Common Core Standards Plus® – Mathematics – Grade 5		
Domain: Measurement & Data	Focus: Converting Metric Units	Lesson: #1
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.		

Lesson Objective: The students will convert metric units for distance and use the conversion to solve problems.

Introduction: "Today we will learn how to convert different measurements of distance for the metric system and use that knowledge to help us solve real world problems."

Instruction: "The *standard unit* is the unit to which all other units within the system relate. When we measure distance within the metric system, the standard unit is the meter (m). Many things we measure are smaller or larger than is appropriate to measure with a meter. We can *convert* the standard unit into smaller or larger units. Look at the chart at the top of your page. The metric system is based on a system of ten, so we multiply or divide by a power of ten to *convert* between units."

Guided Practice: "We will use the table to help us convert units of measurement for distance within the metric system. The meter is the *standard unit* of measurement for length or distance in the metric system. Each new unit of measure is based on that unit, and its prefix lets us know its value to the meter. Look at the bottom row of the chart. What pattern do you see? (Pause and allow students to examine the pattern before they share.) As the units get smaller, the number of them gets larger. Each space we move smaller from the kilometer in terms of units is a power of ten larger in terms of number. Look at Example A. One space is multiplied by 10. Three spaces is multiplied by 1,000. What pattern do you see as we convert from the centimeter to larger units?   (Pause and allow students to examine the pattern before they share. 3 spaces or 1,000; 1 km × 1,000 = 1,000 meters.) Look at Example B. To change from meters to hectometers we divided. One space means you divide by 10, two spaces means you divide by 100. (2 spaces or 100, 1 ÷ 100, 1/100, 0.01)"

Independent Practice: "Now you will complete the problems independently. Read each problem and convert the measurement."

Review: Review problems with the students. Partner Discussion: Ask students to share the pattern they see happening between the number of steps and the multiple of ten they use to convert. Listen for students to note that the number of steps away is the power of ten you multiply or divide by when you convert (i.e., three steps equals 10^3 or 10 × 10 × 10 = 1,000).

Closure: "Today we learned how to convert different measurements of distance for the metric system and used that knowledge to help us solve real world problems."

Answers:
1. 2 spaces or 100; 100,000 ÷ 100 = 1,000 m
2. 3 spaces or 1,000; 10 × 1,000; 10,000 m
3. 1 space or 10; 57 × 10; 570 m
4. 3 spaces or 1,000; 60 ÷ 1,000; 0.06 km
5. 27.86 meters of rope
6. 15 meter marks

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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.

A **standard unit** is the unit to which all other units in the system relate.
A meter is the standard unit that measures length.

Thousands	Hundreds	Tens	Basic Unit	Tenths	Hundredths	Thousandths
1,000	100	10	1	0.1	0.01	0.001
kilometer	hectometer	decameter	meter	decimeter	centimeter	millimeter
1 km =	10 hm =	100 dam =	1,000 m =	10,000 dm =	100,000 cm =	1,000,000,000 mm

When we change larger units to smaller units, we multiply.
When we change smaller units to larger units, we divide.

Example A:	**Example B:**
1 km = <u>1,000</u> m	1 m = _____ hm
Count the number of spaces you must move from km to m. (3)	Count the number of spaces you must move from m to hm. (2)
Multiply 1 by 1,000 (three zeroes).	Divide 1 by 100 (two zeroes). 1 m = 0.01 hm

Directions: Read each problem and convert the measurement.

1. 100,000 cm ⟶ m

    _____ spaces or _____

    Number Sentence: _____

    100,000 cm = _____ m

2. 10 km ⟶ m

    _____ spaces or _____

    Number Sentence: _____

    10 km = _____ m

3. 57 cm ⟶ mm

    _____ spaces or _____

    Number Sentence: _____

    57 cm = _____ mm

4. 60 m ⟶ km

    _____ spaces or _____

    Number Sentence: _____

    60 m = _____ km

5. Jim is buying rope at the hardware store for a science project. He knows he will need 2,786 cm of rope, but the hardware store only sells rope by the meter. How many meters of rope does Jim need to buy?

6. Matt has measured a rectangle for playing soccer that is 0.15 hm long. He needs to mark the number of meters along the side line. How many meter marks will he need to make?