3d Shapes

3D shapes

➢ 3D Shapes are solid objects that have three dimensions.

➢ These dimensions are length, width and height.

Examples of 3D shapes

Cube

Cuboid

Sphere

Cone

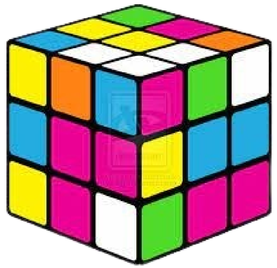
Types of 3D shapes

- **Polyhedrons**
- **Curved Solids**

Polyhedrons

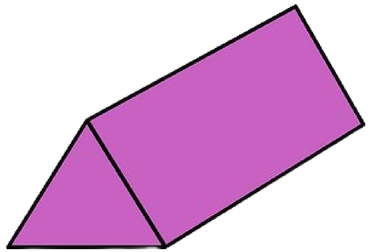
- **Polyhedrons** are **3D shapes**.
- The polyhedrons are also called the **Polyhedra.**
- Polyhedrons should have **straight edges**

Examples



Cube

Cuboid



Prism

Pyramid

Curved Solids

❖ The **3D shapes** that have **curved surfaces** are called **curved solids.**

Examples

Sphere

Cone

Cylinder

Three dimensional shapes

Cone

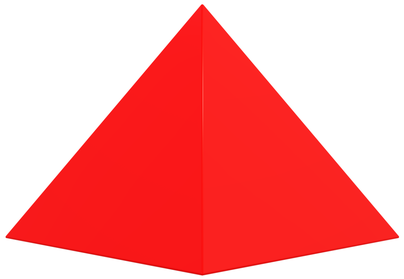
Cuboid

Cube

Prism

Sphere

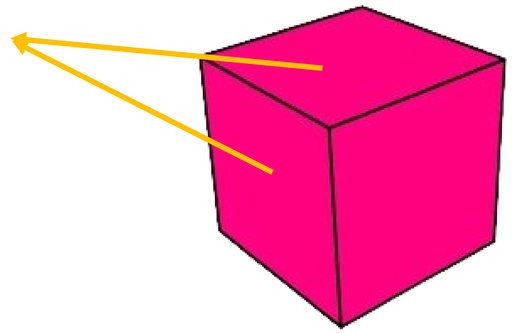
Cylinder



Pyramid

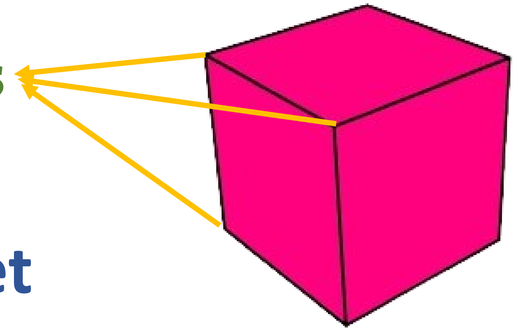
3d shapes

Basic properties : Faces, Vertices or corner, Edges



Faces

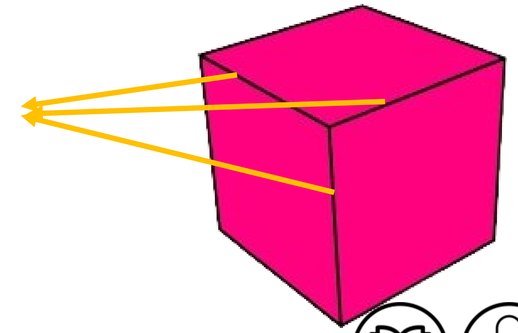
Faces are the surfaces on the outside of a shape



Vertices or corners

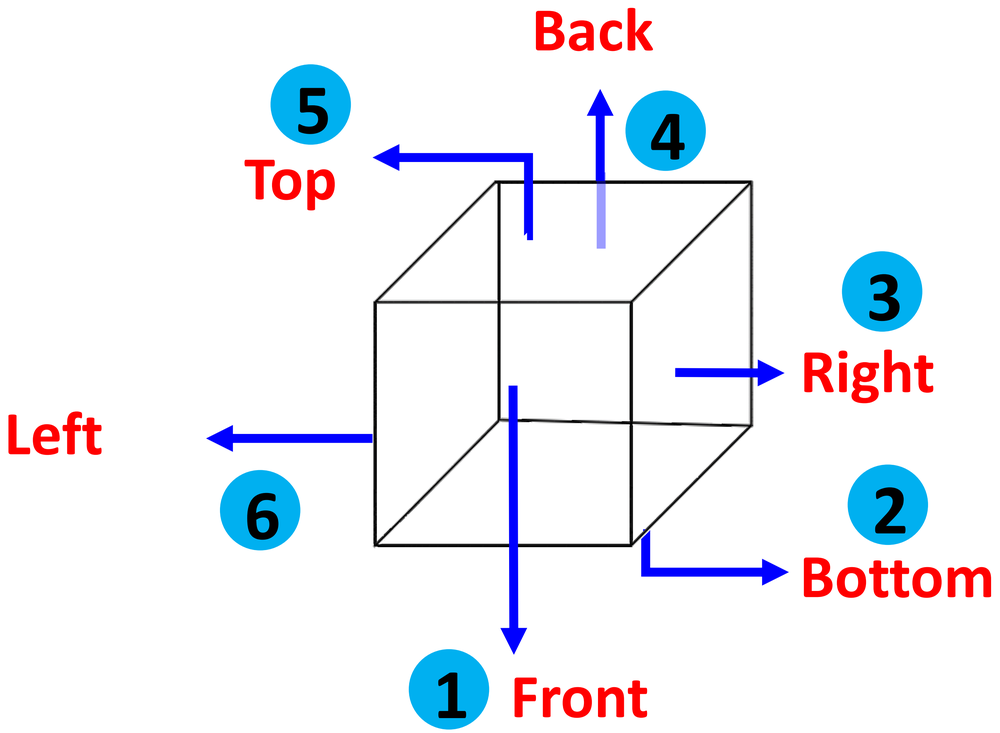
Vertices or corners are where two or more edges meet

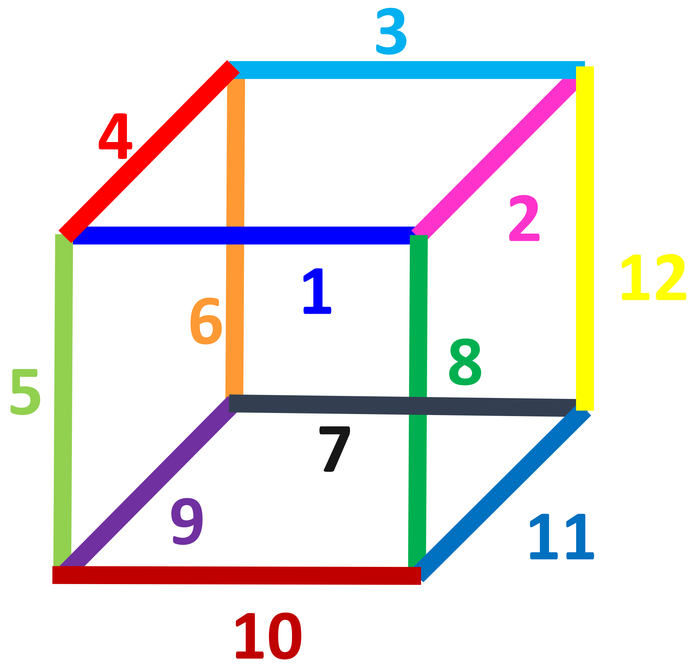
Edges

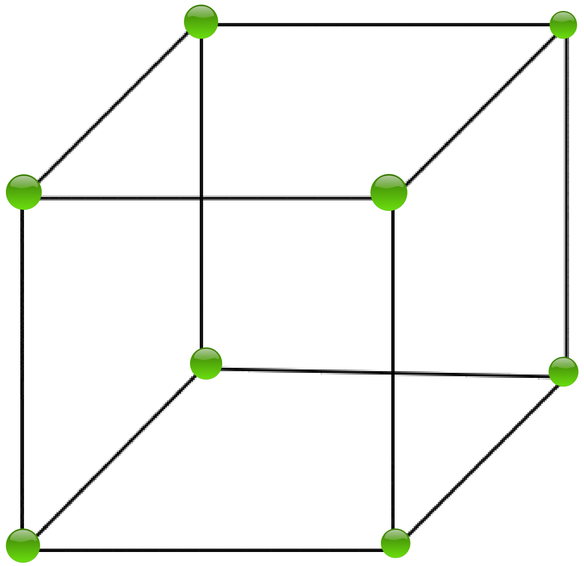


Edges are the lines where two faces meet

Cube





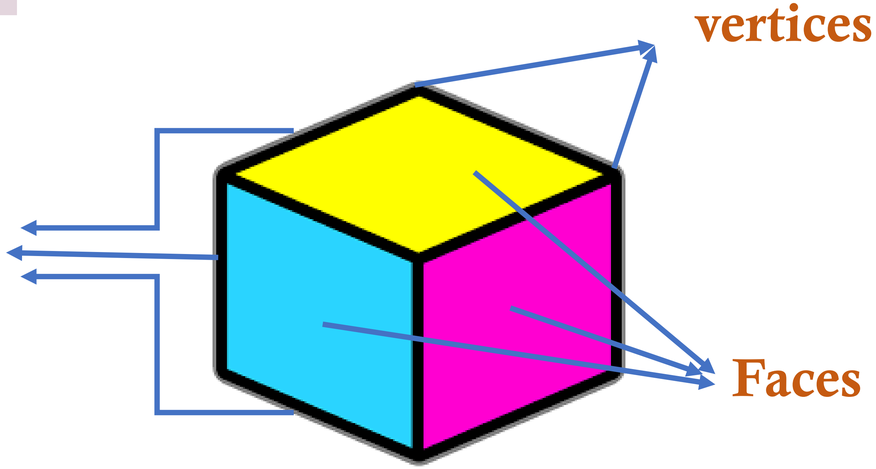


Faces - 6

Edges - 12

Vertices - 8

Cube



Properties/characteristics:

- It is a **3-D shape**.
- It has **six faces**.
- All **sides** are **equal**.
- It has **8 vertices** and **12 edges**.

Examples

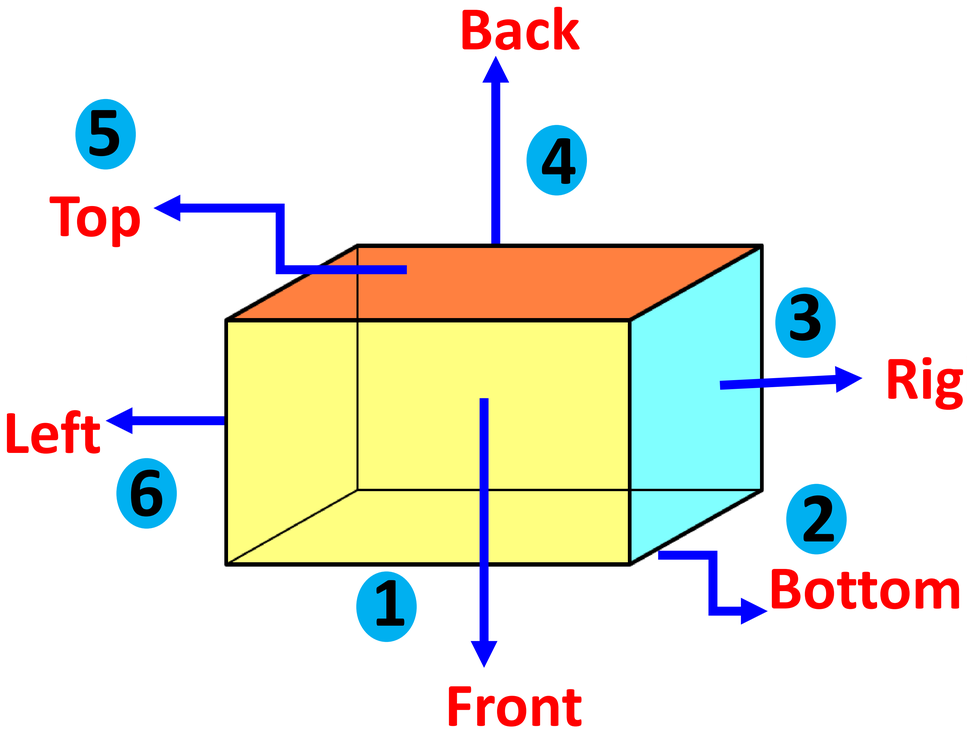
Dice, Ice cubes , Gift box.

Dice

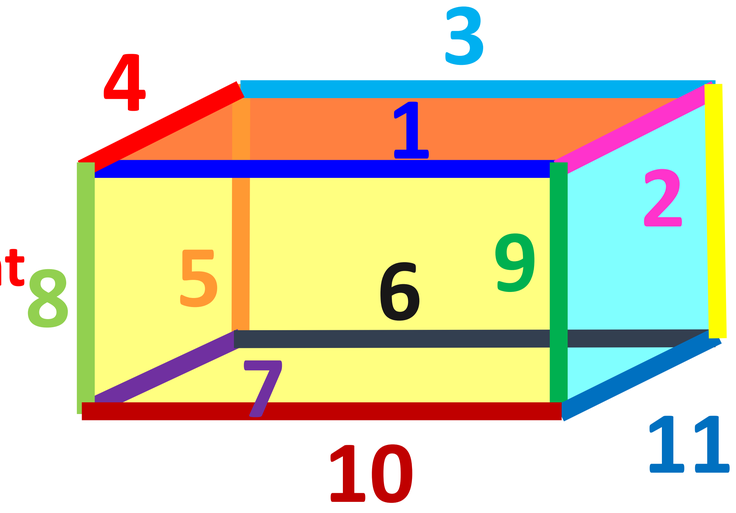
Ice cubes

Gift box

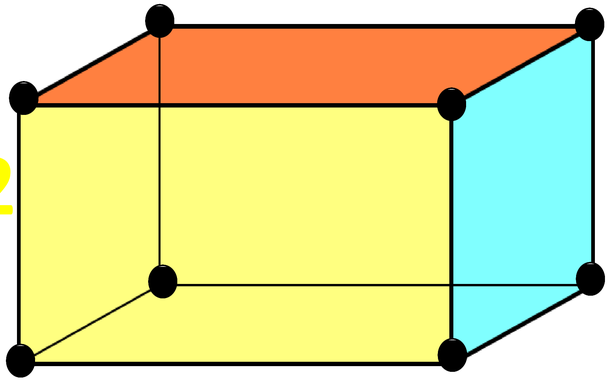
Cuboid



Faces - 6

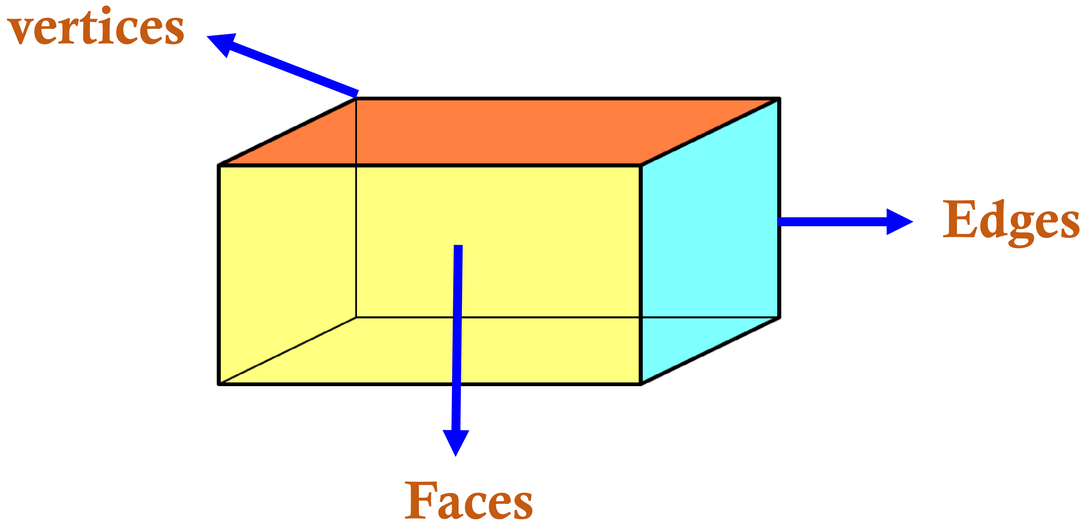


Edges - 12



Vertices - 8

Cuboid



Properties/characteristics:

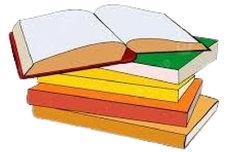
- It is a **3-D shape**.
- It has **six faces**.
- Its **opposite sides** are **equal**.
- It has **8 vertices** and **12 edges**.

Examples

Bricks, Match box , Book.

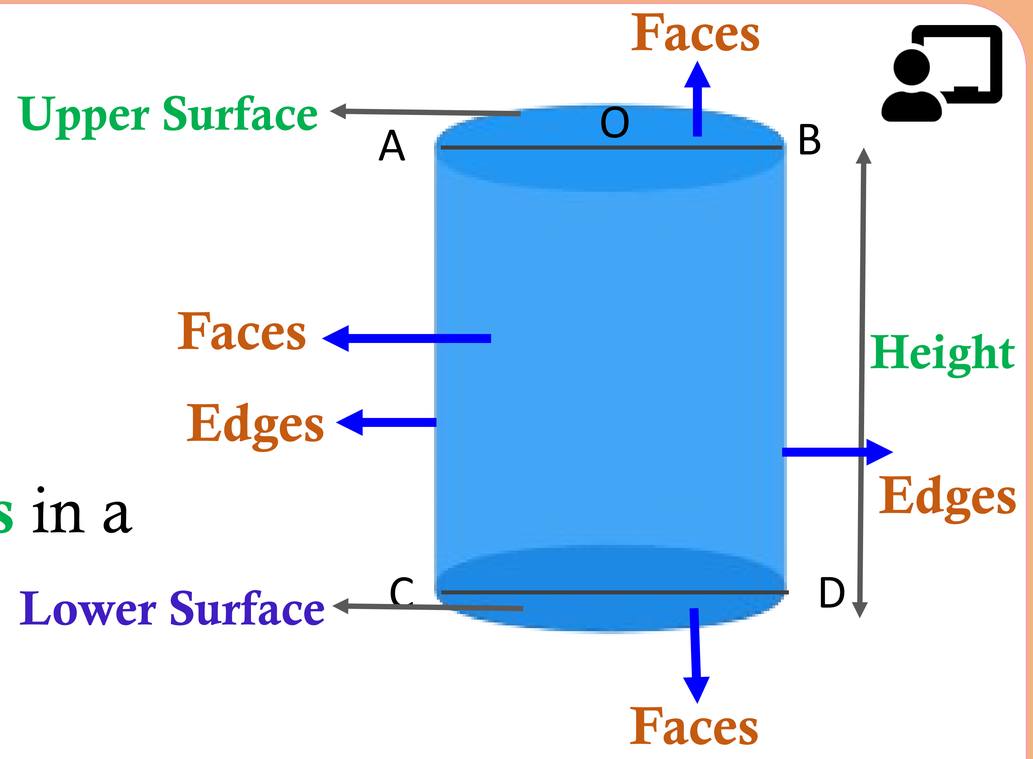
Bricks

Match Box



Book

Cylinder



Properties/characteristics:

- It is a **3-D shape**.
- **Two bases** lie in **upper** and **lower surfaces** in a cylinder.
- It has **3 faces**.
- **Height** is the distance between the **two bases**.
- It has **2 edges** and **no vertices** .

OA = OB = OC = OD Radius
AC = BD Height

Examples

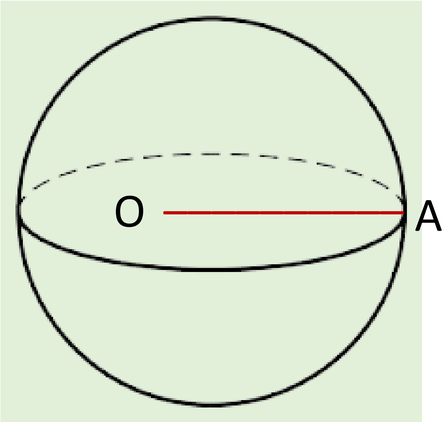
Straw , Cylinder , Pipe.

Straw

Cylinder

Pipe

Sphere



O – Centre point
OA - Radius

Properties/characteristics:

- It is a **3-D shape**.
- It has **one surface.**
- **All points** on the **surface** are at the **same distance from the centre.**
- It has **no vertices** and **edges**.

Examples

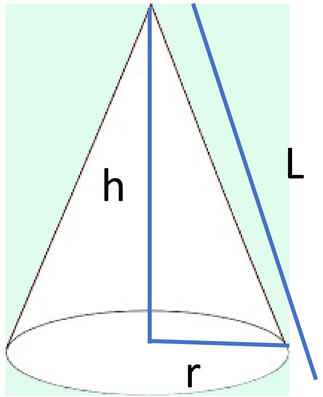
Laddu , Globe , Ball.

Laddu

Globe

Ball

Cone



L – Slant height
h – Height
r - Radius

Properties/characteristics:

- It is a **3-D shape**.
- **Base** of a **cone** is **circular**.
- The **distance** from the **top of the cone** to the **center of the base** is called as **height**.
- The **distance** from the **apex** to any point lying on the **circumference of base** is called as **slant height**.
- The **height** and **slant height** are **not equal**.

Cone ice cream

Party cap

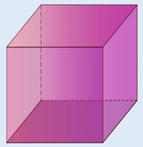
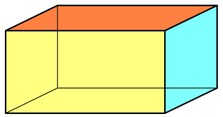
Examples

Cone ice cream, Party cap.

3D Shape Properties

Lateral surface area

Total surface area

Name of the shapes	Formulas
cube 	TSA = $6a^2$ (square units) LSA = $4a^2$ (square units) Volume = a^3 (cubic units)
cuboid 	TSA = 2 (lw + wh + lh) (square units) LSA = 2h(l + w) (square units) Volume = a^3 (cubic units)
cone 	TSA = πr(l + r) (square units) LSA = πrl (square units) Volume = (1/3) π r^2h (cubic units)
cylinder 	TSA = 2 π r(h+r) (square units) Volume = πr^2h (cubic units)
sphere 	TSA = 4πr^2 square units Volume = (4/3)πr^3 cubic units