Unit 3: Domain: Measurement and Data

Content Area: **Mathematics**
Course(s): **Mathematics**
Time Period: **Marking Period 3**
Length: **5-6 Weeks**
Status: **Published**

Unit Overview

In the Measurement Unit, learners will recognize that calendars and clocks "measure" time. They will be given opportunities to use digital and analog clocks to tell and write time to the hour and half hour. Through hands-on activities, students will use nonstandard and standard units of measurement when making estimates and measuring length. Students will also order objects from longest to shortest and tallest to shortest. Finally, students will organize, represent, and interpret data using tally marks and tally charts. They will use bar graphs and picture graphs to answer questions and draw conclusions.

Standards

MA.1.MD.A	Measure lengths indirectly and by iterating length units.
MA.1.MD.A.1	Order three objects by length; compare the lengths of two objects indirectly by using a third object.
MA.1.MD.A.2	Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps.
MA.1.MD.B	Tell and write time.
MA.1.MD.B.3	Tell and write time in hours and half-hours using analog and digital clocks.
MA.1.MD.C	Represent and interpret data.
MA.1.MD.C.4	Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

Essential Questions

- How can measurement be used to solve problems?
- When can and cannot nonstandard units of measurement be used?
- Without standard measurement, what problems would society encounter?

Application of Knowledge and Skills...

Students will know that...

- calendars, analog and digital clocks express and record time
- length is measured in inches and in centimeters
- measurement can be accomplished with nonstandard units as long as they are equal
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- the key for a picture graph determines the number of pictures needed to represent each number in a set of data.
- the minute hand moves a "distance" of 60 minutes for the hour hand to move to the next hour on an analog clock
- time passes as we go about our daily activities

Students will be skilled at...

- telling and writing the time to the hour and half hour using analog and digital clocks
- collecting a set of data and organizing it in a real graph
- estimating and measuring length using standard and nonstandard units
- reading a table and quantifying lapsed time for an activity
- reading bar graphs and picture graphs to answer questions and draw conclusions
- showing the time to the hour and half hour on analog and digital clocks
- using a ruler to measure

Assessments

- Benchmark Tests
- Compare Length: Order pictures of objects from shortest to longest.
- End of the Year Test
- Morning, Afternoon, Evening: Determine the time of day that an activity occurs and read analog clocks to the hour.
- Placement Test: used to test prior knowledge
- Task Cards: used as a reinforcement of a topic
- Time to the Half Hour: Digital/Analog Time Memory Game
- 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: integrates technology into the lesson

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.)

- Tell and write time to the hour on an analog and on a digital clock. (Vocabulary: **hour, minute hand, hour hand, minute, o'clock, half hour)**
- After reading the time on a digital clock, draw the same time to the hour and half hour on an analog clock.
- Using data from a table, assess the lapsed time for an activity as expressed on digital and analog clocks (Vocabulary: **schedule**).
- Using real objects, compare length and order from **shortest** to **longest** and **taller** or **shorter**.
- Estimate and **measure** length using cubes and paper clips as non-standard units.
- Evaluate two estimates of length to choose the better estimate.
- Draw conclusions and answer questions using a real-object graph, **picture graph**, or **bar graph**.
- Collect, organize, represent, and interpret **data** using **tally marks** and a tally chart.
- Using data provided to create a bar graph and a picture graph.

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 12:**
  - **Below level students:**
    - Review how to order numbers from 1 through 20. This review will help children make reasonable estimates and measurements in this topic.
    - Provide real-world examples of measurements to demonstrate the usefulness of measuring accurately. For example, discuss why it is important for builders to measure carefully.
  - **Students with special needs:**
    - Children with special needs could practice measuring and ordering real objects before completing the written exercises in this topic.
    - Some children with special needs may need help measuring the objects. Use a grid or large piece of paper divided into sections in which children can place the objects in an organized way.
  - **ELL**
    - Children who are learning English must learn the language of measurement as well as the measurement process itself. Oral language correlated to hands-on activities is a critical component of concept development. Help children relate the language and concepts to themselves.
    - **Emerging:** Have children point to the objective as you ask questions such as, "Which one is the longest? Which one is the shortest?"
    - **Expanding:** Ask children to order objects and then use the correct terms to describe their relative sizes, such as longest and shortest.
    - **Bridging:** As children order objects, ask them to explain how they determine the order,

such as which is the longest and shortest.

- **Advanced/Gifted:**
  - Have children apply their estimation and measurement skills to other real-life items not pictured in this topic or present in the classroom. Ask, "What is longer, a car or a tricycle?"
  - Ask children which measuring object they would use if they wanted to measure the distance around the classroom and why.

- **Topic 13:**
  - **Below level students:**
    - Many children may not understand the relationship between the number 6 on the clock and 30 minutes. Review counting by 5s to show children that the number 6 marks the 30 minute mark on the clock. You might also post the number :30 and :00 next to the 6 and 12, respectively, on your classroom wall clock.
    - Children performing below level may benefit from using analog clock faces and digital clock faces as they complete the exercises in this topic. This will allow them to have a physical model to use as they solve problems.
  - **Students with special needs:**
    - Children who have difficulty with visual discrimination may not be able to easily differentiate between the minute hand and the hour hand. When using paper clocks, color the hands using 2 different colors to help children correctly identify the hands.
    - Some children with special needs will benefit from real-life opportunities to practice their time-telling skills. For example, you may ask a child to inform the other children in the class when it is exactly 11:00 or when it is time to clean up from an activity.
  - **ELL**
    - English language learners need to learn relevant time vocabulary and relate it to the time vocabulary of their native languages. They need to make connections between the modeled forms of communication about time, such as 10:30 shown on a demonstration clock, and the written forms of communication about time, such as 10:30 written on the board.
    - **Emerging:** Provide analog clock faces to children when posing questions about time. Ask them to show the time ont he clock as you stte the time.
    - **Expanding:** Write a given time on the board using words and numbers. Encourage children with intermediate English skills to read the time both ways.
    - **Bridging:** Ask children with advance English skills to tell short stories about their days' activities. They should explain what they did at various times throughout the day.
  - **Advanced/Gifted:**
    - Children who can tell time accurately may enjoy helping you set up the daily classroom schedule on the board. Ask them to draw clocks and write the times and activities.
    - Encourage children to use their time-telling skills in other subject areas. For example, they may write stories that include time or document the times during science experiments.

- **Topic 14:**
  - **Below level students:**
    - Language is an important part of working with graphs and data. If children do not understand the language associated with graphing and data, they will not be successful in analyzing the information represented in a graph.
    - Give children the tools they need to assist them in making associations within the

relevant language. Have children make a chart with words that are often used in analyzing data. For example, fewer, least, smallest, lowest, more, most, favorite. Allow children to use their language "cheat sheets" when working with data and graphs.

- **Students with special needs:**
  - Special needs children in particular need abstract math ideas to be made concrete through the use of manipulatives and hands-on activities. Use manipulatives as often as possible so that special needs children can make the tactile connection with objects to assist them in understanding abstract math ideas.

- **ELL**
  - Repeated oral language practice of the terms that are used in graphing and probability will help English language learners understand and interpret graphs and statistical events.
  - **Emerging:** Have children point to the correct information on a graph or the place to find the correct information on a graph while you red questions about the graphs aloud.
  - **Expanding:** Have children verbally answer questions about graphs.
  - **Bridging:** Have children write the answers to questions about graphs as well as make their own graphs.

- **Advanced/Gifted:**
  - Children who are comfortable working with graphs and analyzing the data presented in them should be given ample opportunities to explore graphs in real-life situations. Provide children with grade-level-appropriate nonfiction reading materials that will have graphs, data, and statistics in them.
  - Encourage children to analyze the data in graphs further. For example, have children determine how many people were surveyed by looking at the graph or how many more people like soccer better than basketball.

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

Science: Measuring plant growth in *New Plants* unit

Topic 12: STEM: Children will research the legth and height of animals common to our state; draw and cut out animals and write the length and height on index cards; display from shortest to longest (page 380)

Topic 13: Social Studies: Children choose a city from a map and choose a specific time; students will create a

train schedule for that city (page 410)

Topic 14: STEM: Children discuss their favorite summer activities; create a tally chart to show preferences; children make bar graphs from the tally chart (page 432)

Resources

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

Manipulatives: unifix cubes, paperclips, Judy Clock, practice clocks, straws, yarn, number cards 0 - 11 and 12 - 20, two-color counters

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)

Read Aloud Books: How Big is a Foot?, Measuring Penny, Nine O'Clock Lullaby, The Grouchy Ladybug, The Very Hungry Caterpillar

Envision Leveled Math Concept Readers

Topics Categories in book form:

Topic 12: Length

Topic 13: Time

Topic 14: Using Data to Answer Questions

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

Math songs

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.