# Sect 8.4 - Metric Units of Measurement

The rest of the world uses the metric system of measurement. It is important to understand how it works. The system starts with three base units and then uses prefixs to derive the remaining units. The meter, m, ($\approx$ 39.4 inches) is the base unit for length, the liter, L, (slightly bigger than a quart) is the base unit for volume, and the gram, g, (about the weight of one raisin) is the base unit for weight. There are six common prefixes that we will study. They are listed in the table below:

Prefix	Meaning	Length	Weight	Volume
kilo-, k	1000 times	1 km = 1000 m	1 kg = 1000 g	1 kl = 1000 L
hecto-, h	100 times	1 hm = 100 m	1 hg = 100 g	1 hl = 100 L
deka-, da	10 times	1 dam = 10 m	1 dag = 10 g	1 dal = 10 L
deci-, d	1/10 times	1 dm = 0.1 m	1 dg = 0.1 g	1 dl = 0.1 L
centi-, c	1/100 times	1 cm = 0.01 m	1 cg = 0.01 g	1 cl = 0.01 L
milli-, m	1/1000 times	1 mm = 0.001 m	1 mg = 0.001 g	1 ml = 0.001 L

To convert within the metric system, we list our prefixes from largest to smallest, mark the prefix we are converting from and count how many times we have to move to get to the prefix we are converting to. The number of times and the direction tells us how to move the decimal point in the number to get our answer. Here is what our prefix chart looks like:

			grams			
k	h	da	liters	d	c	m
			meters			
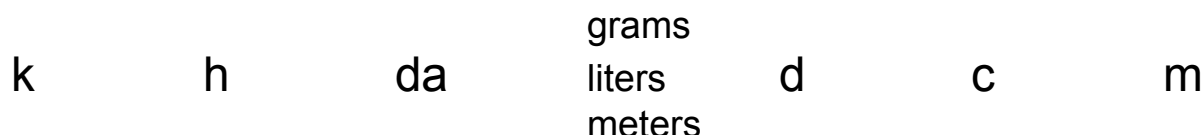
Let's try some examples:

Convert the following:

Ex. 1   Convert 56 m to ___ cm.
Solution:
We start from the base unit and move over two places to the right:
k   h   da   meters   d   c   m

56 m = 56.00 = 5,600 cm.

Ex. 2   Convert 67.3 dg to ___ hg.
Solution:
We start from the d prefix and move three places to the left:

k   h   da   grams   d   c   m

67.3 dg = 067.3 = 0.0673 hg.

Ex. 3   Convert 0.0645 km to dm.
Solution:
We start from the k prefix and move four places to the right:

k   h   da   meters   d   c   m

0.0645 km = 00645 = 645 dm.

Ex. 4   Convert 565 cc to ___ L.
Solution:
The unit cc is the same as mL, so we start from the prefix m and move three places to the left:
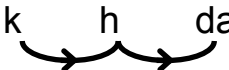
k   h   da   liters   d   c   m

565 cc = 565 mL = 565 = 0.565 L.

Ex. 5   Convert $\dfrac{\$25}{kg}$ to $\dfrac{\$}{dag}$.
Solution:
We start from k and move two places to the right:

k   h   da   grams   d   c   m

So, 1 kg = 1.00 = 100 dag

Thus, $\dfrac{\$25}{kg} = \dfrac{\$25}{100\,dag} = \dfrac{\$0.25}{dag}$