

► Grade 2 Topic 9: Numbers to 1,000

Big Conceptual Idea: [K-5 Progression on Number and Operations in Base Ten](#) (pp. 8-11)

Prior to instruction, view the *Topic 9 Professional Development Video* located in *Pearson Realize* online. Read the *Teacher's Edition (TE): Cluster Overview/Math Background* (pp. 503A-503E), the *Topic Planner* (pp.503I-503L), the *Topic Performance Assessments* (pp. 581-582A) all 10 lessons.

<p>Mathematical Background: Cluster Overview (TE, pp. 503A-503E)</p>	<p>Topic Essential Question: How can you count, read, and show numbers to 1,000?</p> <p><i>Reference Answering the Topic Essential Question (TE, pp. 577-578) for key elements of answers to the Essential Question.</i></p>
---	---

The lesson map for this topic is as follows:

9-1	9-2	9-3	9-4	9-5	9-6	9-7	9-8	9-9	9-10	Assessment
-----	-----	-----	-----	-----	-----	-----	-----	-----	------	------------

2 A/D/E days used strategically throughout the topic.

Instructional note:

The big idea of topic 9 focuses on place value understanding through the structure of the base-10 numeration system. Focus instruction on Nevada Academic Content Standards (NVACS, 2010) cluster 2.NBT.A.

2.NBT.A Understand place value.

1. Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:
 - a. 100 can be thought of as a bundle of ten tens – called a “hundred”.
 - b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).
2. Count within 1,000; skip-count by 5s, 10s, and 100s.
3. Read and write numbers to 1,000 using base-ten numerals, number names, and expanded form.
4. Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using $>$, $=$, and $<$ symbols to record the results of comparisons.

The structure of the base-10 numeration system uses digits 0-9, groups of 10, and place value- the value of a digit is determined by its place. Although this topic focuses on place value, place-value instruction does not need to occur in isolation (Van de Walle, Karp, Lovin, & Bay-Williams, 2014, p. 176). Students have been building their place value understanding through their work with addition and subtraction strategies that require the composition (put together) and decomposition (take apart) of numbers, while simultaneously developing computational understanding.

In kindergarten and first grade, students work with patterns in numbers to 100, and begin to understand a group of ten objects as a unit. That is, they understand ten as both 10 ones and 1 ten. In second grade, students extend these place value understandings to three-digit numbers, understanding one hundred as a bundle of 10 tens and as a “hundred”. This lays the foundation for students to understand the repeated structure of our number system. Each unit represents the bundling of ten units to the right.

The use of concrete manipulatives, drawings and layered place-value cards, such as [Arrow Cards](#) (found under “Instructional Tools” on the WCSD Curriculum & Instruction website) help students to connect written numbers to their meanings in terms of hundreds, tens and ones, as well as sums of these base-10 units (CCSWT, 2015, p.8). It is important that students construct this understanding and impose their own understanding on the model. On the contrary, telling students that a pre-grouped model, such as a hundreds flat, is worth one hundred is ineffective. When considering language, help students connect standard language, “one hundred thirty-five”, to base-ten language, “1 hundred, 3 tens, 5 ones; 1 group of a hundred, 3 groups of ten, 5 ones, etc”. It is recommended that for EL learners, you choose a single variation of base-ten language to use consistently. This will aid students in connecting the base-ten language to standard language (Van de Walle, et al., 2014, p. 178).

Topic 9
Numbers to 1,000

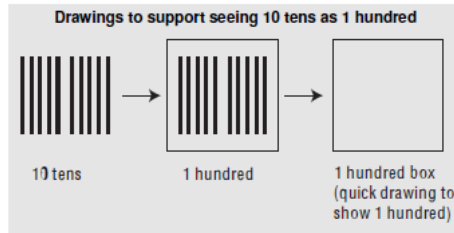
Number of lessons: **10**

A/D/E: 2 days

NVACS Focus:
NBT.A

Total Days: ~12

[2nd Grade Curriculum Pacing Framework:](#)
[Balanced Calendar](#)



Common Core Standards Writing Team. (2015, March 6). *Progressions for the Common Core State Standards in Mathematics (draft). Grades K-5, Number and Operations in Base Ten*. Tucson, AZ: Institute for Mathematics and Education, University of Arizona.

In this Topic, students will continue to develop their mental math skills through skip-counting by 5s, 10s, and 100s (2.NBT.A.2). They will also use place value understanding to compare numbers. Students will reason about the value of a digit based on its place in the number. For example, students will reason that 100, the smallest 3-digit number, is larger than any other 2-digit number. As a result, students will learn to compare the digit in the largest place value position first. Students benefit from both examples and counterexamples. By including counterexamples in class discussions, students are afforded the opportunity to explore their misconceptions and deepen their understanding of place-value (Van de Walle, et al., 2014, p.189). One misconception that often arises is that of zero as a placeholder. Engaging students in an examination of numbers such as 405, 45, and 450 can help students understand the importance of zero in our number system (Van de Walle, et al., 2014, p.189).

Math Practice 7: Look for and make use of structure

Focus on opportunities for students to develop MP.7 behaviors. This is the focus of the *Math Practices and Problem Solving* lesson 9-10. Reference the Teacher’s Edition (pp. F29-F29A) and the *Nevada Academic Content Standards for Mathematical Practice*.

Note: The purpose of the curriculum guides is for additional considerations. Therefore, not all components may have additional notes included in this guide.

Essential Academic Vocabulary			
Use these words consistently during instruction.			
New Academic Vocabulary: (First time explicitly taught)		Review Academic Vocabulary: (Vocabulary explicitly taught in prior grades or topics)	
thousand	equals, =	<i>compare</i>	<i>pattern</i>
place-value chart	decrease	<i>digit</i>	regroup* (T4)
standard form	increase	<i>greater than, ></i>	* Do NOT use <i>borrow</i> or <i>carry</i> as these are misleading, however <i>trade</i> and <i>exchange</i> may be used (Van de Walle, 2014, p. 218).
expanded form		<i>hundred</i>	
word form		<i>less than, <</i>	

Additional terminology that students may need support with: bundled, exchange, trade

***Collaborative Team Conversations (CTC)**



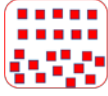
Consider using **one** of the following as part of the formative assessment process at the lesson level to **collect student work** to analyze for **evidence of mathematical understanding**:

Guiding question: “Are students developing conceptual understanding and make connections to the Base-10 system to recognize that digits in each place value represent amounts of hundreds, tens, or ones?”

Lesson	Evidence	Look for
9-5	<i>Solve & Share</i> (student work samples)	Focus CTC around the big idea: <ul style="list-style-type: none"> student strategies and models understanding there are multiple ways to group 1s, 10s, & 100s to show the same number use of models/representations to show numbers
9-10	<i>Quick Check</i> (digital platform) Items 1, 2, 4, and 5	Focus CTC around data analysis and collection of student workspace (scratch paper). Printable version available under “Teacher Resources”.

Learning Cycle Assessments (summative)	Topic Assessments SE pp. 577-582	Use <i>Scoring Guide</i> TE pp. 577—582
--	--	---

Standards listed in **bold** indicate a focus of the lesson.


NVACS (Content and Practices)	Mathematical Development of the Big Idea	Instructional Clarifications & Considerations																						
Lesson 9-1: Understand Hundreds																								
<p> 2.NBT.A.1a 2.NBT.A.1b </p> <p> MP.2 MP.4 MP.5 MP.7 </p>	<p> Access Prior Learning: In first grade, (1.NBT.B.2) students understood that 2-digit numbers represent an amount of tens and ones. They also constructed the understanding of ten as 10 ones and 1 ten. </p> <p> Developing the Big Idea: In this lesson, students are <i>developing</i> understanding of the base-10 number system and the relationships that exist between ones, tens and hundreds to 1,000. Students count by hundreds to 1,000. </p>	<p> A note of CAUTION: When referring to regrouping, do NOT use the terms <i>borrow</i> or <i>carry</i> as they are misleading. Instead, <i>trade</i>, <i>regroup</i> and <i>exchange</i> may be used (Van de Walle et al., 2014, p. 218). </p> <p> Topic Opener: Consider limiting the <i>Topic Opener</i> to discussion of the <i>Topic Essential Question</i> (TE, p. 503), <i>Review What You Know</i> (TE, p. 504), and <i>Topic 9 Vocabulary Words Activity</i> (TE, pp. 505-506) only. Introduce remaining vocabulary words as they appear in instruction. Post the essential question and student strategies on your math focus wall. </p> <p> Solve & Share: Ensure that <i>all</i> students use concrete place-value blocks to support and connect to their drawings. Child-watch for students who demonstrate place value understanding through the use of tens. Also child-watch for students who organize their drawings to make them easy to count. Strategically conference with a student to plant the idea that place-value blocks can be drawn efficiently (a dot for ones, a line for tens, and a square for hundreds). Have this student share, and engage students in a discussion around why that student's drawings are more efficient. Establish a class norm for representing place-value blocks with these symbols. </p> <p> Visual Learning: Ensure that <i>all</i> students use concrete place-value blocks to support conceptual understanding of the bundling of ten units to make one of the next larger unit (10 tens makes 1 hundred, 10 hundreds make 1 thousand). When planning, refer to <i>the Prevent Misconceptions and Error Intervention notes</i> (TE, p.512) to help you anticipate possible misconceptions and plan intentional teacher responses. </p> <p> Independent Practice/Math Practices and Problem Solving: As an extension opportunity and formative assessment for item 6, ask students, "How can you represent 300 without using hundreds flats?" Child-watch for students who are able to show equivalent representations (See Group C below) such as 30 tens, 300 ones, or a combination of tens and ones such as 25 tens and 50 ones. Equivalent representations show the number using fewer than the maximum number of tens, or hundreds. </p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Group A Unitary or count-by-ones approach "I counted them (by ones)."</p> </div> <div style="text-align: center;">  <p>Group B Base-ten or groups-of-tens approach "Two tens and three more."</p> </div> <div style="text-align: center;">  <p>Group C Equivalent or Nonstandard base-ten approach "One ten and thirteen more ones."</p> </div> </div> <p> Van de Walle, J., Karp, K., Lovin, L., & Bay-Williams, J. (2014). <i>Teaching student-centered mathematics: Developmentally appropriate instruction for grades Pre-K-2</i> (Vol. 1). Harlow: Pearson Education International. </p> <p> As previously indicated, students do NOT need to do all of the problems in their Student Edition. However, ALL students NEED to have opportunities to solve problems at varying DOK levels. The <i>Independent Practice</i> page offers problems that support procedural skill and fluency. The <i>Math Practices and Problem Solving</i> page offers problems that support application. The <i>Quick Check</i> items (marked with a pink check) offer both opportunities. Have students complete these items first and continue on to other items as appropriate. </p>																						
Lesson 9-2: Models And 3-Digit Numbers																								
<p> 2.NBT.A.1 2.NBT.A.3 </p> <p> MP.1 MP.2 MP.4 MP.5 </p>	<p> Access Prior Learning: In the prior lesson, second grade students worked with the base-10 number system and the relationships that exist between ones, tens and hundreds to 1,000. </p> <p> Developing the Big Idea: In this lesson, students are <i>developing</i> understanding that place-value blocks and drawings </p>	<p> Place value mats are helpful tools for organizing place-value blocks. Consider adding 2 ten frames to the ones section of the mat. This will reduce students' need to recount the number of ones. It will also support students in identifying when 10 ones need to be bundled into 1 ten. </p> <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;"> <table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 50%;">TENS</td> <td style="width: 50%;">ONES</td> </tr> <tr> <td style="height: 40px;"></td> <td style="text-align: right;"> <table border="1" style="width: 100%; height: 20px;"> <tr><td style="width: 25px;"> </td><td style="width: 25px;"> </td><td style="width: 25px;"> </td><td style="width: 25px;"> </td></tr> <tr><td style="width: 25px;"> </td><td style="width: 25px;"> </td><td style="width: 25px;"> </td><td style="width: 25px;"> </td></tr> </table> </td> </tr> <tr> <td style="height: 40px;"></td> <td style="text-align: right;"> <table border="1" style="width: 100%; height: 20px;"> <tr><td style="width: 25px;"> </td><td style="width: 25px;"> </td><td style="width: 25px;"> </td><td style="width: 25px;"> </td></tr> <tr><td style="width: 25px;"> </td><td style="width: 25px;"> </td><td style="width: 25px;"> </td><td style="width: 25px;"> </td></tr> </table> </td> </tr> </table> </div> <div> <p> This sample serves to illustrate the use of ten frames on a place value mat. Although you will want to use a mat that also includes hundreds. A blackline master is included at the end of this document. </p> </div> </div> <p style="text-align: center; color: red;"> -continues on next page- </p>	TENS	ONES		<table border="1" style="width: 100%; height: 20px;"> <tr><td style="width: 25px;"> </td><td style="width: 25px;"> </td><td style="width: 25px;"> </td><td style="width: 25px;"> </td></tr> <tr><td style="width: 25px;"> </td><td style="width: 25px;"> </td><td style="width: 25px;"> </td><td style="width: 25px;"> </td></tr> </table>										<table border="1" style="width: 100%; height: 20px;"> <tr><td style="width: 25px;"> </td><td style="width: 25px;"> </td><td style="width: 25px;"> </td><td style="width: 25px;"> </td></tr> <tr><td style="width: 25px;"> </td><td style="width: 25px;"> </td><td style="width: 25px;"> </td><td style="width: 25px;"> </td></tr> </table>								
TENS	ONES																							
	<table border="1" style="width: 100%; height: 20px;"> <tr><td style="width: 25px;"> </td><td style="width: 25px;"> </td><td style="width: 25px;"> </td><td style="width: 25px;"> </td></tr> <tr><td style="width: 25px;"> </td><td style="width: 25px;"> </td><td style="width: 25px;"> </td><td style="width: 25px;"> </td></tr> </table>																							
	<table border="1" style="width: 100%; height: 20px;"> <tr><td style="width: 25px;"> </td><td style="width: 25px;"> </td><td style="width: 25px;"> </td><td style="width: 25px;"> </td></tr> <tr><td style="width: 25px;"> </td><td style="width: 25px;"> </td><td style="width: 25px;"> </td><td style="width: 25px;"> </td></tr> </table>																							


	<p>can be used to model and write 3-digit numbers. Students compose and decompose numbers into ones, tens and hundreds.</p>	<p>Visual Learning: <i>Before</i> showing the animation, have students solve the problem presented in the animation (2 hundreds flats, 5 tens rods, and 9 ones cubes) using concrete place-value blocks and place-value mats to increase conceptual understanding and engagement. Students can rote memorize the ones-, tens- and hundreds-digits. As John Van de Walle, et al., caution, “Be aware of how easy it is for a child to show a number on a mat using base-ten blocks and learn to write the number without any understanding of what the number represents.” (2014, p.190) To truly assess place-value understanding, focus questioning on having students <i>show</i> what the digit represents. Given the number 259, some students may be able to identify 5 as the digit in the tens place. However, these same students may not be able to show the value of this same digit. Students who still operate on ones may show the value of this digit as 5 ones, rather than 5 tens or 50 ones. For this reason, just identifying the tens-digit is less effective than connecting that digit to the value it represents.</p> <p>Assess and Differentiate: In the <i>Intervention Activity</i>, “Modeling Numbers” (TE, p.521A), ask them to identify the value of the units they counted. The use of Arrow Cards (found under “Instructional Tools” on the WCSD Curriculum & Instruction website) will support students in understanding the value of the three digits in 3-digit numbers as hundreds, tens and ones.</p>
--	---	--

Lesson 9-3: Name Place Values

<p>2.NBT.A.1 2.NBT.A.3</p> <p>MP.3 MP.4 MP.5 MP.8</p>	<p>Access Prior Learning: In lesson 9-1 and 9-2, second grade students counted by hundreds and modeled, read and wrote 3-digit numbers.</p> <p>Developing the Big Idea: In this lesson, students are <i>developing</i> understanding that the value of a digit depends on its place in the number. They continue to develop understanding of groups of 10 in our number system; that ten of one unit makes one of the next larger unit.</p>	<p>Solve & Share: Continue to encourage students to use concrete place-value blocks. This problem encourages students to engage in MP.3 Critique Reasoning. A review of MP.3 behaviors developed in Topics 1 and 5 may be helpful.</p> <p>Visual Learning: <i>Before</i> showing the <i>Visual Learning</i>, have students solve the problem presented in the animation using concrete place-value blocks and place-value mats to increase conceptual understanding and engagement.</p> <p>Independent Practice/Math Practices and Problem Solving: As an extension opportunity and formative assessment for item 4, ask students to complete <i>Graphic Organizer 4: Some Ways to Show a Number</i> (Teaching Tool 61, also used for the <i>Topic 9 Vocabulary Words Activity</i>, TE, pp.505-506) for the number, 354. Students can either show multiple representations for the digit in the hundreds place, or multiple representations for the full value of the number.</p> <p>Assess & Differentiate: As with lesson 9-2, students may benefit from continued use of Arrow Cards (found under “Instructional Tools” on the WCSD Curriculum & Instruction website).</p>
---	---	---

Lesson 9-4: Read And Write 3-Digit Numbers

<p>2.NBT.A.3 2.NBT.A.1</p> <p>MP.2 MP.4 MP.6 MP.7</p>	<p>Access Prior Learning: In first grade (1.NBT.A.1), students read and wrote numbers to 120 in numeral form. First grade students also may have had exposure to expanded form in the context of days of school.</p> <p>Developing the Big Idea: In this lesson, students are <i>developing</i> understanding of three ways to write numbers: standard form, expanded form and word form.</p>	<p>As stated by Van de Walle, et al., “...the ways we say and write numbers are conventions, not concepts. Children must learn these by being told...” (2014, p.187). However, students must understand the value of digits in a number to represent numbers in expanded form.</p> <p>Solve & Share: Use the <i>Solve & Share</i> to formatively assess student understanding of the value of the digits in 231 as well as conventions for naming numbers. Consider pulling up Jamal's Work (<i>Analyze Student Work</i>, TE p. 529 and available online under the <i>Solve & Share</i> as “Teacher Resources”) to engage students in a discussion that focuses on evaluating his work. This will support students’ use of MP.3 Critique the Reasoning of Others.</p> <div data-bbox="646 1619 1474 1738" style="border: 1px solid #ccc; padding: 5px;"> <p>Develop: Problem-Based Learning</p> <div style="display: flex; align-items: center;">  <div> <p>Math Practices & Problem Solving: Construct Arguments: Solve & Share</p> <p>Assign Info Teacher resources</p> </div> </div> </div> <p>Visual Learning: After the animation, have students create a shared resource for expanded form, standard form and word form to post on the math focus wall.</p>
---	---	---

Lesson 9-5: Different Ways To Name The Same Number		
<p>2.NBT.A.3 2.NBT.A.1a</p> <p>MP.2 MP.3 MP.4 MP.5 MP.6</p>	<p>Access Prior Learning: In first grade, (1.NBT.B.2) students understood that 2-digit numbers represent an amount of tens and ones. They also constructed the understanding of ten as 10 ones and 1 ten.</p> <p>In this topic, second grade students have developed understanding that 100 is equivalent to 10 tens or 100 ones.</p> <p>Developing the Big Idea: In this lesson, students are <i>developing</i> understanding of equivalent names for numbers.</p>	<p>This lesson lays the foundation for regrouping in addition and subtraction of multi-digit numbers. Avoid using the terms <i>carrying</i> or <i>borrowing</i> as they are misleading. Instead, students understand the term <i>trading</i>, as a lead into <i>regrouping</i> (Van de Walle, et al., 2014, p.218).</p> <p>Solve & Share: Continue to encourage use of place-value blocks and place-value mats. These mats are also used in the <i>Visual Learning</i> animation.</p> <p>Visual Learning: During the animation, have students build the representations of 123 using concrete blocks and place-value mats. Ask them to prove that the amount did not change during regrouping to further deepen their understanding of equivalence.</p> <p>Independent Practice/Math Practices and Problem Solving: For item 2, if students have difficulty showing 418 in two other ways using expanded notation, encourage them to build or draw the representation on a place value chart and connect it to the expanded notation.</p> <p>*CTC: <i>Solve & Share</i> (student work samples)</p>
Lesson 9-6: Place-Value Patterns With Numbers		
<p>2.NBT.A.2 2.NBT.B.8</p> <p>MP.3 MP.5 MP.7 MP.8</p>	<p>Access Prior Learning: In lessons 3-1 and 5-1, second grade students used hundred charts to add and subtract. In lesson 9-1, students skip-counted by 100s.</p> <p>Developing the Big Idea: In this lesson, students are <i>developing</i> understanding of 1 or 10 more and 1 or 10 less through the use of place value patterns.</p>	<p>The focus of this lesson is on place value patterns when counting by 1s, 10s and 100s.</p> <p>Solve & Share: During problem solving, encourage students to connect to prior learning around place value patterns and the hundred chart. Ask them to write about a pattern that helped them find the missing numbers. Focus the discussion of student strategies and the patterns they noticed in regards to which digits change when counting by 1s versus when counting by 10s. Consider displaying Gavin's Work (<i>Analyze Student Work</i>, TE, p.541 and available online under the <i>Solve & Share</i> as "Teacher Resources") to engage students in a conversation around patterns and misconceptions when working with numbers beyond 100.</p> <div data-bbox="646 1031 1474 1150" style="border: 1px solid #ccc; padding: 5px;"> <p>Develop: Problem-Based Learning</p> <div style="display: flex; align-items: center;">  <div> <p>Math Practices & Problem Solving: Construct Arguments: Solve & Share</p> <p>Assign Info Teacher resources</p> </div> </div> </div> <p>Independent Practice/Math Practices and Problem Solving: For items 4 and 14, ask students to provide a written explanation of the pattern(s) they used to find the missing numbers. This can be done on a sticky note to provide ample space to write.</p>
Lesson 9-7: Skip Count By 5s, 10s, And 100s To 1,000		
<p>2.NBT.A.2</p> <p>MP.2 MP.4 MP.7 MP.8</p>	<p>Access Prior Learning: In Topics 3 and 5, second grade students used open number lines to add and subtract.</p> <p>In Topics 2 and 8, second grade students used skip counting.</p> <p>In lesson 9-6, second grade students skip counted by 10s and counted by ones from 2-digit and 3-digit numbers.</p> <p>Securing the Big Idea: In this lesson, students are <i>securing</i> understanding of skip counting using patterns and number lines. Students will skip count by 5s, 10s and 100s from 2-digit and 3-digit numbers.</p>	<p>Skip counting and analyzing the resulting patterns supports students with invented strategies for multiplication in third grade. By identifying these patterns, students make sense of the relationships and properties of numbers (Van de Walle, et al., 2014, P.248). Skip counting also develops students' mental math skills and number sense.</p> <p>Solve and Share: During problem solving, some students may connect this problem to their work with nickels and telling time to the nearest 5-minutes in Topic 8. If students do not identify a connection, consider asking a question such as, "What connections can you make to our learning around time and money?" Facilitating these connections helps students develop relational understanding and the concept of mathematics as a series of interwoven ideas. Some students may find the use of manipulatives such as nickels, a clock or other concrete objects helpful.</p> <p>Visual Learning: Consider extending students by asking, "Using the patterns that you see, what three numbers came before the first number on the open number line? Using the patterns that you see, what three numbers come after the last number on the open number line?" Students can record their thinking on whiteboards.</p> <p>Assess and Differentiate: In the <i>Intervention Activity</i> "Counting by s, 10s, and 100s!" (TE, p.551A), encourage students to identify and discuss patterns in their skip counts. Also, include opportunities for students to skip count across decades and centuries (e.g., 380, 390, 400, 410...) as these situations are often more challenging for students.</p>

Lesson 9-8: Compare Numbers Using Place Value		
<p>2.NBT.A.4</p> <p>MP.1 MP.2 MP.3 MP.5 MP.8</p>	<p>Access Prior Learning: In first grade (1.NBT.B.3), students compared two 2-digit numbers using place value and the symbols $>$, $=$, $<$.</p> <p>In this topic, second grade students have worked with 3-digit numbers.</p> <p>Developing the Big Idea: In this lesson, students are <i>developing</i> understanding that place value can be used to compare numbers using the greater than ($>$), equals ($=$), and less than ($<$) symbols.</p>	<p>Students have more experiences with “more” than they do with “less”. For this reason, students may find identifying “less than” more challenging. Make a conscious effort to ask, “Which is less?” questions as often as, or more frequently, than you ask, “Which is more?” questions. Also, when students identify which is greater, follow up by asking them, which is less. The physical construction of quantities also helps students develop understanding of <i>greater than</i> and <i>less than</i> relationships (Van de Walle, et al., 2014, p.105).</p> <p>Symbols and language in mathematics are considered conventions. It is recommended that students construct understanding of concepts <i>before</i> introducing the symbols and terminology (Van de Walle, et al., 2014, p.21). In regards to the greater than ($>$) and less than ($<$) symbols, they are conventions that should be explicitly taught <i>after</i> students develop the concept of greater than and less than. Rather than using the alligator drawings, which are a gimmick that can derail the focus away from mathematics to animals, help students remember these symbols by drawing one dot and two dots, and then connect them with lines. This representation reinforces the meaning of the symbols, while helping students remember that the side with two dots is next to the number with a greater value than the side with one dot.</p> <p>Solve & Share: When sharing and discussing student strategies, encourage students to identify the value of digits in each number, 501 and 510. As suggested, place value blocks offer an effective visual representation to support student understanding of the value of each digit. This problem offers an opportunity for students to discuss the use of zero as a placeholder in our number system.</p> <p>Visual Learning: Have students build or draw the quantities in the animation on place value mats to support understanding of why comparing digits from greatest to least place value works.</p> <p>Independent Practice/Math Practices and Problem Solving: As an extension to item 16, and building on the recommended Topic 9 Game, consider having students create their own base-ten riddles. These riddles can be placed in a center for other students to solve, or used as a formative assessment.</p> <p>Assess and Differentiate: In the <i>Intervention Activity</i>, “Comparison Cards” (TE, p.557A), consider using Arrow Cards (found under “Instructional Tools” on the WCSD Curriculum & Instruction website) to support student understanding of the value of each digit.</p>
Lesson 9-9: Compare Numbers On The Number Line		
<p>2.NBT.A.4</p> <p>MP.2 MP.3 MP.4 MP.7 MP.8</p>	<p>Access Prior Learning: In first grade (1.NBT.B.3), students compared two 2-digit numbers using place value and the symbols $>$, $=$, $<$. First grade students also used open number lines.</p> <p>In the prior lesson, second grade students used place value to compare numbers using the greater than ($>$), equals ($=$), and less than ($<$) symbols. Throughout second grade, students have used open number lines.</p> <p>Developing the Big Idea: In this lesson, students are <i>developing</i> understanding of <i>greater than</i> and <i>less than</i> relationships with 3-digit numbers using number lines. Students are also developing understanding that number lines go on forever in both directions, so there is always a number greater than and less than a given number.</p>	<p>Solve and Share: Child-watch for students who use their understanding of place value patterns to identify a number greater than 256 and a number less than 256. These students are able to reason about the value of each digit, connecting to lesson 9-8, when selecting numbers for their response. Some students will benefit from building or drawing 256, and physically, adding to or removing from, to find a number that is greater than and less than. Encourage these students to reflect on the digits of the numbers they build to facilitate movement toward more efficient strategies based on place value understanding. Consider sequencing the share to begin with a student who physically built the numbers, then progress to a student who reasoned about the value of digits. Comparing these strategies will help students develop more efficient methods and deeper place value understanding.</p> <p>Assess and Differentiate: In the <i>Intervention Activity</i>, “Sticky Numbers” (TE, p.563A), students may benefit from building, drawing or modeling the numbers using Arrow Cards (found under “Instructional Tools” on the WCSD Curriculum & Instruction website).</p>

Lesson 9-10: Math Practices And Problem Solving: Look For And Use Structure		
<p>2.NBT.A.2 2.NBT.B.8 2.NBT.A.4</p> <p>MP.1 MP.2 MP.3 MP.7</p>	<p>Access Prior Learning: In first grade, students engaged in the Standards for Mathematical Practice including MP. 7 Look For and Make Use of Structure.</p> <p>Developing the Big Idea: In this lesson, students are <i>developing</i> understanding of Math Practice 7: Look For and Make Use of Structure, by looking for patterns to help them solve problems.</p>	<p>Consider using the <i>Math Practice 7 Animation</i> on Pearson Realize Online for an example of MP.7 behaviors. Refer to the <i>Math Practices and Problem Solving Handbook</i> for ideas on developing, connecting and assessing MP.7 (TE, pp.F29-F29A).</p> <p>MP. 7 Behaviors:</p> <ul style="list-style-type: none"> Analyze and describe patterns in numbers. Analyze and describe common attributes and patterns in shapes and solids. Analyze expressions, equations, procedures, and objects to represent, describe, and work with them in different ways. <p>Visual Learning: During the animation, encourage students to connect to the patterns they identified in the <i>Solve and Share</i>. The use of concrete manipulatives and drawings on place value mats may support students who have difficulty understanding the patterns used to sort the shirts. <i>The Prevent Misconceptions</i> note (TE p.566) also suggests using hundreds charts to support these students.</p> <p>Assess and Differentiate: In the <i>Intervention Activity</i>, "Pattern or No Pattern?" (TE, p.569A), students may benefit from building, drawing or modeling the numbers using Arrow Cards (found under "Instructional Tools" on the WCSD Curriculum & Instruction website).</p> <p>*CTC: Quick Check (digital platform)</p>

References

- Common Core Standards Writing Team. (2015, March 6). *Progressions for the Common Core State Standards in Mathematics (draft). Grades K-5, Number and Operations in Base Ten*. Tucson, AZ: Institute for Mathematics and Education, University of Arizona.
- Council of Chief State School Officers. (2010). *The Nevada Academic Content Standards*. Retrieved from http://www.doe.nv.gov/uploadedFiles/nde.doe.nv.gov/content/Standards_Instructional_Support/Nevada_Academic_Standards/Math_Documents/mathstandards.pdf.
- Van de Walle, J., Karp, K., Lovin, L., & Bay-Williams, J. (2014). *Teaching student-centered mathematics: Developmentally appropriate instruction for grades Pre-K-2* (2nd ed.). Boston, MA: Pearson.
- Washoe County School District (2017, June 6) Resources and approved supplementation. (2017). Retrieved from <http://washoeschools.net/Page/1069>

Base-Ten Riddles

Base-ten riddles can be presented orally or in written form. In either case, children should use base-ten materials to help solve the riddles. The examples here illustrate a variety of different levels of difficult. After children solve the following riddles, have them write new ones.

- I have 23 ones and 4 tens. Who am I?
- I have 4 hundreds, 12 tens, and 6 ones. Who am I?
- I have 30 ones and 3 hundreds. Who am I?
- I am 45. I have 25 ones. How many tens do I have?
- I am 341. I have 22 tens. How many hundreds do I have?
- I have 13 tens, 2 hundreds, and 21 ones. Who am I?
- If you put 3 more tens with me, I would be 115. Who am I?
- I have 17 ones. I am between 40 and 50. Who am I? How many tens do I have?

(Van de Walle, 2014, p.187)

Van de Walle, J., Karp, K., Lovin, L., & Bay-Williams, J. (2014). *Teaching student-centered mathematics: Developmentally appropriate instruction for grades Pre-K-2* (Vol. 1). Harlow: Pearson Education International.

Ones	<table border="1"><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table>											<table border="1"><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table>										
Tens																						
Hundreds																						

This page is left blank intentionally.