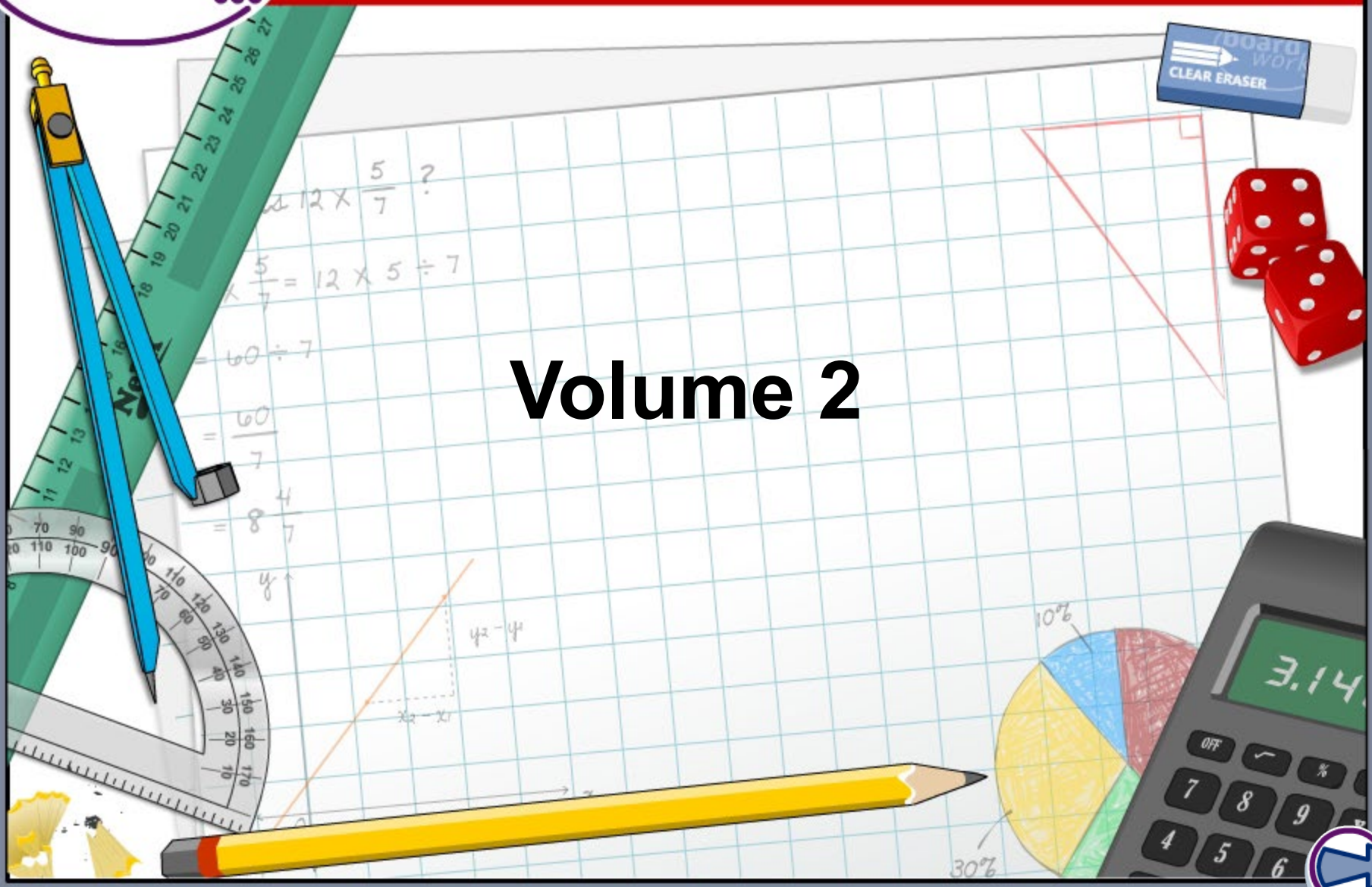


Volume 2

Information

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.

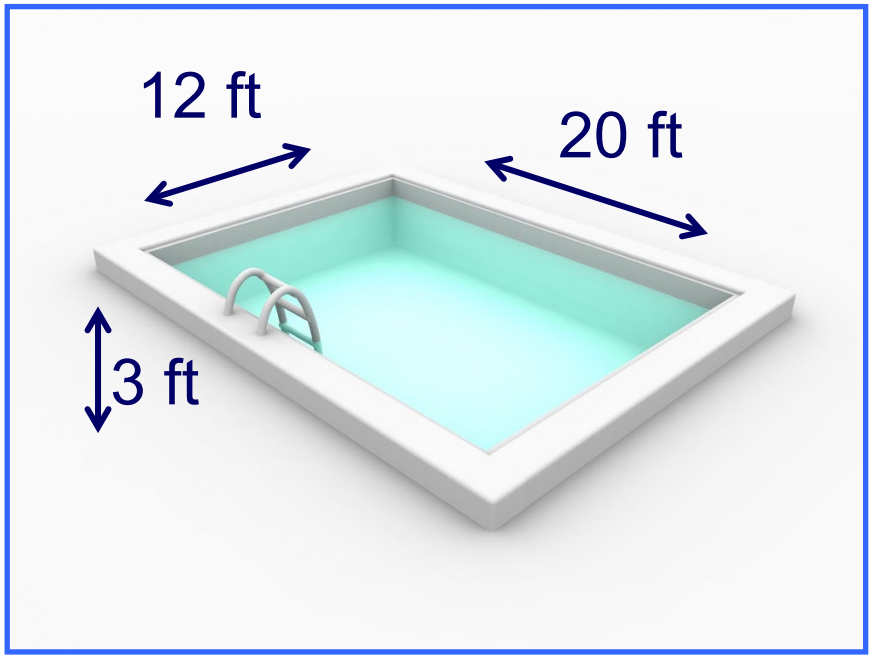
This icon indicates teacher's notes in the Notes field.

Volume

Do you remember how to find volume?
What is the volume of this pool?

Volume of a prism = area of the base × height

If the base is rectangular,
volume = length × width × height



Volume of the pool =

$20 \times 12 \times 3 =$

$720\ ft^3$

Volume of a cylinder

What if the base is not a rectangle? How could we find the volume this mug, for example?

How could we find the area of the base?

The base is a circle, so:

Area of a circle = πr^2

Area of the base = $\pi \times 2^2 = \pi \times 4$

= **12.56 in.^{3}**

How could we use this to find the volume?

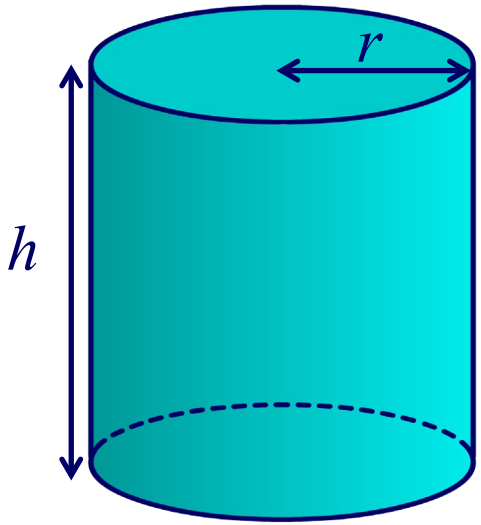
We could multiply by the height.

Volume = 12.56 × 4 = **50.24 in.^{3}**

Volume of a cylinder

Can you think of a formula you could use to find the volume of any cylinder?

The volume of any cylinder can be found by multiplying the area of the cross section by the height of the cylinder.



Area of a circle = πr^2

Volume = πr^2 × height

$$V = \pi r^2 h$$

Volume practice

Each can of baked beans is a cylinder with a height of 11 cm and a diameter of 7 cm. Each can holds 400 g of beans. Each saucepan has a radius of 10 cm and a depth of 15 cm.

A catering company needs 25 kg of beans.

How many cans should they buy? How many saucepans will they need to heat the beans?

25 kg = 25000 g

25000 ÷ 400 = 62.5 cans

Because they cannot buy half a can, they should buy **63 cans** to be sure they have enough.

Volume practice

Each can of baked beans is a cylinder with a height of 11 cm and a diameter of 7 cm. Each can holds 400 g of beans. Each saucepan has a radius of 10 cm and a depth of 15 cm.

How many saucepans do they need to heat the 25 kg of beans?

We can find the volume of each can of beans:

$V = \pi r^2 h = \pi \times 3.5^2 \times 11 =$

$\pi \times 12.25 \times 11 = 38.47 \times 11 =$

423.17 cm^3

There are 63 cans, so $423.17 \times 63 =$ **26659.71 cm^3** of beans in total.

Volume practice

Each can of baked beans is a cylinder with a height of 11 cm and a diameter of 7 cm. Each can holds 400 g of beans. Each saucepan has a radius of 10 cm and a depth of 15 cm.

How many saucepans do they need to heat the 25 kg of beans?

We can also find the volume of each saucepan:

$V = \pi r^2 h = \pi 10^2 \times 15 = 100\pi \times 15 =$

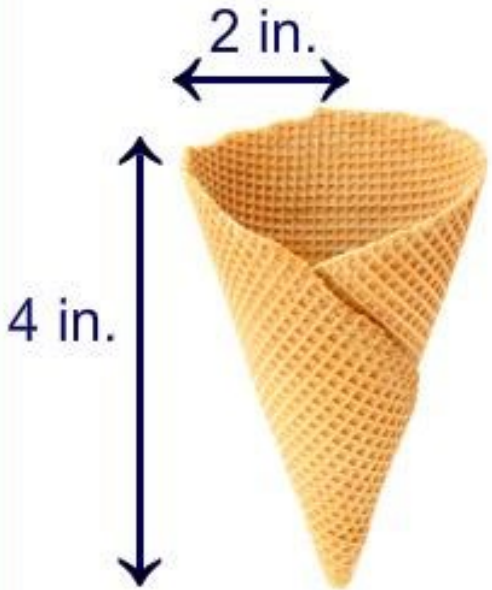
$314 \times 15 =$ **4710 cm^3**

We can then divide to find how many they would need:

$26659.71 \div 4710 = 5.66$ They would need **6 saucepans**

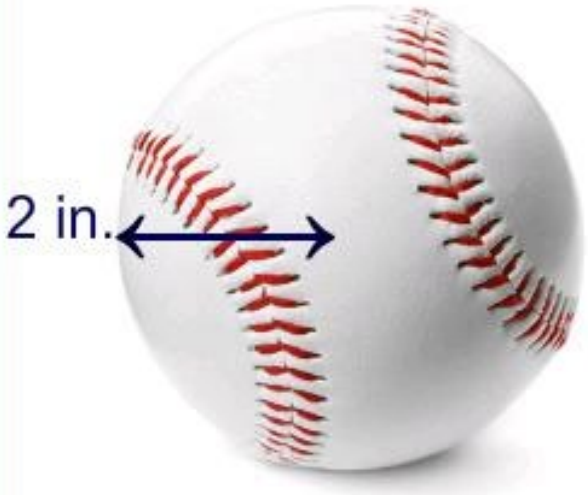
Volume of a cone

How could we find how much ice cream would fit inside this cone?



Volume of a sphere

Mr. Cisneros manufactures sports equipment, and he needs to know the volume of a baseball so that he can order materials. How could he find the volume?



Recognizing the formulas

Match each shape to the correct formula

rectangular prism

$\frac{1}{2}\pi r^2 h$

πr^3

h

^2h

triangular prism

$\frac{1}{2}bh \times l$

Match each shape with the formula that finds its volume.

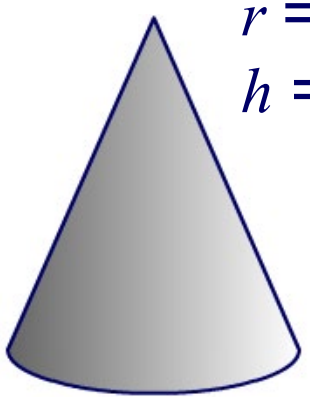
Press start to begin.

start

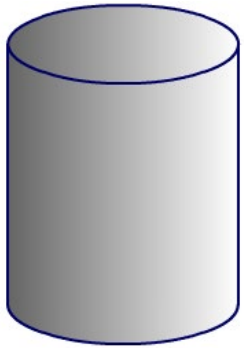
Paperweights

A jeweler sells silver paperweights, which are priced according to their volume; the greater the volume, the greater the cost.

Which paperweight is the most expensive and which is the cheapest?

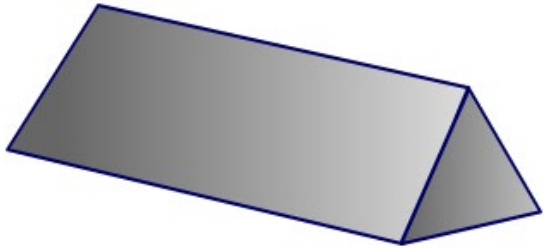


$r = 3\,\text{cm}$
$h = 10\,\text{cm}$



$r = 2\,\text{cm}, \quad h = 8\,\text{cm}$

$b = 4\,\text{cm}, \quad h = 3\,\text{cm},$
$l = 15\,\text{cm}$



Silver costs 50¢ per cm^3. How much cheaper would it be to make the prism rather than the cylinder?

Crystal ball

Solve the word problem below.

A fortune teller puts four identical crystal balls in a fish tank. The tank's base is 35 cm by 50 cm, and when the crystal balls are put in, the water rises by 4.5 cm. **What is the radius of a ball (to the nearest hundredth)?**

Click the "=" button to show the calculations step by step.

- 7.92
- 5.72
- 7.78
- 6.81