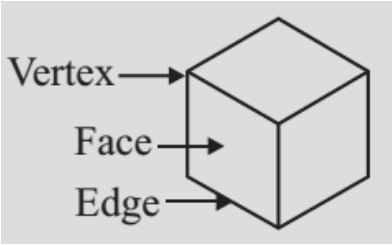
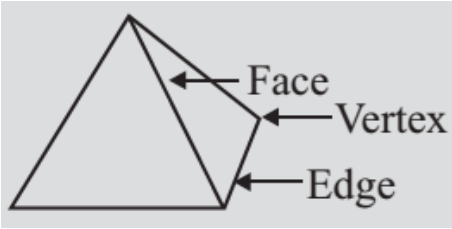
Visualizing solid shapes

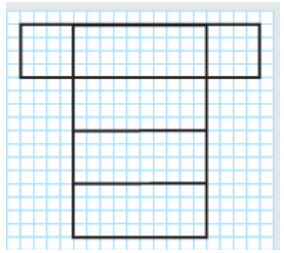
- One dimensional shapes have only length: line
- 2-dimensional or 2-D shapes are plane shapes having length and breadth ; ex triangle, square, circle, pentagon, rectangle etc
- 3-dimensional or 3-D shapes are solid objects that occupy space and have length, breadth and height (depth): cube, cuboid, cone ,sphere, prism, pyramid etc
- 3-D objects are made up of polygonal regions called as faces. Faces (F) meet at line segments called as edges (E)
- Edges meet at points called as vertices (V)
- Diagonals connect two vertices that do not lie on the same face.



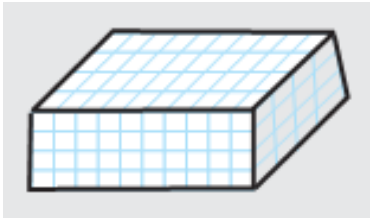


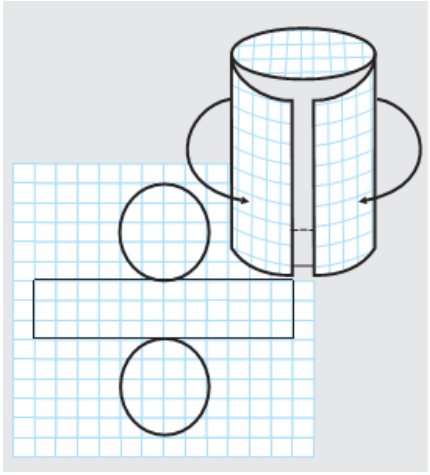
- Solid shapes can be drawn on a flat surface (like paper) realistically: 2-D representation of a 3-D solid.
- Two types of sketches of a solid are possible: Isometric and Oblique
- An oblique sketch: It does not have proportional lengths, but it conveys all important aspects of the appearance of the solid.
- An isometric sketch: is drawn on an isometric dot paper. Here, the measurements are kept proportional.

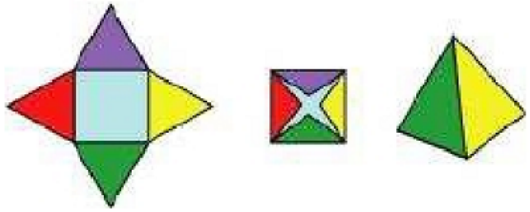
A net is a pattern of two-dimensions that can be folded to make a three dimensional figure It is a skeleton-outline of a solid that can be folded to make it. The same solid can have several types of nets.



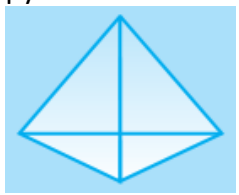
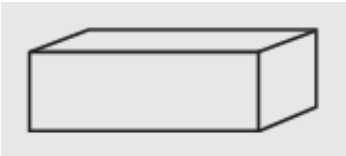
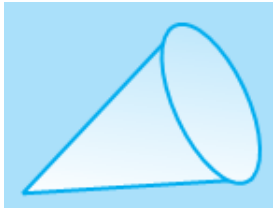
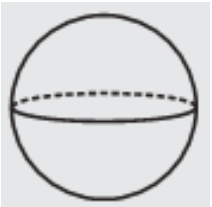
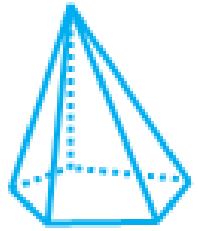
on folding





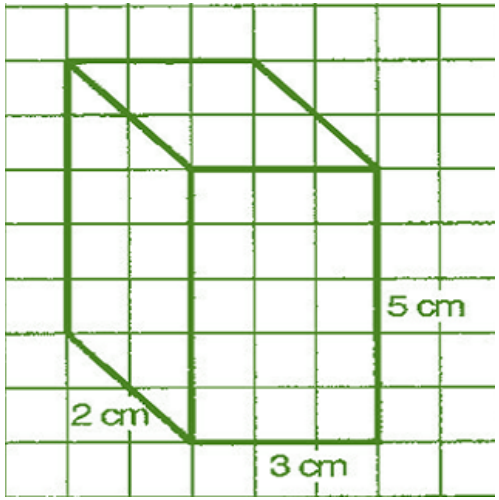


Different 3-D shapes

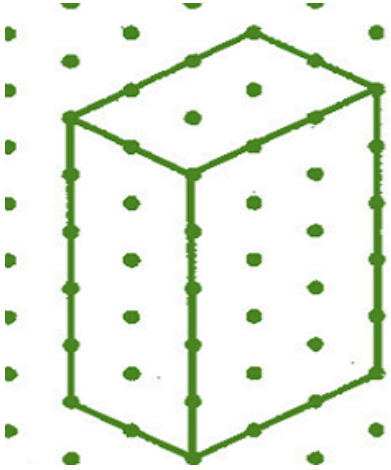
Triangular pyramid	Cuboid	**Cone**	**Sphere**	**Cylinder**	Pentagonal prism	**Pentagonal pyramid**
						

A cuboid of dimension 5 cm, 3 cm and 2 cm

Oblique Sketch

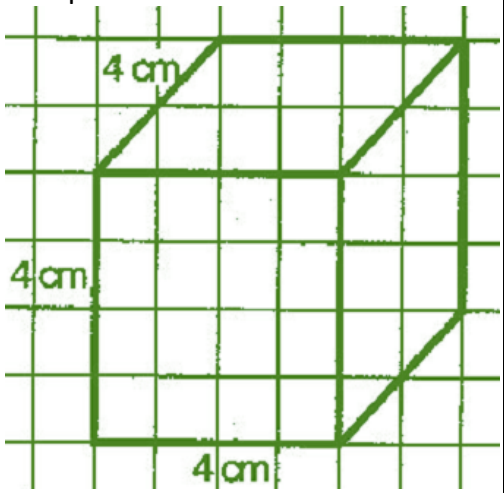


Isometric Sketch



A cube with an edge 4 cm long

Oblique Sketch

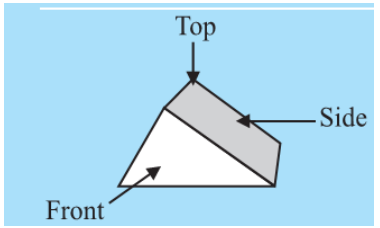


Isometric Sketch

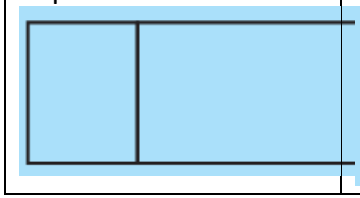
Visualising solid shapes is to see 'hidden' parts of the solid shape.
Different sections of a solid can be viewed in different ways:

- By cutting/slicing the shape ;resulting in the cross-section of the solid (vertical/horizontal cuts)
- Observing a 2-D shadow of a 3-D shape.
- Viewing the shape from different angles; the front-view, the side-view and the top-view
- 3-D objects look differently from different positions(views) ; so they can be drawn from different perspectives

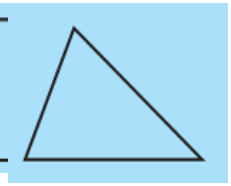
Different view of a 3-D object



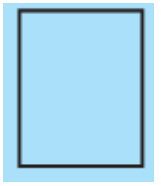
Top view



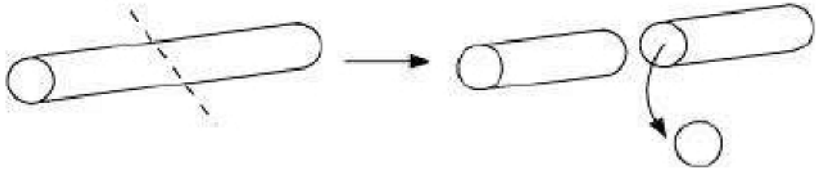
Front View



Side View



Vertical cut to a circular pipe



Horizontal cut to a circular pipe