

4-3-19

Aim: SWBAT calculate and estimate the volume of prisms, pyramids, cylinders, cones, and spheres.

HW: Packet Pages 26 - 27

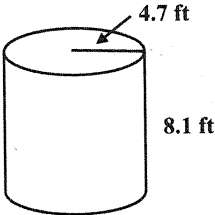
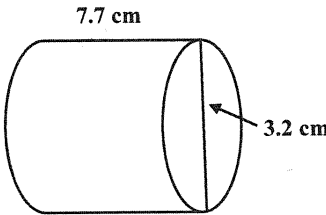
Do Now: Correct hw

Homework - Surface Area of Cylinders, Cones & Spheres

Find the surface area of each of the following figures. Be sure to show your work step-by-step and label your answer with the correct units.

This means you must:

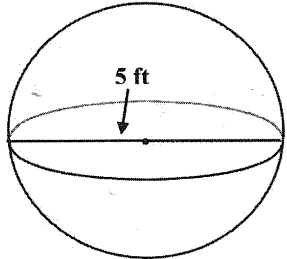
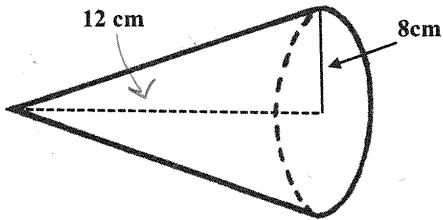
- Write the formula
- Show your substitution
- State your final answer including units

	
<p style="text-align: center;">Surface Area</p> $SA = 2\pi r^2 + 2\pi rh$ $SA = 2 \cdot \pi \cdot (4.7)^2 + 2 \cdot \pi \cdot (4.7)(8.1)$ $SA = 44.18\pi + 76.14\pi$ $SA = 120.32\pi \text{ ft}^2$	<p style="text-align: center;">Surface Area</p> $SA = 2\pi r^2 + 2\pi rh$ $SA = 2 \cdot \pi \cdot (1.6)^2 + 2 \cdot \pi \cdot (1.6)(7.7)$ $SA = 5.12\pi + 24.64\pi$ $SA = 29.76\pi \text{ cm}^2$

Find the surface area of each of the following figures. Be sure to show your work step-by-step and label your answer with the correct units.

This means you must:

- Write the formula
- Show your substitution
- State your final answer including units

	<p style="text-align: right;"><i>Round to the nearest whole.</i></p> 
Surface Area	Surface Area
$SA = 4\pi r^2$ $SA = 4 \cdot \pi \cdot (2.5)^2$ $SA = 25\pi \text{ ft.}^2$	$SA = \pi r (r + \sqrt{h^2 + r^2})$ $SA = \pi \cdot 8 (8 + \sqrt{12^2 + 8^2})$ $SA = 8\pi (22.4222051...)$ $SA = 563.5314786...$ $SA \approx 564 \text{ cm}^2$

Aim: SWBAT calculate and estimate the volume of prisms, pyramids, cylinders, cones and spheres.

Do Now: What is volume?

Notes.

Volume is the amount of space a 3-dimensional figure occupies (the amount of water it can hold).

To find the volume of an object, use the general formula $V = Bh$ (where B = the area of the base). Volume is always units³.

Volume of Prisms

Volume of a Cube: $V = Bh$

$$V = (s \cdot s) \cdot h$$

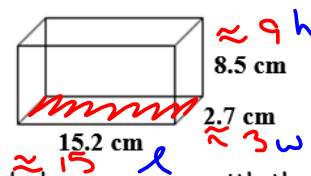
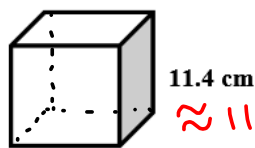
$$V = s^3$$

Volume of a Rectangular Prism: $V = Bh$

$$V = (l \cdot w) \cdot h$$

$$V = lwh$$

Practice Problems. Find the estimated and exact volume each figure. Then find the estimated and exact surface area of each figure.



Be sure to write a formula, show your substitution and label your answer with the correct units.

** Remember: Estimate means to round BEFORE you calculate!!

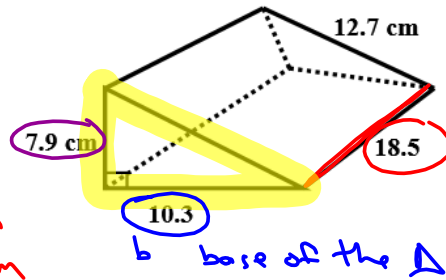
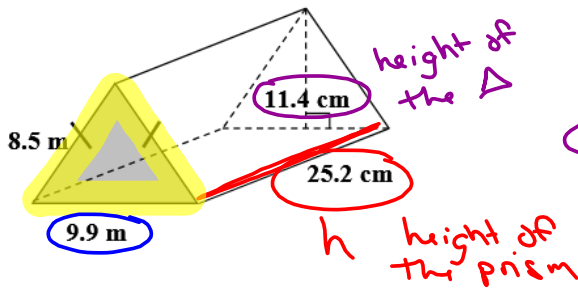
Exact Volume	Estimated Volume	Exact Volume	Estimated Volume
$V = Bh$ $V = (11.4 \cdot 11.4)(11.4)$ $V = 1481.544 \text{ cm}^3$	$V = Bh$ $V \approx (11 \cdot 11)(11)$ $V \approx 1331 \text{ cm}^3$	$V = Bh$ $V = (15.2 \cdot 2.7)(8.5)$ $V = 348.84 \text{ cm}^3$	$V = Bh$ $V \approx (15 \cdot 3)(9)$ $V \approx 405 \text{ cm}^3$

Volume of a Triangular Prism: $V = Bh$

$$V = \left(\frac{1}{2}bh\right) \cdot h$$

↑ height of triangle
 ↑ height of prism (distance between the 2 triangle bases)

Practice Problems. Find the volume each figure.



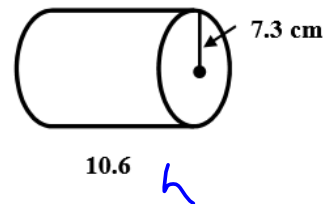
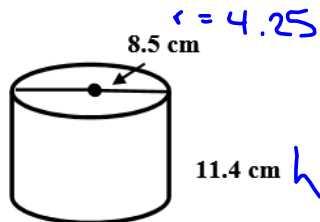
Be sure to write a formula, show your substitution and label your answer with the correct units.

Volume	Volume
$V = Bh$ $V = \left(\frac{9.9 \cdot 11.4}{2}\right) (25.2)$ $V = (56.43) (25.2)$ $V = 1422.036 \text{ cm}^3$	$V = Bh$ $V = \left(\frac{10.3 \cdot 7.9}{2}\right) (18.5)$ $V = (40.685) (18.5)$ $V = 752.6725 \text{ cm}^3$

Volume of a Cylinder: $V = Bh$

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

Practice Problems. Find the estimated and exact volume each figure. Then find the estimated and exact surface area of each figure.



Be sure to write a formula, show your substitution and label your answer with the correct units.

** Remember: Estimate means to round BEFORE you calculate!!

<p style="text-align: center;">Exact Volume</p> $V = Bh$ $V = \pi \cdot (4.25)^2 (11.4)$ $V = 205.9125\pi \text{ cm}^3$	<p style="text-align: center;">Exact Volume</p> $V = Bh$ $V = \pi \cdot (7.3)^2 (10.6)$ $V = 564.874\pi \text{ cm}^3$
<p style="text-align: center;">Estimated Volume</p> $V = Bh$ $V \approx \pi \cdot 4^2 \cdot 11$ $V \approx 176\pi \text{ cm}^3$	<p style="text-align: center;">Estimated Volume</p> $V = Bh$ $V \approx \pi \cdot 7^2 \cdot 11$ $V \approx 539\pi \text{ cm}^3$

Volume of Pyramids

$$V = \frac{1}{3} Bh$$

For pyramids, the volume is $\frac{1}{3}$ the volume of its prism.

Volume of a Rectangular Pyramid \rightarrow $V = \frac{1}{3} lwh$
 ($\frac{1}{3}$ the volume of the rectangular prism)

Volume of a Square Pyramid \rightarrow $V = \frac{1}{3} s^2 \cdot h$ or $V = \frac{1}{3} lwh$
 ($\frac{1}{3}$ the volume of the cube)

Volume of a Triangular Pyramid \rightarrow $V = \frac{1}{3} \left(\frac{1}{2} bh \right) \cdot h$
 ($\frac{1}{3}$ the volume of the triangular prism)

Volume of a Cone \rightarrow $V = \frac{1}{3} \pi r^2 h$
 ($\frac{1}{3}$ the volume of cylinder)

Volume of a Sphere

Volume of a Sphere: $V = \frac{4}{3} \pi r^3$

You Try! Find the volume of a sphere with a radius of 6 inches.

Homework - Volume

For each of the following, use a formula and show your substitution. Don't forget to label your answers. Round your answers to the nearest tenth if necessary.

