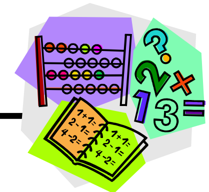
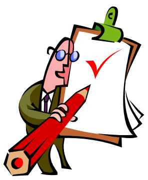
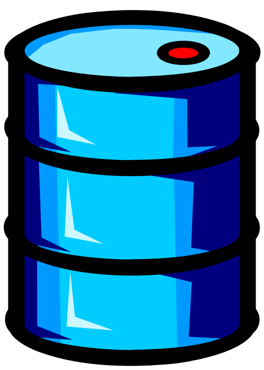


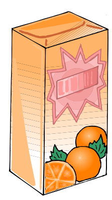
Capacity

Capacity is the amount a container can hold.



The oil, juice drink and gasoline containers are just a few examples of objects that illustrate capacity.





Capacity is measured in the SI base unit called **litres** (L). The most common units for capacity are litre (L) and millilitre (mL).

1000 L	kilolitre (kL)
100 g	hectolitre (hL)
10 g	decalitre (daL)
1 g	litre (L)
1/10 g	decilitre (dL)
1/100 g	centilitre (cL)
1/1000g	millilitre (mL)

Hint: Remember to use this ACRONYM to help you with the order of the units:

King
Henry's
Daughter
Betty
Detested
Counting
Money

Recipes require ingredients in specific amounts to create the desired finished product.

Not all ingredients come packaged in the quantities that recipes call for, so converting between different units of capacity is important.

Examples

A) How many mL does 10 L represent? 10 000 mL

B) How many L does 4000 mL represent? 4 L

C) How many mL does 7.4 L represent? 7400 mL

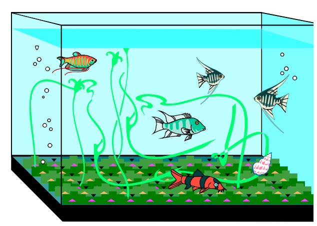
Volume

Volume is the amount of space a container or object occupies.

Example

Capacity is the amount of water required to fill the fish tank (ml or L).

Volume is the space the tank and water take up.



The most common unit of volume is centimetres cubed (cm^3).

One centimetre cubed will hold one millilitre of fluid or another substance.

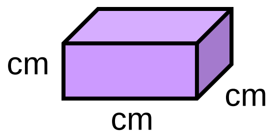
1000 cm^3 will hold one thousand millilitres of fluid or another substance.

1000 mL = 1000 cm^3

Remember that 1000 mL = 1L, so 1L = 1000 cm^3.

Do you see how capacity and volume are similar?
The number stays the same, but the units change.

Volume is commonly measured in cubic units, such as cm^3, because volume is a measure of an object's length, width and height as shown below.

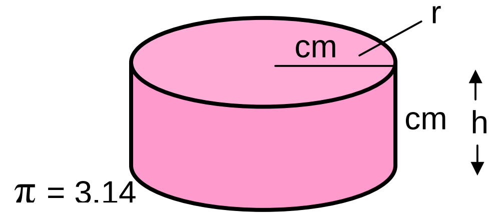


Volume of a cube or rectangular prism

$= l \times w \times h$

$= cm \times cm \times cm$

$= cm^3$



Volume of a cylinder

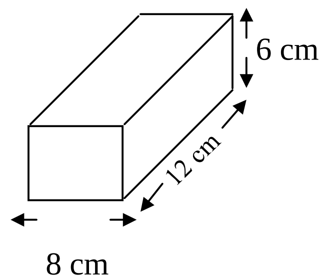
$= \pi \times r^2 \times h$

$= \pi \times cm^2 \times cm$

$= cm^3$

Examples

A) Calculate the volume of the box.



V = $l \times w \times h$

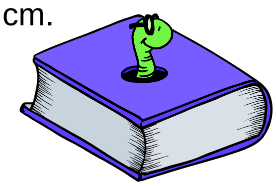
$12 \times 8 \times 6$

$= 576\ cm^3$

How much space does the box take up? $576\ cm^3$

The volume of the box is $576\ cm^3$.

B) Calculate the volume of a book that has a length of 10 cm, a width of 3.2 cm and a height of 15 cm.



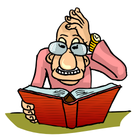
V = $l \times w \times h$

$10 \times 3.2 \times 15$

$= 480\ cm^3$

Practice: Calculating and Converting Capacity

1. Shaz is cleaning under the kitchen sink. He found five 2-litre bottles of glass cleaner. None of the bottles is full. The bottles contain the following amounts.



Bottle 1 – 375 ml
Bottle 2 – 150 ml
Bottle 3 – 190 ml
Bottle 4 – 780 ml
Bottle 5 – 630 ml

   a) How many litres of glass cleaner do the five bottles contain?

   b) If Shaz combines all of the glass cleaners into as few bottles as possible, how many bottles will he use?

2. Perform the following conversions.

   a) 250 mL = ______ L

   b) 1350 mL = ______ L

   c) 62 L = ______ mL

   d) 0.9 L = ______ mL

   e) 625 mL = ______ L

   f) 3.8 L = ______ mL

Practice: Estimating and Calculating Capacity and Volume

1. Find a variety of waterproof containers. Fill them with water, without measuring the amount of water poured into each container.

   Estimate the capacity of each container and record these values in the table.

   Use measuring devices or instruments to measure the actual capacity of water in each container and record these values.

   Use the data about capacity to estimate and calculate volume.

   Be sure to include your units of measurement.

Container Number	Estimated Capacity	Estimated Volume	Actual Capacity	Actual Volume
1				
2				
3				
4				
5				

Think About …

Think about the different uses of capacity and volume in your community. Collect examples and think about the different jobs that are in charge of monitoring or maintaining volume or capacity.

Practice: Converting Capacity and Volume

1. Kathy played a practical joke on her sister. She filled a box with Styrofoam chips and wrapped it. If the box measures 12 cm by 5 cm by 15 cm, what volume of chips did Kathy use to completely fill the box?

2. a) Various sizes of containers are filled to the top with water. Determine the volume of water and the capacity of each container by performing the following conversions.

   Complete the three empty rows using containers from school, home or workplace.

cm^3	mL	L
	45	
9		
		20
160		
12		