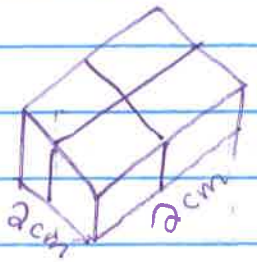
# M5·L4 ~ Use Multiplication to Calculate Volume

AP

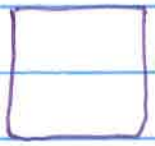



The volume of the prism is 4 $cm^3$. Karen added the numbers together. However with 2 rows of 2 cubes and a height of 1 cm, there are only 4 cubes.

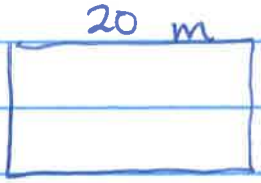
Fluency:

$\frac{1}{3} \times \frac{4}{5} = \frac{4}{15}$ $\frac{2}{3} \times \frac{4}{5} = \frac{8}{15}$ $\frac{\cancel{3}^{1}}{5} \times \frac{2}{\cancel{3}_{1}} = \frac{6}{15} = \frac{2}{5}$ $\frac{3}{\cancel{8}_{1}} \times \frac{\cancel{15}^{1}}{8} = \frac{15}{40} = \frac{3}{8}$

Area = length × width



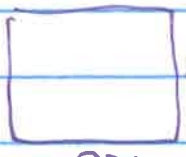

10 cm × 10 cm = 100 $cm^2$

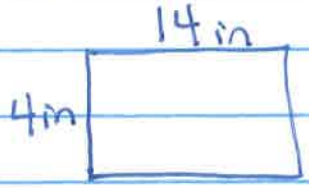




13 ft = 13 ft × 3 ft = 39 $ft^2$

2000 × 9 = 18000 $m^2$

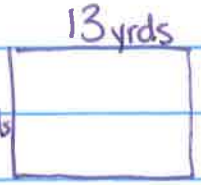


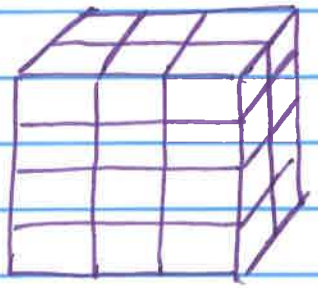

14 in × 4 in = 56 $in^2$

20 in × 20 in = 400 $in^2$

$\overset{2}{13}$
× 8
104




13 yrd × 8 yrd = 104 $yrds^2$

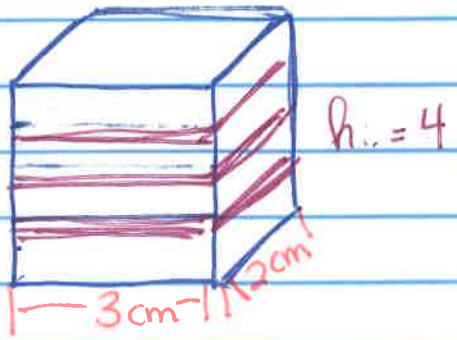


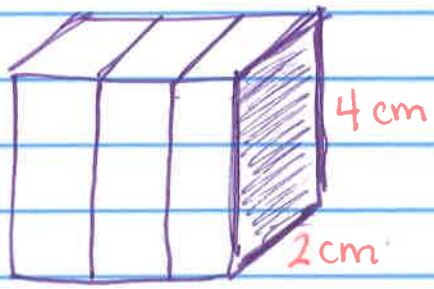
| Cubes in Each Layer | Number of Layers | Volume |
|---|---|---|
| (3 cm × 2 cm) | 4 | 24 $cm^3$ |
| (4 cm × 2 cm) | 3 | 24 $cm^3$ |
| (4 cm × 3 cm) | 2 | 24 $cm^3$ |

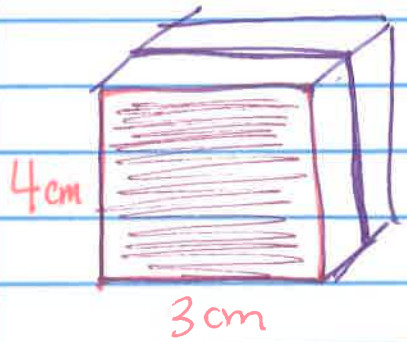
$l = 3$ cm

$w = 2$ cm

$h = 4$ cm



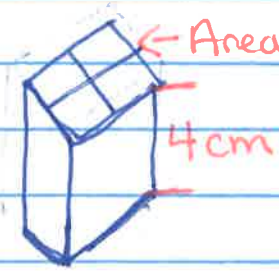




Volume = length × width × height

$V = 3\text{ cm} \times 2\text{ cm} \times 4\text{ cm}$

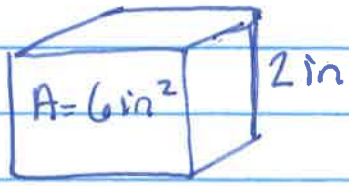
$V = 24\text{ cm}^3$




Volume = (Base) x height

$V = 4\ cm^2 \times 4\ cm$

$V = 16\ cm^3$

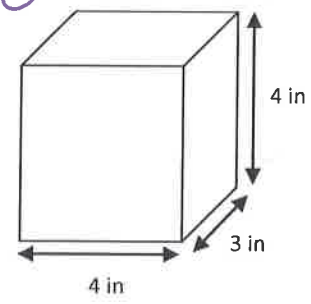



$V = 6\ in^2 \times 2\ in$

$V = 12\ in^3$

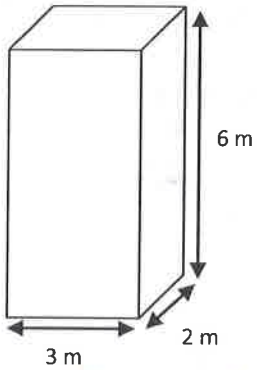
3. Calculate the volume of each rectangular prism. Include the units in your number sentences.

a.



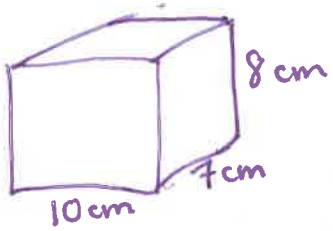

$V = (4 \text{ in} \times 3 \text{ in}) \times 4 \text{ in} = 48 \text{ in}^3$

b.




$V = (3 \text{ m} \times 2 \text{ m}) \times 6 \text{ m} = 36 \text{ m}^3$

4. Tyron is constructing a box in the shape of a rectangular prism to store his baseball cards. It has a length of 10 centimeters, a width of 7 centimeters, and a height of 8 centimeters. What is the volume of the box?

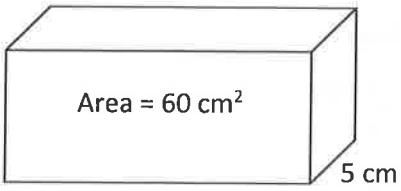



$V = (10 \text{ cm} \times 7 \text{ cm}) \times 8 \text{ cm}$

$V = 560 \text{ cm}^3$

5. Aaron says more information is needed to find the volume of the prisms. Explain why Aaron is mistaken, and calculate the volume of the prisms.

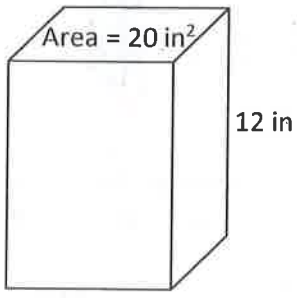
a. $V = (60 \text{ cm}^2) \times 5 \text{ cm} = 300 \text{ cm}^3$




b. $V = (\text{length} \times \text{width}) \times \text{height}$

$V = (20 \text{ in}^2) \times 12$

$V = 240 \text{ in}^3$




Aaron can multiply the area of the face by the height to find volume.