

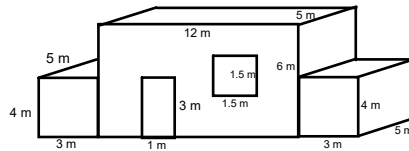
## Curriculum Outcome

(SS2) Determine the surface area of composite 3-D objects to solve problems

Student Friendly:

Calculating the surface area of connecting rectangle prisms. (Quiz review)

Find the total surface area of this warehouse.



Step 1) Calculate the sides of all of the larger prism, (12m , 5m ,6m)

<p>Top</p> <div style="border: 1px solid black; width: 30px; height: 30px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">1</div> <p style="text-align: center;">12m      5m</p> <p><math>A_1 = b \times h</math></p> <p><math>A_1 = 12 \times 5</math></p> <p><math>A_1 = 60 \text{ m}^2</math></p>	<p>left/ right</p> <div style="border: 1px solid black; width: 30px; height: 30px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">2</div> <p style="text-align: center;">5m      6m</p> <p><math>A_2 = b \times h</math></p> <p><math>A_2 = 5 \times 6</math></p> <p><math>A_2 = 30 \text{ m}^2</math></p> <p><math>2A_2 = 60 \text{ m}^2</math></p>	<p>Front / back</p> <div style="border: 1px solid black; width: 30px; height: 30px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">2</div> <p style="text-align: center;">12m      6m</p> <p><math>A_3 = b \times h</math></p> <p><math>A_3 = 12 \times 6</math></p> <p><math>A_3 = 72 \text{ m}^2</math></p> <p><math>2A_3 = 144 \text{ m}^2</math></p>
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So surface area of the large space is:  
 $SA_{big} = 60 + 60 + 144$   
 $SA_{big} = 264 \text{ m}^2$

Step 2) Calculate the sides of all of the small prism, (3m , 4m ,5m)

<p>Top</p> <div style="border: 1px solid black; width: 30px; height: 30px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">1</div> <p style="text-align: center;">3m      5m</p> <p><math>A_1 = b \times h</math></p> <p><math>A_1 = 3 \times 5</math></p> <p><math>A_1 = 15 \text{ m}^2</math></p>	<p>left/ right</p> <div style="border: 1px solid black; width: 30px; height: 30px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">2</div> <p style="text-align: center;">5m      4m</p> <p><math>A_2 = b \times h</math></p> <p><math>A_2 = 5 \times 4</math></p> <p><math>A_2 = 20 \text{ m}^2</math></p> <p><math>2A_2 = 40 \text{ m}^2</math></p>	<p>Front / back</p> <div style="border: 1px solid black; width: 30px; height: 30px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">2</div> <p style="text-align: center;">3m      4m</p> <p><math>A_3 = b \times h</math></p> <p><math>A_3 = 3 \times 4</math></p> <p><math>A_3 = 12 \text{ m}^2</math></p> <p><math>2A_3 = 24 \text{ m}^2</math></p>
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So surface area of the Small space is:  
 $SA_{small} = 15 + 40 + 24$   
 $SA_{small} = 79 \text{ m}^2$

So surface area of the Small space2 is:  
 $SA_{small} = 79 \text{ m}^2$

Identify the Overlap Area: \_\_\_\_\_

Area of door

3m

1m

$A_1 = b \times h$

$A_1 = 3 \times 1$

$A_1 = 3 \text{ m}^2$

Area of window

1.5m

1.5m

$A_1 = b \times h$

$A_1 = 1.5 \times 1.5$

$A_1 = 2.25 \text{ m}^2$

TSA =  $SA_1 + SA_2 + SA_3 - \text{overlap} - \text{overlap} - \text{door} - \text{window}$

$= 264 \text{ m}^2 + 79 \text{ m}^2 + 79 \text{ m}^2 - 40 \text{ m}^2 - 40 \text{ m}^2 - 3 \text{ m}^2 - 2.25 \text{ m}^2$

$= 336.75 \text{ m}^2$



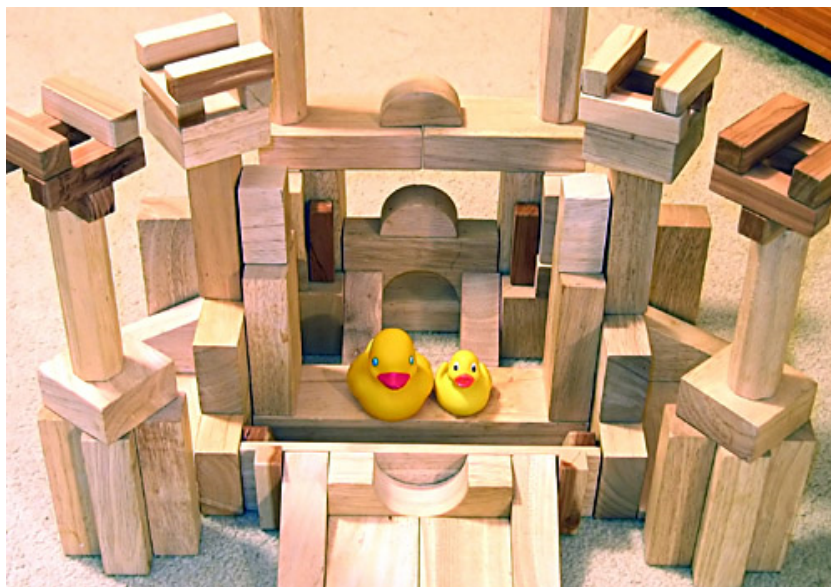
## Section 1.4



# Surface Area Of Other Composite Objects



Surface area????



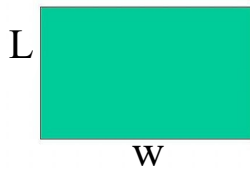
### Other Composite Shapes

3-D shapes sitting on other 3-D shapes (This will cause an overlap meaning that the entire two or more shapes are not exposed to the surface

## Area of Shapes

### Area of a Rectangle

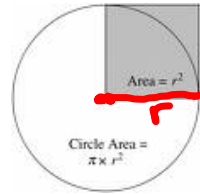
A = length x width



### Area of a Circle

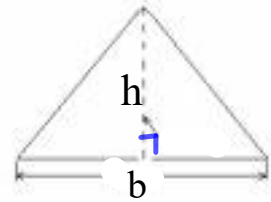
$$A = \pi r^2$$

$$= (3.14) (r)^2$$

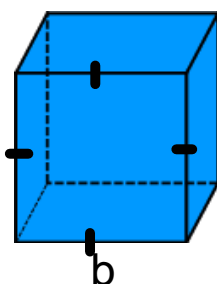


### Area of Triangle

$$A = \frac{(\text{base} \times \text{height})}{2}$$

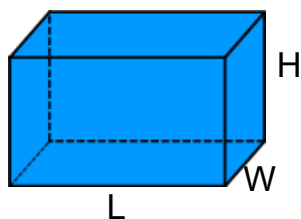


## Cube

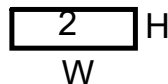
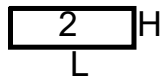
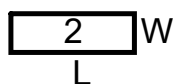


$$SA = 6 \times b^2$$

## Rectangular Prism

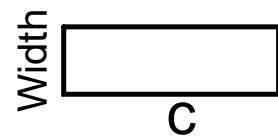
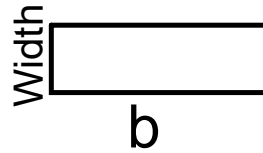
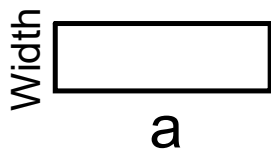
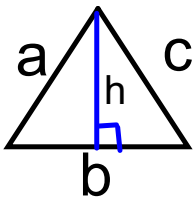
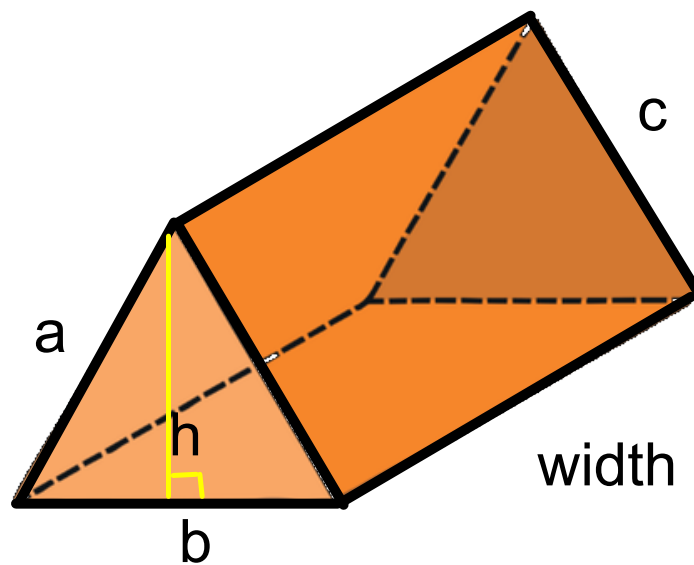


L, W, H



$$SA = 2(L \times W) + 2(L \times H) + 2(W \times H)$$

## Triangular Prism



$$SA = 2 \frac{(b \times h)}{2} + (a \times \text{width}) + (b \times \text{width}) + (c \times \text{width})$$

# Right Triangular Prisms

Determine the surface area.

$$c^2 = a^2 + b^2$$

$$b^2 = c^2 - a^2$$

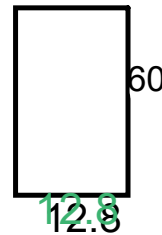
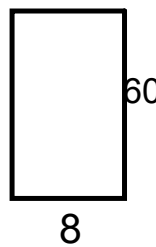
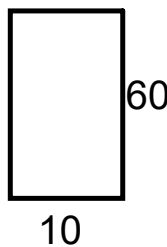
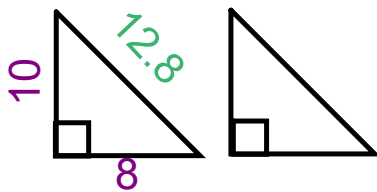
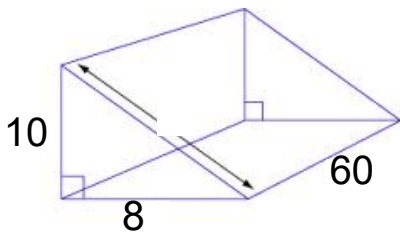
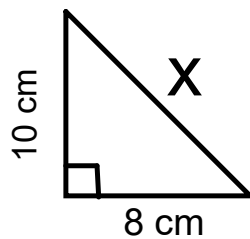
$$c^2 = a^2 + b^2$$

$$c^2 = 10^2 + 8^2$$

$$c^2 = 100 + 64$$

$$\sqrt{c^2} = \sqrt{164}$$

$$c = 12.8 \text{ cm}$$



$$A = \frac{b \times h}{2}$$

$$A = \frac{10 \times 8}{2}$$

$$A = \frac{80}{2}$$

$$A = 40 \times 2$$

$$A = 80$$

$$A = b \times h$$

$$A = 10 \times 60$$

$$A = 600$$

$$A = b \times h$$

$$A = 8 \times 60$$

$$A = 480$$

$$A = b \times h$$

$$A = 12.8 \times 60$$

$$A = 768$$

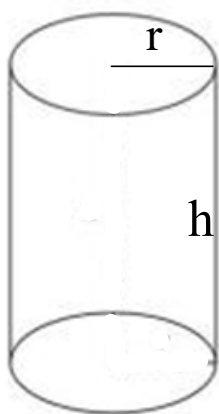
$$SA = 80 + 600 + 480 + 768$$

$$SA = 1928$$





# Cylinder



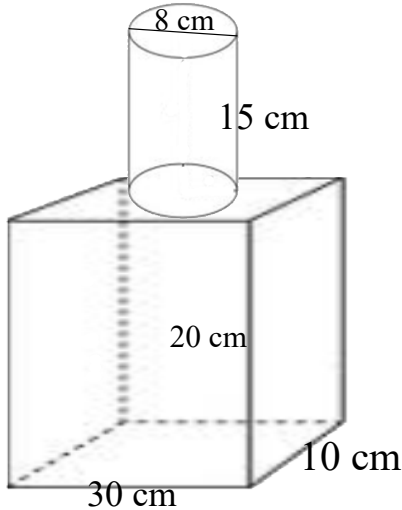
$$\text{Area of Cylinder} = 2\pi r^2 + 2\pi rh$$

*circles*      *rectangle*

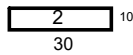
$$= 2(3.14) (\underline{\quad})^2 + 2(3.14) (\underline{\quad}) (\underline{\quad})$$

How much paint is needed to cover the following shape?

Lets try!!!



Rectangular Prism ( , , )

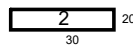


$$A = bxh$$

$$A = 30 \text{ cm} \times 10 \text{ cm}$$

$$A = 300 \text{ cm}^2$$

$$2A = 600 \text{ cm}^2$$

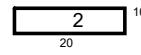


$$A = bxh$$

$$A = 20 \text{ cm} \times 30 \text{ cm}$$

$$A = 600 \text{ cm}^2$$

$$2A = 1200 \text{ cm}^2$$



$$A = b \times h$$

$$A = 10 \text{ cm} \times 20 \text{ cm}$$

$$A = 200 \text{ cm}^2$$

$$2A = 400 \text{ cm}^2$$

$$SA \text{ prism} = 600 \text{ cm}^2 + 1200 \text{ cm}^2 + 400 \text{ cm}^2$$

$$= 2200 \text{ cm}^2$$

Cylinder

$$\text{Area of Cylinder} = 2\pi r^2 + 2\pi rh$$

$$= 2(3.14) (\underline{4})^2 + 2(3.14) (\underline{4}) (\underline{15})$$

$$= 2(3.14) (\underline{16}) + 2(3.14) (\underline{4}) (15)$$

$$= 100.48 + 376.8$$

$$= 477.28$$

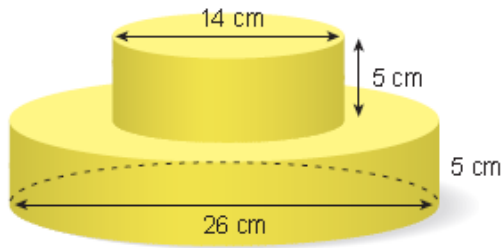
Identify Overlap: \_\_\_\_\_

$$\text{Total Surface Area} = \text{cylinder} + \text{Prism} - \text{Overlap area}$$

$$= 477.28 + 2200 \text{ cm}^2 - 100.48 \text{ cm}^2$$

$$= 2677.28 \text{ cm}^2 - 100.48 \text{ cm}^2$$

$$= 2576.8 \text{ cm}^2$$



$$\begin{aligned}
 \text{Big Cylinder} &= 2\pi r^2 + 2\pi rh \\
 &= 2(3.14) (\underline{13})^2 + 2(3.14) (\underline{13}) (\underline{5}) \\
 &= 2(3.14) (\underline{169}) + 2(3.14) (\underline{13}) (5) \\
 &= \mathbf{1061.32 + 408.2} \\
 &= \mathbf{1469.52 \text{ cm}^2}
 \end{aligned}$$

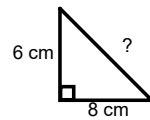
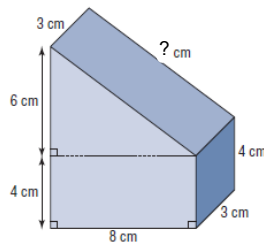
$$\begin{aligned}
 \text{Small Cylinder} &= 2\pi r^2 + 2\pi rh \\
 &= 2(3.14) (\underline{7})^2 + 2(3.14) (\underline{7}) (\underline{5}) \\
 &= 2(3.14) (\underline{49}) + 2(3.14) (\underline{7}) (5) \\
 &= \mathbf{307.72 + 219.8} \\
 &= \mathbf{527.52 \text{ cm}^2}
 \end{aligned}$$

Identify Overlap:

$$TSa = SA_{\text{big}} + SA_{\text{small}} - \text{overlap}$$

$$TSa = 1469.52 + 527.52 - 307.72$$

$$TSa = 1689.32 \text{ cm}^2$$



$$c^2 = a^2 + b^2$$

$$c^2 = 6^2 + 8^2$$

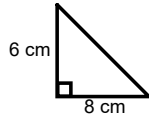
$$c^2 = 36 + 64$$

$$\sqrt{c^2} = \sqrt{100}$$

$$c = 10 \text{ cm}$$

Triangle Prism

Front/Back



$$A = \frac{b \times h}{2}$$

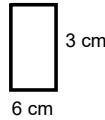
$$A = \frac{6 \times 8}{2}$$

$$A = \frac{48}{2}$$

$$A = 24 \times 2$$

$$A = 48$$

Left Side

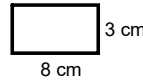


$$A = b \times h$$

$$A = 6 \times 3$$

$$A = 18$$

Bottom

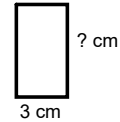


$$A = b \times h$$

$$A = 8 \times 3$$

$$A = 24$$

Top



$$A = b \times h$$

$$A = 3 \times 10$$

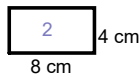
$$A = 30$$

$$SA_1 = 48 + 18 + 24 + 30$$

$$SA_1 = 120 \text{ cm}^2$$

Rectangle Prism (8, 3, 4)

Front/Back



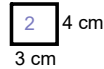
$$A = b \times h$$

$$A = 8 \times 4$$

$$A = 32$$

$$2A = 64$$

Left/Right



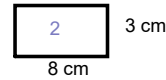
$$A = b \times h$$

$$A = 3 \times 4$$

$$A = 12$$

$$2A = 24$$

Top/Bottom



$$A = b \times h$$

$$A = 3 \times 8$$

$$A = 24$$

$$2A = 48$$

$$SA_2 = 64 + 24 + 48$$

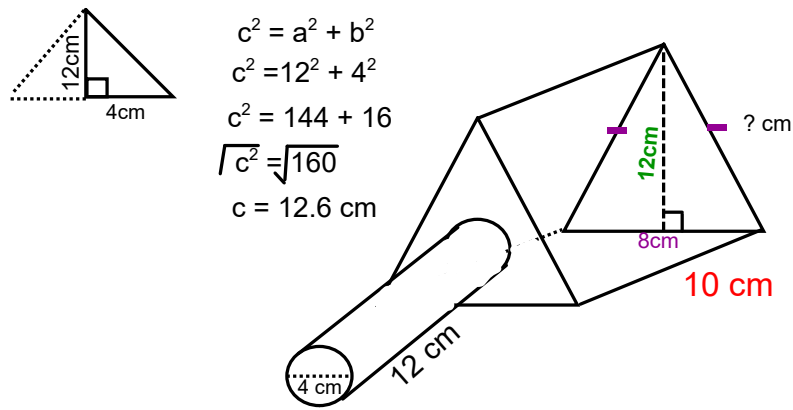
$$SA_2 = 136 \text{ cm}^2$$

Total Surface Area

$$= Sa_1 + Sa_2 - \text{overlap}$$

$$= 120 \text{ cm}^2 + 136 \text{ cm}^2 - 48 \text{ cm}^2$$

$$= 208 \text{ cm}^2$$



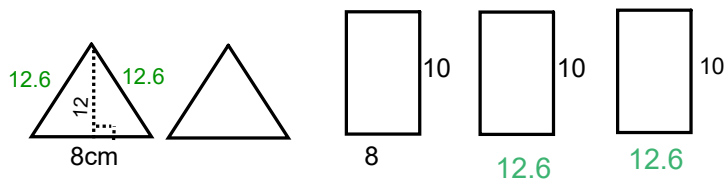
$$c^2 = a^2 + b^2$$

$$c^2 = 12^2 + 4^2$$

$$c^2 = 144 + 16$$

$$\sqrt{c^2} = \sqrt{160}$$

$$c = 12.6 \text{ cm}$$



$A = \frac{b \times h}{2}$	$A = b \times h$	$A = b \times h$	$A = b \times h$
$A = \frac{8 \times 12}{2}$	$A = 8 \times 10$	$A = 12.6 \times 10$	$A = 12.6 \times 10$
$A = \frac{96}{2}$	$A = 80$	$A = 126$	$A = 126$
$A = 48 \times 2$	$SA = 96 + 80 + 126 + 126$ $SA = 428 \text{ cm}^2$		
$A = 96$			

Cylinder

$$Sa = 2\pi r^2 + 2\pi r h$$

$$= 2 \times (3.14) \times (2 \text{ cm})^2 + 2 \times (3.14) (2 \text{ cm}) \times (12 \text{ cm})$$

$$= 2 \times (3.14) \times 4 + 2 \times (3.14) (2 \text{ cm}) \times (12 \text{ cm})$$

$$= 25.12 \text{ cm}^2 + 150.72 \text{ cm}^2$$

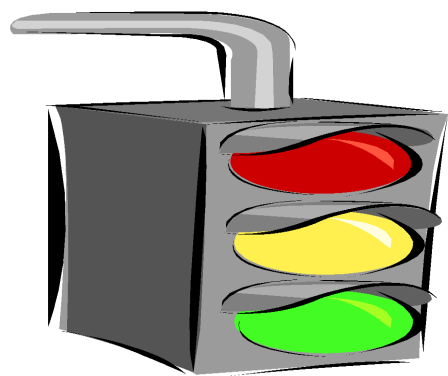
$$= 175.84 \text{ cm}^2$$

Overlap

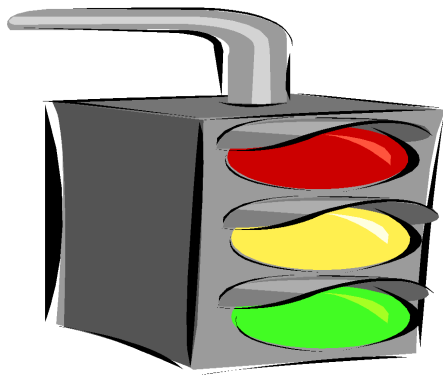
$$TSA = \text{Triangular Prism} + \text{Cylinder} - \text{Overlap}$$

$$= 428 \text{ cm}^2 + 175.84 \text{ cm}^2 - 25.12 \text{ cm}^2$$

$$= 578.72 \text{ cm}^2$$



Now it is  
time for  
Home  
Learning



Page 40 -43  
questions

3 a, b, c, d, e

4a, b

5b

6