Name: ____ Due Date: ______________

In-Class Workbook

Geometry – Unit 7: Workbook Part 1

How do geometric models describe spatial relationships?
How does what we measure influence how we measure?

Standard	Description
7.G.A.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.B.4	Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.
7.G.B.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.

Lesson	I can…
7.1	- understand geometry in context and review important skills
7.2	- determine scale factor and draw an image to scale.
7.3	- calculate the area of triangles and quadrilaterals.
7.4	- solve the area of simple composite figures.
7.5	- calculate the surface area of a rectangular prism.
7.6	- solve mathematical problems involving the properties of circles.
7.7	- practice skills relating to area, surface area and scale.

Packet Completion Rubric				
4	**3**	**2**	**1**	**0**
Workbook demonstrates significant effort. Student utilizes notes to help extend their thinking, writing questions, comments or reactions to the content.	Workbook demonstrates some effort. Student takes notes but could further understanding by questioning and interacting with the material.	Workbook shows little effort. Student takes notes sporadically, and could benefit from greater consistency with the material.	Workbook shows little to no effort. Student does not take notes and must demonstrate future interaction with the material to aid understanding.	Workbook is entirely incomplete or not turned in.

Grading Breakdown: 3.5 - 4 = A 3 - 3.4 = B 2.5 - 2.9 = C 2 - 2.4 = D 0 - 1.9 = F

Score: __/4 Comments:

Use our class website too! www.7mathscience.weebly.com

Geometry Objective: I can understand geometry in context and review important skills.	Lesson 7.1

Lesson 7.1 Do Now	 Examine each product. Which one doesn't belong and **why?** Can you find a reason for each figure? Which do you think is the most environmentally efficient packaging and why?
Homework Reminder	This is where you will shade in the box if you turned in your homework. Today there is no homework due!
Check-In	What is one goal that you have for Quarter 3? How are you doing today?

What is geometry?

What A Waste: Online Retail's Big Packaging Problem

Americans love online retail – it grew by 16% last year in the US, while all retail rose 3.8%. We love the speed and convenience. We love the 'just-got-a-gift' feeling of boxes turning up on our doorstep. We love Amazon too. But love, as they say, is blind. And as consumers, we turn a blind eye to the environmental cost of online retail, particularly when it comes to packaging.

As reported in Fast Company, about 165 billion packages are shipped in the US each year, with the cardboard used roughly equating to more than 1 billion trees (that's *billion* with a 'b'). An article by Pam Baker on "E-commerce packaging waste becoming a bigger issue" helps to unpack the problem. Prior to the Internet, the logistics for traditional retail were simple and linear – goods were shipped in bulk to a warehouse and then to the store. The system for e-commerce is much more complex, and involves many more hands.

Retailers also want to ensure that goods arrive in perfect condition – and that can result in over-packaging. The average box is "dropped 17 times", according to ANAMA Package and Container Testing owner, Anton Cotaj. So that's why you can receive a small package inside a relatively large box filled with "air-bags". It means that the retailer is literally "shipping air", as the director of packaging program at Rutgers University, Hae Chang Gea, puts it. Effective, but wasteful.

It seems that both shoppers and retailers are starting to wake up to the packaging issue. Consumers are getting the guilts. A 2016 New York Times article chronicles the "guilt and frustration" and sheer embarrassment of recycling all those boxes as part of the "cardboard economy". Amazon has a "Frustration-Free Packaging Program" designed to "produce less waste and put an end to 'wrap rage'." Envelopes have replaced boxes for smaller shipments, and a system has been introduced to ship products in their original packaging, rather than doubling up. Amazon also asks constantly for "packaging feedback" after shipping items, and if a comment is sufficiently pointed, will pull "the Andon cord" to stop a product from letting down another customer. Amazon claims to have cut nearly a quarter of a million tons of packaging materials from 2007 to 2017, "avoiding 500 million shipping boxes".

Start-ups are popping up in the field of responsible packaging. Limeloop is pioneering durable shipping pouches that are recycled from billboard wraps and intended to be reused as many as 2,000 times. Co-founder Ashley Etling says it is "essential we reimagine the packaging experience" for an e-commerce economy. A European company called Repack not only promotes re-use but has a reward model, offering an incentive for customers to return the packaging rather than toss it in the trash.

Online retail is only going to get bigger. Amazon alone sold 100 million products on Prime Day, and shipped over 5 billion items through Prime last year. Brand-owners, retailers and plain old consumers alike all need to take responsibility for reducing the packaging impact on the environment. Otherwise, just as in Pixar's Wall-E, we will wind up suffocating in garbage.

https://www.forbes.com/sites/jonbird1/2018/07/29/what-a-waste-online-retails-big-packaging-problem/#6f9eeed8371d

Biggest Table Challenge

Work Space:

The biggest table that you can make is…

Area = ___________________

Perimeter = _______________

Explanation: ____
____
____
____

Smallest Table Challenge

Work Space:

The smallest table that you can make is…

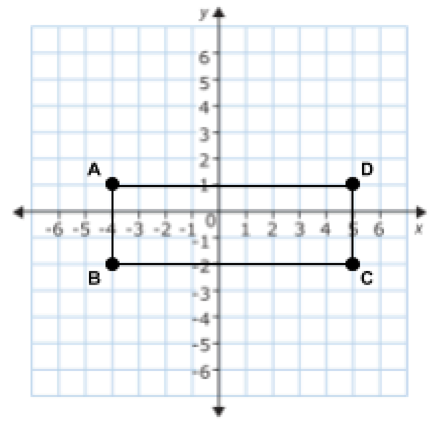
Area = ___________________

Perimeter = _______________

Explanation: ____
____
____
____

Area & Perimeter

Find the perimeter of the shape on the to the right by finding the sum of the lengths of each side of the rectangle. Then, write the value of the perimeter in the space below.



In words, answer the following question: What is *area*?

____

Shade the region representing the area of the figure. Then, find the area by counting the number of squares that this figure takes up on the coordinate plane. State the area of the figure in the space below.

Area = _________ units

In summary, state the following dimensions of the figure above:

Perimeter: _________ units

Area: _________ square units (units^2)

WHY ARE THE UNITS OF PERIMETER AND AREA DIFFERENT?

Perimeter is a measure of distance, which is one-dimensional. For example, if you are measuring the distance you run around a rectangular park, you might make the following calculations:

2 miles + 3 miles + 2 miles + 3 miles = 10 miles

miles + miles = miles

The distance around the park is 10 miles.

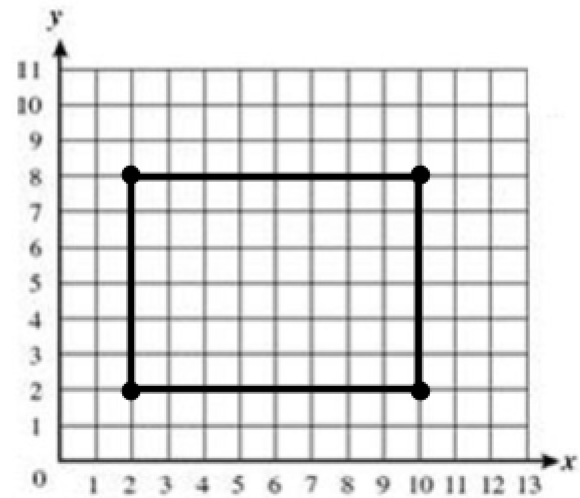
However, if you want to calculate the area of the park you just ran around (how much space it takes up), you would be finding a 2-dimensional space. You would multiply together the length and the width (base and height) of the park to find that the area of the park is 6 square miles (also read 6 miles squared).

(2 miles) × (3 miles) = 6 miles^2

miles × miles = miles ^{2}

So, two-dimensional measures such as <u>area</u> are measured in <u>square units</u> (also read <u>units squared</u>).

Using the proper area formula, find the area of the shape shown below.



Write your formula using variables:

Substitute the values into your formula to solve:

Count the number of squares enclosed in your shape. Was your solution correct?

____

Now, cut your rectangle in half by drawing a line across the diagonal. What shapes did you make?

____

Think about the space that each of your new shapes occupies in the original rectangle. What do you think is the area of each of your new shapes compared to the original rectangle? ***Estimate*** *the approximate area of the new shapes below.*

By this point, you've found that cutting a rectangle in half creates two triangles. You've also learned some new information about the area of the triangles compared to the area of a rectangle. Below, we have included the area of a rectangle. Can you guess the area of a triangle from this information?

Area of a Rectangle: *Base* × *Height*

Area of a Triangle:

Use your new formula to confirm the area of your new triangles:

In Summary:

____

____

____

____

____

Geometry Objective: I can determine scale factor and draw an image to scale.	Lesson 7.2

Lesson 7.2 Do Now	Solve the following percent increase and decrease problems by writing a proportion. **1. What is 120% of 95?** Estimate your answer: ______________________________ Proportion Work Space: Solve: ____________ Explain your answer: ______________________________ ______________________________ **2. What is 65% of 24?** Estimate your answer: ______________________________ Proportion Work Space: Solve: ____________ Explain your answer: ______________________________ ______________________________
Homework Reminder	This is where you will shade in the box if you turned in your homework. Turn in Practice 7.1!
Check-In	What is your favorite type of cheese and why? Do you get enough sleep? Why/why not?

Water Bead Exploration

Background: *Water beads are a non-edible bead made of a combination of water and a water-absorbing polymer. A polymer is made of tiny particles that stick together and form long chains. When dry water beads are immersed in water, they fill up and expand like a sponge.*

Your Goal: Determine how much larger the beads are before and after they are soaked in water.

Initial Mass of 1 Water Bead: __________ g

Mass of 1 Water Bead After Soaking in Water: __________ g

What would you predict the mass of 12 water beads to be?

What happened to the water beads after they were soaked in water?

____

____

Would this be an enlargement or a reduction of the water beads? Why?

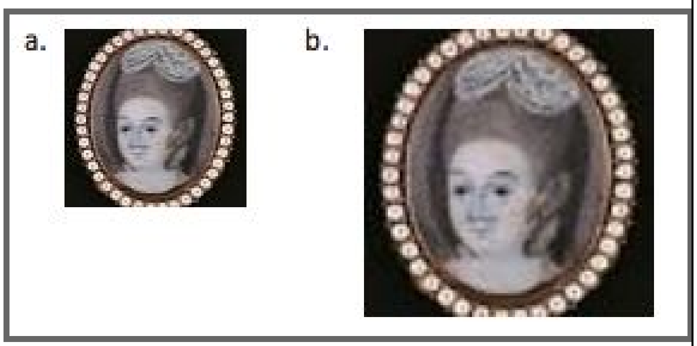
____

____

____

Introduction to Scale Drawings

For the following problems: (a) is the actual picture, and (b) is the drawing.
Is the drawing an enlargement or a reduction of the actual picture?



Enlargement or Reduction?	***Enlargement or Reduction?***

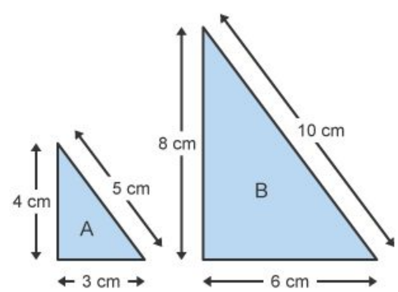
__________________________**:** A ***reduced*** or ***enlarged*** two-dimensional drawing of an original two-dimensional drawing.

An ____________________is a drawing that is larger in scale than its original picture.

A ____________________ is a drawing that is smaller in scale than its original picture.

Two drawings are "to scale" if they have the same ______________________ (constant of proportionality or unit rate)**.**

____________________: a ratio between two sets of measurements.



What are the possible uses for enlarged & reduced drawings/pictures?

______________________ allow us to observe details such as textures and parts that are hard to see to the naked eye. In art, enlargements are used in murals or portraits.

______________________ allow us to get a general idea of a picture/object. These scale drawings can fit in folders, books, wallets, etc.

How to determine scale factor?

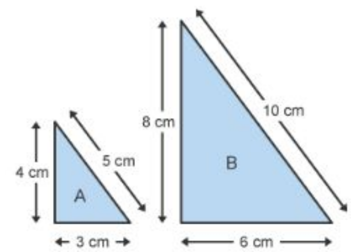
1. Find the ________________________ between the two figures.

   Make sure that you are comparing the <u>same part</u> of each figure. (Compare the length of the new triangle to the length of the old triangle. Or the two heights. Or the two hypotenuses).

	Length	Height	Hypotenuse
New Triangle			
Original Triangle			
Constant of Proportionality (Unit Rate)			

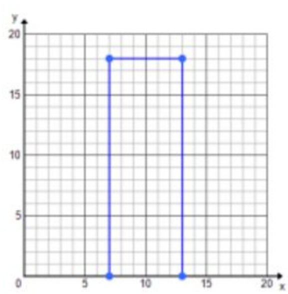
2. Make sure the ____________________ *is in the denominator.*

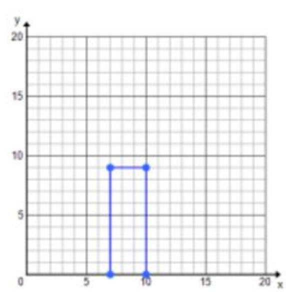
   __New Dimension___
   Original Dimension



How Do You Determine if Two Drawings Are to Scale?

1. **Celeste drew an outline of a building for a diagram she was making and then drew a second one mimicking her original drawing. Use the grid provided to find the height and width of each.**



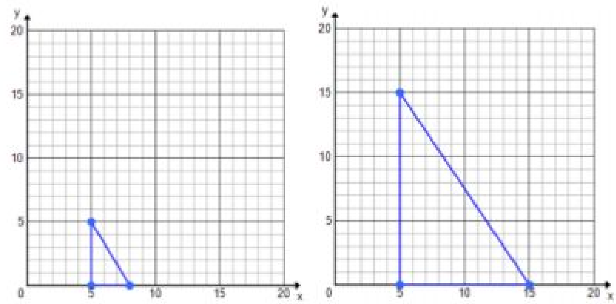


	Height	Width
New Image		
Original Image		
Constant of Proportionality (k)		

a. Does a constant of proportionality exist? ____

b. Is the reduced diagram a scale drawing of the first image? ____________________________

2. **Lucas drew and cut out a small right triangle for a mosaic piece he was creating for art class. His mother liked the mosaic piece and asked if he could create a larger one for their living room. Luca made a second template for his triangle piece.**



	Height	Width
New Image		
Original Image		
Constant of Proportionality (k)		

a. Does a constant of proportionality exist? ______________________________

b. Is the enlarged mosaic a scale drawing of the first image? ______________________

3. Nicole is running for school president. Her best friend designed her campaign poster, which measured 36 inches by 24 inches. Nicole liked the poster so much, she reproduced the artwork on rectangular buttons that measured 3 inches by 2 inches. What is the scale factor?

Converting Units - Recap from Unit 6 Part 1

What is the fun/clever form of one?!

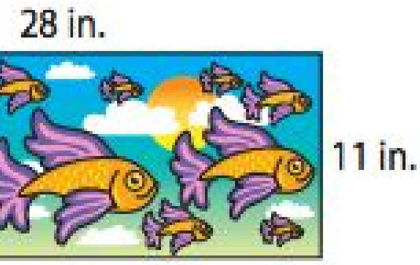
Lauren rides her bike 48 miles in 4 hours. How many feet is Lauren traveling each minute?

Sarah sells 42 candy bars during a 6 hour time period. How many candy bars does Sarah sell in 1 minute?

How To Find New Dimensions Given A Scale Factor

An art class is planning to paint a mural on an outside wall. The figure below is a scale drawing of the wall. The scale factor is 2 inch: 3 feet. Determine the dimensions of the actual wall.

How would you solve?



	Scale Factor	Unit Rate	Height	Width
Feet (New)				
Inches (original)				

Step 1: Find the number of <u>feet</u> represented by 1 <u>inch</u> in the drawing using the <u>scale factor</u> provided. (In other words, find the UNIT RATE!!)

Step 2: Use the unit rate to <u>find the HEIGHT of the actual wall</u> using the height provided in the image (11 in).

Step 3: Use the unit rate to <u>find the WIDTH of the actual wall</u> using the width provided in the image (28 in).

Practice Makes Perfect

Problem #1

Micah made a scale drawing of his bedroom. In his drawing, 1 cm represents 2 feet. What is the actual length of his room?

Step 1: Write the scale:

____

Step 2: Set up a proportion:

Scale | Drawing

Length on Drawing → $\frac{\square}{\square} = \frac{\square}{\square}$ ← Length on Drawing

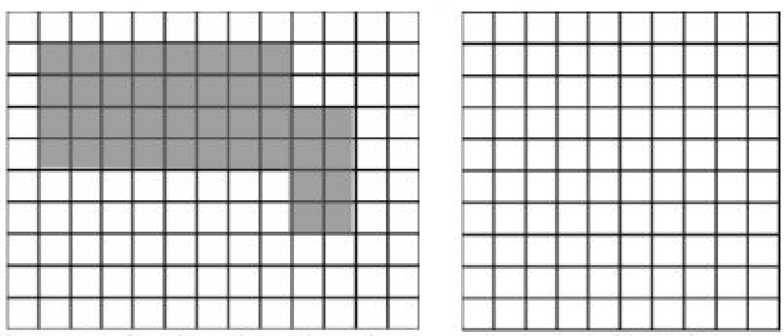
Actual Length → ← Actual Length

Step 3: Solve the proportion:

Show your work here:

Problem #2

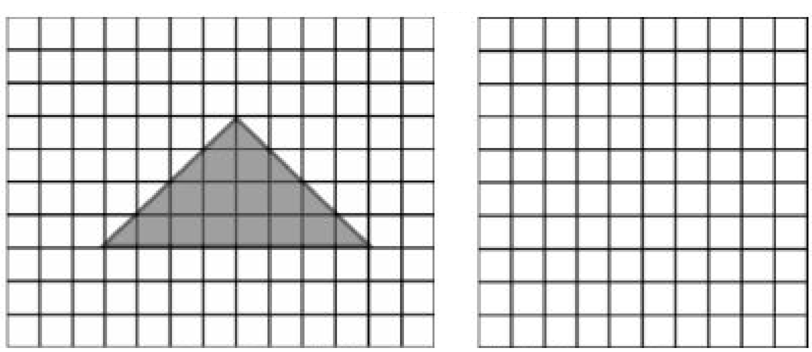
Draw the figure below after a change using a scale factor of ¼.



Challenge: Calculate and compare the area of both figures above!

Problem #3

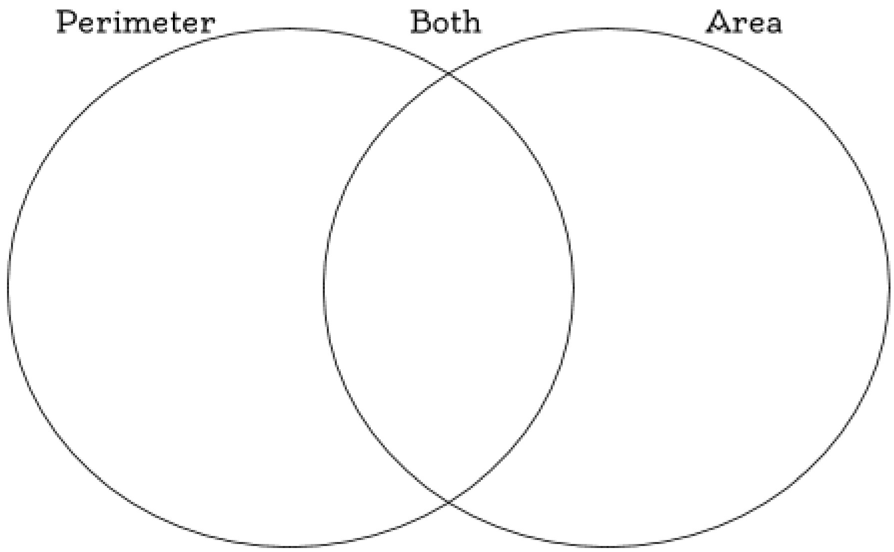
Create a scale drawing of the triangle using a scale factor of ½.



Challenge: Calculate the areas of both figures. What do you notice?

Problem	**Estimate**	**Show and explain your work!**	**Final Answer**
Samuel found a tutorial for building a triangular shaped kite where the height measured 6.1” and each of the side lengths were 7”. Samuel wanted to create a kite that was 1 ⅕ the size of the tutorial. What would the height of Samuel’s kite be?	*Will this be an enlargement or a reduction? Why?*		
On a map of Springfield Park, the distance from the playground to the pond is 2.2 centimeters. The map scale shows that each half-centimeter equals 9 meters. What would be the actual distance between the playground entrance and the pond?	*How can you organize or structure your work?*		
The length of a table is 6 feet. On a scale drawing, the length is 2 inches. Write three possible scales factor for the drawing.	*Why can this problem have multiple scales?*		
Emily’s garden had an area of 81 cm^2 last Spring. This year she wants to triple the dimensions. What would the area of her new garden be?	*Will this be an enlargement or a reduction? Why?*		
The height of a tree is 22 feet. On a scale drawing, the length is 10 inches. Write two possible scale factor for the drawing.	*Why can this problem have multiple scales?*		
Rachel has sketched a mural on graph paper that she would like to paint on her dining room wall. The cherry blossom in her sketch is approximately 8 cm in length. IF her scale is 1cm : 5cm, how long will the cherry blossom be on her wall mural?	*What is a reasonable guess for this problem?*		

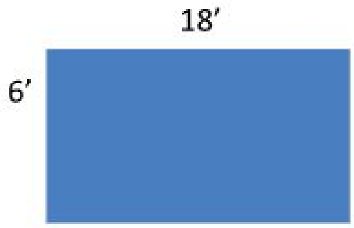
Geometry Objective: I can calculate the area of triangles and quadrilaterals.	Lesson 7.3

Lesson 7.3 Do Now	 Why is it important to understand both of these concepts? What does it mean "Images Not Drawn to Scale"?
Homework Reminder	This is where you will shade in the box if you turned in your homework. Turn in Practice 7.2!
Check-In	What is your favorite place in Hawaii? How are you doing today?

Index Card Activity

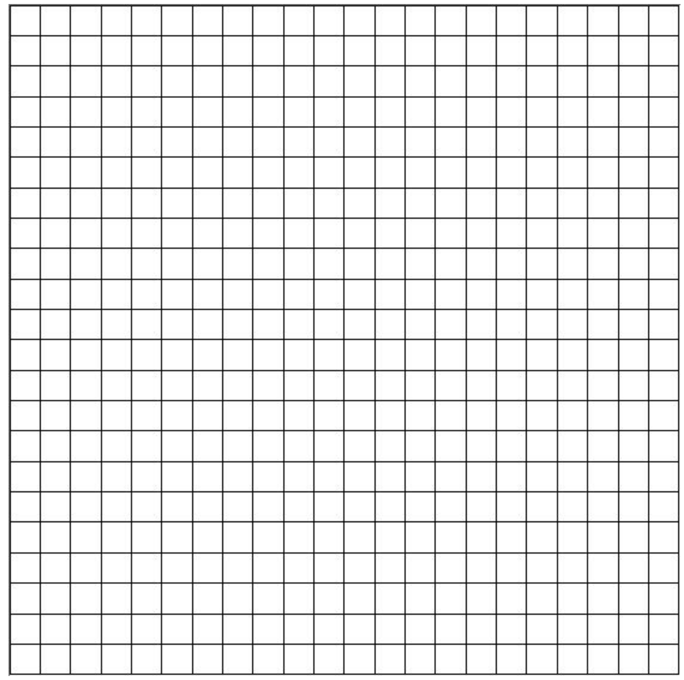
Explore Activity

On the grid below, draw the figure below so that 1 grid line on the graph represents 1 foot. For each equation below, please describe what each term means by using useful vocabulary from the word bank.



Useful Vocabulary

row, tiles, squares, inside, dimensions, equal, equivalent, cover, area



1. **Area = 108**
   a. **How can you prove this answer is correct?**

   ____

   ____

2. **Area = 18 + 18 + 18 + 18 + 18 + 18**
   a. What does this answer mean?

   ____

   ____

3. **Area = 18 x 6**
   a. What does this answer mean?

   ____

   ____

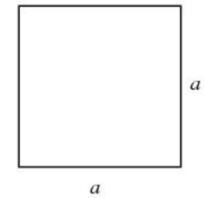
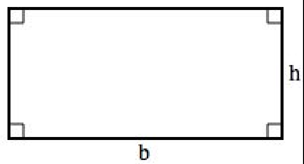
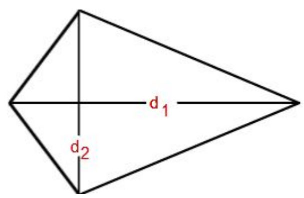
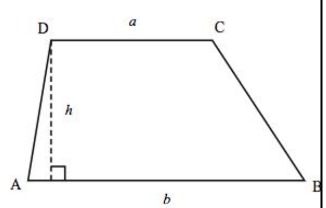
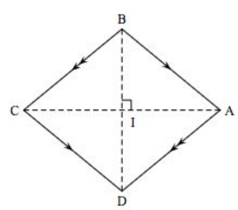
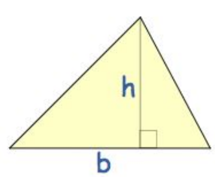
Explain why adding 18 repeatedly will work for calculating the area the same as adding up all the squares inside:

____

____

____

____

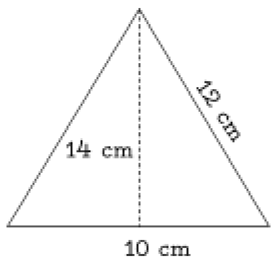
Shape and Formula	Figure	Properties
Shape: ________________ **Formula:** ________________		
Shape: ________________ **Formula:** ________________		
Shape: ________________ **Formula:** ________________		
Shape: ________________ **Formula:** ________________		
Shape: ________________ **Formula:** ________________		
Shape: ________________ **Formula:** ________________		

Let's Try!

What is the area of a square when one of its sides has a length of 12 centimeters?

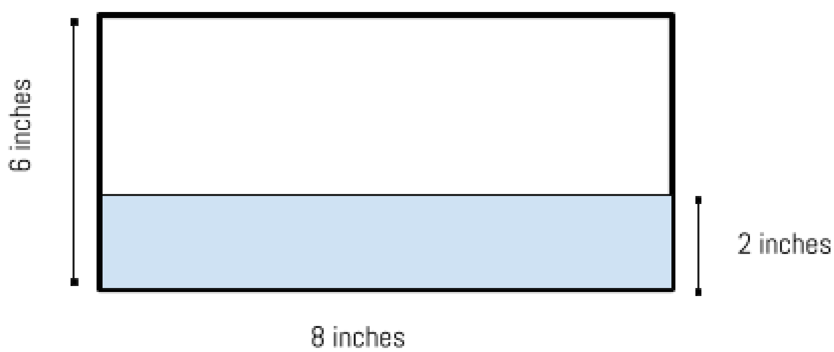
How do you know your answer is correct? Explain.

What is the area of the following triangle?



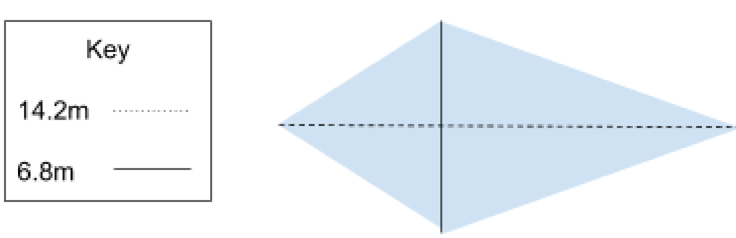
What information is extraneous (extra) in the diagram above? Why?

What is the area of the unshaded part of the rectangle?



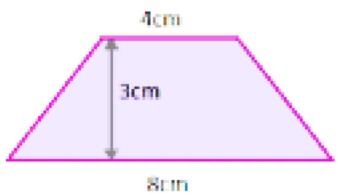
How many different ways can you solve this problem?

What is the area of the kite?



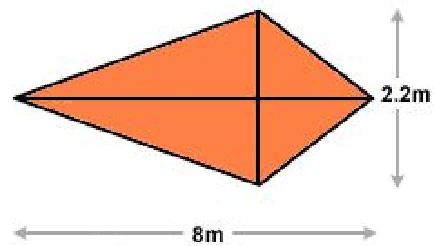
Guided Practice

Use the formulas you derived in your workbook to find the area formula of each shape and write it on the line. Then, solve for the area (include units!). Insert the corresponding letter or number to answer the riddle!



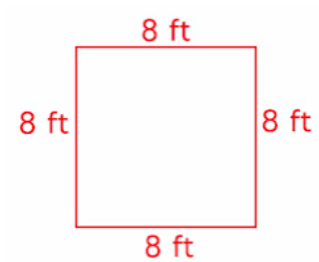
Formula: ____________________

Area _________________



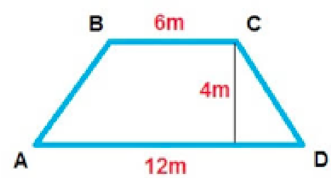
Formula: ____________________

Area _________________



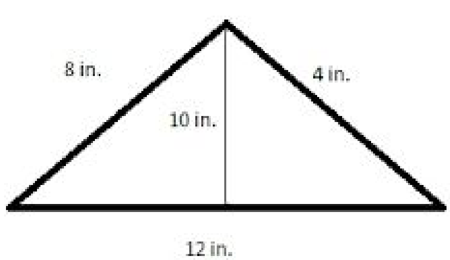
Formula: ____________________

Area _________________



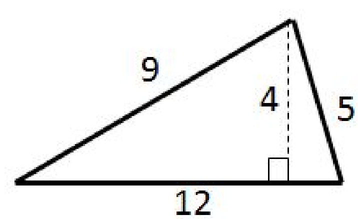
Formula: ____________________

Area _________________



Formula: ____________________

Area _________________



Formula: ____________________

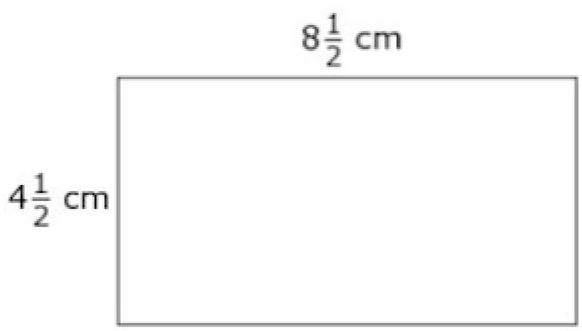
Area _________________

Formula: ____________________

Area __________________

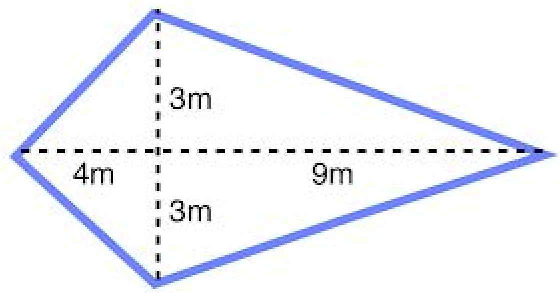
Formula: ____________________

Area __________________



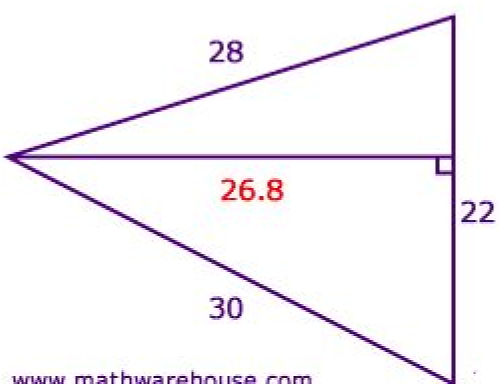
Formula: ____________________

Area __________________



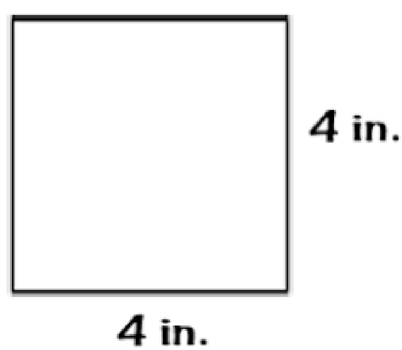
Formula: ____________________

Area __________________



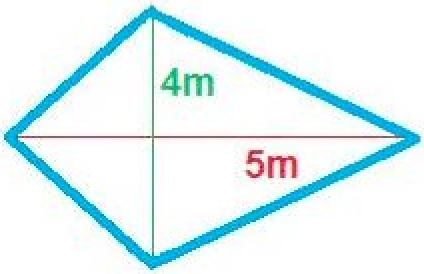
Formula: ____________________

Area __________________



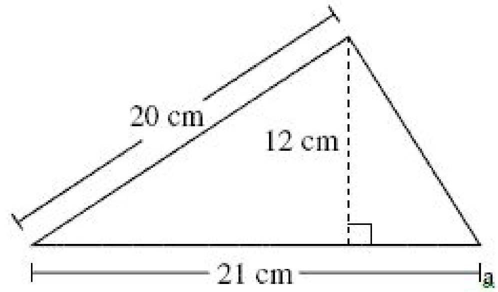
Formula: ____________________

Area __________________



Formula: __________________

Area ________________



Formula: __________________

Area ________________

January in Hawai'i:
Student: I'm cold!
Math Teacher: You should go stand in the corner then!
Student: Why?
Math Teacher:

______	______	______	______	______	______	______		______	______ ,	______
24	16	64	10	38.25	126	8.8		294.8	39	126

______	______		______	______	______	______	______	______	______ !
18	60		36	16	125.46	11	8.8	16	126

The History of Geometry

Geometry's origins go back to approximately 3,000 BC in ancient Egypt. Ancient Egyptians used an early stage of geometry in several ways, including the surveying of land, construction of pyramids, and astronomy. Around 2,900 BC, ancient Egyptians began using their knowledge to construct pyramids with four triangular faces and a square base.

Euclid's Elements: The next great advancement in geometry came from Euclid in 300 BC when he wrote a text titled 'Elements.' In this text, Euclid presented an ideal axiomatic form (now known as Euclidean geometry) in which propositions could be proven through a small set of statements that are accepted as true. In fact, Euclid was able to derive a great portion of planar geometry from just the first five postulates in 'Elements.' These postulates are listed below:

(1) A straight line segment can be drawn joining any two points.
(2) A straight line segment can be drawn joining any two points.
(3) Given any straight line segment, a circle can be drawn having the segment as radius and one endpoint as center.
(4) All right angles are congruent.
(5) If two lines are drawn which intersect a third line in such a way that the sum of the inner angles on one side is less than two right angles, then the two lines inevitably must intersect each other on that side if extended infinitely.

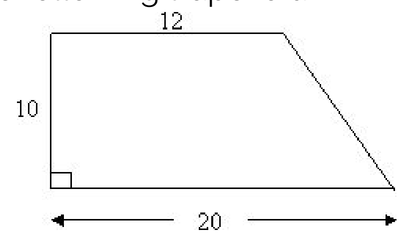
René Descartes' Coordinate Geometry: The next tremendous advancement in the field of geometry occurred in the 17th century when René Descartes discovered coordinate geometry. Coordinates and equations could be used in this type of geometry in order to illustrate proofs. The creation of coordinate geometry opened the doors to the development of calculus and physics.

The Development of Non-Euclidean Geometry: In the 19th century, Carl Friedrich Gauss, Nikolai Lobachevsky, and János Bolyai formally discovered non-Euclidean geometry. In this kind of geometry, four of Euclid's first five postulates remained consistent, but the idea that parallel lines do not meet did not stay true. This idea is a driving force behind elliptical geometry and hyperbolic geometry.

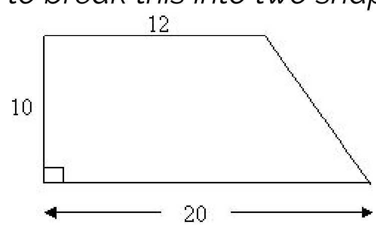
Geometry Objective: I can solve the area of simple composite figures.	Lesson 7.4

Lesson 7.4 Do Now

Solve for the area of the following trapezoid.



*How would you break the following trapezoid into **two** shapes? Draw a line to break this into two shapes.*



Mini-Challenge: Can you find the side lengths of the shapes? Can you now solve for the area of each shape?

Challenge: Compare the total area of the two shapes to the area of the trapezoid. What do you notice?

Homework Reminder

This is where you will shade in the box if you turned in your homework.
Turn in Practice 7.3!

Check-In

What is one way your teacher can help you learn better?

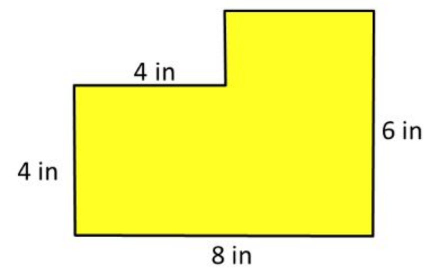
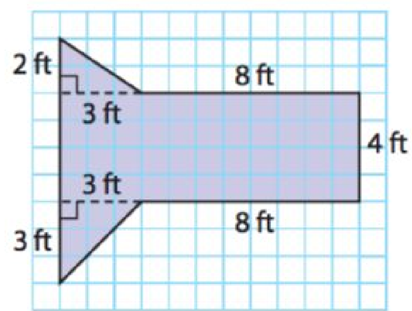
Make a prediction: What's the difference between area and volume?

Video Notes: Composite Figures

What does the term composite mean? ______________________________

What are the most important takeaways from this video?

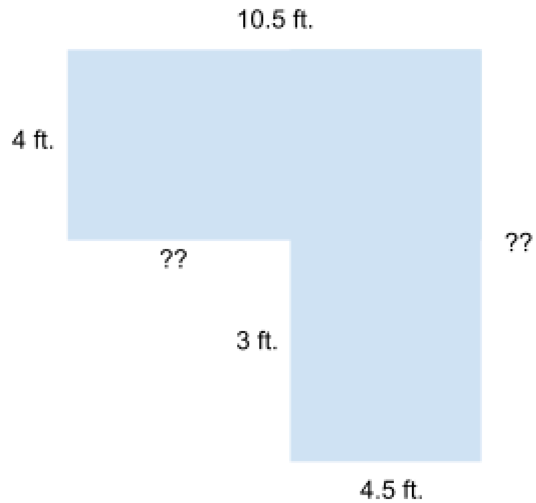
How does this connect to anything you already know?

Finding the Area of a Composite Figure
A composite figure is made up of simple geometric shapes! Steps of finding the area: 1. Divide the figure it into simple, ________________________ geometric shapes. 2. Find the ________ of each simpler shape. 3. ________ the areas together to find the total area of the composite figure.
Draw how you will break up this composite figure and then solve for the area. 
Draw how you will break up this composite figure and then solve for the area.  **Challenge: What is another *different* way you can break up this shape? Will that change the total area? Why or why not?**

Composite Figures Video Notes and Examples
What are some examples of composite figures in your classroom? What are some examples of composite figures in our world?

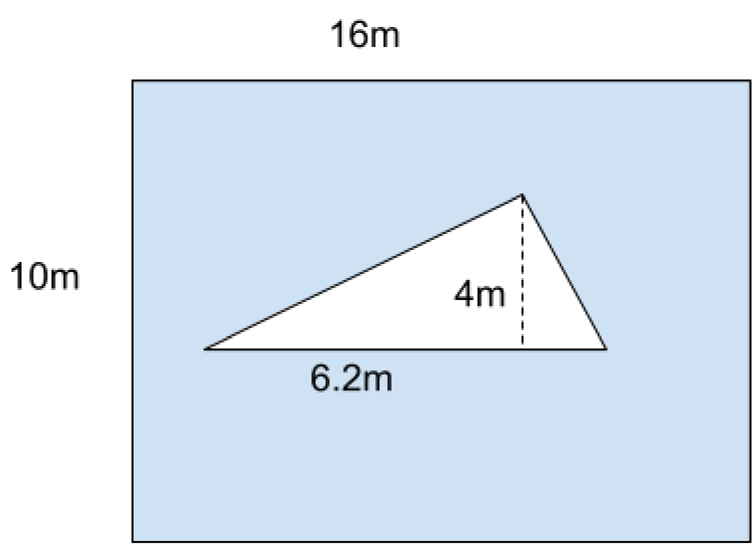
Composite Figure with “Missing” Side Lengths

Are these sides actually missing?!?! Do we have enough information to solve this?



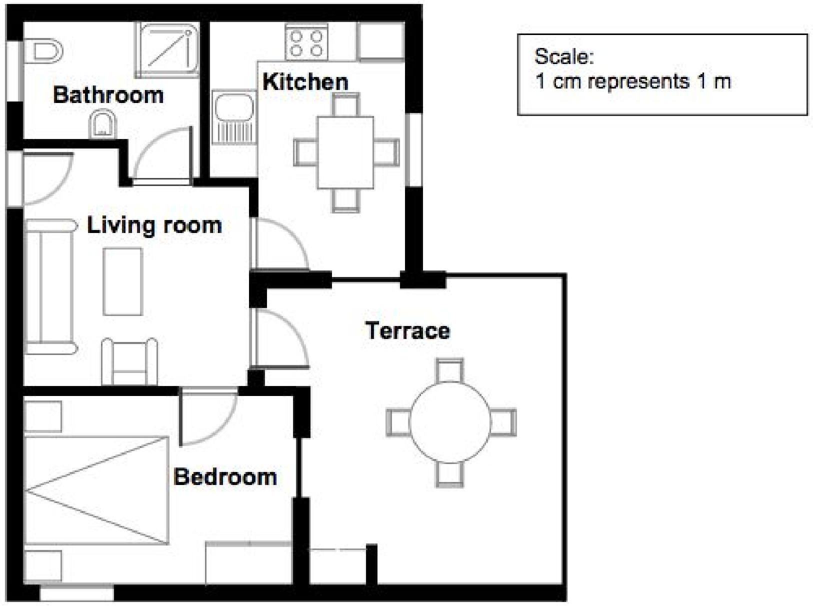
Composite Figure With Subtraction

How do we solve for just the shaded portion of the rectangle WITHOUT the area of the triangle?!



APARTMENT PURCHASE

This is the plan of the apartment that George's parents want to purchase from a real estate agency.



To estimate the total floor area of the apartment (including the terrace and the walls), you can measure the size of each room, calculate the area of each one and add all the areas together. However, there is a more efficient method to estimate the total floor area where you only need to measure four lengths. Mark on the floor plan above the **four** lengths that are needed to estimate the total floor area of the apartment.

Explain how you and your group members arrived at your answer:

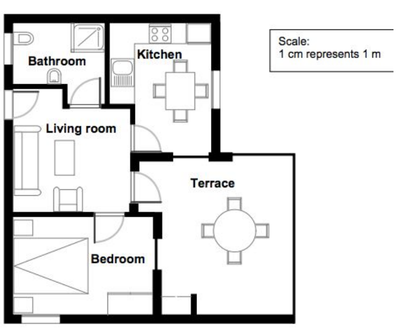
____

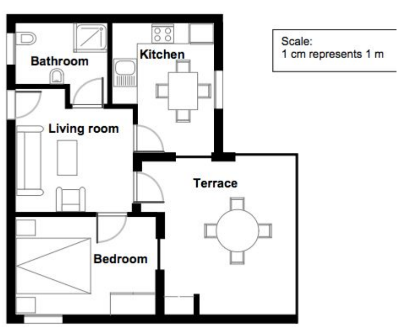
____

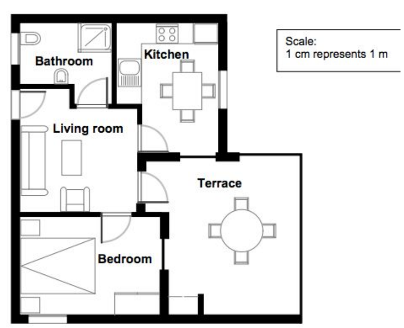
____

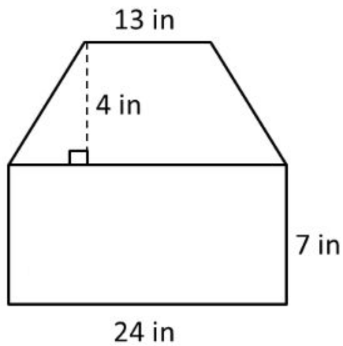
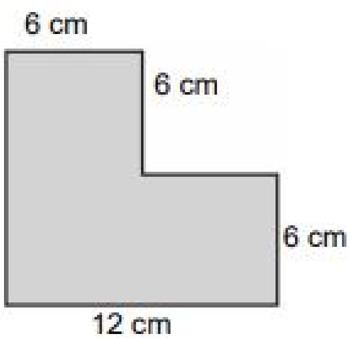
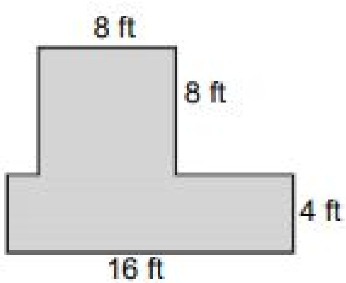
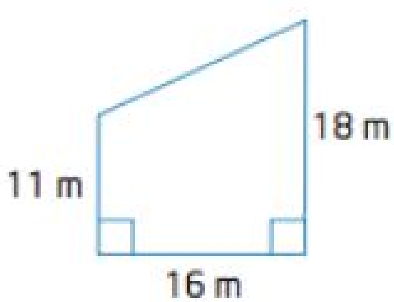
____

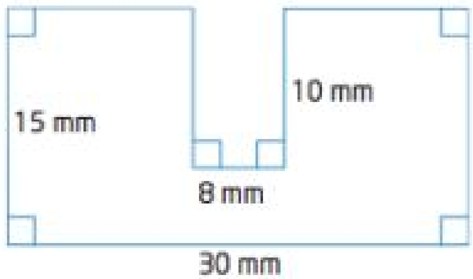
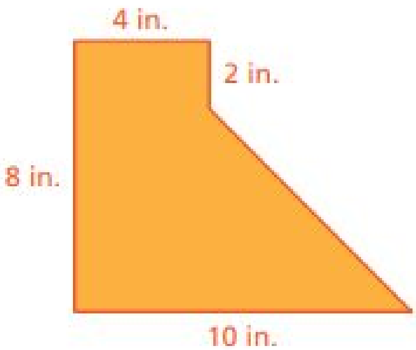
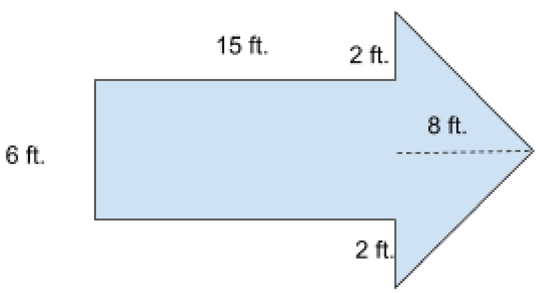
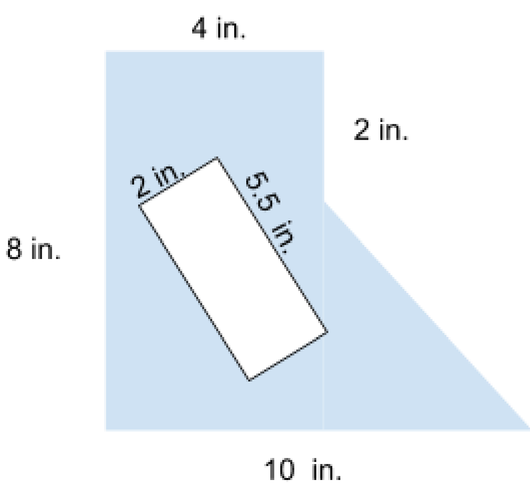
Now try and figure out four other lengths that could be measured on each example below:







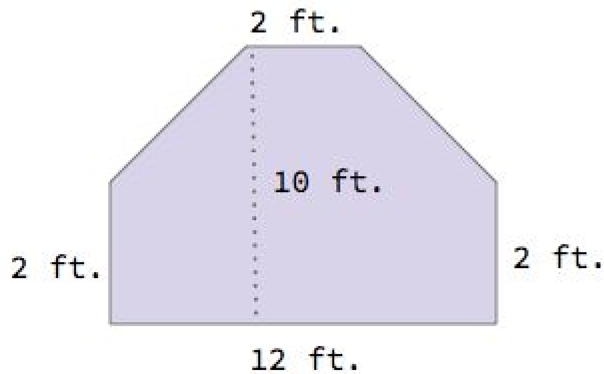
Now Let's Practice!	
	*What is the area of the figure?* ____________________
	*What is the area of the figure?* ____________________
	*What is the area of the figure?* ____________________
	*What is the area of the figure?* ____________________

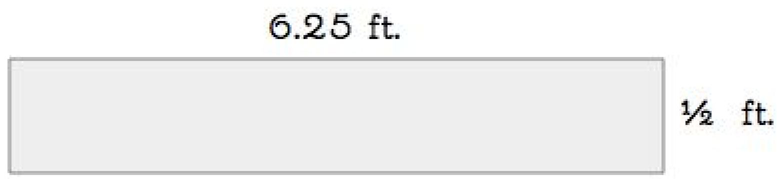
	*What is the area of the figure?* ____________________
	*What is the area of the figure?* ____________________
	*What is the area of the figure?* ____________________
	*What is the area of the* ***shaded*** *figure?* ________________

Geometry Objective: I can calculate the surface area of a rectangular prism. | **Lesson 7.5**

Lesson 7.5 Do Now

Find the area of each of the figures below.





Next: Convert the side lengths to inches and then find the area of each figure in inches!

Homework Reminder

This is where you will shade in the box if you turned in your homework.
Turn in Practice 7.4!!

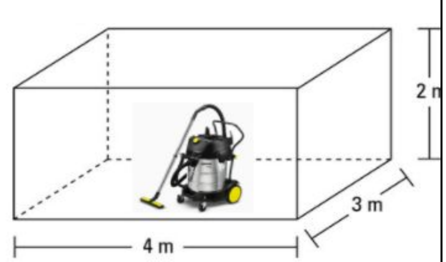
Check-In

How is geometry going so far?

What is your favorite book?

Challenge:

Mr. Wagner tends to procrastinate. On the Eve of his mother's birthday, he was scrambling to wrap her birthday gift and realized he was running low on wrapping paper. He needed to wrap the box below (A NEW VACUUM - WOOHOO!!) using the least amount of wrapping paper possible while still covering the gift.



How could you determine the EXACT amount of wrapping paper Mr. Wagner will need?

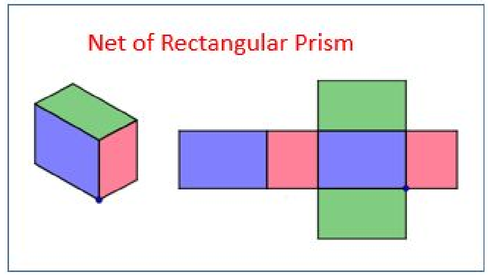
Do your best to calculate the amount of wrapping paper he will need and SHOW ALL OF YOUR WORK.

Surface area: the ______________________________ of a 3-D geometric shape. To calculate surface area, ____!

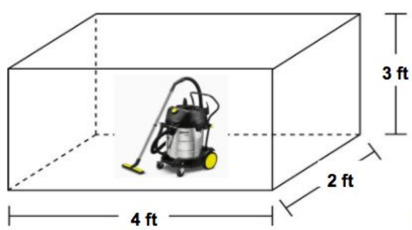
Review of Nets

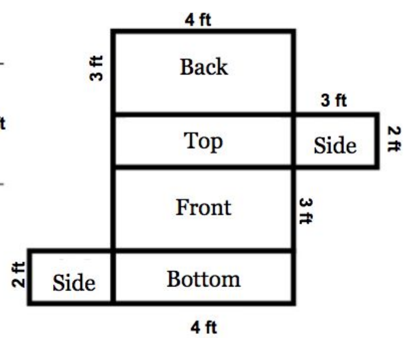
A _______________ is a flattened out three dimensional solid (a three dimensional shape) -- like a cube, a prism or a pyramid.

The net of a rectangular prism becomes _________________.



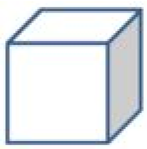
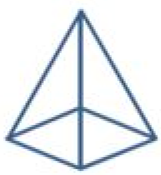
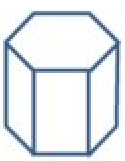
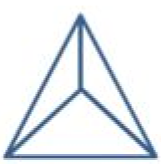
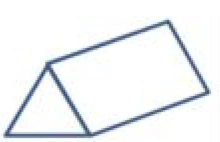
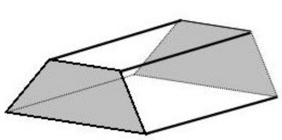
Problem 1: Mr. Wagner's Box





Step 1: Find the area of each side	
Back (yellow)	Front (green)
Top (red)	Bottom (blue)
Side (purple)	Side (orange)
Step 2: Add all areas together	

NETS! SUNG TO THE TUNE OF PAUL MCCARTNEY'S "JET"

3-dimensional Solid	Name	Net
	**Rectangular Prism**	
	**Cube**	
	**Square Pyramid**	
	**Hexagonal Prism**	
	**Triangular Pyramid**	
	**Triangular Prism**	
	**Trapezoidal Prism**	

Guided Practice: Dandy's Candies

You work for the packaging department at a candy company known as Dandy's Candies. Today, your boss sent you 4 possible packaging designs and asked you to select the option that will be the cheapest to manufacture.

Part 1: Predict

Rank these packages in order of which you think uses the most cardboard to which you think uses the least.

1:	2:	3:	4:

Part 2: Calculate Surface Area:

Use the dimensions in your packet to calculate the surface area of each package. Which package will use the least amount of cardboard and therefore be the cheapest to manufacture??

option	length	width	height
A	24	1	1
B	6	2	2
C	12	1	2
D	6	4	1

Option	Surface Area Calculations:
A	
B	
C	
D	

Explain which choice is the best. Use evidence from your calculations.

____

____

____

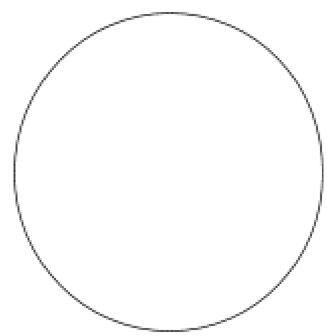
Geometry Objective: I can solve mathematical problems involving the properties of circles.	Lesson 7.6

Lesson 7.6 Do Now	What invention would you make to do your least favorite chore?  **Now let's watch a video!** 1. What information/dimensions would Molly have to consider or calculate when building this device? ____________________ ____________________ 2. Based on what you see, can she cut her whole lawn this way? Why or why not? ____________________ ____________________
Homework Reminder	This is where you will shade in the box if you turned in your homework. Turn in Practice 7.5!!
Check-In	How are you doing today?

Lawn Mower Magic

What do the following parts of the device represent?
Use specific vocabulary.

- Tire/Pole
- Rope
- Distance the lawn mower travels in one circular revolution
- Space mowed by the lawn mower



Trait of the Lawn	Part of the Circle	Description
Tire/Pole		The middle of the circle
Rope		A straight line from the center to the circle
Distance Around the Circle		The distance around the circle
Amount of Space Cut by the Mower		The space contained in the circle
Distance across the circle		A straight line across the circle going through the center.

Directions for Pi Lab
1. Choose six of the circular items from the bin in the front of the room. 2. Record the name of each item in the first column of your chart on the next page. 3. Using the strong, you will wrap the string around the circumference of the circular lid or item. Then, holding where the string meets, lay it out flat and use the ruler to get an accurate measurement in centimeters. Record this measurement in Column 2 (Circumference). 4. Using the ruler (or string if you prefer), measure the diameter of the circular object in centimeters as well. Record this measurement in Column 3 (Diameter). 5. Using the data from Columns 2 and 3, write a ratio of the circumference to the diameter in Column 4 (Ratio). 6. Convert the ratio in Column 4 to a decimal and record it in Column 5 (Decimal). Round to the thousandths place. 7. Repeat the steps for the rest of the circular objects. 8. Answer the questions once you have finished.

Our World of Circles: Pi Inquiry Lab

Object	Circumference Measurement (cm)	Diameter Measurement (cm)	Ratio $\frac{Circumference}{Diameter}$	Decimal $(C \div D)$

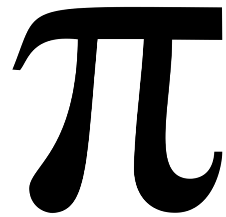
Based on the data above, what can you conclude about the relationship between the circumference and the diameter of a circle?

Do you think this theory or rule can be applied to all circles? Why or why not?

Soooooo, what does this π symbol mean?

The symbol **π** is the ratio of the circumference to the diameter and is the ______________________.

The ratio is called **π** or **pi**, and you can approximate it as _______.

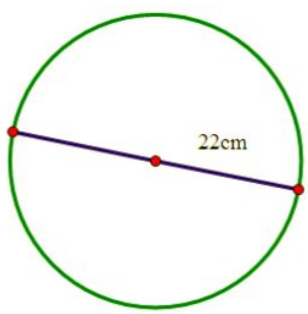


How do we Calculate these Dimensions of a Circle?

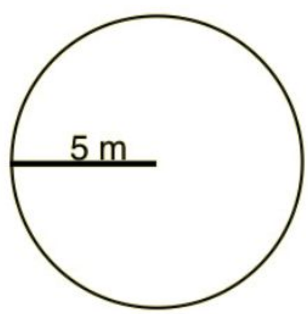
What do you think the following letters represent?	To Find **<u>Circumference:</u>**
r = ______________________ **d** = ______________________ **C** = ______________________ **A** = ______________________	To Find **<u>Area:</u>**

Let's Put Our Equations Into Practice

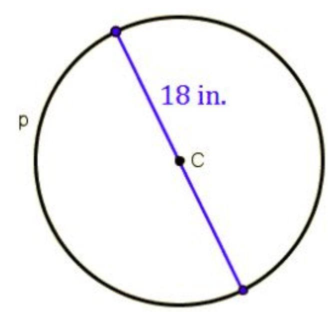
For each of the following circles, identify the **radius, diameter, circumference, and area.** When solving your problems, be sure to write out the formulas for **circumference** and **area** before solving.



r = _______
d = _______
C = _______
A = _______



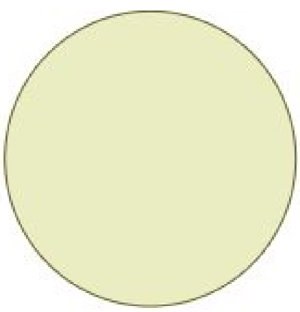
r = _______
d = _______
C = _______
A = _______



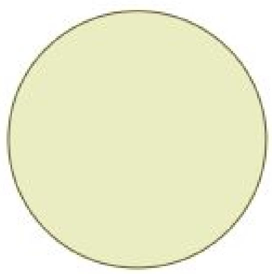
r = _______
d = _______
C = _______
A = _______

Working Backwards…Think About it!
A circular pond has a circumference of 628 feet. A model boat is moving directly across the pond, along a diameter. What is the distance the boat traveled to get from one side of the pond to the other? **What do we know?** **r =** ______ **d =** ______ **C =** ______ **A =** _____

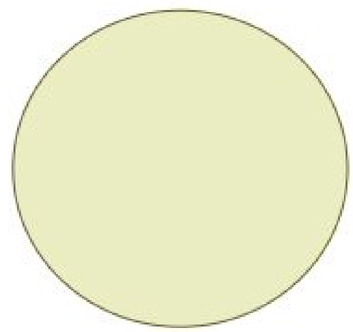
For each of the following circles, identify the **radius, diameter, circumference, and area.** When solving your problems, be sure to write out the formulas for **circumference** and **area** before solving.



r = ______
d = ______
C = 163.28 ft
A = ______

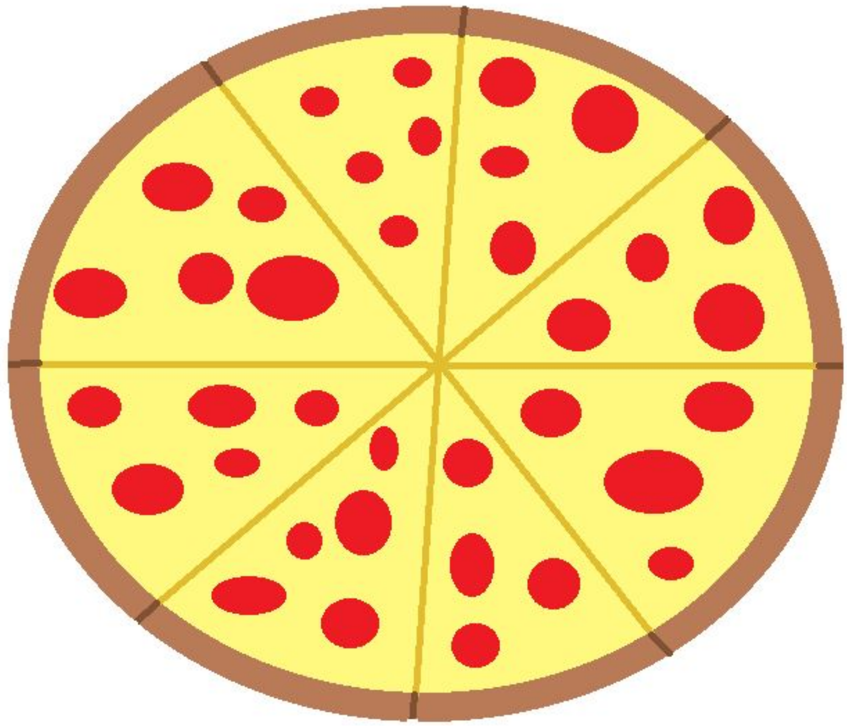


r = ______
d = ______
C = 72.22 in
A = ______



r = ______
d = ______
C = 37.68 m
A = ______

Pizza Practice! A typical pizza is divided into eight slices. Using this information and your knowledge of circles, solve the following problems! *For all calculations, use* **π** *= 3.14*



1. The pizza to the right has a diameter of *approximately* 8 centimeters. What is the radius of this circle? Show and explain how you can prove your answer.

1. Using the information from #1, what is the area of this circle? Show and explain to prove your answer.

2. What is the circumference of the pizza? What part of the pizza does this represent? Show and explain to prove your answer.

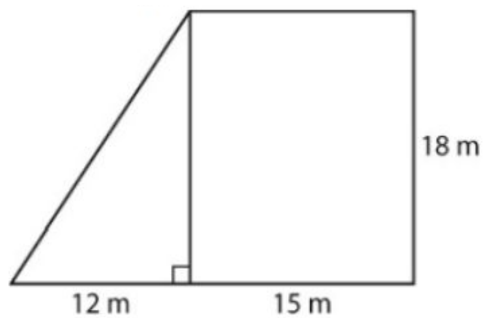
3. The term ***semicircle*** means half of a circle. What would the area of half of this pizza be? Show and explain to prove your answer.

4. What would the area of two slices of pizza be? What fraction of the pizza would this be **equivalent** to?

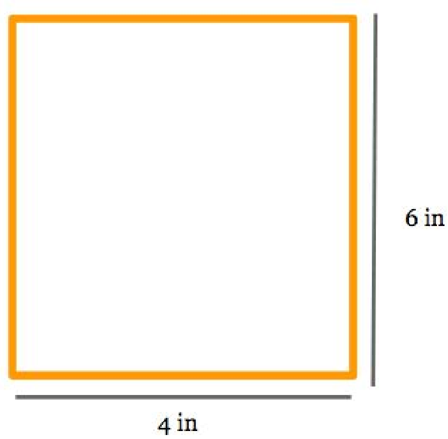
5. What is the area of ***one*** slice of pizza? Show and explain how you arrived at your answer.

Geometry Objective: I can practice skills relating to area, surface area, circles and scale.	**Lesson 7.7**

<u>Lesson 7.7 Do Now</u>	List ALL shapes that this formula could be used to calculate area for. **A= b x h** Calculate the area of the following shape:
<u>Homework Reminder</u>	This is where you will shade in the box if you turned in your homework. Turn in Practice 7.5!!
<u>Check-In</u>	Write as many questions as you can that you will ask your teacher today during review.



Mrs. Flett and Ms. Kimmel want to frame their picture from the Ice Palace field trip. They have a 4” x 6” frame. The original photo is 2” x 3”. Can their picture fill the frame, without cropping it?



Will the picture fit?

	Height	Length
Original Picture		
Second Picture		

In order for the image to remain proportional, each dimension (height and length) needs to be enlarged by the same constant of proportionality.

What is the constant of proportionality in this situation? __________

1. On a map, the distance from the library to city hall is 10 mm. The scale factor on the map reads:

1 mm : 0.5 miles

What is the actual distance between the library and city hall?

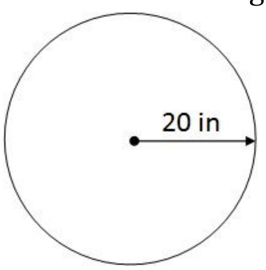
2. Describe in DETAIL how you would calculate the following measurements of a triangular prism:

a. Surface Area

____
____
____
____
____

Draw the net of a triangular prism:

3. What is the **diameter** and the **radius** of the following circle?



What is the area of HALF of this circle?

4. What are the <u>formulas</u> for AREA of a circle and CIRCUMFERENCE of a circle?

A = __________

C = __________

What does pi represent?

Today you will be rotating through five stations, focusing on the following themes:

- Circles
- Teacher Led Instruction & Support
- Scale
- Surface Area
- Composite Figures

As you work, you will need to complete the activities with your group at each station. You will have about 12-15 minutes to work at each station. Submit your work before you rotate to the next station!

Workbook Reflection

Answer the question as completely as possible, using evidence from what we have learned this unit. Justify your response with examples and evidence from throughout the packet.

How do geometric models describe spatial relationships? How does what we measure influence how we measure?

Choose one of the following concepts and describe it. Include visuals to support your answer.

- *Finding the area of a figure*
- *What does an area formula represent*
- *How do we find pi?*
- *Scale and Units*

What lesson most challenged your thinking?

What would you have done differently?

Flip through your packet, and look to see if you shaded the box every day for turning in your homework. How many days did you shade it in?

Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5	Lesson 6	Lesson 7

If you didn't finish it each night, consider why →

Would you like to come in during lunch or recess for support?