3 Math Unit 12: Measurement and Data

Content Area: **Mathematics**
Course(s):
Time Period: **Marking Period 4**
Length: **17 Days**
Status: **Published**

Unit Overview

Unit of Measurement

In this unit, students explore a variety of measurement and data topics while applying skills with the four operations to solve problems related to those topics. Students work with liquid volume and mass, tell time to the minute and determine time intervals, and collect/record data and create/analyze scaled picture and bar graphs. Students also measure to halves and fourths of an inch and show such measurement data on a line plot.

Liquid volume is the amount of liquid in a container. Students estimate and measure liquid volume using the metric units liter (L) and milliliter (mL). For reference, 1 liter is a little more than 1 quart and 1 milliliter is about the size of 20 drops from an eyedropper. Through hands-on experiences, students establish benchmarks for liquid volume that they should be able to use in the real world. They also compare volume and learn that different shaped containers may have the same volume.

Students estimate and measure mass using the metric units gram (g) and kilogram (kg). Mass is a measure of how much matter is in an object. Students use the mass of one object to estimate whether another object is greater or less than 1 gram or 1 kilogram.

Students tell time and and determine time intervals to the minute using both an analog clock and a digital clock. Another term for time interval is elapsed time. It is the amount of time that passes from the start of an activity to the end of an activity.

Students also collect, record, and organize data. Students create and analyze scaled picture graphs and scaled bar graphs. A scaled picture graph uses pictures or symbols to represent data where each symbol stands for more than one data point as indicated by the key. A scaled bar graph uses the lengths of bars to represent data where the intervals on the frequency scale are greater than 1. Students also use the graphs to solve one- and two-step "how many more" and "How many less" problems.

What Students Are Learning

- Students measure, estimate, and solve problems with liquid volume and mass.
- Students tell time to the nearest minute and measure time intervals in minutes.
- Students draw and solve problems using scaled picture graphs and scaled bar graphs.
- Students measure lengths to the nearest half inch and quarter inch.
- Students display measurement data on line plots.

Number Routines

- What's Another Way to Write It?
- Where Does It Go?
- Let's Count
- Mystery Number
- Notice & Wonder
- Which Doesn't Belong?
- Is It Always True?

Standards

3.M.A.1	Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.
3.M.A.2	Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.
3.M.B	Geometric measurement: understand concepts of area and relate area to multiplication and to addition
3.DL.B.3	Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs.
3.DL.B.4	Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters.

Materials

Core Materials:

Reveal Math

12.1 Measure Liquid Volume

12.2 Estimate and Solve Problems with Liquid Volume

12.3 Measure Mass

12.4 Estimate and Solve Problems with Mass

12.5 Tell Time to the Nearest Minute

12.6 Solve Problems Involving Time

12.7 Understand Scaled Picture Graphs

12.8 Understand Scaled Bar Graphs

12.9 Solve Problems Involving Scaled Graphs

12.10 Measure to Halved or Fourths of an Inch

12.11 Show Measurement Data on a Line Plot

Supplemental Materials:

- ST Math

- Happy Numbers
- 3 Act Lessons
- Building Fact Fluency Kit
- Brainingcamp Manipulatives
- Nearpod Lessons
- Brainpop Resources
- Online Resources

Technology

DA	Data & Analysis
	Data can be organized, displayed, and presented to highlight relationships.
8.1.5.DA.1	Collect, organize, and display data in order to highlight relationships or support a claim.
	Individuals can select, organize, and transform data into different visual representations and communicate insights gained from the data.
8.1.5.DA.3	Organize and present collected data visually to communicate insights gained from different views of the data.
8.1.5.DA.4	Organize and present climate change data visually to highlight relationships or support a claim.
8.2.5.ED.2	Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.
8.2.5.ED.3	Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task.

Assessment

Formative Assessment

- Unit Readiness Diagnostics
- Lesson Checks
- Exit Tickets
- Teacher Observation

Summative Assessment

- Unit Assessment Performance Task
- Benchmark Tests
- Alternative Assessments: Performance Tasks & Projects

Accommodations & Modifications

Special Education

Differentiated Instruction			
Accommodate Based on Students Individual Needs: Strategies			
Time/General • Extra time for assigned tasks • Adjust length of assignment • Timeline with due dates for reports and projects • Communication system between home and school • Provide lecture notes/outline	**Processing** • Extra response time • Have students verbalize steps • Repeat, clarify, or reword directions • Mini-breaks between tasks • Provide a warning for transitions • Reading partners	**Comprehension** • Precise step-by-step directions • Short manageable tasks • Brief and concrete directions • Provide immediate feedback • Small group instruction • Emphasize multi-sensory learning	**Recall** • Teacher-made checklist • Use visual graphic organizers • Reference resources to promote independence • Visual and verbal reminders • Graphic organizers
Assistive Technology • Computer/whiteboard • Tape recorder • Spell-checker • Audio-taped books	**Tests/Quizzes/Grading** • Extended time • Study guides • Focused/chunked tests • Read directions aloud	**Behavior/Attention** • Consistent daily structured routine • Simple and clear classroom rules • Frequent feedback	**Organization** • Individual daily planner • Display a written agenda • Note-taking assistance • Color code materials

504

- In class/pull out support with special ed teacher Additional time during intervention time
- Preferred seating
- Questions read aloud
- Extended time for completing tasks Graphic organizers
- Vocabulary support Mnemonic devices

- Songs/videos to reinforce concepts Limit number of questions
- Scribe Manipulatives Calculators Reteach pages Leveled homework
- Lesson intervention activities
- Math Diagnosis & Intervention System Another look homework video
- Practice buddy

ELL

- Translation device/dictionary
- In class/pull out support with ESL teacher
- Preferred seating
- Questions read aloud
- Extended time for completing tasks
- Graphic organizers
- Vocabulary support
- Mnemonic devices
- Songs/videos to reinforce concepts
- Manipulatives
- Math Diagnosis & Intervention System

At-risk of Failure

- Additional time during intervention time
- Questions read aloud
- Graphic organizers
- Vocabulary support
- Mnemonic devices
- Songs/videos to reinforce concepts
- Manipulatives
- Calculators
- Reteach pages
- Leveled homework
- Lesson intervention activities
- Math Diagnosis & Intervention System
- Another look homework video
- Practice buddy

Gifted & Talented

- Independent projects
- Enrichment pages
- Online games
- Leveled Homework
- Extension Activities
- Today's Challenge

Interdisciplinary Connections

3-5-ETS1-2	Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
RL.CR.3.1	Ask and answer questions and make relevant connections to demonstrate understanding of a literary text, referring explicitly to textual evidence as the basis for the answers.
RL.TS.3.4	Utilize and reference features of a text when writing or speaking about a text, referring to parts of stories, dramas, and poems, using terms such as chapter, scene, and stanza; describe how each successive part builds on earlier sections.
W.IW.3.2	Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
3-ESS2-1	Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.

Career Readiness, Life Literacies & Key Skills

9.2.5.CAP.3	Identify qualifications needed to pursue traditional and non-traditional careers and occupations.
9.2.5.CAP.4	Explain the reasons why some jobs and careers require specific training, skills, and certification (e.g., life guards, child care, medicine, education) and examples of these requirements.
9.4.5.CT	Critical Thinking and Problem-solving
9.4.5.CT.3	Describe how digital tools and technology may be used to solve problems.
9.4.5.CT.4	Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global (e.g., 6.1.5.CivicsCM.3).
9.1.5.FI	Financial Institutions
9.1.5.FI.1	Identify various types of financial institutions and the services they offer including banks, credit unions, and credit card companies.
	There are specific steps associated with creating a budget.
9.1.5.PB.1	Develop a personal budget and explain how it reflects spending, saving, and charitable contributions.

Career Ready Practices

STEM in Action

STEM Career: Geologist: Maya explains her aspirations to become a geologist.

Maya Measures the Height of a River: Maya uses measurement and data to measure the height of a river to make predictions of an event, such as floods.

- CRP1. Act as a responsible and contributing citizen and employee.
- CRP2. Apply appropriate academic and technical skills.
- CRP4. Communicate clearly and effectively and with reason.
- CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
- CRP12. Work productively in teams while using cultural global competence.