Volume of Rectangular Prisms Worksheets

1. Geoffrey wants to make one planter that extends from the ground to just below his back window. The window starts 3 feet off the ground. If he wants the planter to hold 36 cubic feet of soil, name one way he could build the planter so itis not taller than 3 feet. Explain how you know.

2. After all of this gardening work, Geoffrey decides he needs a new shed to replace the old one. His current shed is a rectangular prism that measures 6 feet long by 5 feet wide by 8 feet high. He realizes he needs a shed with 480 cubic feet of storage.

a. Will he achieve his goal if he doubles each dimension? Why or why not?

b. If he wants to keep the height the same, what could the other dimensions be for him to get the volume he wants?

c. If he uses the dimensions in part(b), what could be the area of the new shed's floor?

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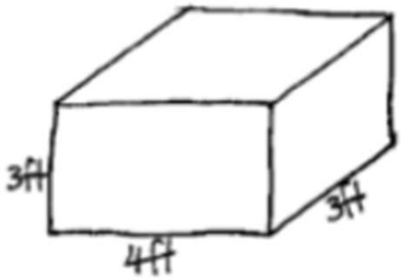


$36 \div 3 = 12$

$12 = 4 \times 3$

$V = L \times W \times H$

$= 4ft \times 3ft \times 3ft$

$= 36 ft^3$

Since Geoffrey wants to build a planter with a height of 3ft & a volume of $36ft^3$, the base of the planter should have an area of $12ft^2$. I drew a planter with $L = 4ft$, $W = 3ft$, $H = 3ft$.

2. After all of this gardening work, Geoffrey decides he needs a new shed to replace the old one. His current shed is a rectangular prism that measures 6 feet long by 5 feet wide by 8 feet high. He realizes he needs a shed with 480 cubic feet of storage.

a. Will he achieve his goal if he doubles each dimension? Why or why not?

Shed: $V = 6ft \times 5ft \times 8ft$
$= 240ft^3$

shed dimensions doubled: $V = 240ft^3 \times 8$
$= 1{,}920 ft^3$

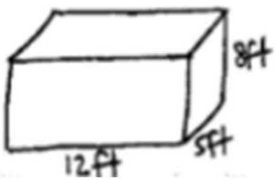
By doubling each dimension of the shed, Geoffrey will get a shed that is 8 times the current size because ($2 \times 2 \times 2 = 8$). To double the volume he needs only to double one dimension, not all three.

b. If he wants to keep the height the same, what could the other dimensions be for him to get the volume he wants?

He could double the length and keep the width the same. OR he could double the width and keep the length the same.

$L = 12ft$, $W = 5ft$, $H = 8ft$ OR $L = 6ft$, $W = 10ft$, $H = 8ft$

c. If he uses the dimensions in part(b), what could be the area of the new shed's floor?



$A = L \times W$

$= 12ft \times 5ft$

$= 60ft^2$

The floor could have an area of $60ft^2$.