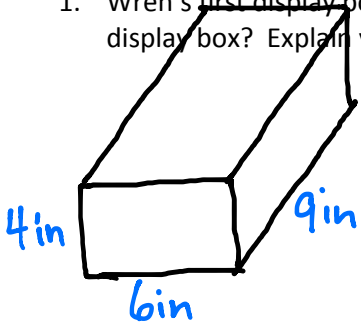


Name _____

Date _____

Wren makes some rectangular display boxes.

1. Wren's first display box is 6 inches long, 9 inches wide, and 4 inches high. What is the volume of the display box? Explain your work using a diagram.



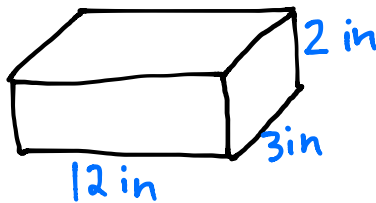
$$\begin{aligned}
 V &= l \times w \times h \\
 &= 6\text{in} \times 9\text{in} \times 4\text{in} \\
 &= 216\text{in}^3
 \end{aligned}$$

The box has a volume of 216in^3 .

2. Wren wants to put some artwork into three large display boxes. She knows they all need a volume of 60 cubic inches, but she wants them all to be different. Show three different ways Wren can make these boxes by drawing diagrams and labeling the measurements.

<p>Shadow Box A</p> $ \begin{aligned} V &= l \times w \times h \\ &= 3\text{in} \times 4\text{in} \times 5\text{in} \\ &= 60\text{in}^3 \end{aligned} $	<p>Shadow Box B</p> $ \begin{aligned} V &= l \times w \times h \\ &= 2\text{in} \times 3\text{in} \times 10\text{in} \\ &= 60\text{in}^3 \end{aligned} $
<p>Shadow Box C</p>	$ \begin{aligned} V &= l \times w \times h \\ &= 15\text{in} \times 2\text{in} \times 2\text{in} \\ &= 60\text{in}^3 \end{aligned} $

3. Wren wants to build a box to organize her scrapbook supplies. She has a stencil set that is 12 inches wide that needs to lay flat in the bottom of the box. The supply box must also be no taller than 2 feet. Name one way she could build a toy box with a volume of 72 cubic inches.



$$\begin{aligned} V &= l \times w \times h \\ &= 12 \text{ in} \times 3 \text{ in} \times 2 \text{ in} \\ &= 72 \text{ in}^3 \end{aligned}$$

the box is 12 inches long, 3 inches wide, and 2 inches high.

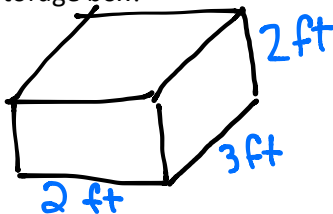
4. After all of this organizing, Wren decides she also needs more storage for her soccer equipment. Her current storage box measures 1 foot long by 2 feet wide by 2 feet high. She realizes she needs to replace it with a box with 12 cubic feet of storage, so she doubles the width.

- a. Will she achieve her goal if she does this? Why or why not?

$$1 \text{ ft} \times \cancel{2 \text{ ft}}_4 \times 2 \text{ ft} = 8 \text{ ft}^3$$

Wren does not reach her goal.

- b. If she wants to keep the height the same, what could the other dimensions be for a 12-cubic-foot storage box?



$$\begin{aligned} V &= l \times w \times h \\ &= 2 \text{ ft} \times 3 \text{ ft} \times 2 \text{ ft} \\ &= 12 \text{ ft}^3 \end{aligned}$$

*length = 2 feet
width = 3 feet
height = 2 feet*

- c. If she uses the dimensions in Part (b), what is the area of the new storage box's floor?

The area of the box's floor is 6 ft^2 ($2 \text{ ft} \times 3 \text{ ft}$).

- d. How has the area of the bottom in her new storage box changed? Explain how you know.

The original area of the box floor in Part (a) was 2 ft^2 ($1 \text{ ft} \times 2 \text{ ft}$). In Part (c) the area of the box floor is 6 ft^2 ($2 \text{ ft} \times 3 \text{ ft}$).