

What is Volume?

Volume is the amount of space that a substance, or an object, occupies.



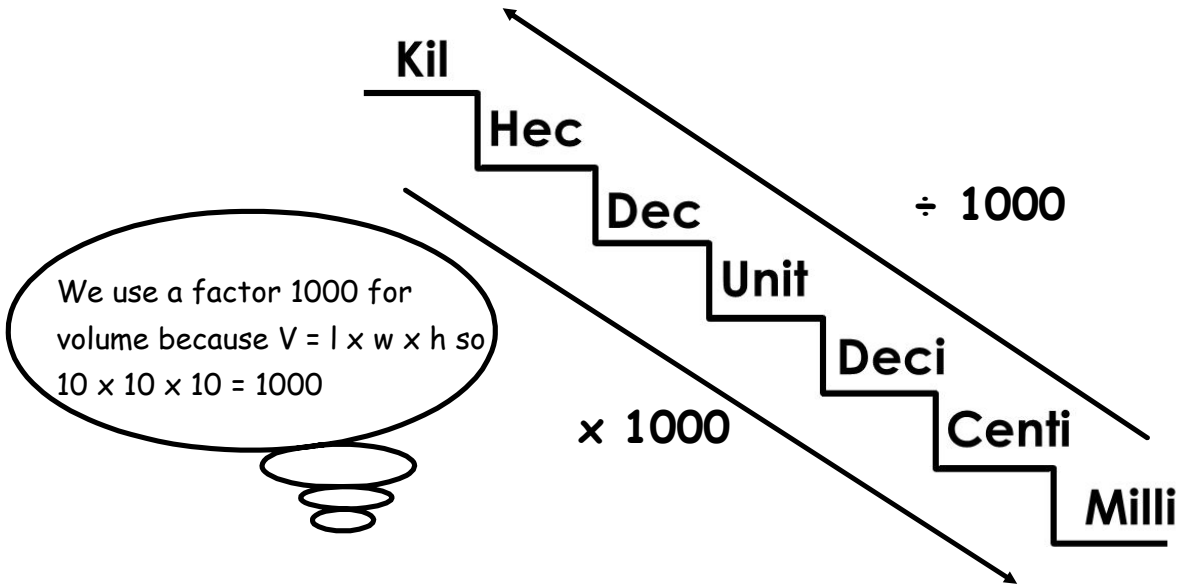
All of the substances above have a different volume as they each take up a different amount of space.

5.5 - Metric Units for Volume

The Metric system uses the basic unit Cubic Metre (m^3) and also:

- cubic kilometre (km^3)
- cubic hectometre (hm^3)
- cubic decametres (dam^3)
- cubic decimetres (dm^3)
- cubic centimetres (cm^3)
- millimetres³(mm^3)

Cubic Metric Staircase



5.5 - Metric Units for Volume page 135

4. A researcher claims that the average amount of fresh water used in Canada is 125 m^3 per person per year.

a) How much is this in cubic centimeters per person per day?



$1 \text{ cm}^3 = 1 \text{ ml}$

b) How much is this in litres per person per day?

Your Turn!

complete # 1 and 2 on page 135

5.4 - Imperial Units for Volume page 132

The Imperial system uses:

-Cubic Inches (cu in OR in³)

-Cubic Feet (cu ft OR ft³)

-Cubic Yards (cu yd OR yd³)

-Cubic Miles (cu mi OR mi³)

Ratios:

$$\frac{1728 \text{ cu in}}{1 \text{ cu ft}}$$

$$\frac{27 \text{ cu ft}}{1 \text{ cu yd}}$$

$$\frac{46656 \text{ cu in}}{1 \text{ cu yd}}$$

5.4 - Imperial Units for Volume page 132

Example: Kyle, a bricklayer, needs 245 cu ft of lime to use in mortar. How many whole cubic yards of lime does Kyle need to buy?

Your Turn!

complete # 1 and 3 on page 133

5.6 - Volume in Different Systems

When converting between systems, using the following ratios:

<u>Metic to Imperial</u>		
$\frac{0.06 \text{ cu in}}{1 \text{ cm}^3}$	$\frac{1.31 \text{ cu yd}}{1 \text{ m}^3}$	$\frac{0.24 \text{ cu mi}}{1 \text{ km}^3}$

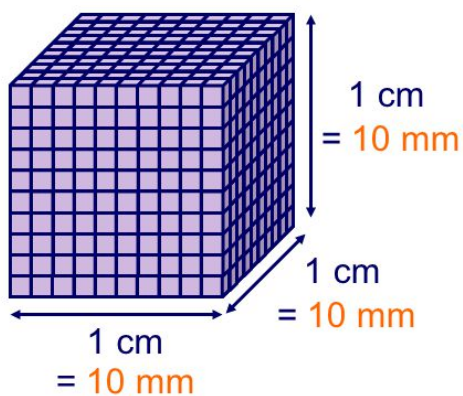
<u>Imperial to Metric</u>			
$\frac{16.39 \text{ cm}^3}{1 \text{ cu in}}$	$\frac{28.32 \text{ dm}^3}{1 \text{ cu ft}}$	$\frac{0.76 \text{ m}^3}{1 \text{ cu yd}}$	$\frac{4.17 \text{ km}^3}{1 \text{ cu mi}}$

Units of volume



Volume is measured in cubic units.

Here is a cubic centimetre or 1 cm³.



How many mm³ are there in a cm³?

$$1 \text{ cm} \times 1 \text{ cm} \times 1 \text{ cm} = 1 \text{ cm}^3$$

$$10 \text{ mm} \times 10 \text{ mm} \times 10 \text{ mm} = 1000 \text{ mm}^3$$

So, $1 \text{ cm}^3 = 1000 \text{ mm}^3$



5.6 - Volume in Different Systems page 136

Example:

Matt is the manager of an arena. He wants to buy 14m^3 of sand to create beach volleyball courts in the arena after the skating season ends. How many cubic yards of sand does he need?



Your Turn!

complete # 1-4 and 6 on page 137