) Place value disks (10 ones, 10 tens, 10 hundreds) and place value chart per pair of students

Part A: Show the Equivalence of 10 Ones and 1 Ten, 10 Tens and 1 Hundred, 10 Hundreds and 1 Thousand

Students work in pairs.

T: Show me 10 ones in two vertical columns of 5, the ten-frame way, on your place value chart.
S: (Students work.)
T: What is the value of your 10 ones?
S: 10!
T: 10 potatoes?
S: 10 ones.
T: Can you change 10 ones to make a larger unit?
S: Yes.
T: What unit can you make?
S: A ten.
T: Change 10 ones for 1 ten. Did you put your 1 ten to the left or to the right?
S: To the left!
T: Yes, on the place value chart our numbers get bigger to the left!
T: Skip-count by tens on your place value chart until you have placed 10 tens.
T: Can you change to make a larger unit? (Repeat the cycle with 10 tens and 10 hundreds.)
T: Just like with our bundles, bills, and blocks, disks allow us to see how numbers work.

Part B: Count by Ones from 186 to 300 Using Place Value Disks

T: Show (silently write 186 on the board) with your place value disks. Make sure you show your units the ten-frame way.
S: (Students show.)
T: Let’s count up to 300 by ones. How many ones do I need to make ten?
S: 4 ones.
T: It is easy to see because of the ten-frame format in which you have laid out your disks. Use that structure as you count to 300 please.
T: Let me hear you whisper count as you count by ones.
S: (Whispering.) 187, 188, 189, 190.
T: Pause. Can you change for a larger unit?
S: Yes. We can change 10 ones for 1 ten.
T: Do that and then keep counting with your partner up to 300. If you finish before your classmates, count down from 300 to 275.
(While students are counting, circulate and say, “Pause a moment. What number are you on? Did you just make a unit? How many more do you need to count to make the next larger unit?”)

T: (Continue once most students have finished.) What were some numbers where you had to change 10 smaller units for 1 of the next unit to the left?
S: 190, 200, 250, 300, etc.
T: Use your words to tell your partner what happened when you got to both 200 and 300.
S: We made 1 ten. → We made 1 hundred. → We changed to make a ten from the ten ones. Then, that ten meant we could change 10 tens for 1 hundred.
T: Mark is expressing the change from 299 to 300 very well. Mark, will you share?
S: We changed to make a ten from the ten ones. Then, that ten meant we could change 10 tens for 1 hundred.
T: Restate Mark’s explanation to your partner. You certainly may use your own words to express the same idea.
T: (Students talk.) Think about the number 257. Do you remember what it looks like with your disks?
S: Yes!
T: How many more ones did 257 need to make a ten?
S: 3 ones.
T: The place value disks help us to visualize that because we put them in rows. We can easily see that missing 3 ones.
T: Next, you are going to count from 582 to 700 and as you go, think about how many more you need to make the next unit.

Problem Set (10 minutes)

Materials: (S) Problem Set, place value disks, and chart as in the concrete portion of the lesson

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first.

Directions: Count by ones from 582 to 700 using your place value disks.

1. Model 582 with your place value disks. Count up by ones to 700.
2. Pause at each number listed on your Problem Set. At that number, did you make a larger unit?
3. If the answer is yes, tell what unit or units you made.
4. If the answer is no, tell how much more you need
Lesson 12: Change 10 ones for 1 ten, 10 tens for 1 hundred, and 10 hundreds for 1 thousand.

Student Debrief (10 minutes)

Lesson Objective: Change 10 ones for 1 ten, 10 tens for 1 hundred, and 10 hundreds for 1 thousand.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience. Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

T: Think about the number 582. Do you remember what it looks like with your disks?
S: Yes!
T: How many more ones did 582 need to make a ten?
S: 8 ones.
T: The place value disks help us to visualize. We can easily see the 8 missing ones. Go over the answers on your Problem Set with a partner.
S: (Share answers.)
T: At which numbers did you not make a change?
S: 618 and 652.
T: And at which numbers did you make a change?
S: 590, 600, 640 and 700.
T: How many tens does 590 need to change 10 tens for 1 hundred?
S: 1 ten.
T: How many hundreds does 600 need to change 10 hundreds for 1 thousand?
S: 4 hundreds.
T: How many tens does 640 need to change 10 tens for 1 hundred?
T: 6 tens.
T: How many hundreds does 700 need to change 10 hundreds for 1 thousand?
S: 3 hundreds.
T: With your partner, count without disks from each of the numbers on the Problem Set to 900 using ones, tens and hundreds. Remember how we used to count bundles by counting ones to complete a ten, then counting tens to complete a hundred, then counting up by hundreds? Visualize the disks to help you.

NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

It may be challenging for some English language learners to say the names of larger numbers. Invite students to use their personal boards to write each number as they count. Writing and seeing the number supports oral language development.
Lesson 12

S: (e.g., 590, 600, 700, 800, 900, etc.)

T: Today we focused on changing 10 ones for 1 ten, 10 tens for 1 hundred and 10 hundreds for 1 thousand.

Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students’ understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.
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<td>22</td>
<td>16 + 4 =</td>
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</table>

Lesson 12: Change 10 ones for 1 ten, 10 tens for 1 hundred, and 10 hundreds for 1 thousand.
Date: 8/7/13
Lesson 12: Change 10 ones for 1 ten, 10 tens for 1 hundred, and 10 hundreds for 1 thousand.

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<tr>
<td>23</td>
<td>11 + 9 =</td>
<td>44</td>
</tr>
</tbody>
</table>
Lesson 12: Change 10 ones for 1 ten, 10 tens for 1 hundred, and 10 hundreds for 1 thousand.

Date: 8/7/13

Count from 582 to 700 using place value disks. Change for a larger unit when necessary.

When you counted from 582 to 700:

<table>
<thead>
<tr>
<th>Did you make a larger unit at...</th>
<th>Yes, I changed to make:</th>
<th>No, I need _______</th>
</tr>
</thead>
<tbody>
<tr>
<td>590 ?</td>
<td>1 ten  1 hundred</td>
<td>___ ones.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>___ tens.</td>
</tr>
<tr>
<td>600 ?</td>
<td>1 ten  1 hundred</td>
<td>___ ones.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>___ tens.</td>
</tr>
<tr>
<td>618 ?</td>
<td>1 ten  1 hundred</td>
<td>___ ones.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>___ tens.</td>
</tr>
<tr>
<td>640 ?</td>
<td>1 ten  1 hundred</td>
<td>___ ones.</td>
</tr>
<tr>
<td></td>
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<td>___ tens.</td>
</tr>
<tr>
<td>652 ?</td>
<td>1 ten  1 hundred</td>
<td>___ ones.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>___ tens.</td>
</tr>
<tr>
<td>700 ?</td>
<td>1 ten  1 hundred</td>
<td>___ ones.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>___ tens.</td>
</tr>
</tbody>
</table>
1. Match to show the equivalent value.

   10 ones     1 hundred
   10 tens     1 thousand
   10 hundreds     1 ten

2. Draw a model on the place value chart to show 348.

   a. How many more ones to make a ten?                      _____ ones
   b. How many more tens to make a hundred?              _____ tens
   c. How many more hundreds to make a thousand?     _____ hundreds
### Lesson 12 Homework

Name __________________________ Date ________________

**Count by ones from 368 to 500. Change for a larger unit when necessary.**

When you counted from **368 to 500**:

<table>
<thead>
<tr>
<th>Did you make a larger unit at...</th>
<th><strong>Yes,</strong> I changed to make:</th>
<th><strong>No,</strong> I need ________</th>
</tr>
</thead>
<tbody>
<tr>
<td>377 ?</td>
<td>1 ten 1 hundred</td>
<td>___ ones. ___ tens.</td>
</tr>
<tr>
<td>392 ?</td>
<td>1 ten 1 hundred</td>
<td>___ ones. ___ tens.</td>
</tr>
<tr>
<td>400 ?</td>
<td>1 ten 1 hundred</td>
<td>___ ones. ___ tens.</td>
</tr>
<tr>
<td>418 ?</td>
<td>1 ten 1 hundred</td>
<td>___ ones. ___ tens.</td>
</tr>
<tr>
<td>463 ?</td>
<td>1 ten 1 hundred</td>
<td>___ ones. ___ tens.</td>
</tr>
<tr>
<td>470 ?</td>
<td>1 ten 1 hundred</td>
<td>___ ones. ___ tens.</td>
</tr>
</tbody>
</table>
Lesson 13

Objective: Read and write numbers within 1,000 after modeling with place value disks.

Suggested Lesson Structure

Fluency Practice (10 minutes)
- Sprint: Place Value Counting to 100 2.NBT.3 (8 minutes)
- 100 More/100 Less 2.NBT.2 (1 minute)
- How Many Tens/How Many Hundreds 2.NBT.1 (1 minute)

Sprint: Place Value Counting to 100 (8 minutes)

Materials: (S) Place Value Counting to 100 Sprint

100 More/100 Less (1 minute)

T: I’ll say a number. You say the number that is 100 more. Wait for my signal. Ready?
T: 70. (Signal after each number.)
S: 170!
T: 200.
S: 300!
T: 480.
S: 580!
T: 900.
S: 1,000!

Continue with 10 more, then switch to 10 less.
Lesson 13: Read and write numbers within 1,000 after modeling with place value disks.

Date: 8/7/13

How Many Tens/How Many Hundreds (1 minute)

T: I'll say a number. You say how many tens are in that number. For example I say, “14 ones.” You say, “1 ten.” Wait for my signal. Ready?

T: 20 ones. (Signal after each number.)
S: 2 tens!
T: 28 ones.
S: 2 tens!
T: 64 ones.
S: 6 tens!
T: 99 ones.
S: 9 tens!

Continue in this manner, and then switch to asking how many hundreds.

T: 15 tens.
S: 1 hundred!
T: 29 tens.
S: 2 hundreds!
T: 78 tens.
S: 7 hundreds!

Application Problem (10 minutes)

Sarah’s mom bought 4 boxes of crackers. Each box had 3 smaller packs of 10 inside. How many crackers were in the 4 boxes?

T: Read this problem with me.
T: We always have to pay special attention to the information given.
T: How many boxes are there?
S: 3.
T: What is inside each box?
S: 3 packs of 10 crackers.
T: What unit are we solving for, boxes or crackers?
Reread the question and then tell your partner.
S: Crackers.
T: Correct. Now discuss with your partner what you could draw that would help you answer the question.
Lesson 13:

Read and write numbers within 1,000 after modeling with place value disks.

S: I drew 4 boxes and wrote 10, 10, 10 in each one. Then I skip-counted by tens and got 120. I drew 4 big circles and put 3 ten-disk inside each. Then I used doubles, 3 tens + 3 tens is 6 tens, and 6 tens + 6 tens is 12 tens or 120. I drew the same picture as Yesenia, but I skip-counted 3, 6, 9, 12. And since they’re tens, I said 30, 60, 90, 120.

T: Great strategies for solving! So what is the answer to the question?

S: There are 120 crackers in the 4 boxes.

Concept Development (30 minutes)

Drawing Place Value Disks to Represent Numbers (10 minutes)

Materials: (T) Plenty of white board space (S) personal white boards

T: I’m going to draw some pictures of numbers. As I draw, count out loud for me.

T: (On a place value chart silently draw pictures of the disks to represent 322.)

S: 1 hundred, 2 hundred, 3 hundred, 3 hundred ten, 3 hundred twenty, 3 hundred twenty-one, 3 hundred twenty-two.

T: What is the value of the number on my place value chart? Write the value on your personal board. Show the value to me at the signal.

S: 322.

T: Excellent. Try another. (Silently draw as students count the value.)

S: One hundred, one hundred one, one hundred two, one hundred three.

T: What’s the total value of this new number? Write it on your personal board. Show the value to me at the signal.

S: 103.

T: Now we’ll try a new process. I’m thinking of a number. Don’t count while I draw. Wait until I have finished drawing before you whisper its value to your partner.

T: (Silently and quickly draw 281 into a place value chart. Be sure to draw the ten-frame way as modeled in the Problem Set below.)

T: Write this new number on your personal white board.

T: Here is another one. (A possible sequence would be 129, 710, 807, 564.)

T: What is it about the way I am drawing that is making it easy for you to tell the value of my number so
Lesson 13: Read and write numbers within 1,000 after modeling with place value disks.

Date: 8/7/13

quickly? Talk to your partner.
S: The labels are easy to read. She draws the hands way, one five then the other. The place value chart makes the units easy to see.

T: I hear lots of interesting ideas. We have some great tools here. What tools are we using?
S: A place value chart. Number disks. The ten-frame.
T: Now it is your turn to represent some numbers by drawing place value disks.

Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students solve these problems using the RDW approach used for Application Problems.

Directions: Draw the numbers indicated using place value disks drawn the ten-frame way.

Notes on drawing place value disks:
- Have the students draw the value of the unit first, and then circle it. (They like to draw the circle first and then cram the unit’s value inside.)
- Have the students start drawing at the base-line of the place value chart, filling their column of 5 (if your number is 5 or greater).
- Go back down and start from the bottom up to build towards the other five for 6, 7, 8, and 9.

Estimating Numbers on the Empty Number Line (10 minutes)

T: Let’s represent the same numbers from our Problem Set on empty number lines. Imagine we are traveling from 0 to 72.
T: Here is 0’s address for now. And here is 72’s address at the other end of the number line.
T: How many tens am I going to travel?
S: 7 tens.
T: I would like the 7 jumps to be as equal as I can make them. I like drawing little arrows to show the jumps I make. Count for me.
Lesson 13: Read and write numbers within 1,000 after modeling with place value disks.

Date: 8/7/13

S: 1 ten, 2 tens, 3 tens, 4 tens, 5 tens, 6 tens, 7 tens, 1 one, 2 ones. Small hops for the ones. Bigger hops for the tens.

T: Below, I'm going to draw my disks (as pictured).

T: Now you try. Here is a template. Use a pencil because you might erase a few times. Make your address for 0 and 72, and then get to 72 the best you can with 7 tens and 2 ones.

T: (Circulate and support. Move them on to 427. "What units do you have in that number?" "Which is the largest?" "Draw the disks below to show the units within each hop."

Encourage the students to have fun and think about the best way to show each number on the empty number line. Accept all reasonable work. Do not be overly prescriptive. Watch for students who make different units the same size. "Yes, the disks are the same size but will the hops be the same size on the number line?" This is an estimation exercise and a chance to consider the size of a unit while working with the disks.

Student Debrief (10 minutes)

Lesson Objective: Read and write numbers within 1,000 after modeling with place value disks.

Materials: (T) Base ten bundles of straws on the carpet for students to refer to, Problem Sets

The Student Debrief is intended to invite reflection and active processing of the total lesson experience. Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

T: Bring your work to the carpet. Check your partner’s place value charts. Make sure the correct number of units is drawn and that they are easy to read. Make sure they are in the correct place, too.

S: (Students share.)

T: Let’s start by analyzing our place value charts. In each number there is a 7. With your partner, review the values of the sevens.

T: (Students review the values of the 7s.) Read the numbers in order from A to F when I give the signal.

S: Students read.

T: Discuss with your partner the bundles that would match each of your six numbers. I have the bundles on the carpet here for you to refer to.
Lesson 13

T: (After students discuss). Now share your number lines with your partner. Explain your thinking about the size of your hops.

S: I knew I had to get in 7 hops by the end of the line so I made them smaller here than in this one. → It’s interesting because this line was 427 and this line was 72. → So on this one, I made 4 really big hops and 2 small ones and then 7 minis. → Then 700; I decided to just make one big hop for all the hundreds.

T: Let’s read through the numbers we showed both on the place value chart and on the empty number line.

S: 72, 427, 713, 171, 187.

T: As we already saw, each of our numbers has a 7 in it. Show your partner how you represented the 7 in each number on your number line. Why are they different?

S: This was 7 hundreds and this was 7 ones so these were little and these were big. → Both these numbers had 7 in the tens place but 72 is smaller than 171 so the hops were bigger when I was only going to 72. → 705 and 713 both have 7 hundreds. On this number line I hopped 7 times but on this number line I made one big jump for all seven. I guess that it’s just about the same though.

T: So I’m hearing you say that the biggest difference was in the way the 7 tens in 171 and 72 looked, the unit in the middle.

T: It’s so interesting because a number could be counting something really small like 70 grains of rice or something really big like 70 planets! We read and write numbers and they describe things. Turn and talk to your partner. What could our number 427 be describing?

S: 427 apples. → 427 students. → 427 ants. → 427 stars.

Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students’ understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.
### Write the number.

<table>
<thead>
<tr>
<th></th>
<th>5 tens</th>
<th>23 80 + 4 =</th>
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</thead>
<tbody>
<tr>
<td>2</td>
<td>6 tens 2 ones</td>
<td>24 4 + 80 =</td>
</tr>
<tr>
<td>3</td>
<td>6 tens 3 ones</td>
<td>25 7 tens</td>
</tr>
<tr>
<td>4</td>
<td>6 tens 8 ones</td>
<td>26 5 tens 8 ones</td>
</tr>
<tr>
<td>5</td>
<td>60 + 4 =</td>
<td>27 5 tens 9 ones</td>
</tr>
<tr>
<td>6</td>
<td>4 + 60 =</td>
<td>28 5 tens 2 ones</td>
</tr>
<tr>
<td>7</td>
<td>8 tens</td>
<td>29 50 + 7 =</td>
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<tr>
<td>8</td>
<td>9 tens 4 ones</td>
<td>30 7 + 50</td>
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<tr>
<td>9</td>
<td>9 tens 5 ones</td>
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<td>10</td>
<td>9 tens 8 ones</td>
<td>32 7 tens 4 ones</td>
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<td>16</td>
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<td>70 + 8 =</td>
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<td>18</td>
<td>8 + 70 =</td>
<td>40 8 tens 6 ones</td>
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<td>8 tens 1 one</td>
<td>42 5 + 60 =</td>
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<td>8 tens 2 ones</td>
<td>43 8 tens 20 ones</td>
</tr>
<tr>
<td>22</td>
<td>8 tens 7 ones</td>
<td>44 30 + 7 tens =</td>
</tr>
</tbody>
</table>
Lesson 13:

Read and write numbers within 1,000 after modeling with place value disks.

Date: 8/7/13

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<td>3</td>
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<td>4</td>
<td>5 tens 8 ones</td>
<td>26</td>
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<td>7</td>
<td>4 + 50 =</td>
<td>29</td>
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<td>8 tens 4 ones</td>
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<td>9</td>
<td>8 tens 5 ones</td>
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<td>8 tens 8 ones</td>
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<td>9 tens 7 ones</td>
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<td>90 + 8 =</td>
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<td>8 + 90 =</td>
<td>40</td>
</tr>
<tr>
<td>19</td>
<td>5 tens</td>
<td>41</td>
</tr>
<tr>
<td>20</td>
<td>6 tens 1 one</td>
<td>42</td>
</tr>
<tr>
<td>21</td>
<td>6 tens 2 ones</td>
<td>43</td>
</tr>
<tr>
<td>22</td>
<td>6 tens 7 ones</td>
<td>44</td>
</tr>
</tbody>
</table>
Lesson 13

Directions: Draw place value disks to show and read the following numbers.

A. 72

B. 427

C. 713

D. 171

E) 187

F) 705

When you have finished, use your whisper voice to read each number out loud in both unit and word form. How much does each number need to change for a ten? For 1 hundred?
Name ___________________________________________ Date ___________

1. Draw place value disks to show the numbers.

   a. 560
      
      
   b. 506
      
      
2. Draw and label the jumps on the number line to move from 0 to 141.
Draw place value disks to show and read the following numbers.

A. 43  
B. 430

C. 270  
D. 720

E. 702  
F. 936

When you have finished, use your whisper voice to read each number out loud in both unit and word form. How much does each number need to change for a ten? For 1 hundred?
Lesson 14

Objective: Model numbers with more than 9 ones or 9 tens; write in expanded, unit, standard, and word forms.

Suggested Lesson Structure

- Fluency Practice (10 minutes)
- Application Problem (12 minutes)
- Concept Development (28 minutes)
- Student Debrief (10 minutes)

Total Time (60 minutes)

Fluency Practice (10 minutes)

- Sprint: Review of Subtraction in the Teens 2.OA.2 (8 minutes)
- Happy Counting Up and Down by Ones Crossing 100 2.NBT.2 (2 minutes)

Sprint: Review of Subtraction in the Teens (8 minutes)

Materials (S) Review of Subtraction in the Teens Sprint

Happy Counting Up and Down by Ones Crossing 100 (2 minutes)

T: Let’s play Happy Counting!

T: Watch my fingers to know whether to count up or down. A closed hand means stop. (Show signals as you explain.)

T: We’ll count by ones, starting at 76. Ready? (Teacher rhythmically points up until a change is desired. Show a closed hand then point down. Continue, mixing it up.)

Lesson 14: Model numbers with more than 9 ones or 9 tens; write in expanded, unit, standard, and word forms.

Date: 8/7/13

Application Problem (12 minutes)

A second grade class has 23 students. What is the total number of fingers of the students?

T: Read this problem with me.
T: I’m very curious to see what you’ll draw to solve this! Talk with your partner to share ideas, and then I’ll give you 2 minutes to draw and label your picture.
T: (After several minutes.) Who would like to share their thinking?
S: I drew 23 circles to be the 23 students. Then I put the number 10 in each to be the 10 fingers for everybody. Then I skip-counted by tens and got to 230. → I drew 23 ten-disks because each student has 10 fingers. Then I circled 1 group of 10 circles and wrote 100 because 10 tens equals 100. Then I circled another group of 10 circles. That made 200. And there were 3 tens left, which is 30. So the answer is 230.
T: 230 what?
S: 230 fingers!
T: Why is it easier to draw 23 ten-disks than, say, 23 sets of hands?
S: It’s faster! → It takes longer to draw 2 hands for every student instead of just 1 circle for each student.
T: Good reasoning! It’s good to be fast if you can be accurate, but it’s also important to use a strategy that makes sense to you.
T: So how many fingers do 23 students have?
S: 23 students have 230 fingers!
T: Please add that statement to your paper.

Concept Development (28 minutes)

Materials  (T) White board, poster space or magnetized place value disks  (S) Place value disks (9 hundreds, 15 tens, 15 ones), place value mat, pencil and paper, Problem Set
Lesson 14: Model numbers with more than 9 ones or 9 tens; write in expanded, unit, standard, and word forms.

T: On your place value mat, show me the number 14.
S: (Students show.)
T: What disks did you use from greatest to smallest?
S: 1 ten and 4 ones.
T: Change 1 ten for 10 ones. (Pause as students work.) What disks did you use this time?
S: 14 ones.
T: Discuss with your partner why this statement is true. (Silently write 1 ten 2 ones = 12 ones.)
S: Yes, it is true. It’s true because 1 ten is 10 ones and 10 + 2 is 12 ones. Yes, but my teacher said you can’t have more than 9 ones. It’s okay to use more. It’s just faster to use a ten.
T: Show me the number 140 to me with your disks.
S: (Students show.)
T: What place value disks did you use from greatest to smallest?
S: 1 hundred 4 tens.
T: Change 1 hundred for 10 tens. (Pause as students work.) What disks did you use this time?
S: 14 tens.
T: Touch and count by tens to find the total value of your tens.
S: 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140.
T: What is the value of 14 tens? Answer in a full sentence, “The value of 14 tens is...”
S: The value of 14 tens is 140.
T: Discuss why this statement is true with your partner. (Silently write: 1 hundred 4 tens = 14 tens.)
T: (After discussion.) Now discuss with your partner why this is true. (Silently write: 14 tens = 140 ones.)
T: Show me the number 512.
T: What disks did you use?
S: 5 hundreds 1 ten 2 ones.
T: Change 1 ten for 10 ones. (Pause as students work.) What disks did you use?
S: 5 hundreds 12 ones.
T: Discuss why the statement is true. (Write 5 hundreds 1 ten 2 ones = 5 hundreds 12 ones. Continue with more guided examples if necessary with a small group.)
T: First model A and then B. Tell the total value of each number you model.

<table>
<thead>
<tr>
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<tr>
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<tr>
<td>11 tens</td>
<td>1 hundred 1 ten</td>
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<td>1 ten 3 ones</td>
<td>13 ones</td>
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<td>12 tens 9 ones</td>
<td>1 hundred 2 tens 9 ones</td>
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</table>

Date: 8/7/13
Problem Set (12 minutes)

Materials: (S) Problem Set Part B

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students solve these problems using the RDW approach used for Application Problems.

Directions: Represent each number two ways on the place value charts. The instructions will tell you what units to use.

Student Debrief (10 minutes)

Lesson Objective: Model numbers with more than 9 ones or 9 tens; write in expanded, unit, standard, and word forms.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

 Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

T: Bring your Problem Set to our Debrief.
S: Check your work carefully with a partner. How did you show each number? I will circulate and look at your drawings, too.
T: (After two minutes.) Which ones were hard for you?
T: (Ask questions, especially with the third page. If no one is forthcoming, choose one you saw many struggled with as you circulated.)
T: Let’s look at question number 4. What number is written?
S: 206.
T: Say 206 in expanded form.
S: 200 + 6.
T: 100 + 100 is?
S: 200.
T: 100 is how many tens?
S: 10 tens.
T: 10 tens + 10 tens is?
S: 20 tens.
T: 20 tens is?
S: 200.
T: 206 = 2 hundreds 6 ones = 20 tens 6 ones. Talk to your partner about why this is true.
T: We can have more than 9 units. Let’s try some.
T: The value of 30 tens is?
S: 300.
T: 18 tens?
S: 180.
T: Excellent.

Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students’ understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.

Chart A: Draw 120. Use hundreds and tens place value disks. Count aloud as you draw.
Chart B: Draw 206. Use only tens and ones place value disks. Count aloud as you draw.

Part B: Whisper-talk the numbers and words as you fill in the blanks.

1. 18 = \[ \underline{1} \] hundreds \[ \underline{8} \] ones
   18 = \[ 1 \] tens \[ 8 \] ones

2. 315 = \[ \underline{3} \] hundreds \[ \underline{1} \] tens \[ \underline{5} \] ones
   315 = \[ 3 \] hundreds \[ 15 \] ones

3. 120 = \[ \underline{1} \] hundreds \[ \underline{2} \] tens \[ \underline{0} \] ones
   120 = \[ 12 \] tens \[ 0 \] ones

4. 206 = \[ \underline{2} \] hundreds \[ \underline{0} \] tens \[ \underline{6} \] ones
   206 = \[ 20 \] tens \[ 6 \] ones

5. 419 = \[ \underline{4} \] hundreds \[ \underline{1} \] tens \[ \underline{9} \] ones
   419 = \[ 41 \] tens \[ 9 \] ones

6. 570 = \[ \underline{5} \] hundreds \[ \underline{7} \] tens
   570 = \[ 57 \] tens

7. 718 = \[ \underline{7} \] hundreds \[ \underline{18} \] ones
   718 = \[ 71 \] tens \[ 8 \] ones

8. 909 = \[ \underline{9} \] hundreds \[ \underline{9} \] ones
   909 = \[ 90 \] tens \[ 9 \] ones
Lesson 14: Model numbers with more than 9 ones or 9 tens; write in expanded, unit, standard, and word forms.

Date: 8/7/13

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Lesson 14: Model numbers with more than 9 ones or 9 tens; write in expanded, unit, standard, and word forms.

Date: 8/7/13

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Lesson 14: Model numbers with more than 9 ones or 9 tens; write in expanded, unit, standard, and word forms.

Date: 8/7/13

Whisper count as you show the numbers with place value disks.

A
Draw 18 using tens and ones.

B
Draw 18 using only ones.

A
Draw 315 using hundreds, tens, and ones.

B
Draw 315 using only hundreds and ones.
Lesson 14

Model numbers with more than 9 ones or 9 tens; write in expanded, unit, standard, and word forms.

Date: 8/7/13

A
Draw 120 using hundreds, tens, and ones.

B
Draw 206 using only tens and ones.
Part B

1. Whisper-talk the numbers and words as you fill in the blanks.
   a. 18 = ______ hundreds ______ tens ______ ones
      18 = ______ ones

   b. 315 = ______ hundreds ______ tens ______ ones
      315 = ______ hundreds ______ ones

   c. 120 = ______ hundreds ______ tens ______ ones
      120 = ______ tens ______ ones

   d. 206 = ______ hundreds ______ tens ______ ones
      206 = ______ tens ______ ones

   e. 419 = ______ hundreds ______ tens ______ ones
      419 = ______ tens ______ ones

   f. 570 = ______ hundreds ______ tens
      570 = ______ tens

   g. 718 = ______ hundreds ______ ones
      748 = ______ tens ______ ones

   h. 909 = ______ hundreds ______ ones
      909 ______ tens ______ ones

2. Mr. Hernandez’s class wants to trade 400 tens rods for hundreds flats with Mr. Harrington’s class. How many hundreds flats are equal to 400 tens rods?
Lesson 14: Model numbers with more than 9 ones or 9 tens; write in expanded, unit, standard, and word forms.

Date: 8/7/13

Name ____________________________ Date ________________

Draw 241. Use hundreds, tens, and ones place value disks.

Chart B: Draw 241. Use only tens and ones place value disks.

Fill in the blanks.

1. \(45 = \underline{\phantom{0}} \) hundreds \(\underline{\phantom{0}} \) tens \(\underline{\phantom{0}} \) ones
   \(45 = \underline{\phantom{0}} \) ones

2. \(682 = \underline{\phantom{0}} \) hundreds \(\underline{\phantom{0}} \) tens \(\underline{\phantom{0}} \) ones
   \(682 = \underline{\phantom{0}} \) hundreds \(\underline{\phantom{0}} \) ones
Name ___________________________ Date ________________

1. Whisper-talk the numbers and words as you fill in the blanks.
   a. 16 = ______ tens _______ ones
      18 = ______ ones
   
   b. 217 = ______ hundreds ______ tens _______ ones
      217 = ______ hundreds ______ ones
   
   c. 320 = ______ hundreds ______ tens _______ ones
      320 = ______ tens ______ ones
   
   d. 139 = ______ hundreds ______ tens _______ ones
      139 = ______ tens ______ ones
   
   e. 473 = ______ hundreds ______ tens _______ ones
      473 = ______ tens ______ ones
   
   f. 680 = ______ hundreds ______ tens
      680 = ______ tens
   
   g. 817 = ______ hundreds _______ ones
      817 = ______ tens ______ ones
   
   h. 921 = ______ hundreds _______ ones
      921 = ______ tens ______ ones

2. Write down how you skip-count by ten from 350 to 240? You might use place value disks, number lines, bundles, or numbers.
Lesson 15

Objective: Explore a situation with more than 9 groups of ten.

Suggested Lesson Structure

- Fluency Practice (12 minutes)
- Concept Development (30 minutes)
- Student Debrief (18 minutes)
- Total Time (60 minutes)

Fluency Practice (12 minutes)

- Sprint: Expanded Notation 2.NBT.3 (8 minutes)
- Compare Numbers 0–99 Using <, >, = 2.NBT.4 (4 minutes)

Sprint: Expanded Notation (8 minutes)

Materials: (S) Expanded Notation Sprint

Compare Numbers 0–99 Using <, >, = (4 minutes)

Materials: (T) 1 set of <, >, = comparison symbols (S) Baggie containing 2 sets of digit cards 0–9 per student and 1 personal white board with marker and 1 set of <, >, = per pair

Students are seated in partners at their tables.

T: Take the digit cards out of your baggie. Use the cards to build a number from 0–99. Take 10 seconds.

T: Compare numbers with your partner. Place the appropriate symbol (show <, >, =) between them.

T: Read your number sentence to your partner using the words greater than, less than or equal to. Then use the language of units to explain how you know the number sentence is true.

T: For example, you might say, “34 is less than 67. I know because 3 tens is less than 6 tens.” Go.

NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

Students compared numbers and used the symbols <, >, = in Grade 1, but this activity is their first practice in Grade 2. The activity assumes student familiarity with the symbols <, >, = and with this vocabulary: compare, greater than, less than, equal to, tens and ones. This may not be the case, particularly if you have many ELL students. If necessary, modify the introduction to review symbols and vocabulary.

Suggestion: Write and post vocabulary words. Create a sentence frame (possibly: __ is__ than __.) to help students use vocabulary. Ask pairs to identify the greater number and use the sentence frame to describe it. Do the same with the smaller number.

Have students make or imagine that they have the same number as their partner. Ask them to whisper words they might use to compare the numbers. (Equal is a term that students are more likely to produce independently.) Instruct students to lay the appropriate symbols between numbers as they say the corresponding vocabulary words.
S: 56 is greater than 23. 5 tens are greater than 2 tens.  
→ 12 is less than 22 because 1 ten is less than 2.  
→ 79 is equal to 79. I know because the tens and ones are the same.

T: Good. I’m holding our symbols face down. I’ll flip one over and we’ll read it to see which number “wins” this round. (Flip over a symbol and show it. This element of the game encourages students to diversify the numbers they make.)

T: Who wins?
S: Less than!
T: Yes, the number that is less than wins this time.
T: Let’s play again. Players, use your digit cards to make another number.

Continue, following the same sequence.

Concept Development (30 minutes)

Materials: (S) Problem Set (However, if you do not have a document camera for the Student Debrief, we suggest you give the students poster board for question 4. Students need access to base ten materials (disks, bundles, and/or blocks) at centers. Do NOT place them at the tables or explicitly suggest that students use them. This is so that they learn to “use appropriate tools strategically” -MP.5)

T: Let’s read our 4 problems.
S: Students read.
T: Partner A: Without looking at the paper, retell the problem to your partner.
T: Partner B: Without looking at the paper, retell the problem, too.
T: Your task in class today is to solve these “pencil problems” and record your thinking on paper so that you can share your solution strategies with another group.
T: Before we begin, does anyone have any questions?
S: How much time do we have?
T: Good question. I will give you time signals. You have 20 minutes in all. I will tell you when you have
15, 10 and 5 minutes left.

T: Make sure to include a statement of your answers. You may begin!

As the students work, circulate. This is their second extended exploration. You have been teaching many days consecutively. This is a day to stand back and observe them independently “making sense of a problem and persevering in solving it” (MP.1). Encourage pairs to ask other pairs for help rather than ask you.

**Problem Set (20 minutes)**

Students should do their personal best to complete the Problem Set within the allotted 20 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students solve these problems using the RDW approach used for Application Problems.

**Student Debrief (18 minutes)**

**Lesson Objective:** Explore a situation with more than 9 groups of ten.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

T: Bring your work to our Debrief. Partners, find another group with whom to share your work just on questions 1–3 for now. Explain your solution strategies.

S: (Share with each other.)

T: Let’s go over the answers to questions 1–3. Wait for the signal, question 1?

S: 140 pencils.
Lesson 15: Explore a situation with more than 9 groups of ten.

Date: 8/7/13

T: Please give the answer in a full statement Jeremy.
S: There are 140 pencils in all.
T: Question 2?
S: The principal needs 60 pencils.
T: What unit are we solving for?
S: Boxes.
T: So does 60 pencils answer the question?
S: No.
T: How many boxes does the principal need?
S: 16 boxes.
T: Question 3. Does the principal have enough pencils?
S: No!
T: How do you know?
S: He found 11 boxes in all. That’s 110 pencils. 110 and 140 is less than 300. So he has 140 pencils. He found 70 and 40. That’s 110. So put those together you have 2 hundreds 5 tens, that’s 250. Not enough. You have 2 hundreds and then 10 and 40 is 50 so it’s just 250 not 300. He had 14 boxes. He found 11 boxes. That’s 25 boxes but he needs 5 more to have 30 boxes.
T: Good thinking. He does not have enough pencils. Let’s show two different solutions.
T: Now let’s share our work about question 4. (Possibly project the most concrete/pictorial work first which you feel best supports your mathematical objective.) Tell your partner what you see about how they solved the problem.
T: (Allow 1 or 2 minutes before continuing.) Now look at these students’ work (show the second one down from the top.) Tell your partner what you see about how they solved the problem.
T: (After giving them 1 or 2 minutes.) Did both groups get the same answer?
S: No!
T: Talk to your partner about why their answers are different and if both of them can be right.
T: Do you think both of their answers make sense?
S: Yes.
T: Now think about how each of them solved the problem.

Continue with the analysis of the student work. Get them to observe and analyze similarities and differences. The bottom paper is the most abstract solution. Ask the students to explain the mathematics.

Possibly have them follow up by writing a letter to the principal showing him their ideas and asking his thinking about the number of pencils to be ordered for their class for the four months. Have them run a sale or fund drive to make up the difference, assuming the principal was going to order less!
Exit Ticket  (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students’ understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.
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<td>10</td>
<td>80 + 7 =</td>
<td>32 100 + 10 + 5 =</td>
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<td>14</td>
<td>300 + 40 =</td>
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<td>16</td>
<td>500 + 60 =</td>
<td>38 600 + 40 + 2 =</td>
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<td>17</td>
<td>600 + 70 =</td>
<td>39 600 + 2 =</td>
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<td>18</td>
<td>300 + 40 + 5 =</td>
<td>40 2 + 600 =</td>
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<td>19</td>
<td>400 + 50 + 6 =</td>
<td>41 3 + 600 =</td>
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<tr>
<td>20</td>
<td>500 + 60 + 7 =</td>
<td>42 3 + 40 + 600 =</td>
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<tr>
<td>21</td>
<td>600 + 70 + 8 =</td>
<td>43 5 + 10 + 800 =</td>
</tr>
<tr>
<td>22</td>
<td>700 + 80 + 9 =</td>
<td>44 9 + 20 + 700 =</td>
</tr>
</tbody>
</table>
Names __________________ and __________________ Date ____________

Pencils come in boxes of 10. There are 14 boxes.

1. How many pencils are there in all? Explain your answer using words, pictures, or numbers.

2. The principal wants to have 300 pencils for the second graders for October, November and December. How many more boxes of pencils does he need to get? Explain your answer using words, pictures, or numbers.
3. The principal found 7 boxes in the supply closet and 4 boxes in a desk drawer. Now does he have what he wants for the second graders? Explain your answer using words, pictures, or numbers.

4. How many boxes of pencils do you think would be good for your class to have ready for January, February, March and April? How many pencils is that? Explain your answer using words, pictures, or numbers.
Think about the different strategies and tools your classmates used to answer the pencil question. Explain a strategy you liked that is different from yours.
Name ____________________________ Date _______________

Pencils come in boxes of 10.

1. How many boxes should Erika buy if she needs 127 pencils?

2. How many pencils will she have left over after she gets what she needs out of the boxes?

3. How many more pencils does she need to have 200 pencils?
Topic F

Comparing Two Three-Digit Numbers

2.NBT.4

Focus 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.

Instructional Days: 3

Coherence -Links from: G1–M6 Place Value, Comparison, Addition and Subtraction to 100
-Links to: G2–M4 Addition and Subtraction Within 200 with Word Problems to 100

Number disks make comparison of numbers very easy. *More than* and *less than* lead to the addition and subtraction in the next module. In Lesson 16, students compare using the symbols <, >, and = on the place value chart. Next, students advance to comparing different forms (2.NBT.4), and finally, in Lesson 18, they apply their comparison and place value skills to order more than two numbers in different forms.

A Teaching Sequence Towards Mastery of Comparing Two Three-Digit Numbers

Objective 1: Compare two three-digit numbers with <, >, and =.
(Lesson 16)

Objective 2: Compare two three-digit numbers with <, >, and = when there are more than 9 ones or 9 tens.
(Lesson 17)

Objective 3: Order numbers in different forms. (Optional.)
(Lesson 18)
Lesson 16
Objective: Compare two three-digit numbers using <, >, and =.

Suggested Lesson Structure
- Fluency Practice (12 minutes)
- Application Problem (8 minutes)
- Concept Development (30 minutes)
- Student Debrief (10 minutes)
Total Time (60 minutes)

Fluency Practice (12 minutes)
- Sprint: Sums—Crossing Ten 2.OA.2 (12 minutes)

Sprint: Sums—Crossing Ten (12 minutes)
Materials: (S) Sums—Crossing Ten Sprint

In Topics F and G for the next 6 days of instruction, a blitz will be done on addition and subtraction sums in preparation for Module 4. As the beginning of Module 4 draws near, the goal is to energize and hone students’ addition and subtraction facts before getting there.

Application Problem (8 minutes)
At recess Diane skip-roped 65 times without stopping. Peter skip-roped 20 times without stopping. How many more times did Diane skip-rope than Peter?

T: Use your RDW process. Lead them as necessary through the sequence of questions we want them to internalize:
- What do you see?
- Can you draw something?
- What can you draw?
- What conclusions can you make from your drawing?)

T: What number sentence did you use to find the answer?


T: Were you missing a part or the whole?
S: A part?
T: Turn and talk to your partner about what is the missing part in the story of Diane and Peter.
S: It’s the number of jumps Diane did that Peter didn’t do. It’s how many more Peter had to do to have the same number of jumps as Diane.
T: We are comparing. What did you learn in Grade 1 about comparing and subtraction?
S: We learned that to compare, you subtract, because you’re finding the part that is missing.
T: Excellent. Let’s look at that missing part in two excellent drawings made by your friends. See if you can find them. Talk to your partner.

Let the students point to the missing part in the drawings and really make that connection between the number sentence and the missing part.

**Concept Development (30 minutes)**

Materials: (S) Place value mat, number disks (2 hundreds, 7 tens, and 7 ones), Problem Set 1

**Concrete (6 minutes)**

T: Use number disks to show 74 on your place value mat.
S: (Students show.)
T: Which disks did you use from greatest to smallest?
S: Tens and ones.
T: Add 1 disk so the number becomes 174.
T: (Students show.) What did you add?
S: A hundred.
T: Which number is greater? 74 or 174?
S: 174!
T: Let’s state that as a number sentence.
S: 174 is greater than 74.
T: Change your disks to show 105.
T: (Students show.) Which disks did you use from greatest to smallest?
S: Hundreds and ones.
T: Now make the number 135.
T: (Students show.) Which number is less, 105 or 135?
S: 105.
T: Say it as a number sentence.
S: 105 is less than 135.
T: Talk to your partner. How can you tell? (Circulate and listen.)
T: Let’s hear some of your good ideas. (Choose students to share based on their thinking.)
Lesson 16: Compare two three-digit numbers using <, >, and =.

Date: 8/7/13

S: 105 has fewer tens. → They both have 1 ten but 135 has 3 tens. 105 has no tens. → 105 has 10 tens. 135 has 13 tens.

T: Show 257 on your mat.

T: (Students show.) Change it to show 250.

S: (Students show.)

T: Which number is greater, 257 or 250?

S: 257.

T: Say it as a number sentence.

S: 257 is greater than 250.

T: How do you know?

S: We took away the ones and 257 got smaller.

Continue with other examples until students gain proficiency.

Pictorial (12 minutes)

Materials: (S) Problem Set 1 (pictured above right)

T: Take 2 minutes to draw each number using hundreds, tens, and ones.

T: (After 2 minutes.) Compare with your partner. How are your drawings alike?

S: (Students compare.)

T: Look carefully at our three numbers. Which is greatest?

S: 724!

T: Turn and tell your partner how you know. (Encourage precise explanation.)

T: Some students compared the number of tens and others compared the number of hundreds.

T: Turn and tell your partner, why might comparing units help us figure out which number is greatest?

(As you circulate, identify exemplary explanations.)

S: It works because there are the most hundreds in 724. → Hundreds come first, so it’s easiest to compare them first. → But I’m confused. If you look at the tens, 724 only has 2 and 274 has 7. → I can help you. Remember there are more tens inside the hundreds. 724 really has 72 tens and 274 only has 27.

T: Quite a few of you have excellent explanations.

NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

Support students by creating or posting a chart of words. It might be as simple as smaller, bigger, smallest, biggest, less than, greater than, least, greatest, <, >.

This lesson introduces a new template:

______ strategy is ________.

Students benefit from articulating how another student thought about or solved a problem. Listening is essential to learning a second language. When students hear the familiar names of their peers, they sense a classroom community that is personal, respectful, and caring. This positive feeling hooks them into the lesson.

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Melanie, will you share your thinking?

S: Hundreds are the biggest unit. So, if a number has 7 hundreds and the other only has 4, you already know that the one with 7 has to be greatest.

T: If we use Melanie’s strategy, which number is smallest?

S: 274!

T: Look at 341 and 329 (write these numbers on the board). The number of hundreds is the same. What would you do to compare then?

S: Look at the tens. 4 tens is more than 2 tens.

T: Anthony, will you share how you compare tens? After he shares I’ll ask everyone to retell his idea.

S: Somebody was confused because 274 has more tens than 724, but the number is not greater. I said you have to remember to think about all the tens. 724 really has 72 tens and 274 really has 27 tens.

T: (Write the sentence frame, “Anthony’s strategy is ______.”) Use the frame to retell Anthony’s strategy to your partner.

S: (Students retell.)

T: Use Anthony’s strategy. Name just the tens and say the three numbers from greatest to smallest.

S: 72 tens, 47 tens, 27 tens.

T: Good. Use the symbols < or > to write a number sentence with all three numbers at the bottom of your Problem Set.

S: (Students write.)

T: Check your partner’s work. It might look different from yours, but make sure you agree it’s true.

Problem Set (12 minutes)

Materials: (S) Problem Set 2

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students solve these problems using the RDW approach used for Application Problems.

Instruct students to complete the Problem Set by drawing values on the place value chart as specified and answering the included questions.
Student Debrief (10 minutes)

Lesson Objective: Compare two three-digit numbers using <, >, and =.

Materials: (S) Problem Set 2, pencil

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

T: Bring your Problem Set to our Debrief.
S: Check your work carefully with a partner as I circulate.
T: (After two minutes.) Which problems were hard for you?
S: (Students respond.)
T: Look at the 3s in 132 and 312. What is the difference between them?
S: One is in the tens place and the other is in the hundreds place.
T: You noticed place value. How did place value help you to compare the numbers on the Problem Set in Part(e)?
S: 908 and 980 look almost the same, but if you notice what place the 8 is in, you know that 8 tens is more than 8 ones.
T: Some problems used word form or unit form. Could you still use place value to compare? How did you do it?
S: I just wrote the numbers in standard form. Then it was easy to look at them and see the numbers in their places.
T: Look back at each section of our Problem Set. What was the same about your task in each one?
S: We always had to compare!
T: Now think about your strategy for comparing. Turn and tell your strategy to your partner. Say, “My
strategy is....”
S: My strategy is to compare numbers by looking at hundreds, tens and ones. → My strategy is to compare places. → My strategy is to compare numbers using place value.
T: Write your strategy on your Problem Set so you’re sure to remember it.
T: Share with your partner about Noah and Charlie’s problem and your thinking about who is correct.
S: (Students share.)
T: What materials in our classroom could we use to prove who is correct?
S: The bundles of sticks. → The blocks. → The dollar bills. → Place value disks.
T: True. When we see materials, sometimes it makes the comparison so obvious!

Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students’ understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.
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### Lesson 16: Compare two three-digit numbers using <, >, and =.

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</tbody>
</table>

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Lesson 16: Compare two three-digit numbers using <, >, and =.

Date: 8/7/13

Name __________________________  Date _____________

472  274  724

472  274  724

472  274  724

472  274  724

472  274  724

472  274  724
Lesson 16 Problem Set 2

Name ___________________________ Date __________

1. Draw the following values on the place value charts. Answer the questions below.

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<tbody>
<tr>
<td>132</td>
<td>312</td>
<td>213</td>
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</tbody>
</table>

What is the greatest number? _______________
What is the smallest number? _______________
Order the numbers from smallest to greatest: __________, __________, __________

2. Circle less than or greater than. Whisper the complete sentence.

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<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>a. 97 is less than / greater than 102.</td>
<td>f. 361 is less than / greater than 367.</td>
<td></td>
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<tr>
<td>b. 184 is less than / greater than 159.</td>
<td>g. 705 is less than / greater than 698.</td>
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<tr>
<td>c. 213 is less than / greater than 206.</td>
<td>h. 465 is less than / greater than 456.</td>
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<tr>
<td>d. 299 is less than / greater than 300.</td>
<td>i. 100 + 30 + 8 is less than / greater than 183.</td>
<td></td>
</tr>
<tr>
<td>e. 523 is less than / greater than 543.</td>
<td>j. 3 tens and 5 ones is less than / greater than 32.</td>
<td></td>
</tr>
</tbody>
</table>
3. Write >, < or =.

Whisper the complete number sentences as you work.

900  899
267  269
537  527
419  491
908  nine hundred eighty
130  80 + 40

Two hundred seventy one  70 + 200 + 1
500 + 40  504
10 tens  101
4 tens 2 ones  30 + 12
36 - 10  2 tens 5 ones

Noah and Charlie have a problem.

Noah thinks 42 tens is less than 390.

Charlie thinks 42 tens is greater than 390.

Who is correct? Explain your thinking below.
Write >, < or =.

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<th>Number</th>
<th>Circle</th>
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</thead>
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<td></td>
<td>2 hundred 70 ones</td>
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<td>179</td>
<td></td>
<td>300 + 60</td>
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<tr>
<td>431</td>
<td></td>
<td>4 tens 2 ones</td>
<td></td>
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<tr>
<td>703</td>
<td></td>
<td>3 tens 7 ones</td>
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<tr>
<td>500</td>
<td>✔</td>
<td>70 + 200 + 1</td>
<td></td>
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<tr>
<td>177</td>
<td></td>
<td>306</td>
<td></td>
</tr>
<tr>
<td>421</td>
<td></td>
<td>30 + 12</td>
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<tr>
<td>seven hundred three</td>
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<td>45 - 10</td>
<td></td>
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</tbody>
</table>
Name ______________________________ Date ______________

1. Draw the following values on the place value charts. Answer the questions below.

   241

   412

   124

Order the numbers from smallest to greatest: ________, ________, ________

2. Circle less than or greater than. Whisper the complete sentence.

   a. 112 is less than / greater than 135.
   b. 152 is less than / greater than 157.
   c. 214 is less than / greater than 204.
   f. 475 is less than / greater than 457.
   g. 300 + 60 + 5 is less than / greater than 635.
   h. 4 tens and 2 ones is less than / greater than 24.

3. Write >, < or =.

   100 〇 99 150 〇 90 + 50
   316 〇 361 9 tens 6 ones 〇 92
   523 〇 525 6 tens 8 ones 〇 50 + 18
   602 〇 six hundred two 84 – 10 〇 7 tens 5 on
Lesson 17

Objective: Compare two three-digit numbers using <, >, and = when there are more than 9 ones or 9 tens.

Suggested Lesson Structure

- Fluency Practice (12 minutes)
- Application Problem (8 minutes)
- Concept Development (30 minutes)
- Student Debrief (10 minutes)

Total Time (60 minutes)

Fluency Practice (12 minutes)

- Sprint: Sums—Crossing Ten 2.OA.2 (12 minutes)

Sprint: Sums—Crossing Ten (12 minutes)

Materials: (S) Sums—Crossing Ten Sprint

Day 2 of our “Sums and Differences” blitz continues with another sprint on sums and differences to 20.

T: Tomorrow we are going to do the exact same sprint. If you wish to take this home and study or practice to see if you can do the problems more skillfully, do so!

T: Take a moment to analyze the sprint with your partner. It is arranged from the easiest problems to the hardest.

S: It starts with the ten plus facts. Those are super easy!

→ Yeah, and then it goes to the nines. That is just 1 to make ten.

→ Or I just do it like a ten plus and do 1 less.

T: Raise your hand if you think you might do better tomorrow!
Application Problem (8 minutes)

Walking on the beach on Tuesday, Darcy collected 35 rocks. The day before, she collected 28. How many fewer rocks did she collect on Monday than on Tuesday?

T: Use your RDW process. What do you see?
S: Her 35 rocks from Tuesday and her 28 rocks from Monday.
T: Can you draw something?
S: Yes!!
T: What can you draw?
S: The rocks!
T: I’m only going to give you 2 minutes to draw. Can you think of efficient short-cuts so that you don’t have to draw all the rocks?
S: Yes!
T: Okay. Do so.
S: (Students show.)
T: What number sentence did you use to find the answer?
S: 35 – 28 = ___ → 28 + ___ = 35.
T: Darcy is comparing. Talk to your partner about what she is comparing.

Lead the students in a conversation about subtraction and comparison. Yes, we are finding a missing part. As time permits, look at different examples of student work.

Concept Development (30 minutes)

Materials: (S) Place value mat, number disks (9 hundreds, tens and ones), one set of <, >, = symbol cards per pair

Concrete (5 minutes)

T: Partner A, show 124 on your place value mat. Partner B, show 824.
S: (Students show.)
T: Compare numbers. Place a symbol from the set between your mats to make a true statement. Read the statement.
Lesson 17

NYS COMMON CORE MATHEMATICS CURRICULUM

Compare two three-digit numbers using <, >, and = when there are more than 9 ones or 9 tens.

Date: 8/7/13

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S: (Students place <.) 124 is less than 824.
T: Partner A, add 7 tens to your number. Partner B, take 7 hundreds from your number.
S: (Students show.)
T: Compare. Choose the symbol to go between your mats. Read the statement.
S: (Students place >.) 194 is greater than 124.
T: Partner A, take 4 tens 4 ones from your number. Partner B, add 2 tens 6 ones to yours.
T: Compare numbers. Choose the symbol. Read the statement.
S: (Students place =.) 150 equals 150.
T: How many tens in 150?
S: 15!
T: Partner A, show 5 tens 6 ones. Partner B, show 15 tens 6 ones.
S: (Students show.)
T: Compare numbers and place your symbol. Read the statement, naming just tens and ones.
S: (Students place <.) 5 tens 6 ones is less than 15 tens 6 ones.
T: Partner A, add 7 tens 5 ones to your number. Partner B, take 2 tens 5 ones from your number.
S: (Students show.)
T: Compare numbers and place your symbol. Read the statement naming just tens and ones.
S: (Students place =.) 13 tens 1 one equals 13 tens 1 one.
T: (Write 213 on the board.) Read my number in numeral form.
S: 113!
T: Is my number greater than, less than, or equal to yours? Decide with your partner, then hold up a symbol.
S: (Students hold up <.)
T: Say the number sentence. Say my number in numeral form, and name yours with tens and ones.
S: 113 is less than 13 tens 1 one.

Pictorial (10 minutes)

Materials: (T) 2 place value charts for projection, number disks (15 hundreds, 15 tens, 15 ones) (S) Personal white boards

As an alternative to projecting the place value mats, the teacher may slip place value charts templates into a personal board and use a marker to draw.

T: (Show 55 on the first chart.) Write this number in numeral form. Turn your board horizontally so you have room to write a second number beside it.
S: (Students write 55.)
T: (Show 50 on the second chart.) Now write this number in unit form.
S: (Students write 5 tens.)
Lesson 17

NYS COMMON CORE MATHEMATICS CURRICULUM

Compare two three-digit numbers using <, >, and = when there are more than 9 ones or 9 tens.

Date: 8/7/13

T: Draw a symbol comparing the numbers. Read the number sentence.

S: (Students draw >.) 55 is greater than 5 tens.

T: Good. Erase. (Show 273 on the first chart.) Write in unit form, naming only tens and ones.

S: (Students write 27 tens 3 ones.)

T: (Show 203 on the second chart.) Write in expanded form.

S: (Students write 200 + 3 or 3 + 200.)

T: Draw a symbol to compare the numbers, then read the number sentence.

S: (Students draw >.) 27 tens 3 ones is greater than 200 + 3.

T: Nice. Erase. (Show 406 on the first chart.) Write in word form.

S: (Students write four hundred six.)

T: (Show 436 on the second chart.) Write in expanded form.

S: (Students write 400 + 30 + 6, or a variation on that order.)

T: Draw a symbol and read.

S: (Students draw <.) Four hundred six is less than 400 + 30 + 6.

T: (Show 920 on the first chart.) Write in numeral form.

S: (Students show 920.)

T: Good. Erase. (Show 880 on the second chart.) Write in unit form, naming only tens and ones.

S: (Students write 88 tens.)

T: Draw a symbol and read.

S: (Students draw >.) 920 is greater than 88 tens.

T: Good. On your board, add ‘+ 4 tens’ after 88 tens. Solve. Change the symbol if you need to.

S: (Students work.)

T: Partner A, show your partner how you solved 88 tens + 4 tens.

S: I looked at the teacher’s picture. I started with 880 and counted by tens 4 times - 890, 900, 910, 920. → Oops, I changed it to 884! → I did 88 + 4. Then I got 92, so I knew it changed to 92 tens.

T: Partner B, talk to your partner about what happened to the symbol. Read the number sentence.

S: Once they were both 92 tens I changed the symbol to =. Now it says 92 tens equals 92 tens.
Lesson 17:
Compare two three-digit numbers using <, >, and = when there are more than 9 ones or 9 tens.

Date: 8/7/13

Problem Set (15 minutes)

Students should do their personal best to complete the Problem Set within the allotted 15 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students solve these problems using the RDW approach used for Application Problems.

Review the Problem Set instructions with students. Allow 12 minutes for completion.

Student Debrief (10 minutes)

Lesson Objective: Compare two three-digit numbers using <, >, and = when there are more than 9 ones or 9 tens.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

T: Bring your Problem Set to our Debrief.
S: Check your work carefully with a partner as I circulate. Put a little star next to the ones that were hard.

T: (After two minutes.) Which ones were hard for you?
S: Letter ‘i’ in the star section was hard!
T: Tell us what made it difficult.
S: I thought doing 47 tens + 23 tens was tricky because it’s a lot of tens to draw.
T: That’s true! Drawing takes a while. Can someone share a more efficient strategy?
S: She made a ten! I guess you could just do 7 + 3 to get a ten too, then add 4 tens, 2 tens and 1 ten.
T: What’s another question you starred?
Lesson 17:

Compare two three-digit numbers using <, >, and = when there are more than 9 ones or 9 tens.

Date: 8/7/13

S: Letter ‘g’ in the heart section. I didn’t notice the units are mixed up in the number that’s unit form. I thought it was 964 instead of 649.

T: What will you do differently to avoid that mistake next time?

S: I need to slow down and read more carefully. I wasn’t really paying attention to units, just to order.

T: Thanks for pointing that out, Austin. Thumbs up if you made that mistake on one of the problems.

S: (Several students show thumbs up.)

T: Did anyone have a strategy for paying attention to units?

S: As I read the problems I just wrote the numbers in numeral form. That way I didn’t get messed up.

T: Nice. It’s important to have little strategies for helping yourself.

T: Head back to your seats to complete your exit ticket.

Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students’ understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.
Lesson 17: Compare two three-digit numbers using <, >, and = when there are more than 9 ones or 9 tens.

Date: 8/7/13

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## Lesson 17: Compare two three-digit numbers using <, >, and = when there are more than 9 ones or 9 tens.

### Date: 8/7/13

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<tr>
<td>22</td>
<td>10 + 8 =</td>
<td>44</td>
<td>4 + 9 =</td>
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</tbody>
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Lesson 17 Problem Set 2-3

Name ____________________________ Date ______________

1. Whisper count as you show the numbers with place value disks.

A

Draw 217 using hundreds, tens, and ones.

B

Draw 21 tens 7 ones.

<

=

>

A

Draw 17 ones 1 hundred.

B

Draw 17 ones 1 hundred.

<

=

>
2. Circle less than, equal to, or greater than. Whisper the complete sentence.

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</thead>
<tbody>
<tr>
<td>a. 9 tens is less than 88.</td>
<td>b. 132 is equal to 13 tens 2 ones.</td>
<td>c. 102 is less than 15 tens 2 ones.</td>
</tr>
<tr>
<td>d. 199 is greater than 20 tens.</td>
<td>e. 62 tens 3 ones is less than 623</td>
<td>f. 80 + 700 + 2 is equal to eight hundred seventy two.</td>
</tr>
<tr>
<td>g. 8 + 600 is less than 68 tens</td>
<td>h. Seven hundred thirteen is equal to 47 tens + 23 tens.</td>
<td>i. 18 tens + 4 tens is less than 29 tens - 5 tens.</td>
</tr>
<tr>
<td>j. 300 + 40 + 9 is equal to 34 tens.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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3. Write $>$, $<$ or $=$.

a. 99 $\bigcirc$ 10 tens

b. 116 $\bigcirc$ 11 tens 5 ones

c. 2 hundreds 37 ones $\bigcirc$ 237

d. Three hundred twenty $\bigcirc$ 34 tens

e. 5 hundreds 2 tens 4 ones $\bigcirc$ 53 tens

f. 104 $\bigcirc$ 1 hundred 4 tens

g. 40 + 9 + 600 $\bigcirc$ 9 ones 64 tens

h. 700 + 4 $\bigcirc$ 74 tens

i. Twenty two tens $\bigcirc$ Two hundreds twelve ones

j. 7 + 400 + 20 $\bigcirc$ 42 tens 7 ones

k. 5 hundreds 24 ones $\bigcirc$ 400 + 2 + 50

l. 69 tens + 2 tens $\bigcirc$ 710

m. 20 tens $\bigcirc$ two hundred ten ones

n. 72 tens - 12 tens $\bigcirc$ 60

o. 84 tens + 10 tens $\bigcirc$ 9 hundreds 4 ones

p. 3 hundreds 21 ones $\bigcirc$ 18 tens + 14 tens
Name ___________________________ Date ________________

Circle or write >, <, or =.

A
Draw 142 using hundreds, tens, and ones.

B
Draw 12 tens 4 ones.

< = >

a. 1 hundred 6 tens ○ 106
c. Thirty tens ○ 300
b. 74 tens ○ 700 + 4
d. 21 ones 3 hundreds ○ 31 tens

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Lesson 17: Compare two three-digit numbers using <, >, and = when there are more than 9 ones or 9 tens.

Date: 8/7/13

1. Whisper count as you show the numbers with place value disks.

   A
   Draw 13 ones 2 hundred.

   B
   Draw 12 tens 8 ones.

   <
   =
   >
2. Write >, <, or =.

   a. 199   10 tens
   b. 236   23 tens 5 ones
   c. 21 tens Two hundred twenty
   d. 380   3 hundred 8 tens
   e. 20 + 4 + 500 2 ones 45 tens
   f. 600 + 7 76 tens
   g. 400 + 2 + 50 524
   h. 59 tens + 2 tens 610
   i. 506 50 tens
   j. 97 tens − 12 tens 85
   k. 67 tens + 10 tens 7 hundreds 7 ones
   l. 8 hundreds 13 ones 75 ten
Lesson 18
Objective: Order numbers in different forms.

Suggested Lesson Structure

- Fluency Practice (12 minutes)
- Application Problem (8 minutes)
- Concept Development (30 minutes)
- Student Debrief (10 minutes)
- Total Time (60 minutes)

Fluency Practice (12 minutes)

- Sprint: Sums–Crossing Ten 2.OA.2 (12 minutes)

Sprint: Sums–Crossing Ten (12 minutes)

Materials: (S) Sprint: Sums–Crossing Ten Sprint

This is the third day of our sums and differences intensive. Students heard you say yesterday’s sprint would be repeated today, and you’re keeping your word. Start the session by asking them to remember how many problems they were able to finish the day before.

T: That is your goal. Everyone’s goal is different because we are not competing so much with each other but with..?
S: Ourselves!
T: Your personal best. That is what matters. Share with your partner at least one strategy you use for practicing your sums and differences.
S: (Share.)
T: Here we go. Take your mark, get set, THINK!!

Application Problem (8 minutes)

For an art project, Daniel collected 15 fewer maple leaves than oak leaves. He collected 60 oak leaves. How many maple leaves did he collect?

After guiding the students through the RDW process, let them analyze some work. Here are some suggested questions based on the drawings:

\[ 60 - 15 = 45 \]
Daniel collected 45 maple leaves.
to the right.

- How does the number sentence relate to the drawing?
- How does the first drawing relate to the second drawing?
- What did the student who drew the number disks do to start the problem?
- Could the person who drew the number bonds also have started with making both the oak and maple leaves equal? Can you see that equality in both pictures?

**Concept Development (30 minutes)**

**Concrete (6 minutes)**

Materials: (T) Place value mat, number disks (9 hundreds, tens and ones) (S) Place value mat, number disks (9 hundreds, tens and ones), personal white boards and markers

T: Partner A, show 2 hundreds 12 ones on your place value mat. Partner B, show 15 tens 4 ones.

T: (As students work, project your own place value mat and use number disks to show 103.)

T: Compare numbers with your partner and me.

S: (Students compare.)

T: What’s the smallest number?

S: 103!

T: The greatest?

S: 212, or 2 hundreds 12 ones.

T: Write the 3 numbers from smallest to greatest on your personal board. Use numeral form. At the signal, show your board.

S: (Students write 103, 154, 212.)

T: (Signal.) Good. Partner A, change to show 62 tens 4 ones. Partner B, change to show 4 ones 6 hundreds.

T: (As students work, write ‘five hundred thirty three’ in word form instead of using number disks.)
NOTES ON MULTIPLE MEANS OF REPRESENTATION:

Thinking of a number can be challenging for students below grade level. Provide some less intimidating ways to generate numbers:

- Digit cards
- Spinners
- Dice

Again, post the assignments with visual clues or examples, too.

<table>
<thead>
<tr>
<th>Form</th>
<th>Example</th>
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<td>A: Numeral Form</td>
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<tr>
<td>B: Unit Form</td>
<td>4 ones 2 tens</td>
</tr>
<tr>
<td>C: Word Form</td>
<td>twenty four</td>
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<tr>
<td>D: Expanded Form</td>
<td>20 + 4</td>
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</table>

Pictorial (12 minutes)

Materials:  
(T): Pocket chart, 1 set of <, >, = symbol cards  
(S) Personal white boards and markers

Assign students to groups by counting off as A, B, C, and D.

T: Write your letter on the blank side of your paper so you don’t forget it.

(S): (Students quickly write their letters.)

T: Think of a number and draw it on your place value mat in the way that you choose.

T: Use hundreds, tens, and ones, or any combination of those you’d like. Take about 1 minute.

(S): (Students think of numbers and draw them in a variety of ways.)

T: As, write your number in numeral form below your drawing. Bs, write numbers in unit form. Cs, write them in word form, and Ds, write them in expanded form.

Students are seated at the carpet.

T: (Collect papers. Place 3 student numbers side by side in the pocket chart with space between them.)

T: Work with your partner to order these 3 numbers on your personal white boards.

(S): (Students order the numbers on their boards.)

T: Let’s read the numbers in order.

(S): (Students read.)

T: (Trade drawings for 3 new ones and continue with 2 or 3 drawings at a time until each has been used at least once.)
Problem Set (12 minutes)

Students should do their personal best to complete the Problem Set within the allotted 12 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students solve these problems using the RDW approach used for Application Problems.

Instruct students to draw the values on the place value chart as directed on the Problem Set, then order from least to greatest or greatest to least in numeral form. Write <, >, or =.

Student Debrief (10 minutes)

Lesson Objective: Order numbers in different forms.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

T: Bring your Problem Sets to our Debrief.

T: Work with your partner to carefully check your answers.

S: (Students work for 2 minutes.)

T: Look at your drawings on your place value charts. Think about how your pictures are alike or different. Tell your partner.

S: I drew them just like the words say. They’re all different. I used hundreds, tens, and ones in all of mine. I drew them all differently, but then I wrote the numbers in numeral form. I decided to only use tens and ones to show each number.

T: Look again. What about your drawings makes the numbers easy or difficult to compare?

S: It’s hard to compare them when they all are in
It’s also really hard when the units are mixed up.

T: How might you use what you know about comparing to help you order numbers well?
S: It helps to write all those different forms in the same way. Then it’s simple to put them in order.
T: True! Head back to your seats for your Exit Ticket.

Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students’ understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.
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### Lesson 18: Order numbers in different forms.

#### Date: 8/7/13

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Lesson 18: Order numbers in different forms.

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1. Draw the following values on the place value charts as you think best.

   1 hundred    19 ones                                    3 ones    12 tens                                                 120

Order the numbers from smallest to greatest: _________, ________, ________

2. Order the following from smallest to greatest in numeral form.

   a. 436   297   805                                   a. ________, ________, ________

   b. 317   three hundred seventy   307                  b. ________, ________, ________

   c. 826   2 + 600 + 80   200 + 60 + 8                 c. ________, ________, ________

   d. 5 hundreds 9 ones   51 tens 9 ones   591          d. ________, ________, ________

   e. 16 ones 7 hundreds   6 + 700 + 10   716          e. ________, ________, ________
3. Order the following from greatest to smallest in numeral form.

   a. 731    598    802
      a. ________, ________, ________

   b. 82 tens eight hundreds twelve ones    128
      b. ________, ________, ________

   c. 30 + 3 + 300    30 tens 3 ones    300 + 30
      c. ________, ________, ________

   d. 4 ones 1 hundred    4 tens + 10 tens    114
      d. ________, ________, ________

   e. 19 ones 6 hundreds    196    90 + 1 + 600
      e. ________, ________, ________

4. Write >, < or =.
   Whisper the complete number sentences as you work.

   a. 700        599        388
      a. ________

   b. four hundred nine    9 + 400        490
      b. ________

   c. 63 tens + 9 tens    seven hundred twenty    720
      c. ________

   d. 12 ones 8 hundreds    2 + 80 + 100    128
      d. ________

   e. 9 hundreds 3 ones    390    three hundred nine
      e. ________

   f. 80 tens + 2 tens    837    3 + 70 + 800
      f. ________
Name _________________________________   Date ________________

1. Order the following from smallest to greatest in numeral form.
   a. 426 152 801
      a. _________, ________, ________
   b. six hundred twenty 206 60 tens 2 ones
      b. _________, ________, ________
   c. 300 + 70 + 4 3 + 700 + 40 473
      c. _________, ________, ________

2. Order the following from greatest to smallest in numeral form.
   a. 4 hundreds 12 ones 421 10 + 1 + 400
      a. _________, ________, ________
   b. 8 ones 5 hundreds 185 5 + 10 + 800
      c. _________, ________, ________
1. Draw the following values on the place value charts as you think best.
   241, 412, 124

   |   |   |   |
   |   |   |   |
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Order the numbers from smallest to greatest: __________, __________, __________

2. Order the following from smallest to greatest in numeral form.
   a. 537 263 912
      a. __________, __________, __________
   b. two hundred thirty 213 20 tens 3 ones
      b. __________, __________, __________
   c. 400 + 80 + 5 4 + 800 + 50 845
      c. __________, __________, __________

3. Order the following from greatest to smallest in numeral form.
   a. 11 ones 3 hundreds 311 10 + 1 + 300
      a. __________, __________, __________
   b. 7 ones 9 hundred 79 tens + 10 tens 970
      b. __________, __________, __________
   c. 15 ones 4 hundreds 154 50 + 1 + 400
      c. __________, __________, __________
Topic G
Finding 1, 10, and 100 More or Less than a Number

2.NBT.4

Focus Standard: 2.NBT.2  Count within 1000; skip-count by 5s, 10s, and 100s
Instructional Days: 3
Coherence -Links from: G1–M6 Place Value, Comparison, Addition and Subtraction to 100
-Links to: G2–M4 Addition and Subtraction Within 200 with Word Problems to 100

The module closes with questions such as, “What number is 10 less than 402?” and “What number is 100 more than 98?” As students have been counting up and down throughout the module, these three lessons should flow nicely out of their work thus far and provide a valuable transition to the addition and subtraction of the coming module where more and less will be re-interpreted as addition and subtraction of one, ten, and a hundred (2.NBT.8). The language component of this segment is essential, too. Students need to be encouraged to use their words to make statements such as, “452 is 10 less than 462 and 100 less than 562.” This allows for greater understanding of comparison word problems (2.OA.1) wherein the language of more and less is a constant presence.

A Teaching Sequence Towards Mastery of Finding 1, 10, and 100 More or Less than a Number

Objective 1: Model and use language to tell about 1 more and 1 less, 10 more and 10 less, and 100 more and 100 less.  
(Lesson 19)

Objective 2: Model 1 more and 1 less, 10 more and 10 less, and 100 more and 100 less when changing the hundreds place.  
(Lesson 20)

Objective 3: Complete a pattern counting up and down.  
(Lesson 21)
Lesson 19

Objective: Model and use language to tell about 1 more and 1 less, 10 more and 10 less, and 100 more and 100 less.

Suggested Lesson Structure

- Fluency Practice (12 minutes)
- Concept Development (28 minutes)
- Application Problem (10 minutes)
- Student Debrief (10 minutes)
- Total Time (60 minutes)

Fluency Practice (12 minutes)

- Sprint 2.OA.2 (12 minutes)

Sprint (12 minutes)

Materials: (S) Differences Sprint

T: Yesterday was our third day of practice on sums. Time to move on to differences.
T: 5 – 3 is?
S: 2.
T: 15 – 3 is?
S: 12.
T: 7 – 1 is?
S: 6.
T: 17 – 1 is?
S: 16.
T: Discuss what you see happening. How do the simple problems relate to the subtraction from the teens?
S: (Share.)
T: That is a clue to help you with today’s sprint. Take your mark, get set, THINK!

As you close this fluency activity, remind students that the same sprint will be given tomorrow.
Lesson 19

Model and use language to tell about 1 more and 1 less, 10 more and 10 less, and 100 more and 100 less.

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Concept Development (28 minutes)

Concrete (10 minutes)

Materials: (T) Plenty of board space, sentence frames for \textit{1 more than }\underline{\text{__}} \text{ \textit{is} } \underline{\text{__}}, \textit{10 more than }\underline{\text{__}} \text{ \textit{is} } \underline{\text{__}}, \text{ and } \textit{100 more than }\underline{\text{__}} \text{ \textit{is} } \underline{\text{__}} \text{ (with an analogous } \text{ \textit{less than} } \text{ set)}

(S) Place value mats; number disks (hundreds, tens, and ones)

T: Show 110 on your mat.
S: (Students show.)
T: Use ten disks to count by tens up to 150. (Write 150 on the board.)
S: 120, 130, 140, 150.
T: Add another ten disk.
S: (Students add.)
T: 10 more than 150 is?
S: 160!
T: (Write 160 on the board directly below 150.) Good.
T: (Post sentence frame \textit{10 more than }\underline{\text{__}} \text{ \textit{is} } \underline{\text{__}}.) \textit{10 more than }150 \text{ \textit{is} } 160. \text{ Your turn.}
S: 10 more than 150 is 160.
T: Add another ten disk. How many now?
S: 170!
T: (Write 170 on the board under 160.) Use the frame to say a complete sentence.
S: 10 more than 160 is 170.
T: Look at the numbers we’ve counted (point to the list of 150, 160, 170). Turn and tell your partner what’s the same and different about them.
S: They all have 3 digits. \textit{\rightarrow} The hundreds and ones places are the same. \textit{\rightarrow} The tens are changing. Every time we add a ten disk the ten gets bigger. 5, 6, 7.
T: I heard someone say that every time we add a ten disk the number in the tens place grows. Use our list to predict 10 more than 170.
S: 180!
T: Using our sentence frame?
S: 10 more than 170 is 180.
T: Good. Add the ten disk to show 180.
S: (Students show 180.)
T: (Write 180 under 170.) Now, count by ones to show 186. (Start another list on the board to the right of the tens with 186 at the top.)

MP.8
Lesson 19: Model and use language to tell about 1 more and 1 less, 10 more and 10 less, and 100 more and 100 less.

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NOTES ON MULTIPLE MEANS OF ENGAGEMENT:
English language learners may have a challenging time articulating how the 1 more and 10 more lists are the same and different. Encourage them to use their place value disks to help them explain their thinking if needed. Additionally, invite them to refer to the sentence frames posted on the board to support their responses.

S: 181, 182, 183, 184, 185, 186.
T: (Post sentence frame 1 more than ___ is ___.) Add another one disk. How many now?
S: 187.
T: Use our sentence frame to describe what you know. (Point to the 1 more than frame.)
S: 1 more than 186 is 187.
T: (Write 187 on the board under 186.) Add another one disk.
S: 188.
T: Using our sentence frame?
S: 1 more than 187 is 188.
T: (Write 188 on the board under 187.) Look at our new list of numbers. What do you notice?
S: The ones are changing. → They’re counting up by one each time we add a disk.
T: I’ll label this list (150, 160, 170, 180) 10 more since we counted by tens, and this list (186, 187, 188) 1 more because we counted by ones.
T: Talk to your partner about how our 1 more and 10 more lists are the same and different.
S: The hundreds are all the same. → In both lists only 1 number changes. → When we count by tens, the tens place changes, same for the ones. → The numbers in both lists grow by 1 each time. → They look like they’re growing by 1 in the tens list, but they’re really growing by 10!
T: (Label a 100 more list to the left of 10 more.) Let’s count by hundreds. What place will change?
S: The hundreds place!
T: We have 188 now (write 188 at the top of the 100 more list). Add a hundred disk.
S: (Students show.)
T: How many now?
S: 288!
T: So… (prompt students by posting the frame 100 more than ___ is ___.)
S: 100 more than 188 is 288!
T: (Write 288 under 188 on the 100 more list.) Were we right? Which place is changing?
S: The hundreds place!
T: Use the pattern to finish my sentence. 100 more than 288 is?
S: 388!
T: (Write 388 under 288.) Good. Place another hundred disk to check and see.

Continue, but switch so that students practice counting down by hundreds, tens, and ones.

Pictorial (8 minutes)

T: With 1 more and 1 less, which place is changing?
Lesson 19: Model and use language to tell about 1 more and 1 less, 10 more and 10 less, and 100 more and 100 less.

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NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

If students have a hard time identifying which place value is changing, instruct them to circle, underline, or highlight the number(s) that is changing. This enables them to explicitly see the change in the digits in the ones, tens, or hundreds place.

S: The ones!
T: (Draw and write 427.) What number am I showing?
S: 427.
T: (Draw a one disk.) Use our frame to describe what happened. (Point to the 1 more frame.)
S: 1 more than 427 is 428.
T: (Write 428 under 427.) 1 more than 428 is?
S: 429.
T: So 1 less than 429 is?
S: 428.
T: We can say, “1 less than 429 is 428.” Your turn.
S: 1 less than 429 is 428.
T: (Draw a ten-disk.) What place changed?
S: The tens!
T: Now what’s my number?
S: 439.
T: I’ll add another ten (draw a ten disk). What’s my number now?
S: 449.
T: So 10 less than 449 is?
S: 439.
T: We can say, “10 less than 449 is 439.” Your turn.
S: 10 less than 449 is 439.
T: (Draw a hundred disk.) What’s my number?
S: 549.
T: (Write 649 in standard form next to the drawing.) What unit should I put in order to have 649?
S: 1 hundred.
T: We can say, “100 more than 549 is 649.” Your turn.
S: 100 more than 549 is 649.
T: (Write 650 next to 649.) What is the difference between 649 and 650?
S: A ten!
T: Let’s think about that. Join in and count with me. 646, 647, 648, 649, 650.
S: (Students chorally count.)
T: So what is the difference between 649 and 650?
S: 1!
T: Yes. We can say, “1 less than 650 is 649.” Your turn.
S: 1 less than 650 is 649.

Continue, alternating practice between more and less.
Lesson 1

Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students solve these problems using the RDW approach used for Application Problems.

Instruct students to model each problem on the place value chart, complete the chart, and whisper the complete sentence.

Application Problem (10 minutes)

Mr. Palmer’s second grade class is collecting cans for recycling. Adrian collected 362 cans, Jade collected 392 cans, and Isaiah collected 562 cans.

a) How many more cans did Isaiah collect than Adrian?

b) How many less cans did Adrian collect than Jade?

T: Use your RDW process. (Lead students as necessary through the sequence of questions we want them to internalize.)

- What do you see?
- Can you draw something?
- What can you draw?
- What conclusions can you make from your drawing?

T: Talk with your partner about different ways you can solve this problem using what you’ve learned.

S: I put 362 in my head and skip-counted by 100s: 462, 562.

T: So how many more cans did Isaiah collect than Adrian? Give me a complete sentence.

S: Isaiah collected 200 more cans than Adrian.

T: How can you show that your answer is correct?

S: I could draw bundles to show the numbers.
T: Would you please come up and show us, Stella?
S: I would draw a place value chart.
T: Please show us, Jesse.
S: I counted on and wrote 362, 462, 562 and I circled how many groups of 100 I had to jump, and it was 2 groups, so 200.
S: I wrote it in expanded form, and it was easy to see the tens and ones were the same but 500 is 200 more than 300.
T: I so appreciate your many ways of seeing and solving this problem! And we all agree on the same answer, which is?
S: Isaiah collected 200 more cans than Adrian.
T: Yes! Please complete your drawings and add that statement to your paper.

Repeat this process with Part (b) of the question.

**Student Debrief (10 minutes)**

**Lesson Objective:** Model and use language to tell about 1 more and 1 less, 10 more and 10 less, and 100 more and 100 less.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

T: Bring your Problem Set to our Debrief.
T: Take a couple of minutes to check over your answers with a partner.
T: Which section slowed you down? Why?
S: The fill in the blank section on the Problem Set, especially g, h, i, and j. When it said 10 less I knew I really had to look at the tens, and when it said 100 less I really looked at the hundreds because those places would change.
T: Turn and tell your partner Nadia’s strategy for helping herself with the fill in the blank section.
S: Nadia paid attention to the places of numbers. → Nadia used the 10 less and 100 less part of the question as a clue to help her know which numbers to look at and change.
T: Let’s look at Tyron and Heather’s strategies for solving the last problem. (Project student work.)
T: Tyron, tell us about your strategy for solving.
S: I drew 7 lines in a row. Then I counted by hundreds and wrote each number on a line until I filled up all the lines.
T: Thumbs up if you used the same strategy.
S: (Some students show thumbs up.)
T: Now look at Heather’s strategy. Heather, can you tell us about yours?
S: I knew only the hundreds would change because we were counting by hundreds. I noticed counting by hundreds 7 times is the same as 700. I added those to the 200 in 217. I wrote 200 + 700 = 900. Then I put 900 back together with 17 ones and got 917.
T: Good. How are these strategies the same and different?
S: They’re the same because they both got the right answer. → They both only changed hundreds. → In Tyron’s you can see the pattern of growing by 100. → Heather used a basic fact.
T: Pick a strategy that is different from the one you used and try it on your paper now.
S: (Students work.)
T: Good. Head back to your seats to complete your Exit Ticket.

Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students’ understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.
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## Lesson 19 Sprint

### NYS COMMON CORE MATHEMATICS CURRICULUM

#### Lesson 19:

Model and use language to tell about 1 more and 1 less, 10 more and 10 less, and 100 more and 100 less.

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Name ____________________________ Date __________________

1. Model each change on your place value chart. Then fill in the chart. Whisper the complete sentence. “____ more/less than ____ is ____.”

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2. Fill in the blanks. Whisper the complete sentence.
   a. 1 more than 314 is ________.
   b. 10 more than 428 is ________.
   c. 100 less than 635 is ________.
   d. ________ more than 243 is 343.
   e. ________ less than 578 is 568.
   f. ________ less than 199 is 198.
   g. 1 more than ________ is 405.
   h. 10 less than ________ is 372.
   i. 100 less than ________ is 739.
   j. 10 more than ________ is 946
3. Whisper the numbers as you count:
   a. Count by 1s from 367 to 375.
   b. Skip-count by 10s from 422 to 492.
   c. Skip-count by 100s from 156 to 856.
   d. Count by 1s from 269 to 261.
   e. Skip-count by 10s from 581 to 511.
   f. Skip-count by 100s from 914 to 314.

I found letter ____ to be challenging, because _____________________
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________.

My starting number is 217.
I skip-count up by 100s seven times.
What is the last number I count?
Explain your thinking below:
Lesson 19 Exit Ticket

Name ________________________________ Date ________________

Fill in the blanks.

a. 10 more than 239 is ________.
b. 100 less than 524 is ________.
c. ________ more than 352 is 362.
d. ________ more than 467 is 567.
e. 1 more than _________ is 601.
f. 10 less than _________ is 241.
g. 100 less than _________ is 878.
h. 10 more than _________ is 734
1. Fill in the chart. Whisper the complete sentence.

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<tr>
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2. Fill in the blanks. Whisper the complete sentence.

a. 1 more than 103 is __________.

b. 10 more than 378 is __________.

c. 100 less than 545 is __________.

d. ________ more than 123 is 223.

e. ________ less than 987 is 977.

f. ________ less than 422 is 421.

g. 1 more than __________ is 619.

h. 10 less than __________ is 546.

i. 100 less than __________ is 818.

j. 10 more than __________ is 974.
Lesson 20

Objective: Model 1 more and 1 less, 10 more and 10 less, and 100 more and 100 less when changing the hundreds place.

Suggested Lesson Structure

- Fluency Practice (12 minutes)
- Application Problem (8 minutes)
- Concept Development (30 minutes)
- Student Debrief (10 minutes)
- Total Time (60 minutes)

Fluency Practice (12 minutes)

- Sprint: Differences 2.OA.2 (12 minutes)

Sprint: Differences (12 minutes)

Materials: (S) Differences Sprint

T: Today is going to be a repeat of yesterday’s sprint. Let’s do some related facts practice. If I say 6 – 2, you say 16 – 2 = 14.

T: 5 – 4.
S: 15 – 4 = 11.
T: 8 – 4.
S: 18 – 4 = 14.
T: 6 – 3.
T: Turn and test your partner for 30 seconds. (Pause.) Switch. (Pause.)
T: Ok. How many of you studied last night? Are you prepared to succeed?
S: Yes!!!
T: Take your mark, get set, THINK!

Once again, as you close this fluency activity, inform the students that the same sprint will be given tomorrow.
Lesson 20: Model 1 more and 1 less, 10 more and 10 less, and 100 more and 100 less when changing the hundreds place.

Date: 8/7/13

Application Problem (8 minutes)

399 jars of baby food are sitting on the shelf at the market. Some jars fall off and break. 389 jars are still on the shelf. How many jars broke?

T: Use the RDW process. (Lead students as necessary through the sequence of questions we want them to internalize.)

- What do you see?
- Can you draw something?
- What can you draw?
- What conclusions can you make from your drawing?

T: Talk with your partner about different ways you can solve this problem, using what you've learned.

S: I notice the hundreds are the same, the ones are the same, but the tens changed. So, it's 10 less.

T: Can you draw something that will help everyone understand your thinking?

S: I can draw a place value chart and number disks.

T: Please show us.

T: Thank you, Tegan. Can someone state what Tegan said in another way?

S: 389 is 10 less than 399.

T: And another way?

S: 399 is 10 more than 389.

T: Any other thoughts?

S: I counted on from 389 by 10s: 389, 399, and my partner counted back to check: 399, 389.

T: So what is the answer to the question? How many jars broke?

S: 10 jars broke.

T: Please add that statement to your paper.

Concept Development (30 minutes)

Materials: (S) Place value mats, number disks (hundreds, tens, ones)

Concrete (10 minutes)

T: Show 50 on your place value mat.

S: (Students show.)

T: Use number disks to count by ones from 50 to 59.

S: 51, 52, 53, 54, 55, 56, 57, 58, 59.
Lesson 20:
Model 1 more and 1 less, 10 more and 10 less, and 100 more and 100
less when changing the hundreds place.

Date: 8/7/13

T: Using a complete sentence, say the number that is 1
more than 59.
S: 1 more than 59 is 60. 60 is 1 more than 59.
T: Good. Add your disk to check. Can you make a new
unit?
S: (Students add a disk.) Yes, a ten!
T: Trade your ones for a ten.
S: (Students trade to show 6 ten disks.)
T: Use number disks to skip-count by tens from 60 to 90.
S: 70, 80, 90.
T: Using a complete sentence, say the number that is 10
more than 90.
S: 100 is 10 more than 90. 10 more than 90 is 100.
T: Add a disk to check. Can you make a new unit?
S: (Students add a disk.) Yes, a hundred.
T: Make the trade.
S: (Students trade to show one hundred disk on their mats.)
T: Use number disks to skip-count by hundreds from 100 to 600.
S: 200, 300, 400, 500, 600.
T: Using a complete sentence, say the number that is 100 less than 600.
S: 500 is 100 less than 600. 100 less than 600 is 500.
T: Use your number disks to confirm.
S: (Students confirm.)
T: How can you show me ten less than 500 with your disks?
S: Trade 1 hundred for 10 tens.
T: Perfect. (Pause.) Now can you find 10 less?
S: Yes! It’s 490
T: Show me 500 again. (Pause.) Show me 503.  
(Pause.)
T: How can you show me 10 less than 503?
S: The same way. Change 1 hundred for 10 tens.
T: Do you need to change the 3 ones?
S: No! Don’t touch them. (Pause.)
T: What is 10 less than 503?
S: 493.
T: Give me a complete sentence.
S: 10 less than 503 is 493.
T: 10 less than 500 is?
S: 10 less than 500 is 490.
T: 10 less than 503 is?
S: 10 less than 503 is 493.
T: 10 more than 490 is?
S: 10 more than 490 is 500.
T: 10 more than 493 is?
S: 10 more than 493 is 503.

Repeat that process with a few other numbers. A suggested sequence might be: 10 less than 204, 10 less than 305, 10 less than 502, ten less than 307, etc. Be aware that you are setting a wonderful foundation for regrouping in subtraction and addition.

**Pictorial (8 minutes)**

Materials: (S) Place value mat, personal white boards

Begin with the place value mat inside each student’s personal board.

T: Draw 130.
S: (Students draw.)
T: Make it 140.
S: (Students draw.)
T: Make it 150.
S: (Students draw.)
T: Name my count. 1 more, 1 less, 10 more, 10 less, 100 more, or 100 less?
S: 10 more!
S: (Students draw.)
T: Make it 705.
S: (Students draw.)
T: Make it 695.
S: (Students draw.)
T: Name my count.
S: 10 less!

Students will catch on quickly. Complete another round or two and transition into having students play with a partner while you meet with a small group.
Problem Set (12 minutes)

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students solve these problems using the RDW approach used for Application Problems.

Instruct students to model the problems on the place value chart, fill in the blanks, and circle all that apply. They should also whisper the complete sentence.

Student Debrief (10 minutes)

Lesson Objective: Model 1 more and 1 less, 10 more and 10 less, and 100 more and 100 less when changing the hundreds place.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

T: Bring your Problem Set to the carpet. Skip-count down by hundreds as you transition, starting with 904.

S: 904, 804, 704, 604, 504, 404...

T: Take a couple of minutes to check your work with a partner.

S: (Students compare answers.)

T: I’m hearing several of you disagree about how many jumps Jenny has to do to count to 147. Some say 7 and some say 8. Jackie, will you share your thinking?

Jenny loves jumping rope. Each time she jumps she skip-counts by 10s. She starts her first jump at 77, her favorite number. How many times does Jenny have to jump to get to 147?

Explain your thinking below.

77, 87, 97, 107, 117, 127, 137, 147

Jenny has to do 8 jumps. I know because I counted by 10s from 77 to 147 and it was 8 numbers.
S: I did the difference between tens since she was counting by tens. In 77 there are 7 tens, and in 147 there are 14. I know 7 tens + 7 tens is 14 tens. That means 7 jumps.

T: Freddy, I notice you got a different answer. Will you share your thinking?

S: I wrote the number sequence starting at 77 and finishing at 147. Then I counted the numbers to see how many jumps. There were 8.

T: Turn and talk to your partner. Why did Freddy and Jackie get different answers?

S: Jackie did a plus problem, and Freddy counted by tens. Jackie’s right because 7 + 7 is 14, but Freddy’s right too. There are 8 numbers in his sequence. Freddy counted Jenny’s first jump! Jackie didn’t. She counted on from 7: 8, 9, 10, 11, 12, 13, 14. That’s only 7! Are they both right? I think so. They just counted differently. Jackie’s answer is how many more jumps, and Freddy’s answer is how many in all.

T: Many of you noticed that Freddy and Jackie both got the math right, even if they got different answers. Freddy counted how many jumps in all, and Jackie counted how many from 77. Which solution matches the way we count on? 7 or 8?

S: 7! We usually don’t count the number we start with.

T: True. If you got a solution of 8, on your paper add the words “in all” to Jenny’s number of jumps.

Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students’ understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.
Lesson 20 Sprint

### A

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### Lesson 20 Sprint

**Model 1 more and 1 less, 10 more and 10 less, and 100 more and 100 less when changing the hundreds place.**

**Date:** 8/7/13

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Lesson 20: Model 1 more and 1 less, 10 more and 10 less, and 100 more and 100 less when changing the hundreds place.

Date: 8/7/13

Name ___________________________ Date _____________

1. Model each problem with a partner on your place value chart. Then fill in the blanks and circle all that apply. Whisper the complete sentence.

   a. 1 more than 39 is ____________.
      a. We made a _____________.

   b. 10 more than 190 is ____________.
      a. We made a _____________.

   c. 10 more than 390 is ____________.
      a. We made a _____________.

   d. 1 more than 299 is ____________.
      a. We made a _____________.

   e. 10 more than 790 is ____________.
      a. We made a _____________.

2. Fill in the blanks. Whisper the complete sentence.

   a. 1 less than 120 is ____________.
   f. _______ less than 938 is 838.

   b. 10 more than 296 is ____________.
   g. 10 more than _________ is 306.

   c. 100 less than 229 is ________.
   h. 100 less than _________ is 894.

   d. _________ more than 598 is 608.
   i. 10 less than _________ is 895.

   e. _______ more than 839 is 840.
   j. 1 more than _________ is 1,000.
3. Whisper the numbers as you count:
   a. Count by 1s from 106 to 115.
   b. Count by 10s from 467 to 527.
   c. Count by 100s from 342 to 942.
   d. Count by 1s from 325 to 318.
   e. Skip-count by 10s from 888 to 808.
   f. Skip-count by 100s from 805 to 5.

Jenny loves jumping rope.
Each time she jumps she skip-counts by 10s.
She starts her first jump at 77, her favorite number.
How many times does Jenny have to jump to get to 147?

Explain your thinking below.
Lesson 20 Exit Ticket

Name ____________________________ Date _____________

Fill in the blanks and circle all that apply.

1 more than 209 is ____________.

We made a ________________.

a. 1 less than 150 is ________.

b. 10 more than 394 is ________.

c. _______ less than 607 is 597.

d. 10 more than ________ is 716.

e. 100 less than ________ is 894.

f. 1 more than ________ is 900.
Name ________________________________ Date ________________

1. Fill in the blanks. Whisper the complete sentence.
   a. 1 less than 160 is ________.
   b. 10 more than 392 is ________.
   c. 100 less than 425 is ________.
   d. ________ more than 549 is 550.
   e. ________ more than 691 is 601.
   f. 10 more than ________ is 704.
   g. 100 less than ________ is 986.
   h. 10 less than ________ is 815.
2. Count the numbers aloud to a parent.
   a. Count by 1s from 204 to 212.
   b. Skip-count by 10s from 376 to 436.
   c. Skip-count by 10s from 582 to 632.
   d. Skip-count by 100s from 908 to 18.

   Henry enjoys watching his pet frog hop.
   Each time his frog hops Henry skip-counts backwards by 100s.
   Henry starts his first count at 815.
   How many times does his frog have to jump to get to 15?

   Explain your thinking below.
Lesson 21
Objective: Complete a pattern counting up and down.

Suggested Lesson Structure

- Fluency Practice (12 minutes)
- Application Problem (8 minutes)
- Concept Development (30 minutes)
- Student Debrief (10 minutes)

Total Time (60 minutes)

Fluency Practice (12 minutes)

- Sprint: Differences 2.OA.2

Sprint: Differences 2.OA.2 (12 minutes)

Materials: (S) Differences Sprint

Lesson 21’s Sprint is a review of the take from ten facts. This is in preparation for Module 4 in which students will work towards mastery of the sums and differences to 20. Run a few extra copies to give to students to take home; quite a few will want to. For students struggling for fluency with these basic facts, find time if possible in your instructional day to time their improvement, or allow them to time themselves.

Application Problem (8 minutes)

Rahim is reading a really exciting book! He’s on page 98. If he reads 10 pages every day, what page will he be on in 3 days?

T: Use the RDW process. (Lead students as necessary through the sequence of questions we want them to internalize.)
- What do you see?
- Can you draw something?
Lesson 21: Complete a pattern counting up and down.

Date: 8/7/13

Concept Development (30 minutes)

Materials: (S) Place value mats, number disks (hundreds, tens, ones)

Concrete (10 minutes)

Materials: (S) Place value mat and number disks (hundreds, tens, and ones) per pair

- What can you draw?
- What conclusions can you make from your drawing?

T: Talk with your partner about different ways you can solve this problem using what you’ve learned.

T: (Invite students to share their work and explain their thinking. Then encourage their classmates to ask them questions.)

S: I drew bundles to show the number of pages he read, 98, and then I added 3 more bundles of 10 because he reads 10 pages every day.

S: I wrote 98, and then I drew 3 circles to be the 3 days and put 10 in each to show the pages he read every day. Then I skip-counted by 10.

S: I drew a place value chart and number disks to show 98. Then I added a 10-disk for the first day, and then a 10-disk for the second day, and a 10-disk for the third day because he reads 10 pages every day.

T: These are wonderfully clear drawings, and I like the way you explained how each piece relates to the story problem.

T: All three of these drawings help us see the pattern. Can someone explain how the numbers changed?

S: They got bigger by 10.

T: So, how were we counting?

S: We were skip-counting by 10.

T: What page will Rahim be on in 3 days?

S: Rahim will be on page 128.

T: Please add this statement to your paper.

T: Show 266 with number disks.

S: (Students show.)

T: Use number disks to count out loud by ones from 266 to 272.


T: What unit can you make?

S: A ten.

T: Go ahead and trade ones for a ten.

S: (Students trade.)

T: Use number disks to skip-count out loud by hundreds from 272 to 772.
Lesson 21: Complete a pattern counting up and down.

Date: 8/7/13

S: 372, 472, 572, 672, 772.
T: Say the next 2 numbers in our pattern.
S: 872, 972!
T: Good. Use number disks to complete another ten. Count out loud.
S: 773, 774, 775, 776, 777, 778, 779, 780.
T: Say the next 2 numbers in our pattern, counting up by 1s.
S: 781, 782.
T: Good. Trade your ones for a ten.
S: (Students trade.)
T: Use number disks to skip-count out loud by tens from 780 to 700.
S: 770, 760, 750, 740, 730, 720, 710, 700.
T: Say the next 2 numbers in our pattern.
S: 690, 680.
T: Good. Change your mat to show 1 more than 700.
S: (Students show 701.)
T: Use number disks to count down by tens out loud from 701 to 671.
S: 691, 681, 671.
T: (Write ____ ____ 641, 631 on the board.) Say the numbers missing from our pattern.
S: 661 and 651!
T: Yes. Use number disks to count down by hundreds out loud from 671 to 371.
S: 571, 471, 371.
T: (Write ____ ____ 71 on the board.) Say the numbers missing from our pattern.
S: 271 and 171.
T: Nice work. Use number disks to count out loud by ones from 371 to 375.
S: 372, 373, 374, 375.
T: (Write ____ 377, ____ 378, ____ 379, 380 on the board.) Say the pattern, filling in the blanks.

Pictorial (10 minutes)

Materials: (T) Pocket chart (S) 4 large index cards per pair

Students work as partners. Each partnership belongs to group more or group less.

NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

When counting back by 100s, students may stumble when the numbers change from three-digit to two-digit numbers (e.g., 178 to 78). Have students think–pair–share beforehand on a similar problem to prepare them for the change.

NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

Allow students who are challenged by the Problem Set charts to work together in partners or in small groups. Encourage them to verbalize what they notice about the pattern and movement of the numbers before coming to the Debrief. This will give them the confidence to contribute during the discussion.
Lesson 21:

T: With your partner, make a number pattern. You choose if your pattern shows counting by ones, tens, or hundreds.

T: Talk to your partner and decide now. Take 15 seconds.

S: (Partners discuss and decide.)

T: Your pattern must count down if you are in the less group and up if you are in the more group.

T: Turn and confirm with your partner: “We will count down by____,” or “We will count up by ____.”

S: We will count down by tens. We will count up by hundreds. We will count down by ones. Etc.

T: Pick a number between 40 and 600. Partner A, write the number on a card and hold it up.

S: (Students pick a number, write it, and hold up the card.)

T: Start with that number. Use the other cards to write the rest of the numbers in your sequence.

S: (Students work together.)

T: On the blank side of each card, draw the number you wrote. Take two minutes.

S: (Students create their cards.)

T: Stack the cards in order with the drawings face up and bring them to the rug with your partner.

(Students are seated at the rug.)

T: Molly and Ken, share first. Bring your cards to the pocket chart.

T: Say each number, placing one drawing at a time in the pocket. Go slowly so your friends can figure out your pattern.

S: (Molly and Ken count and place, others chime in.)

236… 336… (all) oh! 436, 536!

T: Name Molly and Ken’s pattern.

S: 100 more!

T: Ken and Molly, can you confirm?

S: That’s it!

Continue whole group or have groups share to each other and rotate. Show some patterns with numbers rather than drawings. For others, show alternating numbers and let the class fill in blanks.

Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students solve these problems using the RDW approach used for Application Problems.
Instruct students to whisper the numbers as you count, find the pattern, fill in the blanks, and complete the chart.

**Student Debrief (10 minutes)**

**Lesson Objective:** Complete a pattern counting up and down.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

T: Bring your Problem Set to the carpet. Count up by tens from 456 as you transition.
S: 466, 476, 486, 496, 506, 516, 526….
T: Take a couple of minutes and check over your answers with your partner.
S: (Students check work.)
T: Turn and tell your partner your reaction to the moon section. What did you think?
S: It was hard! → At first I didn’t know you had to go up and down over the white spaces to get the next number. → Yeah, the up and down ones were trickiest. → I had fun. It was like a puzzle. I used clues to fit the pieces of the puzzle together.
T: Tim, say more about what you mean about a pattern being like a puzzle.
S: Well you have to put it together in order. You have to find clues to help you figure it out.
T: What kinds of clues?
S: Like noticing if the counting is going by 1 more, 1 less, or 10 more or less, or 100 more or less. It makes a pattern. Once you know the pattern, it’s a clue that makes things easy. The pattern just repeats and you know the next number fast.
T: Retell Tim’s idea about patterns to your partner.
S: Tim said you have to look for clues about the counting. → He said you try and see if the pattern is going by ones, tens or hundreds. → Tim said once you know the count by, it’s a clue that makes it easy to know what comes next. You just follow the pattern.
T: So to complete number sequences like these, we look for...
S: The pattern!
T: One way that Tim did that was by noticing...
S: What the numbers are counting by!
Exit Ticket  (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students’ understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.
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### Lesson 21 Sprint

**NYS COMMON CORE MATHEMATICS CURRICULUM**

**Lesson 21:** Complete a pattern counting up and down.

**Date:** 8/7/13

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© Bill Davidson
Name ________________________________ Date ________________

1. Whisper the numbers as you count:
   a. Count by 1s from 326 to 334.
   b. Skip-count by 10s from 472 to 532.
   c. Skip-count by 10s from 930 to 860.
   d. Skip-count by 100s from 708 to 108.

2. Find the pattern. Fill in the blanks.
   a. 297, 298, __________, __________, __________, __________
   b. 143, 133, __________, __________, __________, __________
   c. 357, 457, __________, __________, __________, __________
   d. 578, 588, __________, __________, __________, __________

3. Find the pattern. Fill in the blanks.
   a. 132, __________, 134, __________, __________, 137
   b. 409, __________, __________, 709, 809, __________
   c. 210, __________, 190, __________, __________, 160, 150
Lesson 21: Complete a pattern counting up and down.

Date: 8/7/13

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Lesson 21 Exit Ticket

Name ___________________________   Date ________________

Find the pattern. Fill in the blanks.

a. 109, __________, 111, __________, __________, 114

b. 710, __________, 690, __________, __________, 660, 650

c. 342, __________, __________, 642, 742, ___________

d. 902, __________, __________, 872, __________, 852
Lesson 21 Homework

Name ___________________________ Date ________________

1. Find the pattern. Fill in the blanks.
   a. 396, 397, __________, __________, __________, __________
   b. 251, 351, __________, __________, __________, __________
   c. 476, 486, __________, __________, __________, __________
   d. 630, 620, __________, __________, __________, __________

2. Find the pattern. Fill in the blanks.
   a. 208, 209, __________, __________, __________, 213
   b. 316, __________, __________, 616, 716, __________
   c. 547, __________, 527, __________, 507, __________
   d. 672, __________, 692, __________, __________

3. Fill in the chart.

   206
   218
   230
   237
1. Dora has saved $314.
   
a. Write the amount Dora has saved in three different ways by filling in the blanks.

   - number names _____________________________________________________
   - expanded form ___________________________________________________
   - ___ hundreds ___ tens ___ ones

b. Dora’s goal is to save $400. How many tens are in $400? Explain your answer using words, pictures or numbers.
c. Dora reaches her goal of $400 in savings. She decides to set a new goal of $900. How many more $100 bills will she need to reach $900 in savings? Explain your answer using words, pictures, or numbers.

d. Dora made her new goal! She saved both ten dollar bills and hundred dollar bills to go from $400 to $900. Show how Dora could skip-count using tens and hundreds from 400 to 900. Explain your answer using words, pictures, or numbers.
Mid-Module Assessment Task

Standards Addressed

Understand place value.

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 ones).

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

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

Evaluating Student Learning Outcomes

A Progression Toward Mastery is provided to describe steps that illuminate the gradually increasing understandings that students develop on their way to proficiency. In this chart, this progress is presented from left (Step 1) to right (Step 4). The learning goal for each student is to achieve Step 4 mastery. These steps are meant to help teachers and students identify and celebrate what the student CAN do now and what they need to work on next.
## A Progression Toward Mastery

<table>
<thead>
<tr>
<th>Assessment Task Item and Standards Assessed</th>
<th>STEP 1 Little evidence of reasoning without a correct answer. (1 Point)</th>
<th>STEP 2 Evidence of some reasoning without a correct answer. (2 Points)</th>
<th>STEP 3 Evidence of some reasoning with a correct answer or evidence of solid reasoning with an incorrect answer. (3 Points)</th>
<th>STEP 4 Evidence of solid reasoning with a correct answer. (4 Points)</th>
</tr>
</thead>
</table>
| 1(a) 2.NBT.1 2.NBT.3                      | The student is not able to decide on a strategy or is not able to accurately represent hundreds, tens, and ones.          | The student shows evidence of beginning to represent 314, but the solution is incorrect for two of the three answers. | The student understands how to represent 314 correctly for two of the three answers.          | The student correctly represents three ways of writing 314:  
   - Three hundred fourteen  
   - $300 + 10 + 4 = 314$  
   - 3 hundreds 1 ten 4 ones |
| 1(b) 2.NBT.1a                              | The student is not able to decide on a strategy or is not able to count accurately by tens.                              | The student shows evidence of beginning to use a counting strategy but is unable to get the right answer. | The student has the correct answer of 40, but is unable to explain accurately using pictures, numbers, or words to clearly demonstrate reasoning. Or, the student is able to show skip-counting or a bundling strategy but has an incorrect answer. | The student uses an accurate counting strategy, with the correct answer of 40, and gives a clear explanation using pictures, numbers, and/or words. |
| 1(c) 2.NBT.1b                              | The student is not able to decide on a strategy or is not able to count accurately by hundreds.                          | The student shows evidence of beginning to use a counting strategy but has an incorrect answer.       | The student has the correct answer, but is unable to show sound counting or reasoning. Or, the student is able to reason counting by hundreds but with an incorrect answer. | The student counts correctly by hundreds with a correct answer of 5, showing reasoning using pictures, numbers, and/or words. |
| 1(d) | 2.NBT.1 2.NBT.2 | Not able to decide on a strategy or is not able to count accurately by tens and hundreds. | The student shows evidence of beginning to count by tens and/or by hundreds but is unable to use both to reach a correct answer. | The student has a correct answer, but does not clearly demonstrate an answer that uses both tens and hundreds. Or, the student has an incorrect answer but demonstrates clearly. | The student uses tens and hundreds to count correctly from $400 to $900, using skip-counting or bundling in pictures, numbers, and/or words. |
1. Dora has saved $314.
   
a) Write the amount Dora has saved in three different ways by filling in the blanks.

   - number names: three hundred fourteen dollars
   - expanded form: $300 + 10 + 4 = 314$
   - 2 hundreds \( \underline{\text{1 tens}} \) \( \underline{\text{4 ones}} \)

b) Dora’s goal is to save $400. How many tens are in $400? Explain your answer using words, pictures or numbers.

   40 tens are inside 400. You can see in the picture how I counted. Also unit form: 40 tens 0 ones is 400.
c) Dora reaches her goal of $400 in savings. She decides to set a new goal of $900. How many more $100 bills will she need to reach $900 in savings? Explain your answer using words, pictures or numbers.

Dora has →

10-frame

Dora needs 5 more $100 bills.

---

d) Dora made her new goal! She saved both ten-dollar and hundred-dollar bills to go from $400 to $900. Show how Dora could skip-count using tens and hundreds from 400 to 900. Explain your answer using words, pictures or numbers.

$400.
410.
420.
430.
440.
450.
460.
470.
480.
490.
500.

She could get tens and count to 500.
Then she could get hundreds and go to 900.
1. Mrs. Ortiz has 21 students in her second grade class. All of them have 10 toes and 10 fingers.
   a. Write the total number of toes of the students using hundreds, tens, and ones. Explain using words, pictures, or numbers.
   b. One day, three students are absent. How many students are in Mrs. Ortiz’s class that day? Skip-count to show the number of their toes. Explain using words, pictures, or numbers.
c. Use <, >, or = to:
   - Compare the total number of students’ fingers with the total number of students’ toes in the classroom on a day when all the students are present.
   - ___________ ___________
   - Compare the number of toes when 3 students are absent with how many there are when all the students are in class. Explain using words, pictures, or numbers.
   - ___________ ___________

d. 10 parents are visiting the classroom.
   - How many toes do the students and parents have in all? Explain using words, pictures, or numbers.
   - How many toes and fingers do the students and parents have in all? Explain using numbers.
End-of-Module Assessment Task Standards Addressed

Understand place value.

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 100-900 refer to one, two, three, four, five, six, seven, eight or nine hundreds (and 0 tens and ones).

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

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

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.

Evaluating Student Learning Outcomes

A Progression Toward Mastery is provided to describe steps that illuminate the gradually increasing understandings that students develop on their way to proficiency. In this chart, this progress is presented from left (Step 1) to right (Step 4). The learning goal for each student is to achieve Step 4 mastery. These steps are meant to help teachers and students identify and celebrate what the student CAN do now and what they need to work on next.
### A Progression Toward Mastery

<table>
<thead>
<tr>
<th>Assessment Task Item</th>
<th>STEP 1 Little evidence of reasoning without a correct answer.</th>
<th>STEP 2 Evidence of some reasoning without a correct answer.</th>
<th>STEP 3 Evidence of some reasoning with a correct answer or evidence of solid reasoning with an incorrect answer.</th>
<th>STEP 4 Evidence of solid reasoning with a correct answer.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1(a) 2.NBT.1b</td>
<td>The student is not able to decide on a strategy or is not able to count accurately by tens.</td>
<td>The student writes the correct equation. The student knows to use a counting strategy but is not able to determine the value of 21 tens; able to count accurately past 150 by tens.</td>
<td>The student uses an accurate counting strategy to get the correct answer of 210 using the hundreds, tens, and ones.</td>
<td>The student explains that 21 tens is equal in value to 210 using hundreds, tens, and ones. The student explains the answer using words, pictures or numbers, words or pictures.</td>
</tr>
</tbody>
</table>
| 1(b) 2.NBT.2         | The student is not able to decide on a strategy or is not able to count accurately by tens. | The student knows to use a counting strategy but is unable to get the right answer. | The student uses an accurate counting strategy to get the correct answer of 180. The student, however, is perhaps unable to see that skip-counting down is a faster way to achieve the answer. | The student:
  - Gives correct answer of 18 (or revised if total # students in class is reduced).
  - Skip counts correctly to 180.
  - Explains the answer using numbers, words or pictures. |
| 1(c) 2.NBT.4         | The student is not able to see the connection between the number of fingers and toes. The student is not able to use the correct comparison symbol in the equation. | The student may know to use the same counting strategy as the toes in Problem 2 but makes a mistake for whatever reason at some point in either of the comparisons. | The student uses an accurate counting strategy to get to 210 for the fingers. The student finds the toes and fingers to be equal. The student writes the correct equation. | The student:
  - Gives the correct answers of 210 = 210.
  - Gives the correct answer of 180 < 210.
  - Explains the answer using numbers, words or pictures. |
<table>
<thead>
<tr>
<th>1(d)</th>
<th>2.NBT.1ab</th>
<th>2.NBT.2</th>
<th>2.NBT.3</th>
</tr>
</thead>
</table>
| The student is not able to decide on a strategy or is not able to count accurately by tens. | The student knows to skip-count by tens to 100, but is not able to determine the value of 31 tens. The student knows to use a counting strategy but is not able to determine the value of 62 tens. | The student uses an accurate counting strategy to get the correct answer of 310. The student uses and shows an accurate counting strategy to get the correct answer of 620. | The student:  
- Gives the correct answer of 310.  
- Gives the correct answer of 620.  
- Explains using numbers, words or pictures. |
1. Mrs. Ortiz has 21 students in her second grade class. All of them have 10 toes and 10 fingers.

   a) Write the total number of toes of the students using hundreds, tens and ones. Explain using words, pictures or numbers.

   \[10 + 10 + 10 + 10 + 10 + 10 + 10 + 10 = 100 \text{ toes}\]

   10 students

   \[21 \text{ students} = 10 + 10 + 1\]

   \[100 \text{ toes} + 100 \text{ toes} + 10 \text{ toes} = 210 \text{ toes}\]

   b) One day, three students are absent. How many students are in Mrs. Ortiz's class that day? Skip-count to show the number of their toes. Explain using words, pictures or numbers.

   \[21 - 3 = 18 \text{ students}\]

   \[180 \text{ toes}\]

   10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110,

   120, 130, 140, 150, 160, 170, 180
c) Use <, >, or = to:
   - Compare the total number of students’ fingers with the total number of students’ toes in the classroom on a day when all the students are present.

\[
210 \text{ toes} > 210 \text{ fingers}
\]

\[
210 = 210 \quad \text{the same!}
\]

- Compare the number of toes when 3 students are absent with how many there are when all the students are in class. Explain using words, pictures or numbers.

\[
210 \text{ toes} = 21 \text{ kids} \\
\frac{100}{10} + \frac{10}{1} + \frac{1}{1}
\]

\[
180 \text{ toes} = 18 \text{ kids} \\
\frac{100}{10} + \frac{10}{10} + \frac{10}{1} + \frac{10}{10} + \frac{10}{10}
\]

d) 10 parents are visiting the classroom.
   - How many toes do the students and parents have in all? Explain using words, pictures or numbers.

\[
\text{Students} = 210 \text{ toes}.
\]

\[
\text{Parents} = 10 \frac{1}{10} + 10 \frac{1}{10} + 10 \frac{1}{10} + 10 \frac{1}{10} + 10 \frac{1}{10} + 10 \frac{1}{10} + 10 \frac{1}{10} + 10 \frac{1}{10} + 10 \frac{1}{10} + 10 \frac{1}{10}
\]

\[
210 \text{ toes} + 100 \text{ toes} = 310 \text{ toes}
\]

- How many toes and fingers do the students and parents have in all? Explain using numbers.

\[
210 + 10 = 31 \text{ people}.
\]

1 person = 20 fingers and toes.
10 people have 200.

\[
200 + 200 + 20 = \text{students} < 420
\]

\[
200 = \text{parents}
\]

\[
460, 500, 620 + 20
\]

\[
420 + 200 = 620 \text{ toes and fingers in all.}
\]