

Objective Volume Composition and Decomposition

Warm-Up



Calculate each product.

1. 0.5×0.5

Sample worked out



$$\begin{array}{r}
 2 \\
 0.5 \leftarrow \text{There is } 1 \text{ decimal} \\
 \times 0.5 \leftarrow \text{There is } 1 \text{ decimal} \\
 \hline
 0.25 \leftarrow \text{Total of } 2 \text{ decimal place to put back}
 \end{array}$$

2. 0.1×0.9

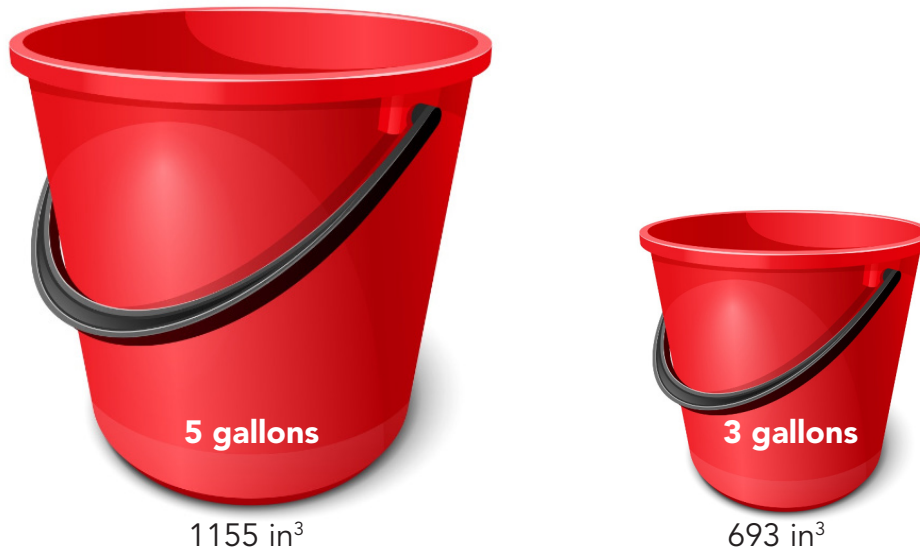
3. 0.3×0.9

4. 0.8×0.7

GETTING STARTED

Measuring Water

You have two empty containers, each with a different volume, as shown. You also have a source of water.

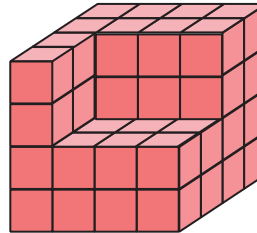
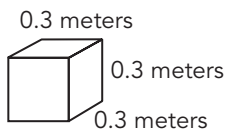


1. Using just these 2 containers, how can you measure out a volume of exactly 4 gallons (924 in.³)?



As part of Let's Build Together, an organization that builds recreation centers for communities in need, your class is building a concrete bench for use in a community garden.

Your class has been provided with a drawing of your assignment and a key scale. You need to determine how much concrete is needed to construct the bench.



1. What kind of information you feel you might need to determine the amount of concrete needed to construct your group's bench?

Let's consider adding decimals.

WORKED EXAMPLE

$$3.421 + 9.5 + 12.85 = ?$$

Before calculating the sum, **estimate** the answer so you know the approximate sum.

$$3 + 10 + 13 = 26$$

To calculate the exact sum, **line up** the decimals so that like place values are in the same column. You can use the decimal point as a reference point to help you align numbers in the correct place-value column.

$$\begin{array}{r} 3.421 \\ 9.5 \\ + 12.85 \\ \hline 25.771 \end{array}$$

The **estimate of 26** and the sum of **25.771** are reasonably close, so the sum appears to be correct.

2. Lijo says that he can write 9.5 as 9.500 to help calculate the sum $3.421 + 9.5 + 12.85$.

a. How does this help Lijo calculate the sum?

b. How might Lijo rewrite 12.85 in this sum?

3. Summarize how to add decimals.

You can use a similar algorithm for subtracting decimals. Let's consider two different subtraction problems.

WORKED EXAMPLE		
	$18.205 - 3.91$	$22.4 - 8.936$
First, estimate the answer so you know the approximate difference.	$18 - 4 = 14$	$22 - 9 = 13$
Then, line up the decimals so that like place values are in the same column and subtract.	$\begin{array}{r} ^7 \\ 18.\cancel{2}\cancel{0}5 \\ - 3.910 \\ \hline 14.295 \end{array}$	$\begin{array}{r} ^1 \\ 22.\cancel{4}\cancel{0}\cancel{0} \\ - 8.936 \\ \hline 13.464 \end{array}$
Compare the answer to your estimate to check your work.	The estimate of 14 and the difference of 14.295 are reasonably close, so the difference appears to be correct.	The estimate of 13 and the difference of 13.464 are reasonably close, so the difference appears to be correct.

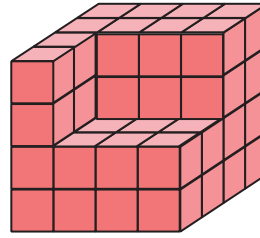
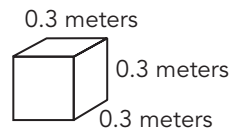
4. Analyze both subtraction problems.

a. What do the subtraction problems have in common?

b. What is different about the subtraction problems in the worked example?

5. Summarize how to subtract decimals.

Let's go back to determining the amount of concrete needed for your group's bench.



6. Sofia proposes that the class decompose the bench into rectangular prisms, calculating the volume of each prism, and then adding up the volumes. Use Sofia's strategy to determine the volume of the bench. First determine how many small block make up the concrete bench.

7. Hunter proposes that the class first calculate the total volume of a 1.2 meter cube. Then, they can subtract out the portion of the cube that forms the seat of the bench. Determine the volume of the bench using Hunter's strategy.

8. Compare the volume calculated using Sofia's strategy with the volume calculated using Hunter's strategy.

9. How are Sofia's and Hunter's strategies for determining the volume of composite solids like the strategies used to determine the area of composite figures?



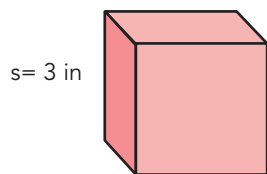
LESSON 3.2a Which Warehouse?



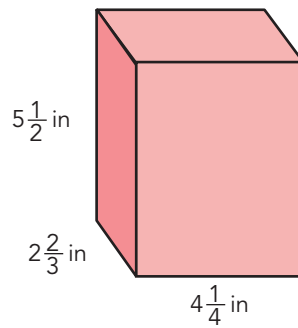
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Calculate the volume of each figure, all work must be shown

1.



2.



3.

