

Metric Conversions

In the United States, we typically measure in feet and inches. Such measures, along with other terms such as quart and pound are part of the English System of measurement. However, scientists and most other countries of the world use a standard set of measures known as the *International System of Measurement (SI)*. SI measurements are based on multiples of ten, so it is much easier to change from one unit to another.

In SI units, the basic unit of measure for:

- ◆ Length is **meters (m)**.
- ◆ Volume is **liters (L)**.
- ◆ Mass is **grams (g)**.

Prefixes such as kilo- or milli- are used to form units larger than or smaller than the basic units. The table below indicates the meaning of each of these prefixes:

Prefix	Abbreviation	Definition	Numerical Value
Mega-	M	One million	1,000,000
Kilo-	k	One thousand	1,000
Hecto-	h	One hundred	100
Deka-	da	Ten	10
Deci-	d	One tenth	0.1
Centi-	c	One hundredth	0.01
Milli-	m	One thousandth	0.001
Micro-	μ	One millionth	0.000001
Nano-	n	One billionth	0.000000001

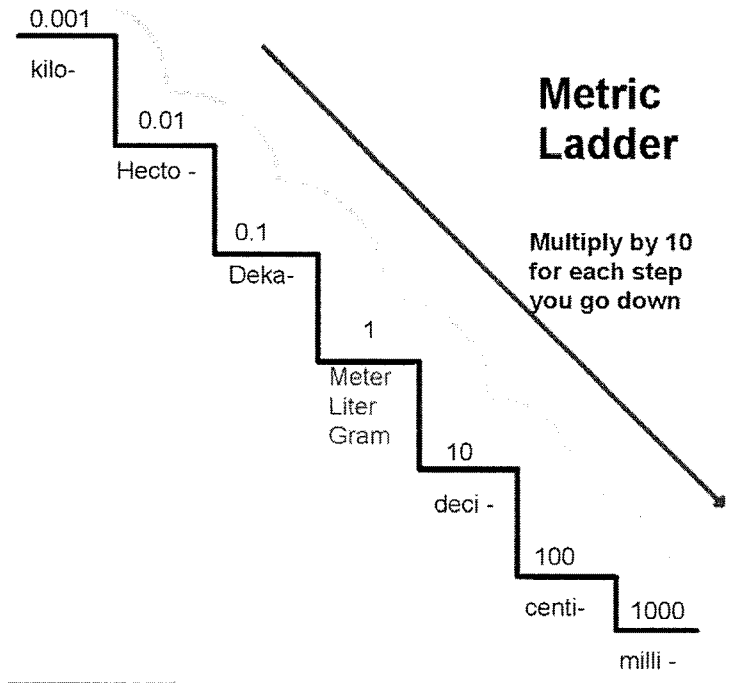
Using the Metric Staircase

Converting from one unit to another in the metric system is easy as a staircase. Once you know and can visualize the steps everything else will fall into place.

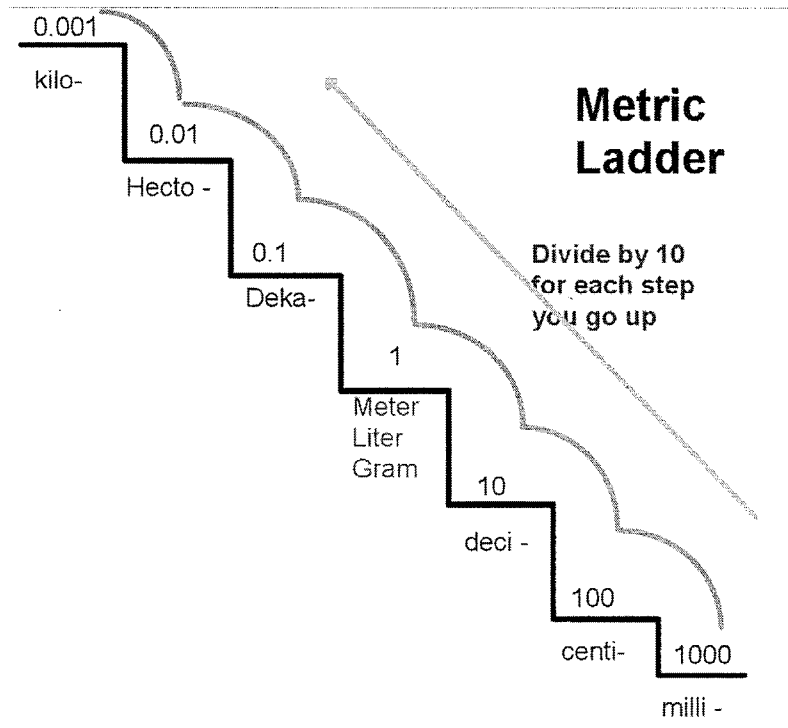
The staircase represents how the different units within the metric system are related. The main units - meter, liter, & gram are the middle step. All of the units above and below the base units are the prefixes that attach to the main unit to differentiate between the units.

For example, 1 meter is equal to 1000 millimeters. 1 gram is equal to 0.001 kilograms.

In order to convert from one metric unit to the other you follow the staircase. When moving down the staircase you multiply by 10 for each step you go down or a shift of the decimal point one place to the right.

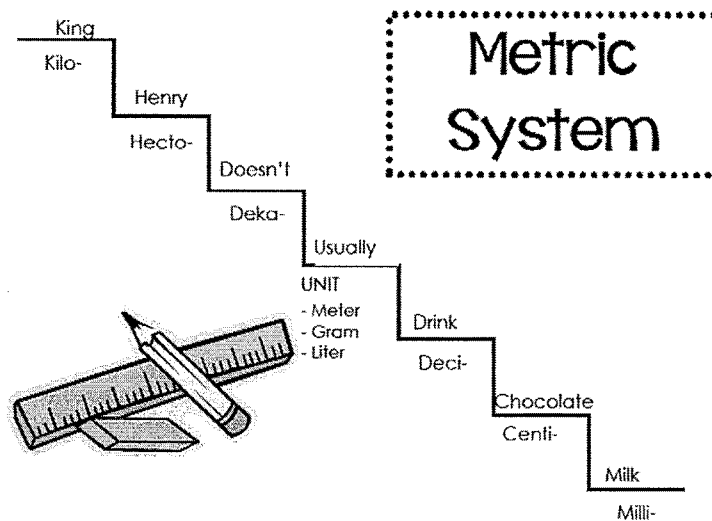


When going up the staircase you divide by 10 for each step you go up or shift the decimal one place the left.



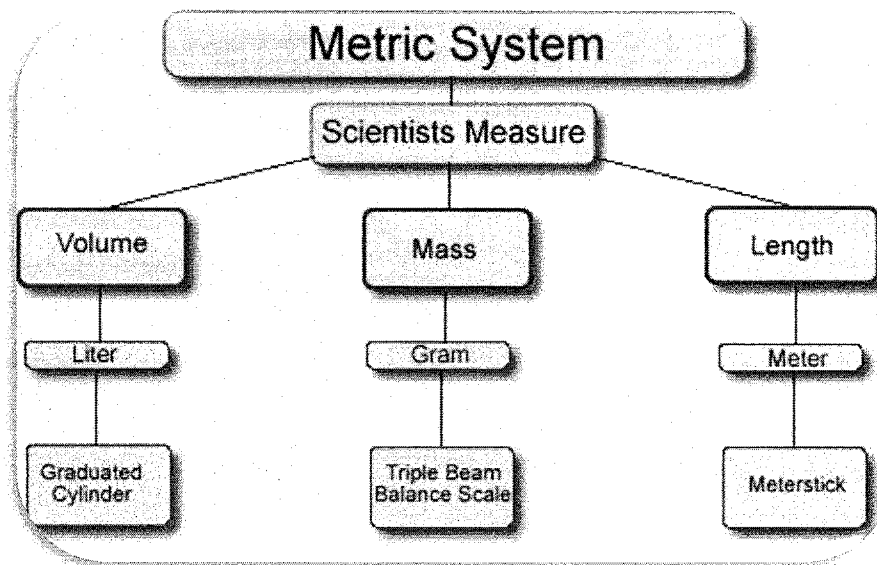
A helpful way to remember metric conversions is to visualize the staircase using the following mnemonic:

“KING HENRY DOESN’T USUALLY DRINK CHOCOLATE MILK!”



A couple of important rules:

1. You should always use **DECIMALS** (never fractions) to express metric measurements.
2. If a measurement is less than one, precede the decimal with a **ZERO**. For example don't write .55mm, instead write 0.55mm.



Now for some practice in metric conversions!

- | | |
|--------------------------------|---------------------------------|
| 1. 450.3 cm = _____ m | 6. 72 cm = _____ mm |
| 2. 45 mm = _____ cm | 7. 932 μm = _____ mm |
| 3. 5,400 mL = _____ L | 8. 87.5 L = _____ mL |
| 4. 62 mm = _____ μm | 9. 95.4 kg = _____ g |
| 5. 436 mg = _____ g | |