LESSON MAKER PRO

Fraction Prism Power

Find volume with fractional edges.

GRADE 6 · 6.G.A.2

CCSS.Math.Content.6.G.A.2 "Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths..."

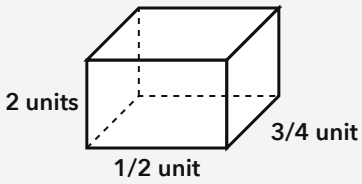
NAME _____ DATE _____

VOLUME OF A PRISM

A right rectangular prism is made of equal cube layers. Find volume by multiplying V = l w h, or multiply base area by height, V = b h. Fractional edges work the same way.

WORKED EXAMPLE

Find the volume of a prism with length 1/2 unit, width 3/4 unit and height 2 units. Each small packing cube has edge 1/4 unit.

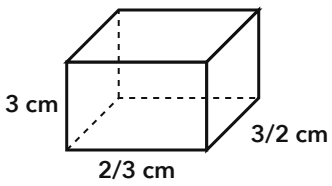


1. 1/2 = 2 fourths, 3/4 = 3 fourths, and 2 = 8 fourths.
2. The prism holds 2 x 3 x 8 = 48 small cubes.
3. Each small cube has volume 1/64 cubic unit.
4. V = 1/2 x 3/4 x 2 = 3/4 cubic unit.

Answer: 3/4 cubic unit

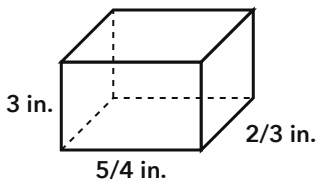
PRACTICE 4 problems

1 Find the volume of a prism with length 2/3 cm, width 3/2 cm and height 3 cm.



ANSWER _____

2 Find the volume of a prism with length 5/4 in., width 2/3 in. and height 3 in.



ANSWER _____

3 A rectangular prism is 7/8 m long, 4 m wide, and 5/6 m high. Find its volume.

ANSWER _____

4 A prism has a base area of 3/5 ft^2 and a height of 5/9 ft. Find its volume.

ANSWER _____

APPLY IT Show your work

1 A student builds a rectangular display box for collectible cards. It is 5/6 ft long, 9/5 ft wide, and 3/2 ft high. What is its volume?

WORK SPACE

ANSWER _____

2 A community garden has a raised soil bed with a rectangular base area of 7/8 yd^2. The soil is 4/7 yd deep. What volume of soil fills the bed?

WORK SPACE

ANSWER _____

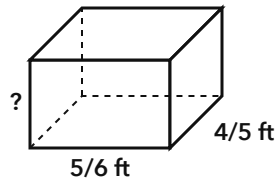
3 Pack and draw: Your teacher supplies 12 equal cubes, each representing an edge of 1/4 unit. Build one complete layer with 3 cubes along the length and 2 along the width. Build an identical layer on top with no gaps. Draw both layer grids and label the prism length, width and height in units. Record cubes per layer and total cubes. Find one cube's volume and use your cube count to find the packed volume. Compare it with l × w × h and explain the agreement.

WORK SPACE

ANSWER _____

CHALLENGE One step up

The prism shown has a volume of 5/3 ft^3. Find its height. Explain how you used the base area.



WORK SPACE AND ANSWER

ANSWER KEY

Fraction Prism Power

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find the volume of a prism with length 2/3 cm, width 3/2 cm and height 3 cm.	**3 cm^3; (2/3) × (3/2) × 3 = 3.**
2	Find the volume of a prism with length 5/4 in., width 2/3 in. and height 3 in.	**5/2 $in.^3$**
3	A rectangular prism is 7/8 m long, 4 m wide, and 5/6 m high. Find its volume.	**35/12 m^3**
4	A prism has a base area of 3/5 ft^2 and a height of 5/9 ft. Find its volume.	**1/3 ft^3**

PART 2 · APPLY IT

1. **9/4 ft^3** Multiply the three edge lengths: 5/6 x 9/5 x 3/2 = 9/4.
2. **1/2 yd^3** Use V = b h: 7/8 x 4/7 = 1/2.
3. **6 cubes per layer, 2 layers, 12 cubes total; length 3/4, width 1/2, height 1/2 unit. Volume = 12/64 = 3/16 cubic unit.** Each cube volume is (1/4)^3 = 1/64. Two complete 3-by-2 layers contain 12 cubes. The product (3/4) × (1/2) × (1/2) also equals 3/16 cubic unit.

CHALLENGE

5/2 ft. The base area is 5/6 x 4/5 = 2/3 ft^2, so h = 5/3 divided by 2/3 = 5/2 ft.

Accept equivalent fractions and mixed numbers for volumes. For the challenge, accept a correct explanation using V = b h or V = l w h. For Apply It 3, supply 12 identical cubes per learner/pair; their edge models 1/4 unit regardless of physical size. Observe actual gap-free packing and require two completed 3-by-2 layer drawings, fractional edge labels, 6/12 counts, cube volume and product comparison. Practice 1 is 3 cubic centimetres, consistent with its displayed 3 cm height.

Fraction Prism Power

Apply It 3: each of TWO identical layers has 6 cubes. Stack them: height 2 × 1/4 = 1/2 unit; 12 cubes of volume 1/64 give 3/16 cubic unit.

