

Section Overview



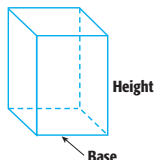
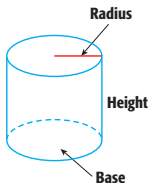
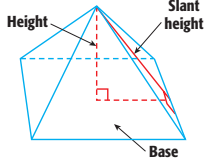
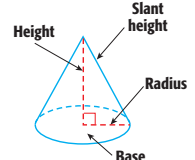
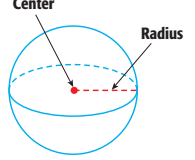
Surface Area

Lessons 10-4 through 10-6

Why? You need to be able to find the surface area of three-dimensional figures for many real-world applications, such as finding the amount of paint needed to cover a rectangular room. You can find surface area by using both nets and formulas.

Surface area is the number of **square units** needed to **cover** all surfaces of a three-dimensional figure.

Surface Area Formulas

	Prism	Cylinder	Pyramid	Cone	Sphere
					
Surface area	$S = 2B + L$ $= 2B + Ph$	$S = 2B + L$ $= 2\pi r^2 + 2\pi rh$	$S = B + L$ $= B + \frac{1}{2}P\ell$	$S = B + L$ $= \pi r^2 + \pi r\ell$	$S = 4\pi r^2$

Key for Variables:

B area of base (circle or polygon)
 L lateral area of polygon surfaces

h height (always perpendicular to base)
 r radius of circular base

P perimeter of base
 ℓ slant height

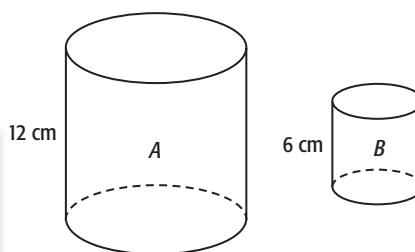
Scaling Three-Dimensional Figures

Lesson 10-7

Why? Students need to understand how the surface area and volume of scale model figures relate to actual-size figures. Students learn how the scale factor of similar figures is used to find the surface area or volume of one figure, given the surface area or volume of the other figure.

$$S_B = S_A \cdot \left(\frac{1}{2}\right)^2$$

For any pair of similar figures, the **surface area** of the model figure equals the surface area of the original figure times the **scale factor squared**.



The **scale factor** of cylinder A to cylinder B is $\frac{1}{2}$.

$$V_B = V_A \cdot \left(\frac{1}{2}\right)^3$$

For any pair of similar three-dimensional figures, the **volume** of the model figure equals the volume of the original figure times the **scale factor cubed**.