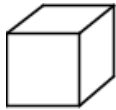


Cuboid Calculations

Volume is the **real space** **inside** a 3D shape.

In other words, volume is asking:
How many *cubes* fill the shape?

The standard size of cube used is a 'cubic centimetre', or cm^3 :



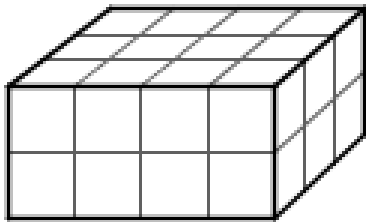
Surface Area is the **flat space** on the **surface** of a 3D shape.

In other words, surface area is asking:
How many *squares* cover the shape?

The standard size of square used is a 'square centimetre', or cm^2 :

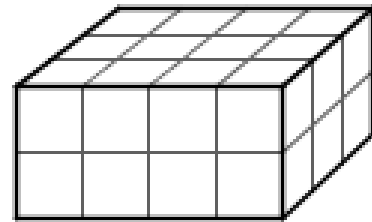


Check that you understand:
 Find the **volume** of this cuboid:



Volume = _____ cm^3

Check that you understand:
 Find the **surface area** of this cuboid:



Surface Area = _____ cm^2

Calculating Volume

To work out the volume without counting cubes, notice that each layer has 3 rows of 4 cubes, and there are 2 layers in total, so we have 2 lots of 3 lots of 4.

Altogether this gives a total of:

$$2 \times 3 \times 4 = \mathbf{24cm^3}$$

Calculating Surface Area

To work out the surface area without counting squares, notice that the front and back faces are 2 rows of 4, the left and right are 2 rows of 3 and the top and bottom are 3 rows of 4.

All six faces together give a total of:

$$8 + 8 + 6 + 6 + 12 + 12 = \mathbf{52cm^2}$$

In general, to work out the volume:
 Multiply **all three dimensions** together:
length \times width \times height

In general, to work out surface area:
 Add together the **area** of all 6 faces:
front + back + left + right + top + bottom

Cuboid Calculations

Task A: Find a cuboid

You will need to find an actual object which is (roughly) cuboid-shaped, such as a cereal box, a microwave, a DVD case, a shoebox, etc. Just make sure you can measure it.

What cuboid have you chosen to use? _____

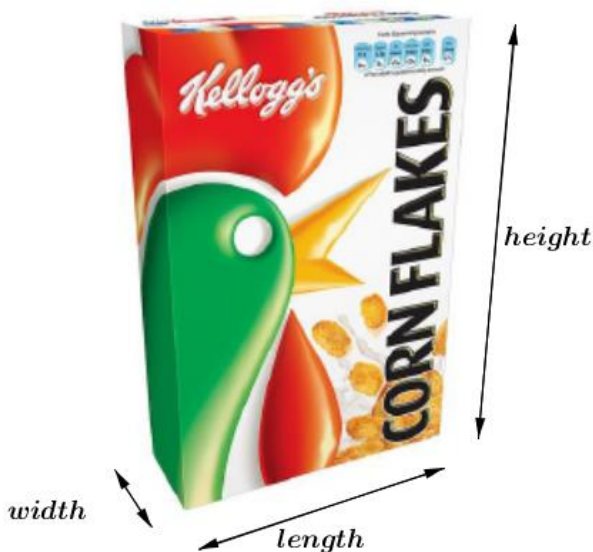
Task B: Measure your cuboid *You will need either a ruler or a tape measure.*

Measure the **length**, **width** and **height**. Circle the units you used to measure.

Length (distance from the left to the right): _____ mm / cm / m

Width (distance from the front to the back): _____ mm / cm / m

Height (distance from the top to the bottom): _____ mm / cm / m



Task C: Calculate the volume
Multiply all three dimensions together.

$$\text{length} \times \text{width} \times \text{height}$$

$$\text{_____} \times \text{_____} \times \text{_____}$$

Volume of my cuboid:

$$V = \text{_____} \text{ mm}^3 / \text{cm}^3 / \text{m}^3$$

Task D: Calculate the surface area *Add together the area of all six faces.*

Front: length \times height

$$\text{_____} \times \text{_____} = \text{_____}$$

Back: same as the front

$$= \text{_____}$$

Right: height \times width

$$\text{_____} \times \text{_____} = \text{_____}$$

Left: same as the right

$$= \text{_____}$$

Top: length \times width

$$\text{_____} \times \text{_____} = \text{_____}$$

Bottom: same as the top

$$= \text{_____}$$

Total surface area: *front + back + right + left + top + bottom*

$$SA = \text{_____} \text{ mm}^2 / \text{cm}^2 / \text{m}^2$$