



Using Measurement and Data to Solve Problems

Key Content from This Unit:

Students solve multistep problems involving measurement and conversion of measurements from a larger unit to a smaller unit (e.g., feet to inches, meter to centimeters, dollars to cents). They solve problems involving distances, intervals of time, liquid volumes, and masses of objects. Students build off of their measurement work from previous grade levels, solidify their understanding of the relationship between metric units and the place value chart, and apply unit conversions to solve and reason about multi-step word problems. Tape diagrams and number lines will serve as models throughout to support applying the standard algorithm to word problems.

Vocabulary to Know:

- Kilometer:** km, a unit of measure for length)
- Mass:** the measure of the amount of matter in an object
- Milliliter:** mL, a unit of measure for liquid volume
- Mixed units:** e.g., 3 m 43 cm
- Capacity:** the maximum amount that something can contain
- Convert:** to express a measurement in a different unit
- Kilogram:** (kg), gram (g) units of measure for mass
- Liter:** (L) unit of measure for liquid volume
- Meter:** (m), centimeter (cm) units of measure for length
- Table:** used to represent data
- Weight:** the measurement of how heavy something is

Length Conversion Table

Yards	Feet
1	3
2	6
3	9
<i>n</i>	<i>n x 3</i>

Common Core Focus:

- Record measurements in a two-column table.
- Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.
- Fluently add and subtract any whole number using the standard algorithm.
- Express metric length measurements in terms of a smaller unit; model and solve addition and subtraction word problems involving metric length, mass and capacity
- Know and relate metric units to place value units in order to express measurements in different units.
- Use addition and subtraction to solve multi-step word problems involving length, mass, and capacity.

What came before this:

In grade 3, students solved problems involving measurement of intervals of time in minutes. They measured, estimated, and solved one-step problems using liquid volume and mass of objects using grams, kilograms, and liters within the same unit.

What comes after this:

Using models and drawings as well as place value strategies, fifth graders will convert decimal units and use these conversions to solve multistep word problems (e.g., 5 centimeters = 0.05 meter). They will learn that volume is an attribute of a geometric figure and a quantity in measurement.

Spotlight on the Math Practices

Model with Mathematics

Mathematically proficient students will experiment with representing problem situations in multiple ways including numbers, words (mathematical language), drawing pictures, using objects, making a chart, list, or graph, creating equations, ect.

In this unit, students will **model with mathematics** when they:

- Apply the mathematics they know to solve problems arising in everyday life.
- Routinely interpret mathematical results in the context of the situation.
- Reflect on whether results make sense.

How Can You Help?

- Use measurement tools when baking or cooking
- Compare items by length or weight
- Practice scheduling events to determine elapsed time.
- Read and analog clock throughout the day.
- Use a stopwatch to keep track of how much T.V. you watch throughout the week and how much time you spend on homework and compare weight, and compare the two amounts.

KEY MATHEMATICAL MODELS of the COMMON CORE

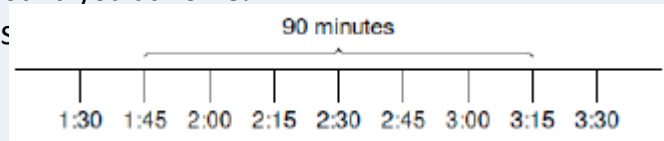
Number Line

The number line is a powerful, flexible model that students can use in many ways. In this particular unit, students use number lines to solve problems involving elapsed time, and measurement. As students move through the grades, number lines can be used to examine the relationships between numbers in ever more detailed ways, including decimals, fractions, and eventually positive and negative numbers. See how many number lines you and your student can spot around you at home!

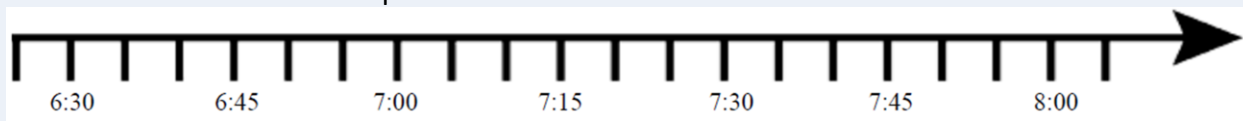
Students solve elapsed time problems us

Examples:

What time does Maria have to leave to be at her friend's house by a quarter to 3 if the trip takes 90 minutes?



At 7:00 a.m. Sarah wakes up to go to school. It takes her 8 minutes to shower and 9 minutes to get dressed and 17 minutes to eat breakfast. How many minutes does she have until the bus comes at 8:00a.m.? Use the number line to solve the problems.



Some Resources to Help at Home

- <http://www.shodor.org/interactivate/activities/ElapsedTime/> - Practice elapsed time with this interactive game
- <https://learnzillion.com/lessons/2847-represent-fractional-distance-measurement-quantities-using-diagrams> - learn how to represent measurement by creating diagrams in this video
- http://www.bgfl.org/bgfl/custom/resources_fnp/client_fnp/ks2/maths/measures/index.htm - interactive game on measurement conversions