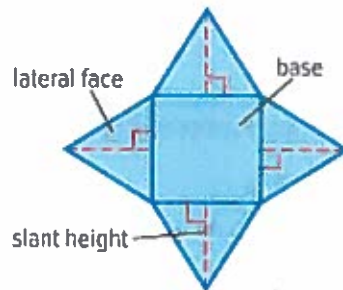# Chapter 10 Lesson 5
Surface Area of Pyramids

A **pyramid** is a three-dimensional figure with at least three triangular sides that meet at a common **vertex** and only one **base** that is a polygon. The triangular sides of a square pyramid are called the **lateral faces**. The **slant height** is the height of each lateral face.
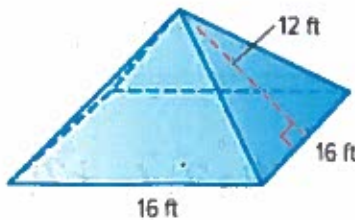
Fill in the blanks on the diagram below with vocabulary words.
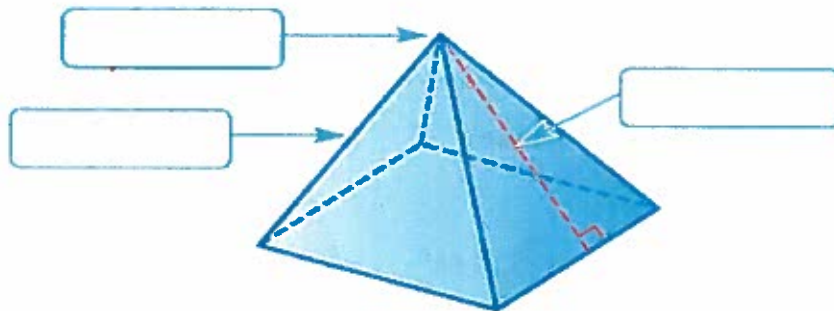
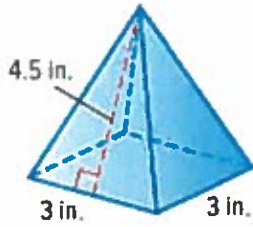**Surface Area of a Pyramid =** Sum of the area of the base + Sum of the area of the lateral faces

lateral face   base

slant height

EXAMPLES:

12 ft

16 ft

16 ft

triangles (4)
$A = \frac{1}{2}bh$
$A = \frac{1}{2}(16)(12)$
$A = 8 \cdot 12$
$A = 96$

$SA = 4(96) + 256$
$SA = 384 + 256$
$\boxed{SA = 640 \text{ ft}^2}$

rectangle
$A = bh$
$A = 16 \cdot 16$
$\boxed{A = 256}$

triangles(4)

$A = \frac{1}{2}bh$

$A = \frac{1}{2}(3)(4.5)$

$A = \frac{1}{2}(13.5)$

$A = 6.75$

rectangle

$A = bh$

$A = 3 \cdot 3$

$A = 9$

$SA = 4(6.75) + 9$

$SA = 27 + 9$

$SA = 36\ in^2$

A **triangular pyramid** has ONE triangular base, and THREE triangular faces.

- If base is an **EQUILATERAL TRIANGLE**, ALL three faces are **CONGRUENT**.
- ✱ If the sides of the base triangle are DIFFERENT lengths, the areas of the lateral faces will also be different. ✱

Triangular Pyramid **with** equilateral triangle as base	base lateral faces

Area of Base: ½ bh

$A = \frac{1}{2}bh$

$A = \frac{1}{2}(4)(3.5)$

$A = 2(3.5)$

$A = 7$

Area of each lateral face: ½ bh

$A = \frac{1}{2}bh$

$A = \frac{1}{2}(4)(5)$

$A = 2.5$

$A = 10$

Add to find the surface area

$SA = 7 + 10 + 10 + 10$

$SA = 17 + 10 + 10$

$SA = 27 + 10$

$SA = 37$

$SA = 37\ ft^2$

A paper model of the Khafre pyramid in Egypt has a square base 7.2 centimeters on each side. The slant height is 6 centimeters How much paper was used to make the model?

$SA = 51.84 + 4(21.6)$

$SA = 51.84 + 86.4$

$SA = 138.24\ cm^2$

rectangle

$A = bh$

$A = 7.2 \cdot 7.2$

$A = 51.84$

Triangle (4)

$A = \frac{1}{2}bh$

$A = \frac{1}{2}(7.2)(6)$

$A = 3(7.2)$