Unit 2: Domain: Number and Operations in Base Ten

Content Area: **Mathematics**
Course(s): **Mathematics**
Time Period: **Marking Period 2**
Length: **8-9 Weeks**
Status: **Published**

Unit Overview

In the Number and Operations in Base Ten Unit, learners will build on their previous experience with basic-fact strategies to learn the facts with sums to 99. Learners will use groups of ten to count to 120 and add and subtract two-digit numbers. They will also compare two-digit numbers using the correct symbols (<, >, =). The learners will make important connections regarding addition and subtraction. The work in this unit will help children integrate their base-ten and place-value understanding with the operations of addition and subtraction.

Standards

MA.1.NBT.A	Extend the counting sequence.
MA.1.NBT.A.1	Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.
MA.1.NBT.B	Understand place value.
MA.1.NBT.B.2	Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:
MA.1.NBT.B.2a	10 can be thought of as a bundle of ten ones — called a “ten.”
MA.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.
MA.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).
MA.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 <.
MA.1.NBT.C	Use place value understanding and properties of operations to add and subtract.
MA.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 (e.g., base ten blocks) or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method 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.
MA.1.NBT.C.5	Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.
MA.1.NBT.C.6	Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Essential Questions

- How do mathematical ideas interconnect and build on one another to produce a coherent whole?
- How can we compare and contrast numbers?
- How do operations affect numbers?
- What makes a computational strategy both effective and efficient?
- How do operations affect numbers?

Application of Knowledge and Skills...

Students will know that...

- basic fact strategies for addition are based on number relationships
- basic fact strategies for subtraction are based on counting back
- flexible methods of computation involve taking apart and combining numbers in various ways
- the symbols <, >, and = are used in comparing numbers
- there are many different strategies that can be used to add and subtract
- there is an inverse relationship between addition and subtraction

Students will be skilled at...

- adding groups of ten
- adding two-digit numbers
- adding two-digit numbers
- counting by tens to 120
- modeling and comparing to find differences
- using a hundred chart to add and subtract tens
- using mental math to add and subtract
- writing numbers in expanded form
- writing numbers in expanded form

Assessments

- Add three numbers: Add three numbers and explain strategy used to add
- Add,then Subtract: Add, then subtract a series of related problems
- Benchmark Tests

- End of the Year Test
- Follow the Rule: Complete a function table
- Make a Match: Use models to show a math story, and make a match to solve
- Placement Test: used to test prior knowledge
- Task Cards: used as a reinforcement of a topic
- Topic Math Projects
- Topic Quick Checks: can be given after each section in the topic to check for understanding
- Topic Tests: given after each topic

Activities

Problem of the Day: sets the stage for what students will be learning that day

Math Stations: reinforces topics taught each day

Station activities- Each section has center activities to reinforce skill (leveled)

- Clip and Cover- Students answer questions and try to cover four spaces in a row on a gameboard to win.
- Display the Digits- Students answer the problem and display the tile that represents the answer.
- Quick Questions- Toss number cubes and answer questions.
- Team Work- Students in turn explain the steps in a multi-step process.
- Think Together- Students choose and discuss answers to problems.
- Tic Tac Toe- Students use algebra to compute solutions to problems.
- Toss and Talk- Students toss number cubes and explain how to solve resulting problems

Interactive Learning: Problem-Based Interactive learning activities at the beginning of each topic such as using tools, structure,reasoning, generalizing, assessing reasonableness and modeling

Topic Opener Projects: sets the stage for what students will be learning in the unit

Interactive Math Stories: gives the students an initial look into the new unit

Practice Work: leveled worksheets/activities

Ticket to Leave: way to assess at the end of a lesson

Other Activities: (Vocabulary shown in bold type)

- Use two ten frames to add numbers more than 10.
- Use counters to show 1 or 2 more or fewer than a number.
- Count groups of 10 i[tp 12 tens and write how many.
- Solve problems by finding patterns in a table.
- Read and write two-digit numbers as groups of 10 and some left over.
- Use groups of tens and **ones** to show and write a given two-**digit** number.
- Model two-digit numbers and write its expanded form.
- **Break apart a ten** to make 10 ones and write new number in expanded form.
- Solve problems by making an organized list.
- Write numbers that are **1 more** or **1 less** than a two-digit number.
- Write numbers that are **10 more** or **10 less** than a two-digit number.
- Use a hundred chart to show number relationships.
- Compare two-digit numbers using models (show **greater than** and **less than**)
- Compare two-digit numbers using symbols (**equal to =**, <, >)
- Add two multiples of 10 for sums to 100.
- Use a hundred chart to add multiples of 10.
- Add a multiple of 10 to make a two-digit number.
- Use mental math to add two-digit numbers and multiples of 10.
- Add one-digit numbers to two-digit numbers with and without **regroup**ing.
- Solve problems by drawing pictures and writing number sentences.
- Subtract using multiples of 10 from 10 - 90.
- Use a hundred chart to subtract multiples of 10.
- Use mental math to subtract multiples of 10 from two-digit numbers.

Activities to Differentiate Instruction

General strategies for modification of this curriculum for students with special needs, ELL, and gifted learners:

- **General strategies:**
  - preferential seating
  - manipulatives
  - modified workbook pages
  - practice or enrich homework pages
  - Enlarged 100 chart with transparent stone

- **Center activities** - There are leveled center activities for each section. There is a separate activity for "Intervention", and then "On-Level" and "Advanced" are in spiral book.
- **Leveled practice pages** - There are three leveled (Reteaching, Practice, and Enrichment) sheets that can be used for practice or homework.
- **Math Concept Readers:** These readers allow the student to read the story at different levels- above level, on level, and below level. (also available on line with audio) Complete the Think and Respond and Write Math questions at the conclusion of each book.
- **Assessment**- Using Quick Check Review can determine differentiated instruction levels using sample

answers and using the rubric at the Close/ Assess and Differentiate section in the teacher edition.

Content specific modification for students with special needs, ELL, and gifted learners:

- **Topic 7:**
  - **Below level students:**
    - As children begin to study more abstract properties of numbers, some find it easier to learn by rote memorization instead of working to grasp the underlying ideas. While this is easier in the short term, rote memorization of rules and "shortcuts" may cause children problems in their later study of mathematics.
    - It is important to emphasize the concepts behind the correct answers, so that children focus on more than just getting the right answers. The use of manipulative materials and visual representations can help children understand the concepts.
  - **Students with special needs:**
    - The concept of counting by 10s is essential for children's understanding of place value. Counting by other numbers is important for children's later understanding of multiplication.
    - Children with special needs may need extra time and help in seeing why certain numbers are used when counting by 10s. Emphasize the concepts behind counting by 10s so children understand the patterns rather than memorizing them.
  - **ELL**
    - Have children practice the names of numbers in English to help them focus on the ideas in this chapter. When modeling concepts, use concrete materials or visuals to help English language learners connect ideas with words.
    - Each day, have children practice counting. Mark a beginning and an ending two-digit number on a hundred chart. You can have the whole group count from the first number to the last together, or you can call on individual children or pairs of children to count aloud.
    - Each time you write a number on the board, read it out loud as you point to it before continuing with the concept you are teaching. You can also ask children to say the numbers out loud before tackling a problem.
  - **Advanced/Gifted:**
    - Children who quickly learn to count by 10s may be ready to extend the process to other numbers. By doing so, they are developing the concept of repeated addition.
    - Counting by a specific number is an opportunity to introduce the concept of multiplication. For instance, in reviewing the results of counting by 5s, you can model the vocabulary by saying, "one 5 is 5, two 5s are 10, three 5s are 15, and so on."

- **Topic 8:**
  - **Below level students:**
    - As children begin to study numbers greater than 10, it may be difficult for them to visualize their value. Children who have problems relating the value of two-digit numbers with the place-value system will need extra support in developing the connection.
    - Provide children who are performing below grade level with a variety of concrete, visual, and real-life models of two-digits numbers. The more tangible connections they make, the more completely they will develop the concept.
  - **Students with special needs:**
    - Special needs children need reinforcement to understand the names and the values of the multiples of 10. Give them hands-on practice by counting by 10s using the tens rods

from the place-value set.
- When modeling numbers using base-ten blocks, count by 10s as you point to the tens rods before you say the actual number. For instance, show a model of 36 and say, "There are 3 tens rods. That's 10, 20, 30. 30 and 6 more makes 36."
- Students with physical disabilities might be unable to write in the tables and models found in this lesson. If this is the case, allow them to dictate their numbers to a scribe in order to show understanding.

- **ELL**
  - Combining auditory and visual skills will help English language learners use, learn, and incorporate number terms and concepts.
  - **Emerging:** Have children practice counting by 10s as you point to the written numeral every day until they have mastered the names of the multiples of 10.
  - **Expanding:** Write 5 two-digit numerals on the board. Ask children to read each aloud. Reinforce the concept of place value by repeating the number and stating how many groups of tens and ones make up the number.
  - **Bridging:** Reinforce the idea that words such as twenty and thirty name groups of 10. On the board, write twenty = 2 tens. As children for the word that means 3 tens, and then write thirty = 3 tens. Continue with multiples of 10 through 90.

- **Advanced/Gifted:**
  - Children who understand the use of tens and ones in naming numbers will be able to apply previously learned concepts to two-digit numbers. Encourage them to apply concepts such as even and odd and comparing to numbers through 100.

- **Topic 9:**
  - **Below level students:**
    - Help children become comfortable comparing numbers by providing opportunities for the to model number comparisons with cubes, counters, and a number line.
    - Provide children with visual keys to help them gain hands-on understanding of comparison symbols.
  - **Students with special needs:**
    - Hands-on exploration and review of counting forward and back by 10s can help special needs children gain a firmer understanding of the concepts of 1 less, 1 more, 10 less, and 10 more.
    - Start by having each child make cube towers consisting of 10 cubs. Provide number lines showing numbers 1-100 and have children count the towers by 10s as they place them on the line. Have them place the towers, one-by-one, on each tens digit starting with 10. Then, have them remove towers, one-by-one, starting at 100, and count back as they go. Next, draw 10 towers of 10 cubes on the board. Ask children to count by 10s. Then count back as you erase the cube towers one at a time.

  - **ELL**
    - Combining auditory, visual, and motor skills will help English language learners use, learn, and incorporate number terms and concepts.
    - **Emerging:** Have a volunteer model the number 33 using three 10-cube towers and 3 loose cubes. Then have children make a cube model of the number that is 1 or 10 more than 33 and 1 or 10 less than 33.
    - **Expanding:** Write the number 33 on the board. Have children say the number and write the number that is 1 or 10 more and the number that is 1 or 10 less.
    - **Bridging:** On the board write the numbers 32, 33, and 34. Invite children to describe the relationship of the three numbers. Encourage them to use the words 1 or 10 more or

1 or 10 less as they describe the numbers.

- **Advanced/Gifted:**
  - Children who have a good understanding of locating numbers on a number line can extend their skills by making a number line and showing numbers on it.
  - Discuss number lines with children and encourage them to explain that numbers greater than a given numbers are to the right and numbers less than a given number are to the left.

- **Topic 10:**
  - **Below level students:**
    - As addition strategies become more complex, it is even more important for children to know the basic addition facts. They should also be comfortable skip counting by tens from any two-digit number.
    - Provide children performing below level with numerous opportunities to practice their basic addition facts, through flash cards, games, and manipulatives.
  - **Students with special needs:**
    - Children with special needs may find it easier to solve problems in this topic by using one strategy more than another. Assess individual children's learning styles to determine whether tens and ones models, the hundred chart, or the paper=and-pencil method are most effective for them.
    - Help children become more comfortable with adding large numbers by providing hands-on opportunities for them to show addition strategies, such as using cubes, tens and ones models, and hundred chart.

  - **ELL**
    - In this topic, children learn to add tens and ones with regrouping. English language learners need to extend their developing language of addition and place value to work with two-digit addition.
    - **Emerging:** Children who are beginning to learn English can use connecting cubes or a hundred chart to demonstrate their understandings in this topic.
    - **Expanding:** Children with intermediate English skills should be asked to use simple phrases to explain their work, such as "add the tens," "add the ones, " and "the sum is. . . "
    - **Bridging:** Children with advanced skills in English can explain in their own words how they find the sum when adding two-digit numbers.

  - **Advanced/Gifted:**
    - Children who quickly grasp how to add two-digit numbers can explore how to solve these problems using mental math. Encourage them to share their thinking with others as they solve problems.
    - Children may apply their understanding of addition to solve two-digit addition problems with three addends without regrouping, such as 32 + 21 +44 or 24 + 11 + 31.

- **Topic 11:**
  - **Below level students:**
    - Review with children having difficulty subtracting how to use cubes to solve basic subtraction facts. These children will also benefit from daily review of the basic facts using flash cards and games.
    - Some children may have trouble remembering the steps to follow for two-digit subtraction with regrouping. Give these children a reference page with the following questions to keep at their desk: What am I subtracting in the ones place? Do I have to

regroup? How many ones do I have now? How many tens?

- **Students with special needs:**
  - Some children with special needs may benefit from a review of the basic subtraction facts before working with twp-digit subtraction. Using tens and ones models, such as connecting cubes, will help children gain a better understanding of the algorithm for two-digit subtraction.
  - Some students with visual or visual processing impairments may have difficulty using a hundred chart to subtract. Allow these students to use base-1- blocks or connecting cubes and cube trains to demonstrate understanding of subtracting tens and ones.

- **ELL**
  - Repeated oral language practice of the terms that are used in two-digit subtraction will help English language learners remember and understand the steps.
  - **Emerging:** Have children use manipulatives while emphasizing the actions of the two-digit subtraction algorithms: break apart into ones, regroup, subtract the ones, subtract the tens, and so on.
  - **Expanding:** Model the algorithm for 3 or 4 two-digit subtraction exercises. Ask children to say "regroup," or "subtract the ones and then the tens."
  - **Bridging:** Write the words tens, ones, two-digit, subtract, and difference on the board. Model the algorithm for two-digit subtraction, having children identify where each of these terms is applied.

- **Advanced/Gifted:**
  - Children who are proficient at subtracting can be challenged to identify two numbers that yield a give two-digit difference.
  - Write 68-__=43 on the board. What digit must be in the ones place of the missing number? How do you know that?

Integrated/Cross-Disciplinary Instruction

Language Arts and Reading: listening to trade books and reading leveled math concept readers, students will discuss the questions at the back of the book for better understanding

Topic 7: Social Studies: Children will research and choose a state mammal; illustrate a counting pattern using the mammal selected (page 238)

Topic 8: STEM: Children will research insects in your state; choose an insect and a number from 10 - 30; draw that many insects and circle groups of 10 (page 268)

Topic 9: Literature: Children research and discuss Native American tribes; children will design necklaces using pasta or other small objects; students count beads by ones and tens (page 298)

Topic 10: Art: Children choose a fruit and draw it on an index card; choose a two-digit number from 11 - 89; add 10 to the number and write a number sentence below the picture (page 324)

Topic 11: Science: Children will research birds native to our state; choose two birds and write and illustrate a subtraction story to compare the two birds (page 354)

Resources

Manipulatives: place value mat, 100 chart, two-color counters, number cards 0 - 11 and 12 - 20, ten-frames, connecting cubes, number cubes, place value blocks

Read Aloud Books: 2 of Everything, Math Appeal Mind Stretching Math Riddles

Investigations: Number Games and Story Problems

Envision Math Grade 1 Teacher's Guide and Student book

Envision Math Practice Workbook (practice work and spiral review)

Envision Math Teacher's Resource Book: masters for enrichment, problem-solving, reteach activities; problem of the day

Envision On-line: student text; teacher's guide; enrichment, reteach, problem-solving and practice worksheets; on-line intervention and enrichment; Math Practice Animations, Visual Learning Animations, Topic Opener Videos, Animated Interactive Math Stories (www.pearsonrealize.com)

Envision Leveled Math Concept Readers

Topics Categories in book form:

Topic 7: Counting and Number Patterns to 120

Topic 8: Tens and Ones

Topic 9: Comparing Numbers to 100

Topic 10: Adding with Tens and Ones

Topic 11: Subtracting with Tens and Ones

Master Enrichment pages

Master Reteaching pages

Master Practice pages

On-line Resources available at www.pearsonrealize.com

- Teacher Edition (TE) Textbook
- Student Edition (SE) Textbook
- Tests on line
- Concepts videos
- Math Tools

21st Century Skills

CRP.K-12.CRP2.1	Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation.
CRP.K-12.CRP4.1	Career-ready individuals communicate thoughts, ideas, and action plans with clarity, whether using written, verbal, and/or visual methods. They communicate in the workplace with clarity and purpose to make maximum use of their own and others' time. They are excellent writers; they master conventions, word choice, and organization, and use effective tone and presentation skills to articulate ideas. They are skilled at interacting with others; they are active listeners and speak clearly and with purpose. Career-ready individuals think about the audience for their communication and prepare accordingly to ensure the desired outcome.
CRP.K-12.CRP8.1	Career-ready individuals readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of problems when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. They carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through their own actions or the actions of others.