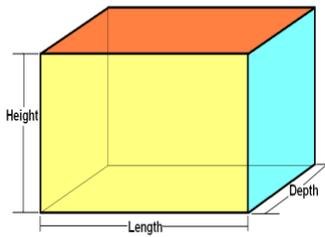# Surface areas and volumes

Class :9th

CUBOID

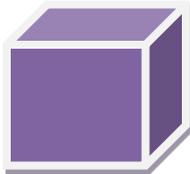Length of the cuboid =l,   Breadth= b and height =h then

Diagonal of cuboids is= $\sqrt{l^2 + b^2} + h^2$

L.S.A. of Cuboids = 2h (l + b) Sq. units

T.S.A of Cuboids = 2 (lb + b h + l h) sq. unit

Volume of cuboids = l b h cu. units

CUBE

If the edge of the cube is a units then

Diagonal of cube is= a $\sqrt{3}$ units

L.S.A. of Cube = 4a² Sq. units

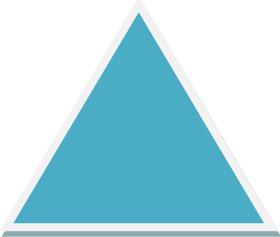T.S.A of Cube = 6a² sq. unit

Volume of cube = a³ cu. units

CYLINDER

L.S.A. of Cylinder = $2\pi rh$ Sq. units = l x b = Area of the rectangle (l = $2\pi r$, b = h)

T.S.A of Cylinder = 2 πr(r + h) sq. unit

Volume of Cylinder = π r^2 h cu. units
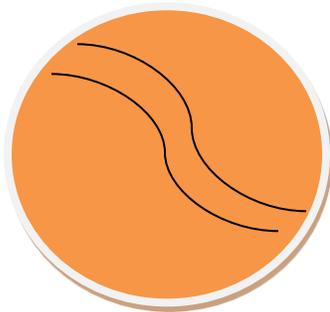
Cone

L.S.A. of Cone = πrl Sq. units

T.S.A of Cone = πr(r + l) sq. unit

Volume of Cone = $\frac{1}{3}$ π r^2 h cu. units

Sphere

Surface area of Sphere = 4π r^2 Sq. units

Volume of Sphere = $\frac{4}{3}$ π r^3 h cu. units

Hemi - Sphere

CSA   of hemi Sphere   = $2\pi\ r^2$ Sq. units

Volume of hemi Sphere = $\frac{2}{3}\ \pi\ r^3$ h cu. units

TSA   of hemi Sphere   = $3\pi\ r^2$ Sq. units

Important problems in Surface areas and volumes

1. Find the length of the longest pole that can be placed in a room, 12m long, 8m broad, and 9m height.
2. The diagonal of the cube is $8\sqrt{3}$ cm. Find its volume and surface area.
3. If each edge of a cube is increased by 50%, find the percentage increase in its surface area
4. Two cubes have their volumes in the ratio 1:27. Find the ratio of their surface areas.
5. The radii of two cylinders are in the ratio 3:5 and their heights are in the ratio of 2:3, Find the ratio their curved surface areas.
6. The radii of the bases of a cylinder and cone area in the ratio of 3:4 and their heights are in the ratio 2:3. Find the ratio their volumes?
7. The TSA of a cube is 96 cm^2, the volume of the cube is ?
8. In a cylinder, radius is double and height is halved curved surface area will be ?
9. In a cylinder, radius is double and height is halved Volume will be?
10. The LSA of a cube is 256 m^2. The volume of the cube is?
11. The Edge of a cuboids are in the ratio 1:2:3 and its surface area is 88 cm^2 Then the volume of the cuboids is ?
12. The surface area of a cube is 600 cm2. The length of its diagonal is ?
13. If each edge of the cube is doubled, then the volume it is?
14. A hemisphere and a cone have equal bases. If their heights are also equal, then the ratio of their CSA will be?
15. A Sphere and cube have equal surface areas. The ratio of the volume of the sphere that of the cube is ?