



6th  
Basic

7th  
Advanced

# Helping With Math

USA  
GRADES

## Volume of Cubes and Rectangular Prisms

*Suitable for students  
aged 10-12*



This pack is suitable for learners aged 10-12 years old or 6th to 7th graders (USA). The content covers fact files and relevant basic and advanced activities involving volume of cubes and rectangular prisms.

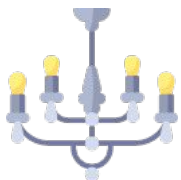
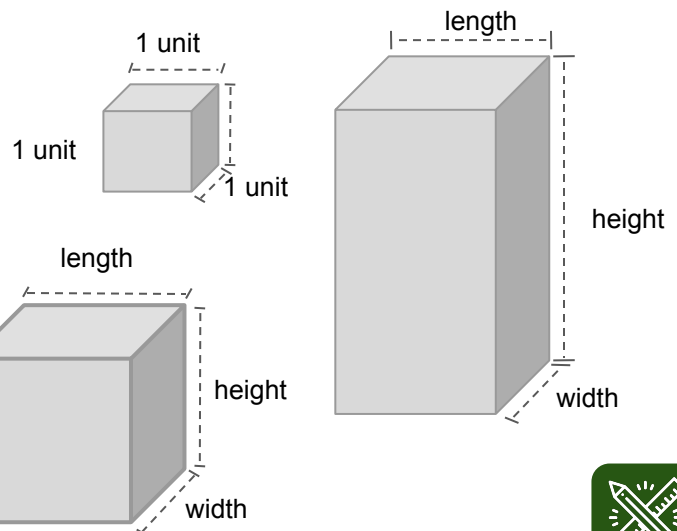
### VOLUME



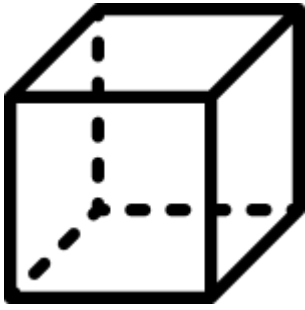
Volume is measured in "cubic" units. The volume of a figure is equal to the number of cubes required to fill it completely, like blocks in a box.



**Solid** figures are three-dimensional figures that have length, width and height.



## CUBE AND RECTANGULAR PRISM

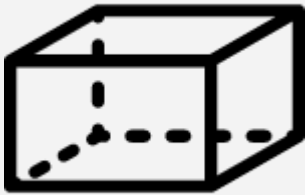


**Cube**

A solid object bounded by six square faces, facets or sides, with three meeting at each vertex.

$$V = s^3$$

where  $s$  is equal to the measurement of a side of the cube.



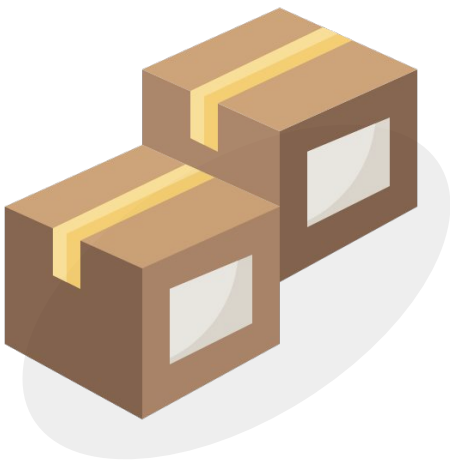
**Rectangular  
Prism**

It is a polyhedron with exactly two rectangular faces/bases that are congruent and parallel. Other faces are called lateral faces.

$$V = LWH$$

where  $L$  = length,  $W$  = width, and  $H$  = height.

## ILLUSTRATIVE EXAMPLE

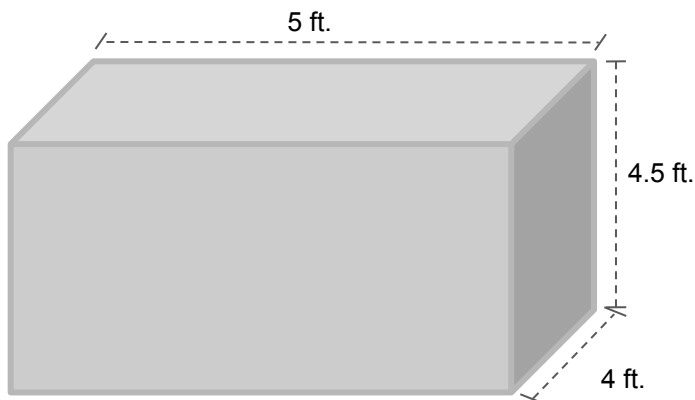
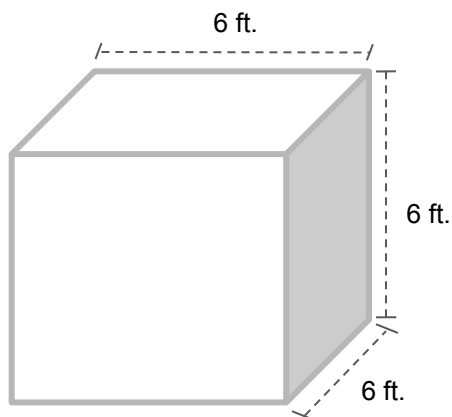


Two cargo boxes arrived at the HWM Furniture shop. One cargo is a cube-shaped box with a side that measures 6 ft. The other one is shaped like a rectangular prism with the following dimensions, 4 ft, 5 ft, 4.5 ft.



## SAMPLE/APPLICATION

A. Sketch the two cargo boxes with their corresponding dimensions.



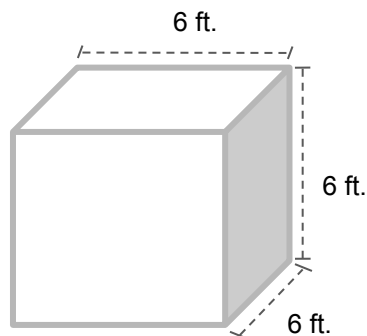
B. Solve for the volume of the two cargo boxes.

The first cargo is a cube so the formula to be used is  $V = s \times s \times s$  or  $s^3$

Since  $s = 6$  ft,

$$V = 6 \text{ ft} \times 6 \text{ ft} \times 6 \text{ ft} = 216 \text{ ft}^3$$

**The volume of the cargo is  $216 \text{ ft}^3$ .**



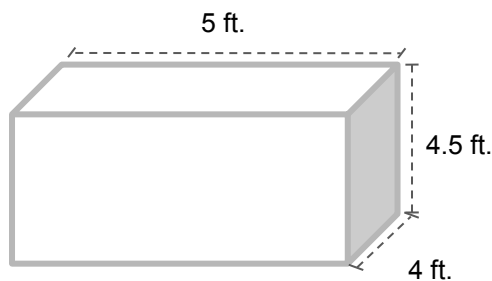
The second cargo is a rectangular prism so the formula to be used is

$$V = L \times W \times H.$$

Since  $L = 5$  ft,  $W = 4$  ft,  $H = 4.5$  ft

$$V = 5 \text{ ft} \times 4 \text{ ft} \times 4.5 \text{ ft} = 90 \text{ ft}^3$$

**The volume of the cargo is  $90 \text{ ft}^3$ .**



# TABLE OF ACTIVITIES

Ages 10-11 (Basic)		6th Grade
1	Mr. O'Malley The Carpenter	
2	The Furniture Sizes	
3	Made to Order Home Decor	
4	Sofa Bed on Sale!	
5	She Wants a Square Table	
Ages 11-12 (Advanced)		7th Grade
6	Choosing the Perfect TV Stand	
7	Furniture for My Kitchen	
8	Colorful Storage Boxes	
9	Our Double-Decker Room	
10	I Need a New Dresser	



# MR. O'MALLEY THE CARPENTER

G6  
Basic

Mr. O'Malley is one of the best carpenters in town. He is known for making amazing furnitures. Below is an outline of his next project. Help him identify if the given dimensions are for cube or for rectangular prism.

Dimensions:	Answer:
1. L = 40 cm    W = 40 cm    H = 40 cm	
2. L = 130 in    W = 120 in    H = 120 in	
3. L = 5 m        W = 5 m        H = 500 cm	
4. L = 3 yd        W = 36 in        H = 9 ft	
5. L = 5.2 m        W = 5.1 m        H = 5.20 cm	
6. L = 7 ft         W = 8 ft         H = 5 ft	
7. L = 1.5 m        W = 1.5 m        H = 1.5 m	
8. L = 100 in        W = 254 cm        H = 100 in	
9. L = 98 cm        W = 98 cm        H = 97 cm	
10. L = 4 m         W = 40 cm        H = 4 m	



# THE FURNITURE SIZES

G6  
Basic

Help Mr. O'Malley determine the sizes of these blocks. Compute for the volume of each cube then classify their sizes. Refer to the table below for the sizes.

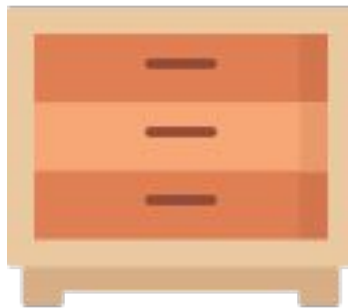
Volume	Size
Less than or equal to 300 cubic cm	Small
Greater than 300 but less than 500 cubic cm	Medium
Greater than 500 but less than 1000 cubic cm	Large
Greater than or equal to 1000 cubic cm	Extra Large

1. A cube measures 8 cm in length.

2. A cube measures 4.5 cm in length.

3. A cube measures 10 cm in length.

4. A cube measures 6.8 cm in length.



5. A cube measures 12.4 cm in length.

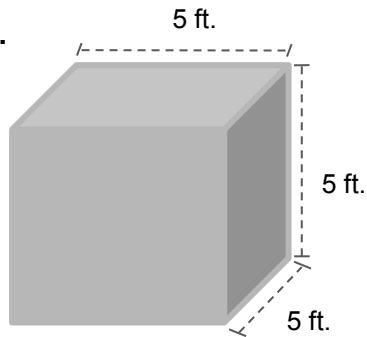


# MADE TO ORDER HOME DECOR

G6  
Basic

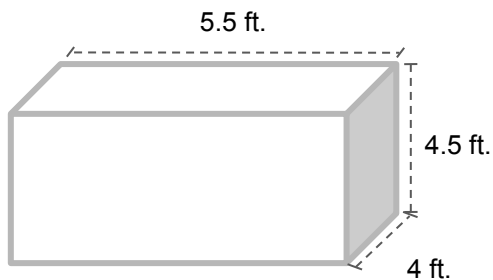
Mrs. Shepherd is Mr. O'Malley's regular customer. She visited the shop to place a made-to-order home decor. Read the order's description below and calculate the volume.

1.



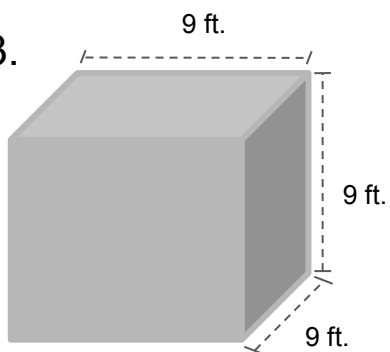
Solution:

2.



Solution:

3.



Solution:



# SOFA BED ON SALE

G6  
Basic

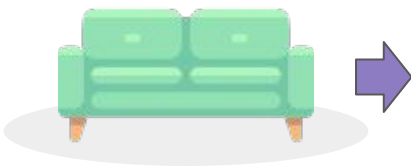
Don't miss the mid-year sale of sofa bed! To determine the amount of the discounted sofa bed, calculate for the volume and match column A with column B.

Assume that the shape of these sofa beds is a rectangular prism.

## Column A



Length = 45 inches  
Width = 34 inches  
Height = 12 inches



Length = 36 inches  
Width = 25 inches  
Height = 13 inches



Length = 30 inches  
Width = 22 inches  
Height = 8 inches



Length = 48 inches  
Width = 36 inches  
Height = 14 inches

## Column B

Volume in cubic inches

A. 18360 for  
\$ 1792

B. 24192 for  
\$ 1560

C. 10700 for  
\$ 1280

D. 11700 for  
\$ 1390

E. 5280 for  
\$ 739

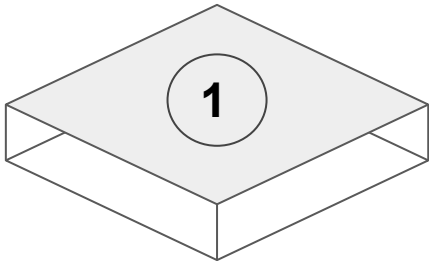




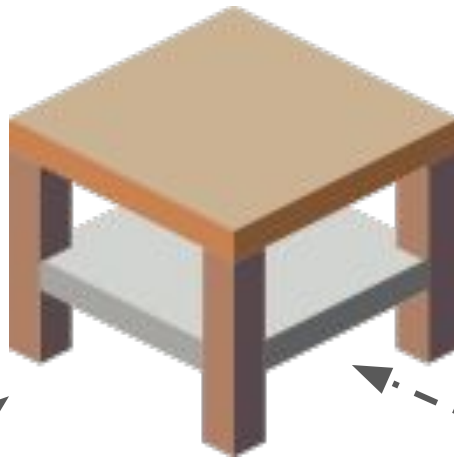
# SHE WANTS A SQUARE TABLE

G6  
Basic

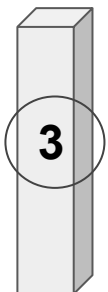
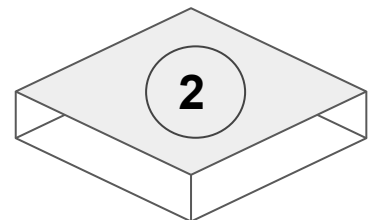
Adele wants a square table for her newly renovated house. Look at the desired design below and given its dimensions, calculate the total volume of the table.



1. The dimensions of this piece are 28 inches in length, 28 inches in width and 6 inches in height.



2. The dimensions of this piece are just two inches shorter than no.1.



3. The dimensions of this piece are 4 inches in width and length, and 20 inches in height.

Four pieces



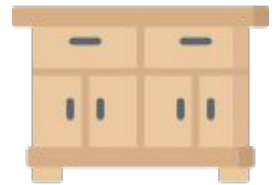
# CHOOSING THE PERFECT TV STAND

G7  
Advanced

Richard is looking for a perfect TV stand for his new house. The volume of the TV stand that he is looking for is described below. Help him choose the perfect TV stand.

A.  $L = 16.3$  cm,  
 $W = 14$  cm, and  $H = 8$   
cm.

B.  $L = 11.3$  cm,  
 $W = 9$  cm, and  $H = 8$   
cm.



C.  $L = 10.5$  cm,  $W = 9.3$  cm, and  $H = 8$   
cm.

D.  $L = 12.3$  cm,  
 $W = 8.8$  cm, and  $H = 8$   
cm.


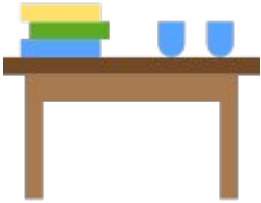

Hi! I am looking for a TV stand that can fit my space at home. I would like to buy a TV stand whose volume is not less than 300 cu. cm but does not exceed 500 cu. cm. Can I have that?



# FURNITURE FOR MY KITCHEN

G7  
Advanced

To make sure that all furniture will fit on her kitchen, Miranda can only buy furniture with a total volume of not less than 100 m. Her choices of purchase are described below. Calculate each furniture's volume and find out if Miranda will make the right choice.

 $L = 1.08 \text{ m}$ $W = 0.75 \text{ m}$ $H = 1.2 \text{ m}$	
 $L = 3.08 \text{ m}$ $W = 1.5 \text{ m}$ $H = 0.95 \text{ m}$	
 $L = 5.08 \text{ m}$ $W = 2.75 \text{ m}$ $H = 1.5 \text{ m}$	

Do you think Miranda will make the right choice if she purchase these three furnitures? Why or why not?



# COLORFUL STORAGE BOXES

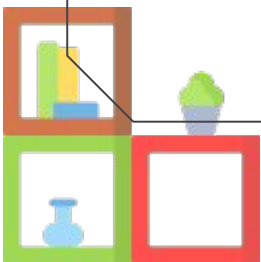
G7  
Advanced

These colorful storage boxes are so cool. They make our things organized. Read and answer the following word problems related to these boxes.

1. One out of three storage boxes can hold 421. 875 cubic yards. This box has a shape of cube. What are its dimensions?

2. If a cube box has a volume of 2744 cubic units, how many blocks of a smaller cube, whose length is 2 cm, can fit on the bigger box?

3. A storage box in cube shape can hold approximately 37 blocks of smaller cubes whose length is 3 cm. Given this, estimate the volume of the storage box.



# OUR BUNK BEDDED ROOM

G7  
Advanced

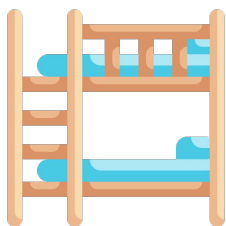
George and his younger brother would like a bunk bed in their room. The description of their desired bunk bed size is given below.

## Description:

The foam bed of the larger frame is 6 inches in height, 54 inches in length, and 30 inches in width. While the smaller foam bed has the same height and length of the larger bed but 6 inches shorter in width than the larger bed.

Task 1: Draw the outline of the foam beds in scale size.  
Let 1 in = 6 in of the original size.

Task 2: Compute for the volume of the two foam beds.



# I NEED A NEW DRESSER

G7  
Advanced

Adele is in need of a new dresser. However, she is not sure if this will fit on the vacant space in her room. Help her solve the problem.

My room can only accommodate a space that is less than 20,000 cubic cm.



The dimensions of the new dresser are 25 in, 10 inches, and 28 inches. Will it be a good fit to Adele's room? Why or why not?



# ANSWER GUIDE

## Activity 1

- |                       |                      |                      |
|-----------------------|----------------------|----------------------|
| 1. Cube               | 2. Rectangular prism | 3. Cube              |
| 4. Cube               | 5. Rectangular prism | 6. Rectangular prism |
| 7. Cube               | 8. Rectangular prism | 9. Rectangular prism |
| 10. Rectangular prism |                      |                      |

## Activity 2

- |                                   |                              |
|-----------------------------------|------------------------------|
| 1. 512 cubic cm - large           | 2. 91.125 cubic cm - small   |
| 3. 1000 cm - extra large          | 4. 314.432 cubic cm - medium |
| 5. 1906.62 cubic cm - extra large |                              |

## Activity 3

- |                |               |                |
|----------------|---------------|----------------|
| 1. 125 cu. ft. | 2. 99 cu. ft. | 3. 729 cu. ft. |
|----------------|---------------|----------------|

## Activity 4

- |      |      |      |      |
|------|------|------|------|
| 1. A | 2. D | 3. E | 4. B |
|------|------|------|------|

## Activity 5

- |                |                |               |
|----------------|----------------|---------------|
| 1. 4704 cu. in | 2. 2704 cu. in | 3. 320 cu. in |
|----------------|----------------|---------------|
- Total volume =  $4704 + 2704 + 320 = 7728$  cu. in

## Activity 6

- |                  |                |                 |
|------------------|----------------|-----------------|
| A. 1825.6 cu. cm | B. 813.6 cu cm | C. 781.2 cu. cm |
|------------------|----------------|-----------------|
- D. 865.92 cu. Cm    Conclusion: There is no perfect TV stand for Richard because their volumes do not fit any of the desired size.



# ANSWER GUIDE

## Activity 7

1. 0.972 cu. m.

2. 4.389

3. 20.955 cu. M

The total volume is 26. 366 cu. m. This means that Miranda will make the right choice.

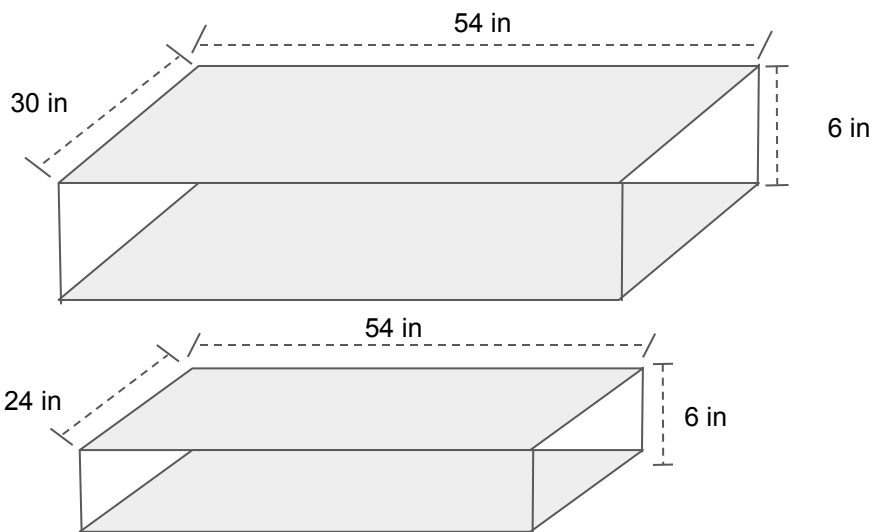
## Activity 8

1. 7.5 yd

2. 343 blocks

3. approximately 1000 cu. cm

## Activity 9



Larger foam bed = 9720 cu. in

Smaller foam bed = 7776 cu in.

## Activity 10

Yes it will be a good fit because the volume of the new dresser is 17, 780 cu. cm which is less than the vacant space (20,000 cu.cm)





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