

Grade 6 · Volume of Rectangular Prisms · Worksheet Answer Key

Common Core 6.G.A.2 · mathovore.fr

Every solution shows the formula, the substitution, and the final volume in cubic units. Use the answers to check your work, and compare the cube-counting method with the multiplication method in problem 5, since both must give the same volume.

Grade 6 Common Core: 6.G.A.2

Problem 1: Whole-number edges

$$V = \ell wh = 6 \times 4 \times 3 = 24 \times 3 = 72$$

The volume is 72 ft^3 .

Problem 2: Box volume

$$V = \ell wh = 7 \times 5 \times 2 = 35 \times 2 = 70$$

The volume is 70 in^3 .

Problem 3: Base area times height

$$V = Bh = 24 \times 5 = 120$$

The volume is 120 in^3 .

Problem 4: Fractional width

$$V = \ell wh = 4 \times \frac{1}{2} \times 3 = 2 \times 3 = 6$$

The volume is 6 in^3 .

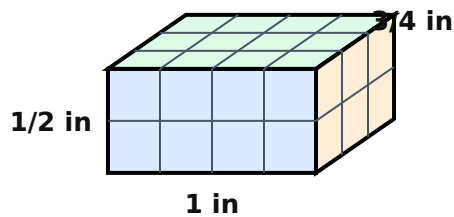
Problem 5: Packing with cubes

(a) Along each edge: $1 \div \frac{1}{4} = 4$, $\frac{3}{4} \div \frac{1}{4} = 3$, $\frac{1}{2} \div \frac{1}{4} = 2$. Cubes: $4 \times 3 \times 2 = 24$.

(b) Four cubes fill 1 inch in each direction, so 64 fit in a 1-inch cube: $\frac{1}{64} \text{ in}^3$.

(c) $24 \times \frac{1}{64} = \frac{3}{8}$. Check: $1 \times \frac{3}{4} \times \frac{1}{2} = \frac{3}{8}$.

Answers: **24 cubes**, $\frac{1}{64} \text{ in}^3$, $\frac{3}{8} \text{ in}^3$.



$$4 \times 3 \times 2 = 24 \text{ cubes}$$

Solution figure.

Problem 6: Missing height

$$150 = 10 \times 5 \times h = 50h$$

$$h = 150 \div 50 = 3$$

The height is 3 ft.

Problem 7: Mixed-number edges

$$V = \frac{5}{2} \times \frac{3}{2} \times 2 = \frac{15}{4} \times 2 = \frac{30}{4} = \frac{15}{2} = 7\frac{1}{2}$$

The volume is $7\frac{1}{2} \text{ ft}^3$.

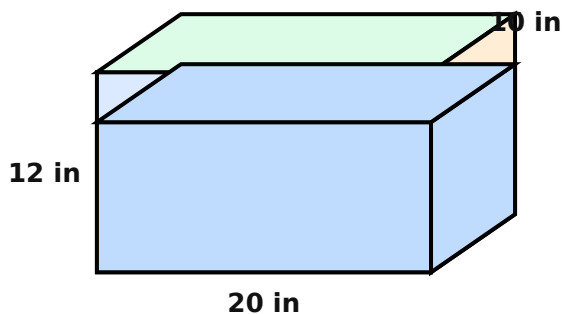
Problem 8: Aquarium

$$\text{Water: } 20 \times 10 \times 9 = 1,800 \text{ in}^3.$$

$$\text{Full tank: } 20 \times 10 \times 12 = 2,400 \text{ in}^3.$$

$$\text{To add: } 2,400 - 1,800 = 600.$$

The tank holds $1,800 \text{ in}^3$ of water and needs 600 in^3 more.



water 1,800 cu in, to add 600 cu in

Solution figure.

Problem 9: Storage boxes

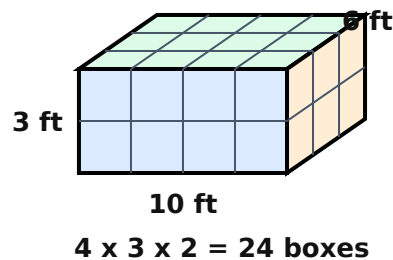
Box: $\frac{5}{2} \times 2 \times \frac{3}{2} = \frac{15}{2} = 7.5 \text{ ft}^3$.

Space: $10 \times 6 \times 3 = 180 \text{ ft}^3$.

$$180 \div 7.5 = 24$$

Check by rows: $10 \div 2.5 = 4$, $6 \div 2 = 3$, $3 \div 1.5 = 2$, and $4 \times 3 \times 2 = 24$.

24 boxes fit.



Solution figure.

Problem 10: Sandbox

$$V = 6 \times \frac{9}{2} \times \frac{3}{4} = 27 \times \frac{3}{4} = \frac{81}{4} = 20.25 \text{ ft}^3.$$

Cost: $20.25 \times \$4 = \$81$.

The sand fills 20.25 ft^3 and costs \$81.