

Goals: To learn how to navigate the metric system of measurement.

- The Basics of the Metric System
 - Definition and application.
 - Basic prefixes.
- Things that we Measure
 - Length
 - Mass
 - Volume

The Basics of the Metric System:

The **metric system** is the system of measurement that is preferred by most mathematicians and scientists as it involves a decimal system that is easy to navigate. In this system, there are common prefixes that are used to represent different place value no matter what type of measurement is being conducted (length, mass or volume). The most commonly used prefixes are listed in the box below.

Prefix	Meaning
Kilo -	1,000
Hecto-	100
Deca-	10
Liter/Gram/Meter	1
Deci-	0.1
Centi-	0.01
Milli-	0.001

<https://study.com/academy/lesson/metric-prefixes-lesson-for-kids.html>

Super helpful side note: These common prefixes can be remembered using a simple mnemonic device!

k _____ h _____ da _____ d _____ c _____ m _____

Fact: The Metric System is easy to use because of the fact that the prefixes represent powers of 10. For this reason, when we change units, we merely multiply or divide by a power of 10. From our previous studies, we know that multiplying and dividing by 10 is just a matter of moving the decimal place around!

Super cool side note: There are other prefixes that are used quite often! For example, if you work with computers a lot, you may be familiar with the mega- (1,000,000), giga- (1,000,000,000) or tera- (1,000,000,000,000) prefixes (in measuring the number of bytes that a computer can store). Also, if you work in an area involving pharmacy you may use prefixes that represent smaller units of measurement (such as the micro- prefix which represents 0.000001).

Things that we Measure:

Length: In the metric system, we use **meters** for the standard measurement of length. Each of our prefixes are combined with this standard to describe the length of a certain object.

Prefix	Name of Measurement	Abbreviation
Kilo-	Kilometers	km
Hecto-	Hectometers	hm
Deka-	Dekameters	dam
--	Meters	m
Deci-	Decimeters	dm
Centi-	Centimeters	cm
Milli-	Millimeters	mm

Examples: Convert each of the measurements accordingly.

- 1,156 m. to km.

Using our prefixes, we see that kilometers are three places to the **left** of meters. Moving to the left signifies **division**. This means we will be dividing by 10^3 (we will be moving the decimal place three times to the left).

$$1,156 \text{ m.} = 1.156 \text{ km.}$$

- 276 cm. to m.

- 13.5 dam. to cm.

Mass: In the metric system, we use **grams** for the standard measurement of mass. Each of our prefixes are combined with this standard to describe the mass of a certain object.

Note: In the metric system we measure mass while the customary measuring system measures weight. There is a difference!

“Mass is a measurement of the amount of matter something contains, while Weight is the measurement of the pull of gravity on an object.” <http://www.nyu.edu/pages/mathmol/textbook/weightvmass.html>

Prefix	Name of Measurement	Abbreviation
Kilo-	Kilograms	kg
Hecto-	Hectograms	hg
Deka-	Dekagrams	dag
--	Grams	g
Deci-	Decigrams	dg
Centi-	Centigrams	cg
Milli-	Milligrams	mg

Examples: Convert each of the measurements accordingly.

- 0.05 dag. to mg.

In looking at our prefixes, we see that milligrams are four places to the **right** of dekagrams. Moving to the right signifies multiplication. Thus, we will be multiplying by 10^4 (move the decimal four times to the right).

$$0.05 \text{ dag.} = 500 \text{ milligrams}$$

- 345 cg. to hg.

Volume: In the metric system, we use **litres** for the standard measurement of volume. Each of our prefixes are combined with this standard to describe the volume of a certain quantity.

Note: In the metric system we use a different spelling for liters as that in the customary system.

Prefix	Name of Measurement	Abbreviation
Kilo-	Kilolitres	kl
Hecto-	Hectoliters	hl
Deka-	Dekalitres	dal
--	Litres	l
Deci-	Decilitres	dl
Centi-	Centilitres	cl
Milli-	Millilitres	ml

Examples: Convert each of the measurements accordingly.

- 5,763 mL. to daL.
- 0.056 kL. To L.