

Metric Measurements

The following table shows many of the prefixes that you may encounter:

Prefix	Symbol	Power of ten indicated	
		Numeral form	Scientific notation
nano	n	= 0.000000001	= 1×10^{-9}
micro	μ	= 0.000001	= 1×10^{-6}
milli	m	= 0.001	= 1×10^{-3}
centi	c	= 0.01	= 1×10^{-2}
deci	d	= 0.1	= 1×10^{-1}
deka	da	= 10	= 1×10
hecto	h	= 100	= 1×10^2
kilo	k	= 1000	= 1×10^3

These prefixes can be attached to different basic metric units. Watch how this happens in the following list of some of the most common metric units:

Basic unit	Symbol	Measure of	Examples
meter	m	length	nanometer (nm) centimeter (cm)
gram	g	mass	microgram (μg) kilogram (kg)
liter	ℓ	volume	milliliter (m ℓ) dekaliter (da ℓ)

The following tables show the relationships between some English and metric units. When converting between the two systems, you will need to use these relationships to create the fraction(s) that will make your initial unit cancel out to produce the new unit.

English-Metric Conversions		Metric-English Conversions	
1 inch	= 2.54 centimeters	1 centimeter	= 0.3937 inches
1 foot	= 0.3048 meter	1 meter	= 3.281 feet
1 yard	= 0.9144 meter	1 meter	= 1.094 yards
1 mile	= 1.609 kilometers	1 kilometer	= 0.6214 mile
1 quart	= 0.946 liter	1 liter	= 1.057 quarts
1 gallon	= 3.785 liters	1 liter	= 0.2642 gallon
1 ounce	= 28.35 grams	1 gram	= 0.0353 ounce
1 pound	= 453.59 grams	1 gram	= 0.0022 pound

Length		Volume	
12 inches (in.)	= 1 foot (ft)	2 cups (c)	= 1 pint (pt)
3 feet (ft)	= 1 yard (yd)	2 pints (pt)	= 1 quart (qt)
5280 feet (ft)	= 1 mile (mi)	4 quarts (qt)	= 1 gallon (gal)
Weight			
16 ounces (oz)	= 1 pound (lb)		
2000 pounds (lb)	= 1 ton		

Examples:

A- Compare. Write <, > or =

1) $45 \text{ cm} \geq 65 \text{ mm}$

2) $2,000 \text{ m} \equiv 2 \text{ km}$

3) $40 \text{ kg} \leq 40,000 \text{ g}$

4) $78 \text{ mg} \leq 7.8 \text{ g}$

5) $92 \text{ dm} \geq 120 \text{ mm}$

6) $32.2 \text{ cl} \equiv 322 \text{ ml}$

B- Convert the given units.

7) $42 \text{ km} = \underline{4,2000} \text{ m}$

8) $4 \text{ L} = \underline{400} \text{ cl}$

9) $41 \text{ g} = \underline{41,000} \text{ mg}$

10) $340 \text{ dm} = \underline{34} \text{ m}$