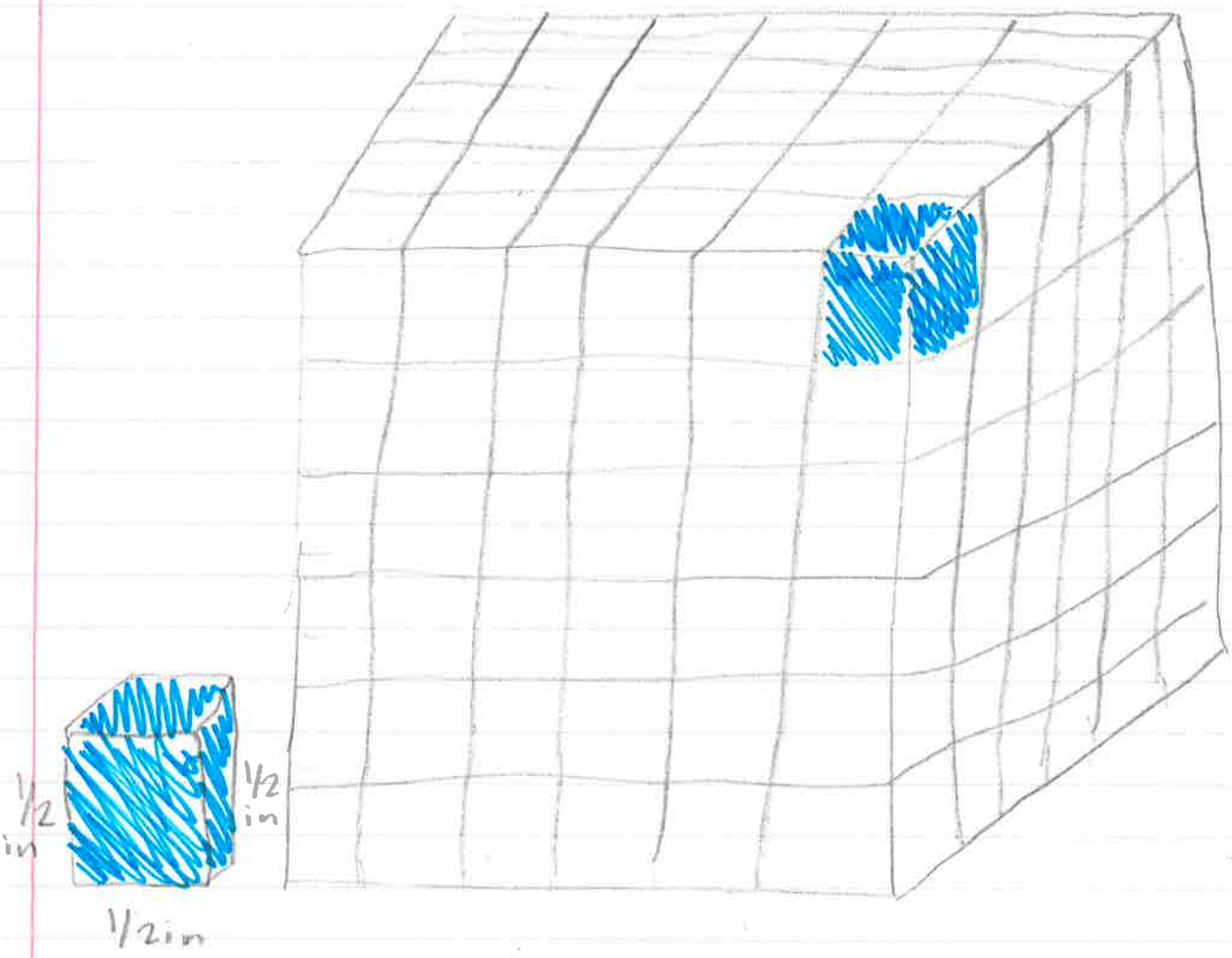
Mrs. Joshi

Kendall Lugos

CDC Writing

Question: Tracy said the volume of this 3D shape is 3x3x3. Mark said the volume was 6x6x6x 1/8. Who is correct? Explain with proper reasoning.



Mark and Tracy are both correct they just used two different methods. Mark used lxwxhxv which is one of the two ways you can solve the volume. Tracy counted how many cubes for the edge length. which is the second way you can use to find the volume.

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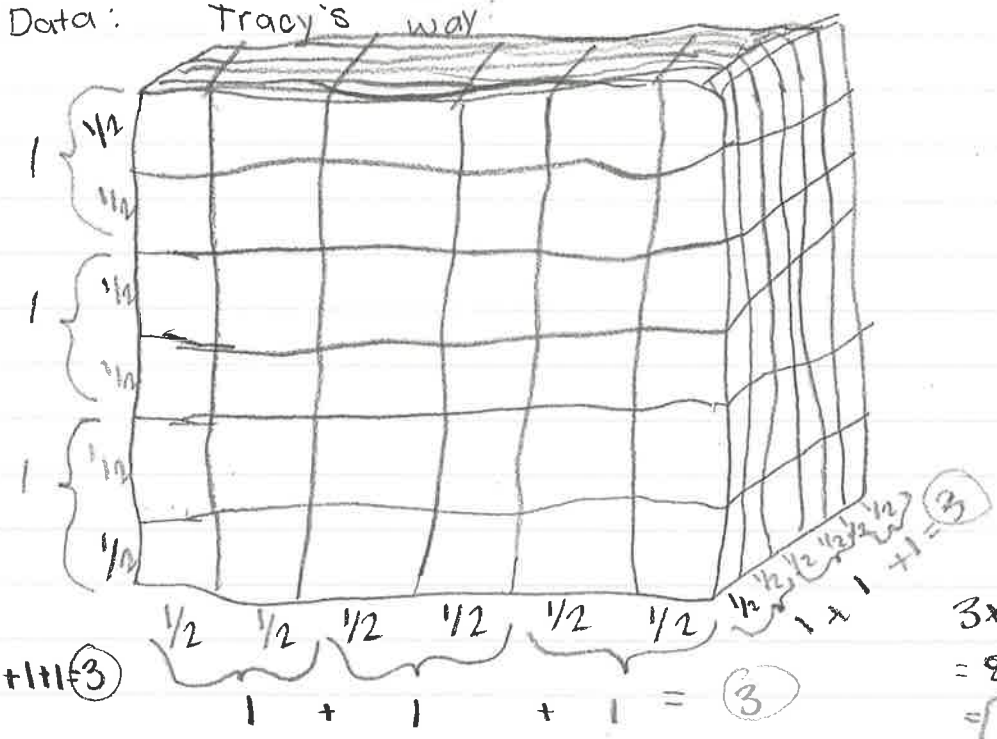
Data: Tracy's way



1+1+1=3

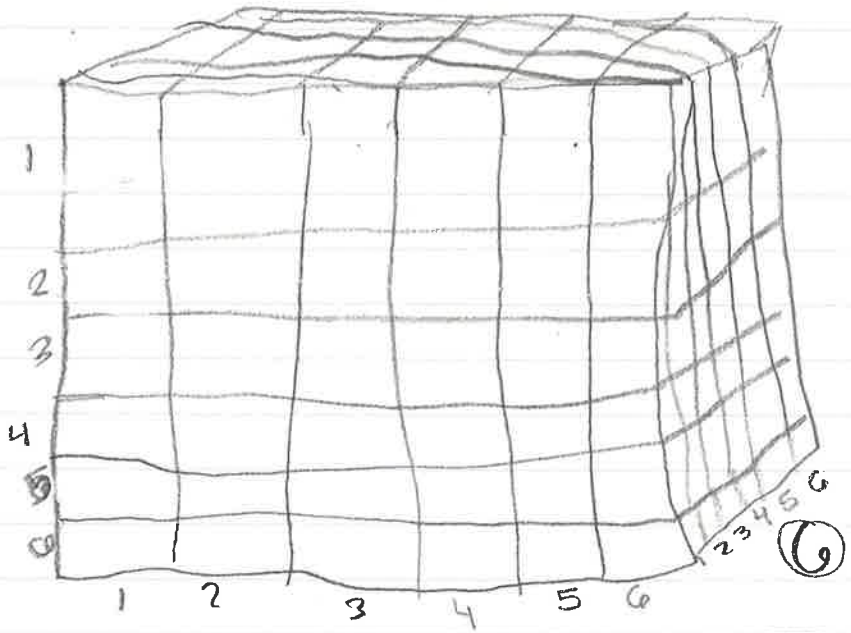
1 + 1 + 1 = 3

$3 \times 3 \times 3 =$

$= 9 \times 3$

$= 27 in^3$

Mark's Way:



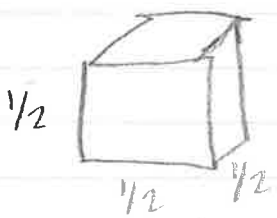
6

6

$\frac{6}{1} \times \frac{6}{1} \times \frac{6}{1} \times \frac{1}{8}$

$\frac{6}{1} \times \frac{6}{1} \times \frac{6}{1} \times \frac{1}{8} = \frac{216}{8}$

$= 27 in^3$



$\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} = \frac{1}{8}$

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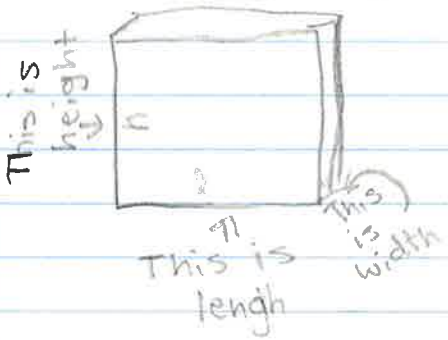
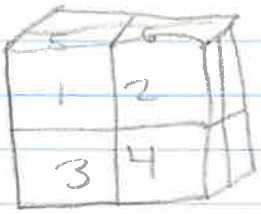
Commentary:

To know who is correct, you have to know what volume is. It's the amount of cubic units that will be able to fit in a 3D object. Since in this problem it's a cube, one way would be: lxwxh (length times width times height)

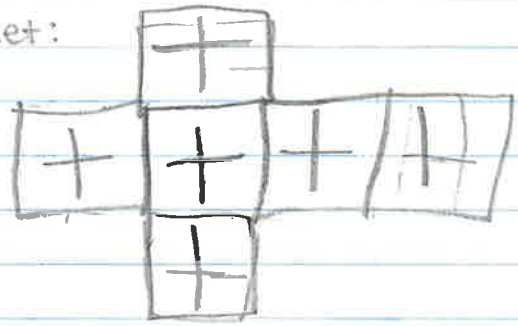


So this means you can only do lxwxh on 3D objects.

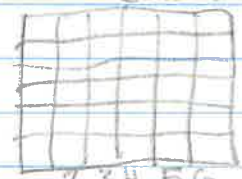
The other way to find volume is by counting every cube.



You see every cube if you can make a net:



Mark and Tracy used fractional edge length for volume. For Tracy's way, the first thing you need to do is find the edge length on one cube. In this question it's 1/2; and count how many cubes there are:



There are six 1/2's for the length. 6/2 is equal to 3 so that's the length. And since there are six 1/2's on the width and height that would be 3 for width and 3 for height.

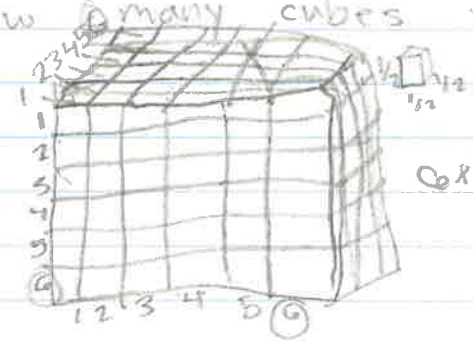
$\frac{6}{2} = 3$

Since you found the length, width, and height you multiply them: $3 \times 3 \times 3$

9×3

$27 in^3$

Now I'm going to explain Mark's way! Find the volume of 1 cube. Then find how many cubes there are.



$1/2 \times 1/2 \times 1/2 = 1/8$

$6 \times 6 \times 6 = 216$

Now multiply $216 \times 1/8$: 27

$$\frac{216}{1} \times \frac{1}{8} = \frac{27}{1} = 27 in^3$$

This shows Tracy and Mark are both right they just used 2 different methods.