



# MATH NEWS



Grade 4, Module 2, Topic B

## 4<sup>th</sup> Grade Math

Module 2: Unit Conversions and Problem Solving with Metric Measurement

### Math Parent Letter

This document is created to give parents and students a better understanding of the math concepts found in Eureka Math (© 2013 Common Core, Inc.) that is also posted as the Engage New York material which is taught in the classroom. Module 2 of Eureka Math (Engage New York) covers unit conversions and problem solving with metric measurement.

### Words to Know:

- Capacity** - the maximum amount something can contain
- Weight/Mass** – the measurement of how heavy something is
- Length** -the measurement of something from end to end

### OBJECTIVES OF TOPIC B

- ▶ 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.

### Focus Area ▶ Topic B: Application of Metric Unit Conversions Understanding Metric Conversions

While practicing measurement conversions, students will complete tables and fill in the missing parts of number sentences as demonstrated in the examples below.

### Conversion Practice with Tables

Complete the following table.

Smaller Unit	Larger Unit	How Many Times as Large
one	hundred	100
centimeter	meter	100
one	thousand	1,000
gram	kilogram	1,000
meter	kilometer	1,000

### Conversion Practice with Missing Parts

429 cm is 4 meters 29 cm.

2,456 m is 2 kilometers 456 m.

13,709 g is 13 kg 709 grams.

### Metric Measurements on a Number Line

Students will need to be able to place various forms of measurements on a number line.

### Example Problem and Answer

Place the following measurements on the number line:

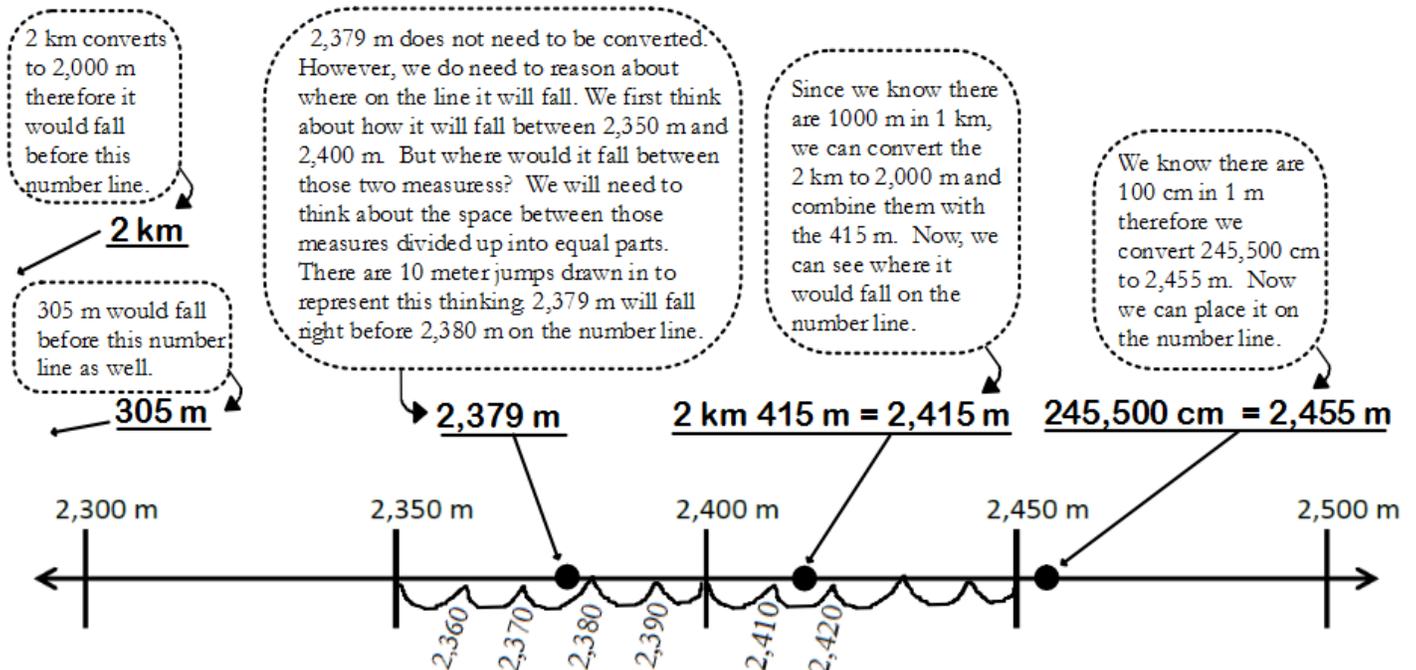
2 km

305 m

2,379 m

2 km 415 m

245,500 cm



**Strategies for Solving Multi Step Problems**

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, which is important preparation for multi-digit operations and for manipulating fractional units in future modules. Tape diagrams and number lines will serve as models throughout to support applying the standard algorithm to word problems. Students solve problems by converting between units and by using simplifying strategies or algorithms. Examine the student work below to better understand these strategies.

**Example Problem and Answers**

Coach Thomas had a bottle containing 8 liters 500 milliliters of liquid chlorine. He poured 5 L 293 mL of chlorine into the pool at 6:00 am. At 4:30 pm, he noticed the pool was still cloudy. He put an extra 1 L 108 mL in the pool. By the next morning, the pool was finally clear. How much chlorine did Coach Thomas have left in the bottle?

▶ Here's how Blake answered the question.

Blake set up a tape diagram to help better understand the problem. ①

8 L 500 mL

First amount poured in pool	Extra poured in	?
5 L 293 mL	1 L 108 mL	

② The tape diagram shows that the amount left in the container can be found by subtracting the two amounts poured into the pool, (2 known parts) from the amount Coach Thomas started with, (the whole).

Blake's next step was to add the two amounts poured in the pool (2 known parts) together. ③

Blake then converted the liters to milliliters and used the algorithm strategy. ④

$$\begin{array}{r} 5,293 \text{ mL} \\ + 1,108 \text{ mL} \\ \hline 6,401 \text{ mL} \end{array}$$

⑤ 6,401 mL of chlorine was poured from the bottle so Blake subtracted that amount from the whole using a simplifying strategy.

⑥ He used a number bond to pull out 1 mL. This made subtracting 6,401 mL from 8,499 mL much simpler.

$$\begin{array}{r} 8,500 \text{ mL} - 6,401 \text{ mL} \\ \hline 8,499 \text{ mL} \quad 1 \text{ mL} \\ - 6,401 \text{ mL} \\ \hline 2,098 \text{ mL} \end{array}$$

⑦ He added the remaining 1 mL from the number bond to find the amount of chlorine left in the bottle.

$$\begin{array}{r} 2,098 \text{ mL} \\ + 1 \text{ mL} \\ \hline 2,099 \text{ mL} = 2 \text{ L } 99 \text{ mL} \end{array}$$

▶ Here's how Cara answered the question.

Cara set up a tape diagram as well. ①

8 L 500 mL		
5 L 293 mL	1 L 108 mL	?

Cara's next step was to add the liters then add the milliliters. ②

$$5 \text{ L} + 1 \text{ L} = 6 \text{ L}$$

③ To add the mL, she made a number bond to pull out 7 mL. Then she put the 7 mL with the 293 mL. That made 300 mL which she added to the 101 mL from the rest of the number bond for a total of 401 mL.

$$\begin{array}{l} 293 \text{ mL} + 108 \text{ mL} \\ \hline 7 \text{ mL} \quad 101 \text{ mL} \\ \hline 300 \text{ mL} \quad 401 \text{ mL} \end{array}$$

④ Then Cara combined the liters and the milliliters to get the amount of chlorine poured from the bottle.

$$6 \text{ L } 401 \text{ mL}$$

⑤ She needed to subtract to find the amount left in the bottle.

$$8 \text{ L } 500 \text{ mL} - 6 \text{ L } 401 \text{ mL}$$

⑥ Cara used the number line below to model the subtraction.

⑦ She first jumped 9 mL to get to 6 L 410 mL.

⑧ Next, she jumped 90 mL to get to 6 L 500 mL.

⑨ Then she jumped 2 L to get to 8 L 500 mL.

⑩ Finally, she added the jump amounts to find out how much chlorine is left in the bottle.

$$2 \text{ L} + 90 \text{ mL} + 9 \text{ mL} = 2 \text{ L } 99 \text{ mL}$$