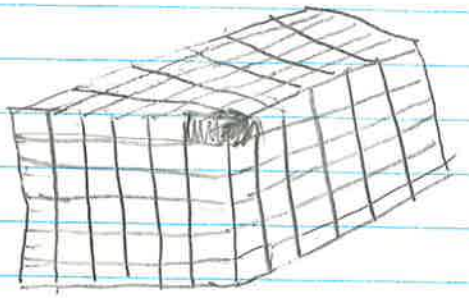
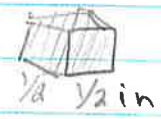
Mrs. Joshi
Will Vetroubek

CDC

Tracy said the volume of this shape was $3 \times 3 \times 3$. Mark said it was $6 \times 6 \times 6 \times \frac{1}{8}$. Who is correct? Explain your reasoning.





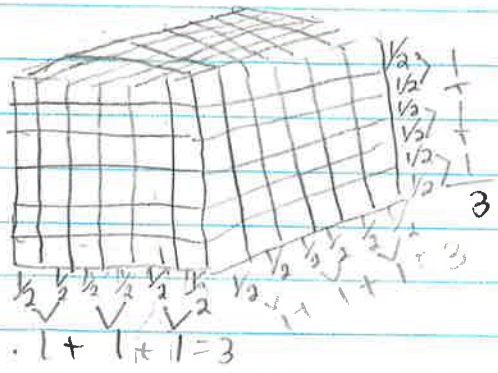
CLAIM

Tracy and Mark used two different methods and they both got it right. Tracy counted with each cube as $\frac{1}{2}$ and then multiplied and Mark multiplied to find a cube's volume and then multiplied by the number of cubes in the prism.

DATA

Tracy's way

$V = lwh$



$3 \times 3 \times 3 = 27 \text{ in}^3$

(2)

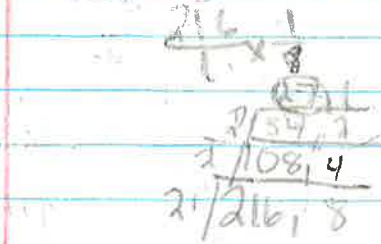
Mrs. Joshi
Will Votroubek

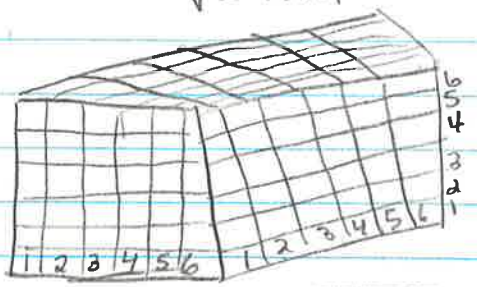
Mark's way

$V = lwh$

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

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





$27 in^3$

COMMENTARY

I will explain both ways to solve this problem but I will start with Tracy's.

Tracy started by finding the side of one cube which is ½ an inch (this is called fractional edge length)

For every cube each side is ½ an inch so she counted how much halves were on each side. For length which is  there was six halves which makes 3 since two halves $\frac{1}{2} + \frac{1}{2} = 1$ equals 1 and there is 3 $1 + 1 + 1 = 3$ sits of it.

Next, she found the height which is  the lines going vertical. She also found these were six halves which is 3. Then, she found the width which is  the lines going back. She counted six halves again which is 3.

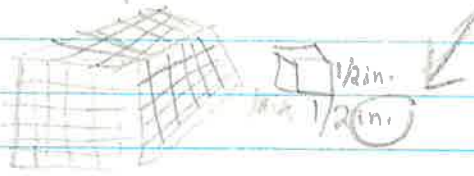
The next part to solving is finding volume. (volume is the amount a object can hold). To find this prism's volume we will multiply length, width, and height. ($V = lwh$) We have already

Mrs. Joshi
Will Votroubek

found them. So we now multiply them.

Length	Width	Height
3	x 3	x 3
9	x 3	= 27

3x3=9 and then we multiply 9 by 3 and get 27. To write the answer correctly we find the unit (inch, meter, foot, etc.). For this we look at the question and see in. (stands for inch)



So the answer is $27in^3$ (the small three means that we found volume of a 3-D)

Now, I will explain the way Mark did it.

He first looked at fractional edge length

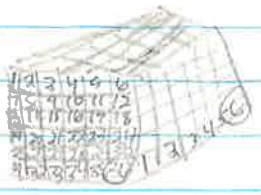
Mark multiplied $\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$ to find the volume of a one cube. (Remember $V=lwh$) He got $\frac{1}{8}$ from doing this since when multiplying fractions you multiply the numerator (number ABOVE the line) and denominator (number BELOW the line) separately.

$$\frac{1}{2} \times \frac{1}{2} = \frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$$

Since this is the volume of one cube we multiply $\frac{1}{8}$ to the number of cubes in the prism. To find the number of cubes in the shape

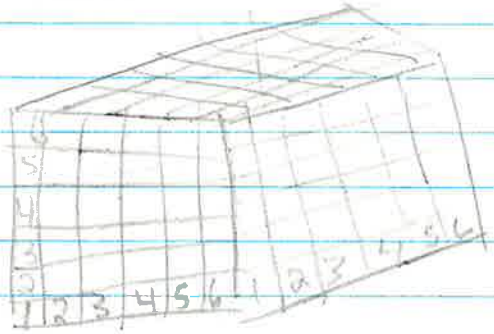
Mrs. Joshi
Will Votroubek

We can either count the front and then multiply it by the width



$36 \times 6 = 216$

Or you could multiply length, width, and height and find it quick.



$6 \times 6 \times 6 = 216$

So now you multiply 216 and 1/8 to find the answer. You have to make 216 a fraction to multiply so it would look like this

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

When multiplying fractions you have to simplify. For this you find the GCF, (Greatest Common Factor) which you find is 8 which you can use to make it simplified. It looks like this.

$$\frac{216, 8}{}$$

First, you can simplify it by 2 since the last number of 216 is 6 which is divisible by 2 and 8 is too.

5

Mrs. Joshi

Will Votroubek

You will get this

$$2\overline{)216,8}\quad 108,4$$

Next, you will find 108 and 4 are also divisible by 2.

$$2\overline{)108,4}\quad 54,2$$

$$2\overline{)216,8}$$

Then you have 54 and 2 which are divisible by 2

$$2\overline{)54,2}\quad 27,1$$

$$2\overline{)108,4}$$

$$2\overline{)216,8}$$

Now you have 27 and 1 which is the farthest you can go. Lastly, you multiply the fractions

$$\frac{27}{1} \times \frac{1}{1} = \frac{27}{1}$$

27 is your answer.

$27 in^3$