

## Volume and Measurement Conversion: math practice, Grade 5 – download the PDF

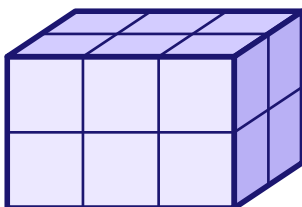
22 problems graded by difficulty (★ easy, ★★ medium, ★★★ hard). Try first, without looking at the solutions!

1

### Count the cubes



This prism is built from unit cubes.



- How many cubes are in one layer?
- How many layers are there?
- What is the volume of the prism?

## 2 Square units or cubic units?



For each situation, say whether you would measure in linear units, square units or cubic units.

- a. The floor of a gym
- b. The sand in a sandbox
- c. The length of a jump rope
- d. The space inside a moving box

## 3 Apply the formula



A rectangular prism is 7 cm long, 3 cm wide and 4 cm tall. Find its volume.

## 4 A cube-shaped box



- a. A cube-shaped gift box has an edge of 5 in. Find its volume.
- b. A cube-shaped block has an edge of 10 cm. Find its volume.

## 5 Customary lengths



Convert.

- a. 4 ft = \_\_\_ in
- b. 5 yd = \_\_\_ ft
- c. 36 in = \_\_\_ ft
- d. 2 mi = \_\_\_ ft

## 6 Metric lengths



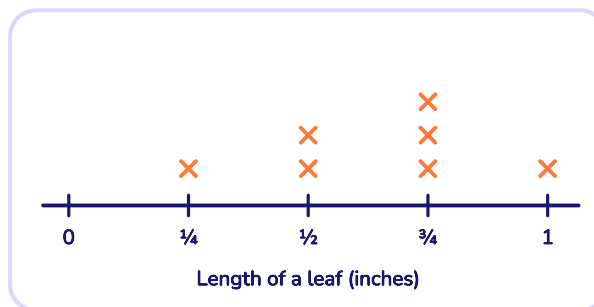
Convert.

- a. 7 m = \_\_\_\_ cm
- b. 3 km = \_\_\_\_ m
- c. 60 mm = \_\_\_\_ cm
- d. 4.5 m = \_\_\_\_ cm

## 7 Read the line plot



The line plot shows the lengths, in inches, of 7 leaves.



- a. Which length appears most often?
- b. How many leaves are longer than  $\frac{1}{2}$  in?
- c. What is the difference between the longest and the shortest leaf?

## 8 Find the missing height



A rectangular prism has a volume of  $96 \text{ in}^3$ . Its length is 8 in and its width is 6 in. Find its height.

9

**The aquarium**

An aquarium is 24 in long, 10 in wide and 12 in tall.

- Find the volume of the aquarium.
- Find the volume of water when it is filled to half its height.

10

**Using the base area**

The base of a prism is a rectangle 6 ft by 3 ft. The prism is 5 ft tall.

- Find the base area  $B$ .
- Use  $V = B \times h$  to find the volume.

11

**Packing cubes**

A shipping box is 12 in long, 9 in wide and 6 in tall. It is packed with small cubes that each have an edge of 3 in. How many cubes fit in the box?

12

**Two prisms joined**

A garden shed is a rectangular prism 10 ft long, 8 ft wide and 7 ft tall. A storage bin 4 ft long, 8 ft wide and 5 ft tall is attached to one side of the shed. What is the total volume of the shed and the bin together?

**13****Capacity and weight**

Convert.

- a. 3 gal = \_\_\_\_ qt
- b. 40 c = \_\_\_\_ pt
- c. 6 lb = \_\_\_\_ oz
- d. 3 tons = \_\_\_\_ lb

**14****Metric mass and capacity**

Convert.

- a. 2.5 kg = \_\_\_\_ g
- b. 8,000 mL = \_\_\_\_ L
- c. 350 cm = \_\_\_\_ m
- d. 0.75 L = \_\_\_\_ mL

**15****Which is bigger?**

Convert to the same unit and compare. Write which measurement is greater.

- a. 2 ft 6 in or 31 in
- b. 1.2 km or 1,150 m
- c. 3 lb or 50 oz

## 16 True or false?



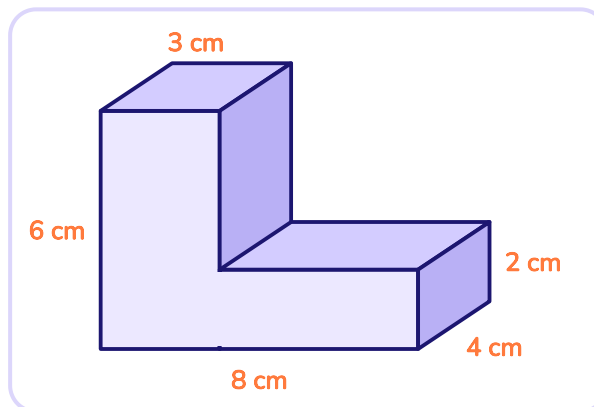
Say whether each statement is true or false. Justify your answer.

- a. If you double the length of a prism and keep the width and height, the volume doubles.
- b. A cube with an edge of 4 cm has a volume of  $16 \text{ cm}^3$ .
- c.  $1 \text{ yd} = 12 \text{ in.}$
- d.  $5,000 \text{ mL} = 5 \text{ L.}$

## 17 An L-shaped solid



Find the volume of this solid. All the angles are right angles.



Solve it in two ways: by adding two prisms, and by subtracting a missing piece from a big block.

## 18 Filling a tank



A tank is 20 cm long, 10 cm wide and 15 cm tall. Remember that  $1 \text{ cm}^3$  holds 1 mL.

- a. Find the volume of the tank in  $\text{cm}^3$ .
- b. How many liters can it hold?
- c. Marcus pours in 2.4 L of water. How many milliliters are still needed to fill the tank?

**19 Two missing measures**

A rectangular prism has a volume of  $210 \text{ cm}^3$  and a base area of  $35 \text{ cm}^2$ .

- Find its height.
- The base is a rectangle 7 cm wide. Find the length of the base.

**20 Doubling dimensions**

A prism measures 3 in by 4 in by 5 in.

- Find its volume.
- Double only the height. What is the new volume? How many times as large is it?
- Double all three dimensions. What is the new volume? How many times as large is it?

**21 Punch for the party**

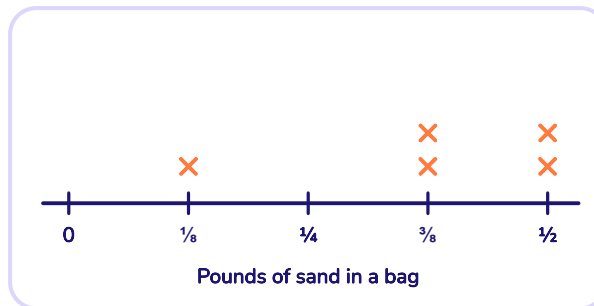
A school party cooler holds 3 gallons of punch. Each serving is  $\frac{3}{4}$  cup.

- How many cups are in 3 gallons?
- How many servings can be poured?

22

**Sharing sand equally**

The line plot shows the pounds of sand in 5 bags.



- How much sand is there in all?
- The sand is poured out and shared equally among the 5 bags. How much is in each bag?

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