Unit 4: Domain Measurement and Data

Content Area: **Mathematics**
Course(s): **Mathematics**
Time Period: **Marking Period 4**
Length: **5-6 Weeks**
Status: **Published**

Unit Overview

In this unit, students will solve word problems involving dollars, quarters, dimes, nickels and pennies using money symbols appropriately. They will measure the length of anobject by selecting and using appropriate measuring tools. They will be able to tell and write time from both analog and digital clocks to the nearest five minutes using a.m. or p.m.

Standards

MA.2.NBT.A.2	Count within 1000; skip-count by 5s, 10s, and 100s.
MA.2.NBT.B.5	Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
MA.2.NBT.B.9	Explain why addition and subtraction strategies work, using place value and the properties of operations.
MA.2.MD.A.1	Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
MA.2.MD.A.2	Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.
MA.2.MD.A.3	Estimate lengths using units of inches, feet, centimeters, and meters.
MA.2.MD.A.4	Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.
MA.2.MD.B.5	Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.
MA.2.MD.C.7	Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.
MA.2.MD.C.8	Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately.
MA.2.MD.D.9	Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.
MA.2.MD.D.10	Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put together, take-apart, and compare problems using information presented in a bar graph.

Essential Questions

- What are the unique value of coins and bills?

- How can a given money amount be shown in different ways?
- What is the process for adding or subtracting money using symbols?
- What are possible measurement tools and how and why are they utilized in measuring various objects?
- What are some ways of collecting, organizing and presenting data?

Application of Knowledge and Skills...

Students will know that...

- Any number, measure,numerical expresssion, algebraic expression or equation can be represented in many different ways.
- Data can be collected, displayed and analyzed in many different ways.
- Mathematics content and practices can be applied to solve problems.
- Numbers, expressions, measures and objects can be compared and related to othe numbers, expressions, measures and objects in different ways.
- Numbers, numerical calculations and measurements can be approximated.
- Some attributes of objects are measurable and can be quantified using unit amounts.
- There are multiple interpretations of addition, subtraction, multiplication and division of rational numbers and each operation is related to other operations.
- There is more than one algorithm for each of the operations with rational numbers.

Students will be skilled at...

- collecting data and using various types of graphs to display and analyze that data.
- completing and recording addition and subtraction problems using two-digit coin amounts.
- counting collections of coins with different values.
- estimating sums and differences of 2 two-digit numbers.
- estimating the length of various objects
- identifying the value of coins and bills.
- measuring using standard and nonstandard units and tools.
- showing given amounts of money in different ways.
- telling time to the nearest five minute, quarter, half and hour using an analog and digital clock.
- using addition and subtraction to solve measurement problems.
- using symbols when expressing money amounts.

Assessments

- basic facts timed tests
- benchmark test
- end of the year test- administered after completing the program
- Placement Test- administered prior to delivering the program
- task cards
- topic math projects
- topic quick checks
- 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 rpresents the answer.
- Quick Questions: Toss number cubes and answers questions.
- Teamwork: 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 algebraic rules 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:

- Showing the Same Amount p. 438
- Making a Bar Graph p. 532

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 - There is a math project for each topic (Topic 13-16). See Cross Disciplinary instruction for project 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 13**
  - **Below level students:**
    - Counting money involves a variety of skills and concepts including coin recognition, identifying coin values, and using the values to count, compare, and find equivalences.
    - Math manipulatives, visuals, and hands-on learning will help below level students master these skills.
  - **Students with special needs:**

- Provide special needs students with many opportunities to learn about counting money through visual hands-on learning. Begin with activities that allow children to identify and compare the value of individual coins they can examine and hold in their hands. Then, model how to count the coins by adding on.
- Introduce the hundred chart to give children visual support and practice in learning to add coin values by counting on and skip counting.

- **ELL**
  - Oral language practice, couple with hands-on activities, will help these learners to identify coin names and values, to count and compare coins, and to build their vocabulary.
  - **Emerging:** Provide children with an assortment of coins. On the board write 5¢, 10¢, and 25¢. As you point to each, say the amount. Have children display the coin with that value. Write the coin's name on the board, say it aloud, and ask children to repeat it.
  - **Expanding:** On the board, write the amounts 1¢, 5¢, 10¢, 25¢, and 50¢. Point to 5¢. Invite a volunteer to read the amount and tell the name of the coin that has that value. Repeat with the other amounts.
  - **Bridging:** Write 10¢, 25¢, and 50¢ on the board.. Ask children to name coin combinations of equal value.

- **Advanced/Gifted:**
  - Children who display a strong number sense when using money concepts can be given special challenges that extend their ability to use and connect math operations with money concepts.
  - Challenge children to use mental math to estimate addition and subtraction answers before using paper and pencil to solve them.

- **Topic 14**
  - **Below level students:**
    - Provide support for below-level students by providing simple steps that might make it easier for children to focus on the problem.
    - Encourage and support children in experiencing success for each step they master in performing addition and subtraction problems.
  - **Students with special needs:**
    - Experiences and activities that connect rounding and estimation to concrete representations can help give operations meaning for special needs students.
    - Provide opportunities for special needs students to work with estimation tactilely and visually, as well as symbolically.

  - **ELL**
    - English language learners need to understand that an estimate is not an exact answer. It is an intelligent guess. They need to practice estimating.
    - **Emerging:** Have children practice estimating numbers of objects.
    - **Expanding:** Have children explain how they used estimation to solve a problem
    - **Bridging:** Have children solve problems by deciding whether an estimate is enough or whether an exact answer is needed.

  - **Advanced/Gifted:**
    - Students who easily master addition and subtraction will enjoy working with problems that provide them with new or unusual information that is relevant to their own lives.
    - Provide advanced students with numerous opportunities to use new skills in ways that

allow them to analyze and interpret information from their daily experience in different ways.

- **Topic 15**
  - **Below level students:**
    - As children are introduced to the concept of measurement and the many ways and tools for measuring, it is important that they build a foundation for measurement by gaining mastery with the most basic tool, the ruler, and its units, an inch and a foot.
    - Children who have poor conceptualization may need extra time to process key concepts. Provide children performing below level with many opportunities for hands-on measurement activities, and provide them manipulatives that support concept development.
  - **Students with special needs:**
    - The number of steps involved in measuring length may confuse children with special needs. Break down the process into parts and coach children through each step to help keep children from feeling overwhelmed by the task.
    - First, have children trace the direction they will measure with their finger. Ask children to find the side of the ruler in centimeters. Model how to line up the end of the unit with the edge of the object and show how to find the correct number. Finally, have the children write down the measurement including the unit of measure used.
  - **ELL**
    - English learners must learn the language of measurement as well as the process.
    - **Emerging:** Provide pairs of children with 12-inch rulers. Have them use the rulers to measure the length of two different books. Ask each childr to report about how man inches each book measures.
    - **Expanding:** Have children measure two different books using 12-inch rulers and report how many inches each measures. The invite children to estimate the length of different books that you hold up.
    - **Bridging:** On the board write "about 1 inch," "about 8 inches," and "about 80 inches." Ask children which measurement would be the most likely to describe the length of a book. Have them explain.
  - **Advanced/Gifted:**
    - Encourage children who are strong conceptual thinkers to expand their skills by asking them to solve measuring challenges.
    - Provide children with measurement puzzles in which children must find ways to measure objects with dimensions that re not immediately straightforward and for which children must use problem-solving, as well as measurement skills.

- **Topic 16**
  - **Below level students:**
    - In order to read clocks children need to understand that not all scales increase by ones. The minutes on an analog clock increase in increments of 5.
    - Give children performing below grade level reinforcement in skip counting by fives before beginning the study of time. When teaching reading a clock to the nearest 5 minutes, have children count aloud by gives to the minute hand when explaining examples.
  - **Students with special needs:**
    - Focusing on both hours and minutes can be confusing children with special needs. They need to remember that the long hand is the minute hand and they need to skip count by fives when reading minutes. They also need to remember that while the short

hand names the number it points to at the exact hour, it moves gradually closer to the next number as the time approaches it.
- To help special needs students integrate all this information, it is often beneficial to have them make and use clocks. This allows them to approach telling time in a more concrete and tactile manner.

- **ELL**
  - Children who are learning English may have problems with the language used to express time. They will need practice with reading times using customary English.
  - **Emerging:** Review the names of numbers from 1 through 12 and the names for multiples of 5 through 55 with children.
  - **Expanding:** Ask children to relate specific time durations to certain activities. Ask them. How long might it take to eat a sandwich - 15 hours or 15 minutes? Help them out with standard English words as needed.
  - **Bridging:** Introduce children to the vocabulary needed for more advanced ways of telling time. For example, model 4:50 as "four-fifty," "10 minutes before five," "10 minutes till five," and "10 of five."

- **Advanced/Gifted:**
  - Children who are able to tell time easily are ready to solve problems involving elapsed time. They can begin by figuring out what time it will be in 1 hour, in 10 minutes, in 30 minutes, and so on. They can also solve problems such as finding the time 1 hour ago, 10 minute ago, and 30 minutes ago.
  - Once children are proficient at determining times ahead and in the past, they will be able to solve elapsed time problems in which they find the amount of time between a beginning and ending time.

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. Language Arts/Science/Social Studies:

- Worldscapes Readers
- Topic Opener Math Projects
- Writing in Math/Math Journals
- Interactive Notebooks

Topic 13: Alexander, who used to be rich last Sunday: Social Studies: Students will create a class menu of favorite foods and their prices. p.418

Topic 14: Subtraction Action: Social Studies: Students will draw a fair ground scene with 4 rides and set prices. Students will decideand discuss how they would spend 99 cents. p. 444

Topic 15: Measuring Penny: STEM: Research length of animals. Then students will draw, label and order animals in the classroom. p. 466

Topic 16: What Time is It?: STEM: Research and draw favorite dinosaur. Use drawings to create a

classroom bar graph. p. 508

Resources

Topic Categories in book form:

Topic 13: Counting Money

Topic 14: Money

Topic 15: Measuring Length

Topic 16: Time, Graphs and Data

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.