Finding Volume Using Formulas

Finding Volume Using Formulas: Apply, Compare, and Design

Name _____ **Date** _____ **Score** _____ / 6

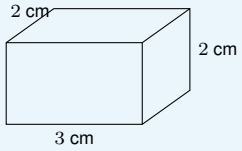
QUICK REVIEW

For a rectangular prism, $V = l \times w \times h = B \times h$, where B is base area. A 5 cm by 3 cm base has $B = 15$ cm^2; at height 4 cm, $V = 15 \times 4 = 60$ cm^3. To find height, divide volume by base area.

Worked example

Find the volume of a rectangular prism measuring 3 cm by 2 cm by 2 cm.

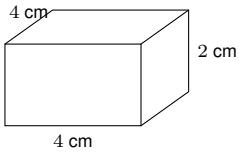
1. One layer or base has $3 \times 2 = 6$ square centimeters.
2. Volume is base area times height: $6 \times 2 = 12$ cubic centimeters.
3. Check the height: $12 \div 6 = 2$ cm.
Answer: 12 cm^3.



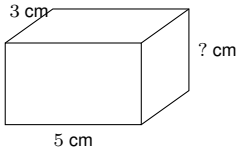
Practice Problems

Show your thinking.

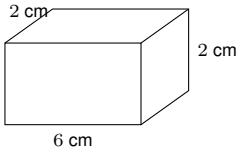
1. A box has internal dimensions 4 cm by 4 cm by 2 cm. It contains 16 cm^3 of blocks. Find the unfilled volume.



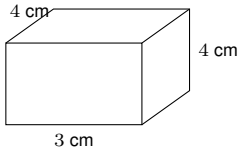
2. Design a prism with volume 45 cm^3 using length 5 cm and width 3 cm. Find the required height.



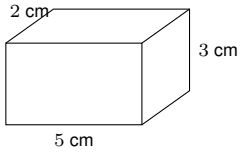
3. A prism has dimensions 6 cm, 2 cm, and 2 cm. Only its height doubles. Find the original and new volumes.



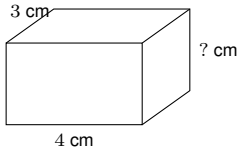
4. Compare the volume of this 3 cm by 4 cm by 4 cm prism with a volume of 49 cm^3. Find the gap.



5. A box has internal dimensions 5 cm by 2 cm by 3 cm. It contains 15 cm^3 of blocks. Find the unfilled volume.



6. Design a prism with volume 24 cm^3 using length 4 cm and width 3 cm. Find the required height.



Answer Key

1. 16 cm^3 unfilled.
2. 3 cm.
3. 24 cm^3 and 48 cm^3.
4. The given prism has 1 cm^3 less volume.
5. 15 cm^3 unfilled.
6. 2 cm.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. One layer or base has $4 \times 4 = 16$ square centimeters.
2. Volume is base area times height: $16 \times 2 = 32$ cubic centimeters.
3. Check the height: $32 \div 16 = 2$ cm.
4. Unfilled: $32 - 16 = 16$ cm^3.

Problem 2

1. Use the known base area $5 \times 3 = 15$ cm^2; missing height is $45 \div 15 = 3$ cm.
2. One layer or base has $5 \times 3 = 15$ square centimeters.
3. Volume is base area times height: $15 \times 3 = 45$ cubic centimeters.
4. Check the height: $45 \div 15 = 3$ cm.

Problem 3

1. One layer or base has $6 \times 2 = 12$ square centimeters.
2. Volume is base area times height: $12 \times 2 = 24$ cubic centimeters.
3. Check the height: $24 \div 12 = 2$ cm.
4. New height 4 cm; new volume $12 \times 4 = 48$ cm^3.

Problem 4

1. One layer or base has $3 \times 4 = 12$ square centimeters.
2. Volume is base area times height: $12 \times 4 = 48$ cubic centimeters.
3. Check the height: $48 \div 12 = 4$ cm.
4. $49 - 48 = 1$ cm^3.

Problem 5

1. One layer or base has $5 \times 2 = 10$ square centimeters.
2. Volume is base area times height: $10 \times 3 = 30$ cubic centimeters.
3. Check the height: $30 \div 10 = 3$ cm.
4. Unfilled: $30 - 15 = 15$ cm^3.

Problem 6

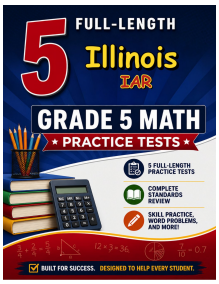
1. Use the known base area $4 \times 3 = 12$ cm^2; missing height is $24 \div 12 = 2$ cm.
2. One layer or base has $4 \times 3 = 12$ square centimeters.
3. Volume is base area times height: $12 \times 2 = 24$ cubic centimeters.
4. Check the height: $24 \div 12 = 2$ cm.

TESTINAR

Keep Building Grade 5 Math Skills

Choose the practice book matched to your state assessment and turn worksheet practice into a complete test-prep plan.

All Grade 5 books



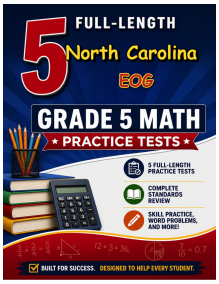
ILLINOIS IAR

5 Full-Length Math Practice Tests

Build Grade 5 accuracy, confidence, and test stamina with 5 printable practice tests.

Printable eBook • Instant PDF access

View eBook



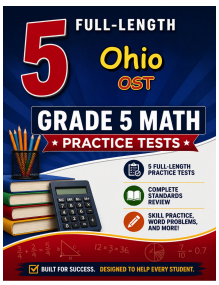
NORTH CAROLINA EOG

5 Full-Length Math Practice Tests

Build Grade 5 accuracy, confidence, and test stamina with 5 printable practice tests.

Printable eBook • Instant PDF access

View eBook



OHIO OST

5 Full-Length Math Practice Tests

Build Grade 5 accuracy, confidence, and test stamina with 5 printable practice tests.

Printable eBook • Instant PDF access

View eBook

Need a different state?
Testinar has Grade 5 math practice books for state assessments across the country.

TESTINAR.COM/GRADES/5