UNIT 10 · STANDARD 6.G.2

Volume with Whole Number Edges

Lesson 10-1

Name: _____ Date: _____ Class: _____

Key Vocabulary

Level 1 support

Picture first, then the word, then a plain-language meaning. Say each word out loud.

A box 3 × 2 × 4 holds 24 unit cubes, so V = 24 cubic units

Volume

How much space is inside a solid shape.

A cereal box or shoe box — it has length, width, and height

Rectangular prism

A solid box shape with six flat rectangle sides.

A tiny cube that is 1 in × 1 in × 1 in = 1 in³ (one cubic inch)

Cubic units

The units used to measure space inside, like cubic inches.

V = l × w × h: for a box 5 × 3 × 2, volume = 30 cubic units

Length, width, height

How long, how wide, and how tall a box is.

A cross-shaped pattern of 6 rectangles folds into a rectangular box

Net

A flat shape that folds up into a solid.

A cube has 12 edges — 4 along the top, 4 along the bottom, 4 vertical

Edge

The line where two flat sides of a solid meet.

Key Ideas & Notes

- Your team is building time capsule containers to store class memories.
- Each container is a rectangular prism, and you need to figure out how much each one can hold.
- That means calculating the volume using whole number dimensions!
- Calculate the volume of each time capsule container. Use $V = l \times w \times h$.

Think About It

- What three measurements do you need to find the volume of a box?
- What does volume tell us about a container?
- How is volume different from the area of one face?

My Notes

Guided Examples

Example 1

What is the volume of a rectangular prism with l = 7 in, w = 3 in, h = 4 in?

Solution: $V = l \times w \times h = 7 \times 3 \times 4 = 84$ cubic inches.

Answer: A. 84 in^3

Example 2

A time capsule box has a volume of 120 cm^3. Its length is 10 cm and width is 4 cm. What is its height?

Solution: $V = l \times w \times h \rightarrow 120 = 10 \times 4 \times h \rightarrow 120 = 40h \rightarrow h = 3$ cm.

Answer: A. 3 cm

Example 3

Which unit is used for volume?

Solution: Volume measures 3D space, so it uses cubic units like in^3. Square units (in^2) are for area, and inches are for length.

Answer: A. Cubic inches (in^3)

Write About the Math

The Writing Revolution

I can explain my work using the words volume, rectangular prism, cubic units, and edge.

1. Kernel Sentence

subject + verb

Model: Volume is how much space is inside a solid shape.
Volumen es cuánto espacio hay dentro de una figura sólida.

Write a kernel sentence about volume. Use a subject and a verb.
Escribe una oración base sobre volumen. Usa un sujeto y un verbo.

2. Sentence Expansion

because · but · so

Kernel: Volume matters in math
Volumen importa en matemáticas

Expand the kernel three ways. Add a reason, a contrast, and a result.

because *porque*

Volume matters in math because ____.
Volumen importa en matemáticas porque ____.

but *pero*

Volume matters in math, but ____.
Volumen importa en matemáticas, pero ____.

so *entonces*

Volume matters in math, so ____.
Volumen importa en matemáticas, entonces ____.

3. Sentence Types

4 ways to write a math idea

Statement
Afirmación

Tell one true fact about volume.
Di un hecho verdadero sobre volume.

Volume ____.

Question
Pregunta

Ask a question about volume.
Haz una pregunta sobre volume.

How does ____ ?
¿Cómo ____ ?

Exclamation
Exclamación

Show excitement about volume.
Muestra entusiasmo sobre volume.

Wow, ____ !
¡Guau, ____ !

Command
Mandato

Tell a partner what to do with volume.
Dile a un compañero qué hacer con volume.

First, ____ .
Primero, ____ .

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4. Explain Your Reasoning

use a sentence starter

I counted ____ cubes in each layer.
Conté ____ cubos en cada capa.

The volume is ____ cubic units.
El volumen es ____ unidades cúbicas.

I would find volume to ____.
Hallaría el volumen para ____.

Try It

Solve on your own. Check the answer key when you are done.

1. Which unit is used for volume?

A. Cubic inches (in^3)

B. Square inches (in^2)

C. Inches (in)

D. Degrees (°)

Show your work:

2. Two storage bins: Bin A is 8 × 6 × 5 inches. Bin B is 9 × 4 × 7 inches. Which holds more and by how much?

A. Bin B by 12 in^3

B. Bin A by 12 in^3

C. Bin B by 24 in^3

D. They hold the same

Show your work:

Stretch Your Thinking

Level 2 enrichment

Challenge task — explain your reasoning in full sentences.

A box needs to hold exactly 60 cubic inches. Give three different sets of whole-number dimensions that work. Which set would make the box closest to a cube shape? Why might that matter?

Sentence starter: Option 1: ___ × ___ × ___. Option 2: ___ × ___ × ___. Option 3: ___ × ___ × ___. The ___ option is closest to a cube because ___. This matters because ___.

Show your work:

Reflect — Exit Ticket

A rectangular prism has l = 11 in, w = 5 in, h = 4 in. What is the volume?

A. 220 in^3

B. 55 in^3

C. 220 in^2

D. 200 in^3

Your answer:

Answer Key & Teacher Guide

1. **Try It 1:** A. Cubic inches (in^3) — *Volume measures 3D space, so it uses cubic units like in^3. Square units (in^2) are for area, and inches are for length.*
2. **Try It 2:** A. Bin B by 12 in^3 — *Bin A: $8 \times 6 \times 5 = 240$ in^3. Bin B: $9 \times 4 \times 7 = 252$ in^3. Bin B holds 12 in^3 more.*
3. **Exit Ticket:** A. 220 in^3 — *$V = 11 \times 5 \times 4 = 220$ cubic inches. Remember: volume uses cubic units (in^3).*

Writing (TWR) — what to look for

- **Kernel sentence:** A complete sentence needs a subject and a verb. Example: Volume is how much space is inside a solid shape.
- **Expansion:** *because* gives a reason, *but* shows a contrast or exception, *so* shows a result. Answers vary; each must keep the kernel idea and add the correct kind of detail.
- **Sentence types:** Statement ends with a period, question with "?", exclamation with "!", and a command starts with an action verb (a "bossy" verb).