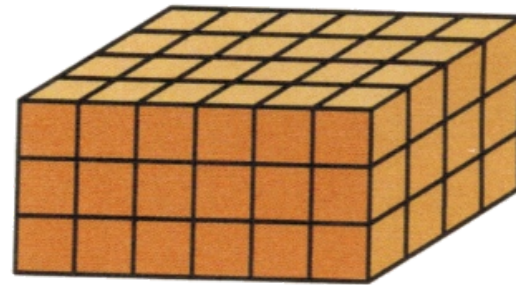


Vision 5.1

Area and Volume

Area is the measure of a surface bounded by a figure. The area of a figure is expressed in square units.

Volume is the measure of the space occupied by a solid. The volume of a solid is expressed in cubic units.

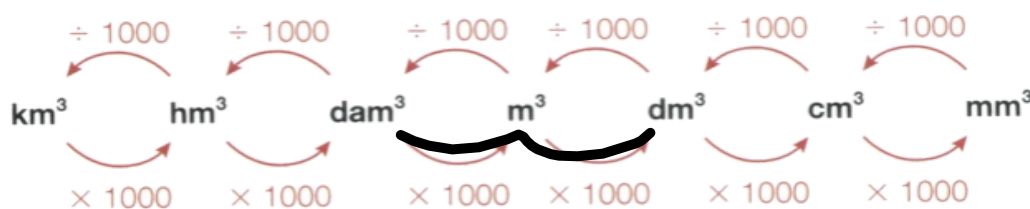


Choosing a Unit of Measure for Volume

We can use different units of volume to measure a given space. The context generally helps determine the most appropriate unit. The table below shows the unit of volume using in the International System of Units.

Name of the unit of volume	Symbol	Example of an appropriate context
Cubic kilometre	km ³	Volume of a mountain
Cubic hectometre	hm ³	Volume of a shopping centre
Cubic decametre	dam ³	Volume of a house
Cubic metre	m ³	Volume of a refrigerator
Cubic decimetre	dm ³	Volume of a television
Cubic centimetre	cm ³	Volume of an eraser
Cubic millimetre	mm ³	Volume of a coin

In the representation below, each unit of volume has a value that is 1,000 times greater than the value directly to its right.



Example:

a) Convert 10.1 cm³ to km³.

$$10.1 \text{ cm}^3 \div 1000 \div 1000 \div 1000 \div 1000 \div 1000 = 0.0000101 \text{ km}^3$$

b) convert 3.0 dam³ to dm³

$$3.0 \text{ dam}^3 \times 1000 \times 1000$$

$$3.000,000 = 3,000,000 \text{ dm}^3$$

c) 921 cm³ to mm³

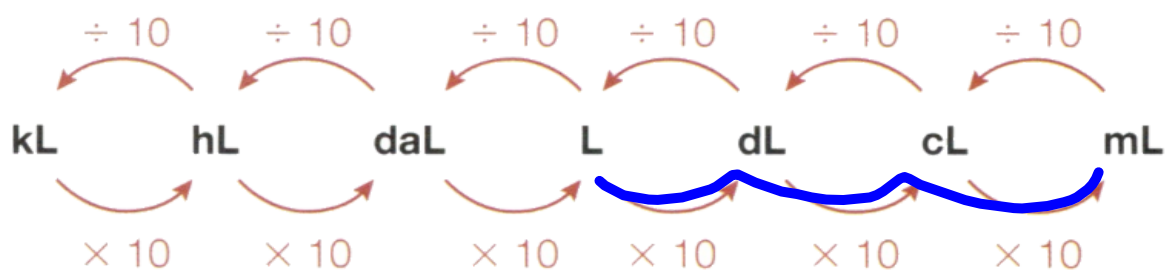
$$921 \text{ cm}^3 \times 1000 = 921,000 \text{ mm}^3$$

Capacity

The capacity of a solid or container is the

Name of the unit of capacity	Symbol	Example of an appropriate context
Kilolitre	kL	Capacity of a bathtub
Hectolitre	hL	Capacity of an aquarium
Decalitre	daL	Capacity of an oxygen tank
Litre	L	Capacity of a milk carton
Decilitre	dL	Capacity of a small juice bottle
Centilitre	cL	Capacity of a tablespoon
Millilitre	mL	Capacity of a teaspoon

In the representation below, each unit of volume has a value that is 10 times greater than the value directly to its right.



Example:

a) Convert 10.1 L to mL.

$$10.1 \text{ L} \times 10 \times 10 \times 10 = 10,100 \text{ mL}$$

b) convert 3.0 DL to DAL.

$$3.0 \text{ DL} \div 10 \div 10 = 0.03 \text{ DAL}$$

A given space can be measured in either units of volume or units of capacity. We can convert units of volume into units of capacity and vice versa according to the following equivalency:

$$1 \text{ dm}^3 = 1 \text{ L}$$

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

$$1 \text{ m}^3 = 1 \text{ kL}$$

Example:

$$\text{dm}^3 \rightarrow \text{L} \rightarrow \text{mL}$$

a) Convert 15.2 dm^3 to mL

$$15.2 \text{ dm}^3 = \underline{15.2} \text{ L} \times 10 \times 10 \times 10 = 15200 \text{ mL}$$

b) convert 3700 cm^3 to kL

$$\text{cm}^3 \rightarrow \text{m}^3 \rightarrow \text{kL}$$

$$3700 \text{ cm}^3 \div 1000 = 1000$$

$$= 0.003700 \text{ m}^3 = 0.003700 \text{ kL}$$

$$\text{cm}^3 \rightarrow \text{mL} \rightarrow \text{kL}$$

$$3700 \text{ cm}^3 = 3700 \text{ mL} \div 10 \div 10 \div 10 = 10 \div 10 = 10$$

$$= 0.003700 \text{ kL}$$