

MEASUREMENT: VOLUME

05 JUNE 2014



Lesson Description

In this lesson we:

- Introduce and work through questions relating to:
 - Various 3-dimensional shapes
 - Volume of a rectangular prism
 - Volume of a cylinder
 - Volume of a triangular prism
 - Calculations to do with Volume
 - Costings

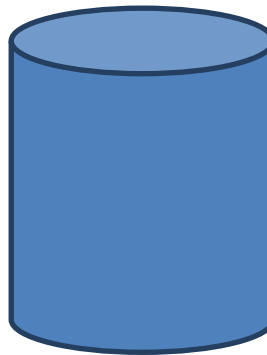


Summary

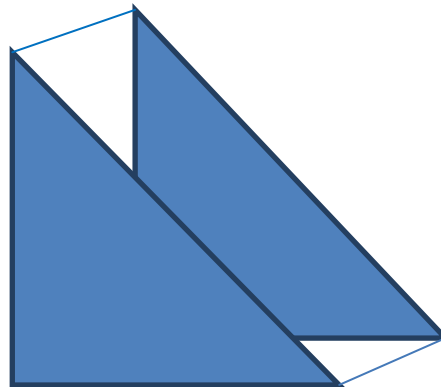
Volume of a rectangular prism = $l \times b \times ht$



Volume of a cylinder = $\pi \times r^2 \times ht$



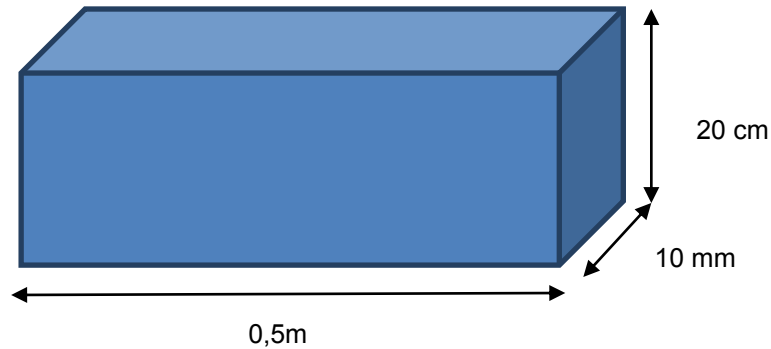
Volume of a triangular prism = $\frac{1}{2} \times base \times ht \times width$





Test Yourself

Consider the diagram below when answering questions 1 - 3



Question 1

0,5m =

- A 10cm
- B 5cm
- D 500cm

Question 2

The dimensions of the prism are:

- A 20cm x 1cm x 5cm
- B 20cm x 0,1cm x 50cm
- C 20cm x 1cm x 50cm
- D 20cm x 100cm x 50cm

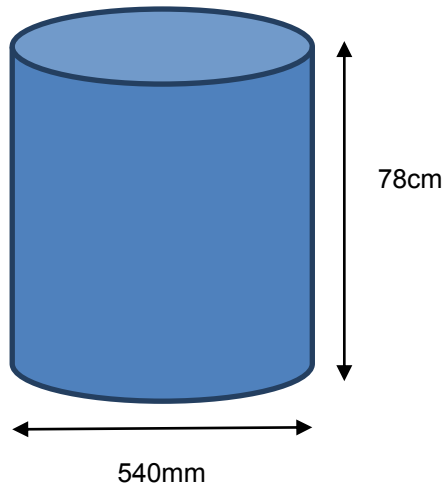
Question 3

What is the volume of the rectangular prism?

- A $100m^3$
- B $100cm^3$
- C $100mm^3$
- D $0,001m^3$

notes for...

Consider the diagram below when answering questions 4 and 5



Question 4

The radius of the cylinder is:

- A 270cm
- B 27cm
- C 78cm
- D 39cm

Question 5

The volume of the cylinder is:

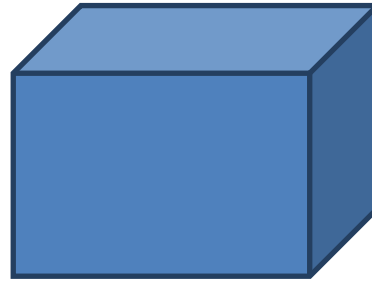
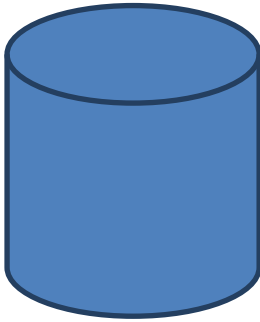
- A 178 546 680 mm^3
- B 17 854 668 mm^3
- C 71 418 672 mm^3
- D 714 186 720 mm^3

Question 6

400 000 000 mm^3 =

- A 40 000 000 cm^3
- B 4 000 000 cm^3
- C 400 000 cm^3
- D none of the above

Consider the following diagram when answering questions 7 – 9



The diagrams illustrates a round tin (15cm high and 6cm in diameter) and a rectangular tin with measurements 9cm long, 5cm wide and 2,5cm high.

Question 7

What is the volume of the round tin?

- A $423,9 \text{ cm}^3$
- B $1\,695,6 \text{ cm}^3$
- C $847,8 \text{ cm}^3$
- D None of the above

Question 8

What is the volume of the rectangular tin?

- A $122,5 \text{ cm}^3$
- B $112,5 \text{ cm}^3$
- C 1125 cm^2
- D None of the above

Question 9

Which has the greater volume?

- A The round tin
- B The rectangular tin
- C They are both the same
- D None of the above

Question 10

Which has the greater volume to surface area ratio?

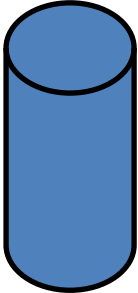
- A The round tin
- B The rectangular tin
- C They are both the same
- D None of the above



Improve your Skills

Question 1

James, lives on a farm. He relies on a water tank to keep drinking water for his chickens.



The water tank, as illustrated above, has a height of 3m and a diameter of 2m.

1.1 What is the volume of the water tank?

Remember: Volume of a cylinder = $\pi \times r^2 \times ht$

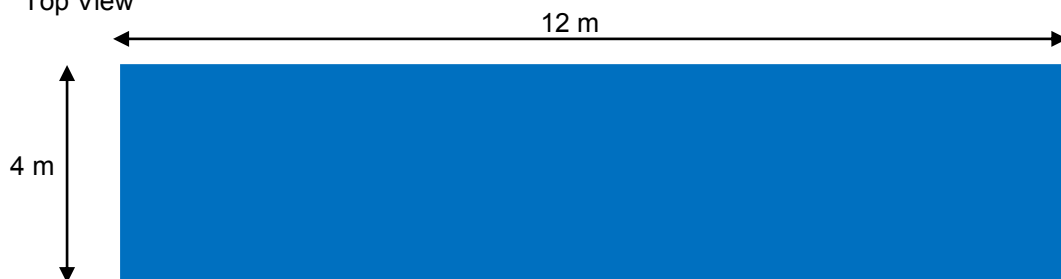
1.2 If 1 litre of water can fit into a space of 1000 cm^3 , then determine how many litres of water can fit into the water tank if it is 95% filled.

1.3 How much water (in litres) does James need every day for his 543 chickens if each chicken drinks 500ml of water per day?

1.4 How long will the water in the water tank last if James never fills it and if the chickens get the required amount of water every day?

Question 2

Top View



Side View



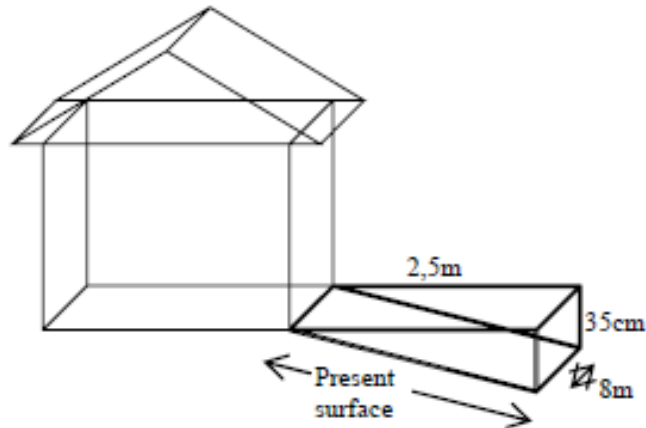
Calculate how many litres of water are needed to fill the pool if $0,001 \text{ m}^3$ equals 1 litre.

Question 3

James's Garden

The 3-dimensional section below (not drawn to scale) shows how the garden is sloped.

James decides that he will have to level the garden by laying more soil at the bottom end and building his garden up. James calculates that the new soil will have to be 35cm deep at its deepest point, and will have to be laid 2,5m wide horizontally from the edge of his house to the edge of the garden. The garden extends the whole length of his 8m long house.



$$\text{Volume of triangular prism} = \frac{1}{2} \times \text{base} \times \text{height} \times \text{length}$$

- 3.1 Calculate how many cubic meters of soil James needs to buy in order to level his garden.
- 3.2 James is told that he will need to lay a top dressing to help the growth of his grass. The dressing is sold in bags of $0,03\text{m}^3$. The top dressing needs to be 2cm thick and cover the whole surface of the garden.

Calculate the number of bags that James will need to buy in order to top dress his garden sufficiently.

(6)