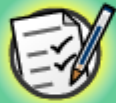


$$5 \times 7 = 35$$
$$20 + 2 = 22$$

Calculating Volume



Common core icons



This icon indicates a slide where the Standards for Mathematical Practice are being developed. Details of these are given in the Notes field.



Slides containing examples of mathematical modeling are marked with this stamp.



This icon indicates an opportunity for discussion or group work.

The **Standards for Mathematical Practice** outlined in the Common Core State Standards for Mathematics describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.

These are:

- 1) **Make sense of problems and persevere in solving them.**
- 2) **Reason abstractly and quantitatively.**
- 3) **Construct viable arguments and critique the reasoning of others.**
- 4) **Model with mathematics.**
- 5) **Use appropriate tools strategically.**
- 6) **Attend to precision.**
- 7) **Look for and make use of structure.**
- 8) **Look for and express regularity in repeated reasoning.**



This icon indicates that the slide contains activities created in Flash. These activities are not editable.



This icon indicates teacher's notes in the Notes field.

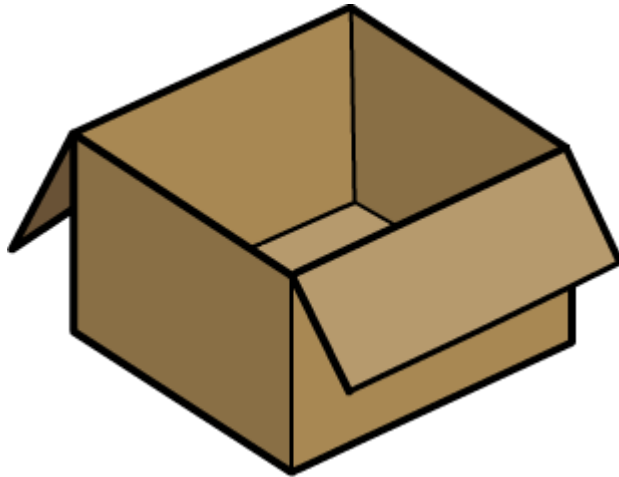
Which box?

MODELING



board
works

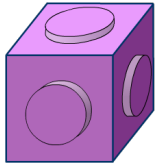
Michael's grandma tells him he can have as many cookies as he can fit into a box. She gives him two boxes to choose from. Once he chooses a box, he cannot change his mind.



How will he know which box to choose?



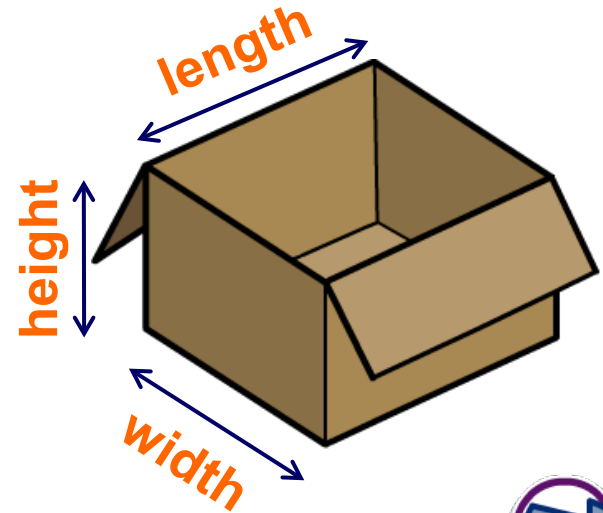
The amount of space a solid object takes up is called its **volume**. The volume of an object measures its combined length, width and height.



Suppose that this cube has a side length of one unit. We call this a **unit cube**.

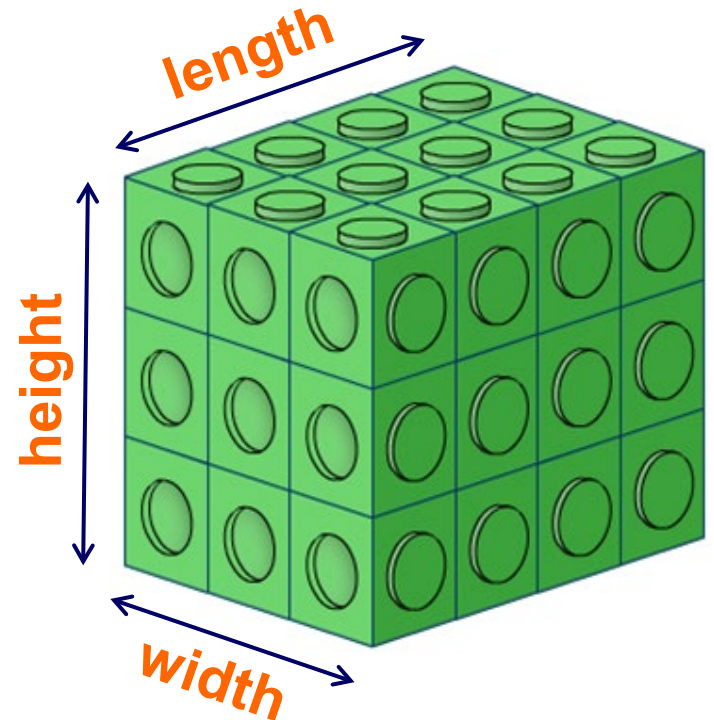
How could we use unit cubes to find the volume of this box?

We can pack the box with unit cubes. The number of unit cubes that fit into the box is the box's volume.



Volume is measured in cubic units.

We can use in^3 , ft^3 , yd^3 , mi^3 ,
 mm^3 , cm^3 , m^3 or km^3 .

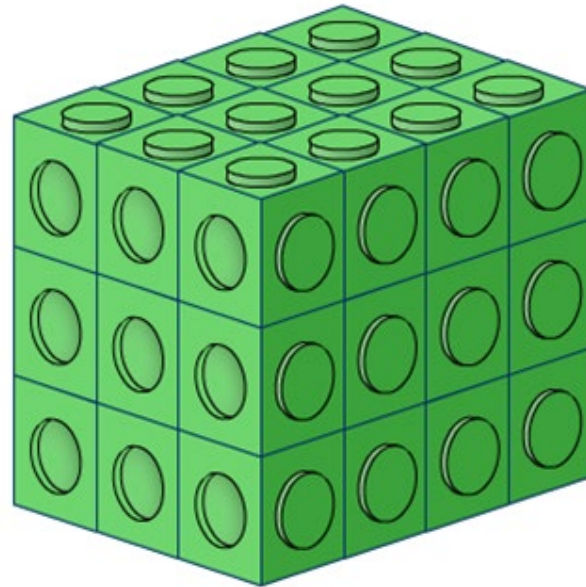


The ³ tells us that there are three dimensions being measured:
length, **width** and **height**.



Volume of a rectangular prism

This prism is made out of interlocking unit cubes.



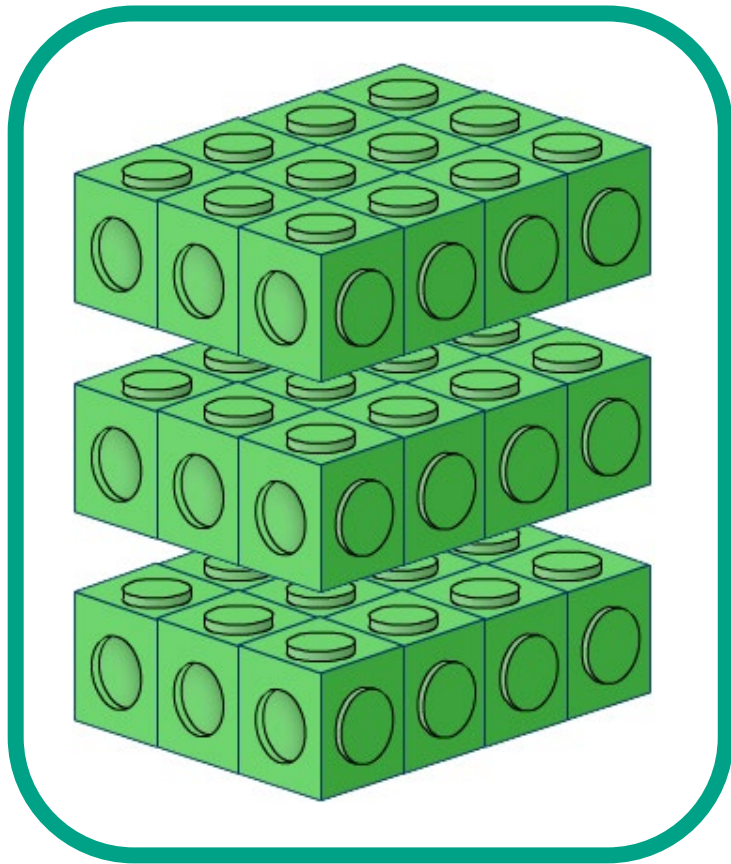
How many cubes does it contain?



Volume of a rectangular prism



One way to figure this out is to divide the prism into layers.

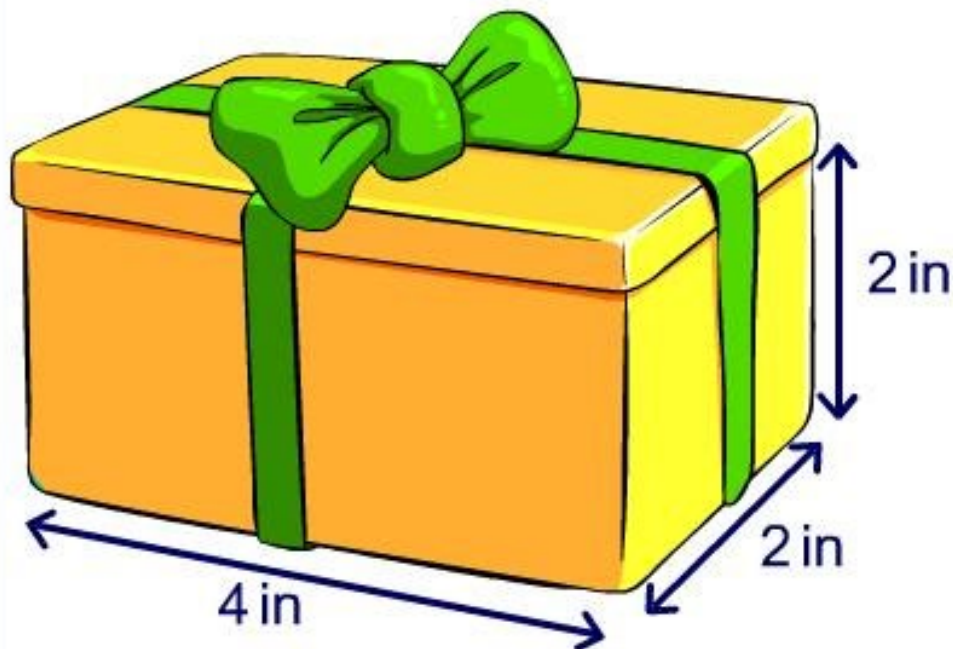


The number of unit cubes in each layer can be found by multiplying the number of cubes along the length by the number of cubes along the width.

$$3 \times 4 = 12 \text{ cubes in each layer}$$

There are three layers altogether, so the total number of cubes in the prism = $3 \times 12 = 36$ cubes.

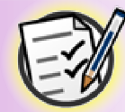
What is the volume of this prism?



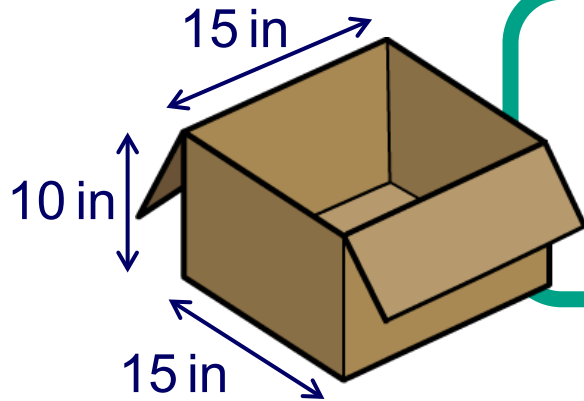
Nicole is bringing fudge to her school's annual gift exchange. She needs to know how many pieces will fit in this box. If each piece of fudge is a 1-inch cube, how many pieces can she bring?



Which box?



Remember Michael's deal with his grandma.
Which box should Michael choose to fill with cookies?



Volume of Box A:

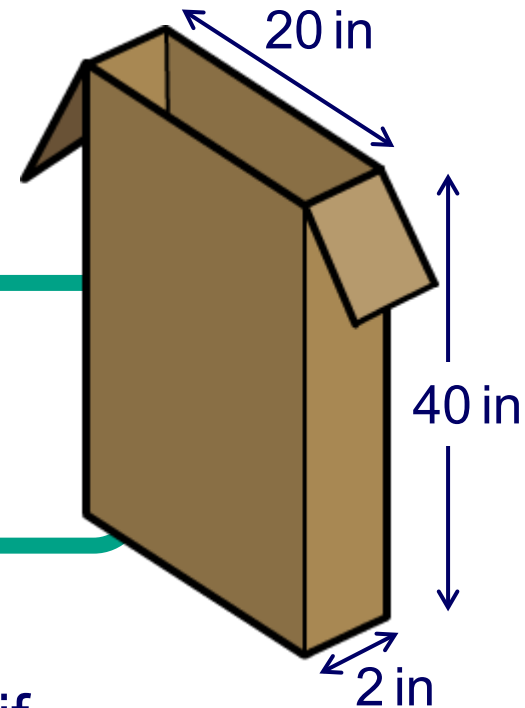
$$V = lwh$$

$$15 \times 15 \times 10 = \mathbf{2250 \text{ in}^3}$$

Volume of Box B:

$$V = lwh$$

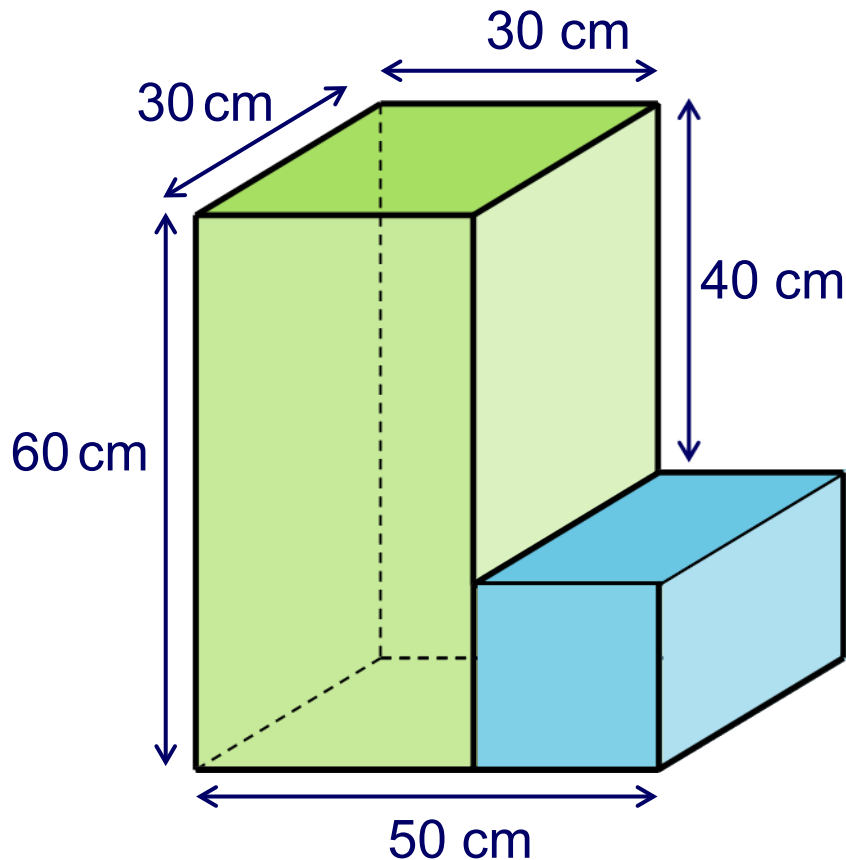
$$20 \times 2 \times 40 = \mathbf{1600 \text{ in}^3}$$



Box A has a greater volume.
Michael will get more cookies if
he chooses Box A.



Josh wants to take this box on an airplane. If the size limit is $80,000 \text{ cm}^3$, will he be able to take the box?



We can think of the shape as two prisms joined together.

Volume of the green prism:

$$60 \times 30 \times 30 = 54000 \text{ cm}^3$$

Volume of the blue prism:

$$30 \times 20 \times 20 = 12000 \text{ cm}^3$$

Total volume:

$$54000 + 12000 = 66,000 \text{ cm}^3$$

Josh will be able to take the box.



Find the volume



Use the formula $V = lwh$ to solve these volume calculations.

Press **start** to begin.

start

