

Metric to Metric

The following linear units are used to measure length. Use the table to convert between metric units of length.

Kilometer	Hectometer	Dekameter	Meter	Decimeter	Centimeter	Millimeter
1,000 meters	100 meters	10 meters	1 meter	0.1 meters	0.01 meters	0.001 meters

The following units of capacity are used to measure volume. Use the table to convert between metric units of capacity.

Kiloliter	Hectoliter	Dekaliter	Liter	Deciliter	Centiliter	Milliliter
1,000 liters	100 liters	10 liters	1 liter	0.1 liters	0.01 liters	0.001 liters

The following units are used to measure mass. Use the table to convert between metric units of mass.

Kilogram	Hectogram	Dekagram	Gram	Decigram	Centigram	Milligram
1,000 grams	100 grams	10 grams	1 gram	0.1 grams	0.01 grams	0.001 grams

When converting from a larger unit to a smaller unit (left to right on the chart) multiply by moving the decimal one place to the right for every unit of measure.

Example: Convert 52.75 kilometers to centimeters.

Start with kilometers on the chart and move five units to the right to centimeters. Multiply by moving the decimal five places to the right.

$$52.75 \text{ km} = 5,275,000 \text{ cm}$$

When converting from a smaller unit to a larger unit (right to left on the chart) divide by moving the decimal one place to the left for every unit of measure.

Example: Convert 365.4 milligrams to grams.

Start with milligrams and move three places to the left to grams. Divide by moving the decimal point three units to the left.

$$365.4 \text{ mg} = 0.3654 \text{ g}$$

Customary to Customary

The following linear units are used to measure length. Use the table to convert between customary units of length.

12 inches	1 foot
36 inches	1 yard
3 feet	1 yard
5,280 feet	1 mile
1,760 yards	1 mile

The following units of capacity are used to measure volume. Use the table to convert between customary units of capacity.

2 tablespoons	1 fluid ounce
8 fluid ounces	1 cup
2 cups	1 pint
2 pints	1 quart
4 quarts	1 gallon

The following units are used to measure weight. Use the table to convert between customary units of weight.

16 ounces	1 pound
2,000 pounds	1 ton

When converting from a larger unit to a smaller unit (right to left on the chart) multiply by the conversion factor.

Example: Convert 12 yards to feet.

$$\text{Multiply: } 12 \text{ yards} \times \frac{3 \text{ feet}}{1 \text{ yard}} = 36 \text{ feet}$$

When converting from a smaller unit to a larger unit (left to right on the chart) divide by the conversion factor.

Example: Convert 14 cups to pints.

$$\text{Divide: } 14 \text{ cups} \div \frac{2 \text{ cups}}{1 \text{ pint}} = 14 \text{ cups} \times \frac{1 \text{ pint}}{2 \text{ cups}} = 7 \text{ pints}$$

Metric to Customary

	Common Benchmark	Conversion Factor
1 millimeter	About the thickness of a dime	
1 cm	About the width of a paperclip	1 inch = 2.54 centimeters
1 meter	A little longer than a yard OR About the width of a door	1 meter \approx 39.37 inches
1 kilometer	A little more than half a mile OR About the length of 6 city blocks	1 mile \approx 1.609 kilometers
1 gram	About the mass of a penny	1 ounce \approx 28.35 grams
1 kilogram	A little more than two pounds	1 kilogram \approx 2.2 pounds
1 milliliter	Less than a fourth of a teaspoon OR About 20 drops	1 teaspoon = 5 milliliters
1 liter	A little bigger than a quart	1 liter \approx 1.057 quarts

Time

60 seconds	1 minute
60 minutes	1 hour
24 hours	1 day
7 days	1 week
52 weeks	1 year
12 months	1 year
100 years	1 century

When converting from a larger unit to a smaller unit (right to left on the chart) multiply by the conversion factor.

Example: Convert 5 days to hours.

$$\text{Multiply: } 5 \text{ days} \times \frac{24 \text{ hours}}{1 \text{ day}} = 120 \text{ hours}$$

When converting from a smaller unit to a larger unit (left to right on the chart) divide by the conversion factor.

Example: Convert 300 minutes to hours.

$$\text{Divide: } 300 \text{ minutes} \div \frac{60 \text{ minutes}}{1 \text{ hour}} = 300 \text{ minutes} \times \frac{1 \text{ hour}}{60 \text{ minutes}} = 5 \text{ hours}$$

Unit Conversion

Convert by expressing a given measurement as a fraction and multiplying it by a unit multiplier. The units cancel as each fraction is multiplied by another unit multiplier, leaving the desired unit when the multiplication is complete.

Step 1: Express the given measurement as a fraction with a denominator of 1.

Step 2: Write the conversion factor as two fractions that both equal 1. These fractions are called unit multipliers.

Step 3: Multiply the given measurement by the unit multiplier that will result in the original units canceling. The resulting product will have the converted units.

Example 1: Convert 96 inches to feet.

Step 1: Given measurement: $96 \text{ inches} = \frac{96 \text{ inches}}{1}$

Step 2: Conversion factor: $\frac{12 \text{ inches}}{1 \text{ foot}}$ and $\frac{1 \text{ foot}}{12 \text{ inches}}$

Step 3: Multiply: $\frac{96 \cancel{\text{ in}}}{1} \times \frac{1 \text{ ft}}{12 \cancel{\text{ in}}} = \frac{96}{12} \text{ ft} = 8 \text{ ft}$

Example 2: Use unit multipliers to convert 1.5 kilometers to centimeters.

Step 1: Given measurement: 1.5 kilometers

Step 2: Conversion factors: $\frac{1,000 \text{ meters}}{1 \text{ kilometer}}$ and $\frac{1 \text{ kilometer}}{1,000 \text{ meters}}$

$$\frac{100 \text{ centimeters}}{1 \text{ meter}} \quad \text{and} \quad \frac{1 \text{ meter}}{100 \text{ centimeters}}$$

Step 3: Multiply: $\frac{1.5 \cancel{\text{ km}}}{1} \times \frac{1,000 \cancel{\text{ m}}}{1 \cancel{\text{ km}}} \times \frac{100 \text{ cm}}{1 \cancel{\text{ m}}} = 150,000 \text{ cm}$

Measurement Conversion

Kiloliter	Hectoliter	Dekaliter	Liter	Deciliter	Centiliter	Milliliter

Kilogram	Hectogram	Dekagram	Gram	Decigram	Centigram	Milligram

Measurement Conversion

Miles	Yards	Feet	Inches

Fluid Ounces	Cups	Pints	Quarts	Gallons

Measurement Conversion

Ounces	Pounds	Tons