

Copy the outcome in your scribbler then **read** the achievement indicators.

SS3: Determine the surface area of:

- right rectangular prisms
 - right triangular prisms
 - right cylinders
- to solve problems



Achievement Indicators

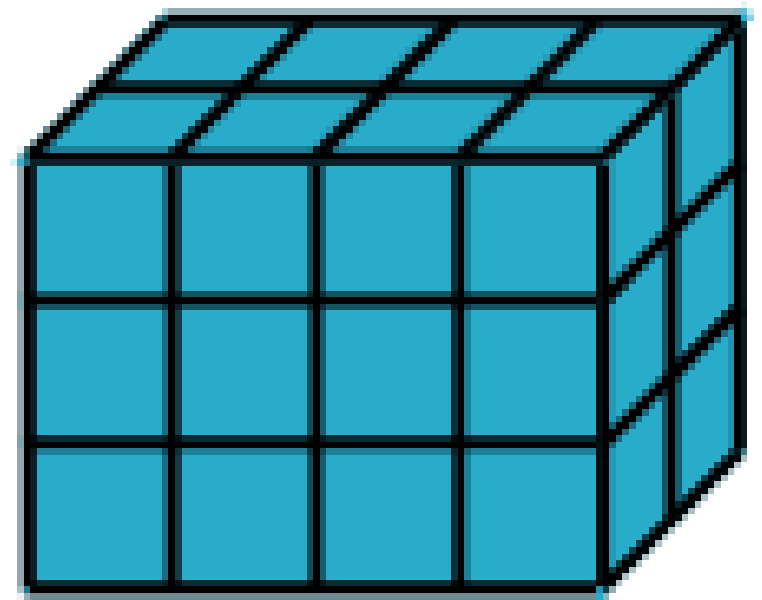
- Explain, using examples, the relationship between the area of 2-D shapes and the surface area of a given 3-D object.
- Identify all the faces of a given cylinder and prism, including right rectangular and right triangular prisms.
- Describe and apply strategies for determining the surface area of a given right rectangular or right triangular prism.
- Describe and apply strategies for determining the surface area of a given right cylinder.
- Solve a given problem involving surface area.

Copy the outcome in your scribbler then **read** the achievement indicators.

SS4: Develop and apply formulas for determining the volume of **right prisms** and right cylinders.

Achievement Indicators

- Determine the volume of a given right prism, given the area of the base.
- Generalize and apply a rule for determining the volume of right cylinders.
- Explain the connection between the area of the base of a given right 3-D object and the formula for the volume of the object.
- Demonstrate that the orientation of a given 3-D object does not affect its volume.
- Apply a formula to solve a given problem involving the volume of a right cylinder or a right prism.



Review from Grade 6 Math - Finding Area for 2D Objects

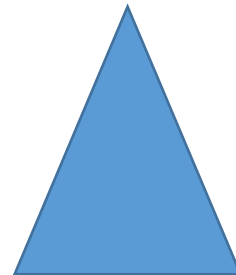
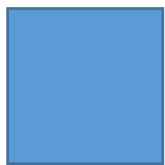
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Watch the following video:

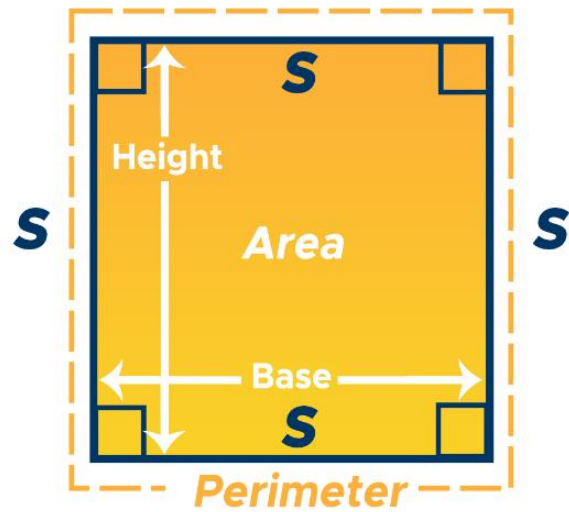
<https://www.youtube.com/watch?v=xCdxURXMdFY> – Finding Area of Squares, Rectangles and Triangles



(To Read)

Review: Area and Perimeter of Squares

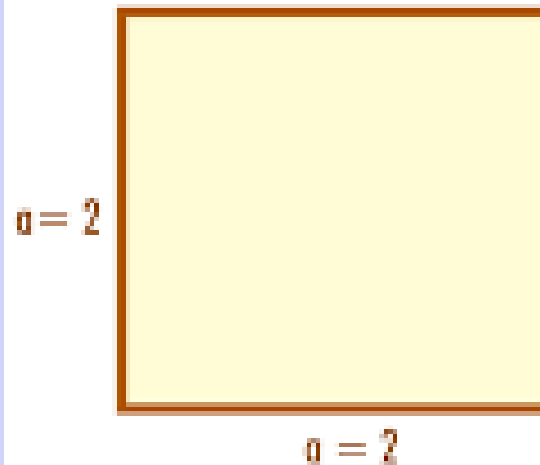
Perimeter and Area of a Square



$$P = 4s$$

$$A = BH \text{ or } s \times s$$

AREA OF SQUARE



$$\text{Area} = a \times a$$

$$\text{Perimeter} = a + a + a + a$$

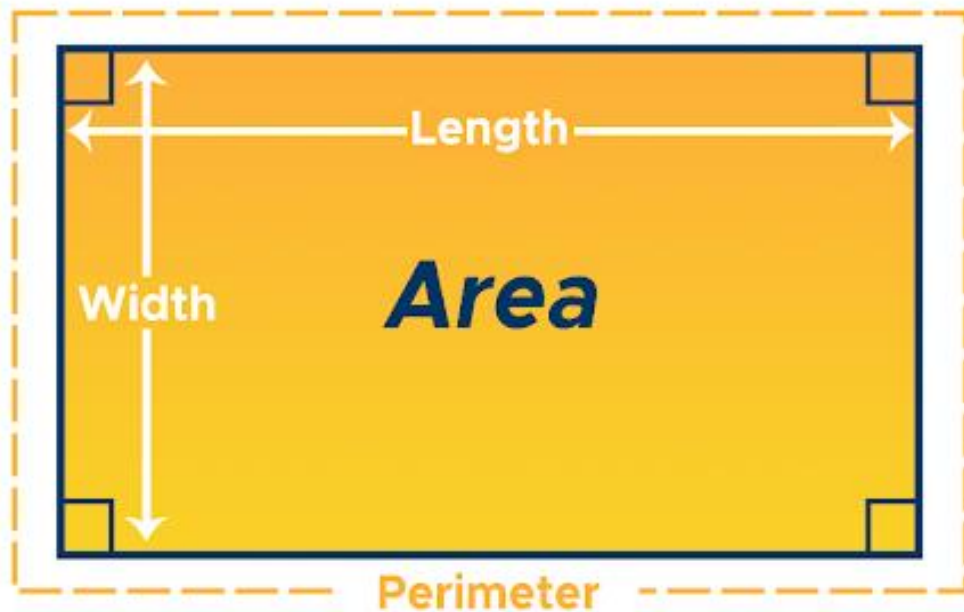
$$\text{Area} = 2 \times 2 = 4 \text{ cm}^2$$

$$\text{Perimeter} = 2 + 2 + 2 + 2 = 8 \text{ cm}$$

(To Read)

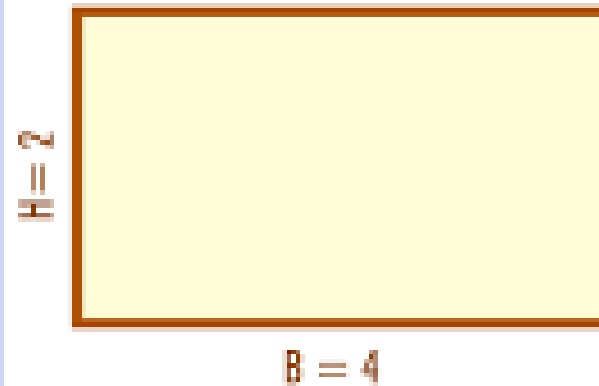
Review: Area and Perimeter of Rectangles

Area of a Rectangle



$$A = L \cdot W$$

AREA OF A RECTANGLE



$$\text{Area} = B \times H$$

$$\text{Perimeter} = H + H + B + B$$

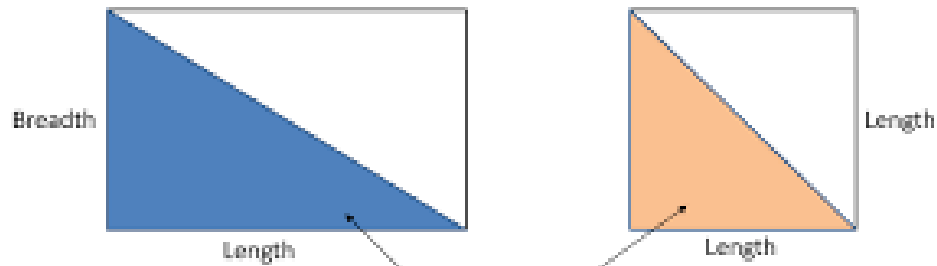
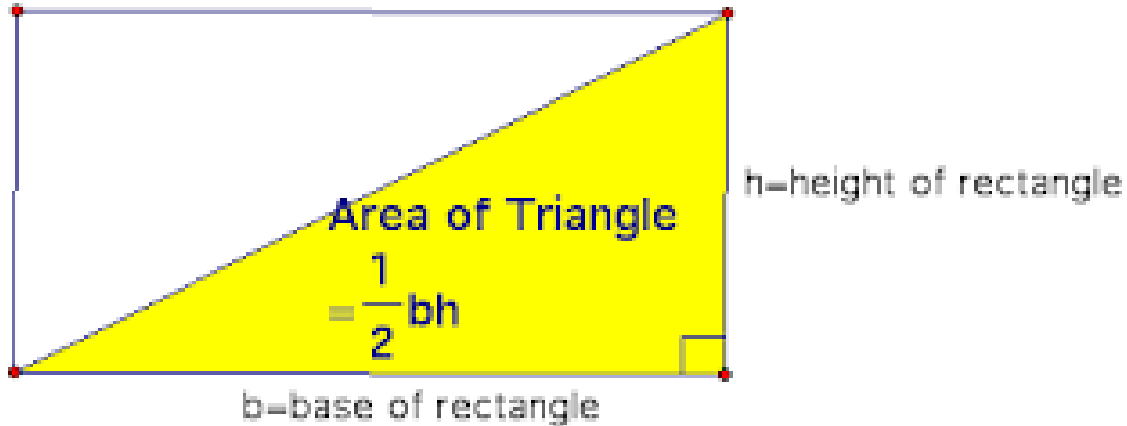
$$\text{Area} = 4 \times 2 = 8 \text{ cm}^2$$

$$\text{Perimeter} = 2 + 2 + 4 + 4 = 12 \text{ cm}$$

(To Read)

Review: Area and Perimeter of Triangles

Area of Rectangle = $b \times h$

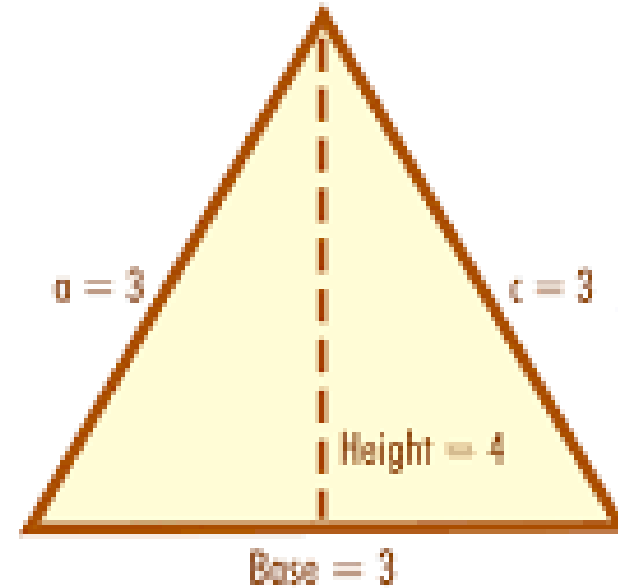


Area of triangle is half of the area of Rectangle or square

$$\rightarrow \frac{1}{2} \times \text{Length} \times \text{Breadth}$$

$$\rightarrow \frac{1}{2} \times \text{Base} \times \text{Height}$$

AREA OF A TRIANGLE



$$\text{Area} = \frac{1}{2} \times (\text{Base} \times \text{Height})$$

$$\text{Perimeter} = a + b + c$$

$$\text{Area} = \frac{1}{2} \times (3 \times 4) = 6 \text{ cm}^2$$

$$\text{Perimeter} = 3 + 3 + 3 = 9 \text{ cm}$$

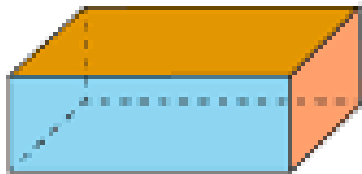


SS3 Review Journal Question #1

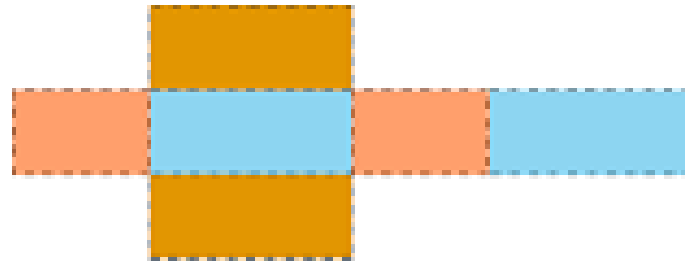
(To read)

Review – Net of a Right Rectangular Prism

Rectangular Prism



Rectangular Prism

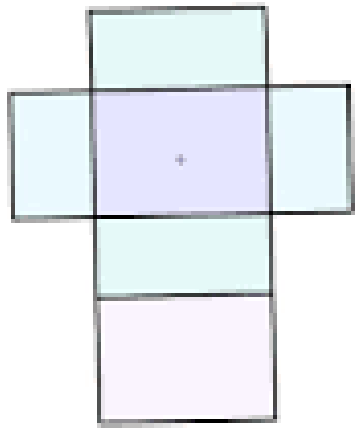


Net of a Rectangular Prism

- So the rectangular prism has 6 faces/sides
- The rectangular prism on the side has measurements of
 - Length(l) – 18 m
 - Width(W)- 4m
 - Height (H) – 5m
- Area of one side is still = $l \times w$
- ****But not all sides are the same size...**

(To read)

Surface Area of a Right Rectangular Prism



SURFACE AREA
OF A
RECTANGULAR PRISM
USING ITS NET



****But not all sides are the same size...for this example; only 2 sides are the same**

Length(l) – 18 m Width(W)- 4m Height (H) – 5m

- Area of one side is still = $l \times w$; so
- $18\text{m} \times 5\text{ m} = 90\text{m}^2$ $\times 2$ faces = 180m^2
- $4\text{m} \times 5\text{ m} = 20\text{m}^2$ $\times 2$ faces= 40m^2
- $18\text{m} \times 4\text{m} = 72\text{ m}^2$ $\times 2$ faces = 144m^2

Total Surface Area=

$$180 + 40 + 144 = 364\text{m}^2$$

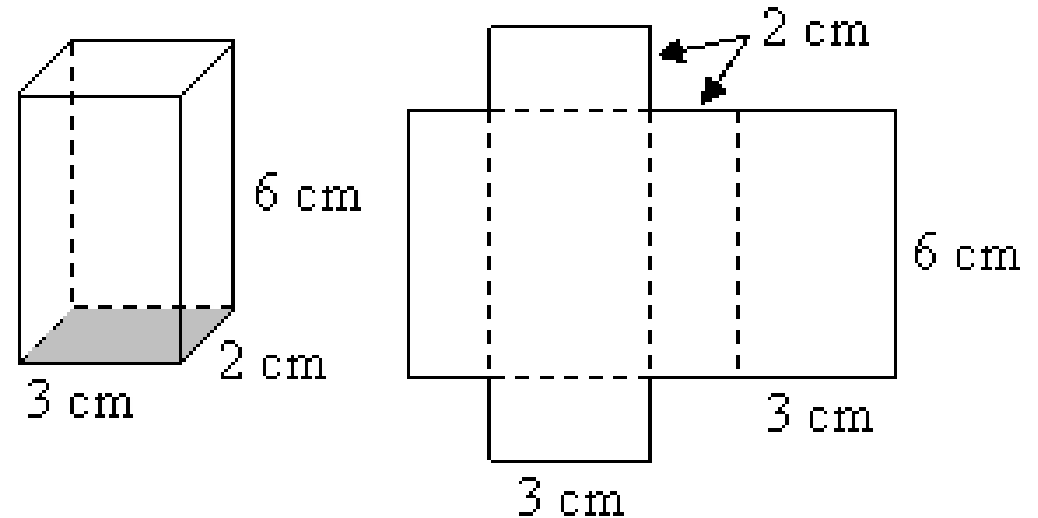
Surface Area of a Right Rectangular Prism – Using a Formula

- 1) **Watch** the following video to see how we calculate area for a rectangular prism using the formula.

[How to Find the Surface Area of a Rectangular Prism | Math with Mr. J - YouTube](#)

2) **Your turn: Calculate(find)** the TOTAL Surface Area of the rectangular prism.

****SA(surface area) $2(lw) + 2(lh) + 2(wh)$**



Volume of a Right Rectangular Prism

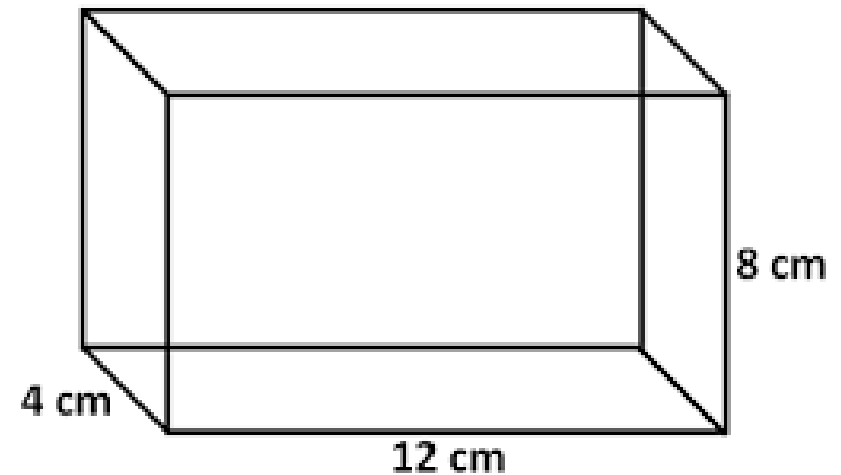
1) **Watch** the following video:

[Volume of Rectangular Prisms | Math with Mr. J – YouTube](#)

2) **Your turn** 😊

Calculate the volume for the right rectangular prism.

** $V = l \times w \times h$ or $V = Bh$ (B = Area of base) or $V = Ah$
(A = Area of the base)



Practice

- 1) **Worksheet 4.3** – Surface Area of a Right Rectangular Prism (pages 81-82 in the Practice and Homework Book)
- 2) **Worksheet 4.5** – Volume of a Right Rectangular Prism (pages 85-86 in the Practice and Homework Book)

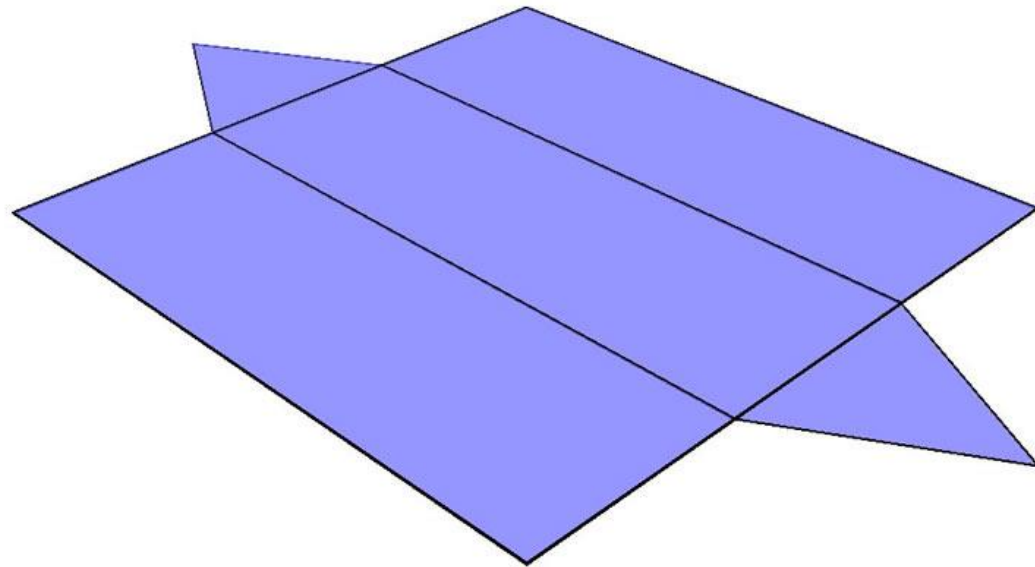
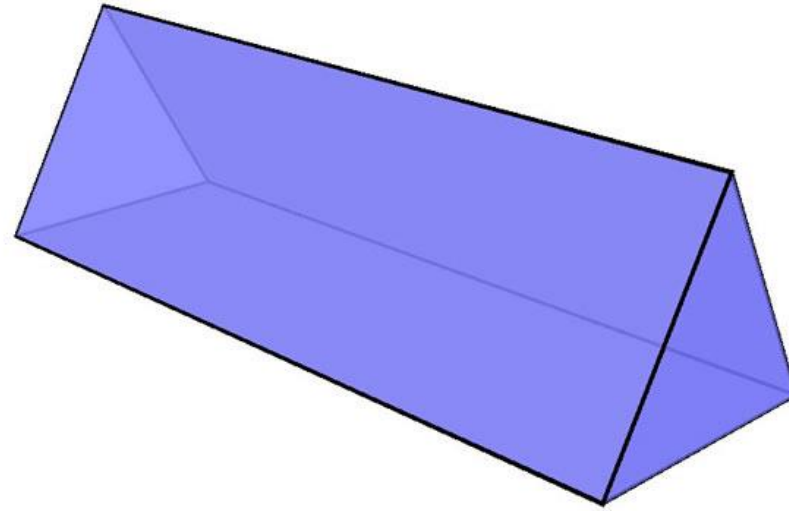


SS3 Journal Question #2

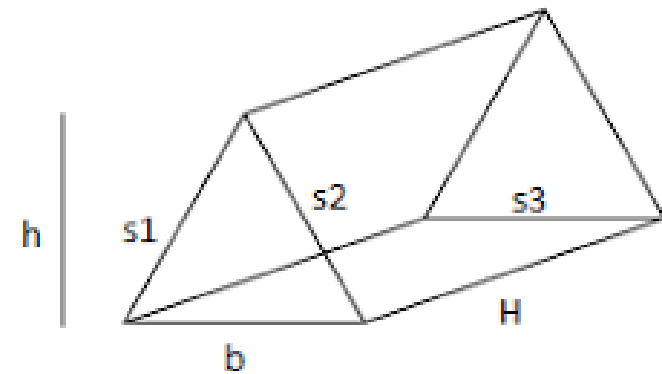
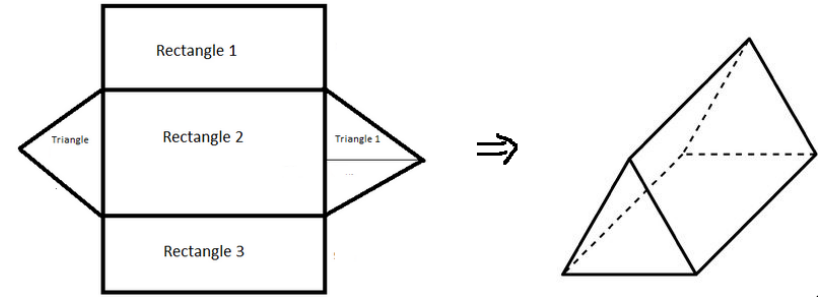
(To Read)

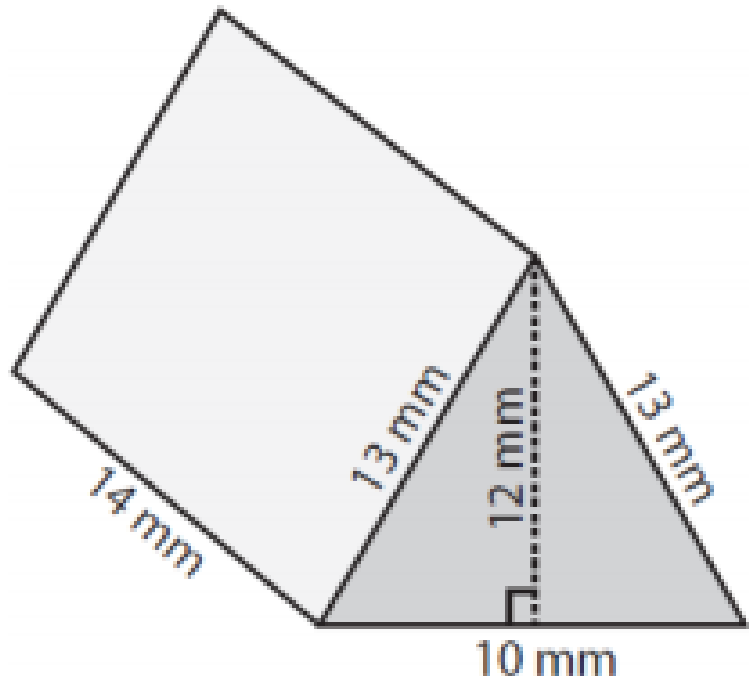
Finding Total Surface Area(SA) for Right Triangular Prism (5 faces)

- So , how do we calculate (find) the surface area of a right triangular prism?
- Look carefully at the net shape. What do you see?
- Note that triangular prisms are made up of 3 rectangles and 2 triangles.
- So **Total Surface Area** would have to be calculated by adding up the 5 sides.
- $A = l \times w$ (3 faces)
- $A = \frac{1}{2} bh$ (2 faces)
- Make sense so far?...



Net of a Right Triangular Prism





(To Read)

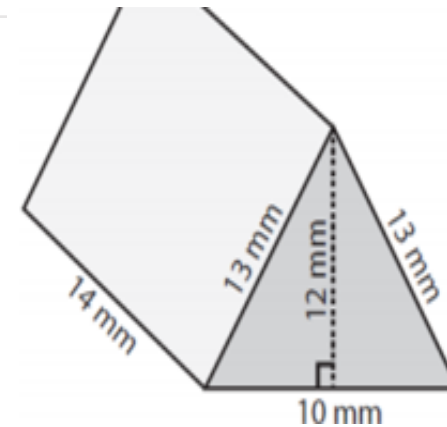
So, how do we go about finding the Total Surface area of the **triangular prism** below?

- **3 rectangles (l x w)**
- **2 triangles ($\frac{1}{2} bh$) or **bh of one triangle****
- Then, add all calculations found.
- **Rectangle:** $14\text{mm} \times 13\text{mm} = 182\text{mm}^2$
- **Rectangle:** $14\text{mm} \times 10\text{mm} = 140\text{mm}^2$
- **Rectangle:** $14\text{mm} \times 13\text{mm} = 182\text{mm}^2$
- **Triangle:** $\frac{1}{2}(10\text{mm} \times 12\text{mm}) = 60\text{mm}^2$
- **Triangle:** $\frac{1}{2}(10\text{mm} \times 12\text{mm}) = 60\text{mm}^2$
- **Note:** do you see why **b x h** can be used instead of $\frac{1}{2}(bh) \times 2$ for the triangle sides?

(To read)

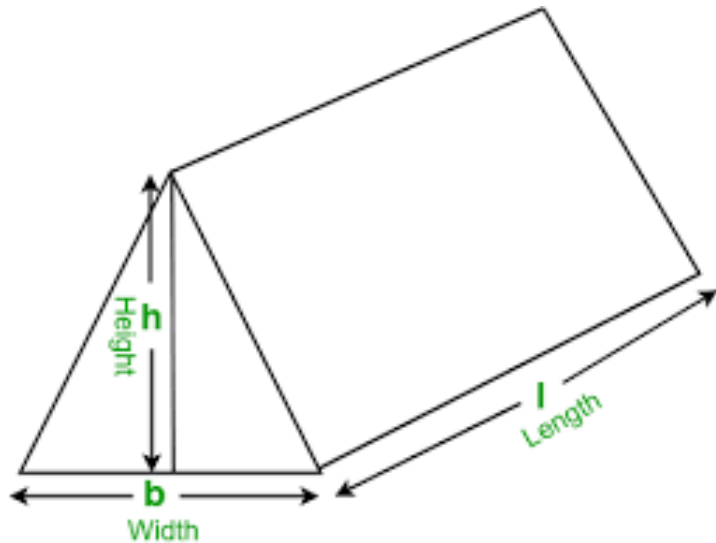
Continued from slide
16: To find the **TOTAL**
Surface Area you **MUST**
remember to now add
all calculations.

- Rectangle: $14\text{mm} \times 13\text{mm} = 182\text{mm}^2$
- Rectangle: $14\text{mm} \times 10\text{mm} = 140\text{mm}^2$
- Rectangle: $14\text{mm} \times 13\text{mm} = 182\text{mm}^2$
- Triangle: $\frac{1}{2}(10\text{mm} \times 12) = 60\text{mm}^2$
- Triangle $\frac{1}{2}(10\text{mm} \times 12\text{mm}) = 60\text{mm}^2$
- Total Surface area of this triangular prism is..
- $140 + 130 + 182 + 60 + 60 = 624\text{mm}^2$

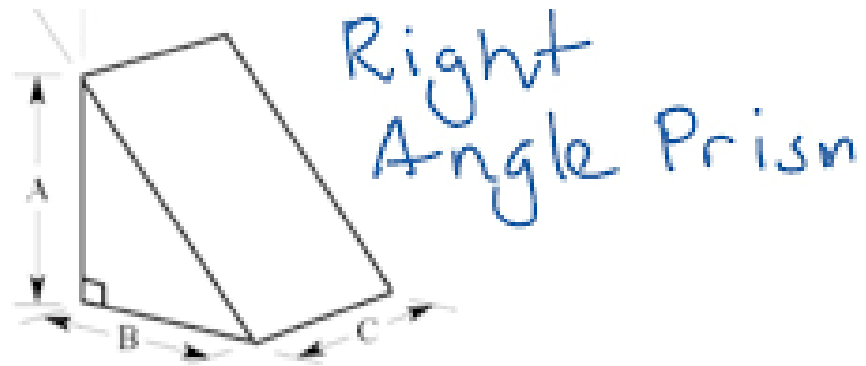


Note: Triangular prisms can have different side lengths but the two below are the ones we mostly use in grade 8.

(Isosceles)



(Right angle)



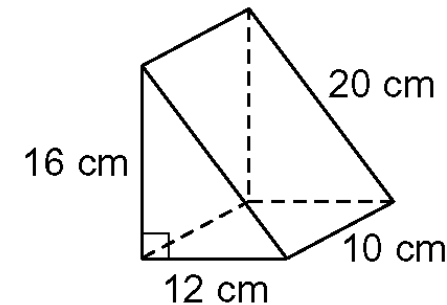
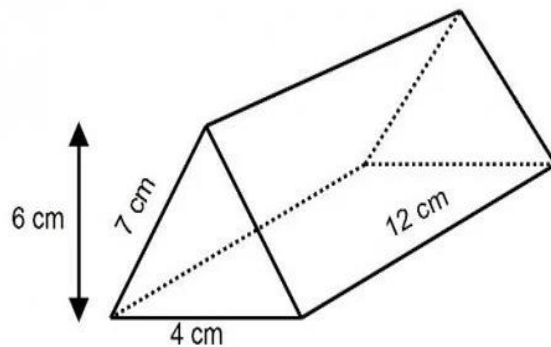
Surface Area of Right Triangular Prism

1) **Watch** the following video to see how we calculate area for a right triangular prism.

[How to Find the Surface Area of a Triangular Prism | Math with Mr. J – YouTube](#)

2) **Your turn** 😊

Find(calculate) the Total surface Area of the following 2 diagrams.



**6cm is the height(h) in diagram 1.

Volume of Right Triangular Prism

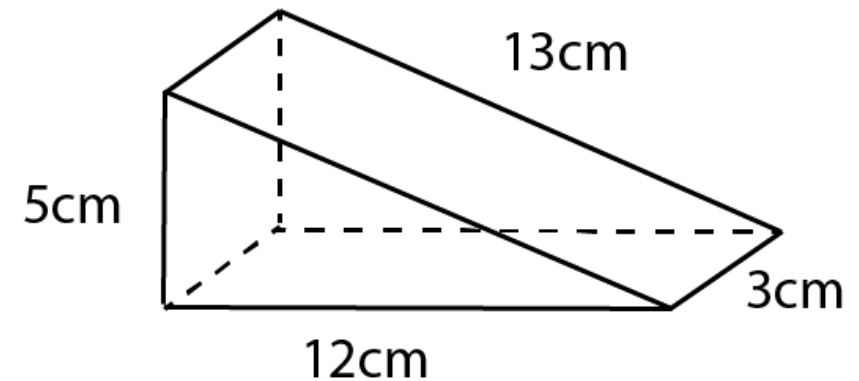
1) **Watch** the following video:

[How to Find the Volume of a Triangular Prism](#)
[| Math with Mr. J – YouTube](#)

2) **Your Turn** 😊

Calculate the volume for the right rectangular prism.

** $V = Bh$ (B= Area of base) or $V = A \ell$ (A = Area of the base = $\frac{bh}{2}$)



Practice

- 1) **Worksheet 4.4** – Surface Area of a Right Triangular Prism (pages 83-84 in the Practice and Homework Book)
- 2) **Worksheet 4.6** – Volume of a Right Triangular Prism (pages 87-89 in the Practice and Homework Book)



SS3 Journal Question #3

EXTEND YOUR LEARNING: It is important to note that the shapes of prisms can vary and so will finding the surface area of the various sides. The following 2 videos are for those students who want to extend their understanding of finding Triangular Prisms if the (h) of the triangular side is unknown. Best of luck to those who want to try 😊

- <https://www.youtube.com/watch?v=Aigefhb-1NM>
- <https://www.youtube.com/watch?v=T6VxjB7bS5o>

Extend your math learning: continued from slide 18:
(when you are NOT given the height(h)

