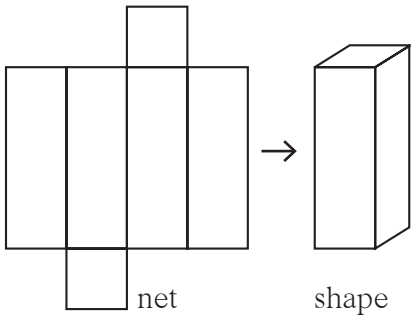
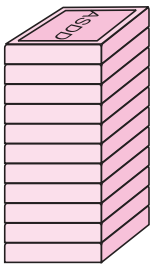
18 Three Dimensional Shapes

Let's recall.

Cuboids or Rectangular Prisms



You have learnt to make a cuboid from its net.
Give examples of how the same shape can be obtained in other ways.

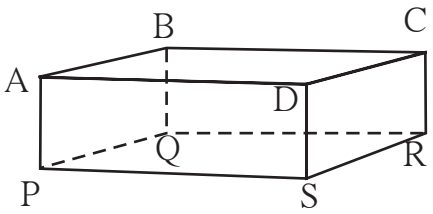


Let's learn.

Rectangular Prisms

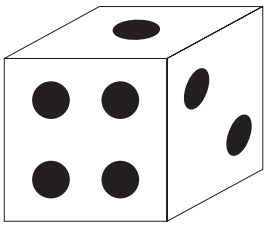
All the faces of a cuboid are rectangular and its opposite faces are identical or congruent. The cuboid is also a **quadrangular prism.** How many edges does the cuboid have? How many vertices does it have? How many faces does it have?

In the figure here, points A and B are two of the eight vertices. Seg AB and seg AP are the names of two edges and ABCD is the name of one face.



A cuboid has **12 edges, 8 vertices** and **6 faces**.

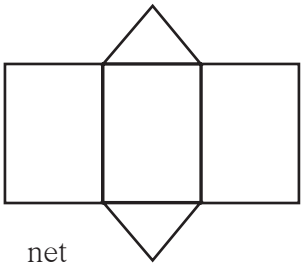
Cubes

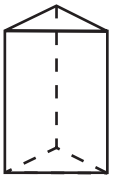


There is a dice in the figure alongside. What difference do you see in the shape of a dice and that of a cuboid? When all the faces of a quadrangular prism are equal squares, it is called a cube.

- How many faces does a cube have?
- How many edges does a cube have?
- How many vertices does a cube have?

Triangular Prisms





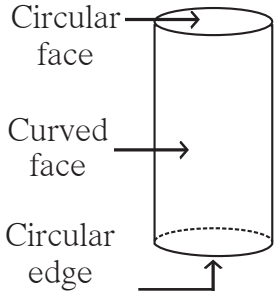
What is the shape of the faces at the base and at the top of the figure alongside?

What is the shape of the faces on the sides?

Such a figure is called a **triangular prism**.

How many edges, vertices and faces does a triangular prism have?

Cylinders



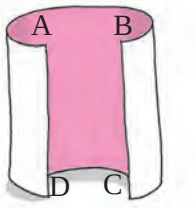
You must have seen a tall box with a circular base. A tin like this is a familiar example of a cylinder. If the tin is closed, it is a closed cylinder. A closed cylinder has two flat circular faces and one curved face. The cylinder has two circular edges and no vertex.

Give some examples of cylinders you are familiar with.

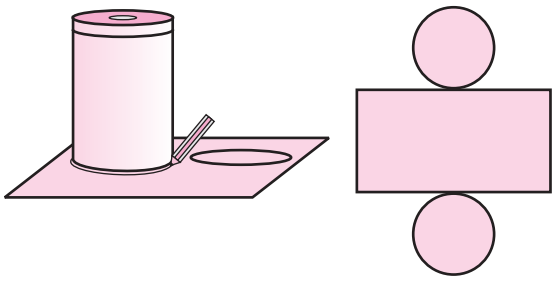
Try this.

Activity :

- Take a rectangular sheet.
- Bring together its opposite sides.
- A hollow cylinder will be formed.



Activity : Take a cylindrical tin. Take a rectangular sheet with one side equal to the height of the tin. Wrap it around the tin to cover it completely and cut away the extra paper. Then unfold it and spread it out on a table.

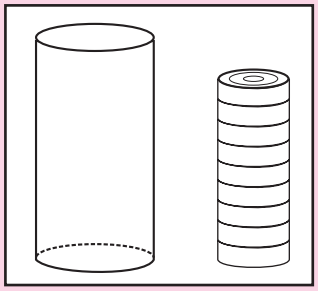


Take another sheet. Place the box on it and draw its circular outline. Cut away the paper around it. Cut out another circle like this one. Place these discs next to the rectangular paper as shown in the figure above. The figure obtained is the net of the closed cylinder. Make a cylinder using this net.

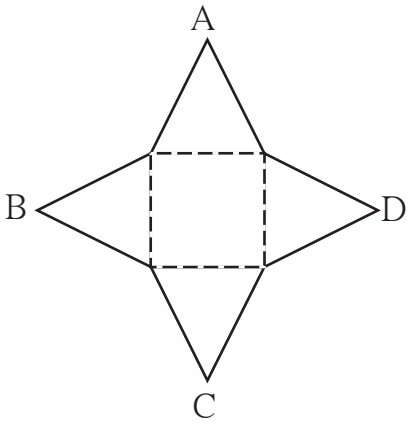
Can you tell?

When playing carrom, you make a pile of the pieces as shown in the picture. What is the shape of this pile?

If you place a number of CD's or round biscuits one on top of the other, what shape do you get?



Try this.



This shape is called a **pyramid**. The top or apex of this shape is pointed like a needle. As the base of this shape is a quadrilateral, it is called a **quadrangular pyramid**. Count the edges, vertices and faces of this shape.

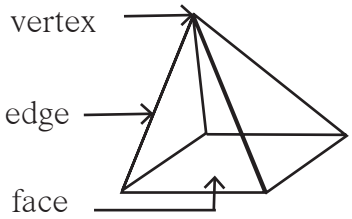
A quadrangular pyramid has 5 faces, 8 edges and 5 vertices.

Activity : Draw the net shown alongside on a card-sheet and cut it out. Fold along the dotted lines of the triangle in the centre and bring together the triangles on the sides so that the vertices A, B and C meet at a point. You will get a pyramid. The base of this pyramid is a triangle. Hence, it is called a **triangular pyramid**. Count and write the number of its edges, vertices and faces.

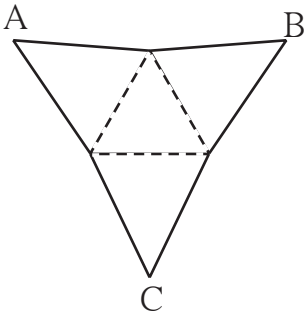
Pyramids

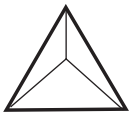
Activity : A net is shown here. It has identical triangular sides. Draw a figure like this on a card-sheet and cut it out. Fold along the dotted lines of the square and bring the sides together so that the vertices A, B, C and D meet at a point.

You will get a shape like the one shown below. Its base is a square and its other standing faces are triangles.



Quadrangular Pyramid





Triangular Pyramid

Now I know –

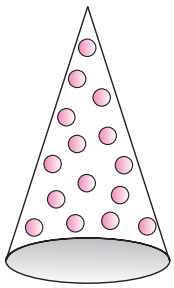
The top and the bottom faces of a prism are identical. The other faces of triangular, quadrangular, etc. prisms are rectangular.
The standing faces of a pyramid are triangular.
The name of a prism or a pyramid depends upon the shape of its base.

Cones

You are familiar with examples of cones.

You can see two of them in the pictures below.

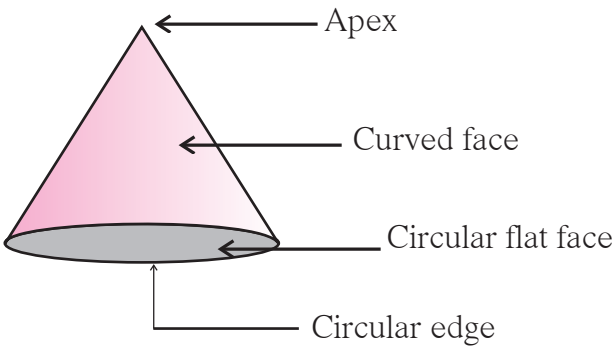
This cone has been closed after filling it with ice-cream. Its circular top is closed.



This is a clown's cap. The circular base of this cap is not closed.

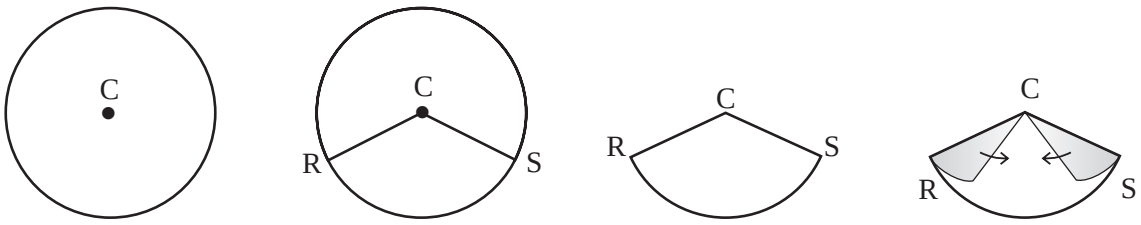
The tip of the cone is called its **apex**. A cone that is closed by a flat disc has one curved face, one circular flat face and one circular edge.

An open cone has a curved face and a circular edge, but no flat face.



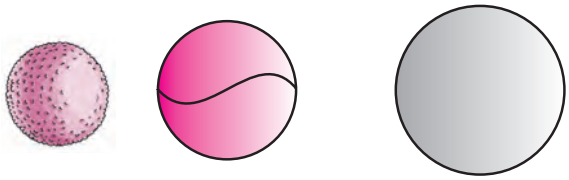
Try this.

- Using a compass, draw a circle with centre C on a paper.
- Draw two radii of the circle, CR and CS.
- Cut out the circle.
- Cut along the radii and obtain two pieces of the circle.
- Bring together the sides CR and CS of each piece.



On completing the activity, what shapes did you get?

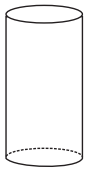
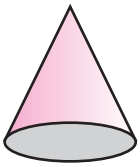
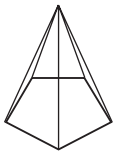
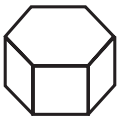
Spheres



The shape of a laddoo, a ball,
a shot put is called a sphere.
The sphere has just **one curved face**.
It does not have any vertices or edges.

Practice Set 41

✸ Write the number of faces, edges and vertices of each shape in the table.

Name	Cylinder	Cone	Pentagonal pyramid	Hexagonal pyramid	Hexagonal prism	Pentagonal prism
Shape						
Faces						
Vertices						
Edges						