

## Methodology for conversion between units:

Conversion between any units can be accomplished by simply transforming the values in increments of known equality.

*For example, if you want to convert 2.3 Miles into centimeters, first start with the known value and place it in a grid as follows:*

2.3 Mile
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*Now add known conversions to the grid so that each vertical grid section (white or blue) is valid. For example, if you know that there are 5280 feet in a mile.*

2.3 mile	5280 ft
	mile

*Above, the Miles cancel and you are left with feet. Now if you know that there are 12 inches in a foot. Add this as the next section to the grid.*

2.3 mile	5280 ft	12 in
	mile	ft

*Above, the feet cancel and you are left with inches. Now if you know that there are 2.54 cm in an inch. Add this as the next section to the grid.*

2.3 mile	5280 ft	12 in	2.54 cm
	mile	ft	in

*Above, the inches cancel and you are left with centimeters. Now the result of the calculation can be found by multiplying all the numbers on the top, and dividing by all the number from the bottom (in this case there are none on the bottom). The result is that there are (2.3 X 5280 X 12 X 2.54) = 370,149.12 centimeters in 2.3 Miles.*

*The same process can be used to convert between any units as long as the known conversion in each section of the grid is valid. For example to convert a flow rate of 2.3 cubic feet per minute into liters per second the following are two possible conversions both of which give the same result:*

2.3 ft <sup>3</sup>	7.48 Gal (US)	3.785L	min
min	ft <sup>3</sup>	Gal (US)	60 sec

$(2.3 \times 7.48 \times 3.785) / 60 = 1.085 \text{ L/sec}$

2.3 ft <sup>3</sup>	(12) <sup>3</sup> in <sup>3</sup>	(2.54) <sup>3</sup> cm <sup>3</sup>	L	min
min	ft <sup>3</sup>	in <sup>3</sup>	1000 cm <sup>3</sup>	60 sec

$(2.3 \times 12^3 \times 2.54^3) / (1000 \times 60) = 1.085 \text{ L/sec}$