

Finding the Volume of Rectangular Prisms

Grade 6 math · Worksheet · Standards: 6.G.A.2

Name: _____ Date: _____ Class: _____

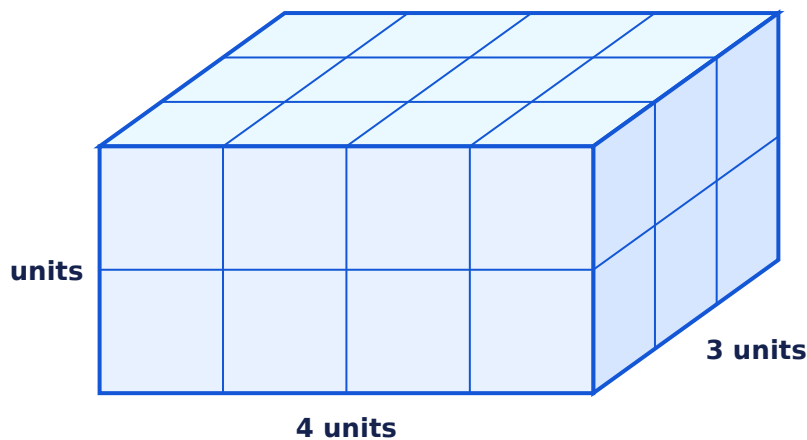
These twenty problems train standard 6.G.A.2: finding the volume of a right rectangular prism with fractional edge lengths, first by packing it with unit cubes and then with $V = lwh$ and $V = Bh$.

The problems begin with counting cubes and simple products, continue with fractions, decimals and missing edges, and end with real situations such as sand, concrete and pools. Always write cubic units.

Standards: 6.G.A.2 · **Level:** Grade 6

Problem 1 Counting unit cubes (easy)

A prism is built from unit cubes as shown. Find its volume.



A prism built from unit cubes.

Problem 2 Volume of a box (easy)

Find the volume of a box that is 9 inches long, 4 inches wide and 5 inches tall.

Problem 3 Volume of a cube (easy)

A foam block shaped like a cube measures 8 centimeters on each edge. How much space does it occupy?

Problem 4 Volume from the base area (easy)

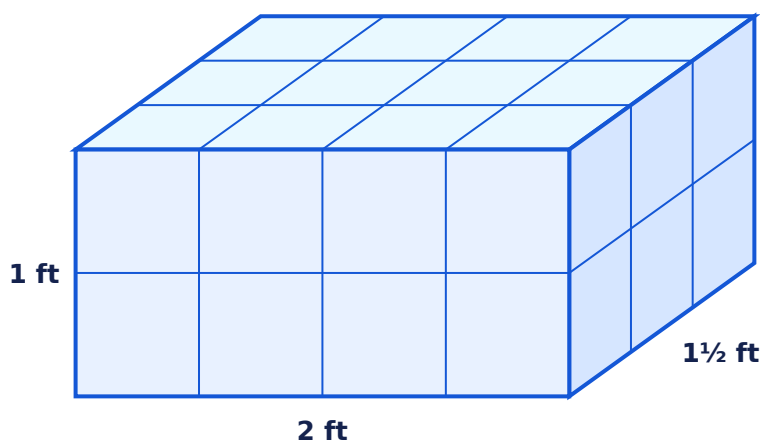
A storage bin has a base area of 24 square feet and a height of 7 feet. Find its volume.

Problem 5 A small metric box (easy)

A box measures 10 centimeters by 6 centimeters by 4 centimeters. Find its volume.

Problem 6 Packing with half-foot cubes (medium)

A crate is filled to the brim with cubes, each $\frac{1}{2}$ foot on a side.



Packed with cubes whose edges are $\frac{1}{2}$ ft.

- Find the number of cubes in the prism.
- Find the volume of one cube.
- Find the volume of the prism.

Problem 7 A prism with fractional edges (medium)

A prism is $2\frac{1}{2}$ inches long, 2 inches wide and $1\frac{1}{2}$ inches tall. Find its volume.

Problem 8 Missing height (medium)

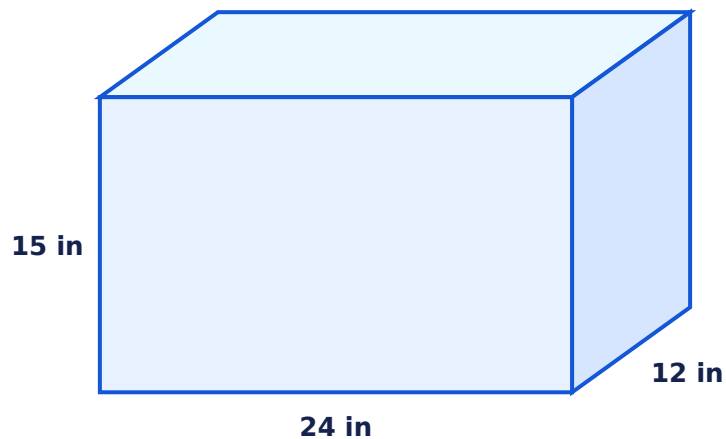
A prism has a volume of 180 cubic feet, a length of 9 feet and a width of 5 feet. Find its height.

Problem 9 Volume with decimals (medium)

A planter has a base area of 3.5 square meters and a height of 4 meters. Find its volume.

Problem 10 Fish tank (medium)

Find the volume of the fish tank.



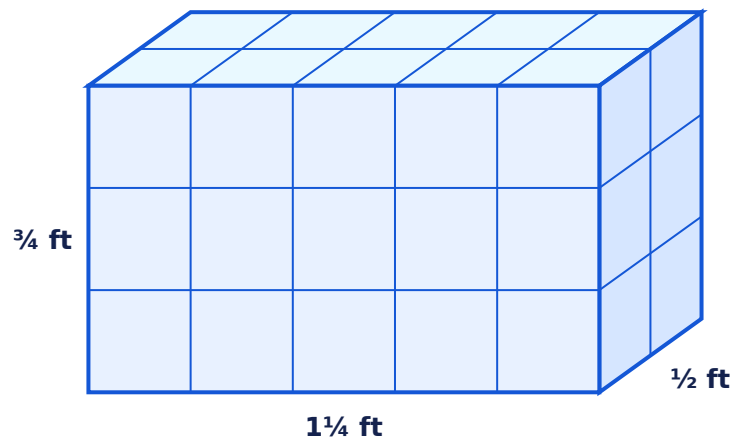
A fish tank.

Problem 11 Cube with a fraction edge (medium)

A cube has edges of $\frac{3}{4}$ inch. Find its volume.

Problem 12 Packing with quarter-foot cubes (medium)

The prism is packed with cubes whose edges are $\frac{1}{4}$ foot long.



Packed with cubes whose edges are $\frac{1}{4}$ ft.

- Find the number of cubes.
- Find the volume of the prism.

Problem 13 Missing width (medium)

A prism has a volume of 96 cubic centimeters, a length of 8 centimeters and a height of 3 centimeters. Find its width.

Problem 14 Comparing two boxes (hard)

Box A measures 14 inches by 6 inches by 5 inches. Box B measures 10 inches by 8 inches by $5\frac{1}{2}$ inches. Which box has the greater volume, and by how much?

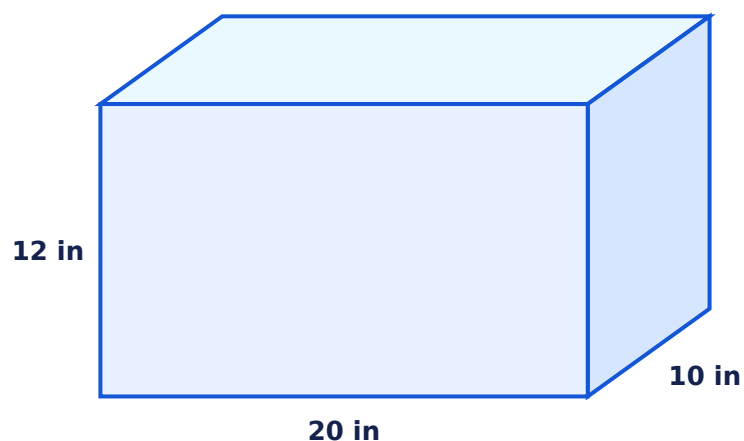
Problem 15 Sand for a sandbox (hard)

A sandbox is 8 feet long, $5\frac{1}{2}$ feet wide and $\frac{3}{4}$ foot deep. A bag of sand holds $2\frac{1}{2}$ cubic feet and costs \$4.50.

- Find the volume of the sandbox.
- Find the number of bags needed.
- Find the cost.

Problem 16 Water in an aquarium (hard)

The aquarium is filled with water to $\frac{3}{4}$ of its height.



An aquarium.

- Find the volume of the aquarium.

- b. Find the volume of the water.
- c. Find the volume of the empty space.

Problem 17 Concrete slab (hard)

A concrete slab is 12 feet long, 9 feet wide and $\frac{1}{3}$ foot thick. Concrete costs \$6.25 per cubic foot.

- a. Find the volume of the slab.
- b. Find the cost of the concrete.

Problem 18 Filling a gift box (hard)

A gift box is $7\frac{1}{2}$ inches long, $4\frac{1}{2}$ inches wide and 3 inches tall. It is packed with cubes whose edges are $1\frac{1}{2}$ inches long.

- a. Find the number of cubes that fit.
- b. Find the volume of the box.
- c. Find the volume of one cube and use it to check part (a).

Problem 19 Filling a pool (hard)

A pool is 20 feet long, 12 feet wide and 5 feet deep. A pump adds 30 cubic feet of water per minute.

- a. Find the volume of the pool when full.
- b. Find the volume of water when the surface is 6 inches below the top.
- c. Find the minutes needed to reach that level.

Problem 20 Changing the height (hard)

A prism has a volume of 270 cubic inches, a length of $7\frac{1}{2}$ inches and a width of 4 inches. Find its height. Then find the volume of a second prism with the same base and half the height.