Grade 5 Math Unit 6-Measurement & Data

UNIT OVERVIEW

Instruction time in Grade 5 centers around 3 Critical Focus Areas. This unit addresses Critical Focus Areas #1,**Developing fluency with addition and subtraction of fractions and developing understanding of the multiplication of fractions and of division of fractions in limited cases (unit fractions divided by whole numbers and whole numbers divided by unit fractions)** and #2, **Extending division to 2-digit divisors, integrating decimal fractions into the place value system and developing understanding of operations with decimals to hundredths, and developing fluency with whole number and decimal operations.** (See Connections for explanation)

This unit will address the following clusters:
- Convert like measurement units within a given measurement system
- Represent and interpret data

STANDARDS

CC_Common Core State Standards - Mathematics (2010) - Grade 5
Domain 5.MD Measurement and Data
Cluster Statement: Convert like measurement units within a given measurement system.
Standard 5.MD.1 Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi step, real world problems.

Cluster Statement: Represent and interpret data.
Standard 5.MD.2 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots.

CONTENT ELABORATIONS

5.MD.1	**5.MD.1** calls for students to convert measurements within the same system of measurement in the context of multi-step, real-world problems. Both customary and standard measurement systems are included; students worked with both metric and customary units of length in second grade. In third grade, students work with metric units of mass and liquid volume. In fourth grade, students work with both systems and begin conversions within systems in length, mass and volume. Fifth graders build on their prior knowledge of related measurement units to determine equivalent measurements. Prior to making actual conversions, they examine the units to be converted, determine if the converted amount will be more or less than the original unit, and explain their reasoning. They use several strategies to convert measurements. When converting metric measurement, students apply their understanding of place value and decimals. Fifth graders should explore how the base-ten system supports conversions within the metric system. Example: 100 cm = 1 meter **MP.1, MP.2, MP.5, MP.6** should be emphasized.
5.MD.2	**5.MD.2** provides a context for students to work with fractions by measuring objects to one-eighth of a unit. This includes length, mass and liquid volume. Students are making a line plot of this data and then adding and subtracting fractions based on data in the line plot. Example: Students measured objects in their desk to the nearest 1/2, 1/4 or 1/8 of an inch then displayed data collected on the line plot. How many objects measured 1/4? 1/2? If you put all the objects together end to end what would be the total length of all the objects? **MP.1, MP.2, MP.4, MP.5, MP.6, MP.7** should be emphasized.

UNIT VOCABULARY

length	ton (T)	millimeter (mm)
inch (in.)	capacity	meter (m)
customary system	cup (c)	kilometer (km)
foot (ft.)	pint (pt)	mass
yard (yd.)	quart (qt)	gram (g)
mile (mi.)	gallon (gal)	kilogram (kg)
convert	fluid ounce (fl oz)	milligram (mg)
weight	fair share	liter (L)
ounce (oz.)	metric system	milliliter (mL)
pound (lb.)	centimeter (cm)	

BIG IDEAS

ENDURING UNDERSTANDINGS

* When changing from smaller units to larger related units within the same measurement system, there will be fewer larger units.
* A line plot can provide a sense of the shape of the data, including how spread out or how clustered the data points are. Each data point is included in the line plot along a continuous numeric scale, similar to a number line.

ESSENTIALS QUESTIONS

Choose a few questions based on the needs of your students

* How can I use measurement conversions to solve real-world problems?

CONNECTIONS

In **Critical Focus Area #1**, students apply their understanding of fractions and fraction models to represent the addition and subtraction of fractions with unlike denominators as equivalent calculations with like denominators. They develop fluency in calculating sums and differences of fractions, and make reasonable estimates of them. Students also use the meaning of fractions, of multiplication and division, and the relationship between multiplication and division to understand and explain why the procedures for multiplying and dividing fractions make sense. (Note: this is limited to the case of dividing unit fractions by whole numbers and whole numbers by unit fractions.)

In **Critical Focus Area #2**, students develop understanding of why division procedures work based on the meaning of base-ten numerals and properties of operations. They finalize fluency with multi-digit addition, subtraction, multiplication and division. They apply their understandings of models for decimals, decimal notation, and properties of operations to add and subtract decimals to hundredths. They develop fluency in these computations, and make reasonable estimates of their results. Students use the relationship between decimals and fractions, as well as the relationship between finite decimals and whole numbers (i.e., a finite decimal multiplied by an appropriate power of 10 is a whole number) to understand and explain why the procedures for multiplying and dividing finite decimals make sense. They compute products and quotients of decimals to hundredths efficiently and accurately.

This unit is connected to **4.MD.1, 5.NF.1-2, 5.NF.4, 5NF.7**

Standards for Mathematical Practice (SMP)
MP.1 Make sense of problems and persevere in solving them
MP.2 Reason abstractly and quantitatively
MP.3 Construct viable arguments and critique the reasoning of others
MP.4 Model with mathematics
MP.5 Use appropriate tools strategically
MP.6 Attend to precision
MP.7 Look for and make use of structure (Deductive reasoning)
MP.8 Look for and express regularity in repeated reasoning (Inductive Reasoning)

CONVERT LIKE MEASUREMENT UNITS WITHIN A GIVEN MEASUREMENT SYSTEM

	CONTENT	SKILLS
5,MD.1	Convert among different-sized standard measurement units within a given measurement system.	Convert among different-sized standard measurement units within a given measurement system. 1. Recognize units of measurement within the same system. 2. Divide and multiply to change units. 3. Convert units of measurement within the same system. 4. Solve multi-step, real world problems that involve converting units.

REPRESENT AND INTERPRET DATA

	CONTENT	SKILLS
5.MD.2	Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8).	Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). 1. Identify benchmark fractions (1/2, 1/4, 1/8). 2. Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). 3. Solve problems involving information presented in line plots which use fractions of a unit (1/2, 1/4, 1/8) by adding, subtracting, multiplying, and dividing fractions.

Common Core Model Curriculum
McGraw-Hill, **My Math** Chapter 11
Manipulatives: Yard Sticks, Meter sticks, ruler with customary and metric, teasponns/tablespoons, measuring cups with metric and customary measurments
Hands On Standards - Grade 5/6 Data analysis and Probability Lesson 1
Georgia Math frameworks, Grade 5 Unit 7
Discovering Gallon Man http://illuminations.nctm.org/LessonDetail.aspx?ID=L513
Fractions in Every Day Life http://illuminations.nctm.org/WebResourceReview.aspx?ID=489
IXL- http://www.ixl.com/math/standards/common-core/grade-5
Math Playground/Common Core http://www.mathplayground.com/common_core_state_standards_for_mathematics_grade_5.html