

Lesson  
31

## Understanding Metric Units

4.MD.1

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.



## Understand the Standards

Sometimes a measurement is not given in the unit you need to use. For example, you may know that you need 10 meters of string, but the label on the package of string is in centimeters. In order to know if you have enough string, you need to **convert**, or change, meters to centimeters.

**Words to Know**

convert

These charts show equivalent metric units.

Length	
The width of your index finger is about 1 centimeter. The width of a door is about 1 meter. A little more than half a mile is about 1 kilometer.	$100 \text{ centimeter (cm)} = 1 \text{ meter (m)}$ $1,000 \text{ m} = 1 \text{ kilometer (km)}$

Mass	
A paper clip has a mass of about 1 gram. A large book has a mass of about 1 kilogram.	$1,000 \text{ grams (g)} = 1 \text{ kilogram (kg)}$

Capacity	
A medicine dropper holds about 1 milliliter. A water bottle holds about 1 liter.	$1,000 \text{ milliliters (mL)} = 1 \text{ liter (L)}$

You can make a table to help you convert measurements. Use the Length chart at the top of the page to convert meters to centimeters.

<b>meters (m)</b>	1	2	3	4	5	6	7	8	9	10
<b>centimeters (cm)</b>	100	200	300	400	500	600	700	800	900	1,000

The table shows that 10 meters = 1,000 centimeters.



## Guided Instruction

Paula needs 4 liters of juice for a punch recipe. How many milliliters of juice does she need?

**Step 1** Look at the Capacity chart on the first page to find how many milliliters are in 1 liter.

$$1,000 \text{ mL} = 1 \text{ L}$$

**Step 2** Make a table using  $1,000 \text{ mL} = 1 \text{ L}$ .

liters (L)	1	2	3	4
milliliters (mL)	1,000	2,000	3,000	4,000

**Step 3** Read the table to solve the problem.

Paula will need 4,000 mL of juice.



## On Your Own

Use the table to complete each conversion.

kilograms (kg)	1	2	3	4	5	6	7	8	9
grams (g)	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000

1.  $3 \text{ kg} = \underline{\hspace{2cm}} \text{ g}$

2.  $7 \text{ kg} = \underline{\hspace{2cm}} \text{ g}$

3.  $5 \text{ kg} = \underline{\hspace{2cm}} \text{ g}$

4.  $2 \text{ kg} = \underline{\hspace{2cm}} \text{ g}$

Name the metric unit you would use to measure each.

5. length of a pencil

\_\_\_\_\_

6. mass of a car

\_\_\_\_\_

7. capacity of a bathtub

\_\_\_\_\_

8. mass of a strawberry

\_\_\_\_\_

9. capacity of a spoon

\_\_\_\_\_

10. distance between two cities

\_\_\_\_\_

Use what you know about metric measures to solve the problem.

11. There are 5 students completing a craft project. They have 10 meters of ribbon to share equally. How many centimeters of ribbon will each student get?

\_\_\_\_\_

12. Complete the table.

<b>kilometers (km)</b>	1	2	3	4	5	6	7	8
<b>meters (m)</b>								

Use the table to complete each conversion.

13. 4 km = \_\_\_\_\_ m

14. 9 km = \_\_\_\_\_ m

15. 6 km = \_\_\_\_\_ m

16. 8 km = \_\_\_\_\_ m

Answer the questions. Share your ideas with a classmate.

17. Jacob has a 1-liter bottle of water. He has a cup that holds 500 mL. How many times can he fill his cup using the liter bottle?

---

18. Grace wants to measure the height of a candle. Which metric unit should she use? Explain your reasoning.

---



---

19. For a science project, each student team needs 3 kilograms of a soil. There are 4 student teams. How many grams of soil are needed for all the teams? Explain how you found your answer.

---



---

Answer the questions below.

20. How many grams are in 5 kilograms?

- A. 50 grams
- B. 500 grams
- C. 5,000 grams
- D. 50,000 grams

21. Kyle is finding the distance from Denver to Sacramento using metric units. Which unit should he use?

- A. kilometers
- B. meters
- C. kilograms
- D. centimeters

22. A student wants to find the mass of a small handful of blueberries. Which metric unit should the student use? Explain your reasoning.

---



---

- Elevate** 23. Each punch bowl has 2 liters of juice in it. There are 3 punch bowls at the party. If Jenny buys 8,000 milliliters of juice, will she have enough punch to fill all three of the punch bowls? Explain how you found your answer.

---

---

---

---

- Elevate** 24. A decimeter is a metric unit of length that is larger than a centimeter, but smaller than a meter. There are 10 decimeters in 1 meter.

Use the information above to complete the conversion table for meters and decimeters.
