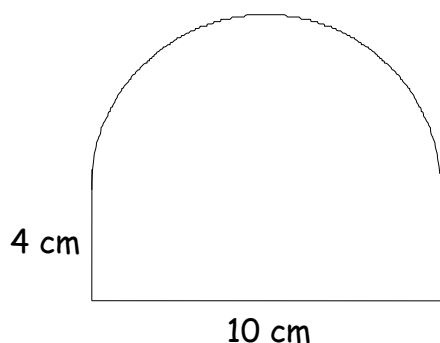


## Section 9.1: Surface Areas of Prisms Teacher Notes

POD: Find the area of the combined figure.



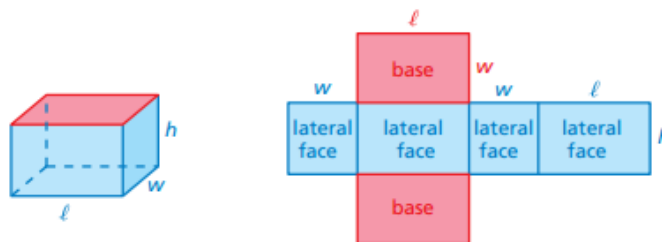
$$\text{Area} = 40 + 39.25 = 79.25\text{cm}^2$$

**Objective:** Students will be able to find the surface area of rectangular and triangular prisms.

**Surface Area of A Prism** - the sum of the areas of the bases and the lateral faces.

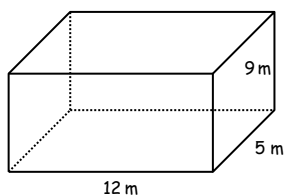
**Finding the Surface Area of Prisms:**

1. Calculate the area of each face.
2. Add the areas of the faces.



Find the surface area of each figure.

1.)



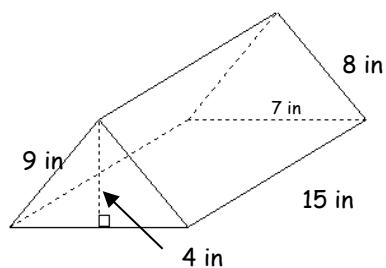
$$\text{Bottom} = 12 \cdot 5 = 60 \cdot 2 = 120$$

$$\text{Side} = 9 \cdot 5 = 45 \cdot 2 = 90$$

$$\text{Front} = 12 \cdot 9 = 108 \cdot 2 = 216$$

$$\text{Total} = 120 + 90 + 216 = 426\text{m}^2$$

2.)



Triangles:

$$\frac{1}{2} \cdot 4 \cdot 9 = 18$$

$$18 \cdot 2 = 36$$

Bottom:

$$7 \cdot 15 = 105$$

Side #1:

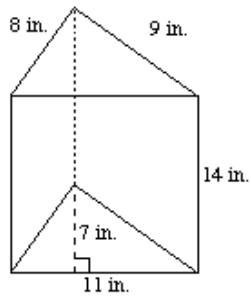
$$9 \cdot 15 = 135$$

Side #2:

$$8 \cdot 15 = 120$$

$$\text{Total: } 36 + 105 + 135 + 120 = 396\text{in}^2$$

3.)



Triangles:

$$\frac{1}{2} \cdot 7 \cdot 11 = 38.5$$

$$38.5 \cdot 2 = 77$$

Side #1:

$$9 \cdot 14 = 126$$

Bottom:

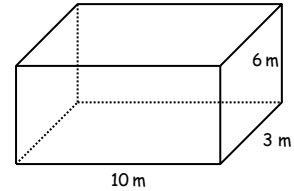
$$11 \cdot 14 = 154$$

Side #2:

$$8 \cdot 14 = 112$$

$$\text{Total: } 77 + 154 + 126 + 112 = 469\text{in}^2$$

4.)



$$\text{Bottom} = 10 \cdot 3 = 30 \cdot 2 = 60$$

$$\text{Side} = 6 \cdot 3 = 18 \cdot 2 = 36$$

$$\text{Front} = 10 \cdot 6 = 60 \cdot 2 = 120$$

$$\text{Total} = 60 + 36 + 120 = 216\text{m}^2$$

5a.) You are painting a room that is 18 ft long, 14 ft wide and 8 ft high. Find the area of the walls that you are going to paint.

$$\text{Side} = 14 \cdot 8 = 112 \cdot 2 = 224$$

$$\text{Front} = 18 \cdot 8 = 144 \cdot 2 = 288$$

$$\text{Total} = 224 + 288 = 512\text{ft}^2$$

5b.) If the paint costs \$6.50 a gallon and each gallon covers 128 ft<sup>2</sup> of wall, how much will it cost to paint the room?

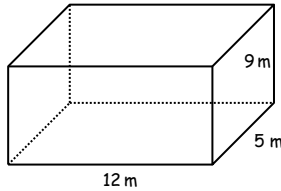
$$512/128 = 4$$

$$4(6.50) = \$26$$

## Section 9.2: Surface Areas of Pyramids Teacher Notes

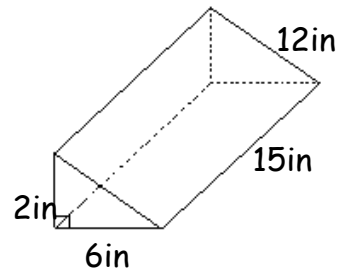
POD: Find the surface area:

1.)



$$= 426 \text{ m}^2$$

2.)



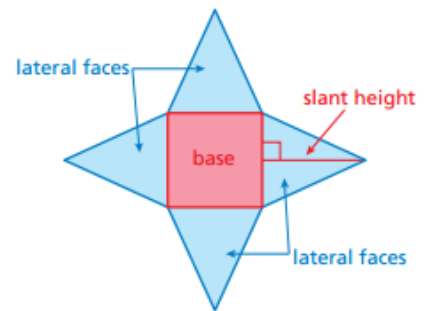
$$= 312 \text{ in}^2$$

**Objective:** Students will be able to find the surface area of pyramids.

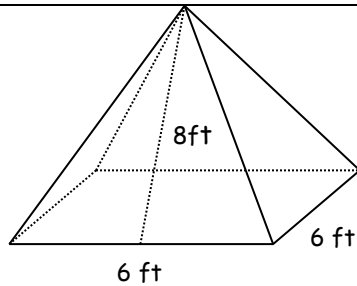
**Surface Area of a Pyramid-** the sum of the areas of the base and the lateral faces

**Steps for Finding the Surface Area of Pyramids:**

1. Calculate the area of the base
2. Calculate the area of the faces
3. Add the areas that were calculated



1.)



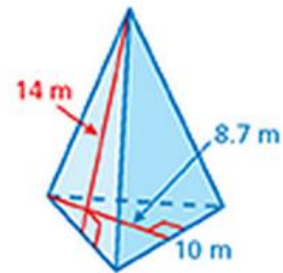
$$\text{Base} = 6 \cdot 6 = 36$$

$$1 \text{ side} = 0.5 \cdot 8 \cdot 6 = 24$$

$$4 \text{ sides} = 4(24) = 96$$

$$\text{Total} = 36 + 96 = 132 \text{ ft}^2$$

2.)



$$\text{Base} = 0.5 \cdot 10 \cdot 8.7 = 43.5$$

$$1 \text{ side} = 0.5 \cdot 10 \cdot 14 = 70$$

$$3 \text{ sides} = 3(70) = 210$$

$$\text{Total} = 43.5 + 210 = 253.5 \text{ m}^2$$

3.) A roof is shaped like a square pyramid. One bundle of shingles covers 25 square feet. How many bundles should you buy to cover the roof?

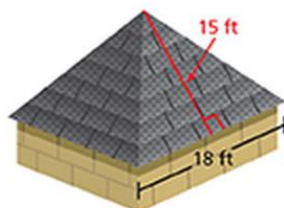
Don't need the bottom!

$$1 \text{ side: } 0.5 \cdot 18 \cdot 15 = 135$$

$$4 \text{ sides: } 4(135) = 540$$

$$540/25 = 21.6$$

**22 bundles**



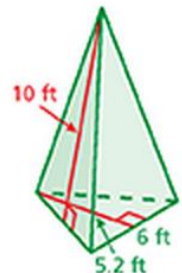
4.)

$$\text{Base} = 0.5 \cdot 6 \cdot 5.2 = 15.6$$

$$1 \text{ side} = 0.5 \cdot 10 \cdot 6 = 30$$

$$3 \text{ sides} = 3(30) = 90$$

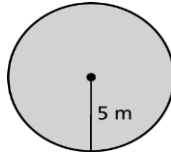
$$\text{Total} = 15.6 + 90 = 105.6 \text{ ft}^2$$



## Section 9.3: Surface Areas of Cylinders Teacher Notes

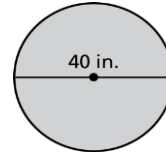
POD: Find the area of each circle.

1.)



$$A = 78.5 \text{ m}^2$$

2.)



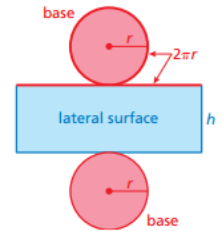
$$A = 1256 \text{ in}^2$$

**Objective:** Students will be able to find the surface area of cylinders.

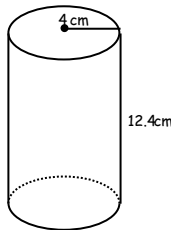
**Surface Area of a Cylinder** - the sum of the areas of the circular bases and the lateral surface.

**Steps for Finding the Surface Area of Prisms:**

1. Calculate the area of each circle
2. Find the lateral area. (circumference  $\cdot$  height of the cylinder)
3. Add the area of the circles and the lateral area



1.)



$$\text{Circle: } 3.14 \cdot 4^2 = 50.24$$

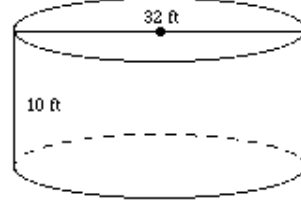
$$\text{Two circles: } 2(50.24) = 100.48$$

$$\text{Lateral Area: } 3.14(8)(12.4) = 311.488$$

$$\text{Total: } 100.48 + 311.488 = 411.968$$

$$= 412 \text{ cm}^2$$

2.)



$$\text{Circle: } 3.14 \cdot 16^2 = 803.84$$

$$\text{Two circles: } 2(803.84) = 1,607.68$$

$$\text{Lateral Area: } 3.14(32)(10) = 1004.8$$

$$\text{Total: } 1607.68 + 1004.8$$

$$= 2,612.48 \text{ ft}^2$$

3.) The diameter of the base of a soda can is 4 inches. The height of the can is 6.5 in. Find the can's surface area to the nearest tenth.

$$\text{Circle: } 3.14 \cdot 2^2 = 12.56$$

$$\text{Two circles: } 2(12.56) = 25.12$$

$$\text{Lateral Area: } 3.14(4)(6.5) = 81.64$$

$$\text{Total: } 25.12 + 81.64 = 106.76 \text{ in}^2$$

4.) A soup can has a radius of 2 in. and a height of 5 in. If the company wants to wrap a label around the can, how much paper will be used for the label?

Only need lateral area!

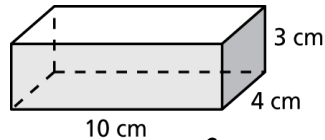


$$\text{Lateral Area: } 3.14(4)(5) = 62.8 \text{ in}^2$$

## Section 9.4: Volumes of Prisms Teacher Notes

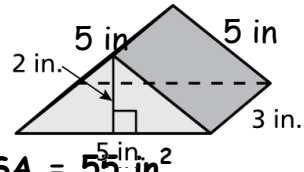
**POD: Find the surface area.**

1.)



$$SA = 164 \text{ cm}^2$$

2.)



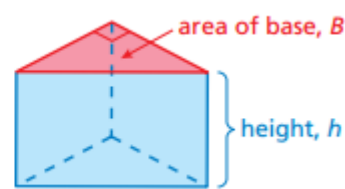
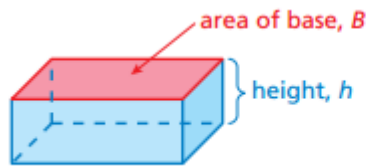
$$SA = 55 \text{ in}^2$$

**Objective:** I can find the volume of prisms.

**Vocabulary:**

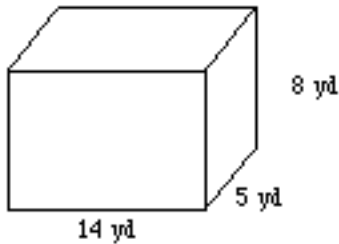
**Volume:** The measure of the amount of space a three-dimensional space occupies

**Volume Formulas for Prisms:**  $V = Bh$  where "B" is the area of the base and "h" is the height



**Day 1:**

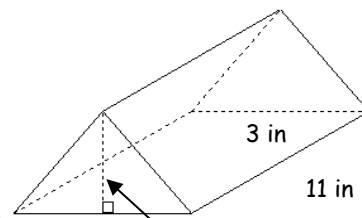
1.)



**Vol**

$$14 \cdot 5 \cdot 8 = 560 \text{ yd}^3$$

2.)

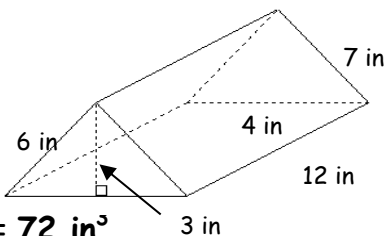


**Volume:**

$$B = \frac{1}{2} \cdot 3 \cdot 6 = 9$$

$$V = Bh = 9 \cdot 11 = 99 \text{ in}^3$$

3.) Find volume.



**Volume:**

$$B = \frac{1}{2} \cdot 6 \cdot 3 = 9$$

$$V = 9 \cdot 12 = 108 \text{ in}^3$$

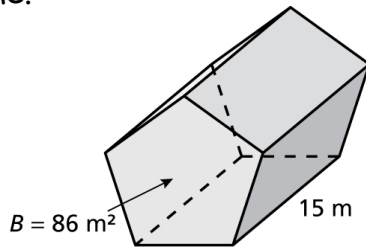
4.) If the volume of a rectangular prism is  $336 \text{ in}^3$ , the base is  $12 \text{ in}$ , and the width is  $7 \text{ in}$ , what is the height?

$$336 = h \cdot 12 \cdot 7$$

$$\frac{336}{84} = \frac{b \cdot 84}{84}$$

$$b = 4 \text{ in}$$

5.) Find volume.



**Volume:**

$$V = 86 \cdot 15 = 1290 \text{ m}^3$$

6.) A water jug is in the shape of a rectangular prism. The length of the jug is 15 inches, the width is 10 inches and the height is 20 inches. How many gallons of water will the water jug hold? (1 gal = 231 in<sup>3</sup>). Round your answer to the nearest gallon.

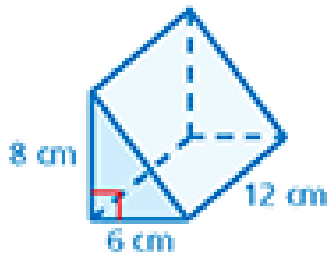
$$V = 15 \cdot 10 \cdot 20 = 3000 \text{ in}^3$$

$$\frac{3000}{231} = 13 \text{ gallons}$$

### Section 9.5: Volumes of Pyramids Teacher Notes

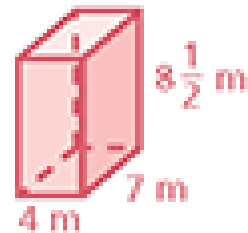
POD: Find the volume of each shape.

1.)



$$V = 288 \text{ cm}^2$$

2.)



$$V = 238 \text{ m}^2$$

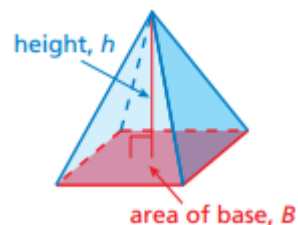
**Objective:** I can find the volume of pyramids.

**Vocabulary:**

**Volume:** The measure of the amount of space a three-dimensional space occupies

**Volume Formula for Pyramids:**

$$V = \frac{1}{3}Bh \text{ where "B" is the area of the base and "h" is the height}$$



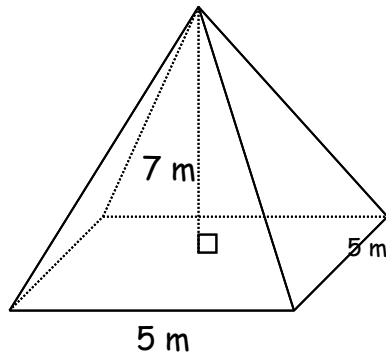
### Day 1:

1.) Find volume.

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

$$= \frac{1}{3} (5 \cdot 5)(7)$$

$$V = 58.33 \text{ m}^3$$



2.) Find volume.

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

$$\frac{1}{3} (0.5 \cdot 10 \cdot 6)(8)$$

$$= 80 \text{ in}^3$$

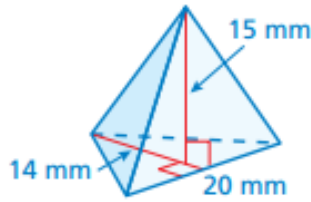


3.) Find volume.

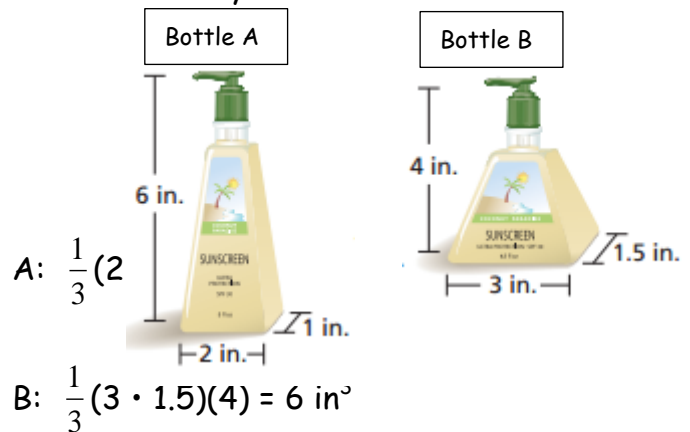
$$V = \frac{1}{3} Bh$$

$$\frac{1}{3} (0.5 \cdot 20 \cdot 14)(15)$$

$$= 700 \text{ mm}^3$$

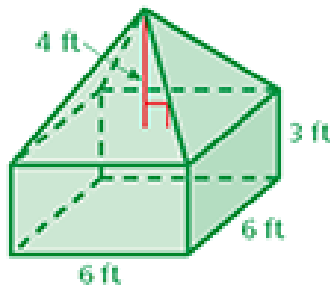


4.) The volume of sunscreen in Bottle B is about how many times the volume in Bottle A?



$6/4 = 1.5$  times larger

5.) Find the volume of the combined figure.



Pyramid:  $\frac{1}{3} (6 \cdot 6)(4) = 72$

Prism:  $6 \cdot 6 \cdot 3 = 108$

$72 + 108 = 180 \text{ ft}^3$

6.) A glass paper weight is made in the shape of a pyramid. The base of the paper weight is a triangle with a base of 2 inches and a height of 3 inches. The height of the paperweight is 5 inches. The glass costs \$3 per cubic inch. What is the cost of the paperweight?

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

$$\frac{1}{3} (0.5 \cdot 2 \cdot 3)(5) = 5 \text{ in}^3$$

$$= 5(3) = \$15$$