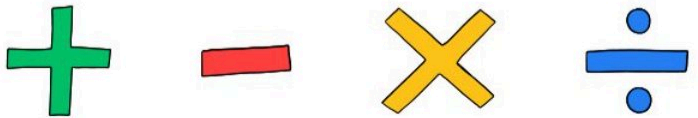
Pack It, Multiply It, Fill It!

Volume of prisms with fractional edges

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BIG IDEA

Packing with tiny fraction cubes gives the same answer as multiplying.

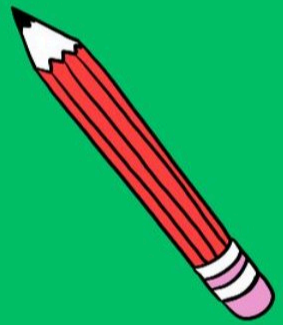


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$a^2+b^2=c^2$

Volume refresher

1. Volume is how many cubic units fit inside.
2. Right prism has rectangles and flat right sides.
3. V = l x w x h or base area x height.



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Three tools for fractions



Unit fraction cube

A tiny cube with edge 1/2 inch or 1/3 foot.



Packing

Fill the prism with no gaps to count volume.



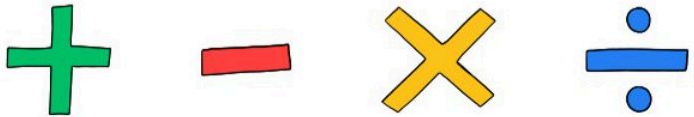
Multiply

l x w x h gives the same count, faster.

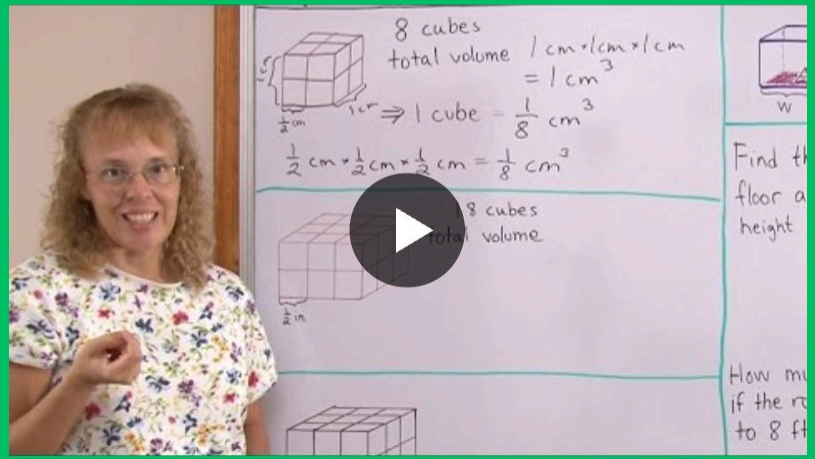


Base area

Find base area first, then times height.



Watch: Packing with half-unit cubes



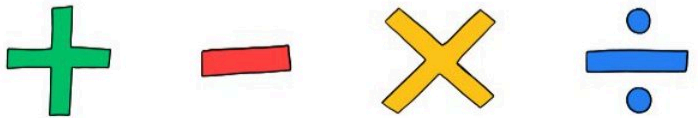
▶ 0:00 – 5:00

- Count how many 1/2-inch cubes fit on each edge.

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Why multiplying works

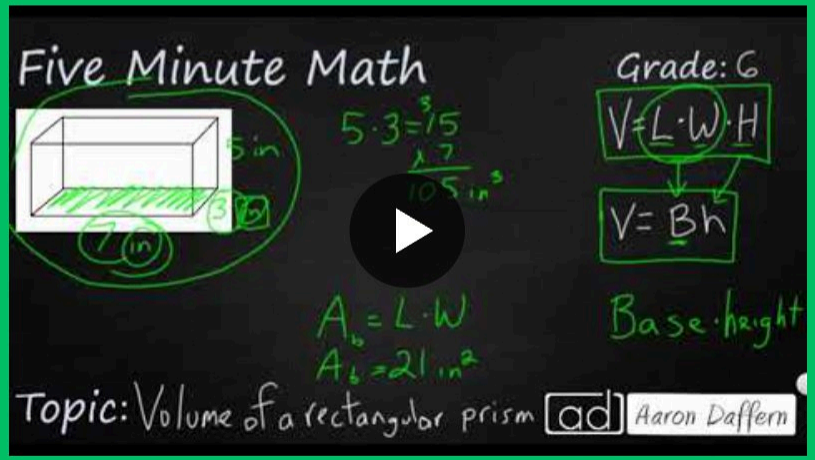
Edge 2 1/2 in holds five 1/2-in cubes → One layer holds 5 x 4 = 20 tiny cubes → 3 layers high holds 60 tiny cubes → 60 x 1/8 in3 = 7 1/2 in3 by multiplying



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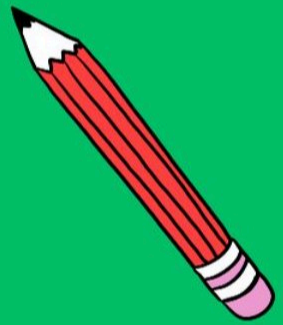
$a^2+b^2=c^2$

Watch: Two formulas in action



▶ 0:00 – 5:00

- Listen for V = lwh and V = Bh with mixed numbers.



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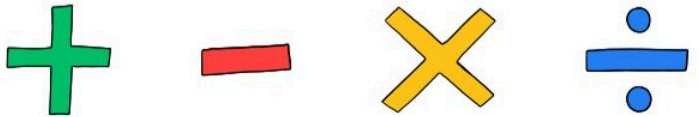
Your task

Find the volume of a storage box 3 1/2 ft long, 2 ft wide, 11/2 ft tall.

1. Sketch and label l, w, h and base area B.
2. Count 1/2-ft cubes that fit on each edge.
3. Solve both ways: l x w x h and B x h.

10 min

In pairs

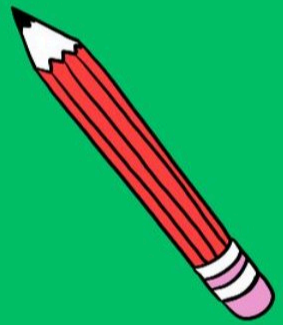


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$a^2+b^2=c^2$

DID YOU KNOW?

Eight half-inch cubes fill one cubic inch.



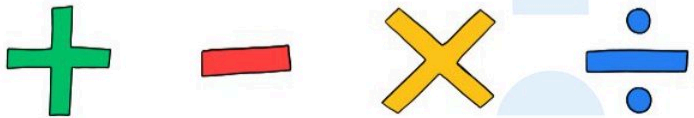
Two fit on each edge, so 2 x 2 x 2 = 8 tiny cubes.

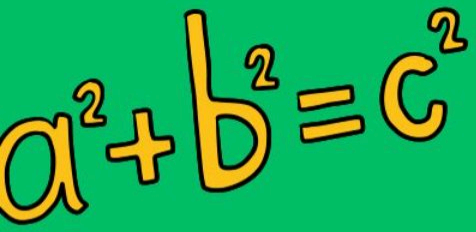
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Think, pair, share

Which holds more: Box A 2 1/2 x 2 x 1 1/2 in or Box B with base 5 in2 and height 1 1/2 in?





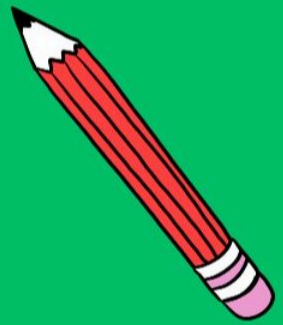


True or false?

A 1/4-in cube has volume 1/64 in3.

V = B x h only works with whole numbers.

A 3 1/2 x 2 x 1 1/2 ft box is 10 1/2 ft3.



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