Name ______________________________ Period __________ Date _____________

6-13
STUDENT PACKET

MATHLINKS: GRADE 6
STUDENT PACKET 13
GEOMETRY

WORD BANK

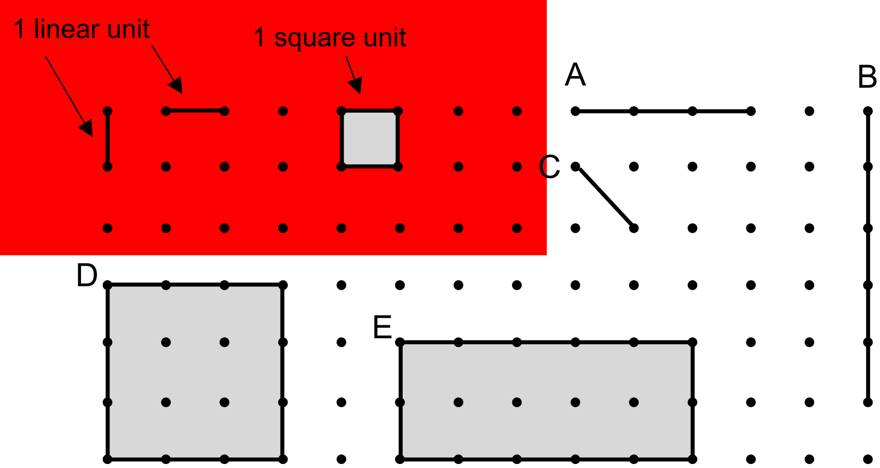
Word or Phrase	Definition or Description	Example or Picture
altitude of a parallelogram		
apex of a pyramid		
area		
base of a polyhedron		
net		
polygon		
polyhedron		
prism		
pyramid		
surface area		
volume		

AREAS OF POLYGONS

Summary	Goals
We will establish formulas for areas of parallelograms, triangles, and trapezoids. We will find areas of irregular polygons. We will apply area formulas to solve problems.	• Derive formulas for the areas of parallelograms, triangles, and trapezoids. • Find areas of irregular polygons. • Solve real-world and mathematical problems that involve area.

Warmup

One unit of length (1 linear unit) and one unit of area (1 square unit) are defined below.



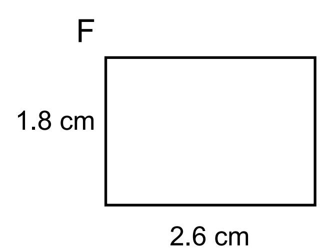
1. Find the length of the segment labeled: A. ___________ B. ___________

2. Is the length of the segment labeled C equal to 1 linear unit? ___________
   Explain how you know.

3. Find the area of the figure labeled D. ___________

4. Find the area of the figure labeled E. ___________

5. Find the area of the rectangle to the right labeled F. ___________



AREA FORMULAS

Fill in the table below when instructed by your teacher.

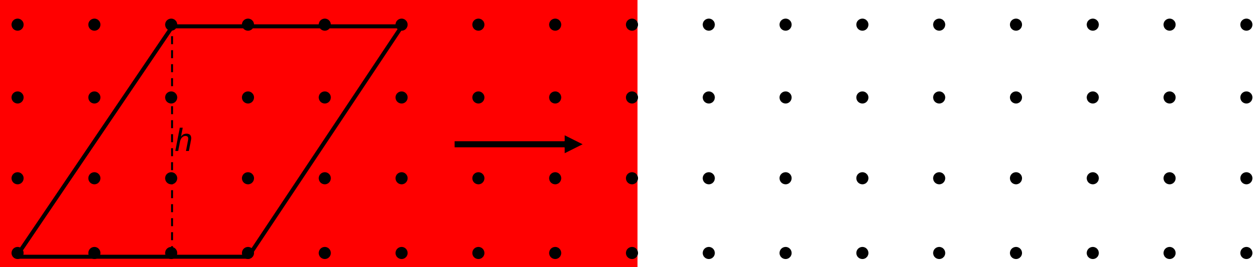
Shape with Definition or Description	**Sketch**	**Area Formula**
1. Rectangle:		
2. Square:		
3. Parallelogram:		
4. Rhombus:		
5. Triangle:		
6. Trapezoid:		

AREAS OF PARALLELOGRAMS

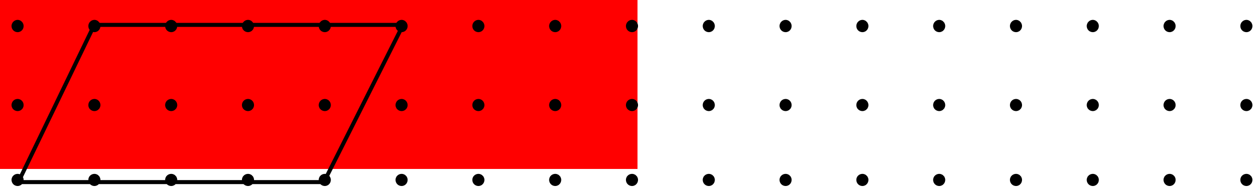
A parallelogram is a quadrilateral in which opposite sides are parallel. In a parallelogram, opposite sides have equal length, and opposite angles have equal measure.

- Use a straightedge to draw an altitude of each parallelogram.
- Rearrange the pieces of the parallelogram to form a rectangle with the same area.
- Draw the rectangle next to the corresponding parallelogram.
- Find the area of each figure.

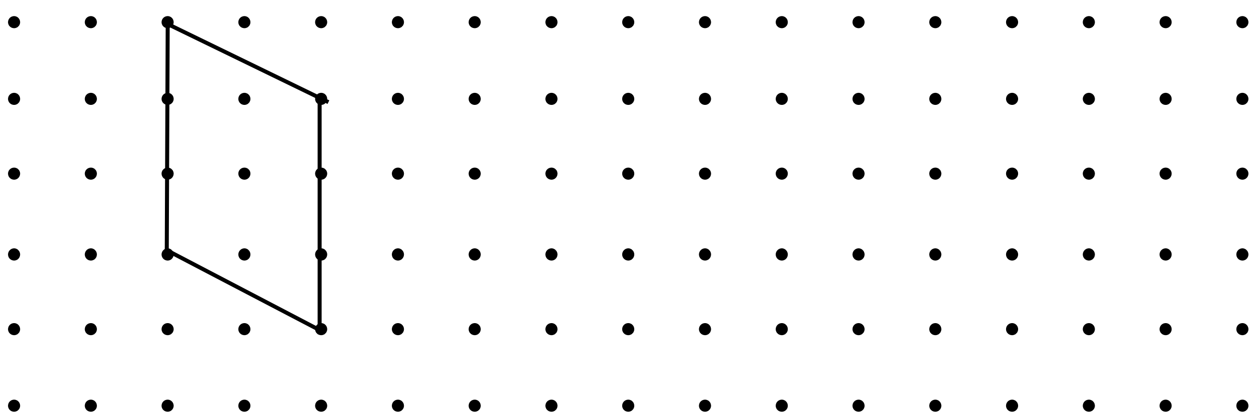
1.



2.



3.



4. Is a rectangle also a parallelogram? Explain.

5. Write in words: The area of a parallelogram is equal to…

6. Write in symbols: $A_{\text{▱}}$ = ____________________

AREA PRACTICE 1

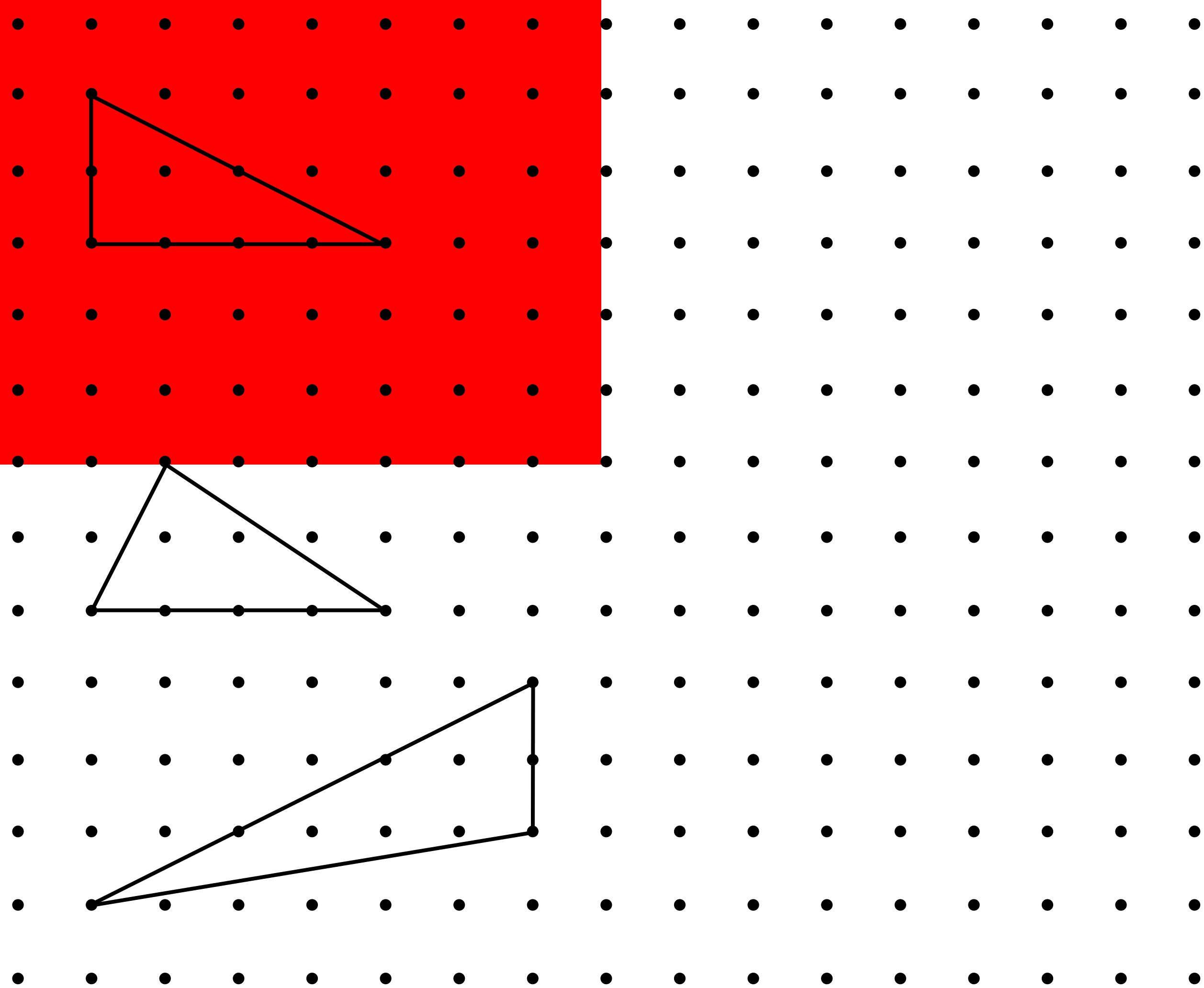
Draw a picture, write an appropriate formula, and substitute to solve each problem.

1. Find the area of a square tabletop whose side is 25 inches.	2. Find the area of a parallelogram with a base of 10 inches and a height of 4 inches.
a. Sketch the figure:	a. Sketch the figure:
b. Write an appropriate formula:	b. Write an appropriate formula:
c. Substitute:	c. Substitute:
d. What is the area of the square? (Use appropriate units.)	d. What is the area of the parallelogram? (Use appropriate units.)
e. If this square space were a tabletop, would it be big enough for a laptop computer? Explain.	e. Do you think this parallelogram would be big enough for the base of a free standing basketball hoop? Explain

AREAS OF TRIANGLES

A triangle is a polygon with three sides.

- Duplicate (or copy) each triangle.
- Rearrange the two triangular pieces to form a rectangle or a parallelogram.
- Draw the rectangle or parallelogram next to the corresponding triangle or on the triangle.
- Find the area of each triangle.


1.
2.
3.

4. Write in words: The area of a triangle is equal to…

5. Write in symbols: $A_{\triangle}$ = ________________

AREA PRACTICE 2

Draw a picture, write an appropriate formula, and substitute to solve each problem.

1. Find the area of an isosceles triangle with a height of 20 cm and a base of 3 cm.

   a. Sketch a figure:

   b. Write an appropriate formula:

   c. Substitute:

   d. What is the area of the triangle? (Use appropriate units.)

   e. Do you think this triangle would make a good outline for a drawing of a clown hat? Explain.

2. Madeleine is building a tabletop in the shape of a triangle. The area of the triangle is 1,200 square centimeters, and the base is 60 centimeters.

   a. Sketch two possible figures that meet these conditions:

   b. Write an appropriate formula:

   c. Substitute:

   d. What is the height of the triangle? (Use appropriate units.)

   e. Do you think this tabletop would be a good size and shape for the bottom of a hamster cage? Explain.

AREAS OF TRAPEZOIDS

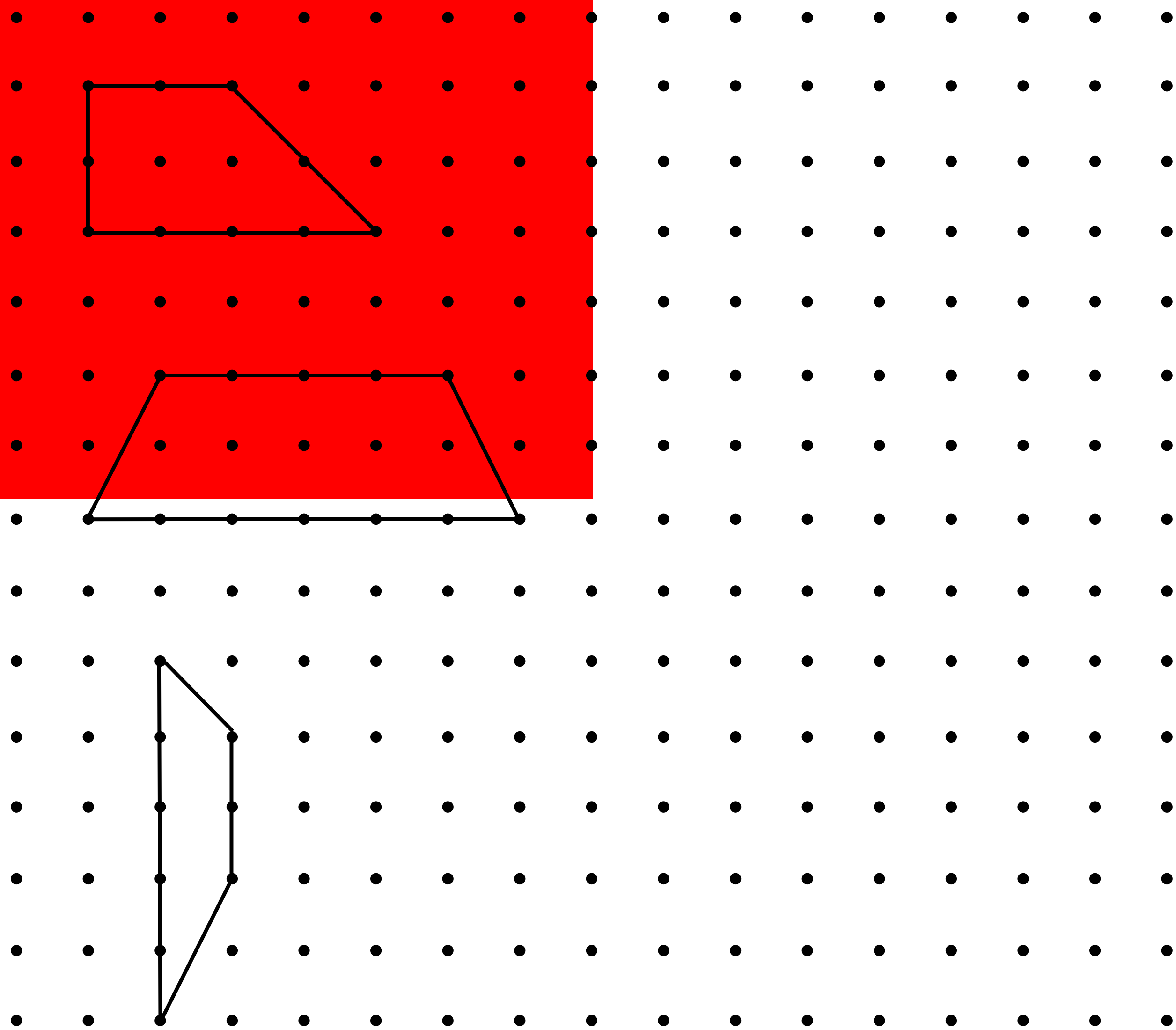
A <u>trapezoid</u> is a quadrilateral which has at least one pair of parallel sides.

- Duplicate each trapezoid.
- Rearrange the two pieces to form a rectangle or a parallelogram.
- Draw the rectangle or parallelogram next to the corresponding trapezoid or on the trapezoid.
- Find the area of each trapezoid.

1.

2.

3.



4. Write in words: The area of a trapezoid is equal to…

5. Write in symbols: $A_{⏢}$ = ________________

AREA PRACTICE 3

Draw a picture, write an appropriate formula, and substitute to solve each problem.

1. The height of an isosceles trapezoid measures 2 inches and the bases measure 7 inches and 13 inches. Find its area.	2. The height of a right trapezoid measures 6 cm and the bases measure 5 cm and 8 cm. Find its area.
a. Sketch the figure:	a. Sketch the figure:
b. Write an appropriate formula:	b. Write an appropriate formula:
c. Substitute:	c. Substitute:
d. What is the area of the isosceles trapezoid? (Use appropriate units.)	d. What is the area of the right trapezoid? (Use appropriate units.)
e. Do you think this trapezoid is a good size for a placemat on a table? Explain.	e. Do you think this trapezoid could be a tabletop for a computer? Explain.

MEASURING TO FIND AREAS OF POLYGONS

For each problem:

- Identify the polygon and the corresponding area formula.
- Measure and label the relevant dimensions to the nearest tenth of a cm (mm).
- Write the appropriate area formula.
- Substitute values into the formula and evaluate to find the area.
- Use appropriate units in your answers.

1. Polygon name:

Area formula:

Substitute:

A = ____________________

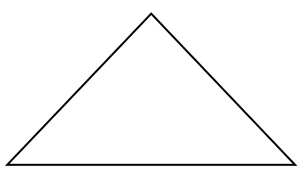
2. Polygon name:

Area formula:

Substitute:

A = ____________________

3. Polygon name:

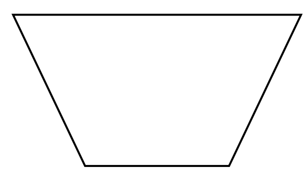


Area formula:

Substitute:

A = ____________________

4. Polygon name:



Area formula:

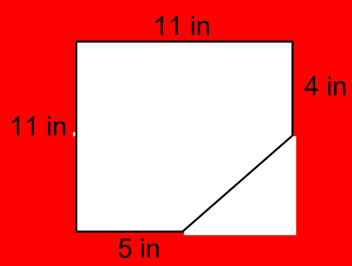
Substitute:

A = ____________________

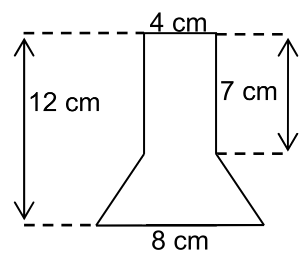
AREAS OF COMPOSITE FIGURES

Below are several composite figures, formed from simple figures that do not overlap. Find the area of each composite figure below in square units. Assume any angle that appears to be a right angle is a right angle. Figures are not drawn to scale. Show your work and your answers clearly.

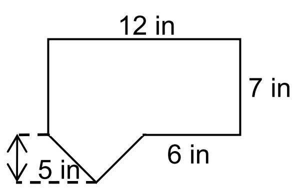
1.



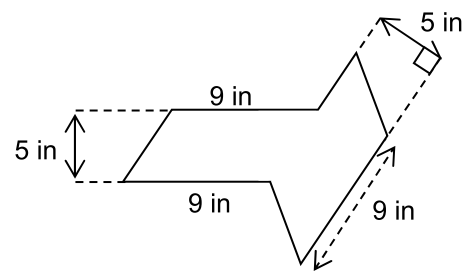
2.



3.



4.



THE DISPLAY BOARD PROBLEM

This problem is about making a display board for a science fair project. You will use important geometry and measurement skills.

- The display board you create must be a 3 feet by 4 feet rectangle.
- The title sheet on the display board must be cut from an $8\frac{1}{2}$-inch by 11-inch piece of paper in the shape of an isosceles trapezoid. One base is $8\frac{1}{2}$ inches, and the other is 6 inches.
- You put a large picture in the center of the display board inside an isosceles triangle that is also cut from an $8\frac{1}{2}$-inch by 11-inch a piece of paper. The base of the triangle is 11 inches and the height is $8\frac{1}{2}$ inches.

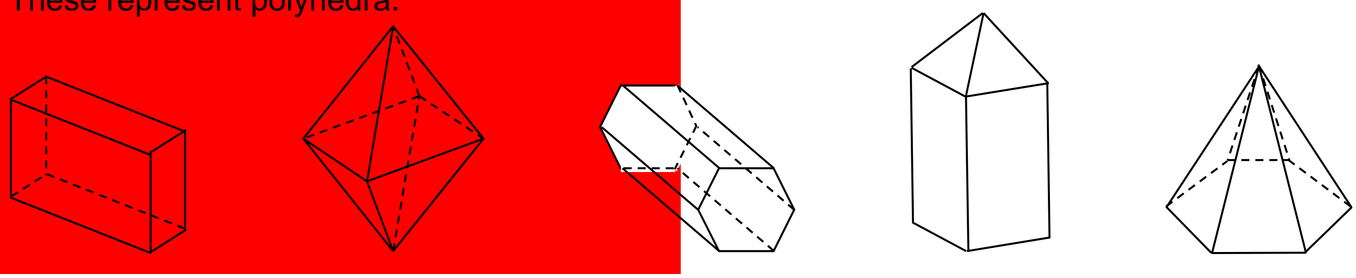
1. Make a sample of your title sheet. Label all the measurements you will need to find its area.
2. Use graph paper to make a scale drawing of the display board with the title sheet. You may put the title sheet and picture wherever you like.
3. Find the area of the display board.
4. Find the area of the title sheet.
5. Find the area of the triangle with the picture on it.
6. Find the area of the remaining space you can use on the display board after the title sheet and triangle with the picture are attached.

VOLUME

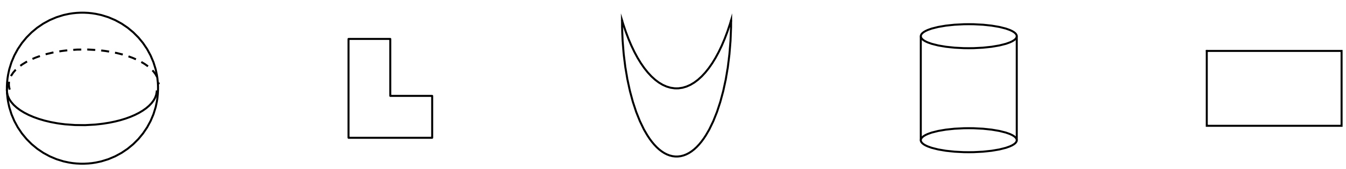
Summary	Goals
We will establish formulas for the volume of a right rectangular prism in three ways. We will solve real-world and mathematical problems that involve volume.	• Distinguish polyhedra from non-polyhedra. • Derive formulas for the volume of a right rectangular prism. • Solve real-world and mathematical problems that involve volume.

Warmup

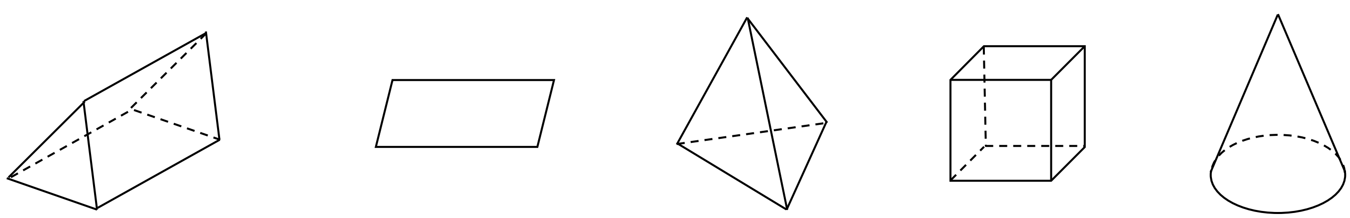
These represent polyhedra.



These do not represent polyhedra.



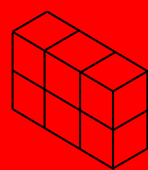
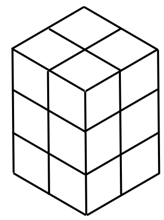
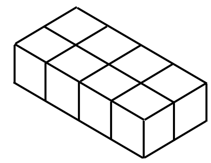
1. Circle the shapes that represent polyhedra.



2. What do you think are some properties of polyhedra?

RIGHT RECTANGULAR PRISMS

A right rectangular prism is a six-sided polyhedron in which all the faces are rectangles. The opposite faces are parallel to each other.

	Prism A	Prism B	Prism C
1. Build each right rectangular prism using cubes.			
2. Count the number of cubes needed to build each right rectangular prism.	______ cubic units	______ cu. units	______ u^3
3. Shade the top layer of cubes for each prism above. Find the volume of the top layer.			
4. How many layers are in each prism?			

5. How does knowing the volume of the top layer and the number of layers help you determine the number of cubes (volume) in the figure?

6. The area of a rectangle is length × width ($A = \ell w$). Find the area of the top surface for each prism.	______ square units	______ sq. units	______ units^2
7. Find the height (h) of each prism.	______ units	______ units	______ units

8. How does knowing the height and the area of the top surface help you determine the number of cubes (volume) in a right rectangular prism?

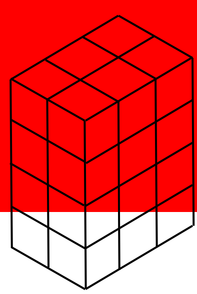
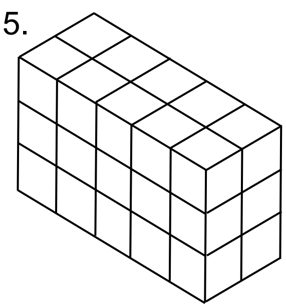
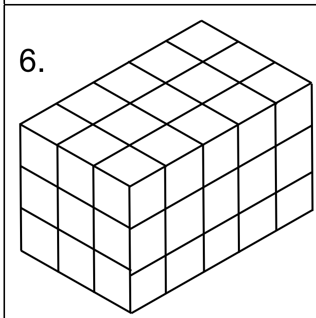
STRATEGIES FOR FINDING VOLUME

1. Arnon said, "I like to find the volume of a right rectangular prism by finding the volume of the top layer of the prism and multiplying that by the number of layers." Write Arnon's strategy using symbols.

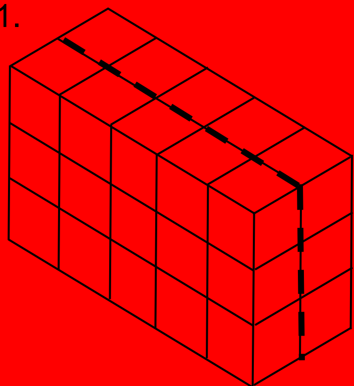
2. Betsy said, "To find the volume of a rectangular prism, I like to multiply length, width, and height together." Write Betsy's strategy using symbols.

3. Camille said, "I like to call the top surface of the prism the 'base.' To find the volume, I like to multiply the area of the base by the height." Write Camille's strategy using symbols.

Find the volume of each right rectangular prism using:

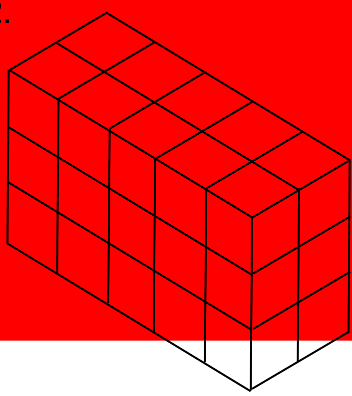
	Arnon's strategy	**Betsy's strategy**	**Camille's strategy**
4. 	Volume $_{\text{top layer}}$ ______ Number of layers ________________ V = ______________	length ___________ width ____________ height ___________ V = ______________	Area of base _____ height ___________ V = ______________
5. 	V $_{\text{top layer}}$ __________ # of layers ________ V = ______________	ℓ ______________ w ______________ h ______________ V = ______________	B ______________ h ______________ V = ______________
6. 			

SLICING A PRISM IN HALF

1. 

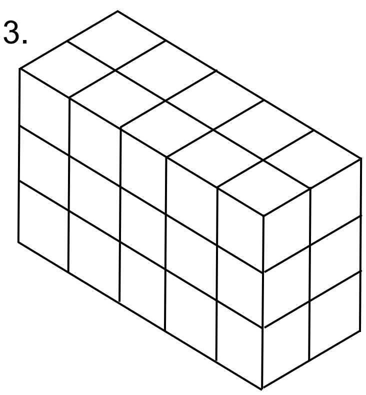
Cut the prism in half with a vertical cut. Shade half of the prism. Use Arnon's strategy to find the volume of the shaded half of the prism.

$V_{\text{top layer}}$ = _____ # of layers = _____

2. 

Cut the prism in half with a different vertical cut. You may need to cut in the middle of some blocks to do this. Shade half of the prism. Use Betsy's strategy to find the volume of the shaded half of the prism.

ℓ = _____ w = _____ h = _____

3. 

Cut the prism in half with a horizontal cut. You may need to cut in the middle of some blocks to do this. Shade half of the prism. Use Camille's strategy to find the volume of the shaded half of the prism.

B = _____ h = _____

4. How do the volumes on this page compare to the volume computed on problem 5 on page 14?

5. Which volume formula do you prefer to use? ______________________ Why?

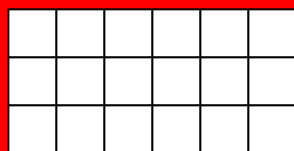
VOLUME OF PRISMS

Volume of a right rectangular prism:
$V = \ell wh$ or $V = Bh$

Find the volume of each right rectangular prism without counting all of the cubes in the layers individually.

1. Top view of the prism:

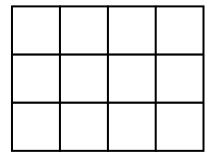
Height of the prism: 12 units



Volume of the prism: ________________

2. Top view of the prism:

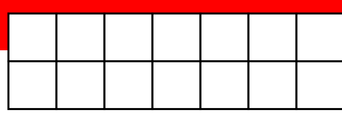
Height of the prism: $3\frac{1}{2}$ units



Volume of the prism: ________________

3. Top view of the prism:

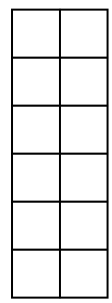
Height of the prism: 7 units



Volume of the prism: ________________

4. Top view of the prism:

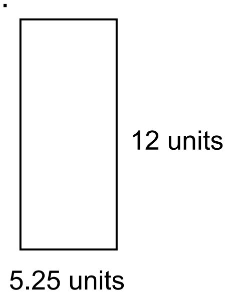
Height of the prism: $\frac{3}{4}$ units



Volume of the prism: ________________

5. Top view of the prism:

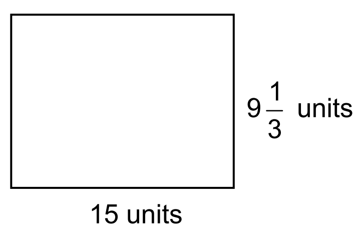
Height of the prism: 3 units



Volume of the prism: ________________

6. Top view of the prism:

Height of the Prism: 2.5 units

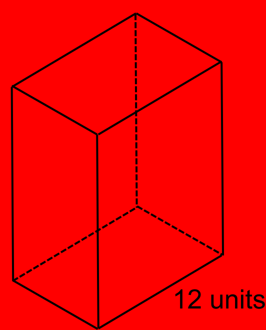


Volume of the prism: ________________

VOLUME OF PRISMS (Continued)

For each RIGHT rectangular prism below, use the formula $V = \ell wh$ or $V = Bh$. Answer the questions below.

7. What could be the dimensions of this rectangular prism if the volume is 504 cubic units and all lengths are whole numbers?

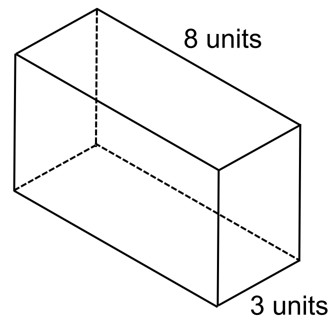


ℓ = 12 units

w = _____

h = _____

8. The volume of this rectangular prism is greater than 96 cubic units and less than 168 cubic units. What could be the height of the prism?



$h >$ _____

$h <$ _____

9. The length of the prism is 10 cm. The height is half the length. The width is 3 cm less than the length.

Determine the dimensions of the prism:

ℓ = _____ w = _____ h = _____

Sketch the prism (hint – use a drawing from above as a model):

Find the volume:

10. The width of the prism is 3.5 feet. The length is 3 times as long as the width. The height is 1 foot more than the width.

Determine the dimensions of the prism:

ℓ = _____ w = _____ h = _____

Sketch the prism:

Find the volume:

WHAT IF?

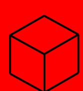
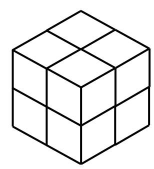
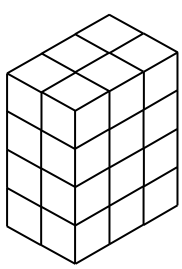
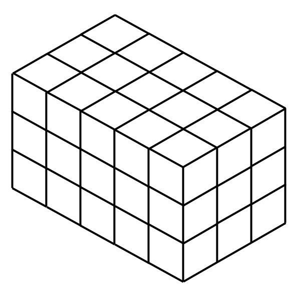
Volume of a right rectangular prism:

$V = \ell wh$ or $V = Bh$

Let ℓ = length w = __________ h = __________ B = ___________

Volume is measured in _______________________________________

What if the side length of each small cube on this page was $\frac{1}{2}$ unit? Find the volumes.

1. ℓ = _____ w = _____ h = _____  → $\frac{1}{2}$ unit of length Label the lengths of the cube. Find the volume of the cube.	2. ℓ = _____ w = _____ h = _____  Find the volume by counting cubes. Find the volume using a formula.
3. ℓ = _____ w = _____ h = _____  Find the volume by counting cubes. Find the volume using a formula.	4. ℓ = _____ w = _____ h = _____  Find the volume by counting cubes. Find the volume using a formula.

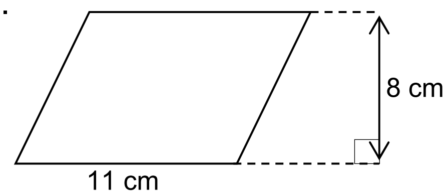
SURFACE AREA

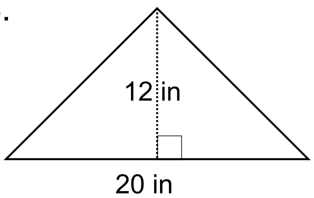
Summary	Goals
We will construct polyhedra from nets. We will use nets to find surface areas of polyhedra.	• Use nets to create polyhedra. • Determine the surface areas of polyhedra using nets. • Solve real-world and mathematical problems that involve surface area.

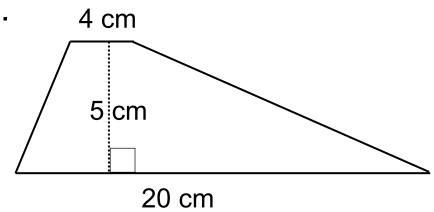
Warmup

Find the area of each figure.

1.


2.


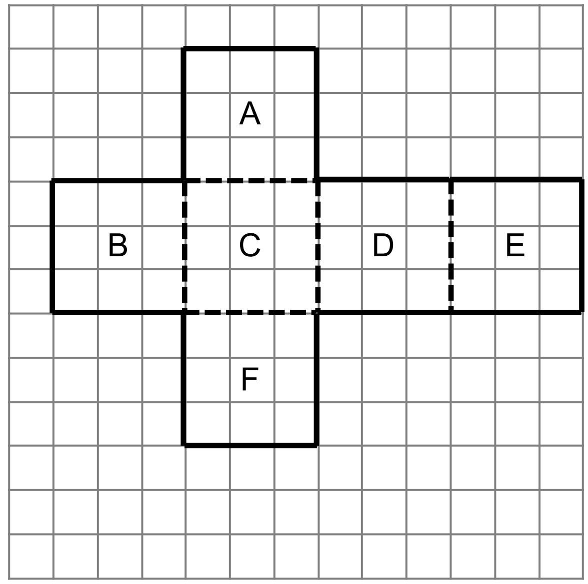
3.


4.


FINDING SURFACE AREAS OF POLYHEDRA

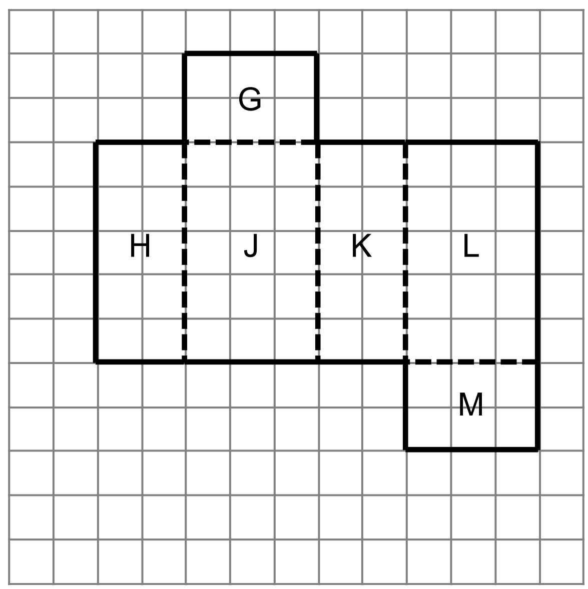
Your teacher will give you some nets to cut out and tape to create polyhedra. Find the surface area (SA), including units. Show your work or explain.

1. Name of polyhedron pictured:



SA = ___________

2. Name of polyhedron pictured:

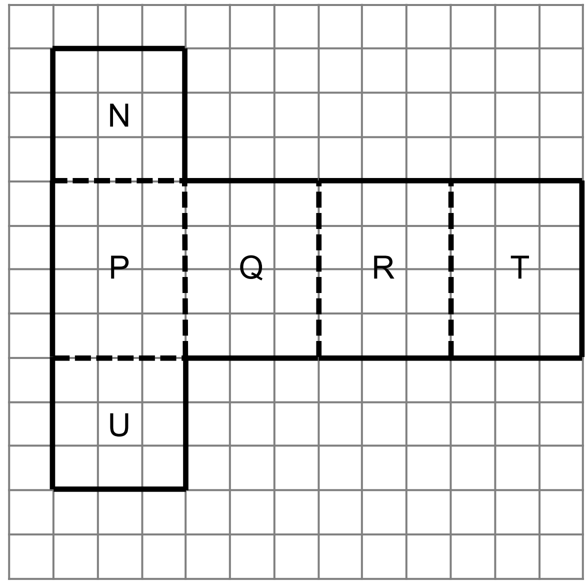


SA = ___________

FINDING SURFACE AREAS OF POLYHEDRA (Continued)

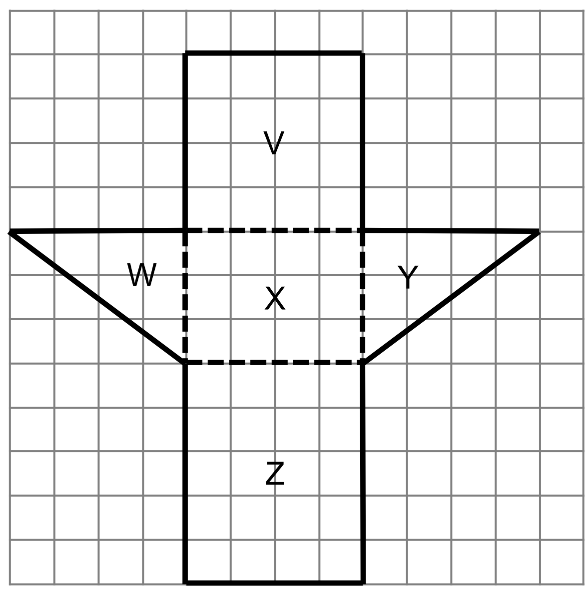
3. Name of polyhedron pictured:

SA = ___________



4. Name of polyhedron pictured:

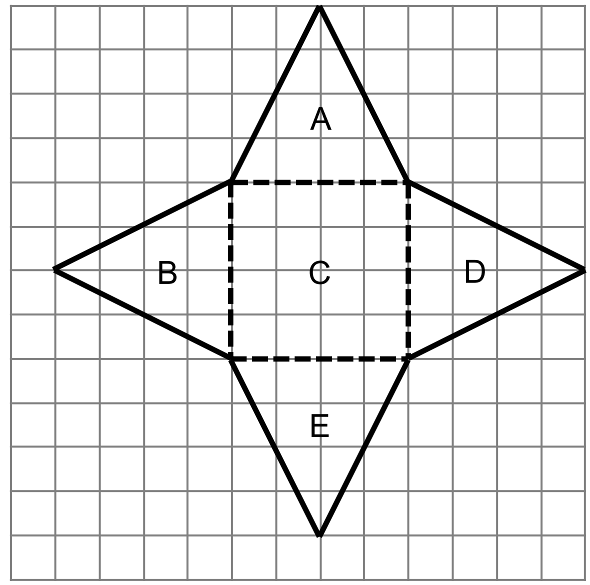
SA = ___________



5. Explain how the polyhedron model you built in problem 4 is different from the polyhedra models in problems 1-3.

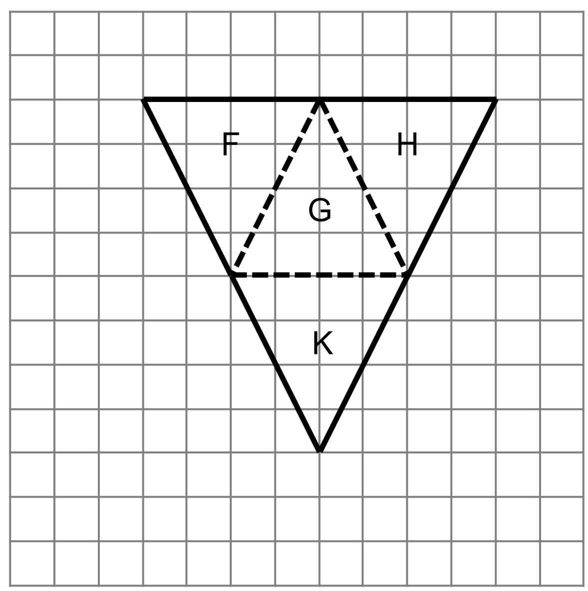
FINDING SURFACE AREAS OF POLYHEDRA (Continued)

6. Name of polyhedron pictured:



SA = ___________

7. Name of polyhedron pictured:



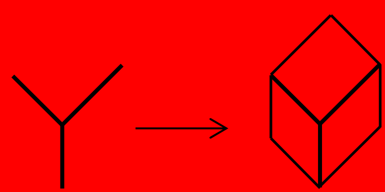
SA = ___________

8. Explain how the polyhedra models on this page are different than those you built in problems 1-4.

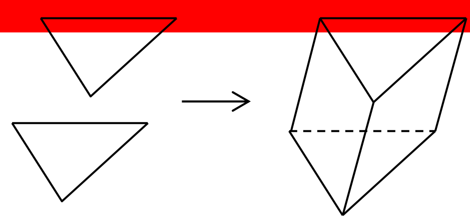
STRATEGIES FOR SKETCHING POLYHEDRA

Here are a few simple tricks to help you sketch polyhedra. Try these, or share some of your own techniques with your classmates.

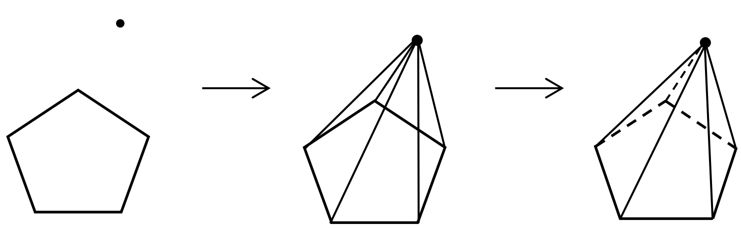
1. Start with a "Y." Then add parallel lines to complete the figure. This technique works well when drawing cubes or rectangular prisms.



2. Start by drawing two congruent polygons. Then connect vertices to complete the figure. This technique works well when drawing polyhedra that have two parallel bases (prisms). You can also use dashed lines to indicate edges that cannot be seen if you like.



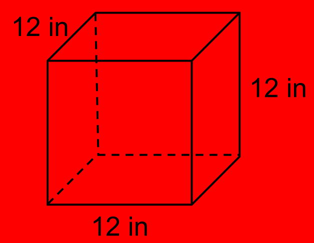
3. Start by drawing one polygon. Then put a point somewhere on the paper. Connect the point to the vertices of the polygon. Redraw using dashed lines to indicate edges you cannot see. This technique works well when drawing polyhedra with one base and an apex (pyramids).



SURFACE AREA PRACTICE

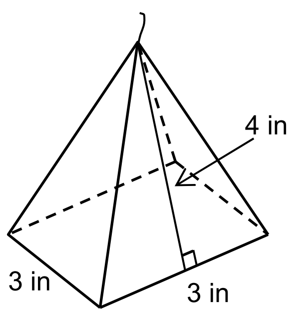
Sketch the faces for each object. Find its surface area. Then answer the related question. Diagrams are not to scale.

1. Gift box — Sketch the faces and find the surface area.



Will a piece of wrapping paper that is 18 inches by 18 inches be large enough to wrap the gift box? Explain.

2. Candle — Sketch the faces and find the surface area.

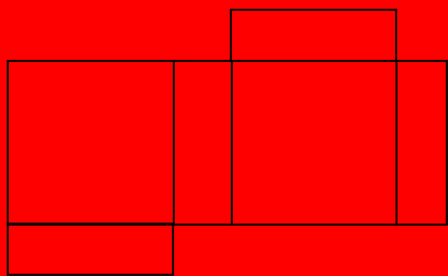


Will the candle fit inside the gift box in problem 1? Explain.

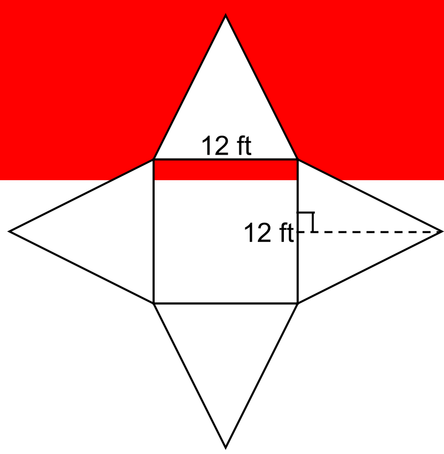
SURFACE AREA PRACTICE (Continued)

Sketch the polyhedron represented by the net and answer the question.

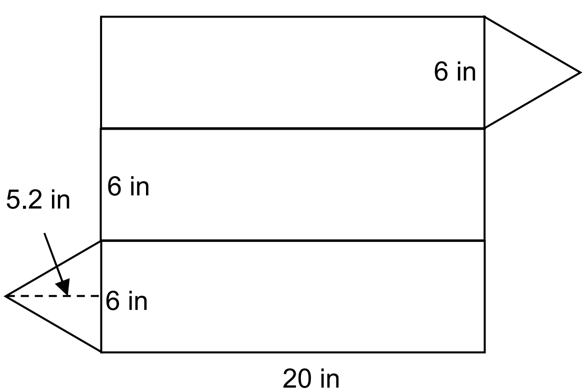
3. A puzzle box has a surface area of 96 square inches. The top and bottom faces of the box are squares with side lengths 6 inches. What is the height of the box?



4. This camping tent has a surface area of 432 square feet. The base of the tent is a square and the sides are isosceles triangles. What is the height of the triangular face?



5. What is the surface area of this shipping tube?



SKILL BUILDERS, VOCABULARY, AND REVIEW

SKILL BUILDER 1

About 1 out of 10 people are left-handed.

1. What is the ratio of left-handed people to total people?	2. What is the ratio of left-handed people to right-handed people?
3. In a group of 70 people, about how many people would you expect to be left-handed?	4. There are 14 people in a group who are left-handed. Estimate the size of the group.

(For problems 5-10) Kristin walks in a fundraiser for cancer research. She walks at a steady rate, completing 18 miles in 6 hours, and raises $1,440.

Write a unit rate that represents each of the following statements.

5. miles walked per hour	6. dollars raised per mile walked	7. dollars raised per hour

Use a table, a double-number line diagram, or equations for problems 8-10. Assume that Kristin walks at a steady, constant rate.

8. How much money will Kristin raise if she walks 12 miles?	9. How long will it take Kristin to walk 12 miles?	10. How far does Kristin have to walk to raise $2,160?

SKILL BUILDER 2

1. Amira cut and used 0.37 meters of a 10 m piece of string. How much string does she have left?

2. Mr. Adams drives a school bus 5 days per week, two trips per day. Each trip averages 35.8 miles. How many miles does Mr. Adams drive in one week?

Compute.

3. $5(3 + 2) - 8 \bullet 2$	4. $15 \div 3 \bullet 4 + 8 - 3$	5. $5 + 8 \bullet 2 - 2^3$

6. Miranda's heart beats 3 times every 2 seconds. At that rate, how many times does her heart beat in 1 minute?

7. A neighborhood veterinarian treats cats and dogs in her clinic. She keeps track of her patients, and notices that the ratio of cats to dogs is usually about 1 : 4. Draw a tape diagram to represent this.

   a. How many cats and how many dogs are in the clinic if there are a total of 45 animals?

   b. What percent of her patients are cats?

SKILL BUILDER 3

Solve.

1. $x + 3\frac{1}{2} = 5\frac{1}{4}$	2. $w - 1\frac{3}{4} = 3\frac{1}{5}$	3. $y + 7\frac{2}{3} = 12\frac{5}{8}$
4. $34y = 2176$	5. $4{,}680 = 24g$	6. $\frac{w}{154} = 23$

Write <, >, or = to make each statement true.

7. $3\frac{1}{5}$ ______ $\frac{17}{5}$	8. $5\frac{7}{8}$ ______ 5.87	9. $\frac{35}{4}$ ______ $8\frac{3}{4}$

Each student in a group was challenged to name six football teams in 15 seconds. The score of correctly named teams for each student is represented by the graph to the right.

10. How many students were involved in the challenge?

11. Find the mean, median, mode, and range of the data.

SKILL BUILDER 4

Compute.

1. $\dfrac{345.9}{0.09}$	2. $\dfrac{93.84}{0.12}$

3. Maci wanted to fill an 8 gallon bucket using a two pint plastic container. How many times will Maci need to pour the container to fill the bucket?

Compute.

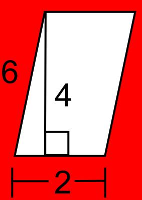
4. How many yards equal 40 inches?	5. 3 liters is equal to about how many cups?

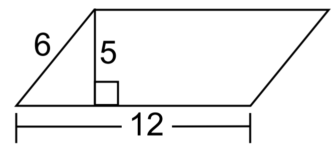
Compute.

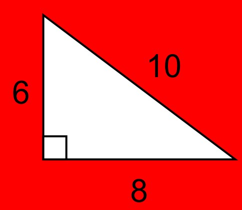
6. 30% of 18 cm	7. 90% of 178 in	8. 12% of 140 days
9. What is 85% of $540?	10. What percent of $15 is $30?	11. What percent is $12 of $60?

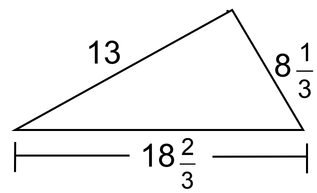
SKILL BUILDER 5

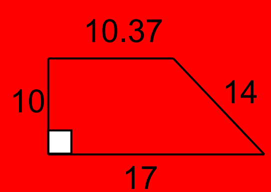
Find the area of each figure in square units. Show your work. Drawings not to scale.

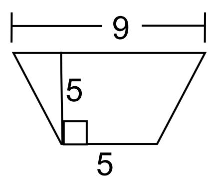
1.


2.


3.


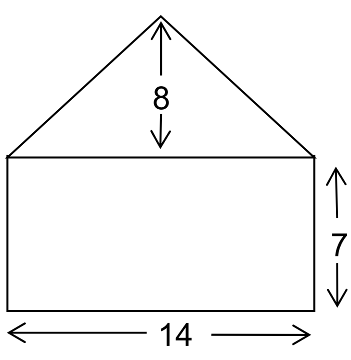
4.


5.


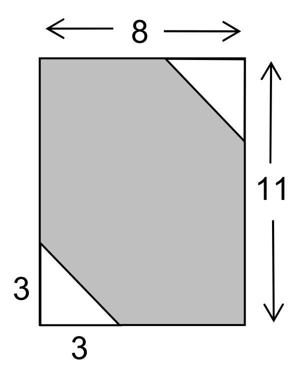
6.


Find the area of each figure in square units. Figures are not drawn to scale.

7. Brandon drew a sketch of the front of a garage with the dimensions below (in feet). What is the area pictured?



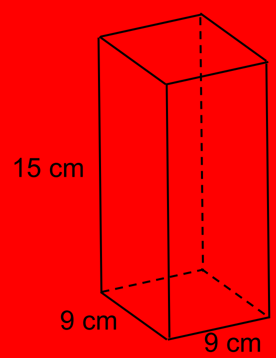
8. Theresa has an 8-inch by 11-inch piece of paper. She cut identical triangles from two corners. What is the area of the remaining paper?



SKILL BUILDER 6

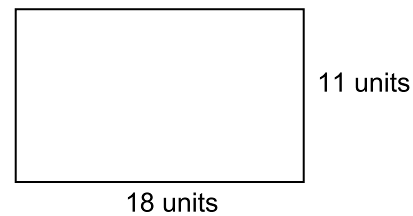
Find the volume of each rectangular prism. Use appropriate units.

1. Box to hold a doll:



Volume (V) = ______________

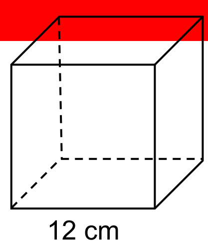
2. The top view of the prism:



Height of the prism = 2.5 units

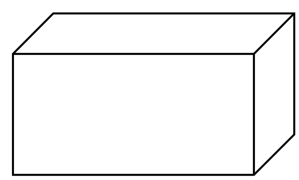
Volume (V) = ______________

3. The cube has a side length of 12 cm:



Volume (V) = ______________

4. A shipping box that is 24 inches wide, 12 inches deep, and 15 inches tall:



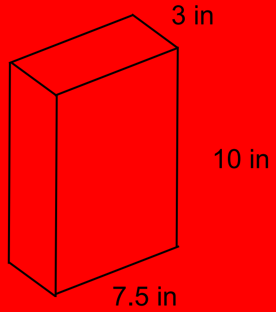
Volume (V) = ______________

5. The length of the prism is 12 cm. The height is one-third the length. The width is 5 less than the length. Sketch the rectangular prism and find the volume.

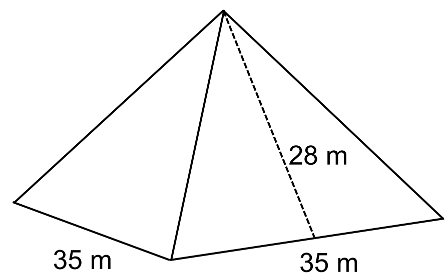
SKILL BUILDER 7

Sketch a net for each polyhedron below. Then find its surface area. Use appropriate units.

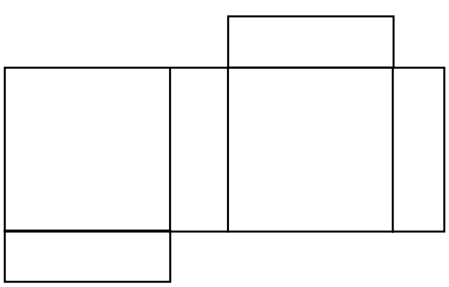
1. Cereal box:



2. The Louvre Pyramid in Paris:



3. A puzzle box has surface area of 192 square units. The top and bottom faces of the box are squares with side lengths of 8 units. What is the height of the box?



SKILL BUILDER 8

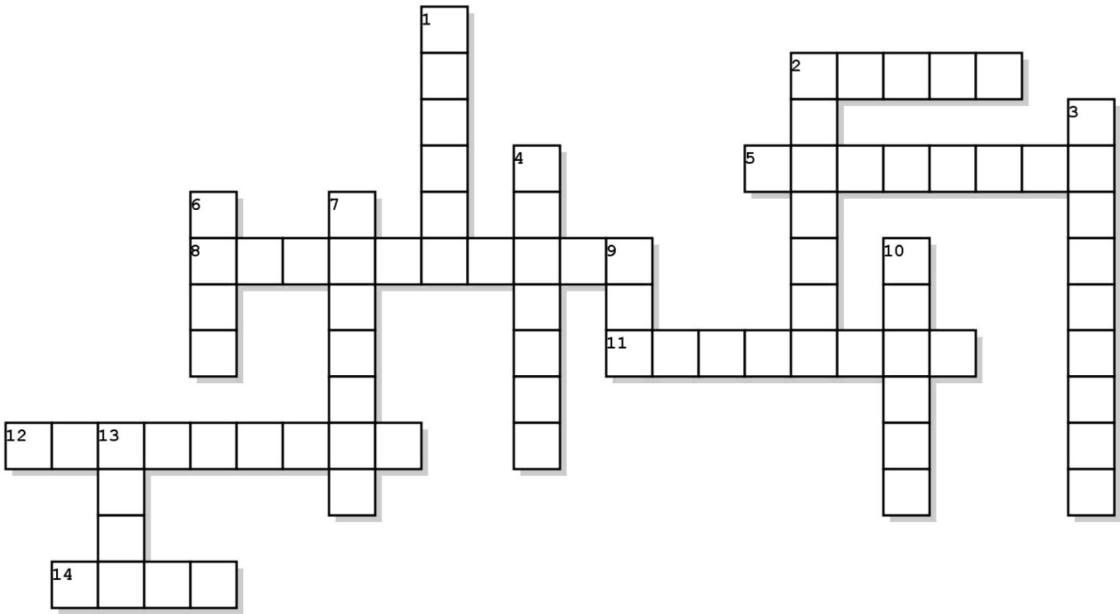
A rectangular prism has a length of 3.5 cm, a width of 4.5 cm, and a height of 5 cm.

1. Sketch the rectangular prism and label its dimensions.	2. Sketch the net and label its dimensions.
3. Find its volume. Use appropriate units. Formula:	4. Find its surface area. Use appropriate units.

5. Sarah has a fish tank shaped like a rectangular prism that is 18 cm × 20 cm × 16 cm. What is the volume of the tank?

6. If Sarah only fills the tank $\frac{3}{4}$ of the way, what will be the volume of the water in the tank?

FOCUS ON VOCABULARY



Across

2 shape of a tissue box

5 height = length of ____________

8 closed figure in three-dimensions with polygonal faces

11 three-sided polygon

12 quadrilateral with at least one pair of parallel sides

14 a pre-designated side or face of a figure

Down

1 rectangle with four equal sides

2 closed figure formed by line segments

3 polygon with four right angles

4 area of faces of a polyhedron: ____ area

6 top of a pyramid

7 three-dimensional figure with a polygonal base and triangular sides

9 two-dimensional pattern for a three-dimensional figure

10 a measure in cubic units

13 a measure in square units

(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).

1. Horatio's bedroom floor is 12 feet long and 14 feet wide. Which of the following calculations could he use to calculate the area of his floor? Choose all that apply.

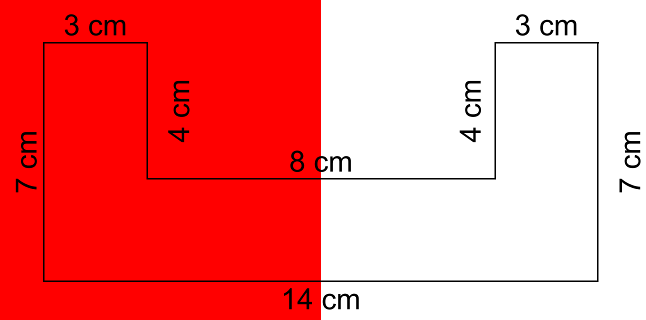
   A. 12 • 14 B. 14 • 12

   C. 14 + 12 D. 14 + 14 + 12 + 12

2. What is the area of a triangular sticker with a height of 5 cm and a base of 12 cm?

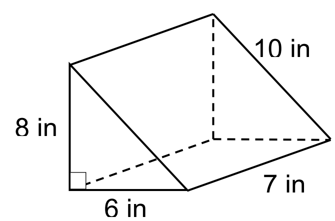
   A. 17 cm^2 B. 60 cm^2 C. 30 cm^2 D. 25 cm^2

3. Find the area of the figure below.



   A. 50 cm^2 B. 66 cm^2 C. 98 cm^2 D. None of these

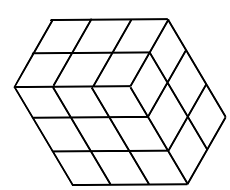
4. Find the surface area of the prism to the right.



   A. 216 square inches B. 264 square inches

   C. 3,360 cubic inches D. 1,680 cubic inches

5. Choose all of the following that can be used to calculate the volume of the rectangular prism to the right.



   A. 9 + 6 + 6 B. 2(3) + 2(3) + 2(3)

   C. 4(6) + 2(9) D. 2 • 3 • 3

KNOWLEDGE CHECK

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

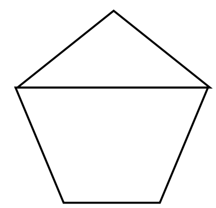
13.1 Area of Polygons

For problem 1 and 2, draw a picture, write an appropriate formula, and then solve each problem.

1. Find the area of a parallelogram whose base is 76 cm and whose height is 50 cm.

2. Find the area of a trapezoid whose bases are 9 meters and 4 meters and whose height is 3 meters.

3. Use a ruler to measure the appropriate parts of the composite figure to the right in order to find its area. Measure lengths to the nearest tenth of a cm (nearest mm).



13.2 Volume

4. Find the volume of a shipping box that is 18 inches by 12 inches by 4.5 inches.

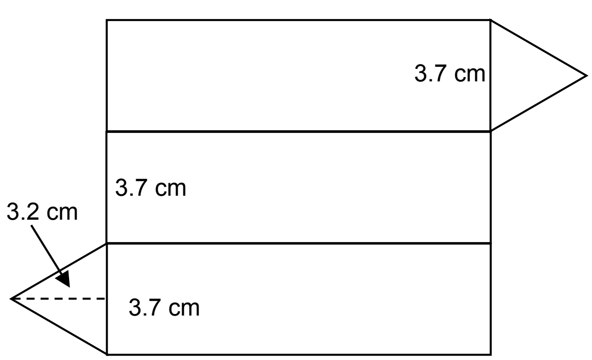
5. Find the volume of a cube that has a side length of $3\frac{1}{2}$ inches.

13.3 Surface Area

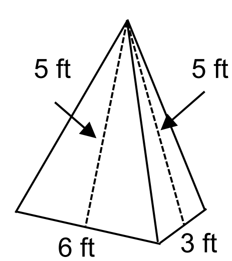
6. The net below folds to make a polyhedron. Find its surface area.

7. Find the surface area of the rectangular pyramid below.

Problem 6



Problem 7

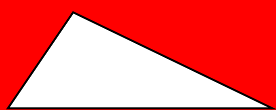


HOME SCHOOL CONNECTION

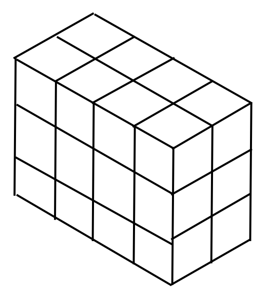
Here are some problems to review with your young mathematician.

1. Sketch two different parallelograms, each with an area of 30 square units, but with different bases and heights. Label the dimensions of each parallelogram.

2. Describe the process required to find the area of each of the polygons below.



Use the right rectangular prism to the right for problems 4-6.



3. Sketch a net for the prism.

4. Find the surface area of the prism.

5. Find the volume of the prism.

Parent (or Guardian) Signature______________________________

COMMON CORE STATE STANDARDS – MATHEMATICS

STANDARDS FOR MATHEMATICAL CONTENT	
6.EE.A	**Apply and extend previous understandings of arithmetic to algebraic expressions.**
6.EE.2a	Write, read, and evaluate expressions in which letters stand for numbers: Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation “Subtract y from 5” as 5 – y.
6.EE.2c	Write, read, and evaluate expressions in which letters stand for numbers: Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). *For example, use the formulas* $V = s^3$ *and* $A = 6\ s^2$ *to find the volume and surface area of a cube with sides of length* $s = 1/2$.
6.EE.4	Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). *For example, the expressions* $y + y + y$ *and* $3y$ *are equivalent because they name the same number regardless of which number y stands for.*
6.G.A	**Solve real-world and mathematical problems involving area, surface area, and volume.**
6.G.1	Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.
6.G.2	Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = l\ w\ h$ and $V = b\ h$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.
6.G.4	Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.

STANDARDS FOR MATHEMATICAL PRACTICE	
MP1	Make sense of problems and persevere in solving them.
MP2	Reason abstractly and quantitatively.
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 1 8 4