L-15 THREE DIMENSIONAL SHAPES

Objects with fixed shape, size, and occupying fixed space are called solids. Solid figures have three dimensions - length, breadth and height.
e.g. A ball, a brick, an ice cream cone and a can.

Face
The flat surface of a solid shape is called a face.

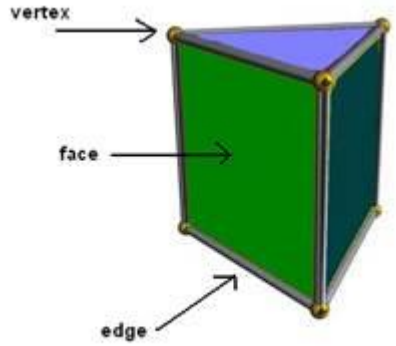
Edge
Any two adjacent faces of a solid shape meet on a line segment called an edge.

Vertex
A vertex of a solid shape is a point where three or more edges meet.

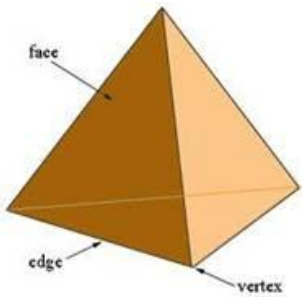
A solid bounded by six rectangular faces is called a **cuboid**. A cuboid has 6 faces, 12 edges and 8 vertices. A solid bounded by six square faces is called a **cube.**

A solid whose bases are parallel plane polygons and the lateral faces are rectangles is called a **prism.** A **pyramid** is a solid whose base is a plane rectilinear figure whose lateral faces are triangles with a common vertex, called the vertex of the pyramid**.** Prisms and pyramids are named after their bases. The base of a prism can be of any polygonal shape such as triangle and square.

A prism with two congruent triangles as bases which are parallel to each other and three lateral rectangular faces is a Triangular prism. There are 5 faces, 9 edges and 6 vertices in a triangular prism.



There are 4 faces, 6 edges and 4 vertices in a triangular pyramid.

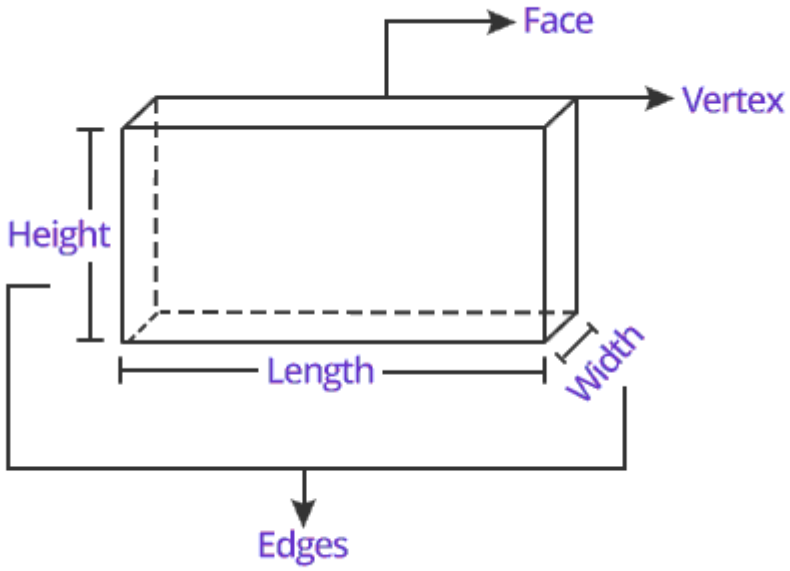


A cylinder has two circular plane surfaces at its base and top. It has a curved surface in the middle. A cylinder has 2 flat faces, 1 curved surface and 2 edges. There are no vertices in a cylinder.

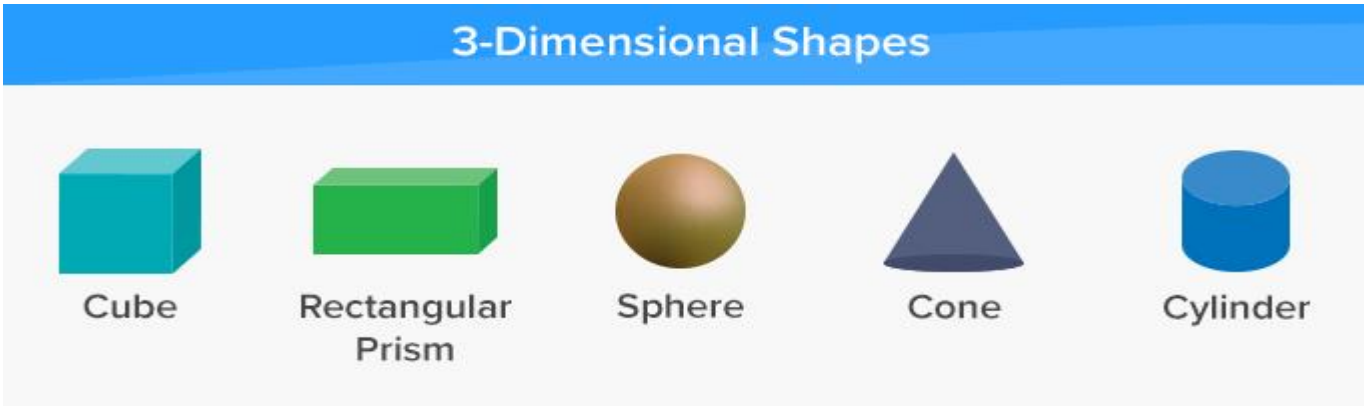
A cone has 1 flat face and 1 curved surface. There are 1 edge and 1 vertex.

The ball-like shape is called a sphere. A sphere has one curved surface, no edge and no vertex.
The attributes of a three-dimensional figure are faces, edges and vertices.

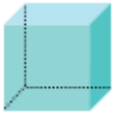
The three dimensions compose the edges of a 3D geometric shape.



A cube, rectangular prism, sphere, cone and cylinder are the basic 3-dimensional shapes we see around us.



Here's a list of the 3-D or three-dimensional shapes with their name, pictures and attributes.

Name of 3D shape:	**Picture of 3D shape**:	**Attributes**:
Cube		Faces - 6 Edges - 12 Vertices - 8
Rectangular Prism or Cuboid		Faces - 6 Edges - 12 Vertices - 8
Sphere		Curved Face - 1 Edges - 0

		Vertices - 0
Cone		Flat Face - 1 Curved Face - 1 Edges - 1 Vertices - 1
Cylinder		Flat Face - 2 Curved Face - 1 Edges - 2 Vertices - 0

Nets for Building 3D Shapes

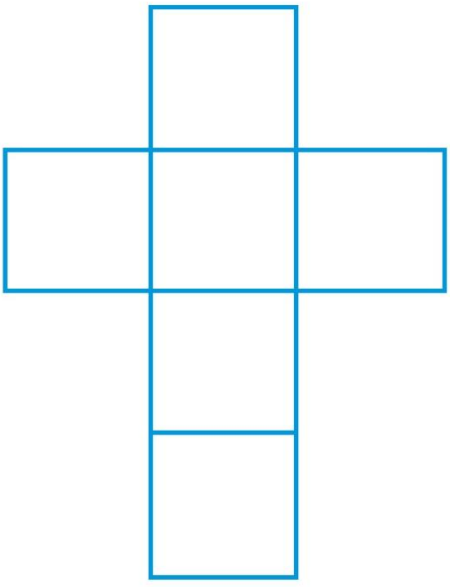
A net is a three-dimensional solid that has been flattened. It's a two-dimensional skeleton outline that can be folded and bonded together to become a three-dimensional construction. Nets are used to create three-dimensional shapes.

Polyhedrons

The word polyhedra are the plural of a polyhedron which may be defined as a solid shape bounded by polygons. Like a polygon, we have different polyhedron types as regular, irregular, concave and convex polyhedrons.

Net Pattern for a Cube

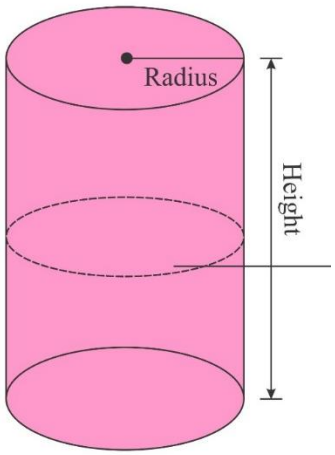
A cube is a three-dimensional object with six square faces that are all the same size and exact dimensions. A cube has 66 faces, 1212 edges and 88 vertices. The net for a solid cube is shown below.

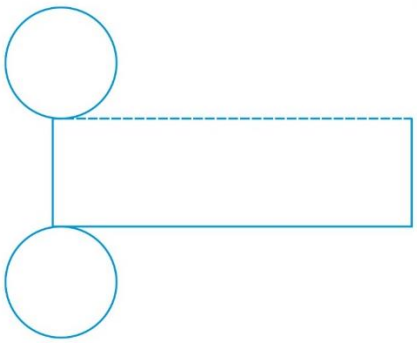


Net Pattern for a Cylinder

A cylinder is a solid three-dimensional form made up of two parallel bases connected by a curved surface. These bases are shaped like a round disc. The cylinder's axis is a line that runs from the centre or connects the centres of two circular bases. The height represents the distance between the two bases of the cylinder, which is termed perpendicular distance.

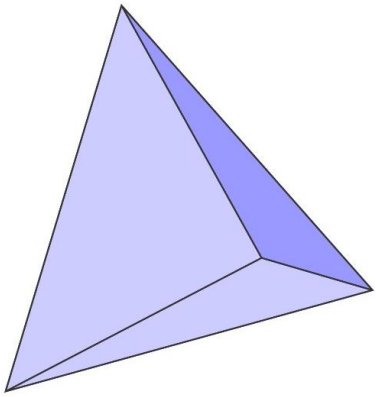
A cylinder has 33 faces, 22 edges and 00 vertices.

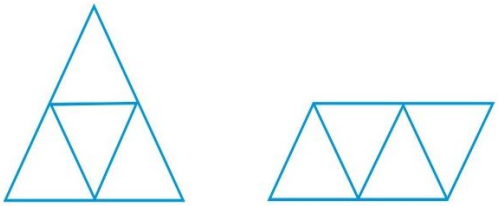




Net Pattern for a Tetrahedron

A polyhedron with 44 faces, 66 edges and 44 vertices, and triangular faces is known as a tetrahedron.





Revision Worksheet

1. Fill in the blanks.

(a) The surface of a solid object is called its_____.

(b) The point of intersection of two or more edges is called a _____.

(c) The surfaces that share a common edge with the base are called_____.

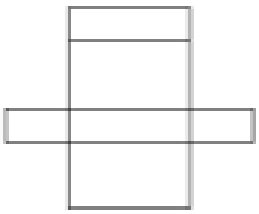
(d) A _____is a polyhedron having two identical bases, which are at opposite ends.

Name the 3D shape formed by each net.

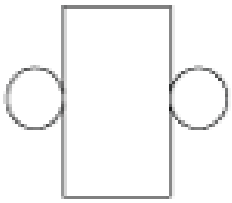
3D Shapes and Nets

Name the 3D shape formed by each net.

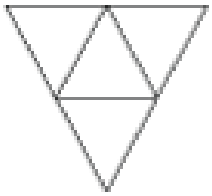
1)



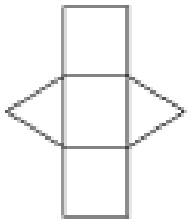
2)



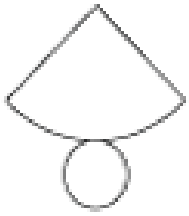
3)



4)



5)



6)