Fifth Grade

Unit Name	***Unit 2:*** *Building Conceptual Understanding of Place Value Using Measurement and Data Reasoning*	**Unit Duration (Days)**	*4-5 weeks*

GA K-12 Standards

In this unit, students will solve problems by representing mathematical relationships between quantities using mathematical expressions and equations. Students will investigate the effects of multiplying whole numbers by powers of 10. Students will change units to related units within the same measurement system by multiplying or dividing using conversion factors and use line plots to display a data set of measurements that includes fractions. Students will also use operations to solve problems based on data displayed in a line plot. The students will select appropriate units, strategies, and tools for solving problems that involve estimating and measuring volume. Students will communicate precisely by engaging in discussion about their reasoning using appropriate mathematical language.

5.NR.1: **Use place value understanding to solve real-life, mathematical problems.**
- **5.NR.1.1** Explain that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.
- **5.NR.1.2** Explain patterns in the placement of digits when multiplied or divided by a power of 10. Use whole number exponents to denote powers of 10, up to 10^3 .

5.MDR.7: **Solve problems involving customary measurements, metric measurements, and time and analyze graphical displays of data to answer relevant questions.**
- **5.MDR.7.1** Explore real-life problems involving different units of measurement, including distance, weight, volume, and time.
- **5.MDR.7.2** Ask questions and answer them based on gathered information, observations, and appropriate graphical displays to solve problems relevant to everyday life.
- **5.MDR.7.3** Convert among units within the metric system and then apply these conversions to solve multi-step, real life problems.
- **5.MDR.7.4** Convert among units within relative sizes of measurement units within the customary measurement system.

5.MP.1-8 Display perseverance and patience in problem-solving. Demonstrate skills and strategies needed to succeed in mathematics, including critical thinking, reasoning, and effective collaboration and expression. Seek help and apply feedback. Set and monitor goals. *(It is important to note that MPs 1, 3 and 6 should support the learning in every lesson.)*
- **5.MP.1** Make sense of problems and persevere in solving them.
- **5.MP.2** Reason abstractly and quantitatively.
- **5.MP.3** Construct viable arguments and critique the reasoning of others.
- **5.MP.4** Model with mathematics.
- **5.MP.5** Use appropriate tools strategically.
- **5.MP.6** Attend to precision.
- **5.MP.7** Look for and make use of structure.

- **5.MP.8** Look for and express regularity in repeated reasoning.

The [Framework for Statistical Reasoning](#) and the [Mathematical Modeling Framework](#) should be taught throughout the units. The [K-12 Mathematical Practices](#) should be evidenced at some point throughout each unit depending on the tasks that are explored. It is important to note that MPs 1, 3 and 6 should support the learning in every lesson.

Essential Questions/ I Can Statements

- How does the placement of digits affect their value?
- I can identify that a digit to the left is worth ten times more than the digit to the right.
- I can identify that a digit to the right is worth 1/10 the value of the digit to the left.
- I can use conversion factors to solve problems involving customary units of measurement.
- What is the relationship between yards, feet, and inches?
- What is the relationship between pounds and ounces?
- I can convert between units in the customary measurement system focusing on length.
- What is the relationship between kilometers, meters, and centimeters?
- What is the relationship between liters and milliliters?
- I can convert between metric measurements to solve multistep, practical problems.

Tier II Vocabulary Words- High Frequency Multiple Meaning	**Tier III Vocabulary Words-** Subject/ Content Related Words
conversion/convert, length, units of measure, line plot, numerical patterns, liquid volume,, mass, rules, measurement, weight	metric and customary system, power of ten [K-12 Mathematics Glossary](#)

Assessments

Formative Assessment(s):
- 5.GSR.NR.1.1
- 5.GSR.NR.1.2
- 5.GSR.MDR.7
- MCS K-5 Activity & Assessment Collection

Estimate - Measure - Estimate 5.MDR.7 Performance Task
- In this lesson students will estimate and make actual measurements for length, time, liquid volume, weight or mass. They will convert those measurements to a different unit within the same measurement system and use that to estimate the measurement of a similar item. *(Suggested Time Frame 1-2 days)*

It is the responsibility of each schools' grade level PLC to identify appropriate instructional lessons and resources, based on data and student needs, using the suggested pacing duration. The following learning tasks have been vetted to align to the standards included in this unit. The GA Dept. of Education strongly recommends that any additional tasks, resources, and/or assessments used for instruction should be vetted using the [Quality Assurance Rubric](#), to ensure alignment to the state standards.

Objective or Content	Learning Experiences		Differentiation Considerations

5.NR.1: Use place value understanding to solve real-life, mathematical problems.	**GA DOE Learning Plans**
	
	Place Value Structure
	In this learning plan, students will explore the structure of the place value system. Students will use base ten blocks to visually create numbers and show how the place value system is used to efficiently multiply and divide powers of 10. (Suggested Timeframe: 2-3 days)
	   ● Teacher Guidance
	   ● Student Reproducibles
	
	Patterns in Powers of Ten
	In this learning plan, students explore the understanding of exponents and the placement of digits when numbers are multiplied or divided by a power of ten. Students first build an understanding of exponents through a visual understanding of powers of ten. Students then explore multiplying and dividing by powers of ten using a place value chart. (Suggested Timeframe: 1-2 days)
	   ● Teacher Guidance
	   ● Student Reproducibles
	
	Ten Again
	In this learning plan, students will apply their understanding of exponents and the placement of digits when numbers are multiplied or divided by a power of ten. (Suggested Timeframe: 2-3 days)
	   ● Teacher Guidance
	   ● Student Reproducibles
	
	Track & Field
	In this learning plan, students apply place value reasoning and their knowledge of multiplying and dividing by powers of ten to convert between different metric lengths. (Suggested Timeframe: 2-3 days)
	   ● Teacher Guidance
	   ● Student Reproducibles
		MCS Curriculum Resources
		
		SAVVAS Topic 1: Understand Place Value
		Students expand their understanding of the place-value system for whole numbers and decimals.
		   ● Lesson 1-1 Patterns with Exponents and Powers of 10
		   ● Lesson 1-2 Understand Whole-Number Place Value
		
		SAVVAS Topic 3: Fluently Multiply Multi-Digit Whole Numbers
		Students will use place-value understandings and patterns to mentally multiply whole numbers and powers of 10.
		   ● Lesson 3-1 Multiply Greater Numbers by Powers of 10
		
		SAVVAS Topic 5: Use Models and Strategies to Divide Whole Numbers
		Students will use place-value patterns and mental math to find quotients.
		   ● Lesson 5-1 Use Patterns and Mental Math to Divide
		
		MIP Module 1: Understanding Place Value
		Students continue to expand their place-value understanding and powers of 10.
		   ● What do you notice?, p 20
		   ● Making Observations about place value, p. 25
		   ● Place Value Partners p. 30
		   ● Talk About It/ Write About It, p.31
		   ● What is 3?, p.31
		   ● Guess My Number, p. 31
		   ● Create It, p. 32
		   ● Multiplying by Power of 10 p.41
		   ● Dividing by Power of 10 p.42
		   ● Powerful 10, p.43
		   ● Building Expressions with Powers of 10, p. 44
		   ● Build It, p. 45
			GADOE Intervention Tasks
			
			Close to 100 or 100: Identify relative values of digits in different places.
			
			Sherpa (Tensing): Multiply by 10s, 100s, 1000s, and other multiples of 10
			
			Hut Building:Convert between metric units, using whole numbers and commonly used decimals.

5.MDR.7 Solve problems involving customary measurements, metric measurements, and time and analyze graphical displays of data to answer relevant questions**.**	**Pourable Math** *In this learning plan, students will solve multi-step problems involving metric liquid measurements conversions. Students will focus on base-ten structure and conversions while working with decimals, fractions, and powers of ten in exponential form. They will extend this learning to solving contextual problems. (Suggested Timeframe: 1-2 days)* ● Teacher Guidance ● Student Reproducibles **Length Conversions** *In this learning plan, students solve conversion problems with standard length units. Students will use the skills they developed in previous grade levels where they learned to multiply and divide whole numbers. Students continue to work with whole numbers and think strategically about whether to convert from the larger unit to the smaller unit or from the smaller unit to the larger unit. (Suggested Timeframe: 1-2 days)* ● Teacher Guidance ● Student Reproducibles ● Black Line Masters **Measure, Measure** *In this learning plan, students will estimate and make actual measurements for length, time, liquid volume, weight or mass. They will convert those measurements to a different unit within the same measurement system and use that to estimate the measurement of a similar item. (Suggest Timeframe: 3-4 days)* ● Teacher Guidance ● Student Reproducibles	**SAVVAS Topic 12: Convert Measurements** *Students will focus on measuring length, capacity, weight, mass, and time.* ● Lesson 12-1: Convert Customary Units of Length ● Lesson 12-2: Convert Customary Units of Capacity ● Lesson 12-3: Convert Customary Units of Weight ● Lesson 12-4: Convert Metric Units of Length ● Lesson 12-5: Convert Metric Units of Capacity ● Lesson 12-6: Convert Metric Units of Mass ● Lesson 12-7: Convert Units of Time ● Lesson 12-8: Solve Word Problems Using Measurement Conversions **MIP Module 11: Converting Like Measurement Units** *Students will convert between different units within the same measurement system. Students will solve multi-step word problems using conversions.* ● Using Conversion Tables, p. 232 ● Decimal Computations & Metric Conversions, p. 234 ● Problem Solving with Conversions with Customary Units, p.224 ● Investigating Heights, Measure and Convert, Metric Measurement Match & Focus on the Question, p.241	Making Benchmarks: Create and use appropriate units and devices to measure length, area, volume and capacity, weight (mass), turn (angle), temperature, and time. Weights: Create and use appropriate units and devices to measure length, area, volume and capacity, weight (mass), turn (angle), temperature, and time.

Content Resources

GA DOE Links: ● GA DOE Grade 5 Unit 2: *Building Conceptual Understanding of Place Value Using Measurement and Data Reasoning* ● GA DOE Grade Comprehensive Grade Level Overview ● GA DOE Grade Level Guide for Effective Mathematics Instruction ● K-5 Georgia Mathematics Strategies Toolkit	**Additional Resources:** ● Metric Longs ● Convert Measurements a ● Convert Measurements b ● Converts Measurements c

Last Revised: April 2023

- Mathematics to Support English Language Learners
- Georgia Numeracy Project
- K-12 Mathematical Modeling Framework
- K-12 Statistical Reasoning Framework
- K-12 Mathematical Practices