Name________________________________ Period __________ Date ______________

7-16
STUDENT PACKET

MATHLINKS: GRADE 7
STUDENT PACKET 16
PLANE AND SOLID FIGURES

WORD BANK

Word or Phrase	Definition or Explanation	Example or Picture
• apex of a pyramid		
• cross section		
• lateral faces		
plane		
plane figure		
right prism		
right rectangular pyramid		
solid figure		
vertex		

PROBLEMS INVOLVING PLANE FIGURES

Summary

We will solve real world and mathematical problems involving area and scale drawings.

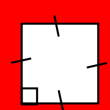
Goals

- Find areas of two-dimensional figures.
- Make and interpret scale drawings.

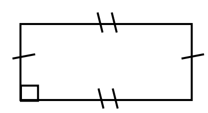
Warmup

Find the area of each figure. They all have the same height of $\frac{1}{2}$ in. (Diagrams are not to scale.)

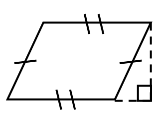
1.



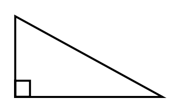
2. The base is twice the height.



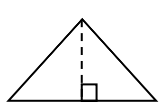
3. The base is $\frac{1}{4}$ in longer than the height.



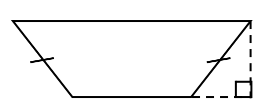
4. The base is $\frac{1}{3}$ in longer than the height.



5. The base of this triangle is the same as the base of the triangle in problem 4.

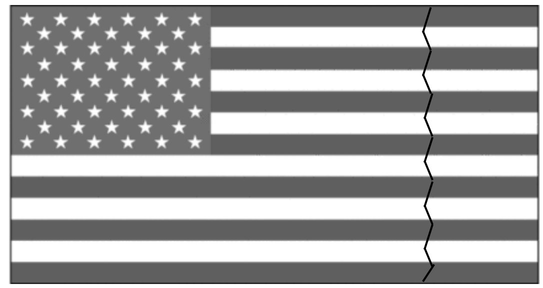


6. The shorter base is $\frac{1}{4}$ in longer than the height. The longer base is $2\frac{1}{2}$ times the length of the height.



THE AMERICAN FLAG

The original Star-Spangled Banner measured 30 feet by 42 feet when it was created in 1813. In the 1800s, a few people were given pieces of the original flag as mementoes. Part of the flag was lost due to wear and tear through use. The flag was given to the National Museum of American History in 1912. Today, the flag measures about 30 feet by 34 feet.



1. How old is the flag that is in the museum today?

2. What percent of the area of the original flag was lost or given away?

3. Is there a wall in your school where a flag this size (30 ft by 34 ft) might be displayed? Explain.

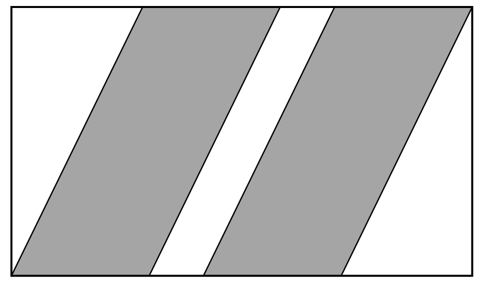
A small American flag measures 30 inches by 42 inches. The blue rectangle that contains the stars has a horizontal width that is $\frac{1}{3}$ the length of the flag, and a vertical height that spans 7 of the stripes.

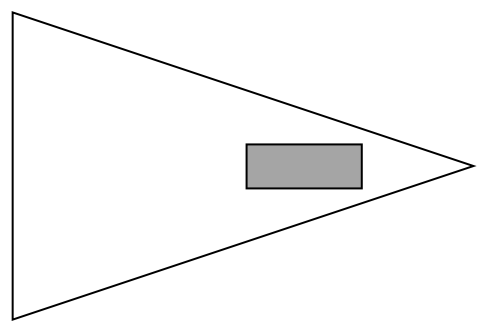
4. Find the area of the blue rectangular corner.

5. Find the area of the flag that is red.

CLASS FLAGS

Two groups in a class designed the flags represented below. For each of their flags, find the area of the shaded part, the area of the unshaded part, the percent of the entire flag that is shaded, and the percent of the entire flag that is unshaded. Measure lengths to the nearest tenth of a centimeter (cm).

1. Show work:	
a. Shaded area:	b. Unshaded area:
c. Shaded percent:	d. Unshaded percent:

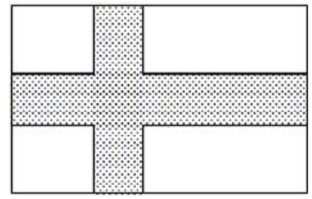
2. Show work:	
a. Shaded area:	b. Unshaded area:
c. Shaded percent:	d. Unshaded percent:

3. Describe an efficient way to compute the unshaded area if the shaded and total areas are known.

4. Describe an efficient way to compute the unshaded percent if the shaded percent is known.

THE FLAG OF FINLAND

To the right is a picture of the Finnish flag. It consists of a blue cross, with a uniform width of 9 inches, against a solid white background. The entire flag measures 2 feet 9 inches by 4 feet 6 inches.

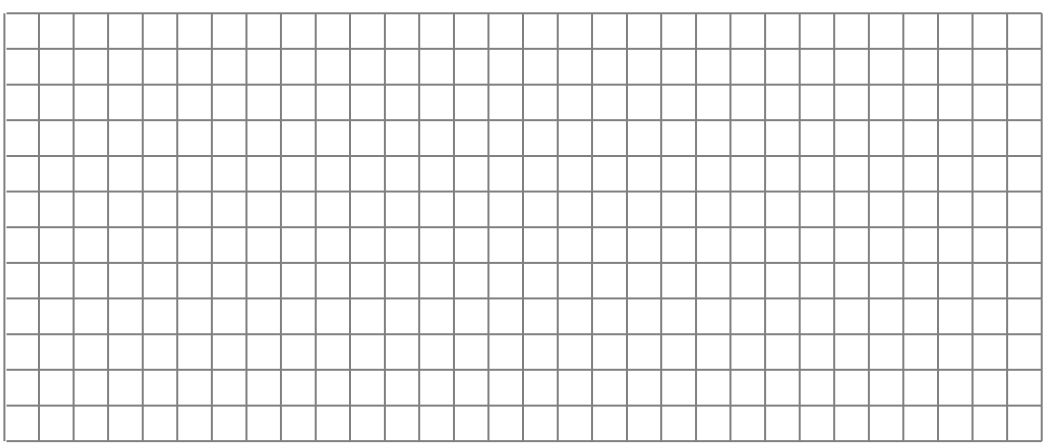


1. Find the perimeter of the flag.

2. Find the area of the flag.

3. Write the area of the blue cross as a fraction, decimal, and percent of the whole flag.

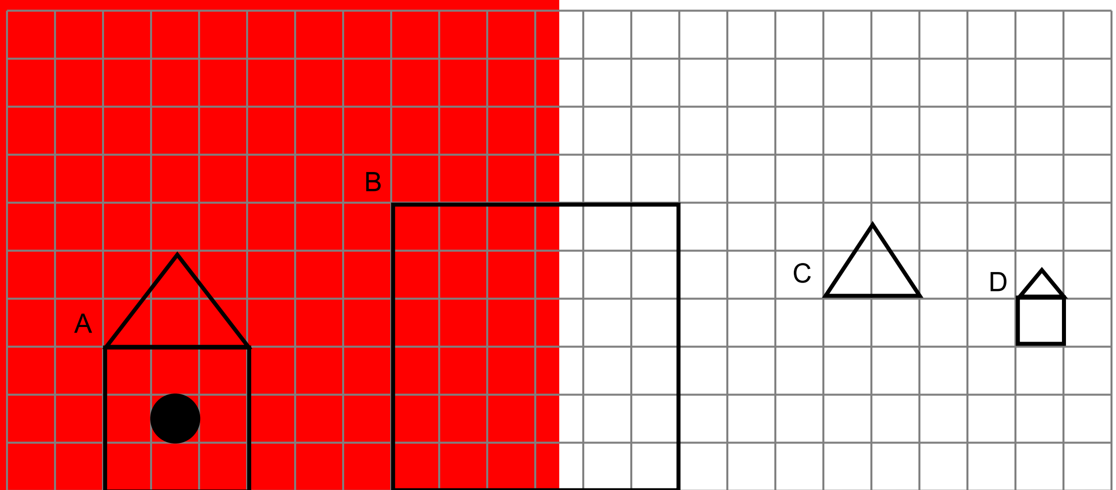
4. The horizontal stripe is centered on the flag. The left edge of the vertical stripe is $1\frac{1}{2}$ feet from the left edge of the flag. Let each small square below represent 3 inches by 3 inches. Draw the flag to scale, using tools appropriately.



A BIRDHOUSE PROBLEM

Natasha wants to make a birdhouse. She completed scale drawing A on quarter-inch graph paper of the front face of the birdhouse, and started scale drawings B, C, and D.

1. Complete drawings B, C, and D.



2. Complete the table.

Scale drawing	Reduction or enlargement compared to drawing A?	Scale factor (multiplier) for drawing relative to drawing A
A		
B		
C		
D		

3. Natasha decides to make the front face of the actual birdhouse with the bottom side of the square equal to 12 inches. What is the area of the front face (excluding the circular opening)?

4. Complete the table.

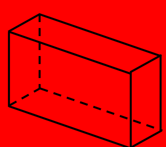
Scale drawing	Reduction or enlargement of the actual birdhouse?	Scale (ratio) for drawing relative to the actual birdhouse
A		
B		
C		
D		

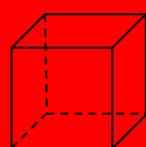
PROBLEMS INVOLVING SOLID FIGURES

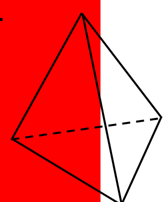
Summary	Goals
We will solve real world and mathematical problems involving surface area and volume.	• Find surface areas and volumes of three-dimensional figures.

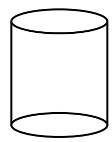
Warmup

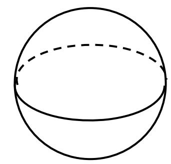
Name each three-dimensional figure.

1. 

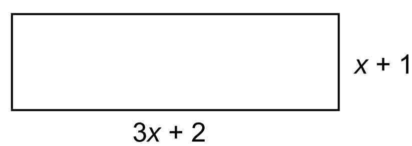
2. 

3. 

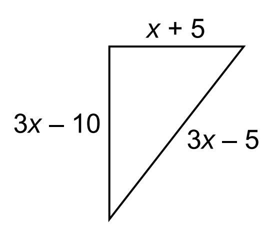
4. 

5. 

6. The rectangle to the right has a perimeter P of 94 units of length. What is its area?



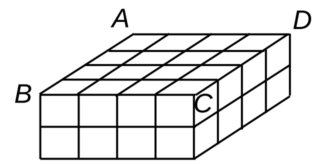
7. The right triangle to the right has a perimeter P of 60 units of length. What is its area?



VOLUME OF RIGHT PRISMS

A right prism is a solid figure in which two faces (the bases) are congruent parallel polygons, and the other faces (the lateral faces) are rectangles that are perpendicular to the bases.

Pictured to the right is a right rectangular prism. It is a rectangular prism because its bases are rectangles. Let each small square measure 1 inch by 1 inch.



1. What is the area of the base (rectangle *ABCD*)?

2. What is the height of the prism?

3. What is the volume of the prism?

If you sliced the prism vertically along diagonal $\overline{AC}$, each half would be a right triangular prism.

4. On the prism above, draw $\overline{AC}$. Then, to the right, sketch the triangular prism with base triangle *ABC*.

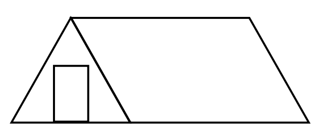
5. What is the area of the base (ΔABC) of this prism?

6. What is the height of this prism?

7. What is the volume of this prism?

8. In general, how do find the volume (V) of a right prism if you know the area of a base (B) and the height (h)?

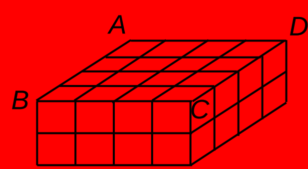
9. **The Tent Problem.** The tent to the right is a right triangular prism made of canvas. The front face is an equilateral triangle. Each side of the triangle measures 6 feet. The tent is 12 feet long and approximately 5.2 feet high. Find the volume enclosed by the tent.



SURFACE AREA OF RIGHT PRISMS

A <u>net</u> for a three-dimensional figure is a two-dimensional pattern for the figure. When cut from a sheet of paper, a net forms one connected piece which can be folded and the edges joined to form the given figure.

1. Create a net for this right rectangular prism.



Net for problem 1:

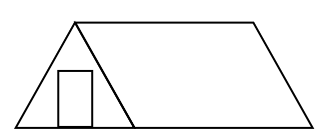
2. Find the surface area of the prism.

Net for problem 3:

3. Create a net for the right triangular prism with base ΔABC, formed by slicing vertically along $\overline{AC}$.

4. If the length of $\overline{AC}$ is 5.66 inches, find the surface area of the right triangular prism.

5. **The Tent Problem Revisited.** Find the surface area of the tent described on page 7 (including the bottom).



6. In general, how do you find the surface area (SA) of a right prism?

POSTER PROBLEMS 6

Part 1: Your teacher will divide you into groups.

- Identify members of your group as A, B, C, or D. I am group member __________.
- Each group will start at a numbered poster. Our group start poster is __________.
- Each group will have a different color marker. Our group marker is ____________.

Part 2: Answer the problems on posters by following the directions of your teacher.

Part 3: Return to your seats.

Refer to the poster problems. Complete the table below. Use scratch paper as needed.

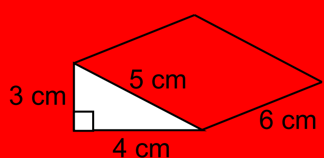


Figure 1

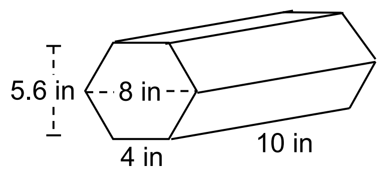


Figure 3

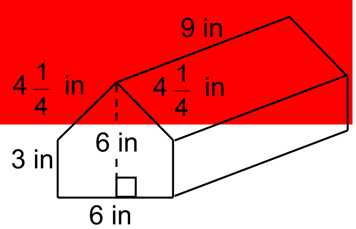


Figure 2

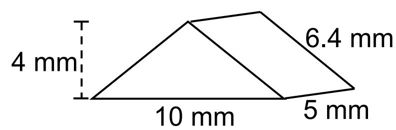


Figure 4

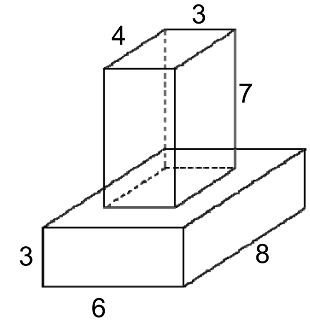
		Figure 1	Figure 2	Figure 3	Figure 4
1.	Name of prism				
2.	Shape of bases				
3.	Shape of lateral faces				
4.	Number of lateral faces				
5.	Surface area of lateral faces				

6. How is the number of rectangular lateral faces of a right prism related to the shape of the base?

THE DISPLAY CASE PROBLEM

A display case is made from a glass rectangular prism on top of a steel rectangular prism. Edge lengths are given in inches in the diagram to the right.

1. Find the total volume of the display case.



2. Find the surface area of the glass that is exposed (exclude the bottom base).

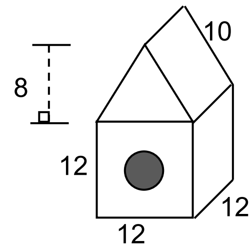
3. Find the surface area of the steel that is exposed and the bottom base.

4. Will the display case fit into a box with dimensions of 9 in $\times$ 10 in $\times$ 12 in? Explain your reasoning.

5. Suppose you want to safely pack this display case so that it can be shipped in a box. You have plenty of “packing peanuts” and “bubble wrap.” The bubble wrap comes in long rolls that are 12 inches wide. Give the length of each of the **two** sheets of bubble wrap you want to use to wrap the display case. Explain your reasoning.

THE BIRDHOUSE REVISITED

A complete diagram of Natasha's bird house is pictured here. Lengths are given in inches. The circular opening has a diameter of 4 inches.

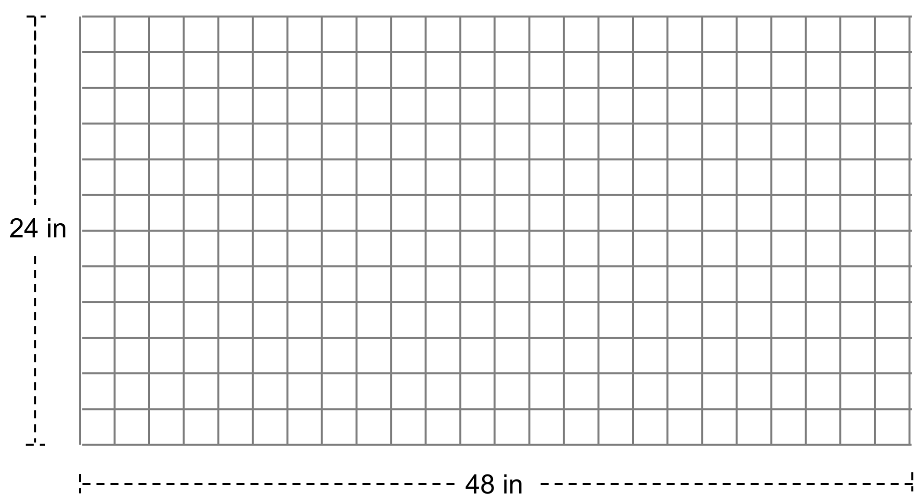


1. Name the two prisms that make up this birdhouse.

2. Find the total volume inside the bird house.

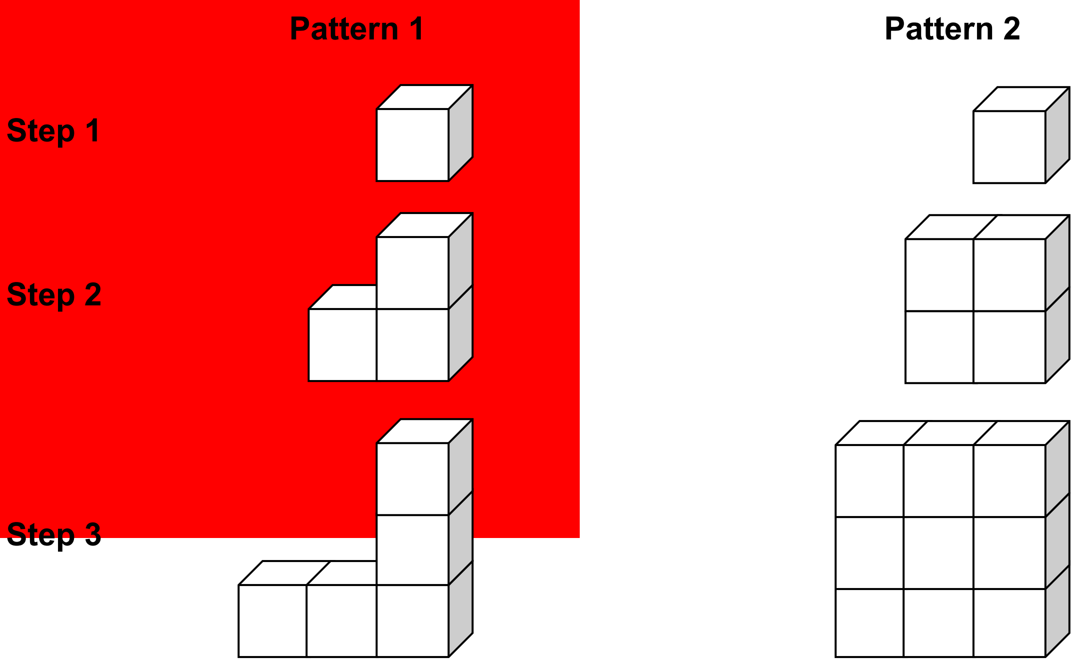
3. Natasha plans to paint the outer portion of the birdhouse, excluding the bottom. Find the surface area she will paint.

4. Natasha wants to make her birdhouse from a piece of wood that is 24 in by 48 in. Make a scale drawing to show the individual pieces. Try to arrange them so that making the birdhouse requires as few cuts as possible.



PATTERN PROBLEMS

Cubes of side length $\frac{1}{2}$ inch are assembled in two patterns of solids. The first three steps of each pattern are shown below and more steps for each pattern are built following the same general idea. Find the volume and surface area of the solids in the first four steps. Surface area includes all exposed faces, including the "bottom" of the figure.



Step #	Pattern 1		Pattern 2	
	V	***SA***	***V***	***SA***
1				
2				
3				
4				

CROSS SECTIONS OF SOLID FIGURES

Summary

We will describe two-dimensional figures that result from slicing three-dimensional figures by planes.

Goals

- Identify and describe two-dimensional cross sections of three-dimensional figures.

Warmup

1. A stick of butter is 8 cm long and has a square face with sides of length 3.5 cm. Find the volume and surface area of the stick of butter.

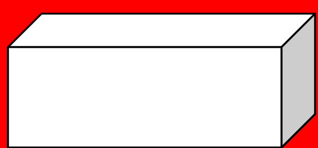


Figure 1

V = ___________ *SA* = ___________

2. Draw a slice that cuts a stick of butter in half. Do this in two different ways.

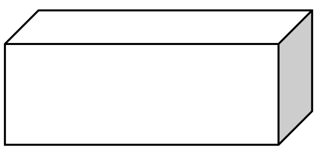


Figure 2

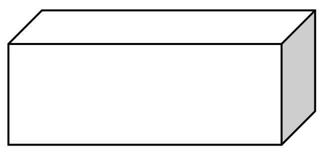


Figure 3

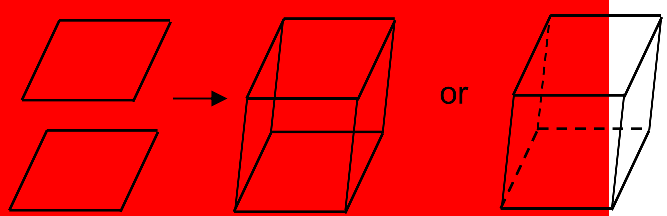
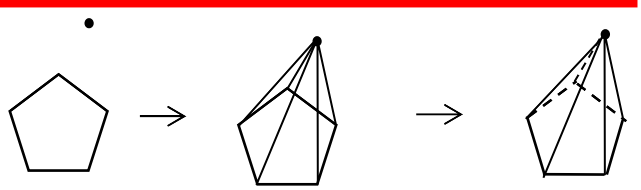
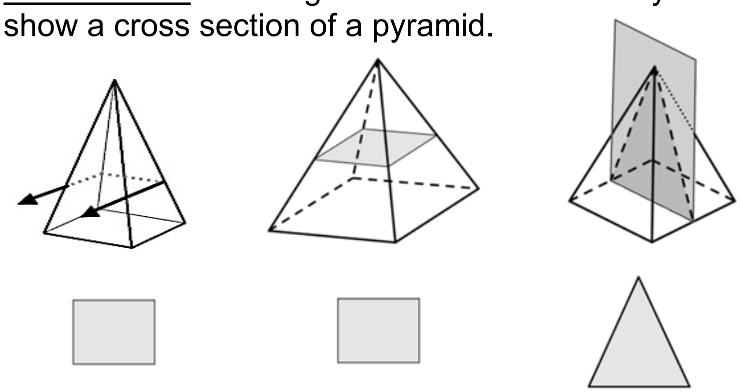
3. Predict which half-stick you think has the…

greater volume:

greater surface area:

SKETCHING THREE-DIMENSIONAL SHAPES

You do not need to be an artist to sketch a three-dimensional figure. Here are a few pointers. Try them, or share some of your own techniques with your classmates.

To draw a <u>prism</u>, start by drawing two congruent polygons for the bases. Then connect vertices to complete the figure. You can also use dashed lines to indicate edges that cannot be seen if you like. 	1. Draw a triangular prism.
To draw a <u>pyramid</u>, start by drawing one polygon for the base. Then put a point somewhere on the paper to represent the apex of the pyramid. Connect the apex to the vertices of the polygon. Redraw using dashed lines to indicate edges you cannot see. 	2. Draw a rectangular pyramid.
The intersection of a solid figure with a plane is a <u>cross section</u> of the figure. Here are three ways to show a cross section of a pyramid. 	3. Draw a triangular prism and show a horizontal cross section.

EXPLORING CROSS SECTIONS

Your teacher will give you some tools to perform this exploration.

Create each three-dimensional (3-D) solid listed below, and explore different ways to create cross sections that produce different shapes. Slice your solids in different directions (e.g., perpendicular to the base, parallel to the base, diagonally, etc.) and draw the two-dimensional (2-D) cross sections. Save your best models to share with the class.

Diagram of 3-D Shape	**Draw 2-D cross sections, name them, and describe how you got them**
1. cube	
2. right rectangular prism (not a cube)	
3. cylinder	

EXPLORING CROSS SECTIONS (Continued)

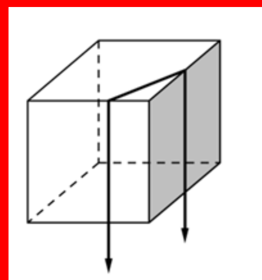
Create each three-dimensional (3-D) solid listed below, and explore different ways to create cross sections that produce different shapes. Slice your solids in different directions (e.g., perpendicular to the base, parallel to the base, diagonally, etc.) and draw the two-dimensional (2-D) cross sections. Save your best models to share with the class.

Diagram of 3-D Shape	Draw 2-D cross sections, name them, and describe how you got them
4. right rectangular pyramid	
5. triangular pyramid	
6. different 3-D solid of your choice	

VISUALIZING CROSS SECTIONS

Name each solid, name the shape of the cross section, and draw the cross section.

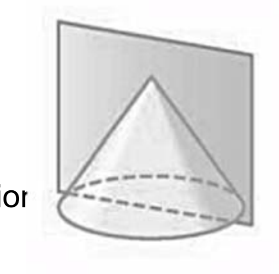
1. Name of solid:



Name of cross section:

Draw cross section:

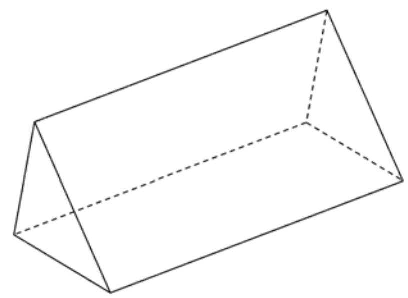
2. Name of solid:



Name of cross sectior

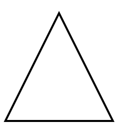
Draw cross section:

3. Consider the box pictured to the right.

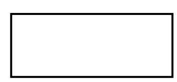


- Circle the figure(s) below that cannot be a cross section of the gift box.
- For the other figures, describe how the plane slices the gift box to make that cross section.

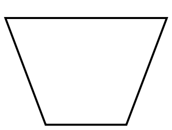
a.



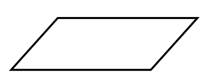
b.



c.

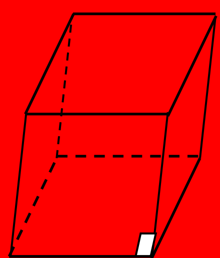
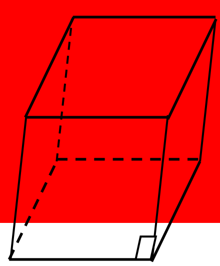
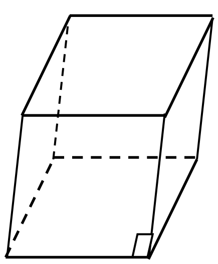


d.



PRACTICE 1

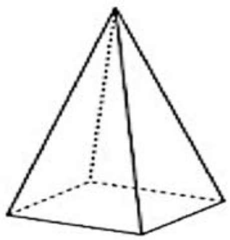
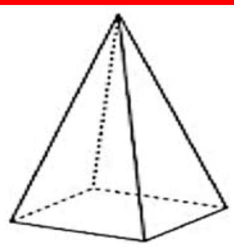
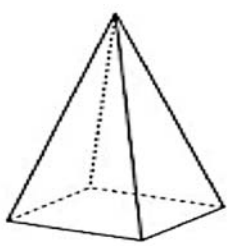
1. Below is a <u>right rectangular prism</u>. Show three different ways to slice through the figure. Then draw and describe the resulting cross sections.

Right Rectangular Prism (draw plane slices here)	**Drawing and Description of Cross Section**
1st 	
2nd 	
3rd 	

2. Name a real-life object that is very close to being a right rectangular prism. Sketch it here. Show how you could slice it. Sketch and describe the cross section.

PRACTICE 2

1. Here is a right rectangular pyramid. Show three different ways to slice through the figure. Then draw and describe the resulting cross sections.

Right Rectangular Pyramid (draw plane slices here)	**Drawing and Description of Cross Section**
1st 	
2nd 	
3rd 	

2. Explain what happens when you slice through the apex parallel to the rectangular base of the pyramid.

SKILL BUILDERS, VOCABULARY, AND REVIEW

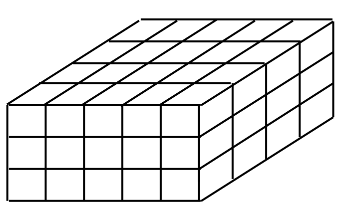
SKILL BUILDER 1

Compute.

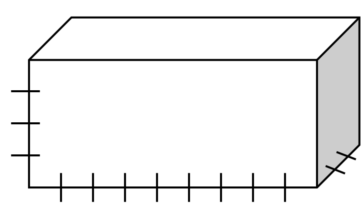
1. $-\frac{5}{6}\left(2\frac{2}{3} - \frac{1}{2}\right)$	2. $5\frac{1}{2} + \left(-4\frac{2}{5}\right)\left(2\frac{1}{2}\right)$	3. $\left(3\frac{1}{3} - 4\frac{3}{5}\right) \div (-5)$
4. $-5.6 - 3.82(2)$	5. $5.75 - 8.45 + 4$	6. $\frac{4.8 - 5.4}{2}$

Find the volume and surface area for each right rectangular prism below.

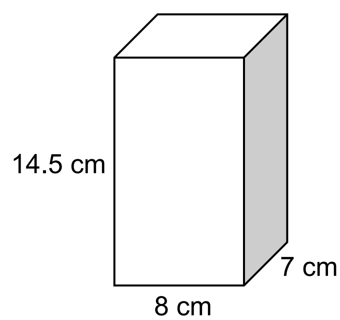
7. Assume that each small square below is one square unit.



8. Assume the tick marks are spaced one unit apart.



9.



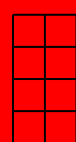
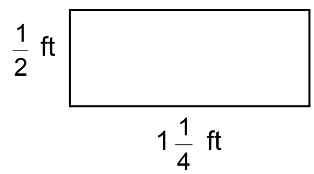
10. A circular rug has a radius of 7 ft. Find its circumference and area.

SKILL BUILDER 2

Simplify each expression below. Then use the distributive property and the GCF of the terms to rewrite each expression so that it is a product of factors.

1. $4n + 1 + 2n + 2$	2. $5(n + 4) - 8n + 4$	3. $-3(n + 1) - 2n - 12$

Each picture below represents the base of a right rectangular prism. Find the volume and surface area of each.

4. Each small square measures 1 square cm. The prism's height is 9 cm. 	5. The prism's height is 7 inches. 

Solve.

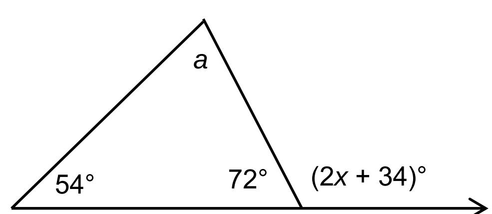
6. $4x + 6 = -18$	7. $12 = \frac{y}{5} + 20$	8. $-2(w - 8) = 6$

9. A circle has an area of approximately 254.34 square units. What is its radius?

Use the figure to the right for problems 10 and 11.

10. Find the measure of $\angle a$.

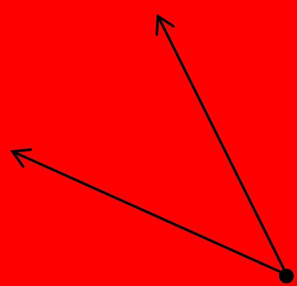
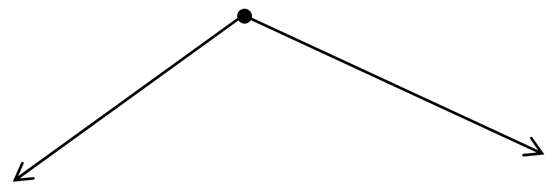
11. Find the value of x.



The drawing is not to scale.

SKILL BUILDER 3

State whether each angle below appears to be acute, right, obtuse, or straight. Then use a protractor to find and record the measure.

1. ____________ 	2. __________ 

3. Consider the probability experiment of rolling two fair number cubes. Create a display to show the sample space for the experiment. Then find the probability of rolling an even product.

On a map, 1 inch represents $\frac{1}{3}$ mile.

4. Jefferson Elementary and Adams Middle School are 6 inches apart on the map. What is the actual distance between the two schools?	5. Haynes Lane is 5.5 miles long. How long would it be on the map?

6. A rocket is 15 meters tall and a scale model of the same rocket is 10 cm tall. What is the scale for the model?

7. Xavier High School had 340 students graduate in 2014. In 2015, 390 students graduated from Xavier. What is the percent increase in the number of graduates from 2014 to 2015?

SKILL BUILDER 4

1. Two children shared 35 balloons in the ratio of 2 to 3. How many balloons did each child get?

2. Enrique goes 3 laps around a playing field in 10 minutes. If 7 laps is 1 mile, is he jogging or walking?

3. Complete the table for Enrique's information, assuming he continued at a constant rate.

# of laps	3		12	15	1		
Time (min)		5				35	1

4. What is Enrique's unit rate in laps per minute? ____________

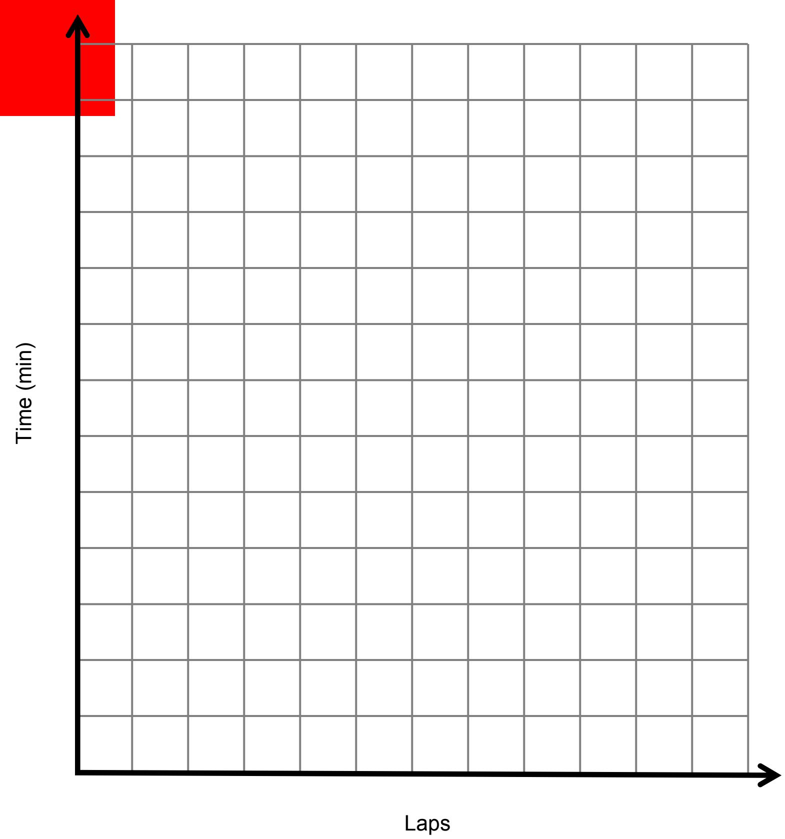
5. Graph the entries from the table as ordered pairs to the right. Be sure to scale the axes appropriately. You may use a different scale on each axis.

6. Does the point (0, 0) "line up" with the other points you graphed?

7. What does (0, 0) represent in the context of the problem?

8. The graph includes the ordered pair (1, _____).

   What do these coordinates represent in the context of the problem?



SKILL BUILDER 5

1. A fish swims 37 feet below sea level, rises 13 feet, and then dives down 20 feet. At the end of the dive, what is the elevation of the fish relative to sea level?

Solve each inequality and graph the solution.

2. $2x + 5 > -7$	3. $-\frac{x}{2} + 5 \leq 2$	4. $8 - x < 4$

5. Which of the following equations could be the result of using the "cross multiplication property" to solve the equation $-\frac{2}{3} = \frac{x}{5}$.

$-10 = 3x$ $\qquad$ $-10 = -3x$ $\qquad$ $10 = 3x$ $\qquad$ $-3x = 10$

6. Odette sold $2,800 worth of merchandise in January. In February, her sales increased by 15%. What is the dollar amount of the merchandise she sold in February?

7. Draw an isosceles triangle with two sides of length equal to 2.5 cm.	8. Draw a quadrilateral that has exactly one set of parallel sides and two right angles.

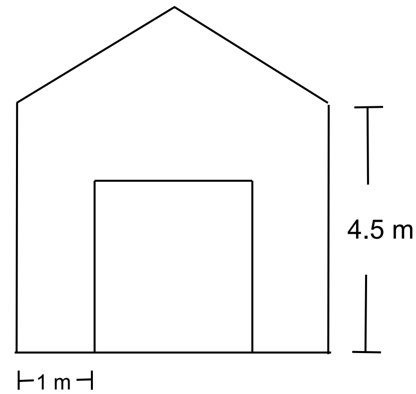
9. Two students had the following test scores in math class:

Mingo : 70, 82, 92, 82, 90, 68 $\qquad$ Mallie: 65, 95, 90, 90, 72, 92

Use one measure of center and one measure of variability to compare their scores.

SKILL BUILDER 6

The front of a garage, except for the door, needs to be painted.



- The door is centered on the front of the garage.
- The height of the door is half of the height of the garage.
- The garage is 5 m wide and 6.6 m high.

1. Find the area that needs to be painted.

2. What percent of the area of the front of the garage is the door?

3. A bucket of paint covers 2.5 sq m. How many buckets of paint will be needed?

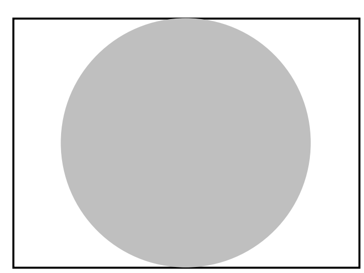
4. A triangle has an area of 6 sq ft and a height of 4 ft. How long is its base?

5. Find the area of a parallelogram if its base is three times its height of 8 cm.

A rectangular flag has a circle in it, as in the diagram below. The dimensions of the entire flag are 4 feet 6 inches by 2 feet 8 inches.

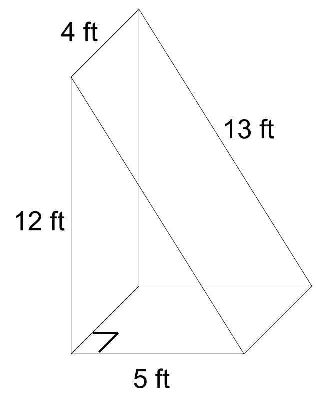
6. Find the area of the flag.

7. What percent of the flag's area is the circle?



SKILL BUILDER 7

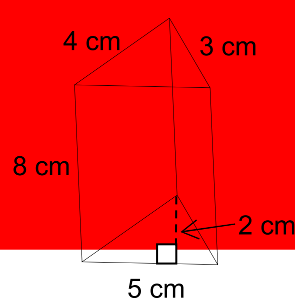
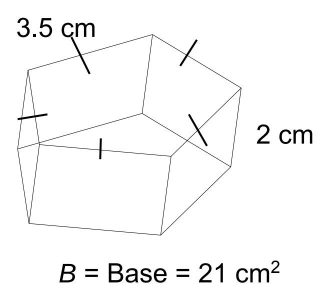
1. Name the figure pictured to the right.



2. Find its volume.

3. Find its surface area.

Find the volume and surface area of each figure below. The figures are not to scale.

4. 	5. 

The volume of a cube is 8 cubic ft.

6. How long is each edge?	7. What is its surface area?
8. If you multiply each dimension by 3, by what factor does the volume increase?	

SKILL BUILDER 8

1. Draw a square pyramid.

2. If you slice this pyramid perpendicular to the base through the vertex, what shape do you get?

3. If you slice this pyramid parallel to the base, what shape do you get?

4. Describe how you could slice the pyramid to get a trapezoid.

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5. If you slice a sphere through its diameter, what shape do you get?

---

6. Draw a cylinder.

7. If you slice this cylinder perpendicular to the base, what shape do you get?

8. If you slice this cylinder parallel to the base, what shape do you get?

9. Explain whether it is possible to get a triangle when slicing a cylinder.

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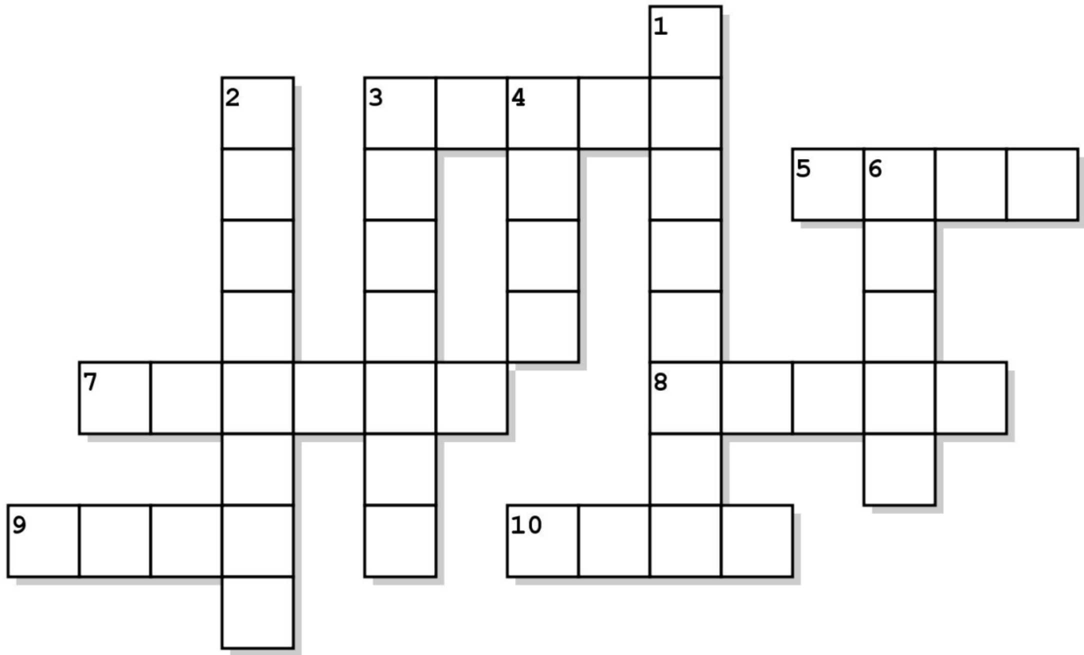
10. If you slice an octagonal prism parallel to the base, what shape do you get?

FOCUS ON VOCABULARY



Across

3 A flat surface in 3-D space that extends to infinity in all directions.

5 The vertex opposite to the base in a pyramid.

7 measurement in cubic units

8 a slice of a 3-D figure (______ section)

9 A cube has 6 faces, 8 vertices, and 12 ______s.

10 A pyramid has only one of these special faces, and a prism has two.

Down

1 plural of vertex

2 lines that never meet

3 solid with an apex

4 measurement in square units

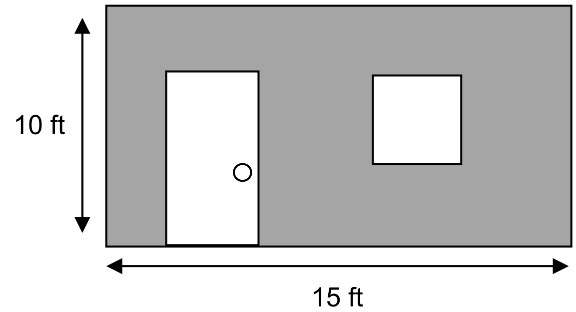
6 solid with two parallel bases

(For word hints, see the word bank and other vocabulary used in this packet.)

SELECTED RESPONSE

Show your work on a separate sheet of paper and select the best answer(s).

- In the diagram to the right, the wall is the shaded region without the window and door.
- The door is 7 feet high and 3 feet wide.
- The window is a square with a side 3 feet long.



Use the diagram to answer problems 1-3.

1. What is the total area of the door and the window?

   A. 21 sq ft B. 30 sq ft C. 150 sq ft D. 189 sq ft

2. What is the area of the wall?

   A. 50 sq ft B. 120 sq ft C. 150 sq ft D. None of these

3. Choose all the statements below that describe problems for which the diagram above could be useful.

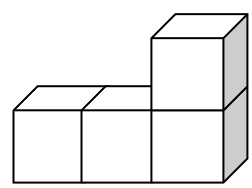
   A. Calculating the amount of carpet needed to cover the floor.

   B. Determining the amount of paint needed to paint the wall.

   C. Figuring out the amount of glass needed for the window.

   D. Finding the volume of the room.

4. The figure to the right is made of 4 cubes that measure $\frac{1}{2}$ cm on each edge. Choose all the statements that are true for this figure.



   A. $V = \frac{1}{2}$ cm^3

   B. $V = 4$ cm^3

   C. $SA = 4\frac{1}{2}$ cm^2

   D. $SA = 18$ cm^2

5. Taylor cuts a solid figure and sees that the cross section is a triangle. Choose all the solids that Taylor could have cut.

   A. A prism with a square base.

   B. A pyramid with a square base.

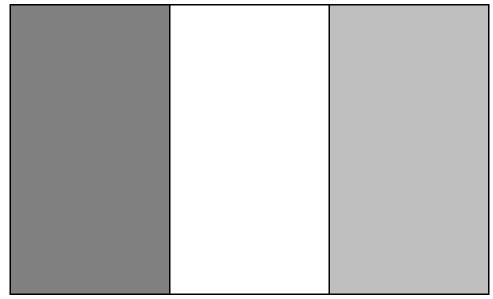
   C. A prism with a triangular base.

   D. A pyramid with a triangular base.

KNOWLEDGE CHECK

Show your work on a separate sheet of paper and write your answers on this page.

16.1 Problems Involving Plane Figures



A diagram of the Irish flag is shown on the right. The diagram measures 1.5 inches by 2.5 inches. It is made of three colors: green on the left, white in the middle, and orange on the right. Each section has the same area.

1. What percent of the flag is not white?

2. A group of students made an Irish flag that measures 3 feet high by 5 feet wide. How much of each fabric color did they need?

3. If the students made the actual flag using the diagram above, what scale did they use?

16.2 Problems Involving Solid Figures

The length of a rectangular prism is 9 cm. The height is one-third of the length. The width is 4 cm less than the length.

4. Sketch the prism and label the dimensions.

5. Find the surface area and volume of the prism.

16.3 Cross Sections of Solid Figures

6. Sketch a triangular pyramid. Draw a slice that shows a cross section resulting in a triangle.

HOME-SCHOOL CONNECTION

Here are some problems to review with your young mathematician.

1. Search online for an image of a flag that is composed of simple shapes and draw it. As an alternative, make one up. Label some lengths and areas. Use appropriate tools and units of measurement.

2. Find a rectangular prism in your home. Sketch it here, and identify it. Measure the relevant dimensions of the prism and include them on your sketch. Then find the surface area and the volume.

3. Identify a 3-D object in your home that is NOT a rectangular prism. Draw a sketch of it here. Sketch and describe two different cross sections of the object.

Parent (or Guardian) Signature ______________________________

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COMMON CORE STATE STANDARDS – MATHEMATICS

STANDARDS FOR MATHEMATICAL CONTENT	
7.NS.A	**Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.**
7.NS.3	Solve real-world and mathematical problems involving the four operations with rational numbers.
7.EE.B	**Solve real-life and mathematical problems using numerical and algebraic expressions and equations.**
7.EE.3	Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. *For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.*
7.G.A	**Draw, construct and describe geometrical figures and describe the relationships between them.**
7.G.1	Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.
7.G.3	Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.
7.G.B	**Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.**
7.G.6	Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

STANDARDS FOR MATHEMATICAL PRACTICE	
MP1	Make sense of problems and persevere in solving them.
MP3	Construct viable arguments and critique the reasoning of others.
MP4	Model with mathematics.
MP5	Use appropriate tools strategically.
MP6	Attend to precision.
MP7	Look for and make use of structure.
MP8	Look for and express regularity in repeated reasoning.

9 7 8 1 6 1 4 4 5 0 7 5 7