Name: **KEY**

Date: **4/22/2022**

VOLUME OF RECTANGULAR PRISMS

1. Volume:
   The measure of the amount of space a 3-d figure occupies.

2. Volume is measured in _____cubic_____ units.
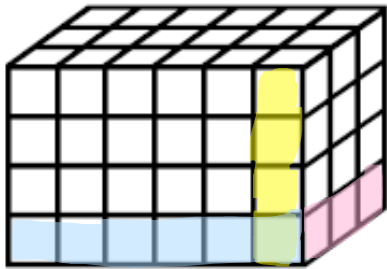
3. A _____unit_____ cube is a cube with an edge length of one unit.

4. The volume of a rectangular prism is the product of the _____length_____, _____width_____ and _____height_____.

5. The formula for volume of a rectangular prism is : $V = l \cdot w \cdot h$
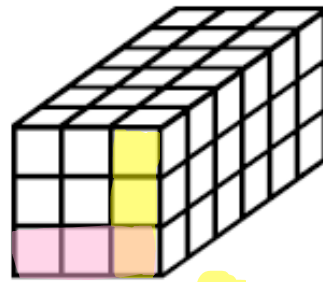
6. The formula for volume of a cube is: $V = s^3$ or $s \cdot s \cdot s$
   $(side)^3$ or $side \times side \times side$

7. Find the volume of each prism.

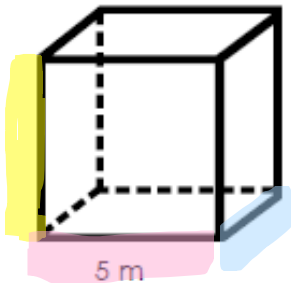$$\begin{array}{r} \overset{3}{18} \\ \times 4 \\ \hline 72 \end{array}$$

$V = l \cdot w \cdot h$
$V = 6 \cdot 3 \cdot 4$
$V = 18 \cdot 4 = 72 \text{ units}^3$

$= 6 \times 3 \times 3$
$= 18 \times 3 = 54 \text{ units}^3$

$$\begin{array}{r} \overset{2}{18} \\ \times 3 \\ \hline 54 \end{array}$$

$$\begin{array}{r} \overset{2}{25} \\ \times 5 \\ \hline 125 \end{array}$$

5 m

$V = 5 \cdot 5 \cdot 5$
$V = 25 \cdot 5$
$V = 125 \text{ m}^3$

9 in.

3 in.
4 in.
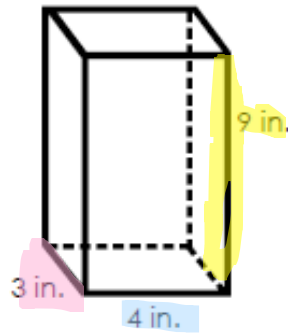
$V = 4 \cdot 3 \cdot 9$
$V = 12 \cdot 9$
$V = 108 \text{ in}^3$

$$\begin{array}{r} \overset{1}{12} \\ \times 9 \\ \hline 108 \end{array}$$

6 cm
6 cm
15 cm
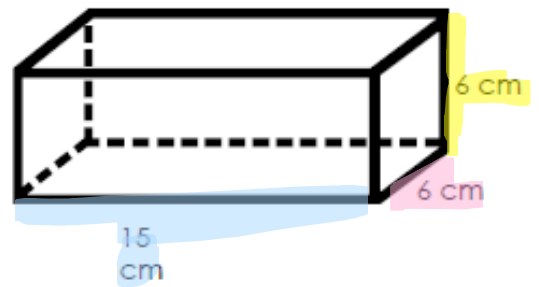
$V = 15 \times 6 \times 6$
$V = 90 \times 6$
$V = 540 \text{ cm}^3$

$$\begin{array}{r} \overset{3}{15} \\ \times 6 \\ \hline 90 \end{array} \quad \begin{array}{r} 90 \\ \times 6 \\ \hline 540 \end{array}$$

It doesn't matter what order you multiply in, since multiplication is commutative.

Name:_____   Date:_____

PRACTICE: VOLUME OF RECTANGULAR PRISMS

#1 What is the volume of a cube with a side length of 10 cm?

$V = 10 \times 10 \times 10$

$V = 100 \times 10$

$V = 1,000 \text{ cm}^3$

#2 What is the volume of a rectangular prims with a length of 7m, a width of 12m and a height of 15m?

$V = 7 \cdot 12 \cdot 15$

$V = 84 \cdot 15$

$V = 1260 \text{ m}^3$

$$\begin{array}{r} 12 \\ \times\ 7 \\ \hline 84 \end{array}$$

$$\begin{array}{r} ^2 84 \\ \times\ 15 \\ \hline 420 \\ 840 \\ \hline 1260 \end{array}$$

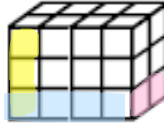**#3** What is the volume of a rectangular prims with a length of 12 in, a width of 26 in and a height of 4 in?

$V = 12 \cdot 26 \cdot 4$

$V = 312 \cdot 4$

$V = 1248 \text{ in}^3$

$$\begin{array}{r} 12 \\ \times 26 \\ \hline 72 \\ 240 \\ \hline 312 \\ \times\ 4 \\ \hline 1248 \end{array}$$

#4 Find the volume of the figure below:

$V = 4 \times 2 \times 3$

$V = 8 \times 3$

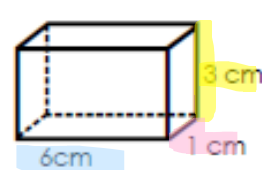$V = 24 \text{ units}^3$

#5 Find the volume of the figure below:

$$\begin{array}{r} 63 \\ \times 22 \\ \hline 126 \\ 1260 \\ \hline 1386 \end{array}$$

7 mm

9 mm

22 mm

$V = 9 \cdot 7 \cdot 22$

$V = 63 \cdot 22$

$V = 1386 \text{ mm}^3$

#6 Find the volume of the figure below:

3 cm

6cm

1 cm

$V = 6 \times 1 \times 3$

$V = 6 \times 3$

$V = 18 \text{ cm}^3$

#7 Evelyn got a new fish tank for her birthday. The height of the fish tank is 3 feet, the width is 2 feet and the length is 8 feet. What is the volume of her fish tank?

$V = 8 \cdot 2 \cdot 3$

$V = 6 \cdot 8$

$V = 48 \text{ ft}^3$
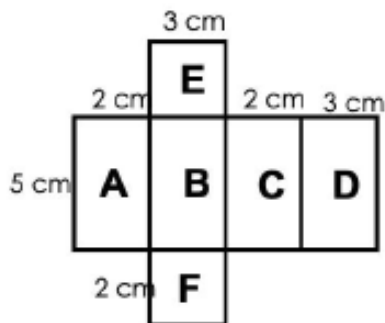
SURFACE AREA OF RECTANGULAR PRISMS

GEOMETRY

VOCABULARY

- **Surface Area:** The __SUM__ of the __AREAS__ of all of the faces of a 3-D figure.
- **Rectangular Prism:** a 3-dimensional __SOLID__ shape which has __6__ faces that are __Rectangles and/or SQUARES__
- **Net:** a __2__-dimensional representation of a __3__-dimensional figure.

GUIDED NOTES:

1. You can use nets to help you find __Surface Area__
2. To find surface area, find the __Area__ of each face.
3. Then __add__ the areas together.
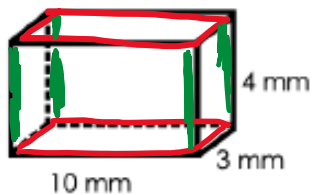4. Find the surface area of the rectangular prism below:

3 cm

Side:	Area:
A	$2 \times 5 = 10$
B	$3 \times 5 = 15$
C	$2 \times 5 = 10$
D	$3 \times 5 = 15$
E	$2 \times 3 = 6$
F	$2 \times 3 = 6$

Add = 62 cm^2

5. You can also use the formula __$SA = 2(lw + lh + wh)$__ to find area of a rectangular prism.
6. The formula to find surface area of a cube is: __$SA = 6 \cdot s^2$__
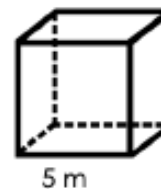
GUIDED PRACTICE:

Find the surface area:

4 mm

3 mm

10 mm

Top and bottom: $2 \times 10 \times 3 = 60$
Front and back: $2 \times 10 \times 4 = 80$
Sides: $2 \times 3 \times 4 = 24$

164 mm^3

Find the surface area:

5 m

6 sides x 5 x 5
$6 \times 25 = 150 \text{ m}^2$

PRACTICE PROBLEMS: Find the surface area of each figure:

1

4m
20
5m 5m 4m
7m 35 28 35 28
20 5m

$(35 \times 2) + (20 \times 2) + (28 \times 2)$
$70 + 40 + 56 = 166$ m^2

2

7 mm
7 mm
20 mm

Top/Bottom: $2 \times 20 \times 7 = 280$
Front/Back: $2 \times 20 \times 7 = 280$
Sides : $2 \times 7 \times 7 = \underline{98}$

658 mm^2

3

11 m

$\begin{array}{r} 66 \\ \times 11 \\ \hline 66 \\ 660 \\ \hline 726 \end{array}$

$6 \times 11 \times 11 =$
$66 \times 11 = 726 \, m^2$

4

5m
6m 30 6m 5m
$\begin{array}{c}15 \\ \times 6 \\ \hline 90\end{array}$ $\begin{array}{c}15 \\ \times 5 \\ \hline 75\end{array}$ 90 75
15 m
30 6m

$(90 \times 2) + (75 \times 2) + (30 \times 2)$
$180 + 150 + 60$
$390 \, m^2$

5 James is wrapping a birthday gift for his mom. The box has a length of 4 feet, a width of 3 feet and a height of 1 foot. What is the exact amount of wrapping paper that he needs to cover the gift?

1 foot
3 feet
4 feet

$(2 \times 4 \times 3) + (2 \times 3 \times 1) + (2 \times 1 \times 4)$
$24 + 6 + 8 = 38 \, ft^2$