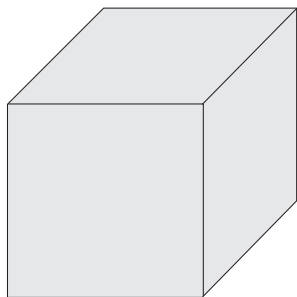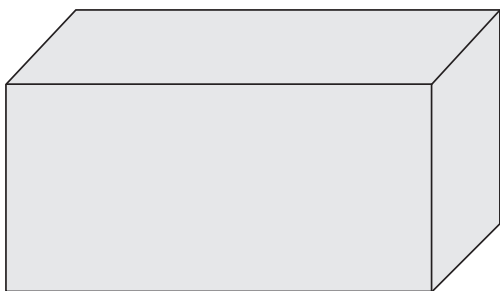# Unit 9 : Volume

Friendly Notes

Cubic Units

All the edges of a **cube** are of equal length.
The sides are all squares.

A **cuboid** has rectangular and/or square sides.
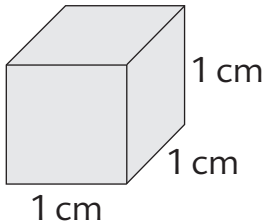
Cubes and cuboids are called **rectangular prisms**.

Rectangular prisms are **solid figures**.

Volume of Rectangular Prisms

The **volume** of a solid is the amount of space it occupies.
The volume of a unit cube is 1 cubic unit.

Each edge of the cube is 1 cm long.
The volume of the cube is 1 cubic centimeter (cm^3).

1 cm
1 cm
1 cm

The cubic centimeter (cm^3) is a unit of volume.
The cubic inch ($in.^3$), cubic foot (ft^3), and cubic meter (m^3) are other units of volume.

Volume of rectangular prism = length × width × height

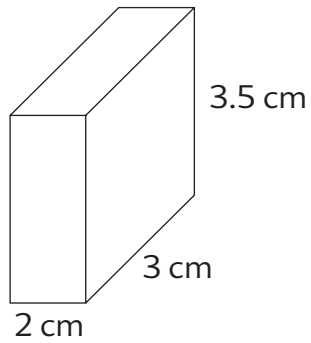1. Find the volume of the rectangular prism which measures 18 cm by 20 cm by 10 cm.

   Volume of rectangular prism = 18 × 20 × 10
   $$= 3,600 \text{ cm}^3$$

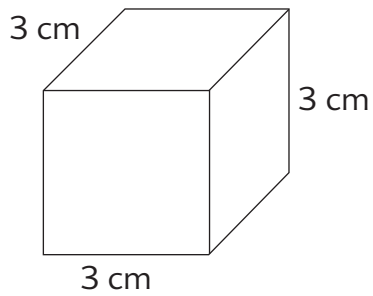2. Find the height of the rectangular prism which has a base area of 24 m^2 and a volume of 120 m^3.

   Height of rectangular prism $= \dfrac{\text{volume}}{\text{base area}}$
   $$= \dfrac{120}{24}$$
   $$= 5 \text{ m}$$

2. Find the volume of each rectangular prism.

(a)

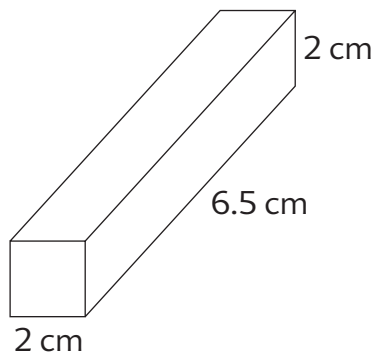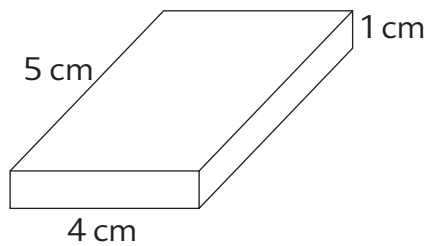3.5 cm
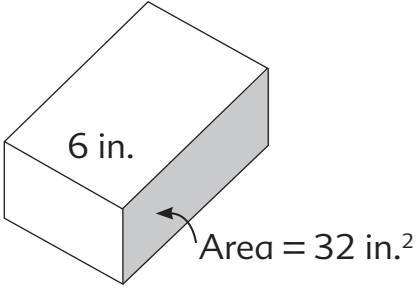
3 cm

2 cm

(b)

3 cm

3 cm

3 cm

(c)

2 cm

6.5 cm

2 cm

(d)

1 cm

5 cm

4 cm

3. Find the volume of each rectangular prism.

(a)

6 in.

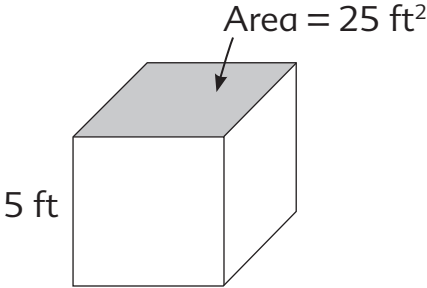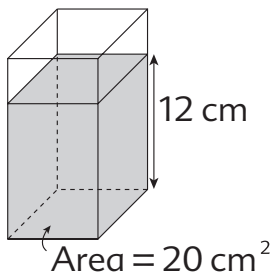Area = 32 in.²

(b)

Area = 25 ft²

5 ft
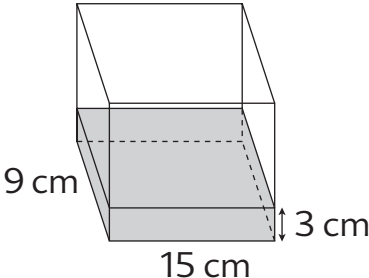
4. Find the volume of the water in each container in cubic centimeters.

(a)

9 cm

15 cm

3 cm

(b)

12 cm

Area = 20 cm²

9. Solve. Show all your work clearly.

   (a) The volume of a rectangular prism is 189 in.^{3}. What is its length if its height is 7 in. and its width is 3 in.?

   (b) A rectangular tank is 25 cm long, 16 cm wide, and 30 cm high. It contains 8 L of water. How many more liters of water can it contain? (1 L = 1,000 cm^3)

   (c) The volume of a wooden block is 1,200 cm^3. Its length is 5 cm more than its width. If its length is 10 cm, find its height.