# Unit 3: Measurement and Data (Grade 2)

Content Area: **Mathematics**
Course(s): **Mathematics - Grade 2**
Time Period: **February**
Length: **12 Weeks**
Status: **Published**

## Unit Overview

In this unit, students will identify and count money amounts to one dollar, analyze data, tell time to five-minute intervals, and utilize customary and metric units of measurement.

**** My Math Benchmark Assessment #1 - to be administered mid-year (approximately January)***

**** Mid Year Fluency Assessment to be administered - basic facts up to 20***

## Transfer

Students will be able to independently use their learning to...

- Identify count money amounts to one dollar.

- Analyze and graph data.

- Tell time to the hour, half hour, and five-minute intervals.

- Utilize customary and metric scales to measure lengths.

For more information, read the following article by Grant Wiggins.

http://www.authenticeducation.org/ae_bigideas/article.lasso?artid=60

## Meaning

## Understandings

Students will understand that...

* A penny is worth 1 cent, a nickel is worth 5 cents, a dime is worth 10 cents, and a quarter is worth 25 cents.

* Skip counting can be used to count groups of coins.

* Different coin combinations can be used to make one dollar.

* A survey can be used to gather data.

* A pictograph or picture graph can be used to graph and analyze data.

* A bar graph can be used to graph and analyze data.

* Line Plots can be used to graph and analyze data.

## Essential Questions

Students will keep considering...

* How do I count and use money?

* How can I record and analyze data?

* How do I use and tell time?

* How can I measure objects?

## Application of Knowledge and Skill

## Students will know...

Students will know...

* The Values of Pennies, Nickels, Dimes, and Quarters
* How to Count Groups of Coins Up to One Dollar and beyond a dollar
* A Dollar Bill Equals 100 Cents
* A Survey Can Be Used to Collect Data
* Picture Graphs, Bar Graphs, and Line Plots can be used to Analyze Data
* How to Tell Time to the Hour, Half Hour, and 5 Minute Intervals
* Inches, Feet and Yards are Customary Units used to Measure Length
* 12 Inches Equals One Foot, 3 Feet Equal One Yard
* Rulers and Yard Sticks can be used to Measure Length in Customary Units
* Centimeters and Meters are Metric Units used to Measure Length
* The Best Unit of Measurement to Measure Specific Objects (Customary and Metric)

## Students will be skilled at...

Students will be skilled at...

* Counting money amounts to one dollar.
* Analyzing data.
* Telling time up to and including 5-minute intervals.
* Measure objects using customary and metric units of measurement.

**Chapter 8:**
penny
cent
nickel
dime
quarter
dollar sign ($)

**Chapter 9:**
data
survery
tally marks
picture graph
symbol
bar graph
line plot

**Chapter 10:**
analog clock
hour hand
hour
digital clock
minute hand
minute
half hour
half past
quarter past
A.M.
P.M.

**Chapter 11:**
length
inch
estimate
measure
foot
yard
centimeters
meters

**Please review the following terms from the previous year or previous lessons:**

**equal groups**

**repeated addition**

**skip count**

**compare**

**graph**

**tally**

**afternoon**

**evening**

**morning**

**compare**

**longest**

**shortest**

## Learning Goal 2

**Students will be able to interpret and represent data, including measurements, on a bar graph, picture graph, and line plot with up to four categoies.**

## Target 1 - Analyze Data: CHAPTER 9

SWBAT:

* take a survey and organize data using tally marks - **(Chapter 9 / Lesson 1) DOK 2**

* use data to create picture graphs - **(Chapter 9 / Lesson 2) DOK 2**

* analyze data on picture graphs - **(Chapter 9 / Lesson 3) DOK 3**

* make bar graphs to show data - **(Chapter 9 / Lesson 4) DOK 2**

* draw conclusions and answer questions based on bar graphs - **(Chapter 9 / Lesson 5) DOK 3**

* make a table to solve word problems - **(Chapter 9 / Lesson 6) DOK 4**

* use data to create line plots - **(Chapter 9 / Lesson 7) DOK 2**

* analyze data on line plots - **(Chapter 9 / Lesson 8) DOK 3**

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| | Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, "Does this make sense?" They can understand the approaches of others to solving complex problems and identify correspondences between different approaches. |
| MA.K-12.2 | Reason abstractly and quantitatively. |
| MA.K-12.3 | Construct viable arguments and critique the reasoning of others. |
| MA.K-12.4 | Model with mathematics. |
| MA.K-12.5 | Use appropriate tools strategically. |
| MA.K-12.6 | Attend to precision. |
| MA.K-12.7 | Look for and make use of structure. |
| MA.K-12.8 | Look for and express regularity in repeated reasoning. |
| MA.2.MD.D | Represent and interpret data. |
| 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. |

## Learning Goal 3

**Students will be able to tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.**

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|---|---|
| MA.K-12.1 | Make sense of problems and persevere in solving them. |
| MA.K-12.2 | Reason abstractly and quantitatively. |

| | |
|---|---|
| MA.K-12.3 | Construct viable arguments and critique the reasoning of others. |
| MA.K-12.4 | Model with mathematics. |
| MA.K-12.5 | Use appropriate tools strategically. |
| MA.K-12.6 | Attend to precision. |
| MA.K-12.7 | Look for and make use of structure. |
| MA.K-12.8 | Look for and express regularity in repeated reasoning. |
| MA.2.MD.C | Work with time and money. |
| 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. |

## Target 1 - Telling Time: CHAPTER 10

SWBAT:

* tell and write time to the nearest hour - **(Chapter 10 / Lesson 1) DOK 1**
* tell and write time to the nearest half hour - **(Chapter 10 / Lesson 2) DOK 1**
* find a pattern to solve problems - **(Chapter 10 / Lesson 3) DOK 2**
* tell and write time to the quarter hour - **(Chapter 10 / Lesson 4) DOK 2**
* tell and write time to the nearest five minutes - **(Chapter 10 / Lesson 5) DOK 2**
* use A.M. and P.M. when telling and writing time - **(Chapter 10 / Lesson 6) DOK 3**

## Learning Goal 4

**Students will use and select appropriate measurement tools to determine, compare, and estimate the length of objects.**

## Target 1 - Measure Length Using Customary and Metric Units: CHAPTER 11

SWBAT:

* use an inch ruler to measure objects - **(Chapter 11 / Lesson 1) DOK 1**
* measure objects in feet and yards - **(Chapter 11 / Lesson 2) DOK 2**

* choose the appropriate customary tool and measure objects by length - **(Chapter 11 / Lesson 3) DOK 2**

* measure to compare customary lengths - **(Chapter 11 / Lesson 4) DOK 2**

* use measurement to relate inches, feet, and yards - **(Chapter 11 / Lesson 5) DOK 2**

* use the logical reasoning strategy to solve problems - **(Chapter 11 / Lesson 6) DOK 3**

* use a centimeter ruler and a meterstick to measure objects - **(Chapter 11 / Lesson 7) DOK 1**

* choose the appropriate metric tool and measure objects by length - **(Chapter 11 / Lesson 8) DOK 2**

* use measurement to compare metric length - **(Chapter 11 / Lesson 9) DOK 2**

* use measurement to relate centimeters and meters - **(Chapter 11 / Lesson 10) DOK 2**

* use a number line to measure objects - **(Chapter 11 / Lesson 11) DOK 1**

* measure lengths to generate data shown on a line plot - **(Chapter 11 / Lesson 12) DOK 2**

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|---|---|
| MA.K-12.1 | Make sense of problems and persevere in solving them. |
| MA.K-12.2 | Reason abstractly and quantitatively. |
| MA.K-12.3 | Construct viable arguments and critique the reasoning of others. |
| MA.K-12.4 | Model with mathematics. |
| MA.K-12.5 | Use appropriate tools strategically. |
| MA.K-12.6 | Attend to precision. |
| MA.K-12.7 | Look for and make use of structure. |
| MA.K-12.8 | Look for and express regularity in repeated reasoning. |
| MA.2.MD.A | Measure and estimate lengths in standard units. |
| 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.B.6 | Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2,..., and represent whole-number sums and differences within 100 on a number line diagram. |

## Formative Assessment and Performance Opportunities

* "Am I Ready?"

* End of Lesson "On My Own" and "Homework" activities

* Journal Writing Activity

* Exit Slips

* Chapter Quizzes

* S.T. Math
  - Measurement
  - Creating Graphs
  - Line Plots
  - Money
  - Time

* Teacher Observation / Anecdotal Notes

* Student Interview

* LinkIt

Performance Task Chapter 8: **Art Supplies** DOK 2, DOK 3 Use tables, coins, cent notation, repeated addition, and subtraction to compare purchases of school supplies (Rubric: TM 518PT2)

Performance Task Chapter 9: **Letter Counts** DOK 2, DOK 3 Use tables, tally marks, and line plots, and bar graphs to compare the number of letters in the names of the months in a calendar year. Prior research is required. (Rubric TM 518PT2)

Performance Task Chapter 10: **Making Time** DOK 2, DOK 3 Analog clocks, AM/PM, and elapsed time to write and interpret time to the hour, half-hour, and quarter hour for a busy schedule (Rubric: TM 634PT2)

Performance Task Chapter 11: **Inch by Inch** DOK 2, DOK 3 Use customary measurements to convert, compare, and create a line plot of furniture lengths (Rubric: TM 724PT2)

**Chapter Projects Available in Student Books:**

Chapter 8 Project: Classroom Store (pg. 474)

Chapter 9 Project: Survey with Data and Graph (pg. 520)

Chapter 10 Project: Create a Temperature Log (pg. 584)

Chapter 11 Project: Measurements All Around (pg. 636)

## Summative Assessment

* My Math Benchmark Assessment #1 - to be administered mid-year (approximately January)

* Chapter Tests (Chapters 8, 9, 10, and 11) - Forms 1, 2, & 3 - Written or On-line Assessment

* Fluency Assessment (timed) - end of 2nd trimester - basic facts up to 20

Additional Resources Available for Assessment Purposes:

* Vocabulary Test

* Oral Assessment

* Listening Assessment

## 21st Century Life and Careers and Technology

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| CRP.K-12.CRP1 | Act as a responsible and contributing citizen and employee. |
| CRP.K-12.CRP1.1 | Career-ready individuals understand the obligations and responsibilities of being a member of a community, and they demonstrate this understanding every day through their interactions with others. They are conscientious of the impacts of their decisions on others and the environment around them. They think about the near-term and long-term consequences of their actions and seek to act in ways that contribute to the betterment of their teams, families, community and workplace. They are reliable and consistent in going beyond the minimum expectation and in participating in activities that serve the greater good. |
| CRP.K-12.CRP2 | Apply appropriate academic and technical 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 | Communicate clearly and effectively and with reason. |
| 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.CRP5 | Consider the environmental, social and economic impacts of decisions. |
| CRP.K-12.CRP5.1 | Career-ready individuals understand the interrelated nature of their actions and regularly make decisions that positively impact and/or mitigate negative impact on other people, organization, and the environment. They are aware of and utilize new technologies, understandings, procedures, materials, and regulations affecting the nature of their work as it relates to the impact on the social condition, the environment and the profitability of the organization. |
| CRP.K-12.CRP12 | Work productively in teams while using cultural global competence. |
| CRP.K-12.CRP12.1 | Career-ready individuals positively contribute to every team, whether formal or informal. |

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| | They apply an awareness of cultural difference to avoid barriers to productive and positive interaction. They find ways to increase the engagement and contribution of all team members. They plan and facilitate effective team meetings. |
| CAEP.9.2.4.A | Career Awareness |
| CAEP.9.2.4.A.2 | Identify various life roles and civic and work - related activities in the school, home, and community. |
| CAEP.9.2.4.A.4 | Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success. |
| TECH.8.1.2.D | Digital Citizenship: Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior. |
| TECH.8.1.2.D.CS1 | Advocate and practice safe, legal, and responsible use of information and technology. |
| TECH.8.1.2.E | Research and Information Fluency: Students apply digital tools to gather, evaluate, and use information. |
| TECH.8.1.2.E.1 | Use digital tools and online resources to explore a problem or issue. |
| TECH.8.1.2.F | Critical thinking, problem solving, and decision making: Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources. |
| TECH.8.1.2.F.CS3 | Collect and analyze data to identify solutions and/or make informed decisions. |

## Accommodations and Modifications

*Utilize manipulatives during instruction to teach and demonstrate concepts

*Give students manipulatives to model all problems (Rulers with single units (no subunit), whiteboard for tally charts, tiles to create bar graphs, counters for picture graphs and comparison, clock)

*Give students number organizational tool to solve basic facts (Graph paper, number line for line plots)

*Provide reference tool for vocabulary (notebook, flashcards, or foldable)

*Provide reference tools for values of measurements (ex: 1ft = 12 inches) and names and values of coins

*Provide reference tool with "word values" for time intervals (ex: Quarter past- 15; Half Past-30; Quarter til: 45)

*Preteach using ST MATH!

* Small Group Instruction

*A slower pace of verbal instruction

*Various representations of directions

*Visual and digital display as well as explanation of domain specific and academic vocabulary

*Verbal communication of not only concept but also language goals (ELL)

*Written and verbal examples given of these goals

*Concepts evaluated for age level as well as cultural appropriateness based on the students background (ELL)

*Allow higher level learners to assist in teaching concepts that they have mastered previously

* Enrichment pages from notebook

*Use TAG manipulative kits

*Count values beyond $1.00

*Solve problems with elapsed time

*Create graphs with beyond single units (Ex: 1 picture = 2 votes)

## Unit Resources

* McGraw-Hill "My Math" Grade 2 Text

  * Chapters 8, 9, 10, 11

  * McGraw-Hill "My Math" Website - www.connected.mcgraw-hill.com

  * Virtual Manipulatives

  * Virtual Games (Sail Through Math, Fact Dash, etc.)

  * Math At Home - Practice Math

  * Math Songs (How Many Pennies?, Lemonade Song, etc.)

  * Real World Problem Solving Library:

    *A Magnets Strength

    * A Mountain of Presidents

    * Animals Big and Small

    * Tracking Snow

    * The Green Cafe

    * Life Cycles

* BrainPop Jr. - www.brainpopjr.com

* Math Fact Cafe - www.mathfactcafe.com

* ST Math

* Student Center: online games and digital support resources for school and home

* STEM app-download fro home and practice www.mheonline.com

*My Math Trade Books to improve interdisciplinary connections

* Fun Brain - www.funbrain.com

* Cool Math 4 Kids - www.coolmath4kids.com

* AAA Math - www.aaamath.com

*http://achievethecore.org/coherence-map/

*https://www.illustrativemathematics.org/

## Interdisciplinary Connections

*A Magnet's Strength* allows students to explore a variety of magnets and how we use them in everyday life. Students are presented with experiements they can replicate and graphs to analyze and evaluate. (2.MD.10)

*A Mountain of Presidents* shows students the process of carving Mt. Rushmore. In addition to using measurements and mapping skills, they will be able to use photographs to develop an understanding of scale. (2.MD.7)

*Animals Big and Small* give students the opportunity to compare sizes of animals, using standard and nonstandard units. Students will also compare adult animals to their offspring. This book contains a map to show area, charts, and Venn diagrams. (2.MD.4)

*Life Cycles* presents the life cycles of butterflies, frogs, mice, and birds, including measurements, charts, and photographs with captions. (2.MD.10)

*The Green Cafe* allows students to explore the business of owning a restaurant, learning abour expenses and the jobs in a restaurant. (2.MD.8)

*Tracking Snow* presents students with the snowfall of several cities in the United States, allowing them to use data recorded on graphs and charts to draw conclusions. (2.MD.5)

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| LA.RI.2.5 | Know and use various text features (e.g., captions, bold print, subheadings, glossaries, indexes, electronic menus, icons) to locate key facts or information in a text efficiently. |
| LA.RI.2.7 | Explain how specific illustrations and images (e.g., a diagram showing how a machine works) contribute to and clarify a text. |
| 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.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. |
| SOC.6.1.4.C.3 | Explain why incentives vary between and among producers and consumers. |
| SOC.6.1.4.C.5 | Explain the role of specialization in the production and exchange of goods and services. |
| SOC.6.1.4.C.CS2 | Economics is a driving force for the occurrence of various events and phenomena in societies. |
| 2-LS4-1 | Make observations of plants and animals to compare the diversity of life in different habitats. |
| 2-PS1-1 | Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. |
| 2-PS1-2.PS1.A.1 | Different properties are suited to different purposes. |
| 2-PS1-1.PSI.A.1 | Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties. |