

Name: _____

UNIT 6 LEARNING GUIDE – GEOMETRY

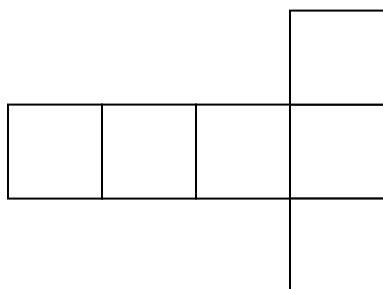
INSTRUCTIONS:

Using a pencil, complete the following questions as you work through the related lessons. Show ALL of your work as is explained in the lessons. Do your best and always ask questions if there is anything that you don't understand.

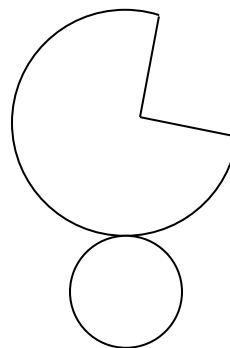
6.1 CONSTRUCTING NETS

Using the nets show below, deduce what the final 3-D shape will end up being. A single name could be used for more than one net. Take your time and try to picture the net in 3-D before writing your answer.

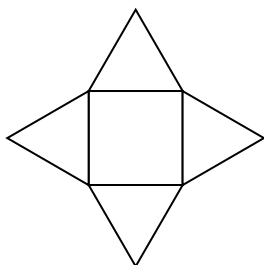
1. _____



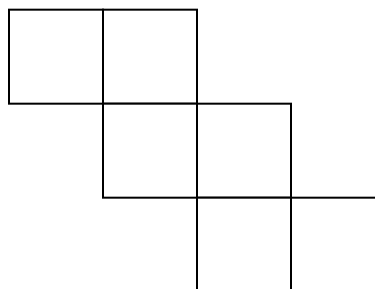
4. _____



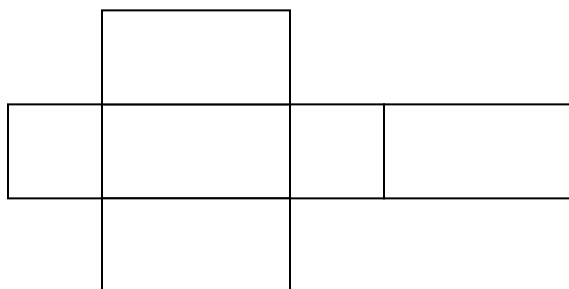
2. _____



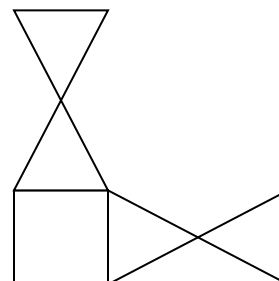
5. _____



3. _____



6. _____

**7. Build That Net!**

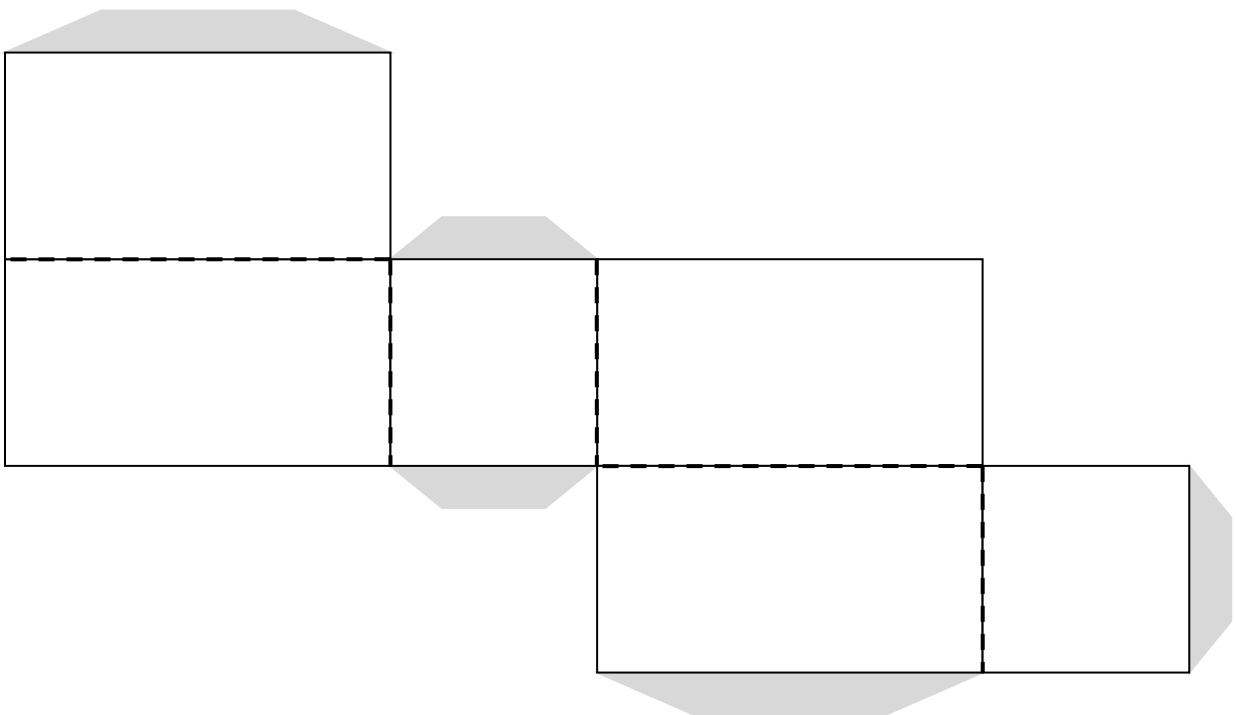
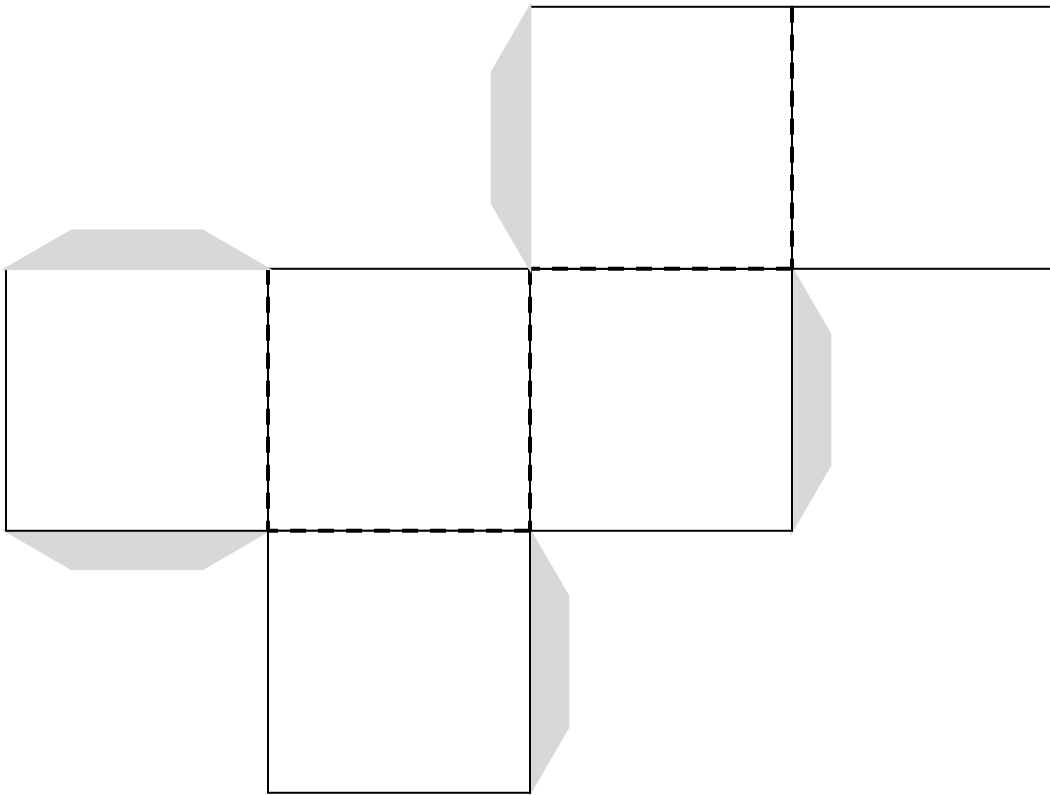
You will find several large nets on the next three pages of this Learning Guide. Cut out each of these carefully and actually construct the 3-D version of the net. Cut out the net carefully, being sure to leave the construction tabs in place also (light gray). The dotted lines indicate possible folding points, not cut points. Before you start constructing, be sure you know which 3-D object you will be creating. You will need some tape or glue to hold the constructs together.

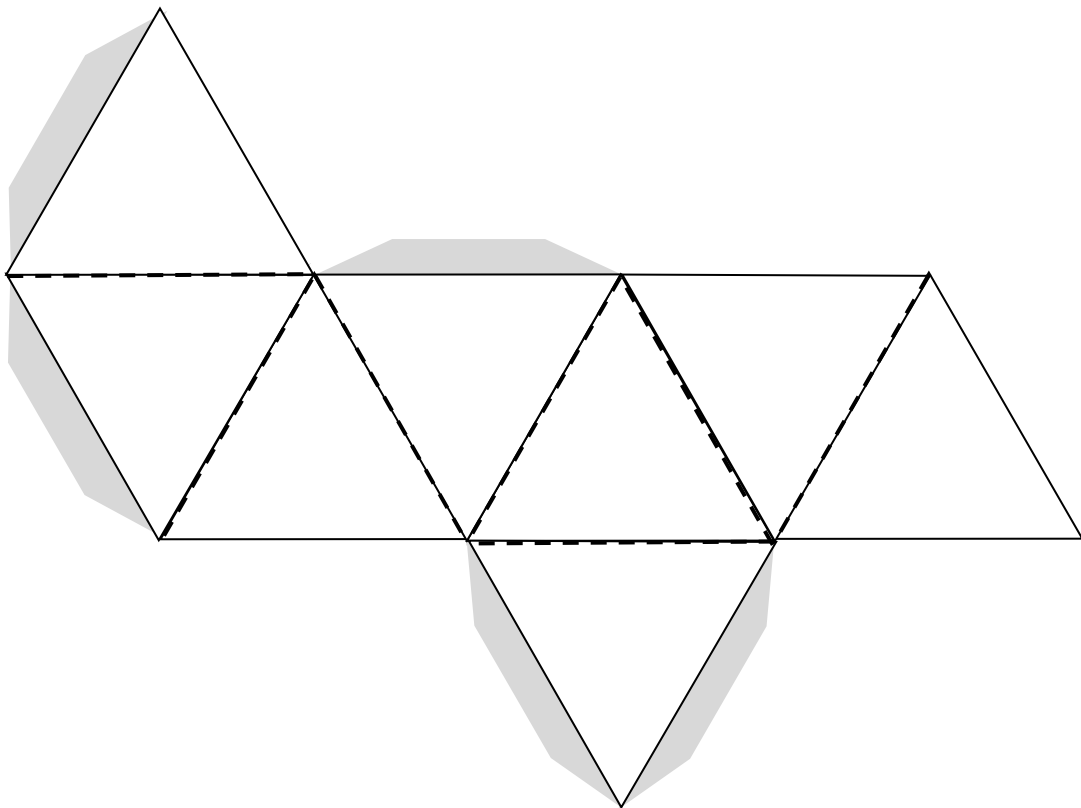
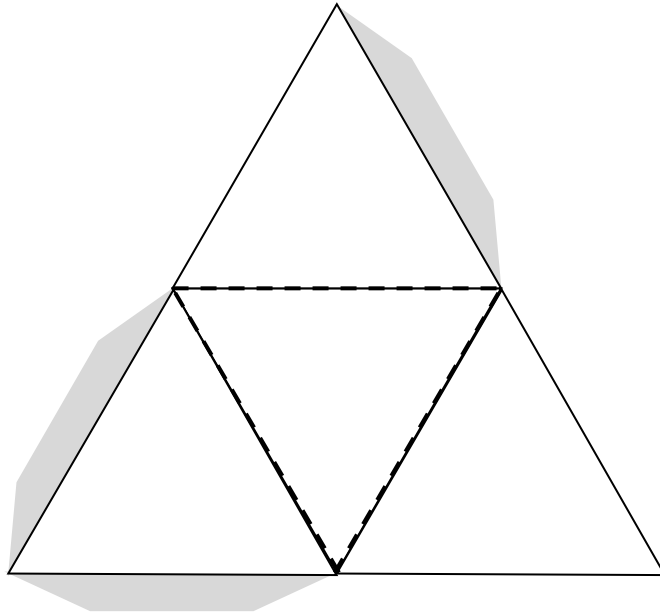
8. Create Your Own Net

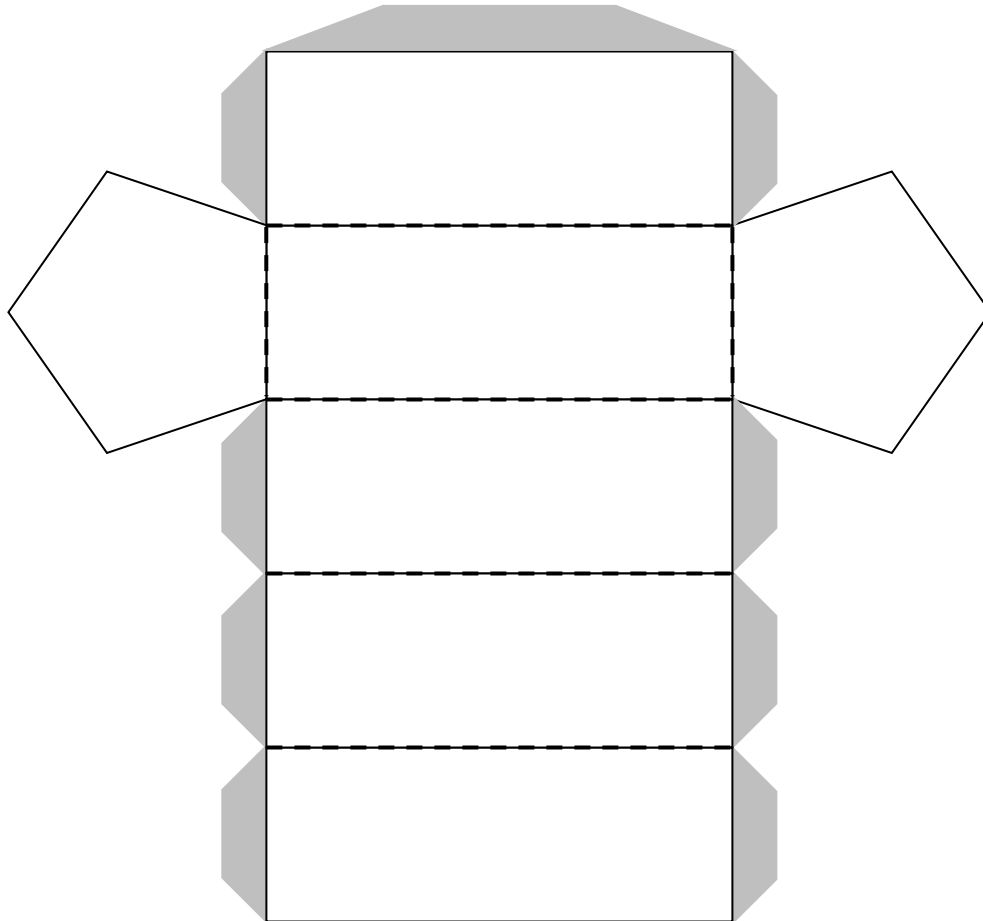
Now you get the chance to create your own net from scratch. Pick a common 3-D object that you wish to construct the net for. Write the name down and draw the appropriate net. If you pick one of the nets that have been shown already, you cannot draw it in the same manner as presented earlier.

Net Name: _____

Draw your net below:

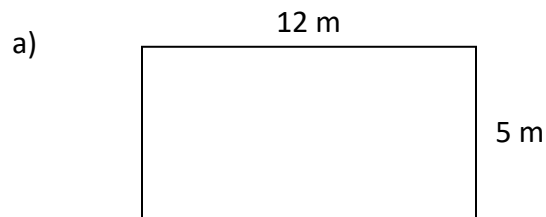




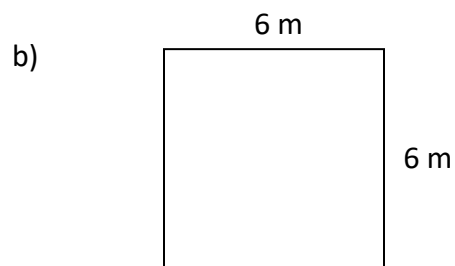


6.2 SURFACE AREA

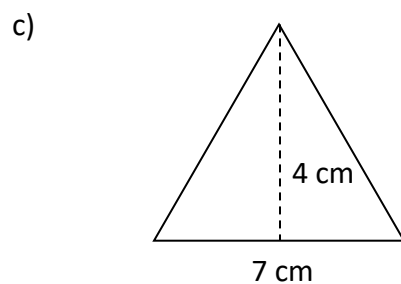
1. Define a prism:
2. Find the area of the following figures **SHOWING ALL WORK**. Take note that you may have to use more than one formula per shape! State your **final** answer in the space provided. Remember your units! State answers to two decimal places if necessary.



Area = _____

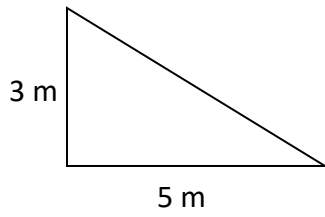


Area = _____



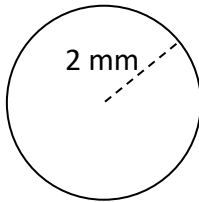
Area = _____

d)



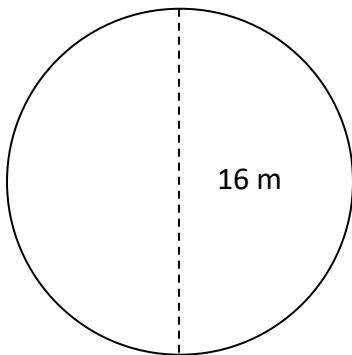
Area = _____

e)



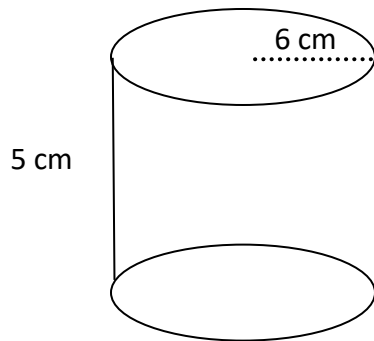
Area = _____

f)



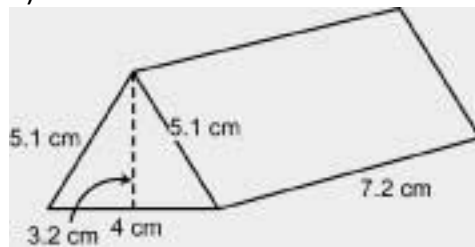
Area = _____

g)



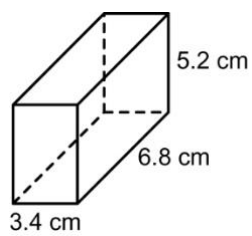
Surface Area = _____

h)



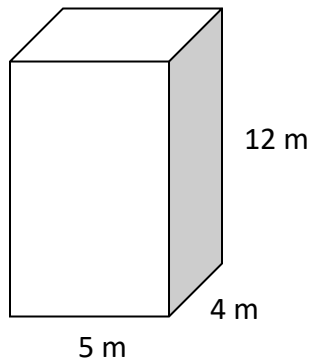
Surface Area = _____

i)



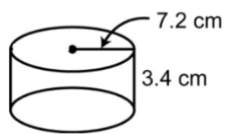
Surface Area = _____

j)



Surface Area = _____

k)

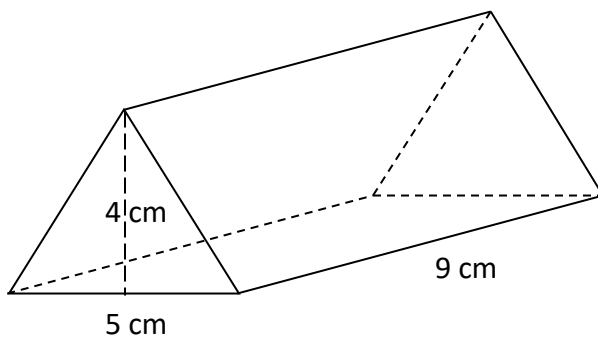


Surface Area = _____

6.3 VOLUME

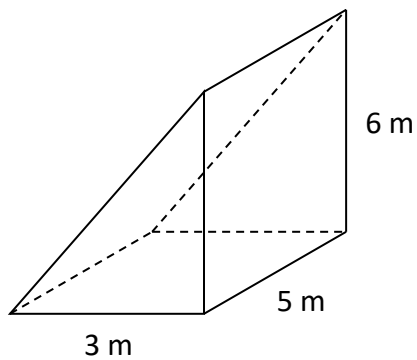
1. Describe the difference between surface area and volume.
2. Find the volume of the following shapes. State your answers to 2 decimal places if necessary, and be sure to include your units! **Show all work.**

a)



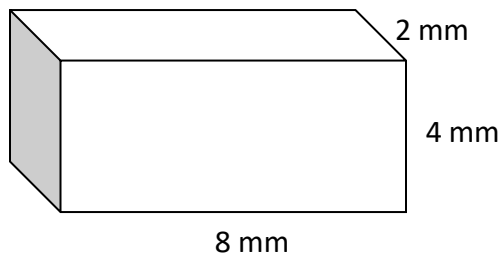
Volume = _____

b)



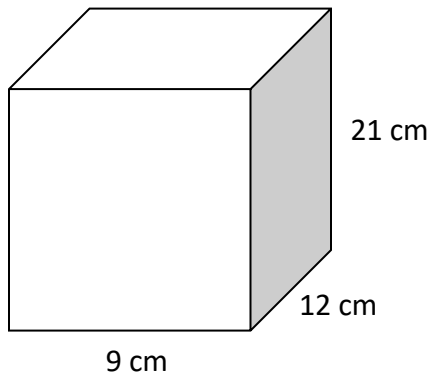
Volume = _____

c)



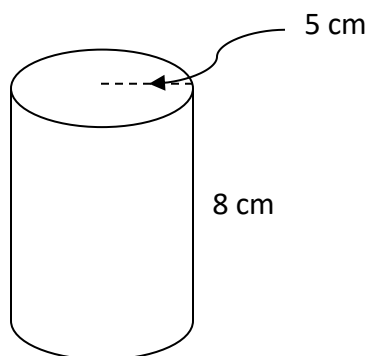
Volume = _____

d)



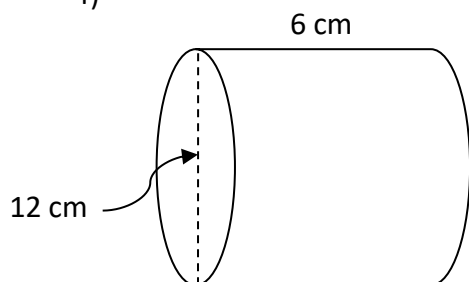
Volume = _____

e)



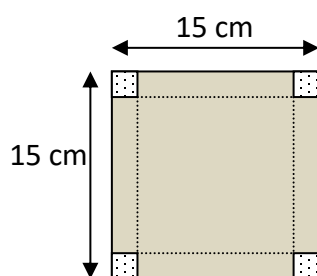
Volume = _____

f)



Volume = _____

3. Imagine a single piece of cardboard as shown; you're going to remove squares from each corner and fold up the edges in order to make a box (without a lid). What size corner would need to be removed in order to make a box that could hold the MAXIMUM volume? Use the chart to help you - the first entry in the chart assumes that each corner is 1 cm x 1 cm, making the length 13 cm and the depth 1 cm. (If you're not sure, use a piece of square paper to make the box)

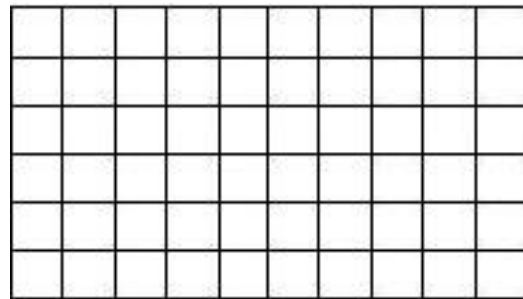
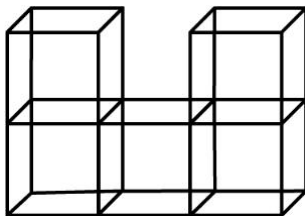


Width of base	Depth of box	Volume
13 cm x 13 cm	1 cm	169 cm ³
11 cm x 11 cm	2 cm	

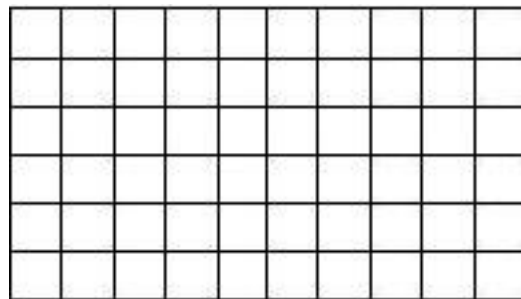
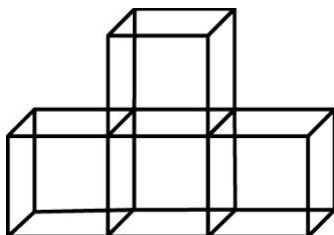
6.4 DRAWING 3D OBJECTS

1. Compare 1D, 2D, and 3D:
2. Draw the front, top, left and right side views of each object on the grid paper and label each view. Make sure you **line up the matching edges** and **show changes in depth** with darker lines as shown in the lesson.

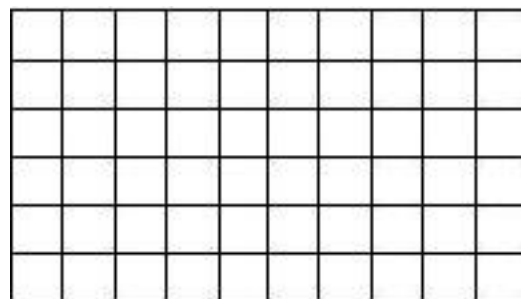
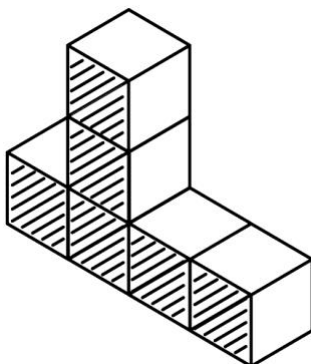
a)



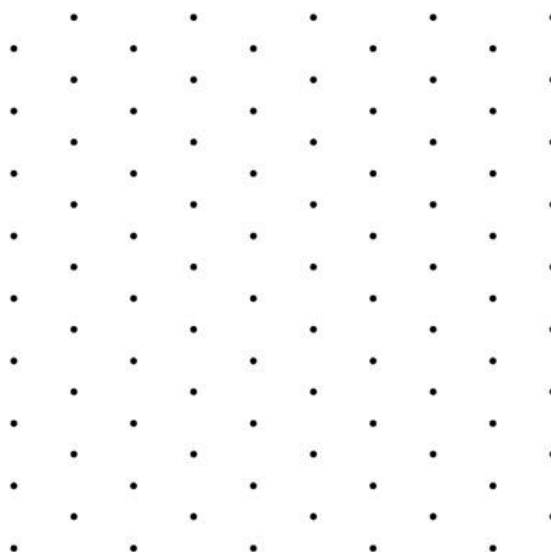
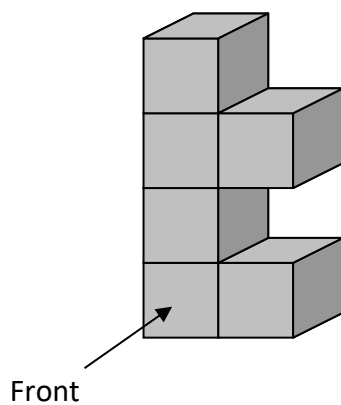
b)



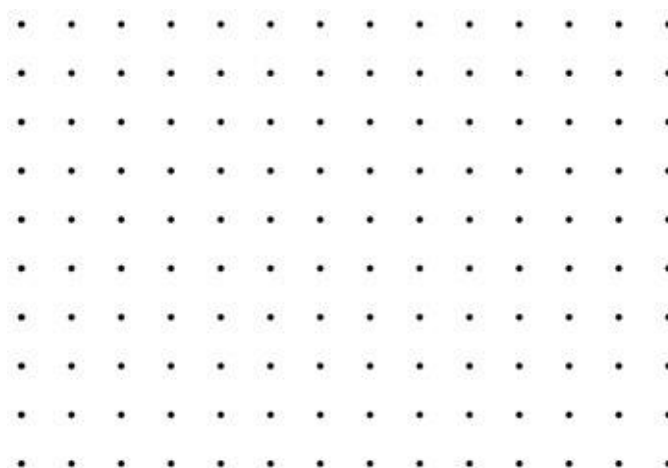
c)



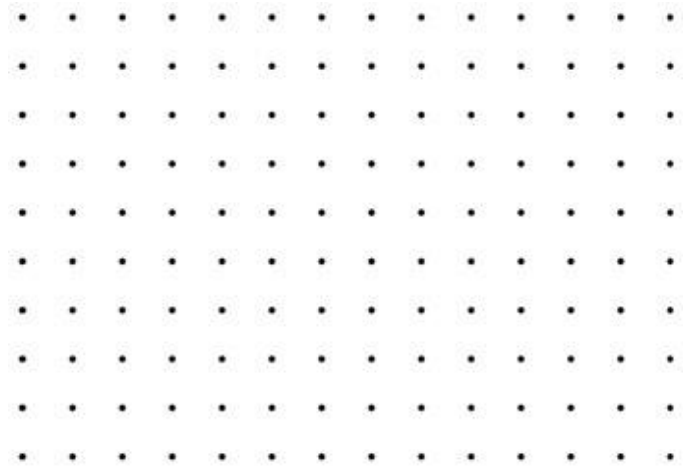
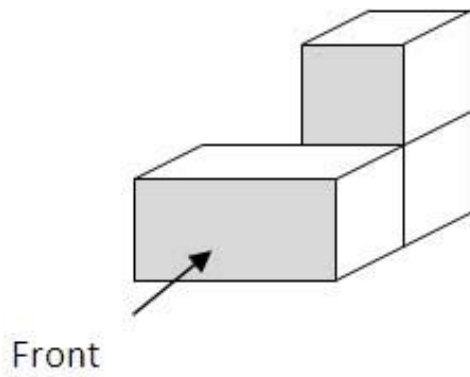
3. a) Use the isometric dot paper to draw the structure.



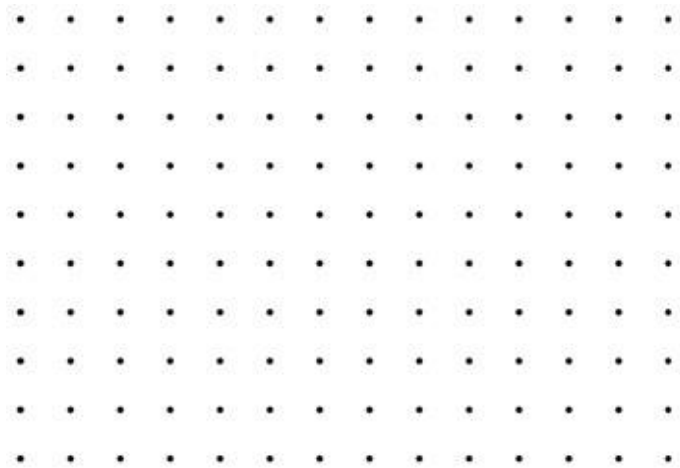
b) Use the square dot paper to draw the front, top and side views of the object.



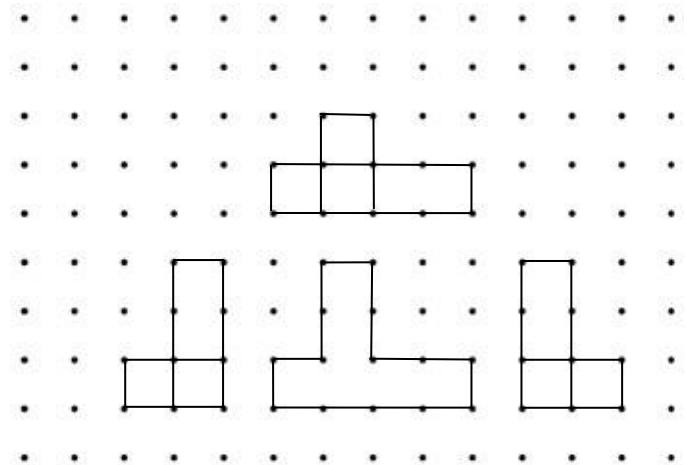
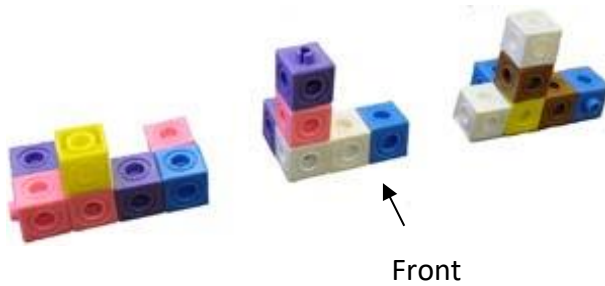
3. a) Sketch the front, top and 2 side views of this object



- b) With the object above, rotate it 90° horizontally in a clockwise direction and draw the front, top and 2 side views.



4. Here are the front, top and 2 side views of an object. Which object will match it? Circle the one it matches.

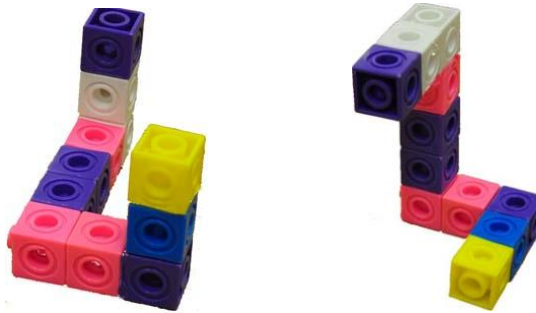


6.5 ROTATING 3D OBJECTS

1. Describe the rotation from first image to the second.

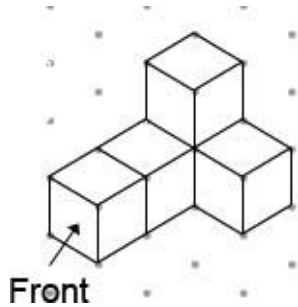
Your answer should include some or all of the following descriptors:

vertical	90°	clockwise	right	towards you
horizontal	180°	counterclockwise	left	away from you
	270°			



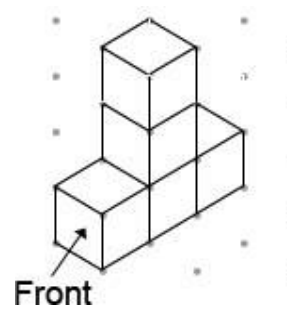
2. Match each view at the bottom of the page (A – G) with the front top and side views of these two objects.

a.

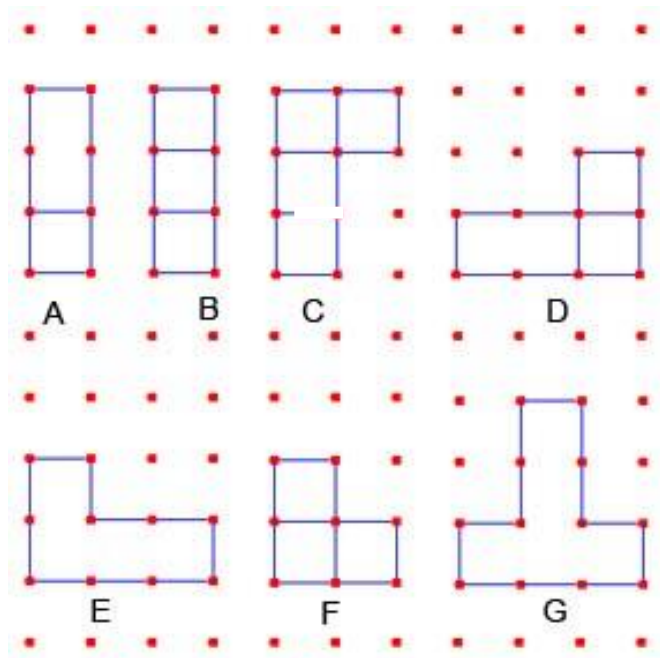


Front	
Top	
Left Side	
Right Side	

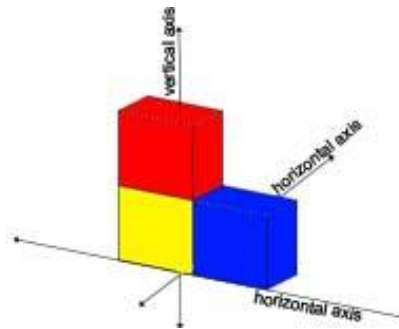
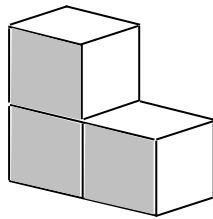
b.



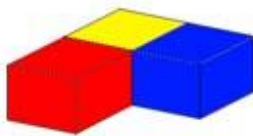
Front	
Top	
Left Side	
Right side	

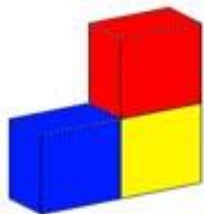


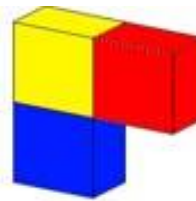
3. Match each rotation description below to the drawing of this rotated object. Note that there are 2 horizontal axes.

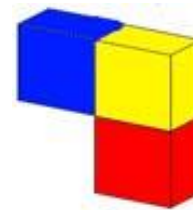


- A. a rotation of 270° counter-clockwise about a vertical axis
- B. a rotation of 90° about a horizontal axis to the right
- C. a rotation of 180° about a horizontal axis to the left
- D. a rotation of 90° about a horizontal axis toward you









UNIT 6 – ANSWER KEY

SECTION 6.1

1. cube 2. rectangular pyramid 3. rectangular prism 4. cone 5. cube 6. rectangular pyramid

SECTION 6.2

2. a) 60cm^2 b) 36m^2 c) 14cm^2 d) 7.5m^2 e) 12.56mm^2 f) 201.06m^2 g) 414.69cm^2 h) 115.04cm^2 i) 152.32cm^2 j) 256m^2 k) 479.53cm^2

SECTION 6.3

2. a) 90cm^3 b) 45cm^3 c) 64mm^3 d) 2268cm^3 e) 628.32cm^3 f) 678.58cm^3
3. answers will vary but chart should show the dimensions including volume

SECTION 6.5

2.a) F,C,E, D b) A,B,G, G