

P. 17, 1.2 Derived Units

Derived units, volume, and conversions

Derived Units: Product or quotient of manipulating units.

- Ex. s $10\text{m} \times 5\text{m} = 50\text{m}^2$ (area)
138 miles in 4.2 hours = 33 miles/hr. (speed)
 $25\text{cm} + 40\text{cm} + 10\text{cm} = 75\text{cm}$ (length)

Volume: derived from length, meter: (demonstrate with ruler and volume boxes)

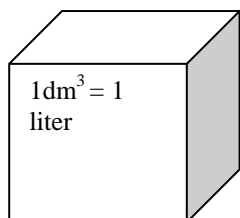
$\text{m} \times \text{m} \times \text{m} = \text{m}^3$, since 10 decimeter = 1 meter ...

$10\text{dm} \times 10\text{dm} \times 10\text{dm} = 1000\text{dm}^3 = 1\text{m}^3$, and since $100\text{cm} = 1\text{m}$


$100\text{cm} \times 100\text{cm} \times 100\text{cm} = 1\,000\,000\text{cm}^3 = 1\text{m}^3$

Or more simply: $1000\text{cm}^3 = 1\text{dm}^3$

Volume Conversion Factors: (liter is metric, dm^3 is SI unit)



is equal to

 $1000\text{cm}^3 = 1000\text{ml}$

Ex. Convert the following:

$$20\text{cm}^3 = \underline{\hspace{2cm}}\text{dm}^3$$
$$100\text{L} = \underline{\hspace{2cm}}\text{dm}^3$$
$$0.350\text{dm}^3 = \underline{\hspace{2cm}}\text{ml}$$

Conversions:

Float decimal point such that: "If the unit gets LARGER then the number must get SMALLER" ...and vice versa. Remember that you are only changing the magnitude of the unit, not the value of the number. Volume has 3 floats.

Derived Units Calculations and maintain units: (and calculator usage)

Ex. $2 \times 10^5\text{m} \times 4.2 \times 10^2\text{m} = ???$

$360\text{lbs.} / (2.5\text{in} \times 0.1\text{inch}) = ???$

$2.333 \times 10^{18}\text{atoms} / (0.25\text{cm} \times 5.0\text{cm} \times 0.125\text{cm}) =$

(demonstrate calculator use of dividing all numbers in the denominator)

