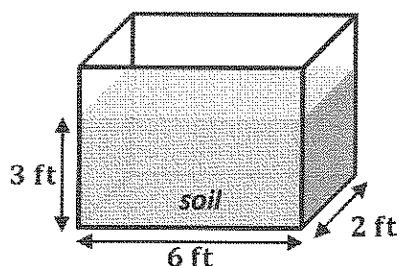


## G5-M5-Lesson 7

Edwin builds rectangular planters.

1. Edwin's first planter is 6 feet long and 2 feet wide. The container is filled with soil to a height of 3 feet in the planter. What is the volume of soil in the planter? Explain your work using a diagram.



I draw a rectangular prism and label all the given information.

$$\text{Volume} = \text{length} \times \text{width} \times \text{height}$$

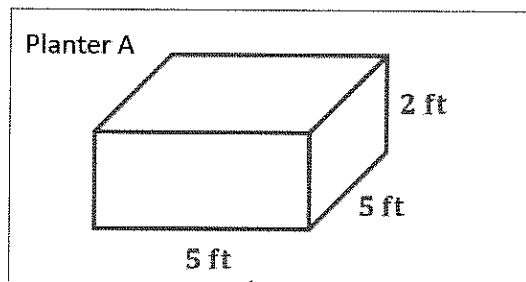
$$V = 6 \text{ ft} \times 2 \text{ ft} \times 3 \text{ ft} = 36 \text{ ft}^3$$

The volume of soil in the planter is 36 cubic feet.

I can multiply the length, width, and height of the soil to find the volume of the soil in the planter.

In order to have a volume of 50 cubic feet, I have to think of different factors that I can multiply to get 50. Since volume is three-dimensional, I will have to think of 3 factors.

2. Edwin wants to grow some flowers in two planters. He wants each planter to have a volume of 50 cubic feet, but he wants them to have different dimensions. Show two different ways Edwin can make these planters, and draw diagrams with the planters' measurements on them.



I draw a rectangular prism and label it as 5 feet by 5 feet by 2 feet.

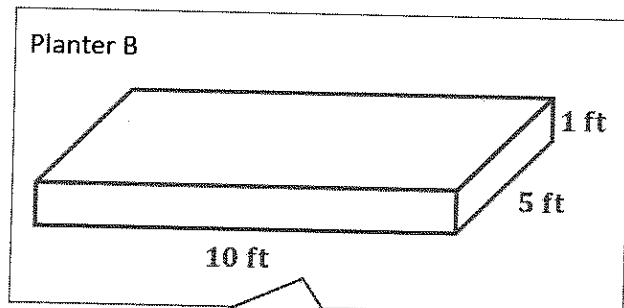
I need to think of 3 factors that give a product of 50.

$$\text{Volume} = l \times w \times h$$

$$V = 5 \text{ ft} \times 5 \text{ ft} \times 2 \text{ ft} = 50 \text{ ft}^3$$

I can verify my answer by finding the volume for Planter A. The answer is 50 cubic feet.

Planter B



I will draw a rectangular prism and label it as 10 feet by 5 feet by 1 foot.

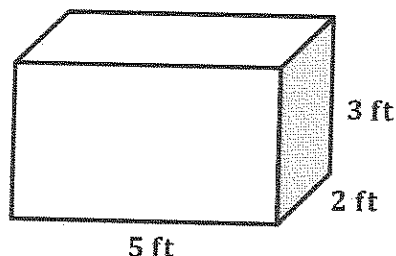
I need the 3 different factors for Planter B.  
 $10 \times 5 \times 1 = 50$

$$\text{Volume} = l \times w \times h$$

$$V = 10 \text{ ft} \times 5 \text{ ft} \times 1 \text{ ft} = 50 \text{ ft}^3$$

In order to have a volume of 30 cubic feet, I have to think of three factors that give a product of 30.

3. Edwin 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 30 cubic feet of soil, name one way he could build the planter so it is not taller than 3 feet. Explain how you know.



I draw a rectangular prism and label the dimensions 5 ft by 2 ft by 3 ft.

The volume is 30 cubic feet, and one of the dimensions must not be more than 3 feet. So, I will keep the height as 3 feet.

$$30 \text{ ft}^3 \div 3 \text{ ft} = 10 \text{ ft}^2$$

I already know the volume is  $30 \text{ ft}^3$ , and the height is 3 ft, so I'll divide the volume by the height to find the area of the base.

$$10 \text{ ft}^2 = 5 \text{ ft} \times 2 \text{ ft}$$

$$\text{Length} = 5 \text{ ft}$$

$$\text{Width} = 2 \text{ ft}$$

$$\text{Height} = 3 \text{ ft}$$

Now that I know the area of the base of the planter is  $10 \text{ ft}^2$ , I need to think of two factors that have a product of 10. 5 and 2 will work!

Since Edwin wants to build a planter with a height of 3 ft and a volume of  $30 \text{ ft}^3$ , the base of the planter should have an area of  $10 \text{ ft}^2$ . I drew a planter with a length of 5 ft, width of 2 ft, and height of 3 ft.