**Overview:** *The overview statement is intended to provide a summary of major themes in this unit.*

This unit works extends the understanding of place value begun in Kindergarten with numbers 11 through 19. Students will work with two-digit numbers to solidify their conceptual understanding of tens and one, building the foundation for place value. Students will use concrete materials to build bundles of ten ones to make ten. Students will use this new understanding of place value to compare two-digit numbers.

**Teacher Notes:** *The information in this component provides additional insights which will help the educator in the planning process for the unit.*

* + - * Review the progression for the Common Core State Standards in Mathematics draft), accessed at: <http://commoncoretools.files.wordpress.com/2011/04/ccss_progression_nbt_2011_04_073.pdf>. This will extend previous work with tens that was explored in Kindergarten. This is also the guiding information for the PARCC Assessment development.
* When implementing this unit, be sure to incorporate the Enduring Understandings and Essential Questions as a foundation for your instruction.
* It is vital the students use concrete or virtual manipulatives to represent the two-digit numbers with which they are working.
* By building the number concretely, students more easily make sense of the place-value system. The positions of digits in numbers determine what they represent—which size group they count. This is the main principle of place-value numeration.
* In first grade, students deepen their understanding of the connection between numerals, words, and quantities. They also move from a unitary understanding of numbers to a more complex understanding, where two digit numbers are composed of bundles of tens and leftovers.
* It is important to incorporate the use of number patterns and money when counting by tens and ones. For example, use dimes and pennies to represent tens and ones.
* There are two ways for a student to count the quantity of a number: they can either count the groups of tens (1 group of ten, 2 groups of ten, 3 groups of ten, etc) and leftovers or they can count the decades (ten, twenty, thirty, etc) and ones. They need to connect these two ways of counting so they can identify that 2 groups of ten is the same as twenty and four groups of ten is the same as forty.
* Five distinct levels of understanding of place-value have been identified by Ross (1989). They are:
  + Level 1: Single numeral – the child writes 36 but views it as a single numeral. The individual digits 3 and 6 have no meaning by themselves.
  + Level 2: Position names – the child identifies correctly the tens and ones positions but still makes no connections between the individual digits and the blocks.
  + Level 3: Face value – the child matches 6 blocks with the 6 and 3 blocks with the 3.
  + Level 4: Transition to Place-value – the 6 is matches with 6 blocks and the 3 with the remaining 30 blocks but not as 3 groups of 10.
  + Level 5: Full understanding– the 3 is correlated with 3 groups of 10 blocks and the 6 with 6 single blocks.

**Enduring Understandings:** *Enduring understandings**go beyond discrete facts or skills. They focus on larger concepts, principles, or processes. They are transferable and apply to new situations within or beyond the subject.*

* There are many ways to represent a number.
* The numbers from 11 to 19 are unique since they don’t follow the pattern of naming tens and then ones.
* Grouping (unitizing) is a way to count, measure, and estimate.
* Place value is based on groups of ten (10 ones = 10 and 10 tens = 100).

**Essential Questions:** *A question is essential when it stimulates multi-layered inquiry, provokes deep thought and lively discussion, requires students to consider alternatives and justify their reasoning, encourages re-thinking of big ideas, makes meaningful connections with prior learning, and provides students with opportunities to apply problem-solving skills to authentic situations.*

* How does using the base ten system make it easier for me to count?
* How does the place value system work?
* How do I determine the most efficient way to represent a number (pictorial, symbolic, with objects) for a given situation?
* In what ways can items be grouped to make exchanges for unit(s) of higher value??
* How does the position of a digit in a number affect its value?
* In what ways can numbers be composed and decomposed?
* How are place value patterns repeated in numbers?
* How can place value properties aid computation?
* How is math relevant to me?
* What do numbers convey?
* How can numbers be expressed, ordered, and compared?
* What are the addition properties of whole numbers?
* In what way can numbers be composed and decomposed?
* What are different models of and models for addition and subtraction?
* How do addition and subtraction relate to each other?

**Content Emphasis by Cluster in Grade 1:** *According to the Partnership for the Assessment of Readiness for College and Careers (PARCC), some clusters require greater emphasis than others. The table below shows PARCC’s relative emphasis for each cluster. Prioritization does not imply neglect or exclusion of material. Clear priorities are intended to ensure that the relative importance of content is properly attended to. Note that the prioritization is in terms of cluster headings.*

**Key:**

* ***Major Clusters***
* ***Supporting Clusters***
* ***Additional Clusters***

Operations and Algebraic Thinking

* Represent and solve problems involving addition and subtraction.
* Understand and apply properties of operations and the relationship between addition and subtraction.
* Add and subtract within 20.
* Work with addition and subtraction equations.

Number and Operations in Base Ten

* Extend the counting sequence.
* ***Understand place value.***
* Use place value understanding and properties of operations to add and subtract.

Measurement and Data

* Measure lengths indirectly and by iterating length units.
* Tell time and write time
* Represent and interpret data.

Geometry

* Reason with shapes and their attributes.

**Focus Standards: *(Listed as Examples of Opportunities for In-Depth Focus developed by Maryland educators):***

*According to the Partnership for the Assessment of Readiness for College and Careers (PARCC), this component highlights some individual standards that play an important role in the content of this unit. Educators should to give the indicated mathematics an especially in-depth treatment, as measured for example by the number of days; the quality of classroom activities for exploration and reasoning; the amount of student practice; and the rigor of expectations for depth of understanding or mastery of skills.*

* **1.NBT.C.4** Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawing and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.

**Possible Student Outcomes:** *The following list is meant to provide a number of achievable outcomes that apply to the lessons in this unit. The list does not include all possible student outcomes for this unit, nor is it intended to suggest sequence or timing. These outcomes should depict the content segments into which a teacher might elect to break a given standard. They may represent groups of standards that can be taught together.*

The student will:

* Actively use concrete and/or virtual manipulatives to represent two-digit numbers.
* Represent two-digit numbers using pictures, symbols, and/or objects.
* Identify and explain the value of a digit in the different positions within a number.
* Compare two two-digit numbers using >, =, and <.

**Progressions from Common Core State Standards in Mathematics:** *For an in-depth discussion of the overarching, “big picture” perspective on student learning of content related to this unit, see:*

The Common Core Standards Writing Team (7 April 2011). *Progressions for the Common Core State Standards in Mathematics (draft),* accessed at: <http://commoncoretools.files.wordpress.com/2011/04/ccss_progression_nbt_2011_04_073.pdf>

**Vertical Alignment:** *Vertical curriculum alignment provides two pieces of information: (1) a description of prior learning that should support the learning of the concepts in this unit, and (2) a description of how the concepts studied in this unit will support the learning of additional mathematics.*

* **Key Advances from Previous Grades:** Students enlarge their concept of and capabilities with the properties of operations to addition and subtraction by applying their understanding of the following:
  + Students in Kindergarten work with numbers 11-19 to gain foundations for place value and understand that these numbers are composed of one ten and 1, 2, 3, 4, 5, 6, 7, 8, 0r 9 ones.
  + Students in Grade 1 extend their counting sequence to 120*.*
* **Additional Mathematics:** Students will use their knowledge of the properties of addition and subtraction:
  + In grade 2 extend their understanding of place value to three-digit numbers.
  + In grade 2 read and write numbers to 1,000 using base ten numerals, number names, and expanded form.
  + In grade 2 compare two three-digit numbers based on the meanings of hundreds, tens, and ones digits.
  + In grade 3 to fluently add and subtract within 1000
  + In grade 3 to multiply one-digit numbers by multiples of 10 in the range 10-90
  + In grade 4 to recognize that in a multi-digit whole number, a digit in one place represent ten times what it represents in the place to its right
  + In grade 4 to read and write multi-digit numbers using base ten numerals, number names, and expanded form
  + in grade 4 to compare two multi-digit numbers based on meanings of the digits in each place
  + In grade 4 to round multi-digit numbers to any place.
  + In grade 4 to fluently add and subtract multi-digit whole numbers
  + in grade 4 to multiply a whole number of up to four digits by a one-digit whole number and multiply two two-digit numbers
  + In grade 4 to find whole number quotients and remainders with up to four-digit dividends and one-digit divisors
  + In grade 5 to recognize that in a multi-digit number, a digit in one place represents 1/10 of what it represents in the place to its left.
  + In grade 5 to explain patterns in the number of zeros of the product when multiply a number by powers of 10
  + In grade 5 explain the placement of the decimal point when a decimal is multiplied or divided by a power of 10
  + In grade 5 to read, write, and compare decimals to thousandths
  + In grade 5 to round decimals to any place.
  + **Possible Organization of Unit Standards:** *This table identifies additional grade-level standards within a given cluster that support the over-arching unit standards from within the same cluster. The table also provides instructional connections to grade-level standards from outside the cluster.*

|  |  |  |
| --- | --- | --- |
| **Over-Arching**  **Standards** | **Supporting Standards**  **within the Cluster** | **Instructional Connections outside the Cluster** |
| **1.NBT.B.2**: Understand that two digits of a two-digit number represent amounts of tens and ones. | **1.NBT.B.2a**: 10 can be thought of as a bundle of ten ones – called a “ten.”  **1.NBT.B.2b**: The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.  **1.NBT.B.2c**: The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones). | **1.NBT.B.5:** Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used. |
| **1.NBT.B.3**: Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and </ |  |  |

**Connections to the Standards for Mathematical Practice:** *This section provides examples of learning experiences for this unit that support the development of the proficiencies described in the Standards for Mathematical Practice. These proficiencies correspond to those developed through the Literacy Standards. The statements provided offer a few examples of connections between the Standards for Mathematical Practice and the Content Standards of this unit. The list is not exhaustive and will hopefully prompt further reflection and discussion.*

***In this unit, educators should consider implementing learning experiences which provide opportunities for students to:***

1. **Make sense of problems and persevere in solving them.**
   1. Determine what the problem is asking for.
   2. Determine whether concrete or virtual models, pictures, or equations are the best tools for solving the problem.
   3. Check the solution with the problem to verify that it does answer the question asked.
2. **Reason abstractly and quantitatively**
   1. Use knowledge of the values of the different digits in a number to make sense of the number’s value.
   2. Compare the values of two two-digit numbers by comparing the value of the digits in the tens place, and the value of the digits in the ones place in both numbers.
3. **Construct Viable Arguments and critique the reasoning of others.**
   1. Compare the concrete or virtual models used by others with yours.
   2. Examine the steps taken that produce an incorrect response and provide a viable argument as to why the process produced an incorrect response.
   3. Use the calculator to verify the correct number, when appropriate.
4. **Model with Mathematics**
   1. Construct visual models using concrete or virtual manipulatives, pictures, or equations to justify thinking and display the solution.
5. **Use appropriate tools strategically**
   1. Use base ten blocks, Digi-Blocks, snap cubes, or other models, as appropriate.
   2. Use the calculator to verify computation.
6. **Attend to precision**
   1. Use mathematics vocabulary such as tens, ones, place value, greater than, less than, etc. properly when discussing problems.
   2. Demonstrate their understanding of the mathematical processes required to solve a problem by carefully showing all of the steps in the solving process.
   3. Correctly write and read numbers up to 99.
   4. Use <, =, and > appropriately to compare numbers.
7. **Look for and make use of structure.**
8. Make observations about the relative size of numbers.
9. Explain the structure of the place value system and how it displays the value of numbers.
10. **Look for and express regularity in reasoning**
    1. Model that when moving from the ones place to the tens place, each place to the left is ten times greater in value (it takes 10 ones to make a ten.).
    2. Use models to demonstrate why one two-digit number is greater in value than another.

**Content Standards with Essential Skills and Knowledge Statements and Clarifications:** *The Content Standards and Essential Skills and Knowledge statements shown in this section come directly from the Maryland State Common Core Curriculum Frameworks. Clarifications were added as needed. Educators should be cautioned against perceiving this as a checklist. All information added is intended to help the reader gain a better understanding of the standards.*

| **Standard** | **Essential Skills and Knowledge** | **Clarification** |
| --- | --- | --- |
| **Standard: 1.NBT.B.2**  Understand that the two digits of a two-digit number represent amounts of tens and ones. | **Essential Skills and Knowledge**   * **Ability to use base ten manipulatives (e.g., base ten blocks, Digi-Blocks, Unifix Cubes, ten frames, interlocking base ten blocks) to represent two-digit numbers** * **Knowledge of the connection between numerals, words, and quantities** * **Knowledge that two-digit numbers are composed of bundles of tens and leftover ones** * **Ability to count by tens and ones** | Students count any number of objects up to 99, making bundles of 10s with or without leftovers. As students are representing the various amounts, it is important that an emphasis is placed on the language associated with the quantity. For example, 53 should be expressed in multiple ways such as 53 ones or 5 groups of ten with 3 ones leftover. When students read numbers, they read them in standard form as well as using place value concepts. For example, 53 should be read as “fifty-three” as well as five tens, 3 ones.  This example uses Base Ten Blocks, but other base ten materials would be equally effective (e.g.: Digi-Blocks, Unifix Cubes, ten frames, and interlocking base ten blocks).  **Picture 8**    **Picture 9**  Picture 10Picture 12  ***place value arrow cards:*** free place value cards found on the Internet at: (<http://www.senteacher.org/Worksheet/47/PlaceValue.xhtml>) and make an excellent tool for students to use to model their understanding of place value. The different arrow cards  represent the value of individual digits in various places and allows the student to build a number using their place value understanding. Example:  [Description: http://www.everyeducaid.co.nz/files/images/products/BAR136sm.jpg](http://www.everyeducaid.co.nz/files/images/products/BAR136sm.jpg)  As students are representing the various amounts, it is important that emphasis is placed on the language associated with the quantity. For example, 43 can be expressed in multiple ways such as 4 groups of ten and 3 ones, as well as 43 ones. When students read numbers, they should read in standard form as well as using place value concepts. For example, 43 should be read as “forty-three” as well as “4 tens, 3 ones. “ |
| **Standard: 1.NBT.B.2a**  Understand the following as a special case: 10 can be thought of as a bundle of ten ones -- called a “ten.” | **Essential Skills and Knowledge**   * **Ability to use base ten manipulatives (e.g., base ten blocks, Digi-Blocks, Unifix Cubes, ten frames, interlocking base ten blocks) to build and compare ten ones and ten** | Understanding the concept of 10 is fundamental to children’s mathematical development. Students need multiple opportunities counting 10 objects and “bundling” them into one group of ten. This conceptual understanding sets the foundation for regrouping and place value.  Students should use base ten manipulatives, such as base ten blocks, Digi-Blocks, snap cubes, ten frames, etc. to construct models of various two-digit numbers.  Picture 13  Students may use the document camera or interactive whiteboard to demonstrate their “bundling” of objects. This gives them the opportunity to communicate their thinking. |
| **Standard: 1.NBT.B.2b**  Understand the following as a **special case**: The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones. | **Essential Skills and Knowledge**   * **Ability to use base ten manipulatives (e.g., base ten blocks, Digi-Blocks, Unifix Cubes, ten frames, interlocking base ten blocks) to build and compare 11 to 19** * **Ability to match the concrete representations of 11 through 19 with the numerical representations** | They count between 10 and 20 objects and make a bundle of 10 with or without some left over (this will help students who find it difficult to write teen numbers). |
| **Standard: 1.NBT.B.2c**  Understand the following as a special case: The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones). | **Essential Skills and Knowledge**   * **Ability to use base ten manipulatives (e.g., base ten blocks, Digi-Blocks, Unifix Cubes, ten frames, interlocking base ten blocks) to build and model the counting by tens** | Incorporating the use of both concrete place value manipulatives and the hundred chart is very valuable in helping students see the relationship of these numbers and the pattern that exists. Students need multiple opportunities counting and “bundling” groups of tens in first grade. Reading 10, 20, 30, 40, 50 as “one ten, 2 tens, 3 tens, etc.” helps students see the patterns in the number system.  Incorporating the use of the hundred chart helps students make sense of the patterns used to skip-count by 10 and visually see those patterns.  Students need many opportunities counting, up to 100, from different starting points. They should also have many experiences skip counting by 5s and 10s, and to develop the concept of place value.  Examples:   * The use of the hundred chart helps students make sense of the patterns used to skip-count and visually see those patterns. * The use of money (nickels, dimes) or base ten blocks may be helpful visual cues. * The use of an interactive whiteboard may also be used to develop counting skills.   The ultimate goal for first graders is the use their understanding of skip-counting to make sense of the place value system. |
| **Standard: 1.NBT.B.3**  Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <. | **Essential Skills and Knowledge**   * **Ability to apply their understanding of the value of tens and ones in order to compare the magnitude of two numbers.** * **Ability to use base ten manipulatives to represent the numbers and model the comparison of their values** * **Ability to represent their reasoning about the comparison of two two-digit numbers using pictures, numbers, and words** * **Ability to Using Cardinality to compare the quantity of the numbers with models** * **Ability to use Ordinality to compare the placement of the numbers on the number line or 100s chart** * **Knowledge of the symbols >, =, < and their meaning** | Students may use models, number lines, base ten blocks, interactive whiteboards, document cameras, written words, and/or spoken words that represent two two-digit numbers. To compare, students apply their understanding of place value. They first attend to the numeral in the tens place, and then to the numeral in the ones place.  Comparative language includes but is not limited to: more than, less than, greater than, most, greatest, least, same as, equal to and not equal to. Students use the appropriate symbols to record the comparisons.  Students should apply their understanding  of the value of tens and ones in order to compare the magnitude of two numbers.  *When comparing 46 and 51 students can recognize that 51 is greater than 46 by looking at the number of tens.*  **Picture 16 Picture 17**  **46 51**  *When comparing 25 and 22 students should recognize that 25 and 22 have the same number of tens, so they will need to compare the ones.*  **Picture 18Picture 19**  **25 22**  When comparing 32 and 32, students should recognize that 32 and 32 have the same number of tens and the same number of ones regardless of their representation.  **32 32**  There are two ways of comparing numbers:   1. Using Ordinality. students can compare the placement of the number on the number line or 100s chart 2. Using Cardinality: students can compare the quantity of number with models   While both are important skills, in first grade, it’s important for students to compare numbers based on their quantities. If a number line or hundreds chart is used, help students make the connection between the value of a number and its place on a number line or hundreds chart. |

**Evidence of Student Learning:** *The Partnership for the Assessment of Readiness for College and Careers (PARCC) has awarded the Dana Center a grant to develop the information for this component. This information will be provided at a later date. The Dana Center, located at the University of Texas in Austin, encourages high academic standards in mathematics by working in partnership with local, state, and national education entities.  Educators at the Center collaborate with their partners to help school systems nurture students' intellectual passions.  The Center advocates for every student leaving school prepared for success in postsecondary education and in the contemporary workplace.*

**Fluency Expectations and Examples of Culminating Standards:** *This section highlights individual standards that set expectations for fluency, or that otherwise represent culminating masteries. These standards highlight the need to provide sufficient supports and opportunities for practice to help students meet these expectations. Fluency is not meant to come at the expense of understanding, but is an outcome of a progression of learning and sufficient thoughtful practice. It is important to provide the conceptual building blocks that develop understanding in tandem with skills along the way to fluency; the roots of this conceptual understanding often extend one or more grades earlier in the standards than the grade when fluency is finally expected.*

* Fluently add and subtract within 10.

**Common Misconceptions:** *This list includes general misunderstandings and issues that frequently hinder student mastery of concepts regarding the content of this unit.*

* Thinks of a two-digit number additively in terms of ones. Example: 64 is thought of as 6 + 4 rather than 300 + 60 + 4
* Recording a number that has zero ones. Example: 5 tens +0 ones = 5 instead of 50
* Inadequate part-part-total knowledge for the numbers 0 to 10 and/or an inability to trust the count
* An inability to recognize 2, 5 and 10 as composite or countable units (often indicated by an inability to count large collections efficiently)
* Little or no sense of numbers beyond 10 (e.g., fourteen is 10 and 4 more)
* a failure to recognize the structural basis for recording 2 digit numbers (e.g., sees and reads 64 as “sixty-four”, but thinks of this as 60 and 4 without recognizing the significance of the 6 as a count of tens, even though they may be able to say how many tens in the tens place)

**Interdisciplinary Connections:** *Interdisciplinary connections fall into a number of related categories:*

* *Literacy*
* *STEM (Science, Technology, Engineering, and Mathematics standards)*
* *Instructional connections to mathematics that will be established by local school systems, and will reflect their specific grade-level coursework in other content areas, such as English language arts, reading, science, social studies, physical education, and fine arts, among others.*

|  |  |  |
| --- | --- | --- |
| **Available Model Lesson Plan(s)** | | |
| The lesson plan(s) have been written with specific standards in mind.  Each model lesson plan is only a MODEL – one way the lesson could be developed.  We have NOT included any references to the timing associated with delivering this model.  Each teacher will need to make decisions related to the timing of the lesson plan based on the learning needs of students in the class. The model lesson plans are designed to generate evidence of student understanding.  This chart indicates one or more lesson plans which have been developed for this unit. Lesson plans are being written and posted on the Curriculum Management System as they are completed. Please check back periodically for additional postings. | | |
| **Standards Addressed** | **Title** | **Description/Suggested Use** |
| 1.NBT.B.2, 1.NBT.B.2a, and 1.NBT.B.2b | Understanding Place Value | Students represent and compare two-digit numbers from 11 to 19 with the most efficient strategy. |

|  |  |  |
| --- | --- | --- |
| **Available Lesson Seeds** | | |
| The lesson seed(s) have been written with specific standards in mind.  These suggested activity/activities are not intended to be prescriptive, exhaustive, or sequential; they simply demonstrate how specific content can be used to help students learn the skills described in the standards. Seeds are designed to give teachers ideas for developing their own activities in order to generate evidence of student understanding.  This chart indicates one or more lesson seeds which have been developed for this unit. Lesson seeds are being written and posted on the Curriculum Management System as they are completed. Please check back periodically for additional postings. | | |
| **Standards Addressed** | **Title** | **Description/Suggested Use** |
| 1.NBT.B.2, 1.NBT.B.2a, 1.NBT.B.2b,& 1.NBT.B.2c | Build & Record | Students will use base ten manipulatives to build two-digit numbers and then record the number numerically. |
| 1.NBT.B.2a & 1.NBT.B.2c | Build 100 | Students play a game in which they take turns spinning a spinner and adding cubes to make tens until they have ten tens or 100 blocks. |
| 1.NBT.B.3 | Comparing Two-Digit Numbers | Students play a game in which they each spin the spinner twice, making two-digit numbers and then record the comparison of them using <, =, or >. |

**Sample Assessment Items:** *The items included in this component will be aligned to the standards in the unit and will include:*

* + *Items purchased from vendors*
  + *PARCC prototype items*
  + *PARCC public released items*
  + *Maryland Public release items*
  + *Formative Assessment*

|  |  |  |  |
| --- | --- | --- | --- |
| **Topic** | **Standards Addressed** | **Link** | **Notes** |
| Understand Place Value | 1.NBT.B.2 | <http://www.illustrativemathematics.org/illustrations/1150> | This activity using The Very Hungry Caterpillar, ten frames, and counters to explore two-digit numbers.  Please see the Illustrative Mathematics site at <http://illustrativemathematics.org> for a variety of tasks for use with your students |
| 1.NBT.B.3 | <http://www.illustrativemathematics.org/illustrations/1102>  <http://www.illustrativemathematics.org/illustrations/6>  <http://www.illustrativemathematics.org/illustrations/682> | Spinner game for comparing two-digit numbers  Assessment task for ordering two-digit numbers.  Class activity in which each of the students is given a two-digit number and they must move to stand in order from least to greatest. |

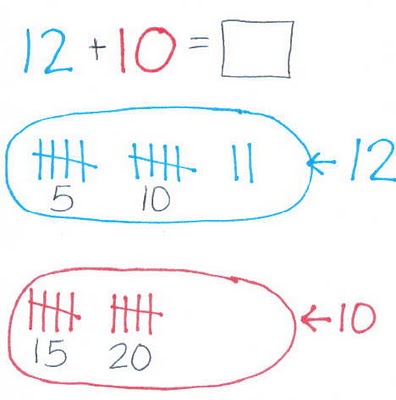
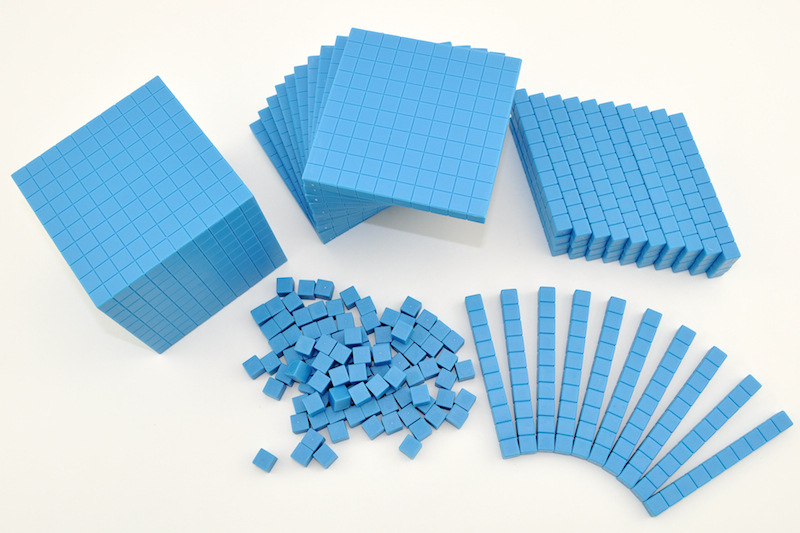
**Interventions/Enrichments:** *(Standard-specific modules that focus on student interventions/enrichments and on professional development for teachers will be included later, as available from the vendor(s) producing the modules.)*

**Vocabulary:** *This section of the Unit Plan is divided into two parts. Part I contains vocabulary and terminology from standards that comprise the cluster which is the focus of this unit plan. Part II contains vocabulary and terminology from standards outside of the focus cluster. These “outside standards” provide important instructional connections to the focus cluster.*

***Part I – Focus Cluster: Understanding Place Value***

***visual representations of numerals:*** concrete materials or pictures that represent specific numerals, showing the quantity represented by those numerals. Examples:

http://ep.yimg.com/ca/I/digiblock_2156_12569936

[](http://www.assessmentservices-edu.com/images/products/detail/DSC_0258.jpg)

***special case:*** This is the first introduction to place value where students build numbers composed of one ten and one, two, three, four, five, six, seven, eight, or nine. It is also the only set of numbers greater than 9 in which the ‘ten’ comes at the end of the word (eighteen) rather than at the beginning (thirty-six). Also, eleven and twelve follow neither rule.

***Part II – Instructional Connections outside the Focus Cluster***

***Counting All:*** the very first addition counting strategy in which a student counts all of the objects, pictures, or items in a problem to determine the total and solve the problem. This is the least efficient counting strategy to use and should lead to the more efficient Counting On strategies. Example: Bobby has two counters and Susie has three. How many do they have all together?

1 2 3 4 5

***Counting On:*** an addition counting strategy in which a student starts with one set of objects and counts up to solve the problem. Example: Bobby has two counters and Susie has three. How many do they have all together?

2 3 4 5

***Counting On from the Larger Number:*** an addition counting strategy in which a student starts with the largest set of objects and counts up to solve the problem. Example: Bobby has two counters and Susie has three. How many do they have all together?

3 4 5

1 2 3 4 5 6 7 8 9 10

***Counting Up:*** a subtraction counting strategy in which a student counts up from one part to the whole in order to find the missing part. Example: 9 – 6 = ? The student would count starting at 6, saying “7, 8, 9” determining that, by counting up three numbers, the missing part of the number sentence is ‘3’.

***Counting Back:*** a subtraction counting strategy in which a student counts back from the total in order to find the missing part. Example: 9 – 6 = ? The student would count starting at 9, saying “8, 7, 6” determining that, by counting back three numbers, the missing part of the number sentence is ‘3’.

1 2 3 4 5 6 7 8 9 10

**Resources**

**Free On-line Resources:** *This section contains links to materials that are intended to support content instruction in this unit.*

* [*http://commoncoretools.files.wordpress.com/2011/05/ccss\_progression\_cc\_oa\_k5\_2011\_05\_302.pdf*](http://commoncoretools.files.wordpress.com/2011/05/ccss_progression_cc_oa_k5_2011_05_302.pdf) (The Common Core Standards Writing Team (01 May, 2011). Progressions for Grades K-5 Counting and Cardinality; K-5 Operations and Algebraic Thinking)
* <http://www.learningbox.com/Base10/BaseTen.html> (Learning Box Game- students make numbers with blocks)
* <http://nlvm.usu.edu/en/nav/category_g_2_t_1.html> (Virtual Manipulatives)
* <http://edweb.sdsu.edu/courses/edtec670/Cardboard/Card/N/NumberClub.html> (Number Club – A Game of Place Value)
* <http://mathwire.com/numbersense/placevalue.html> (place value games and activities)
* <http://illuminations.nctm.org/activitydetail.aspx?id=75> (activity that reinforces counting and place value with ten frames)
* <http://sci.tamucc.edu/~eyoung/literature.html> (mathematics literature connections)
* <http://www.mwpenn.com/lesson-plans/the-kings-commissioners/> (Lesson plan idea for the book, The King’s Commissioners by Aileen Friedman)
* <http://www.mathsolutions.com/index.cfm?page=wp9&crid=56> (Free lesson plan ideas for different grade levels)
* <http://wps.ablongman.com/ab_vandewalle_math_6/0,12312,3547876-,00.html> (Reproducible blackline masters)
* <http://nrich.maths.org/2477> (Information on number sense and how children learn mathematics)
* <http://www.digi-block.com/resources/webLessons/IntroducingFullCarsAndBlocksLeftOver.html> (Digi-block place value lesson)
* <http://yourtherapysource.com/freestuff.html> Simple activities to encourage physical activity in the classroom

**Related Literature:**

* Brimmer, Larry D. How Many Ants?

Notes: As ants march up a hill toward a cake, they increase by multiples of ten.

* Friedman, Aileen.The King’s Commissioners.

Notes: Explores the concepts of counting, addition, and place value.

[Show More](http://www.amazon.com/gp/product/0613373944/qid=1138575779/sr=8-1/ref=sr_8_xs_ap_i1_xgl14/104-8312493-0659953?n=507846&s=books&v=glance)

[Show Less](http://www.amazon.com/gp/product/0613373944/qid=1138575779/sr=8-1/ref=sr_8_xs_ap_i1_xgl14/104-8312493-0659953?n=507846&s=books&v=glance)

* Murphy, Stuart J. A Fair Bear Share. (Mathstart Series)

Notes: Bear cubs gather nuts, berries and seeds. They add their food by arranging them in groups of tens and ones.

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* Arizona Department of Education. “Arizona Academic content Standards.” Web. 28 June 2010

<http://www.azed.gov/standards-practices/common-standards/>

* Bamberger, H.J., Oberdorf, C., Schultz-Ferrell, K. (2010). *Math Misconceptions: From Misunderstanding to Deep Understanding.*
* Bamberger, H.J., Oberdorf, C. (2010). *Activities to Undo Math Misconceptions, Grades PreK-Grade 2*. Portsmouth, NH: Heinemann.
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* The Common Core Standards Writing Team (12 August 2011). *Progressions for the Common Core State Standards in Mathematics (draft), accessed at:* [*http://commoncoretools.files.wordpress.com/2011/08/ccss\_progression\_nf\_35\_2011\_08\_12.pdf*](http://commoncoretools.files.wordpress.com/2011/08/ccss_progression_nf_35_2011_08_12.pdf)
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