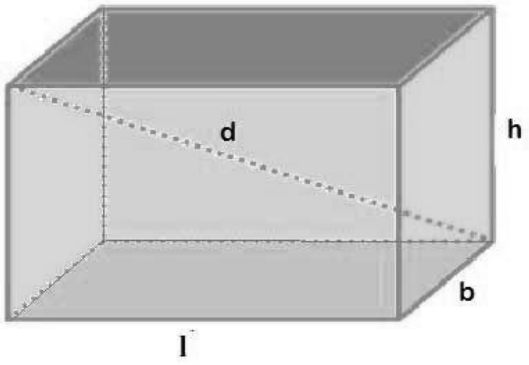
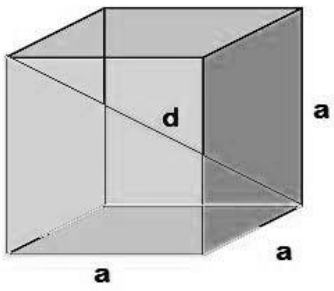
Volume of Cuboid and Cube

Understanding of Volume of Cuboid and Cube

- A cuboid is a solid box-shaped figure with length, breadth, and height.
- A cube is a special cuboid where all sides are equal.
- Volume is the amount of space occupied by the object, measured in cubic units.
- Volume tells us how much space a solid object can contain.



Area & Volume of Cuboid



Area & volume of Cube

Important Points

- Volume of Cuboid = length × breadth × height.
- Volume of Cube = side × side × side = side^3.
- Units of volume are always in cubic measures like cm^3, m^3.
- Make sure all dimensions are in the same unit before calculating volume.
- Volume increases greatly with even small increases in side lengths.

Examples with Solutions

Example: Volume of a Cuboid with Simple Numbers

➢ **Find the volume of a cuboid with length 8 cm, breadth 5 cm, and height 3 cm.**

Solution: Volume = 8 × 5 × 3 = 120 cm^3

Example: Volume of a Cube

➢ **Find the volume of a cube whose side is 6 cm.**

Solution: Volume = 6^3 = 6 × 6 × 6 = 216 cm^3

Example: Volume of a Cuboid with Fractions

➢ **Find the volume of a cuboid with length $\frac{5}{2}$ m, breadth $\frac{3}{2}$ m, and height $\frac{4}{2}$ m.**

Solution: Volume = $\left(\frac{5}{2}\right) \times \left(\frac{3}{2}\right) \times \left(\frac{4}{2}\right) = \frac{60}{8}$ = 7.5 m³

Example: Find Side When Volume is Given (Cube)

➢ **The volume of a cube is 512 cm³. Find the side.**

Solution: Side = $\sqrt[3]{512}$ = 8 cm

Example: Compare Volumes of Cube and Cuboid

➢ **A cube has side 5 cm. A cuboid has dimensions 5 cm, 5 cm, and 2 cm. Which has greater volume?**

Solution: Volume of cube = 5^3 = 125 cm³

Volume of cuboid = 5 × 5 × 2 = 50 cm³

Answer: Cube has greater volume.

Summary Points

- Volume of cuboid = length × breadth × height.
- Volume of cube = side³.
- Always express volume in cubic units like cm³ or m³.
- Cube has maximum volume among cuboids with same edge length.
- Check units before calculating volume.