



## Topic B

# Application of Metric Unit Conversions

## 4.MD.1, 4.MD.2

<b>Focus Standards:</b>	4.MD.1 <sup>1</sup>	Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. <i>For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...</i>
	4.MD.2 <sup>2</sup>	Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.
<b>Instructional Days:</b>	2	
<b>Coherence -Links from:</b>	G2–M2	Addition and Subtraction of Length Units
	G3–M2	Place Value and Problem Solving with Units of Measure
<b>-Links to:</b>	G5–M1	Place Value and Decimal Fractions
	G5–M2	Multi-Digit Whole Number and Decimal Fraction Operations

In Topic B, students continue to build off their measurement work from previous grade levels. They 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 (**4.MD.2**). Applying the skills learned in Module 1, students discover and explore the relationship between place value and conversions. The beauty of both the place value and measurement systems is the efficiency and precision permitted by the use of different size units to express a given quantity.

<sup>1</sup>Pounds, ounces, and time are addressed in Module 7. This is a non-tested standard, but expressing metric measurements of length, mass, and capacity from larger to smaller units strengthens the upcoming modules.

<sup>2</sup>Time and money are addressed in Module 7. This is a non-tested standard, but the context of operating on distance, volume, and mass strengthens the upcoming modules.

Lesson 4 connects metric measurement conversions and place value by comparing mixed units of measure and verifying statements such as *1 kilometer is 1,000 times as much as 1 meter*. In Lesson 5, as students solve two- and three-step word problems by adding and subtracting metric units, their ability to reason in parts and wholes is taken to the next level. This is important preparation for multi-digit operations and manipulating fractional units in future modules.

Throughout Topic B, tape diagrams and number lines serve as models to support application of the standard algorithm to word problems. Students solve problems by converting between units and using simplifying strategies or algorithms (**4.MD.1**).

### A Teaching Sequence Toward Mastery of Application of Metric Unit Conversions

**Objective 1: Know and relate metric units to place value units in order to express measurements in different units.**  
(Lesson 4)

**Objective 2: Use addition and subtraction to solve multi-step word problems involving length, mass, and capacity.**  
(Lesson 5)