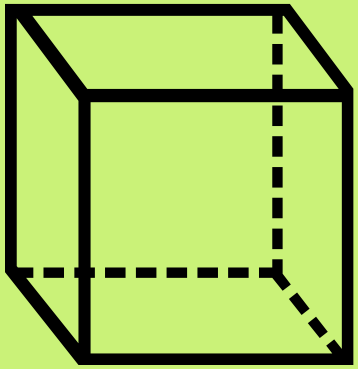
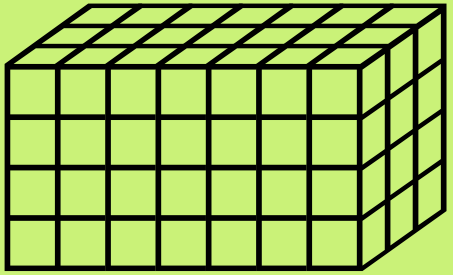
Finding Missing Dimensions if Given Volume





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Let's review the formula for volume of a prism.

- V = Bh, where B is the area of the base.
- For a rectangular prism, the base is a rectangle, so B = lw.
- This means the volume of a rectangular prism is V = Bh = lwh.

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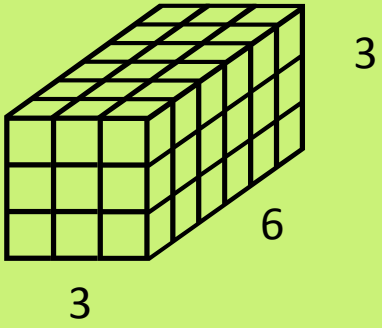
Using V = Bh = lwh

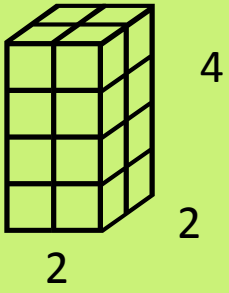
- What is the volume of each of these prisms?

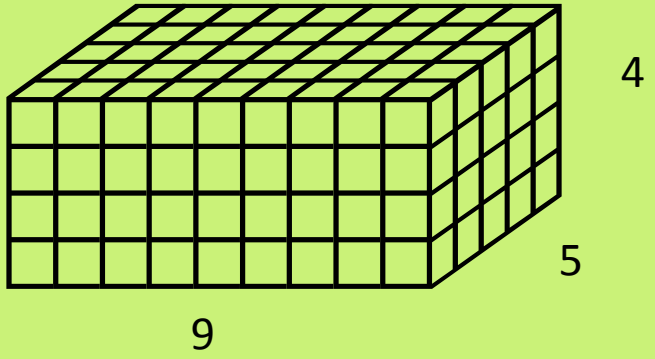
V = 3 x 6 x 3
= 54

V = 2 x 2 x 4
= 16

V = 9 x 5 x 4
= 180







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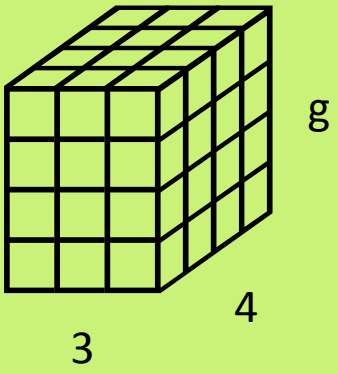
How about working backwards?

- How would the process change if we were given the volume but were missing a dimension?

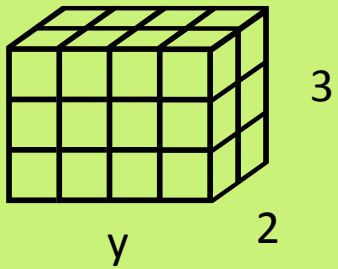
V = 48

$$V = lwh$$
$$48 = 3 \times 4 \times g$$
$$48 = 12 \times g$$
$$\frac{48}{12} = \frac{12g}{12}$$
$$4 = g$$



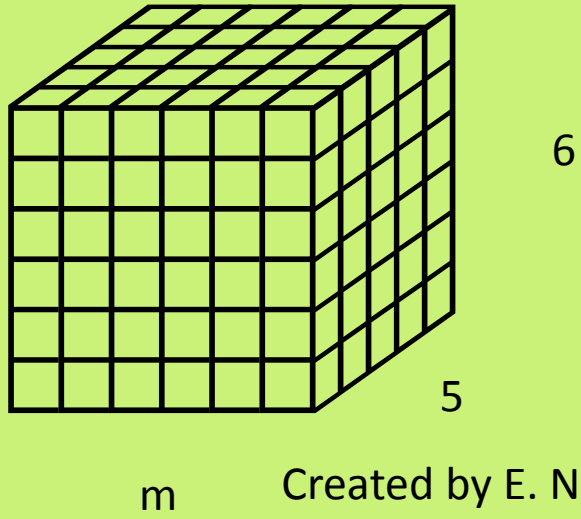
V = 24

$$V = lwh$$
$$24 = y \times 2 \times 3$$
$$24 = y \times 6$$
$$\frac{24}{6} = \frac{6y}{6}$$
$$4 = y$$



V = 180

$$V = lwh$$
$$180 = m \times 5 \times 6$$
$$180 = m \times 30$$
$$\frac{180}{30} = \frac{30m}{30}$$
$$6 = m$$



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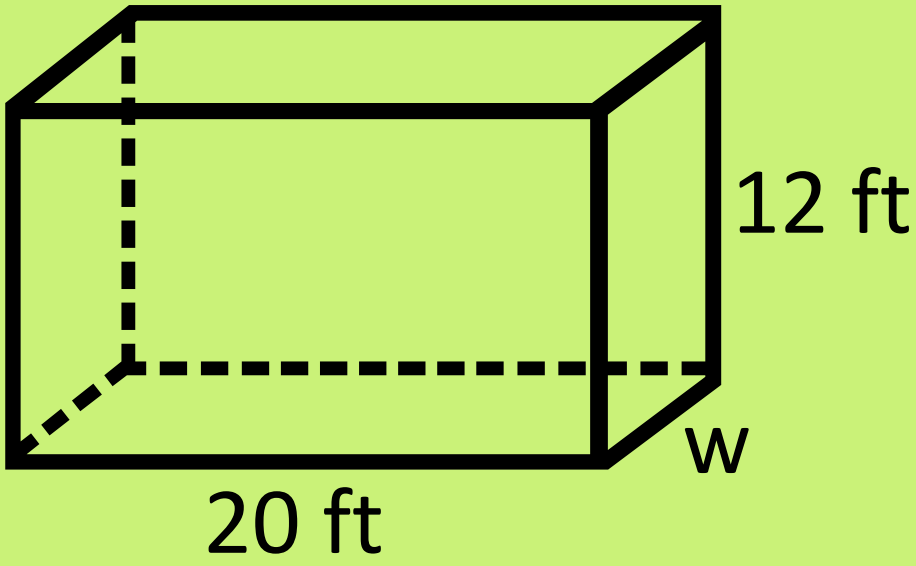
But what if there aren't any boxes?

V = 1680 ft^3



$$V = lwh$$
$$1680 = 20 \times w \times 12$$
$$1680 = 240 \times w$$
$$\frac{1680}{240} = \frac{240w}{240}$$
$$7ft = w$$

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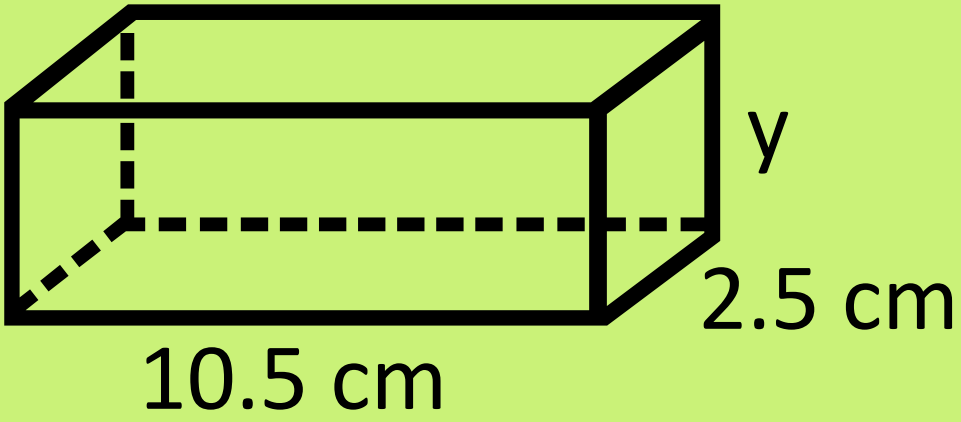
But what if there aren't any boxes?

V = 78.75 cm^3



$$V = lwh$$

$$78.75 = 10.5 \times 2.5 \times y$$

$$78.75 = 26.25 \times y$$

$$\frac{78.75}{26.25} = \frac{26.25y}{26.25}$$

$$3\ cm = y$$

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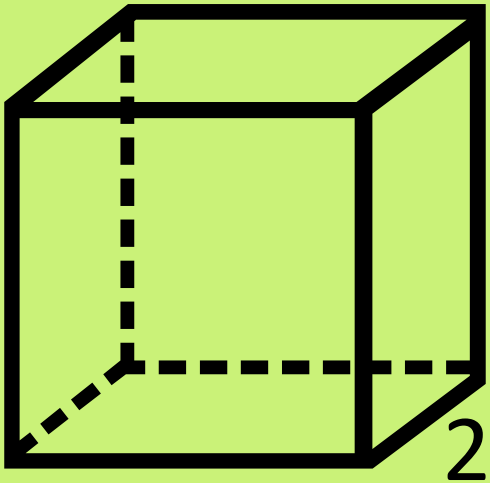
Now you try . . . .

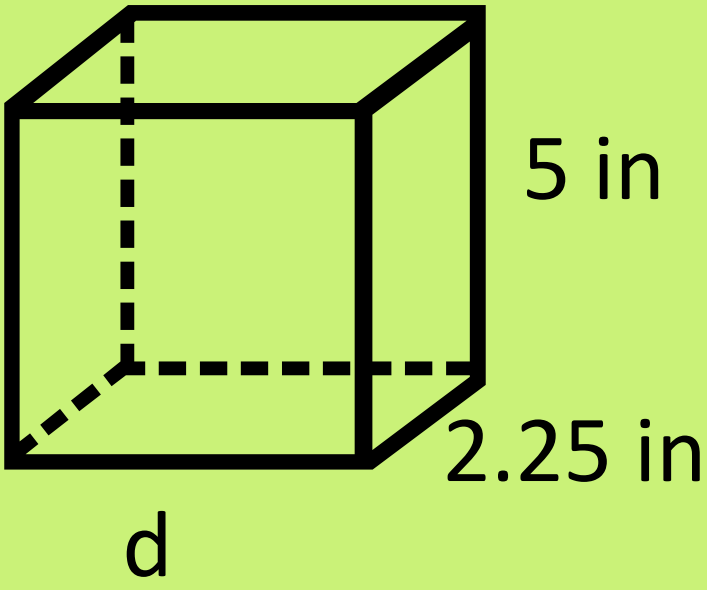
$V = 45\ in^3$

$V = lwh$



Now you try . . . .

$V = 45\ in^3$



$$V = lwh$$

$$45 = d \times 2.25 \times 5$$

$$45 = d \times 11.25$$

$$\frac{45}{11.25} = \frac{11.25d}{11.25}$$

$$4\ in = d$$

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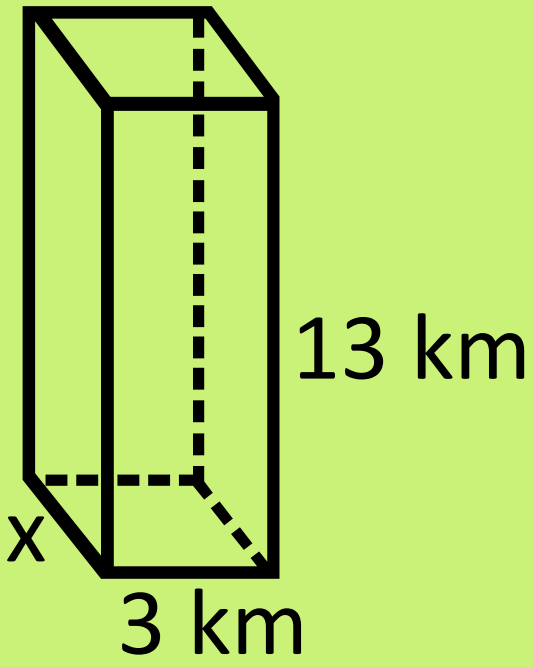
Now you try . . . .

V = 68.25 km^3

$V = lwh$



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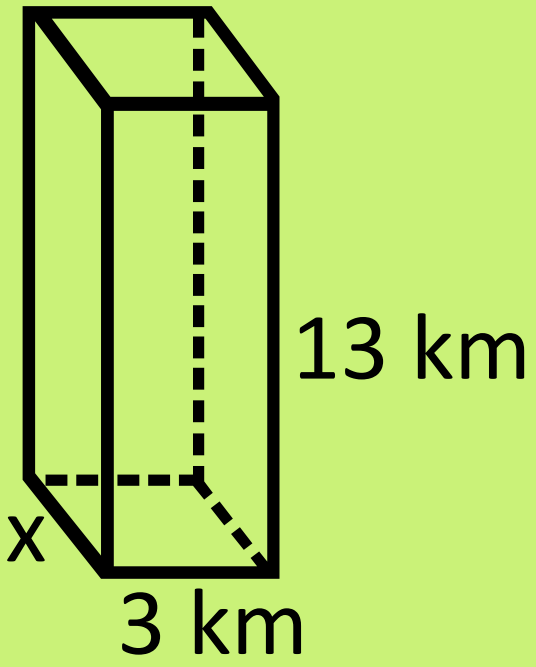
Now you try . . . .

V = 68.25 km^3



$$V = lwh$$
$$68.25 = x \times 3 \times 13$$
$$68.25 = x \times 39$$
$$\frac{68.25}{39} = \frac{39x}{39}$$
$$1.75\ km = x$$