SURFACE AREA AND VOLUME FORMULAS
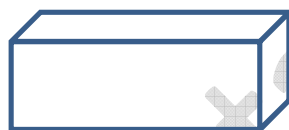
Volume Unit conversion

1 cm³	1mL	1000 mm³
1 Litre	1000ml	1000 cm³
1 m³	10^6 cm³	1000 L
1 dm³	1000 cm³	1 L

Surface Area and Volume of Cube and Cuboid
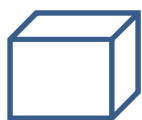
Cube   Cuboid

| Type	Measurement
Surface Area of Cuboid of Length L, Breadth B and Height H	2(LB + BH + LH).
Lateral surface area of the cuboids	2(L + B) H
Diagonal of the cuboids	$\sqrt{L^2 + B^2 + H^2}$
Volume of a cuboids	LBH
Length of all 12 edges of the cuboids	4 (L+B+H).
Surface Area of Cube of side L	$6L^2$

Lateral surface area of the cube	$4L^2$
Diagonal of the cube	$L\sqrt{3}$
Volume of a cube	L^3

Surface Area and Volume of Right circular cylinder
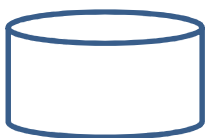
Radius	The radius (r) of the circular base is called the radius of the cylinder
Height	The length of the axis of the cylinder is called the height (h) of the cylinder
Lateral Surface	The curved surface joining the two base of a right circular cylinder is called Lateral Surface.

| Type	Measurement
Curved or lateral Surface Area of cylinder	$2\pi rh$
Total surface area of cylinder	$2\pi r (h+r)$
Volume of Cylinder	$\pi r^2 h$

Surface Area and Volume of Right circular cone



Radius	**The radius (r) of the circular base is called the radius of the cone**
Height	The length of the line segment joining the vertex to the center of base is called the height (h) of the cone.
Slant Height	The length of the segment joining the vertex to any point on the circular edge of the base is called the slant height (L) of the cone.
Lateral surface Area	The curved surface joining the base and uppermost point of a right circular cone is called Lateral Surface

Type	Measurement
Curved or lateral Surface Area of cone	πrL
Total surface area of cone	πr (L+r)
Volume of Cone	$\frac{1}{3}\pi r^2 h$

## Surface Area and Volume of sphere and hemisphere
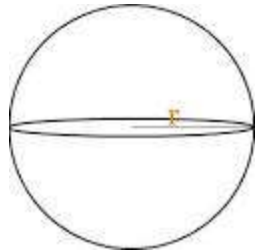
Sphere
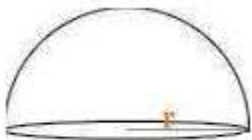
Hemisphere

Sphere	A sphere can also be considered as a solid obtained on rotating a circle About its diameter
Hemisphere	A plane through the centre of the sphere divides the sphere into two equal parts, each of which is called a hemisphere
radius	The radius of the circle by which it is formed
Spherical Shell	The difference of two solid concentric spheres is called a spherical shell
Lateral Surface Area for Sphere	Total surface area of the sphere
Lateral Surface area of Hemisphere	It is the curved surface area leaving the circular base

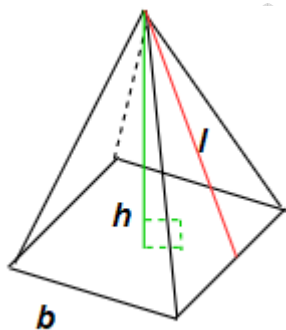| Type	Measurement
Surface area of Sphere	$4\pi r^2$
Volume of Sphere	$\frac{4}{3}\pi r^3$
Curved Surface area of hemisphere	$2\pi r^2$
Total Surface area of hemisphere	$3\pi r^2$
Volume of hemisphere	$\frac{2}{3}\pi r^3$
Volume of the spherical shell whose outer and inner radii and 'R' and 'r' respectively	$\frac{4}{3}\pi(R^3 - r^3)$

Surface Area and Volume of frustum of cone
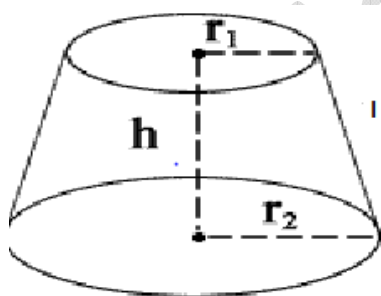
h = vertical height of the frustum
l = slant height of the frustum
$r1$ and $r2$ are radii of the two bases (ends) of the frustum.

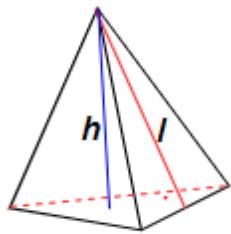| Type	Measurement
Volume of a frustum of a cone	$\frac{1}{3}\pi h(r_1^2 + r_2^2 + r_1 r_2)$
Slant height of frustum of a cone	$\sqrt{h^2 + (r_1 - r_2)^2}$
Curved surface area of a frustum of a cone	$\pi l(r_1 + r_2)$
Total surface area of frustum of a cone	$\pi l(r_1 + r_2) + \pi(r_1^2 + r_2^2)$

Square Regular Pyramid

h = vertical height of the pyramid
l = slant height of the pyramid

b = side of the square base

Type	Measurement
Volume of a square pyramid	$\frac{1}{3}b^2h$
Slant height of square pyramid	$\sqrt{h^2 + \frac{b^2}{4}}$
Lateral surface area of a frustum of a cone	$\frac{1}{2}(4b)l = 2bl$
Total surface area of frustum of a cone	$2bl + b^2$

Regular Triangular Pyramid

h = vertical height of the pyramid
l = slant height of the pyramid
p = perimeter of the base triangle

Type	Measurement
Volume of a square pyramid	$\frac{1}{3} \left(Area\ of\ the\ Base \right) \times h$
Lateral surface area of a frustum of a cone	$\frac{1}{2} \times Perimeter \times l$
Total surface area of frustum of a cone	$\left(Area\ of\ Base \right) + \frac{1}{2} \times Perimeter \times l$

Tetrahedron

A tetrahedron is a special case of regular triangular pyramid where each face is an equilateral triangle

Type	Measurement
Volume of a tetrahedron	$\frac{\sqrt{2}}{12} (edge)^3$
Total surface area of frustum of a cone	$\sqrt{3} \times (edge)^2$