Metric System: Weight and Capacity

Some metric units of weight are kilogram, gram, and milligram. A person that weighs about 50 pounds measured in the customary system would weigh 110 kilograms in the metric system.

Metric units of capacity measure how much a container holds. A liter container is close to holding about a quart of liquid while a milliliter holds about a dropper full of liquid.

Metric System Conversion Tables

Length	
kilometer (km)	1000 meters
1 meter (m)	100 centimeters
1 centimeter (cm)	10 millimeters (mm)

Weight	
kilogram (kg)	1000 grams
1 gram (g)	1000 milligrams (mg)

Capacity	
liter (l)	1000 milliliters (ml)

Metric System Prefixes

Metric prefixes have meaning.

kilo **means 1000 times the base unit.**

kilo **+ meter means 1000 meters.**
Thus a kilometer = 1000 meters.

kilo **+ gram means 1000 grams.**
Thus a kilogram = 1000 grams.

deci **means** $\dfrac{1}{10}$**th of the base.**

deci **+ meter means** $\dfrac{1}{10}$ **of a meter.**

Thus, a decimeter is $\dfrac{1}{10}$**of a meter**   *or*   **1 meter = 10 decimeters.**

centi **means** $\dfrac{1}{100}$**th of the base.**

centi **+ meter means** $\dfrac{1}{100}$ **of a meter.**

Thus, a centimeter is $\dfrac{1}{100}$**of a meter**   *or*   **1 meter = 100 centimeters.**

milli **means** $\dfrac{1}{1000}$**th of the base.**

milli **+ meter means** $\dfrac{1}{1000}$ **of a meter.**

Thus, a millimeter is $\dfrac{1}{1000}$**of a meter**   *or*   **1 meter = 1000 millimeters.**

milli **+ gram means** $\dfrac{1}{1000}$ **of a gram**
1 gram = 1000 milligrams

milli **+ liter means** $\dfrac{1}{1000}$ **of a liter**
1 liter = 1000 milliliters

Converting Metric Units of Weight
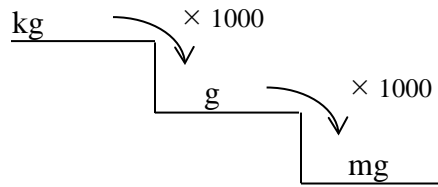
A pair of shoes could weigh a kilogram.

The weight of a cherry is close to a gram.

The weight of a grain of sand is close to a milligram.

To express a **larger unit as a smaller unit**, *multiply* by the conversion factor.

kg ⟶ × 1000

g ⟶ × 1000

mg

Solve: 3.28 kg = _____ g

Using the steps, multiply 3.28 × 1000.

3.28 kg = 3280 g

Solve: 6 g = _____ mg

Using the steps, multiply 6 × 1000.

6 g = 6000 mg

To express a **smaller unit as a larger unit**, *divide* by the conversion factor.

kg

g

÷ 1000

mg
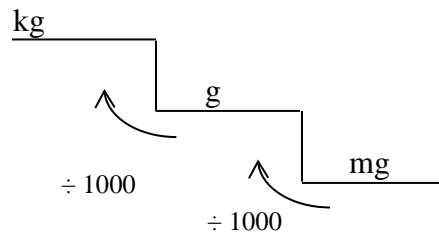
÷ 1000

Solve: 15,000 g = _____ kg

Using the steps, divide 15,000 by 1000.

15,000 kg = 15 g

Solve: 500mg = _____ g

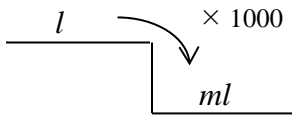Using the steps, divide 500 by 1000.

500 mg = 0.5 g

Converting Metric Units of Capacity

A liter is a little more than a quart of milk.

The amount of medicine that is held in a dropper is about one milliliter.

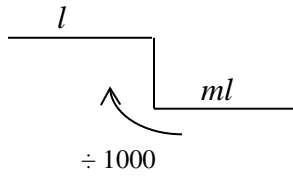To express a **larger unit as a smaller unit**, *multiply* by the conversion factor.

$$l \quad \overset{\times\ 1000}{\searrow}$$
$$ml$$

Solve: $5\ l = $ _____ ml

Using the steps, multiply 5×1000.

$$5\ l = 5000\ ml$$

To express a **smaller unit as a larger unit**, *divide* by the conversion factor.

$$\overline{l}$$

ml

÷ 1000

Solve: 350 *ml* = _____ *l*

Using the steps, divide 350 by 1000.

350 *ml* = 0.35 *l*