

Finding the Volume of Solid Figures

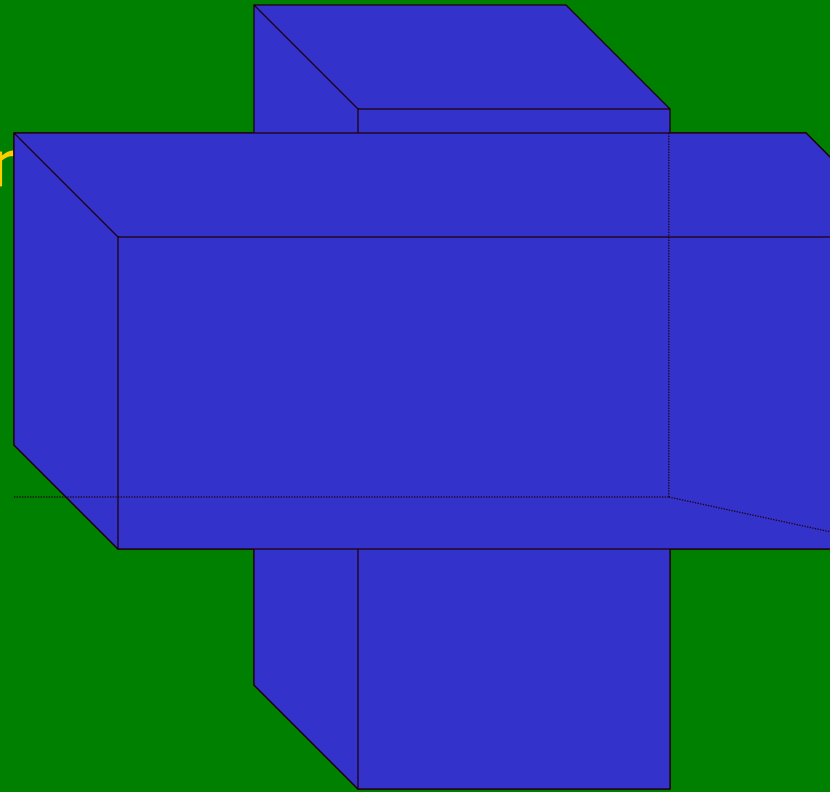
MCC6.G.2 – Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = lwh$ and $V = bh$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.

What Is Volume ?

The volume of a solid is the amount of space inside it.

Consider this rectangular prism

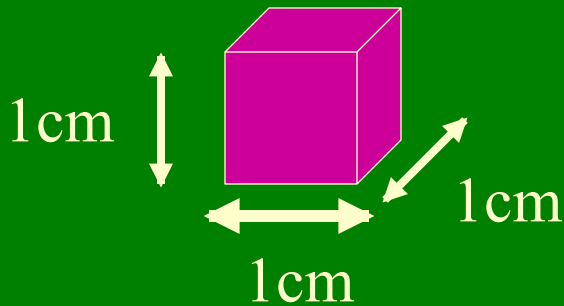
If we were to fill the prism with water, the volume would be the amount of water it could hold.



Measuring Volume

Volume is measured in cubic centimeters (also called centimeters cubed).

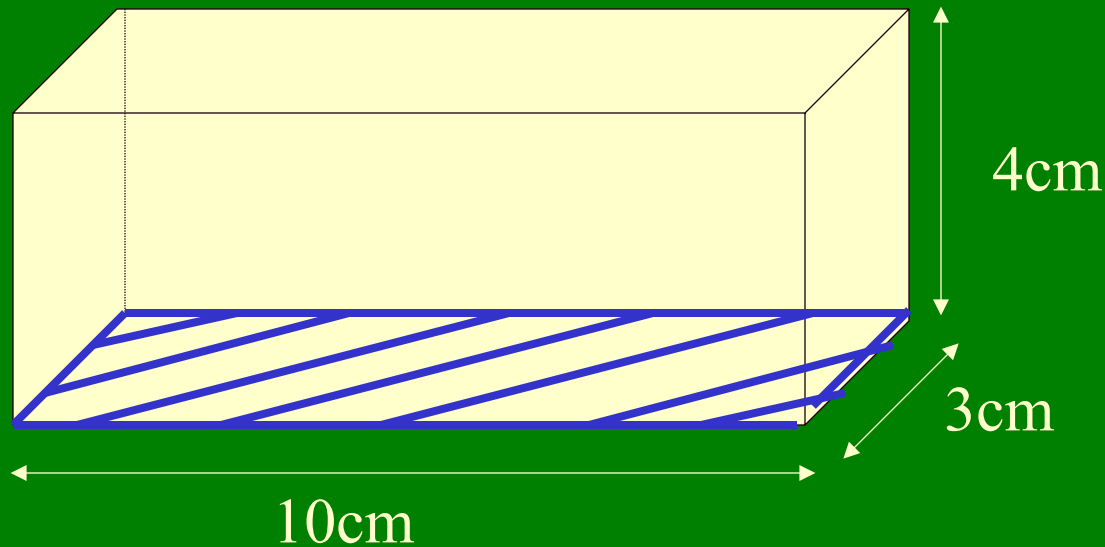
Here is a cubic centimeter



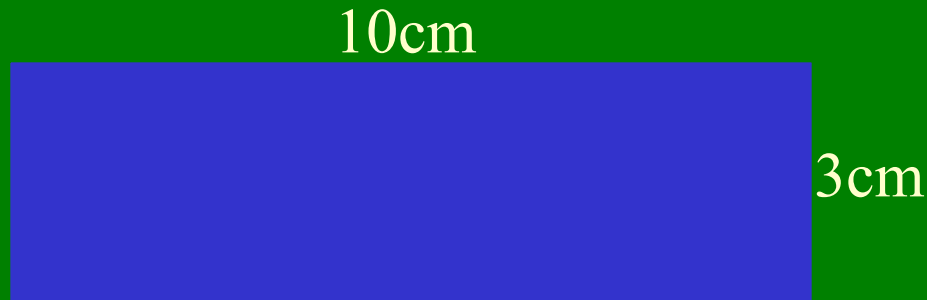
It is a cube which measures 1cm in all directions.

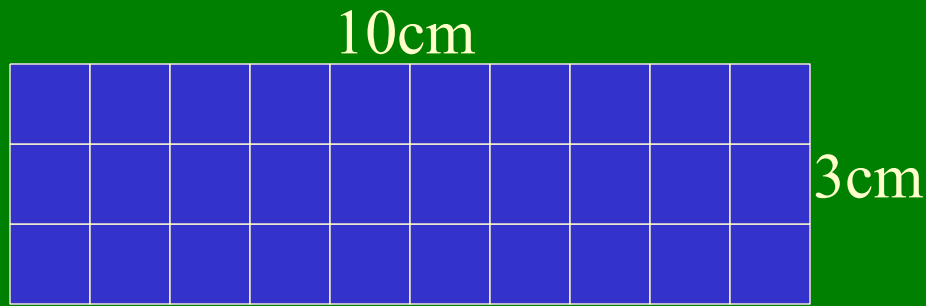
Volume of a Rectangular Prism

Look at the rectangular prism below:



We must first calculate the area of the base ("big B"):
The base is a rectangle measuring 10cm by 3cm:



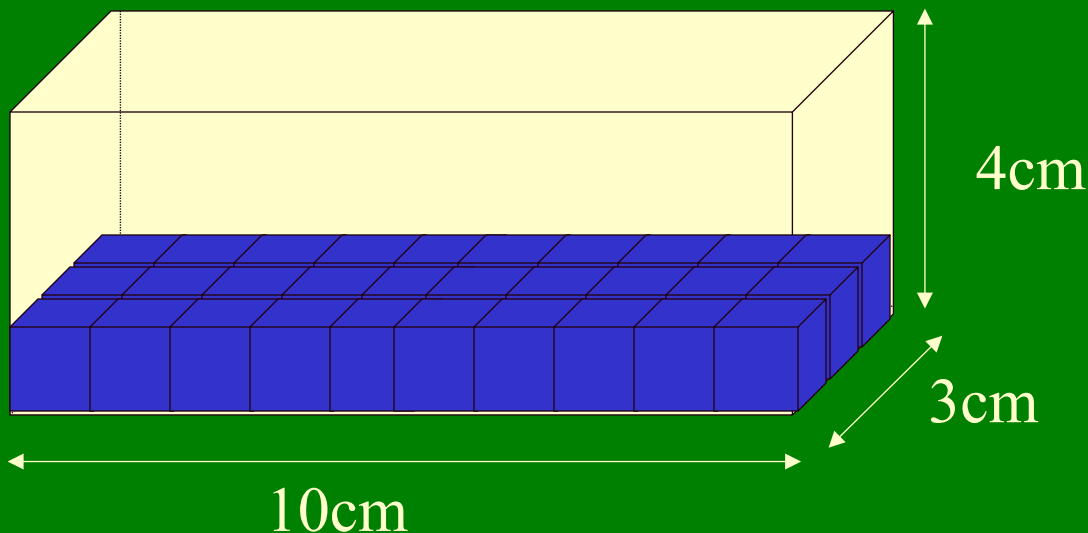


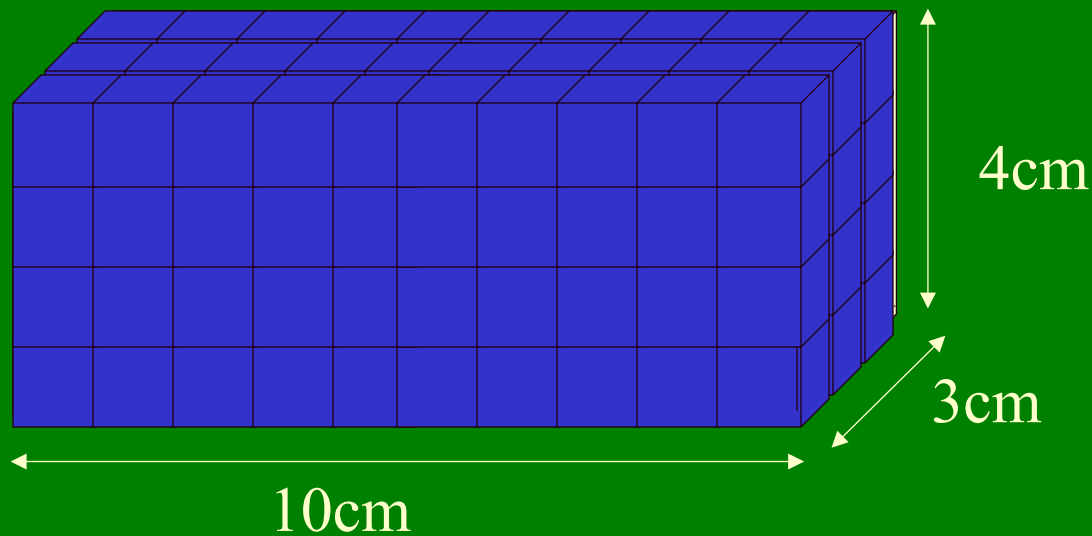
Area of a rectangle = length x width

$$\text{Area} = 10 \times 3$$

$$\text{Area} = 30\text{cm}^2$$

We now know we can place 30 centimeter squares on the base of the prism.





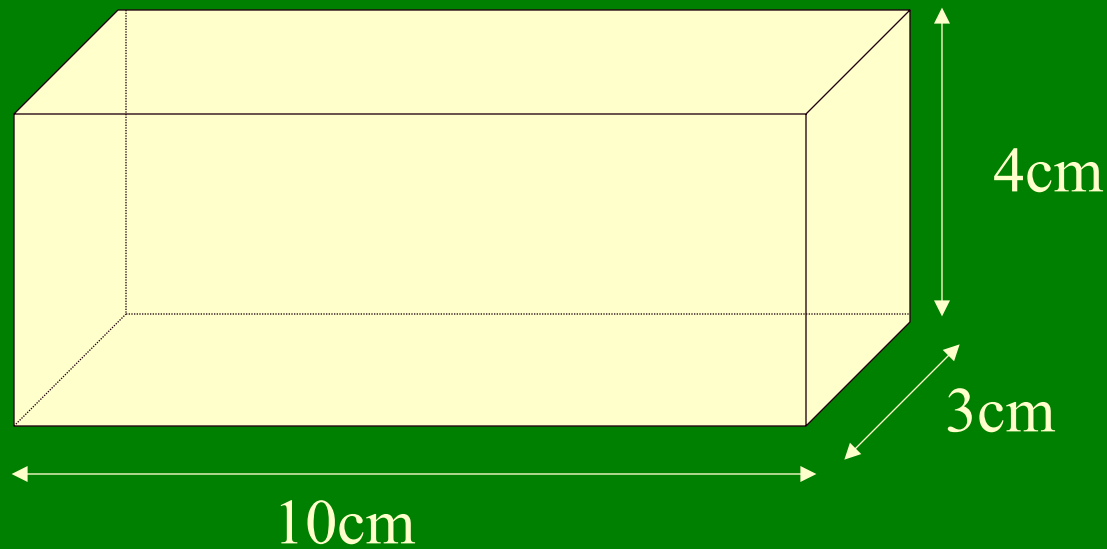
Now we need to find how many layers of 1cm cubes we can place in the prism:

We can fit 4 layers.

$$\text{Volume} = 30 \times 4$$

$$\underline{\text{Volume} = 120\text{cm}^3}$$

That means that we can place 120 centimeter cubes inside the prism.



We have found that the volume of the prism is given by:

$$\text{Volume} = 10 \times 3 \times 4 = 120\text{cm}^3$$

This gives us our formula to find the volume of a prism:

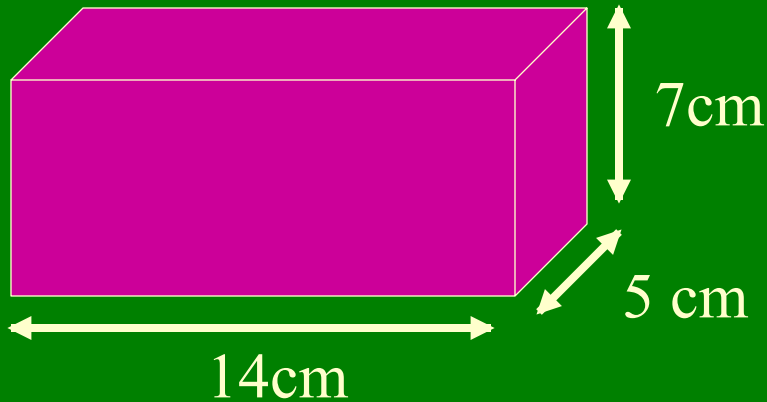
Volume = Area of the base x Height

$$V=Bh$$

Let's Practice

Calculate the volume of the prism below:

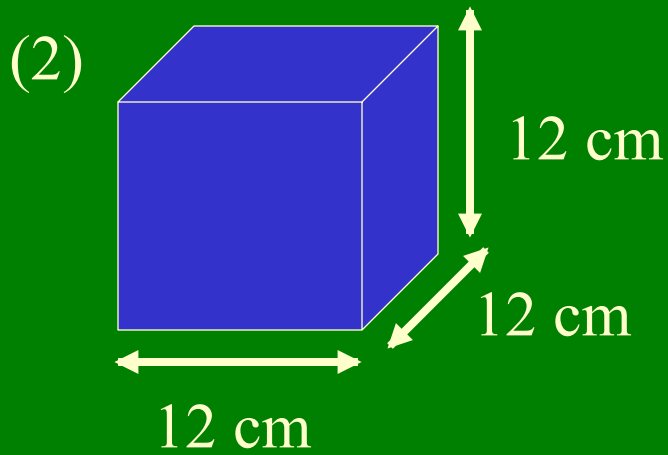
(1)



$$V = l w h$$

$$V = 14(5)(7)$$

$$V = 490 \text{ cm}^3$$



$$V = l w h$$

$$V = 12(12)(12)$$

$$V = 1728 \text{ cm}^3$$

$$V = l w h$$

$$V = 9(7)(3.2)$$

$$V = 201.6 \text{ m}^3$$