

The Shipping Container Escape

Volume of Rectangular Prisms: Find the volume of right rectangular prisms by packing them with unit cubes, and apply $V = l \times w \times h$ and $V = B \times h$ to solve real-world problems.

Learning target: I can find the volume of rectangular prisms and composite figures and explain what volume means.

Success looks like: Students use the vocabulary correctly, complete the escape room, and score 80% or higher on the evidence-based exit ticket.

Materials: Student devices, the printed lesson worksheet (one per student), projector for the mini-lesson presenter.

LESSON AT A GLANCE

60 minutes

Time	Part	Teacher does	Students do
0:00-0:08	Warm-up	Project the warm-up. Circulate, then call on 2-3 students. Save question 3 for the debrief.	Answer Part 2 of the lesson worksheet; share with a partner.
0:08-0:20	Mini-lesson	Teach with the 4-step presenter. Run each quick check with the whole class.	Complete worksheet Parts 4-11 as each slide appears; answer checks with fingers.
0:20-0:48	Escape Room	Launch The Shipping Container Escape. Assign mission levels; circulate with the answer key.	Play solo or in pairs; record code pieces; complete any written evidence task.
0:48-0:52	Debrief	Ask 2 debrief questions and revisit warm-up question 3.	Finish worksheet Part 13 (prediction check + one thing learned).
0:52-1:00	Exit ticket	Hand out the exit ticket. Collect and sort with the mastery guide.	Answer with evidence independently.

Key vocabulary

Word	Student-friendly definition
Volume	The amount of space inside a 3-D figure, measured in cubic units.
Cubic unit	A cube 1 unit on each side (cm^3 , in^3 , ft^3).
Rectangular prism	A 3-D figure with 6 rectangular faces, like a box.
Base (B)	The area of the bottom face: length $\times$ width.
Composite figure	A solid made of two or more prisms joined together.

1. WARM-UP

0:00–0:08 · 8 min

Warm-up expectations (post these): Answer in Part 2 of the lesson worksheet (or on this sheet). Number each answer to match the question. Answer in complete sentences. For math, show your work. Work silently for 5 minutes, then share with a partner for 2 minutes. Be ready to share one answer with the class.

#	Question	Look for
1	What is the area of a rectangle 5 cm long and 3 cm wide?	15 cm ² .
2	What is the difference between area and volume?	Area covers a flat surface (square units). Volume fills a space (cubic units).
3	About how many sugar cubes could fit in a small box? How could you find out?	Answers vary. Find how many fit in one layer, then multiply by the number of layers.

2. MINI-LESSON

0:08–0:20 · 12 min

Project the Lesson presenter from the room page. It runs the whole hour: target and agenda, warm-up with timer, hook vote, 4 teaching steps (key idea, interactive tool, turn and talk, check for understanding), I do / we do / you do, a work-time screen with a timer and expectations, debrief, and the exit ticket. Press N for teacher notes, T to pause the timer, and P to pick a student.

Hook (1 min): How could you find how many sugar cubes fill a box without filling it? Class vote: Count one layer, then multiply / Guess / Measure the outside only

Step 1 (3 min): Volume fills space

Teach	Area counts squares that cover a flat surface. Volume counts cubes that fill a space. Units are cubed: cm ³ .
Interactive tool	Visual: A prism made of 1-cm cubes
Students do	Count the cubes in the prism by layers.
Turn and talk	Why is volume measured in cubic units instead of square units?
Worksheet Part 5A	Volume counts CUBES that fill a space. It is measured in CUBIC units.
Check for understanding	How many cubes are in the prism? Answer: 24

Step 2 (3 min): Layers: $V = l \times w \times h$

Teach	Build one layer: length $\times$ width cubes. Stack layers: multiply by height.
Interactive tool	Board and notes
Students do	Write $V = l \times w \times h$ and solve for a $5 \times 2 \times 3$ box.

Turn and talk	Does it matter which face you call the base? Why or why not?
Worksheet Part 6A	Volume = LENGTH $\times$ WIDTH $\times$ HEIGHT.
Check for understanding	A box is 5 cm $\times$ 2 cm $\times$ 3 cm. Volume? Answer: 30

Step 3 (3 min): $V = B \times h$

Teach	B is the area of the base. $V = B \times h$ means base area times the number of layers.
Interactive tool	Board and notes
Students do	Find V for a box with base 6 cm ² and height 4 cm.
Turn and talk	How is $V = l \times w \times h$ the same as $V = B \times h$?
Worksheet Part 7A	$V = B \times h$, where B is the area of the BASE.
Check for understanding	Base area = 12 cm ² , height = 5 cm. Volume? Answer: 60

Step 4 (3 min): Composite figures

Teach	Split a composite figure into rectangular prisms, find each volume, then add.
Interactive tool	Visual: A composite figure: two prisms side by side
Students do	Split the figure into two prisms and find each volume.
Turn and talk	How would you find the volume of an L-shaped room?
Worksheet Part 8A	For a COMPOSITE figure, split it into prisms and ADD the volumes.
Check for understanding	Prism A is 4 $\times$ 2 $\times$ 2. Prism B is 2 $\times$ 2 $\times$ 4. Total volume? Answer: 32

I do: worked example (shown one step at a time)

1. Problem: a prism 4 cubes long, 3 wide, and 5 tall.
2. Step 1: One layer: $4 \times 3 = 12$ cubes.
3. Step 2: There are 5 layers.
4. Step 3: $12 \times 5 = 60$.
5. Answer: 60 cubic units. Formula: $V = l \times w \times h$.

What to say on every slide is in the presenter script PDF.

We do: guided practice

A fish tank is 5 dm long, 3 dm wide, and 4 dm tall. How many liters does it hold? (1 dm³ = 1 liter)

1. One layer: $5 \times 3 = 15$ cubes.
2. Stack 4 layers: $15 \times 4 = 60$.
3. $V = 60$ dm³.
4. Since 1 dm³ = 1 liter, the tank holds 60 liters.

Answer: 60 liters

You do: independent check (2 min)

A box has a base of 20 cm² and a height of 6 cm. What is its volume?

Answer: 120. Students who miss it: 3-minute reteach at the teacher table, then start the room at the Explorer level.

Misconception: "Volume and area are the same." Area is 2-D square units; volume is 3-D cubic units.

Misconception: "Add the dimensions." Volume multiplies them.

Misconception: "Composite figures: multiply all the numbers you see." Split into separate prisms first.

3. ESCAPE ROOM: THE SHIPPING CONTAINER ESCAPE

0:20–0:48 · 28 min

Launch: project the start screen, read the story aloud, and assign mission levels (Explorer = extra support, Agent = on level, Legend = challenge). Students can open Supports any time for read-aloud, bigger text, a word bank, and a scratch pad.

- Locks open in order, so every student moves through the same sequence. Circulate and listen for which lock is causing a traffic jam.
- Pairs work well: one student reads the clue card aloud, the other controls the device. Switch roles at every lock.
- If a group is stuck for more than 3 minutes, ask "What does the clue card say about this?" before giving the hint.

Students turn in: the completion code plus their copied "turn in your work" block (Canvas Text Entry).

4. DEBRIEF

0:48–0:52 · 4 min

1. Explain why $V = l \times w \times h$ works using the idea of layers.
2. How did you split a composite figure?
3. When would someone in real life need to know volume?

Close the loop: return to warm-up question 3. Answer: Answers vary. Find how many fit in one layer, then multiply by the number of layers.

5. EXIT TICKET

0:52–1:00 · 8 min

Print the exit ticket PDF (page 2 is the key and mastery guide). Every item requires evidence: Part A asks students to justify each choice, Part B asks for an explanation, and Part C applies the standard to a new situation using Solve-Show-Explain. Sort results into Mastered, Approaching, and Beginning to plan tomorrow's groups.

LESSON RESOURCES

Resource	How it fits the lesson
Warm-up worksheet (PDF)	Optional standalone warm-up (also Part 2 of the lesson worksheet), with a key.

Resource	How it fits the lesson
Mini-lesson presenter	Projectable, step-by-step interactive lesson with tools and quick checks (room page).
Lesson worksheet (PDF + key)	One printable packet students complete during the whole lesson: short fill-ins and quick checks in 13 small parts that match the presenter slides.
The Shipping Container Escape (.html)	The escape room for Canvas, with differentiated levels, supports, and a turn-in.
Exit ticket (PDF + key)	Evidence-based check with a rubric and a mastery sorting guide.
Illustrative Mathematics (extra)	Free Grade 5 volume unit. https://im.kendallhunt.com/
Khan Academy: 5th Grade Math (extra)	Volume videos and practice. https://www.khanacademy.org/math/cc-fifth-grade-math
Toy Theater: 3-D Shapes (extra)	Free virtual manipulatives. https://toytheater.com/
Open Middle (extra)	Volume puzzles with many solution paths. https://www.openmiddle.com/

ANSWER KEY: THE SHIPPING CONTAINER ESCAPE

Lock 1: Unit Cubes (code piece: C)

1. How many cubes are in the bottom layer? -> 12
2. What is the volume of the box? -> 24 cm^3
3. What does volume measure? -> The amount of space inside a 3-D figure

Lock 2: The Formula (code piece: U)

1. What is the volume of the crate? -> 120 cm^3
2. A box is 9 inches long, 2 inches wide, and 3 inches tall. What is its volume? -> 54 in^3
3. Sort the units. -> Measures area (2-D): square feet (ft^2), square cm (cm^2) | Measures volume (3-D): cubic feet (ft^3), cubic inches (in^3), cubic meters (m^3)

Lock 3: Base Times Height (code piece: B)

1. A box has a base area of 36 square inches and a height of 5 inches. What is its volume? -> 180 in^3
2. A box's base is 7 feet by 4 feet, and it is 10 feet tall. What is its volume? -> 280 ft^3
3. Pack a new crate: build a prism with a BASE AREA of 12 square units and a VOLUME of 36 cubic units. -> Any prism with volume 36 and base 12

Lock 4: The Missing Measurement (code piece: E)

1. A box has a volume of 96 cm^3 . It is 4 cm long and 4 cm wide. How tall is it? -> 6 cm
2. A box has a volume of 60 ft^3 and a base area of 15 ft^2 . What is its height? -> 4 ft

Lock 5: The Loading Dock (code piece: S)

1. What is the volume of Part A? -> 30 m^3
2. What is the volume of Part B? -> 24 m^3
3. What is the total volume of the loading dock? -> 54 m^3

Final code: CUBES