

WHAT IS AND WHY SHOULD WE USE THE METRIC SYSTEM?

The purpose of the metric system was to create a system that did not rely on many different sets of standards and to create a system that was easier to convert between units within the metric system. Today, every country in the world uses the metric system, though in the United States, measurement in inches and feet is still widely used.

What makes the metric system so easy to use?

The metric system uses only one unit of measurement (base unit) for each type of quantity measured (length, mass, volume, etc.).

Here is a table of the different base units used in the metric system. The way to interpret this table is to say that the prefix KILO is 1000 times larger than the BASE unit. The MILLI unit is 1000 times smaller than the BASE unit.

| Metric Prefixes | Unit Multiples | |
|-----------------|----------------|--|
| kilo | 1000 | 1000 times larger than base unit |
| hecto | 100 | 100 times larger than base unit |
| deka | 10 | 10 times larger than base unit |
| base unit | 1 | 1 |
| deci | .1 | (.1) or 10 times smaller than base unit |
| centi | 0.01 | (.01) or 100 times smaller than base unit |
| milli | 0.001 | (.001) or 1000 times smaller than base unit |

The base units for measuring different quantities in the metric system are outline in the table below. All are important to recognize, though we will spend the majority of our time utilizing the units for length, mass, volume and temperature.

| QUANTITY | BASE UNIT | SYMBOL |
|--------------------|-----------------------|-----------|
| length | meter | m |
| mass | gram | g |
| volume | liter | L |
| temperature | degree Celsius | °C |
| Temperature | degree Kelvin | °K |
| force | newton | N |
| energy | joule | J |
| power | watt | W |
| pressure | pascal | Pa |
| frequency | hertz | Hz |

The metric system is a 10 base system where objects are expressed as multiples of 10 of the base unit. For example, the **meter** is the base unit for measuring length in the metric system. One meter is equal to 100 centimeters. The simplicity comes in that depending on which way you move making the conversion, you need only move the decimal place the correct number of places.

PRACTICE PROBLEM – How many centimeters is one meter?

Moving right from the BASE unit two places to the CENTI unit requires the decimal to move two places to the right – the equivalent of multiplying by 100. Since the CENTI unit is 100 times smaller than the BASE unit, there are many more centimeters in a meter. One way to remember this is by looking at a meter stick. There are 100 centimeters in a meter.

Step one – identify the starting unit.

Step two – identify the ending unit that you would like to convert to including the direction (left or right).

Step three – count the number of spaces between the starting and ending units.

Step four – move the decimal the correct number of places and in the same direction as identified in step two.

| kilo | hecto | deka | base | deci | centi | milli |
|------|-------|------|---------|---------------|-----------------|-------|
| | | | 1 meter | 10 decimeters | 100 centimeters | |



$$1.\underline{0}\underline{0} \text{ meter} = 100. \text{ centimeters}$$

PRACTICE PROBLEM – How many kilometers are in one meter?

Moving left from the base unit three places to the kilo unit requires the decimal to move three places to the left – the equivalent of dividing by 1000. Since the KILO unit is 1000 times larger than the BASE unit, there are many more meters in a kilometer. One way to remember this is by looking at a meter stick. There are 100 centimeters in a meter.

| kilo | hecto | deka | base | deci | centi | milli |
|-----------------|-----------------|---------------|---------|------|-------|-------|
| .001 kilometers | .01 hectometers | .1 dekameters | 1 meter | | | |



$$\underline{.0}\underline{.0}\underline{.1} \text{ meter} = .001 \text{ kilometers}$$