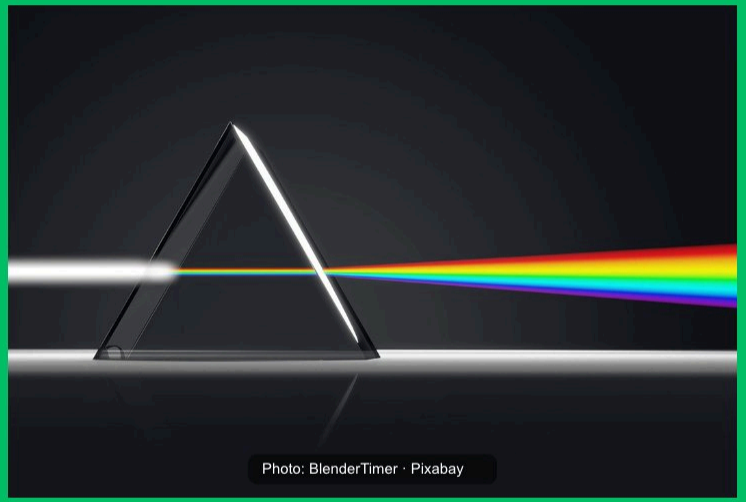
Volume of Prisms

Same slice all the way through



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A HANDY VOLUME NUMBER

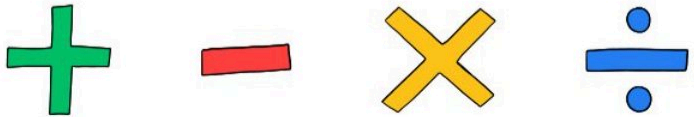
1000 cm^3

in every 1 litre of space

We will use it to sense-check container volumes later.



Illustration: OpenClipart-Vectors · Pixabay



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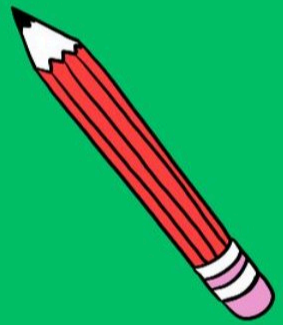
$a^2+b^2=c^2$

What Do We Need?

- triangle: 1/2 x b x h
- trapezium: 1/2(a+b) x h
- any prism: cross-section area x length

Prism volume

- parallelogram: b x h
- cuboid: l x w x h
- cylinder: pi x r^2 x h



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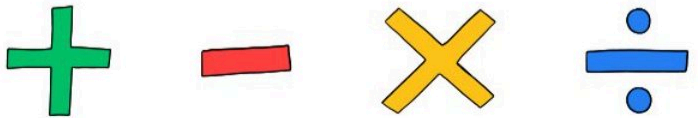
Find Any Prism Volume

1. Spot the repeating end - the cross-section
2. Work out its area in square units, cm^2
3. Multiply by length straight through
4. Give answer in cubic units, cm^3



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$$a^2+b^2=c^2$$

What could this be?

I have two identical triangular ends and three rectangles round me. I am hollow and you can sleep inside me. What am I?





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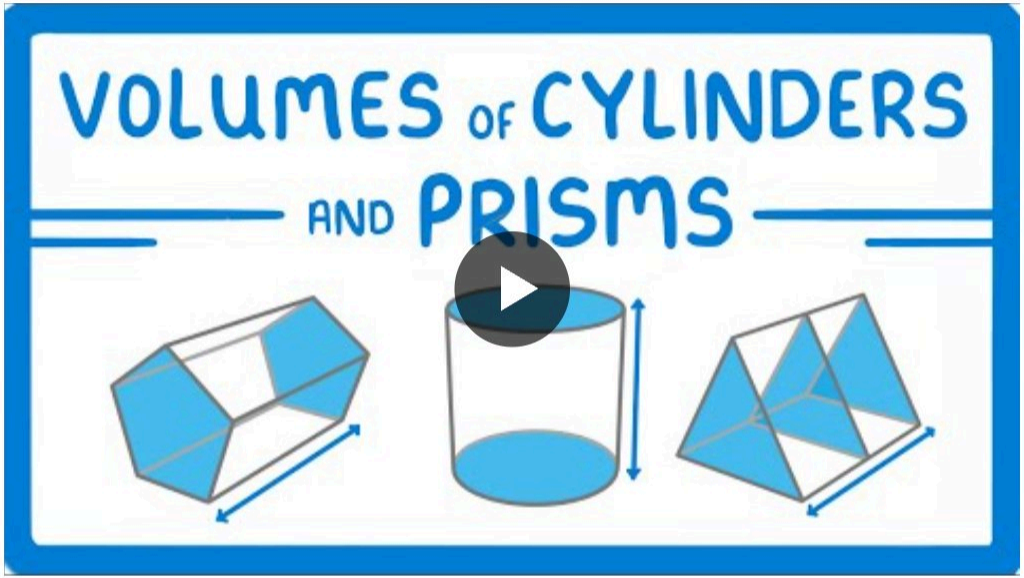
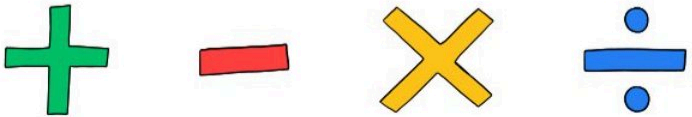
Watch: Slices Make Volume



▶ 0:00 – 3:28

- Spot how cross-section stays the same
- Listen for area x length rule



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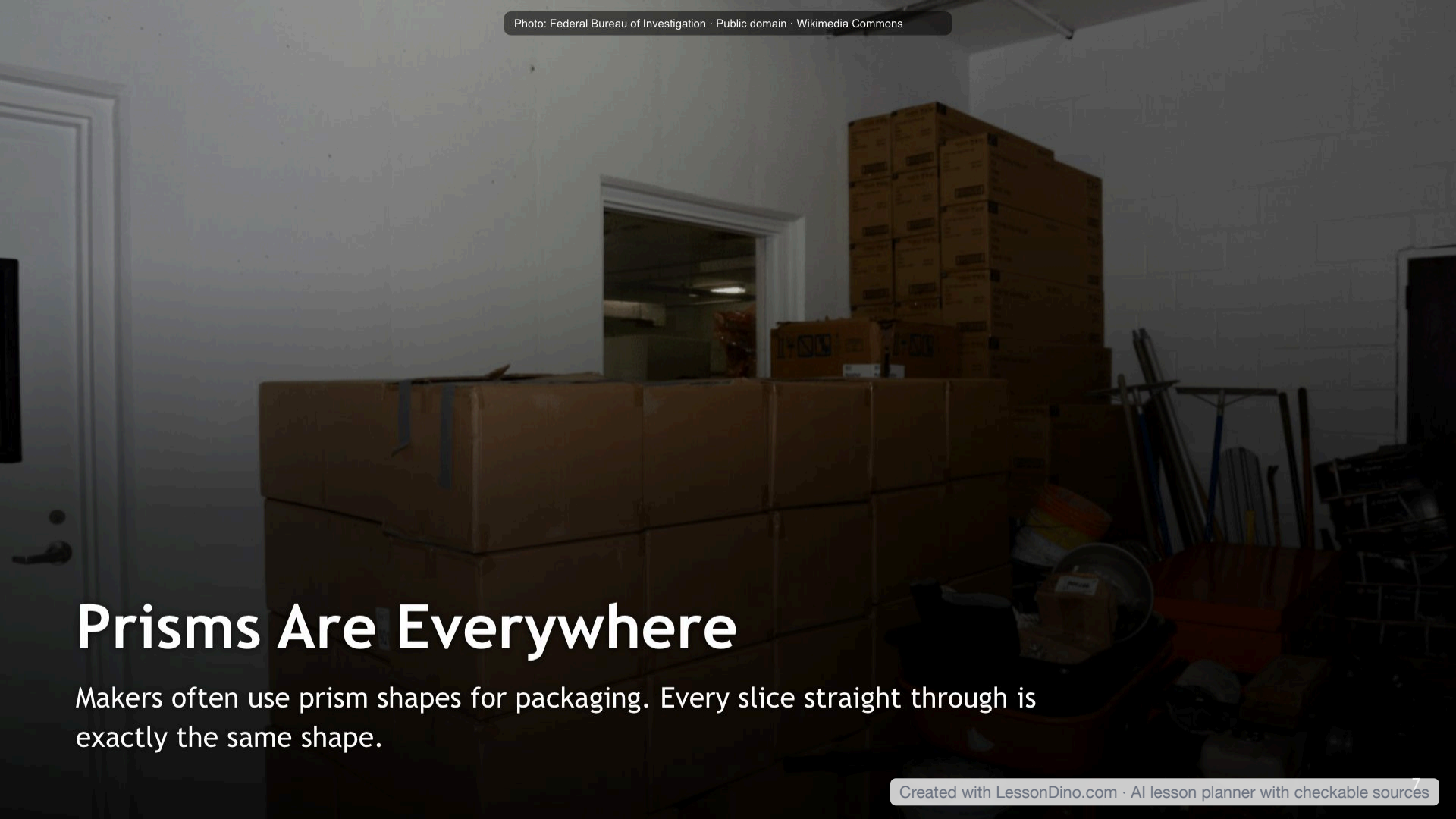

Photo: Federal Bureau of Investigation · Public domain · Wikimedia Commons

Prisms Are Everywhere

Makers often use prism shapes for packaging. Every slice straight through is exactly the same shape.

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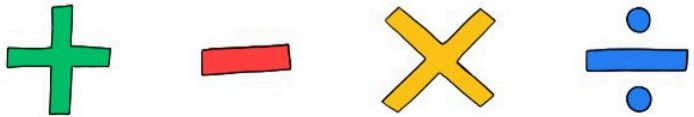
Watch: Triangles to Prisms



▶ 0:00 – 4:34

- See cuboid volume link to triangle area
- Note length stays at right angles



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$a^2+b^2=c^2$

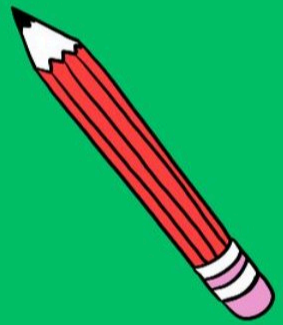
Your task

In pairs, find the volumes of Prism A, B and C on the board.

1. A: cuboid 9 cm by 4 cm by 5 cm
2. B: triangle base 6 cm, height 4 cm, length 10 cm
3. C: circle radius 3 cm, height 7 cm - leave in terms of pi

10 min

In pairs



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Avoid These Traps

- Use the repeating end, not any face
- Halve for triangles: 1/2 x base x height
- Use radius, not diameter, for cylinders
- Give cubic units: cm^3, not cm^2

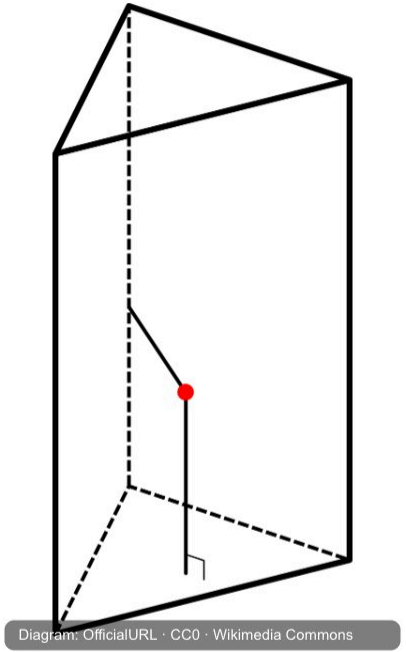
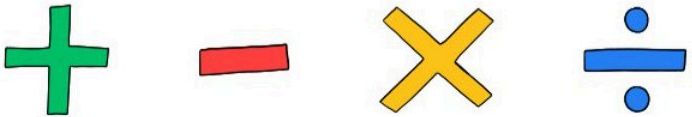


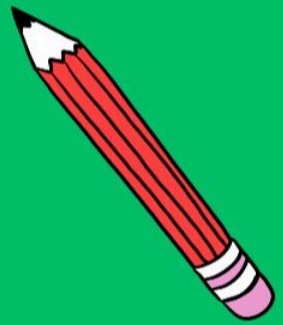
Diagram: OfficialURL · CC0 · Wikimedia Commons



$a^2+b^2=c^2$

Best Pencil Case?

Which prism shape would make the best pencil case?



- **A** Flat cuboid box
- **B** Triangular tube
- **C** Cylinder tube

Vote with your hands, then explain why.

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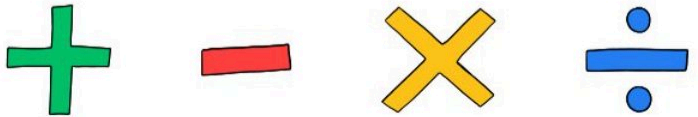
Exit ticket

1. Volume of any prism = ...

2. One calculation I am confident with is ...

3. One question I still have is ...



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