Unit 1: Domain: Number and Operations in Base Ten

Content Area: **Mathematics**
Course(s): **Mathematics**
Time Period: **Marking Period 1**
Length: **8-9 Weeks**
Status: **Published**

Unit Overview

In this unit, students will use place value understandings to round whole numbers to the nearest 10 or 100. They will fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

Standards

MA.3.OA.D	Solve problems involving the four operations, and identify and explain patterns in arithmetic.
MA.3.OA.D.8	Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.
MA.3.OA.D.9	Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations.
MA.3.NBT.A	Use place value understanding and properties of operations to perform multi-digit arithmetic.
MA.3.NBT.A.1	Use place value understanding to round whole numbers to the nearest 10 or 100.
MA.3.NBT.A.2	Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

Essential Questions

- How are addition and subtraction related?
- How can we decide when to use an exact answer and when to use an estimate?
- How can we use models to represent mathematical relationships?
- How do addition and subtraction help us solve problems?
- How do mathematical ideas interconnect and build on one another?
- How do operations affect numbers?
- How does place value help us make sense of mathematical concepts?
- What makes a computational strategy both effective and efficient?

Application of Knowledge and Skills...

Students will know that...

- each real number can be associated with a unique point on the number line
- equivalent numbers can be used to simplify calculations
- mathematics content and practices can be applied to solve problems
- numbers can be classified and represented in different ways
- numbers can be used for different purposes
- numerical calculations can be approximated by replacing numbers with other numbers that are close and easy to compute with mentally
- properties are relationships or rules that are always true about a given set of numbers
- the base-ten number system is a scheme for recording numbers using digits 0-9, groups of ten, and place value
- the operations of addition, subtraction, multiplication, and division are related to each other.
- the place of each digit in a number affects its value
- the set of real numbers (whole numbers, integers, and fractions) is infinite and ordered
- there is more than one way to solve a problem for each opteration

Students will be skilled at...

- adding and subtracting with mental math
- finding the value of an unknown number in a subtraction or addition equation
- locating and writing numbers on a number line
- modeling the Commutative, Associative, and Identity Properties of Addition
- reading and writing 3-digit numbers
- rounding 3- and 4-digit whole numbers to the nearest ten or hundred
- rounding two-digit and three-digit whole numbers to the nearest ten or hundred
- solve problems by adding 3 or more 2- and 3-digit numbers
- solve problems by adding 3-digit numbers
- solve problems by subtracting 3-digit numbers
- solving problems by using estimation
- use inverse operations to check addition and subtraction
- using subtraction to solve problems

Assessments

- Basic Facts Timed Tests
- Benchmark Tests
- End of Year Test-administered after completing program
- Placement Test- administered prior to delivering program

- Task Cards
- Topic Math Projects
- Topic Quick Check
- Topic Tests

Activities

Problem of the Day-Present a daily problem that serves as a review from the previous day's lesson.

Vocabulary - Have students create a chart for each new vocabulary word that includes the word's meaning and an example or use vocabulary cards as flash card game

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.

STEM - Certain sections have Going Digital integrating technology and the use of calculators such as:

- Adding With Mental Math, p 37
- Mixed Problem Solving, p 47
- Adding With Regrouping, p 63
- Subtracting With Regrouping, p 89

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

Topic Opener Projects - There is a math project for each topic (Topic 1-3). See Cross-Disciplinary instruction for projects and page numbers.

Practice work - Communicator practice can be done using Independent work and problem- solving practice problems in each section.

Ticket to Leave - Quick Checks on each sections

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
- **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 1**
  - **Below level students:**
    - Students experiencing difficulty comparing numbers will benefit from numerous opportunities designed to reinforce understanding of place-value concepts.
      - Have students record numbers in a place-value chart and use the tool to give the value of each digit.
      - Ask students to create a model of a number with place-value blocks and use the model to write the number in expanded form.
  - **Students with special needs:**
    - Repeated use of place-value blocks will help special needs students grasp the concept of place value, which is needed to round numbers.
      - Write a 2-digit number on the board. Have a student model the number with place-value blocks. Then have students use the model to write the number in expanded form. Repeat the process with various 3-digit numbers.
      - Once students are proficient at repating a model of a number, switch tasks. Display models of 2-digit and 3-digit numbers and have students express each in standard form.
      - Have a student express any given number first as a model of place-value blocks, then as a pictorial model, and finally in standard/expanded form. Concrete --> Pictorial --> Abstract
  - **ELL**

        - Repeated oral language practice with the terms used to indicate place value will help English learners read, write, compare, and order numbers.
            - Provide students with word cards for ones, tens, and hundreds. Read each word together. Then have students arrange the cards across a pocket chart. Write 52. As you point to each number, have students hold up the word cad that names the place value of the digit 5.
            - Write 782 on the board. Have students say the number and identify the place value of each digit.

    - **Advanced/Gifted:**
        - Students who have mastered rounding numbers to the nearest ten or hundred may enjoy playing a game involving thousands or even ten thousands.
            - Prepare a set of 26 to 30 index cards with a different number (thousand or ten thousand) written on each card. Groups of students mix up the cards and hand them out to each player in equal piles. Students turn over the first card. The student with the greatest card gets everyone else's card. The game ends when one student has all the cards.

- **Topic 2**
    - **Below level students:**
        - Observing horizontal models of 2-digit numbers will help below-level students recognize why numbers are rounded up or down.
            - Model the numbers 12 and 17 horizontally using ones blocks. Place 2 tens blocks below these models.
            - Ask students the following questions: Why do we round 12 to 10 rather than to 20? (It is closer to 10 than to 20). Why do we round 17 to 20 rather than to 10? (It is closer to 20).
            - Display a number line to students. Place a sticky note at 23 and 28. Why do we round 23 to 20 rather than to 30? (It is only 3 spaces away from 20 but 7 spaces away from 30.) Why do we round 28 to 30 rather than 20? (It is only 2 spaces from 30 but 8 spaces from 20.)
    - **Students with special needs:**
        - Special needs students will benefit from visual models that illustrate how 2-digit numbers can be broken apart and combined in many ways.
            - Write 36 + 23 on the board. Display place-value blocks for each number. Group all the tens blocks together and have students find the sum. Group all the ones blocks together and have students find the sum. Add the sums together to find the total sum of all the blocks.
            - Write 18 + 46 on the board. Have students display place-value blocks for each number. Move 2 ones blocks from the model of 46 to the model of 18. Exchange the 10 ones blocks for 1 tens block. Ask students to name the addition sentence the blocks now model and find its sum. (20 + 44 = 64).

    - **ELL**
        - Repeated oral practice with the terms generally used to indicate addition will help English learners translate a word problem into an equation.
            - Act out story problems such as: Jack has 6 crayons. He found 3 more crayons. How many crayons did he have in all? After students find the sum, point out the words more and in all on the board.

    - **Advanced/Gifted:**
        - Challenge students to use logic and reasoning skills to estimate sums. Have them track

the variety of ways in which they are able to solve problems without using a paper-and-pencil method.
- Connect students who have a firm grasp of the paper-and-pencil addition algorithm with the concept of multiplication. Allow them to explore the idea that adding doubles is the same as multiplying by 2 and so on.

- **Topic 3**
  - **Below level students:**
    - Discrete models that can be broken apart to demonstrate regrouping will help students recognize that a number can be expressed in a variety of ways.
      - Provide students with 34 paper clips. Have them attach the clips to form 3 chains of 10 clips and 4 single clips. How could you remove 9 clips from the model? (Break apart one chain to add 10 single clips to the 4 you already have.) Have students exchange the clips, remove 9 clips, and find the number that remains.
      - Display 5 tens. Ask students to name the number it represents. (50). Have them change the model to remove 23 ones blocks and write a subtraction sentence that describes their actions. (50-23=27).
  - **Students with special needs:**
    - Visual models will help special needs students grasp the concept of regrouping.
      - Display two hundreds place-value blocks to students. Ask them to adjust the model in order to remove 86 blocks.
      - Give a students a $100 play money bill. Have another student name an amount of money he or she needs to borrow. Have classmates explain how the bill should be broken into smaller bills to accommodate the request.

  - **ELL**
    - Repeated oral language practice with the terms generally used to indicate addition or subtraction will help English learners translate a word problem into an equation.
      - Write addition word problems on the board. After students read and solve problems, point out addition terms such as more or all together. Tell students these terms can indicate addition.
      - Write subtraction word problems on the board. After students read and solve the problems, point out subtraction terms such as how many more than or how many fewer than. Tell students these terms can indicate subtraction.

  - **Advanced/Gifted:**
    - Challenge students to use reasoning to identify addition and subtraction sentences that yield a certain 3-digit number as the sum or difference.
      - Have students spin a spinner twice and form a 2-digit number from the results. Ask them to write a problem that produces the number as a sum. Then have them write a second problem that produces the number as the difference.
      - Write a subtraction sentence on the board. Have students draw a picture that models the sentence and then find the difference.

Integrated/Cross-Disciplinary Instruction

Reading and Writing: The Worldscapes Readers present math problems to be solved within the context of

nonfiction text. Think and Respond and Write Math questions can be found at the conclusion of the books.

Topic 1: Social Studies: Fiji Facts and Figures-Research the height of a famous structure and add facts that contain numbers about the structure.

Topic 2: Social Studies: Magic Squares and More- Research, compare, estimate and combine the heights of three amusement rides.

Topic 3: Social Studies: Fiji Facts and Figures- Research, record and compare the number of days students around the world are in school.

Resources

Topics Categories in book form:

Topic 1: Numeration

Topic 2: Number Sense: Addition and Subtraction

Topic 3: Using Place Value to Add and Subtract

Master Enrichment pages

Master Reteaching pages

Master Practice pages

Student Edition workbook

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.