Volume of Rectangular Prisms

Volume of rectangular prisms: Models and calculations

Name _____ **Date** _____ **Score** _____ / 6

QUICK REVIEW

Rectangular prism volume is $V = lwh$, in cubic units. With $l = 4, w = 3, h = 2$ cm, the base has $4 \times 3 = 12$ unit squares and 2 layers make 24 cm^3. Fractional edges work too: $3 \times 2 \times \frac{1}{2} = 3$ cm^3. A missing edge equals volume divided by the product of the other two.

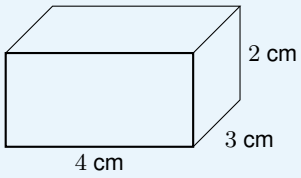
Worked example

Find the rectangular prism volume.

1. Base area $= 4 \times 3 = 12$ cm^2.

2. Volume $= 12 \times 2 = 24$ cm^3.

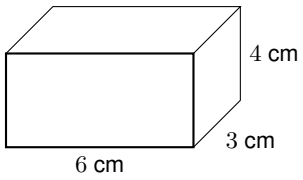
Answer: 24 cm^3.



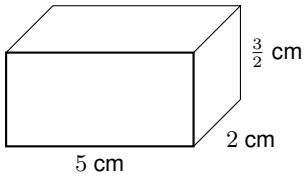
Practice Problems

Show your thinking.

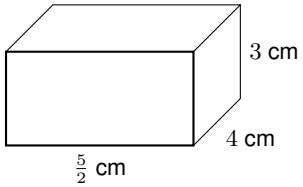
1. Find volume.



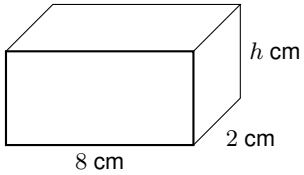
2. Count layers, including the fractional height.



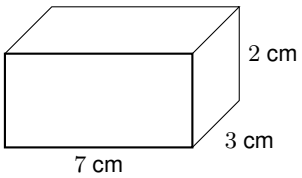
3. Find volume with a fractional edge.



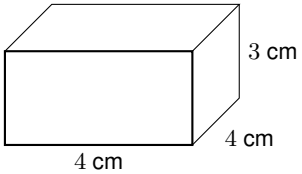
4. Find the missing height. Volume is 80 cm^3; find height h.



5. A box has these inside dimensions. Find capacity in cubic cm.



6. Explain why volume uses cubic units, then compute.



Answer Key

1. 72 cm^3.
2. 15 cm^3.
3. 30 cm^3.
4. 5 cm.
5. 42 cm^3.
6. 48 cm^3.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. Base area $= 6 \times 3 = 18$ cm^2.
2. Volume $= 18 \times 4 = 72$ cm^3.

Problem 2

1. Base area $= 5 \times 2 = 10$ cm^2.
2. Volume $= 10 \times \frac{3}{2} = 15$ cm^3.

Problem 3

1. Base area $= \frac{5}{2} \times 4 = 10$ cm^2.
2. Volume $= 10 \times 3 = 30$ cm^3.

Problem 4

1. Base area $= 8 \times 2 = 16$ cm^2.
2. $h = 80/16 = 5$ cm; check $16 \times 5 = 80$ cm^3.

Problem 5

1. Base area $= 7 \times 3 = 21$ cm^2.
2. Volume $= 21 \times 2 = 42$ cm^3.

Problem 6

1. Each layer has $4 \times 4 = 16$ cubes that are each 1 cm on a side.
2. With 3 such layers, there are $16 \times 3 = 48$ unit cubes.
3. Each cube has volume 1 cm^3, so the box holds 48 cm^3.

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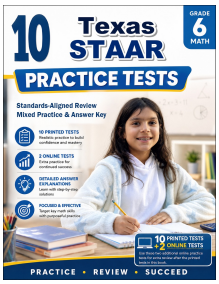

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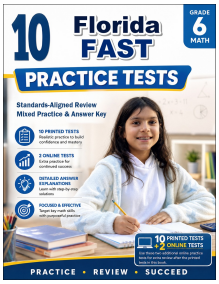

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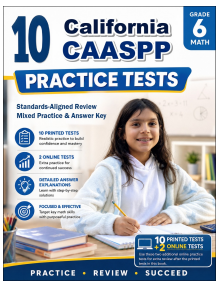

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