Eureka Math™

Grade 5, Module 5

Student File_A

Contains copy-ready classwork and homework as well as templates (including cut outs)

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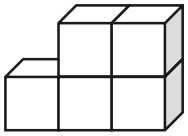
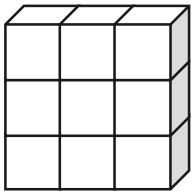
10 9 8 7 6 5 4 3 2 1

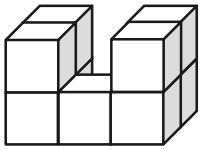
Name _____ Date _____

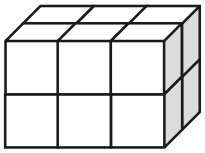
1. Use your centimeter cubes to build the figures pictured below on centimeter grid paper. Find the total volume of each figure you built, and explain how you counted the cubic units. Be sure to include units.

A. 

B. 

C. 

D. 

E. 

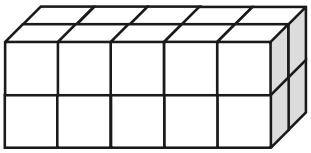
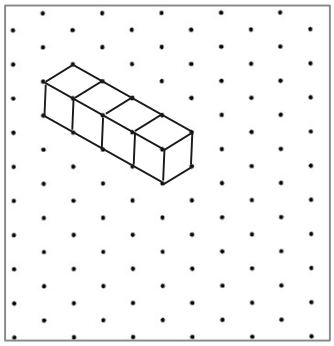
F. 

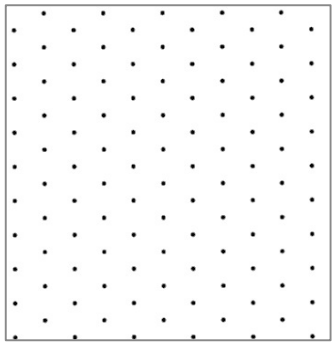
Figure	Volume	Explanation
A		
B		
C		
D		
E		
F		

2. Build 2 different structures with the following volumes using your unit cubes. Then, draw one of the figures on the dot paper. One example has been drawn for you.

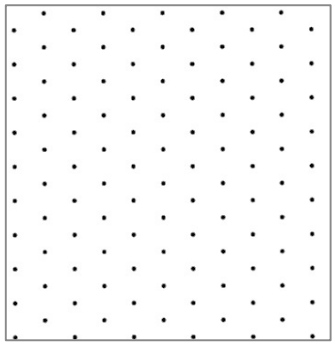
a. 4 cubic units



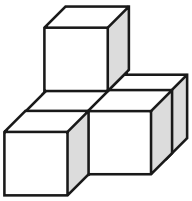
b. 7 cubic units



c. 8 cubic units



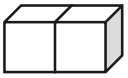
3. Joyce says that the figure below, made of 1 cm cubes, has a volume of 5 cubic centimeters.
   a. Explain her mistake.

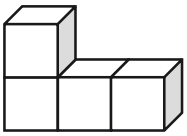


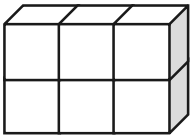
   b. Imagine if Joyce adds to the second layer so the cubes completely cover the first layer in the figure above. What would be the volume of the new structure? Explain how you know.

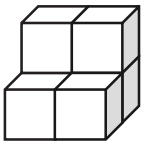
Name _____ Date _____

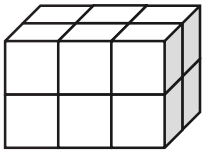
1. The following solids are made up of 1 cm cubes. Find the total volume of each figure, and write it in the chart below.

A. 

B. 

C. 

D. 

E. 

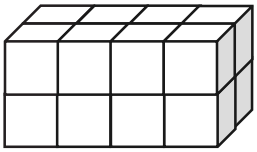
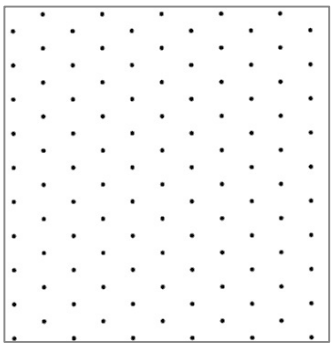
F. 

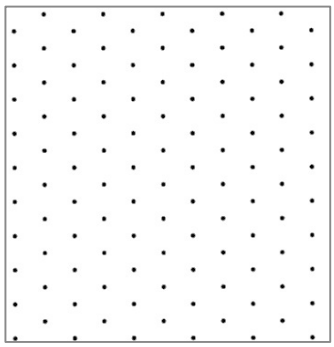
Figure	Volume	Explanation
A		
B		
C		
D		
E		
F		

2. Draw a figure with the given volume on the dot paper.

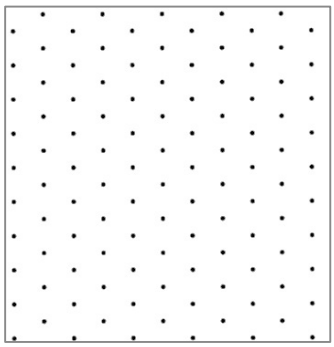
a. 3 cubic units



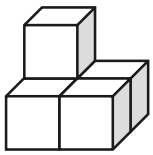
b. 6 cubic units



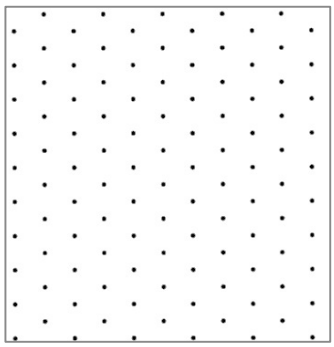
c. 12 cubic units

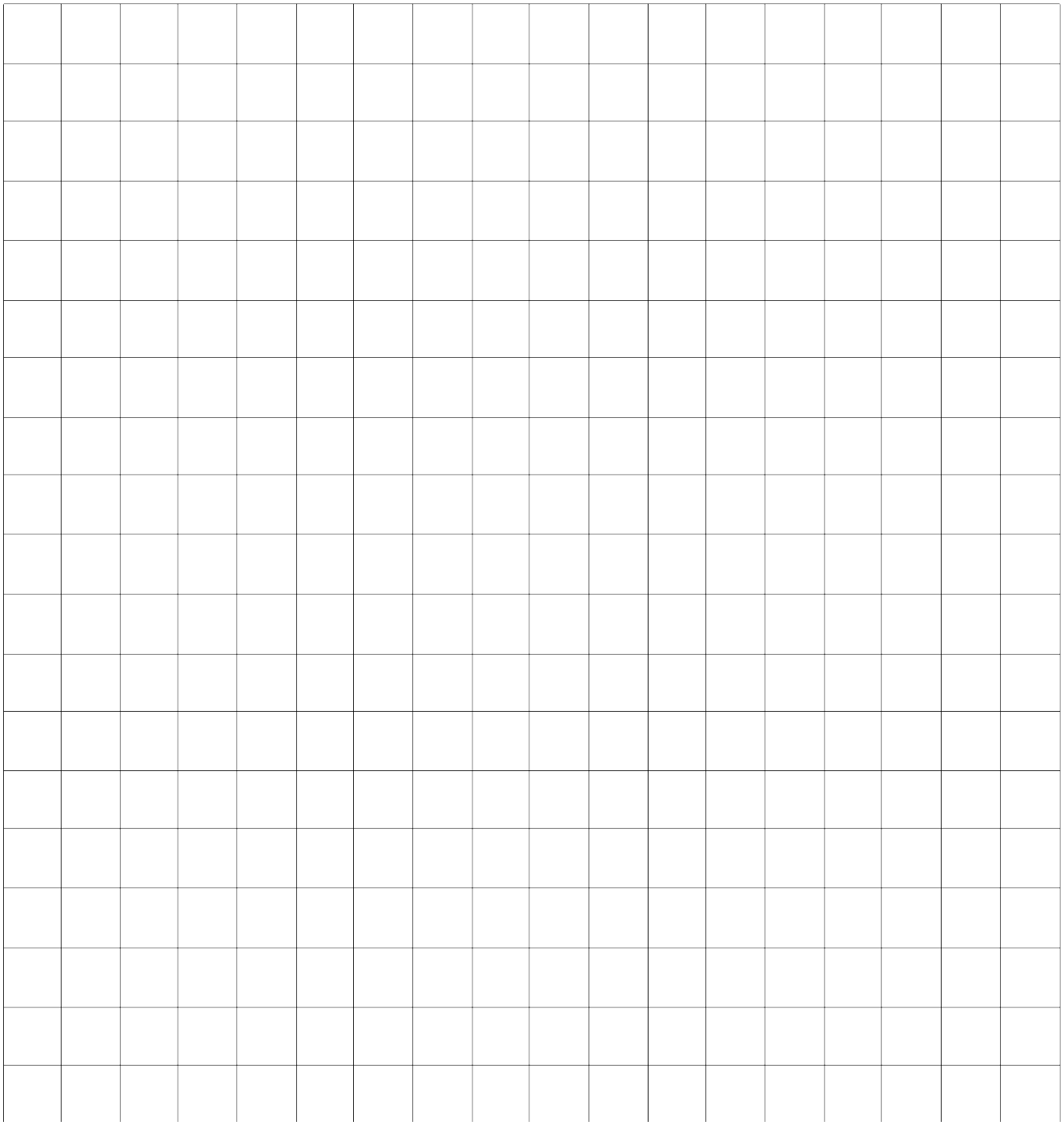


3. John built and drew a structure that has a volume of 5 cubic centimeters. His little brother tells him he made a mistake because he only drew 4 cubes. Help John explain to his brother why his drawing is accurate.

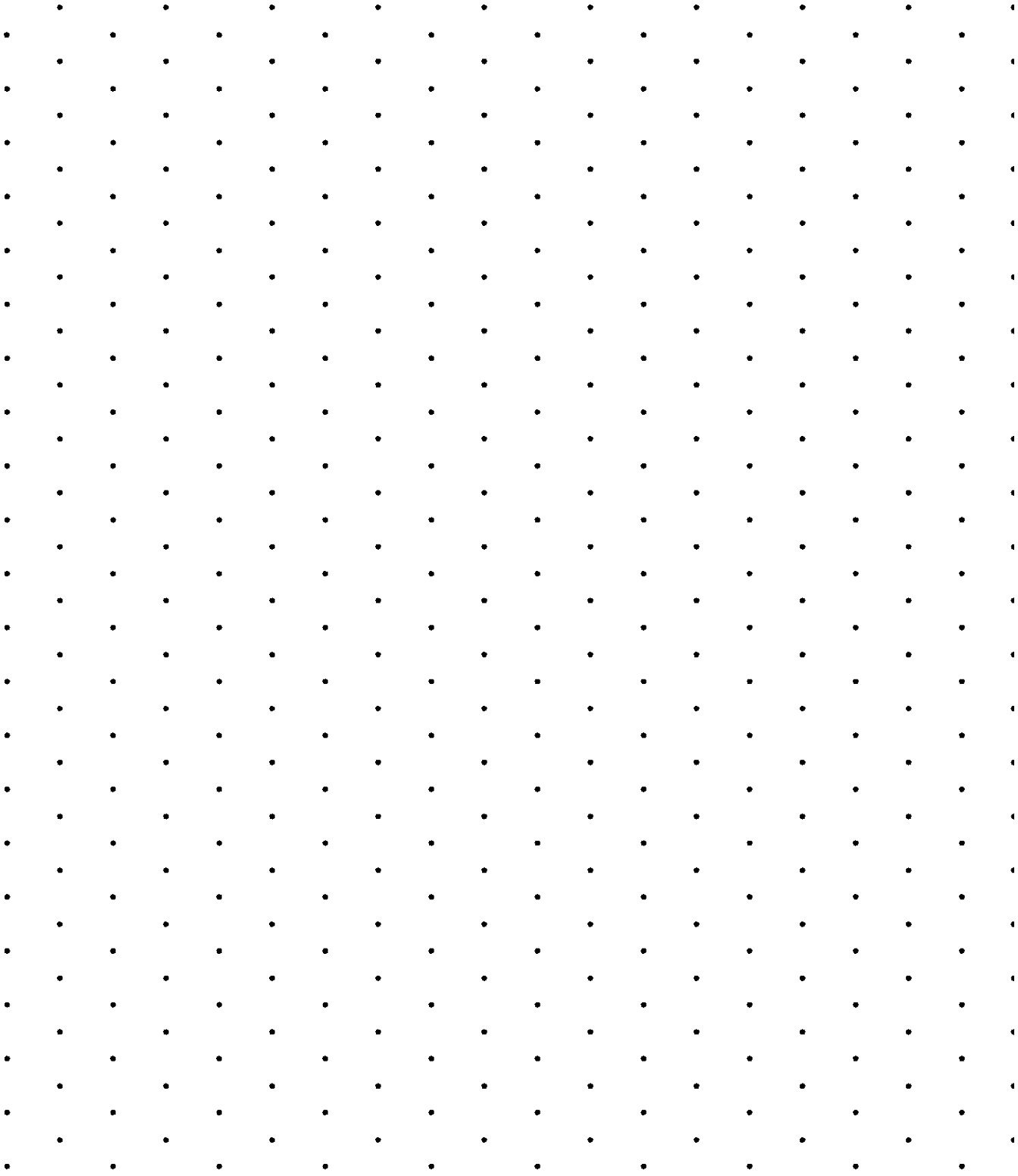


4. Draw another figure below that represents a structure with a volume of 5 cubic centimeters.





centimeter grid paper

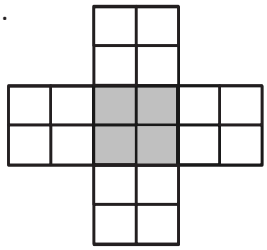


isometric dot paper

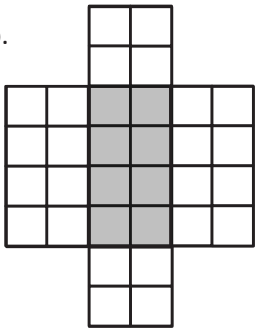
Name _____ Date _____

1. Shade the following figures on centimeter grid paper. Cut and fold each to make 3 open boxes, taping them so they hold their shapes. Pack each box with cubes. Write how many cubes fill each box.

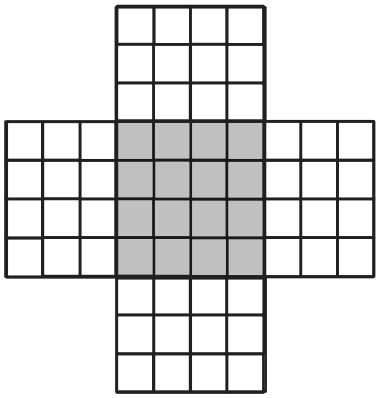
a. Number of cubes: _____



b. Number of cubes: _____



c. Number of cubes: _____

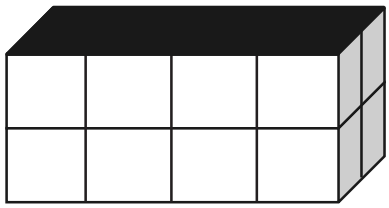


2. Predict how many centimeter cubes will fit in each box, and briefly explain your predictions. Use cubes to find the actual volume. (The figures are not drawn to scale.)

a.

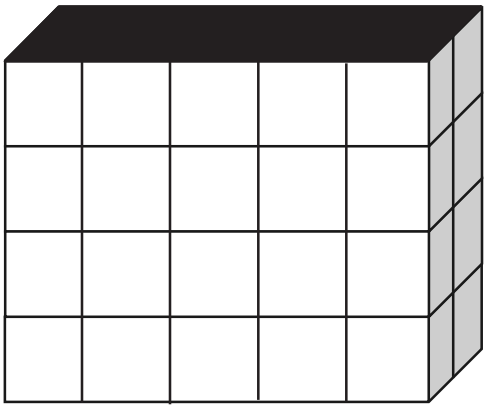
Prediction: _____

Actual: _____

b. 

Prediction: _____

Actual: _____

c. 

Prediction: _____

Actual: _____

3. Cut out the net in the template, and fold it into a cube. Predict the number of 1-centimeter cubes that would be required to fill it.

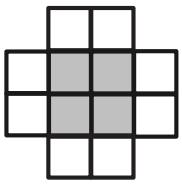
   a. Prediction: _____

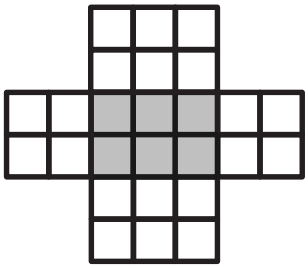
   b. Explain your thought process as you made your prediction.

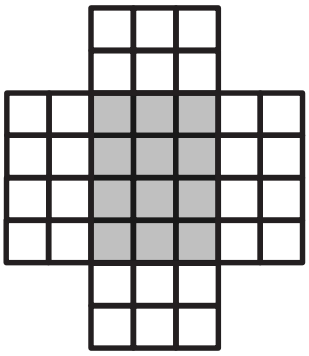
   c. How many 1-centimeter cubes are used to fill the figure? Was your prediction accurate?

Name _____ Date _____

1. Make the following boxes on centimeter grid paper. Cut and fold each to make 3 open boxes, taping them so they hold their shapes. How many cubes would fill each box? Explain how you found the number.

a.  Number of cubes: _____

b.  Number of cubes: _____

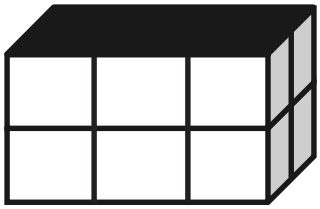
c.  Number of cubes: _____

2. How many centimeter cubes would fit inside each box? Explain your answer using words and diagrams on each box. (The figures are not drawn to scale.)

a. 

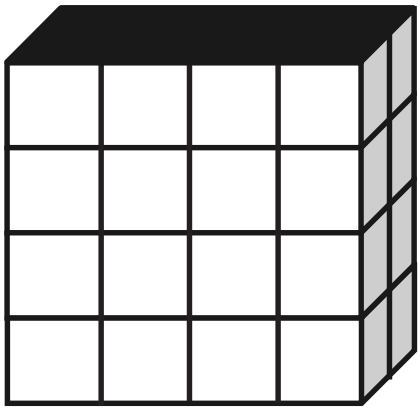
Number of cubes: _____

Explanation:

b. 

Number of cubes: _____

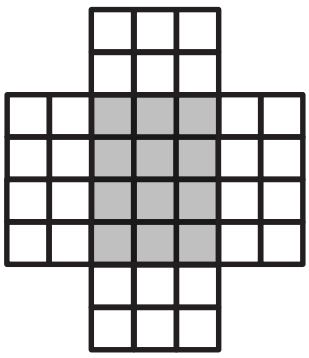
Explanation:

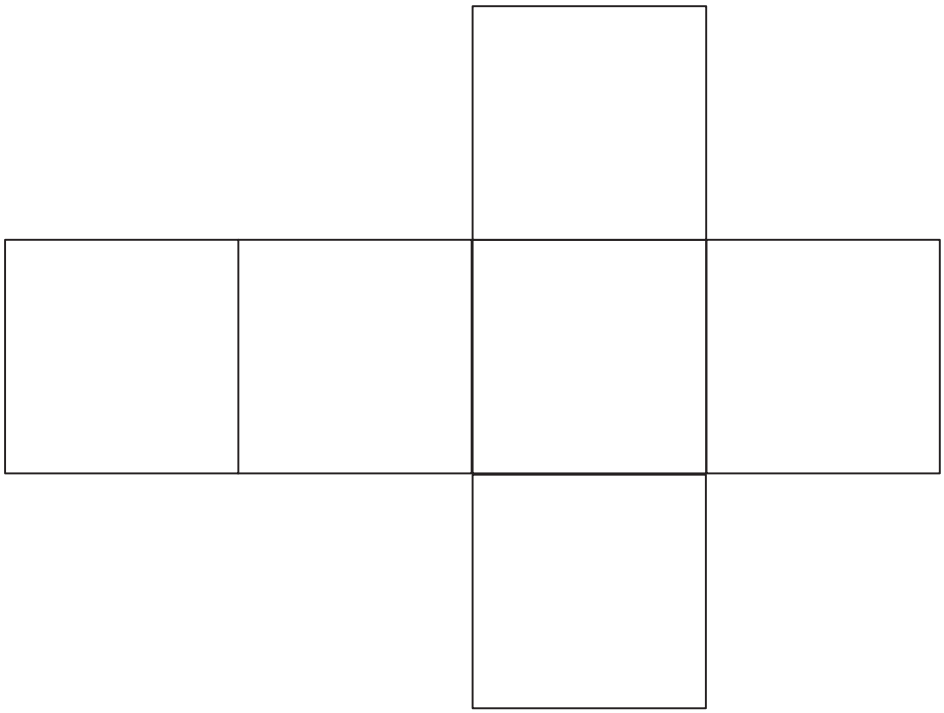
c. 

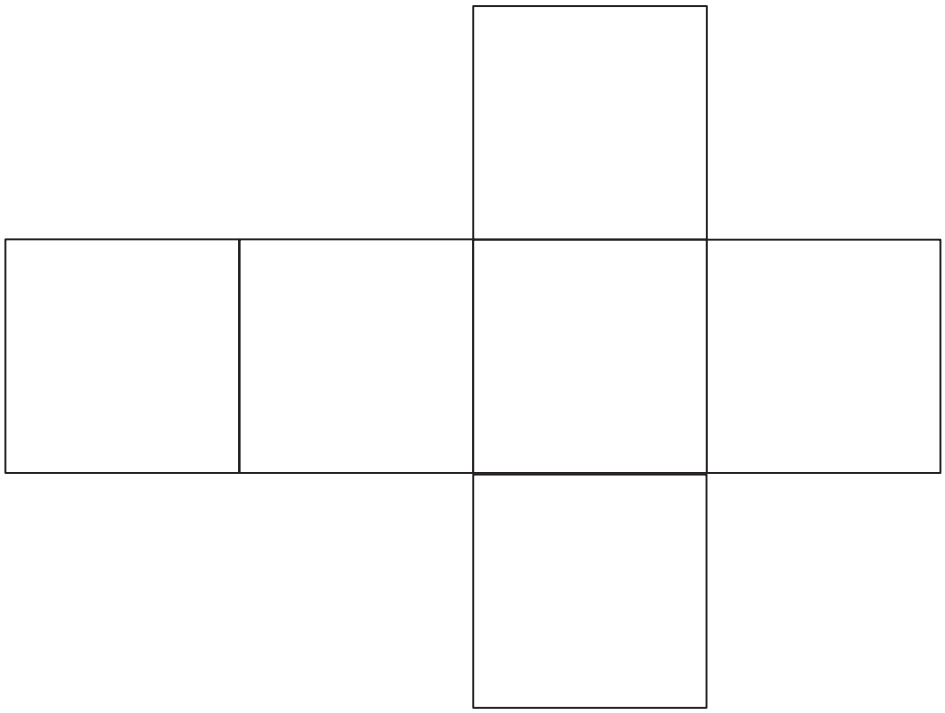
Number of cubes: _____

Explanation:

3. The box pattern below holds 24 1-centimeter cubes. Draw two different box patterns that would hold the same number of cubes.







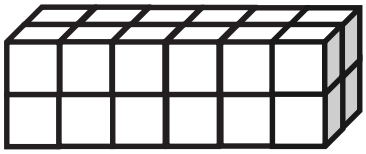
net

Name _____ Date _____

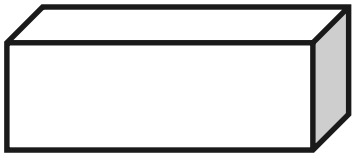
1. Use the prisms to find the volume.

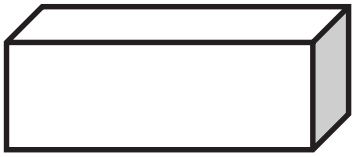
   - Build the rectangular prism pictured below to the left with your cubes, if necessary.
   - Decompose it into layers in three different ways, and show your thinking on the blank prisms.
   - Complete the missing information in the table.

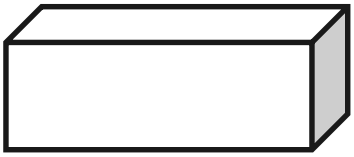
a.



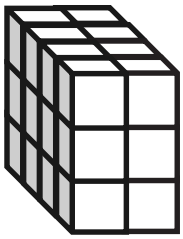
Number of Layers	Number of Cubes in Each Layer	Volume of the Prism
		cubic cm
		cubic cm
		cubic cm



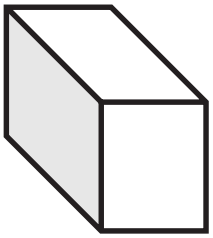


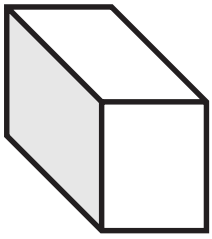


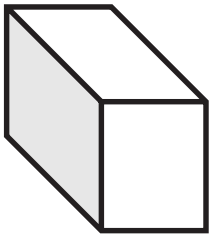
b.



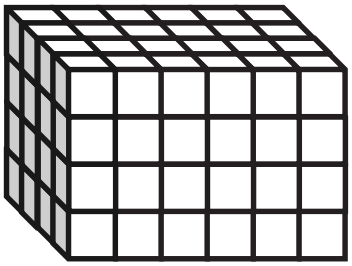
Number of Layers	Number of Cubes in Each Layer	Volume of the Prism
		cubic cm
		cubic cm
		cubic cm







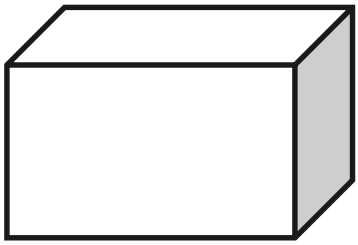
2. Josh and Jonah were finding the volume of the prism to the right. The boys agree that 4 layers can be added together to find the volume. Josh says that he can see on the end of the prism that each layer will have 16 cubes in it. Jonah says that each layer has 24 cubes in it. Who is right? Explain how you know using words, numbers, and/or pictures.



3. Marcos makes a prism 1 inch by 5 inches by 5 inches. He then decides to create layers equal to his first one. Fill in the chart below, and explain how you know the volume of each new prism.

Number of Layers	Volume	Explanation
2		
4		
7		

4. Imagine the rectangular prism below is 6 meters long, 4 meters tall, and 2 meters wide. Draw horizontal lines to show how the prism could be decomposed into layers that are 1 meter in height.



It has _____ layers from bottom to top.

Each horizontal layer contains _____ cubic meters.

The volume of this prism is _____.

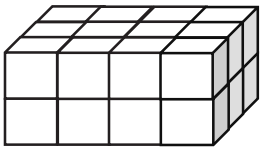
Name _____ Date _____

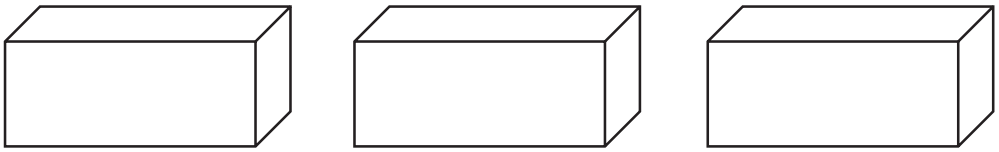
1. Use the prisms to find the volume.

   - The rectangular prisms pictured below were constructed with 1 cm cubes.
   - Decompose each prism into layers in three different ways, and show your thinking on the blank prisms.
   - Complete each table.

a.

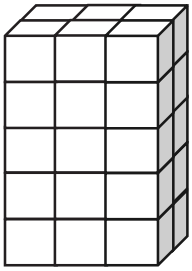
Number of Layers	Number of Cubes in Each Layer	Volume of the Prism
		cubic cm
		cubic cm
		cubic cm

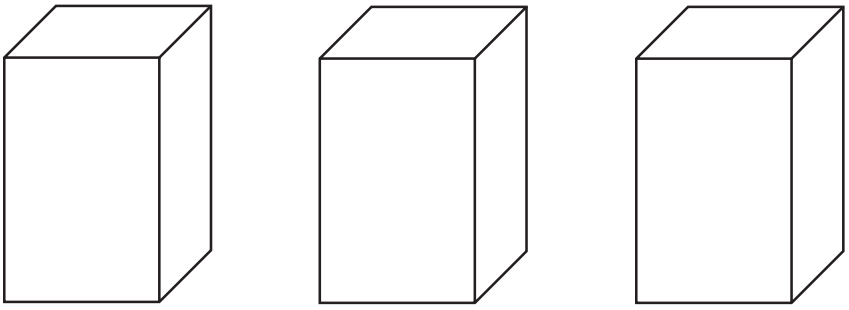




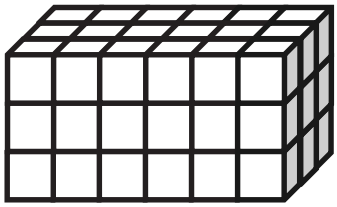
b.

Number of Layers	Number of Cubes in Each Layer	Volume of the Prism
		cubic cm
		cubic cm
		cubic cm





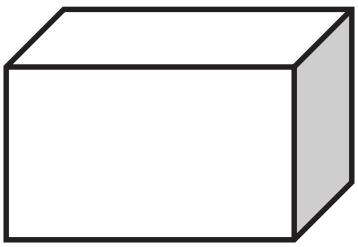
2. Stephen and Chelsea want to increase the volume of this prism by 72 cubic centimeters. Chelsea wants to add eight layers, and Stephen says they only need to add four layers. Their teacher tells them they are both correct. Explain how this is possible.



3. Juliana makes a prism 4 inches across and 4 inches wide but only 1 inch tall. She then decides to create layers equal to her first one. Fill in the chart below, and explain how you know the volume of each new prism.

Number of Layers	Volume	Explanation
3		
5		
7		

4. Imagine the rectangular prism below is 4 meters long, 3 meters tall, and 2 meters wide. Draw horizontal lines to show how the prism could be decomposed into layers that are 1 meter in height.



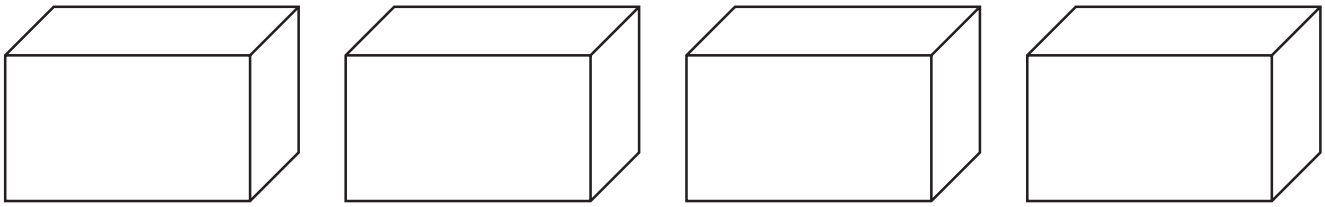
It has _____ layers from top to bottom.

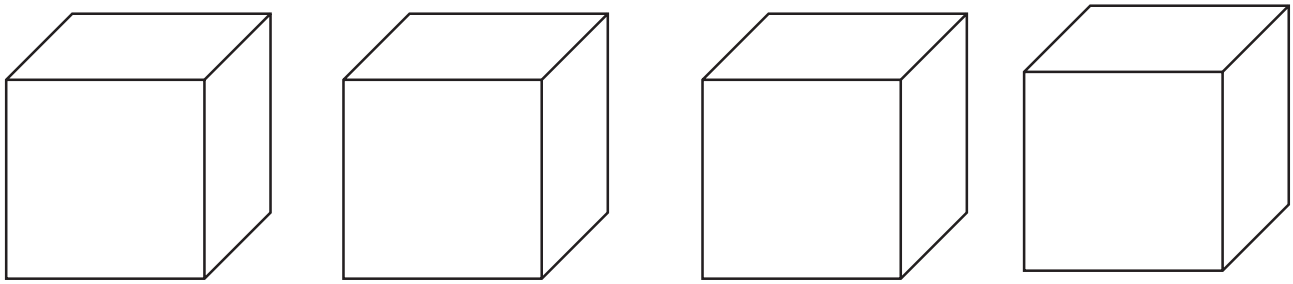
Each horizontal layer contains _____ cubic meters.

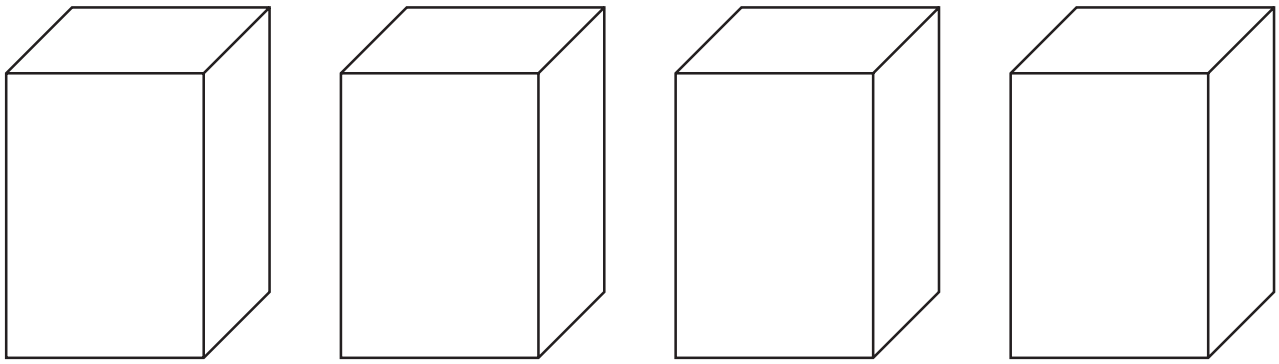
The volume of this prism is _____

Name _____ Date _____

Use these rectangular prisms to record the layers that you count.



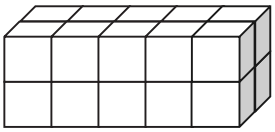




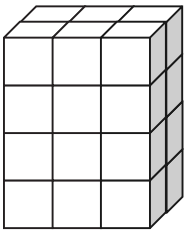
rectangular prism recording sheet

Name _____ Date _____

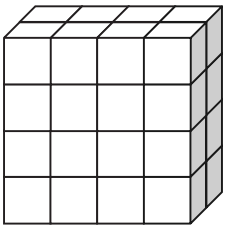
1. Each rectangular prism is built from centimeter cubes. State the dimensions, and find the volume.

a. 

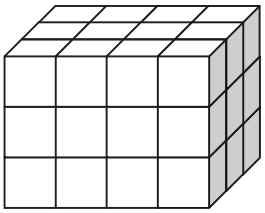
Length: _____ cm
Width: _____ cm
Height: _____ cm
Volume: _____ cm^3

b. 

Length: _____ cm
Width: _____ cm
Height: _____ cm
Volume: _____ cm^3

c. 

Length: _____ cm
Width: _____ cm
Height: _____ cm
Volume: _____ cm^3

d. 

Length: _____ cm
Width: _____ cm
Height: _____ cm
Volume: _____ cm^3

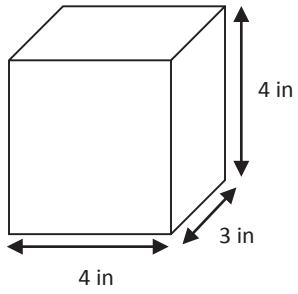
2. Write a multiplication sentence that you could use to calculate the volume for each rectangular prism in Problem 1. Include the units in your sentences.

a. _____ b. _____

c. _____ d. _____

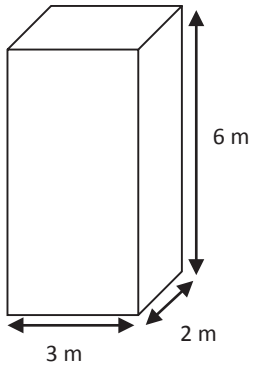
3. Calculate the volume of each rectangular prism. Include the units in your number sentences.

a.



V = _____

b.

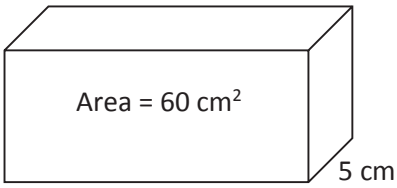


V = _____

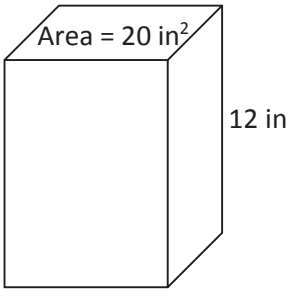
4. Tyron is constructing a box in the shape of a rectangular prism to store his baseball cards. It has a length of 10 centimeters, a width of 7 centimeters, and a height of 8 centimeters. What is the volume of the box?

5. Aaron says more information is needed to find the volume of the prisms. Explain why Aaron is mistaken, and calculate the volume of the prisms.

a.

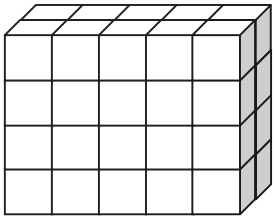


b.

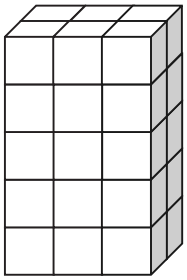


Name _____ Date _____

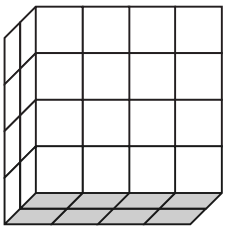
1. Each rectangular prism is built from centimeter cubes. State the dimensions, and find the volume.

a. 

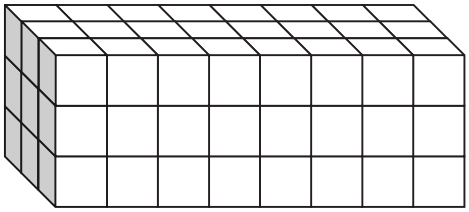
Length: _____ cm
Width: _____ cm
Height: _____ cm
Volume: _____ cm^3

b. 

Length: _____ cm
Width: _____ cm
Height: _____ cm
Volume: _____ cm^3

c. 

Length: _____ cm
Width: _____ cm
Height: _____ cm
Volume: _____ cm^3

d. 

Length: _____ cm
Width: _____ cm
Height: _____ cm
Volume: _____ cm^3

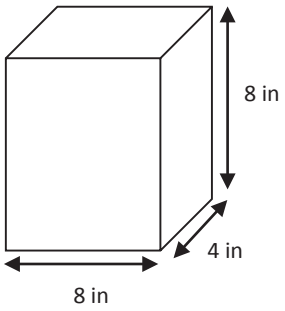
2. Write a multiplication sentence that you could use to calculate the volume for each rectangular prism in Problem 1. Include the units in your sentences.

a. _____ b. _____

c. _____ d. _____

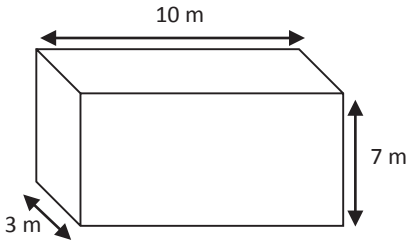
3. Calculate the volume of each rectangular prism. Include the units in your number sentences.

a.



Volume: _____

b.



Volume: _____

4. Mrs. Johnson is constructing a box in the shape of a rectangular prism to store clothes for the summer. It has a length of 28 inches, a width of 24 inches, and a height of 30 inches. What is the volume of the box?

5. Calculate the volume of each rectangular prism using the information that is provided.

a. Face area: 56 square meters

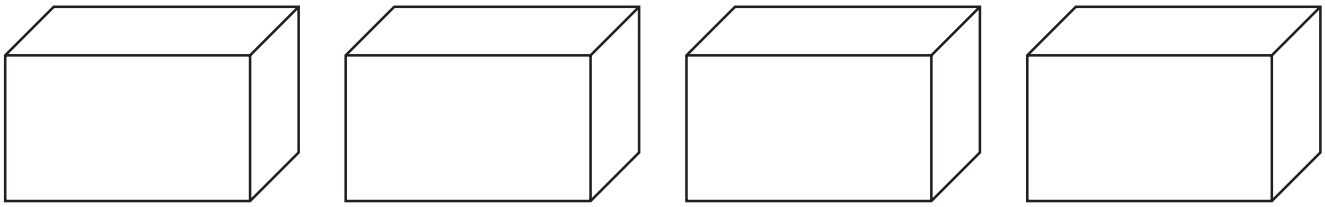
Height: 4 meters

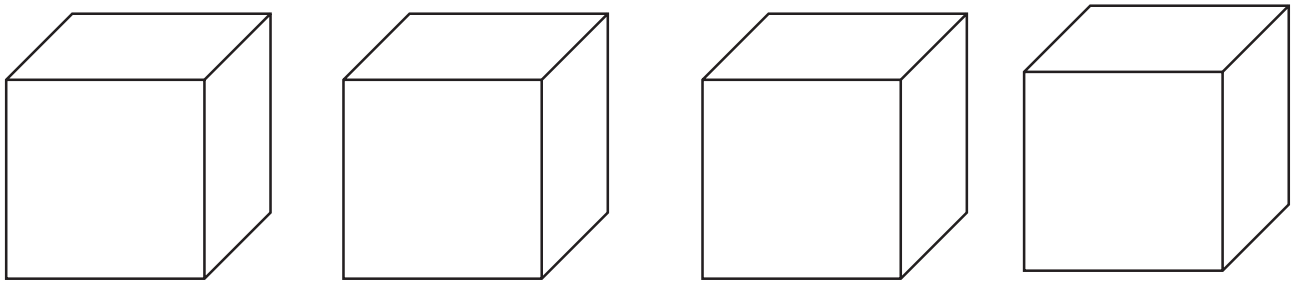
b. Face area: 169 square inches

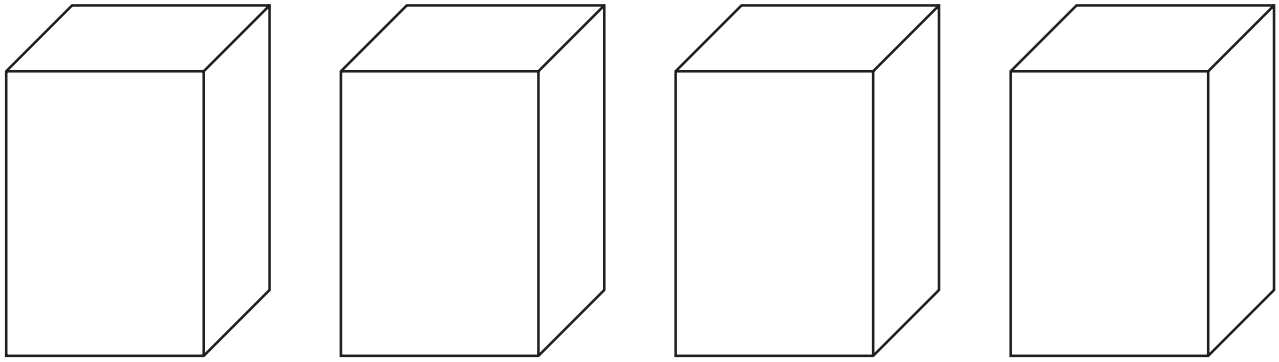
Height: 14 inches

Name _____ Date _____

Use these rectangular prisms to record the layers that you count.







_____

rectangular prism recording sheet (from Lesson 3)

Name _____ Date _____

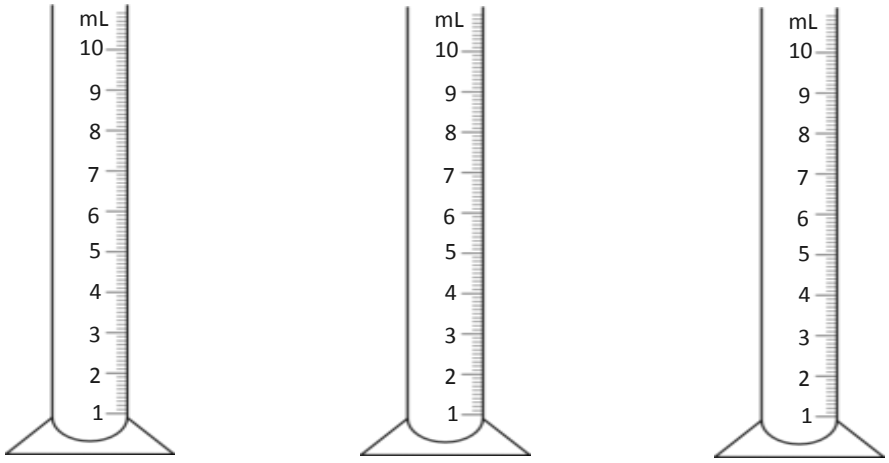
1. Determine the volume of two boxes on the table using cubes, and then confirm by measuring and multiplying.

Box Number	Number of Cubes Packed	Measurements Length	Width	Height	Volume

2. Using the same boxes from Problem 1, record the amount of liquid that your box can hold.

Box Number	Liquid the Box Can Hold
	mL
	mL

3. Shade to show the water in the beaker.



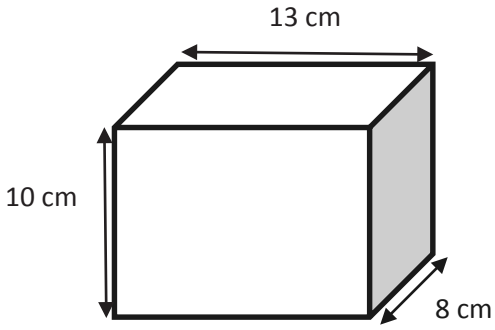
At first: _____ mL

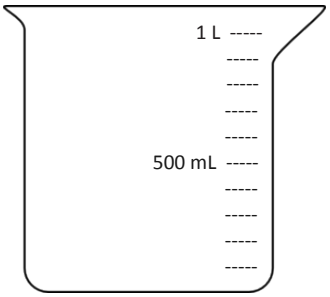
After 1 mL water added: _____ mL

After 1 cm cube added: _____ mL

4. What conclusion can you draw about 1 cubic centimeter and 1 mL?

5. The tank, shaped like a rectangular prism, is filled to the top with water.





Will the graduated cylinder hold all the water in the tank? If yes, how much more will the beaker hold? If no, how much more will the tank hold than the beaker? Explain how you know.

6. A rectangular fish tank measures 26 cm by 20 cm by 18 cm. The tank is filled with water to a depth of 15 cm.

   a. What is the volume of the water in mL?

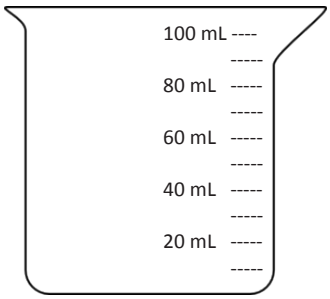
   b. How many liters is that?

   c. How many more mL of water will be needed to fill the tank to the top? Explain how you know.

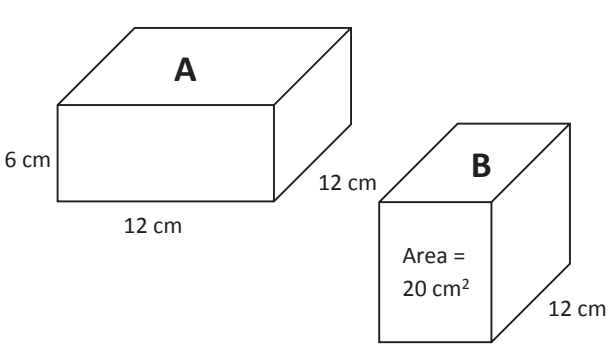
7. A rectangular container is 25 cm long and 20 cm wide. If it holds 1 liter of water when full, what is its height?

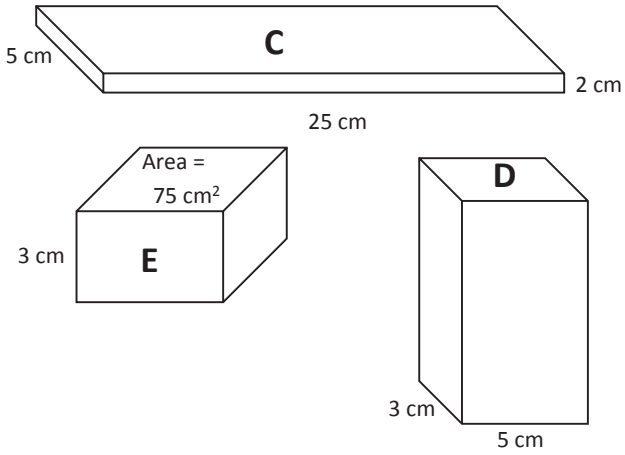
Name _____ Date _____

1. Johnny filled a container with 30 centimeter cubes. Shade the beaker to show how much water the container will hold. Explain how you know.



2. A beaker contains 250 mL of water. Jack wants to pour the water into a container that will hold the water. Which of the containers pictured below could he use? Explain your choices.



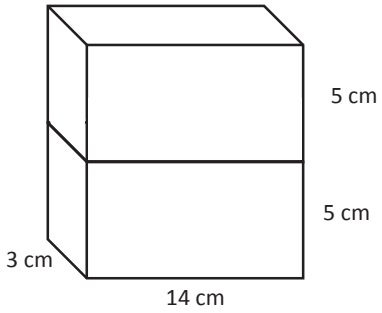


3. On the back of this paper, describe the details of the activities you did in class today. Include what you learned about cubic centimeters and milliliters. Give an example of a problem you solved with an illustration.

Name _____ Date _____

1. Find the total volume of the figures, and record your solution strategy.

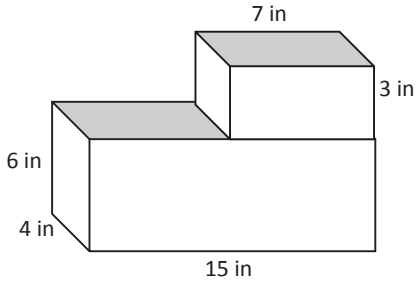
a.



Volume: _____

Solution Strategy:

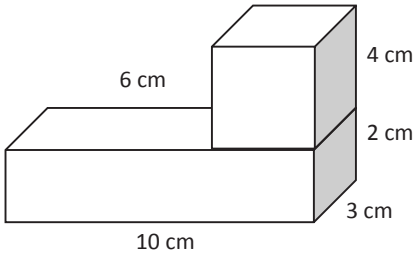
b.



Volume: _____

Solution Strategy:

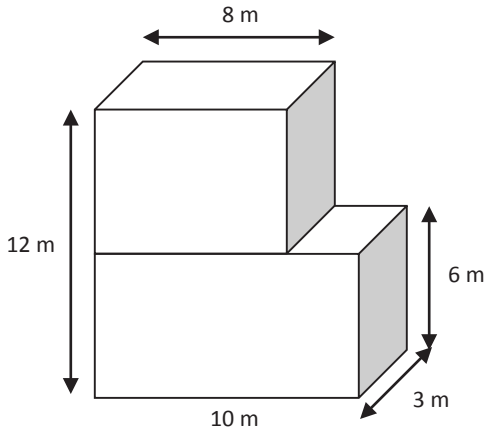
c.



Volume: _____

Solution Strategy:

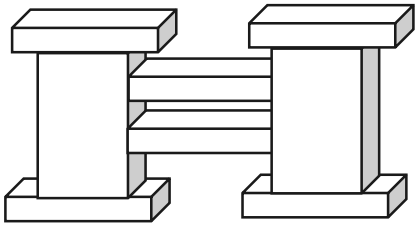
d.



Volume: _____

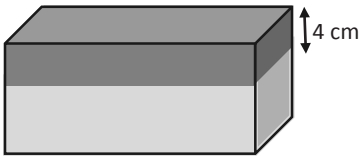
Solution Strategy:

2. A sculpture (pictured below) is made of two sizes of rectangular prisms. One size measures 13 in by 8 in by 2 in. The other size measures 9 in by 8 in by 18 in. What is the total volume of the sculpture?



3. The combined volume of two identical cubes is 128 cubic centimeters. What is the side length of each cube?

4. A rectangular tank with a base area of 24 cm^2 is filled with water and oil to a depth of 9 cm. The oil and water separate into two layers when the oil rises to the top. If the thickness of the oil layer is 4 cm, what is the volume of the water?



5. Two rectangular prisms have a combined volume of 432 cubic feet. Prism A has half the volume of Prism B.

   a. What is the volume of Prism A? Prism B?

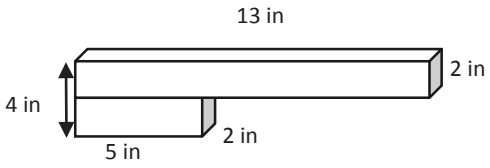
   b. If Prism A has a base area of 24 ft^2, what is the height of Prism A?

   c. If Prism B's base is $\frac{2}{3}$ the area of Prism A's base, what is the height of Prism B?

Name _____ Date _____

1. Find the total volume of the figures, and record your solution strategy.

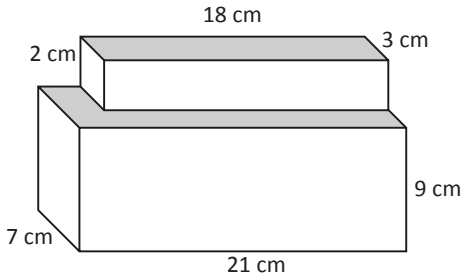
a.



Volume: _____

Solution Strategy:

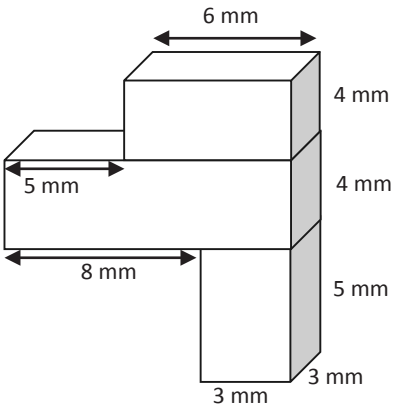
b.



Volume: _____

Solution Strategy:

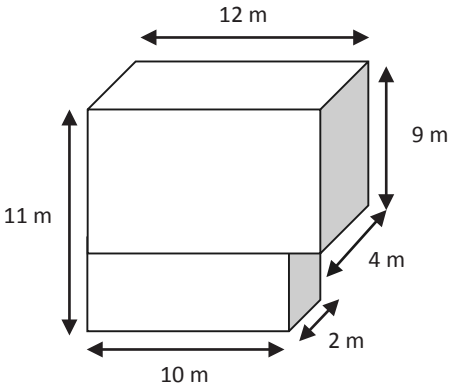
c.



Volume: _____

Solution Strategy:

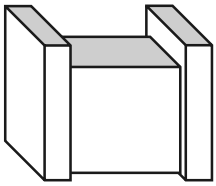
d.



Volume: _____

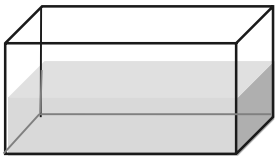
Solution Strategy:

2. The figure below is made of two sizes of rectangular prisms. One type of prism measures 3 inches by 6 inches by 14 inches. The other type measures 15 inches by 5 inches by 10 inches. What is the total volume of this figure?



3. The combined volume of two identical cubes is 250 cubic centimeters. What is the measure of one cube's edge?

4. A fish tank has a base area of 45 cm^2 and is filled with water to a depth of 12 cm. If the height of the tank is 25 cm, how much more water will be needed to fill the tank to the brim?



5. Three rectangular prisms have a combined volume of 518 cubic feet. Prism A has one-third the volume of Prism B, and Prisms B and C have equal volume. What is the volume of each prism?

Name _____ Date _____

Geoffrey builds rectangular planters.

1. Geoffrey's first planter is 8 feet long and 2 feet wide. The container is filled with soil to a height of 3 feet in the planter. What is the volume of soil in the planter? Explain your work using a diagram.

2. Geoffrey wants to grow some tomatoes in four large planters. He wants each planter to have a volume of 320 cubic feet, but he wants them all to be different. Show four different ways Geoffrey can make these planters, and draw diagrams with the planters' measurements on them.

Planter A	Planter B
Planter C	Planter D

3. Geoffrey wants to make one planter that extends from the ground to just below his back window. The window starts 3 feet off the ground. If he wants the planter to hold 36 cubic feet of soil, name one way he could build the planter so it is not taller than 3 feet. Explain how you know.

4. After all of this gardening work, Geoffrey decides he needs a new shed to replace the old one. His current shed is a rectangular prism that measures 6 feet long by 5 feet wide by 8 feet high. He realizes he needs a shed with 480 cubic feet of storage.

   a. Will he achieve his goal if he doubles each dimension? Why or why not?

   b. If he wants to keep the height the same, what could the other dimensions be for him to get the volume he wants?

   c. If he uses the dimensions in part (b), what could be the area of the new shed's floor?

Name _____ Date _____

Wren makes some rectangular display boxes.

1. Wren's first display box is 6 inches long, 9 inches wide, and 4 inches high. What is the volume of the display box? Explain your work using a diagram.

2. Wren wants to put some artwork into three shadow boxes. She knows they all need a volume of 60 cubic inches, but she wants them all to be different. Show three different ways Wren can make these boxes by drawing diagrams and labeling the measurements.

Shadow Box A	Shadow Box B
Shadow Box C	

3. Wren wants to build a box to organize her scrapbook supplies. She has a stencil set that is 12 inches wide that needs to lay flat in the bottom of the box. The supply box must also be no taller than 2 inches. Name one way she could build a supply box with a volume of 72 cubic inches.

4. After all of this organizing, Wren decides she also needs more storage for her soccer equipment. Her current storage box measures 1 foot long by 2 feet wide by 2 feet high. She realizes she needs to replace it with a box with 12 cubic feet of storage, so she doubles the width.

   a. Will she achieve her goal if she does this? Why or why not?

   b. If she wants to keep the height the same, what could the other dimensions be for a 12-cubic-foot storage box?

   c. If she uses the dimensions in part (b), what is the area of the new storage box's floor?

   d. How has the area of the bottom in her new storage box changed? Explain how you know.

Name _____ Date _____

Using the box patterns, construct a sculpture containing at least 5, but not more than 7, rectangular prisms that meets the following requirements in the table below.

1.	My sculpture has 5 to 7 rectangular prisms. Number of prisms: _____	
2.	Each prism is labeled with a letter, dimensions, and volume.	
	Prism A _____ by _____ by _____ Volume = _____ Prism B _____ by _____ by _____ Volume = _____ Prism C _____ by _____ by _____ Volume = _____ Prism D _____ by _____ by _____ Volume = _____ Prism E _____ by _____ by _____ Volume = _____ Prism __ _____ by _____ by _____ Volume = _____ Prism __ _____ by _____ by _____ Volume = _____	
3.	Prism D has $\frac{1}{2}$ the volume of Prism ____.	Prism D Volume = _____ Prism ____ Volume = _____
4.	Prism E has $\frac{1}{3}$ the volume of Prism ____.	Prism E Volume = _____ Prism ____ Volume = _____
5.	The total volume of all the prisms is 1,000 cubic centimeters or less.	Total volume: _____ Show calculations:

Name _____ Date _____

1. I have a prism with the dimensions of 6 cm by 12 cm by 15 cm. Calculate the volume of the prism, and then give the dimensions of three different prisms that each have $\frac{1}{3}$ of the volume.

	Length	Width	Height	Volume
Original Prism	6 cm	12 cm	15 cm	
Prism 1				
Prism 2				
Prism 3				

2. Sunni's bedroom has the dimensions of 11 ft by 10 ft by 10 ft. Her den has the same height but double the volume. Give two sets of the possible dimensions of the den and the volume of the den.

Project Requirements

1. Each project must include 5 to 7 rectangular prisms.
2. All prisms must be labeled with a letter (beginning with A), dimensions, and volume.
3. Prism D must be $\frac{1}{2}$ the volume of another prism.
4. Prism E must be $\frac{1}{3}$ the volume of another prism.
5. The total volume of all of the prisms must be 1,000 cubic centimeters or less.

Project Requirements

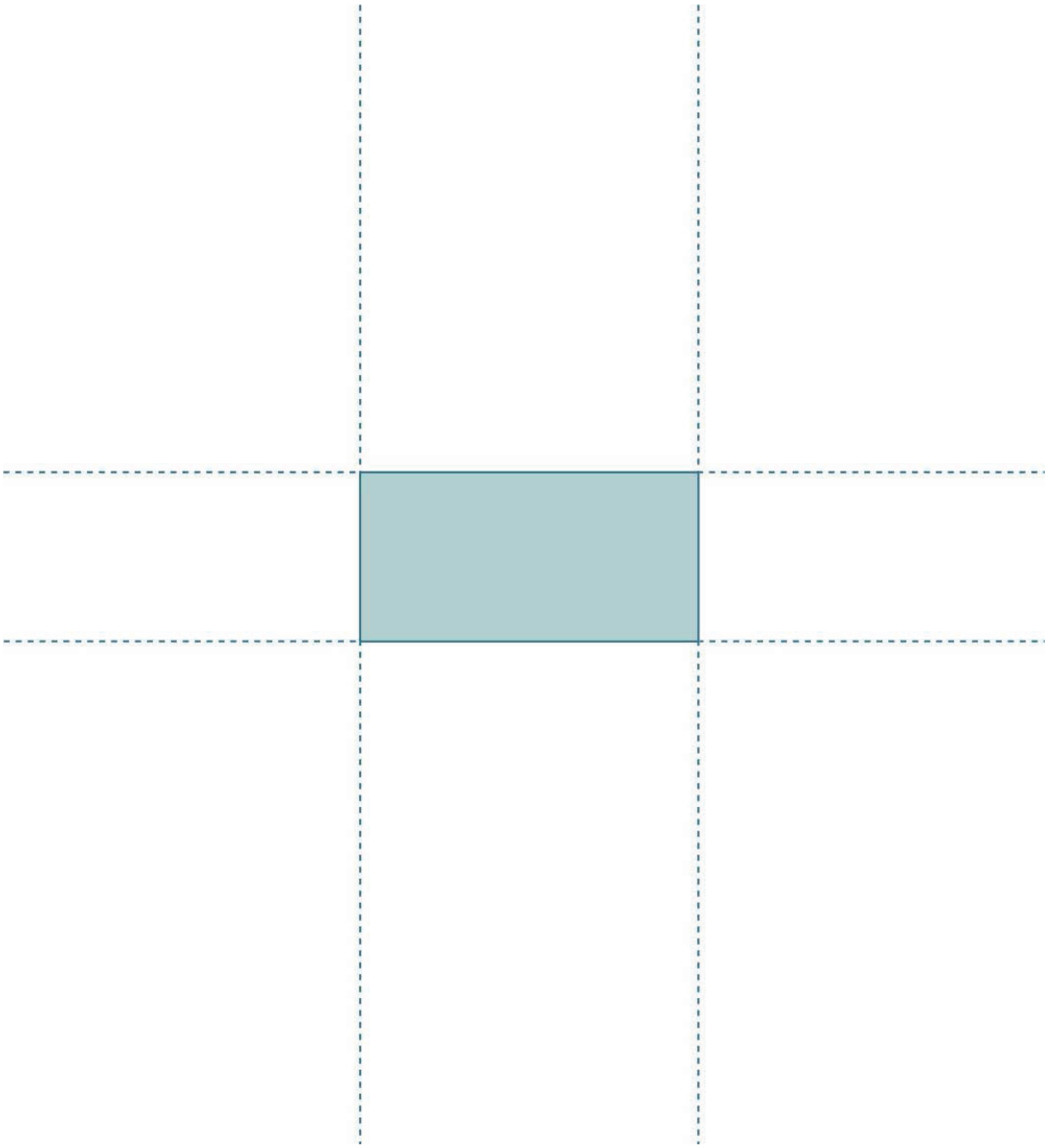
1. Each project must include 5 to 7 rectangular prisms.
2. All prisms must be labeled with a letter (beginning with A), dimensions, and volume.
3. Prism D must be $\frac{1}{2}$ the volume of another prism.
4. Prism E must be $\frac{1}{3}$ the volume of another prism.
5. The total volume of all of the prisms must be 1,000 cubic centimeters or less.

Project Requirements

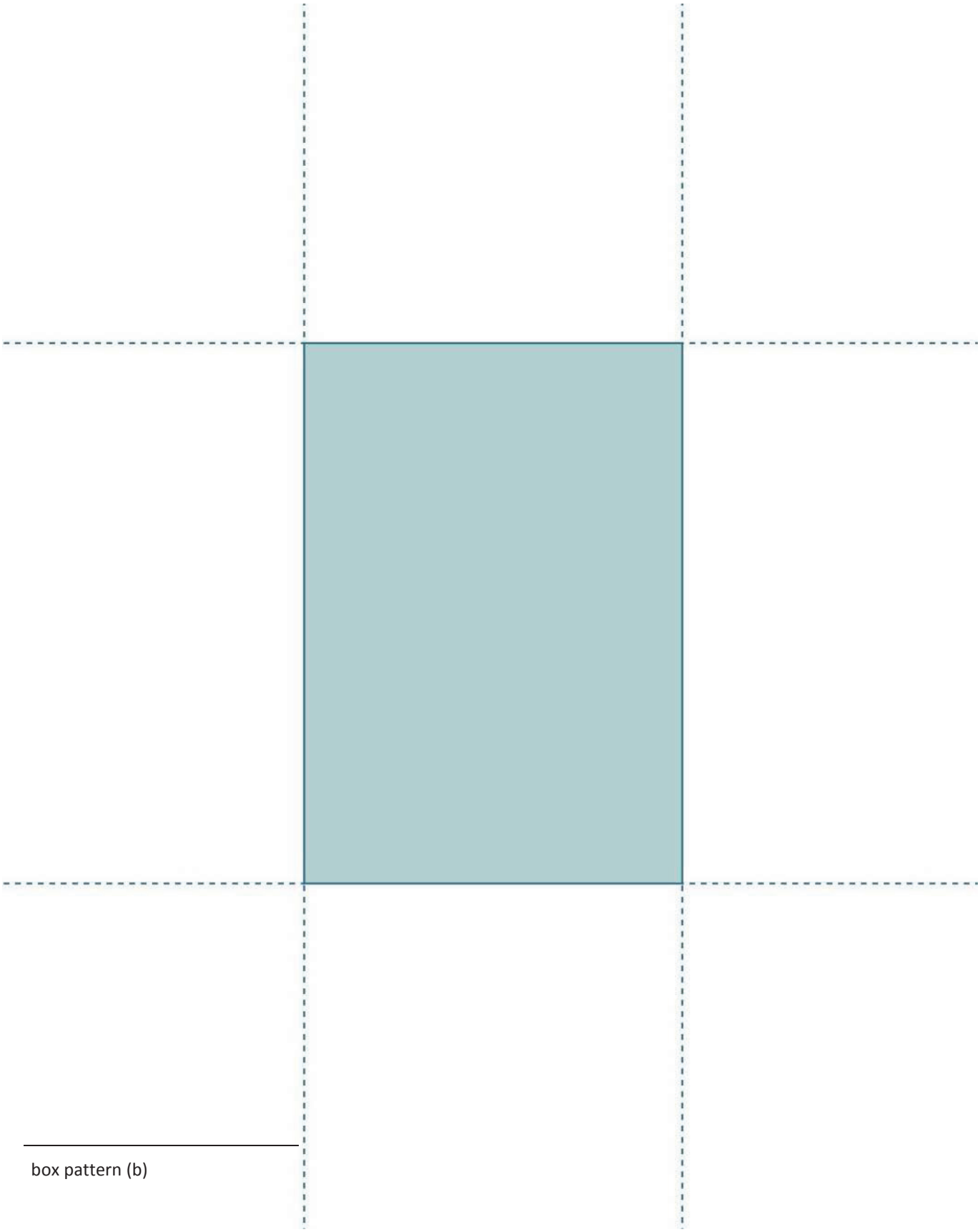
1. Each project must include 5 to 7 rectangular prisms.
2. All prisms must be labeled with a letter (beginning with A), dimensions, and volume.
3. Prism D must be $\frac{1}{2}$ the volume of another prism.
4. Prism E must be $\frac{1}{3}$ the volume of another prism.
5. The total volume of all of the prisms must be 1,000 cubic centimeters or less.

project requirements

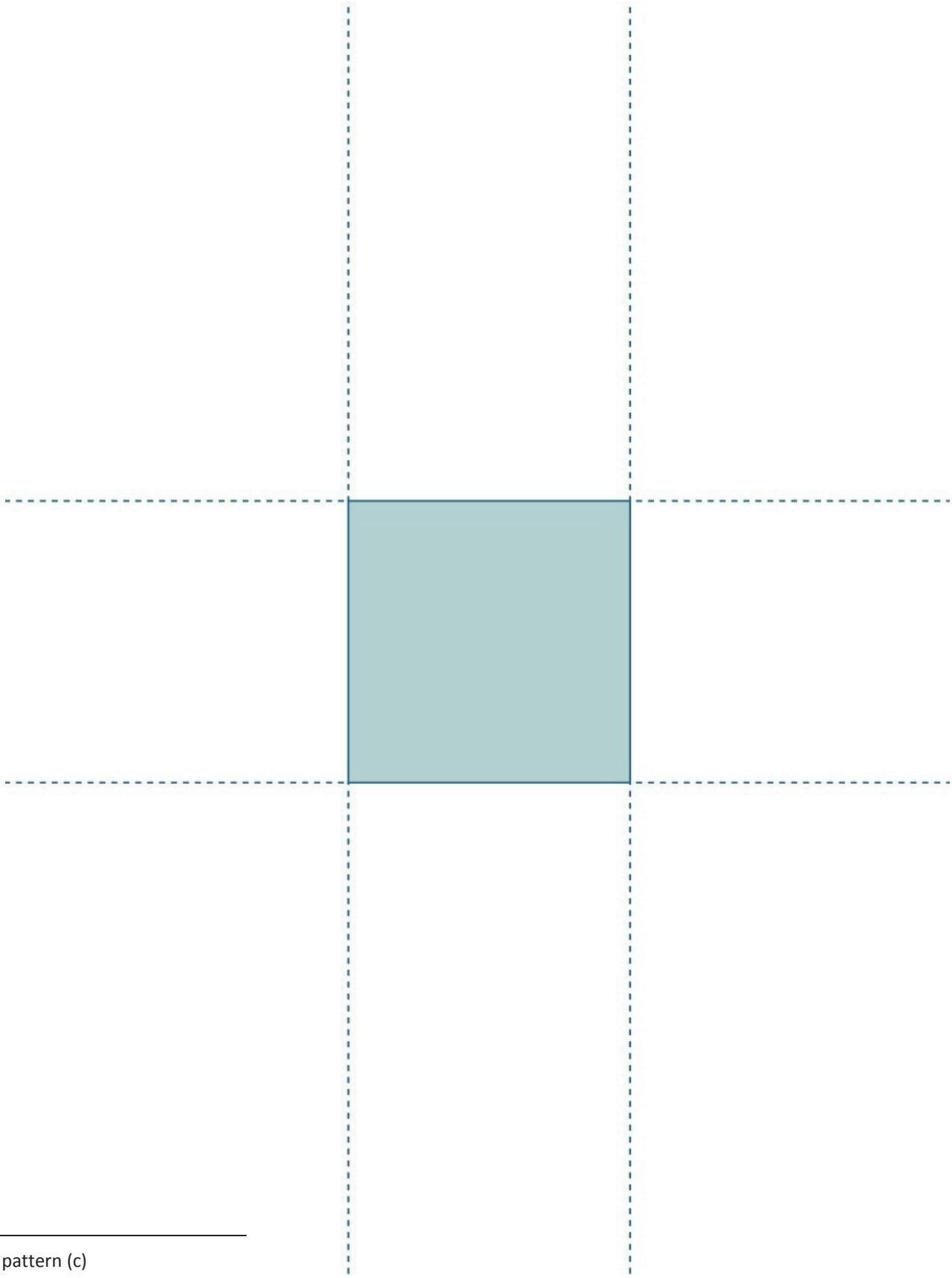
Note: Be sure to set printer to *actual size* before printing.



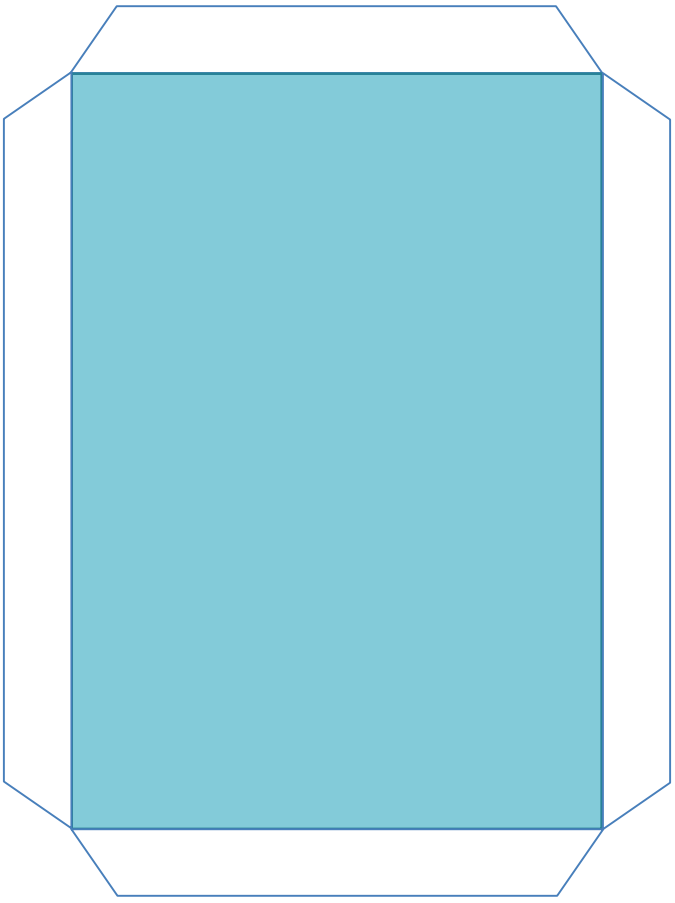
box pattern (a)

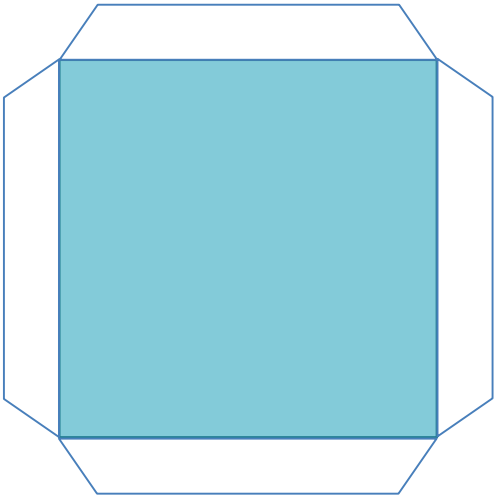


box pattern (b)



box pattern (c)





lid patterns

Name _____ Date _____

Evaluation Rubric

CATEGORY	4	3	2	1	Subtotal
Completeness of Personal Project and Classmate Evaluation	All components of the project are present and correct, and a detailed evaluation of a classmate's project has been completed.	Project is missing 1 component, and a detailed evaluation of a classmate's project has been completed.	Project is missing 2 components, and an evaluation of a classmate's project has been completed.	Project is missing 3 or more components, and an evaluation of a classmate's project has been completed.	(× 4) _____/16
Accuracy of Calculations	Volume calculations for all prisms are correct.	Volume calculations include 1 error.	Volume calculations include 2–3 errors.	Volume calculations include 4 or more errors.	(× 5) _____/20
Neatness and Use of Color	All elements of the project are carefully and colorfully constructed.	Some elements of the project are carefully and colorfully constructed.	Project lacks color or is not carefully constructed.	Project lacks color and is not carefully constructed.	(× 2) _____/4
					TOTAL: _____ /40

evaluation rubric

Name _____ Date _____

I reviewed project number _____.

Use the rubric below to evaluate your friend's project. Ask questions and measure the parts to determine whether your friend has all the required elements. Respond to the prompt in italics in the third column. The final column can be used to write something you find interesting about that element if you like.

Space is provided beneath the rubric for your calculations.

	Requirement	Element Present? (✓)	Specifics of Element	Notes
1.	The sculpture has 5 to 7 prisms.		*# of prisms:*	
2.	All prisms are labeled with a letter.		*Write letters used:*	
3.	All prisms have correct dimensions with units written on the top.		*List any prisms with incorrect dimensions or units:*	
4.	All prisms have correct volume with units written on the top.		*List any prism with incorrect dimensions or units:*	
5.	Prism D has $\frac{1}{2}$ the volume of another prism.		*Record on next page:*	
6.	Prism E has $\frac{1}{3}$ the volume of another prism.		*Record on next page:*	
7.	The total volume of all the parts together is 1,000 cubic units or less.		*Total volume:*	

Calculations:

8. Measure the dimensions of each prism. Calculate the volume of each prism and the total volume. Record that information in the table below. If your measurements or volume differ from those listed on the project, put a star by the prism label in the table below, and record on the rubric.

Prism	Dimensions	Volume
A	_____ by _____ by _____	
B	_____ by _____ by _____	
C	_____ by _____ by _____	
D	_____ by _____ by _____	
E	_____ by _____ by _____	
	_____ by _____ by _____	
	_____ by _____ by _____	

9. Prism D's volume is $\frac{1}{2}$ that of Prism _____.
   Show calculations below.

10. Prism E's volume is $\frac{1}{3}$ that of Prism _____.
    Show calculations below.

11. Total volume of sculpture: _____.
    Show calculations below.

Name _____ Date _____

1. Find three rectangular prisms around your house. Describe the item you are measuring (cereal box, tissue box, etc.), and then measure each dimension to the nearest whole inch, and calculate the volume.

   a. Rectangular Prism A

      Item:

      Height: _____ inches

      Length: _____ inches

      Width: _____ inches

      Volume: _____ cubic inches

   b. Rectangular Prism B

      Item:

      Height: _____ inches

      Length: _____ inches

      Width: _____ inches

      Volume: _____ cubic inches

   c. Rectangular Prism C

      Item:

      Height: _____ inches

      Length: _____ inches

      Width: _____ inches

      Volume: _____ cubic inches

Name _____ Date _____

Sketch the rectangles and your tiling. Write the dimensions and the units you counted in the blanks. Then, use multiplication to confirm the area. Show your work. We will do Rectangles A and B together.

1. **Rectangle A:**

Rectangle A is

_____ units long _____ units wide

Area = _____ $units^2$

2. **Rectangle B:**

Rectangle B is

_____ units long _____ units wide

Area = _____ $units^2$

3. **Rectangle C:**

Rectangle C is

_____ units long _____ units wide

Area = _____ $units^2$

4. **Rectangle D:**

Rectangle D is

_____ units long _____ units wide

Area = _____ $units^2$

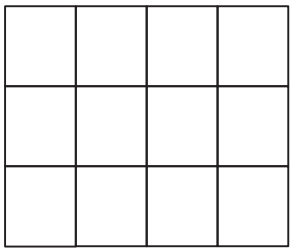
5. **Rectangle E:**

Rectangle E is

_____ units long _____ units wide

Area = _____ $units^2$

6. The rectangle to the right is composed of squares that measure $2\frac{1}{4}$ inches on each side. What is its area in square inches? Explain your thinking using pictures and numbers.

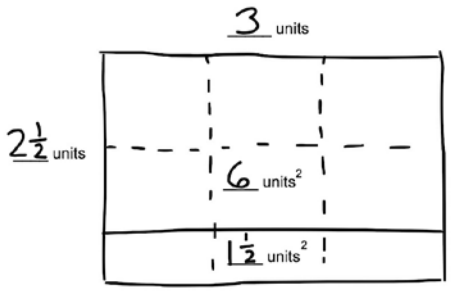


7. A rectangle has a perimeter of $35\frac{1}{2}$ feet. If the length is 12 feet, what is the area of the rectangle?

Name _____ Date _____

1. John tiled some rectangles using square units. Sketch the rectangles if necessary. Fill in the missing information, and then confirm the area by multiplying.

a. **Rectangle A:**

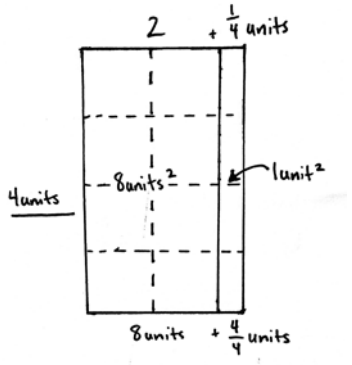


Rectangle A is

3 units long 2 1/2 units wide

Area = _____ units²

b. **Rectangle B:**



Rectangle B is

_____ units long _____ units wide

Area = _____ units²

c. **Rectangle C:**

Rectangle C is

3/4 units long 4 units wide

Area = _____ units²

d. **Rectangle D:**

Rectangle D is

2 units long $1\frac{3}{4}$ units wide

Area = _____ units^2

2. Rachel made a mosaic from different color rectangular tiles. Three tiles measured $3\frac{1}{2}$ inches × 3 inches. Six tiles measured 4 inches × $3\frac{1}{4}$ inches. What is the area of the whole mosaic in square inches?

3. A garden box has a perimeter of $27\frac{1}{2}$ feet. If the length is 9 feet, what is the area of the garden box?

Name _____ Date _____

Draw the rectangle and your tiling.
Write the dimensions and the units you counted in the blanks.
Then, use multiplication to confirm the area. Show your work.

1. **Rectangle A:**

Rectangle A is

_____ units long _____ units wide

Area = _____ units^2

2. **Rectangle B:**

Rectangle B is

_____ units long _____ units wide

Area = _____ units^2

3. **Rectangle C:**

Rectangle C is

_____ units long _____ units wide

Area = _____ units^2

4. **Rectangle D:**

Rectangle D is

_____ units long _____ units wide

Area = _____ units^2

5. Colleen and Caroline each built a rectangle out of square tiles placed in 3 rows of 5. Colleen used tiles that measured $1\frac{2}{3}$ cm in length. Caroline used tiles that measured $3\frac{1}{3}$ cm in length.

   a. Draw the girls' rectangles, and label the lengths and widths of each.

   b. What are the areas of the rectangles in square centimeters?

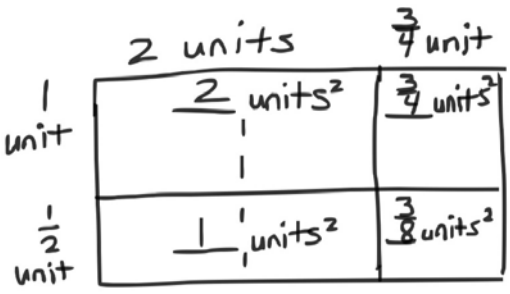
   c. Compare the areas of the rectangles.

6. A square has a perimeter of 51 inches. What is the area of the square?

Name _____ Date _____

1. Kristen tiled the following rectangles using square units. Sketch the rectangles, and find the areas. Then, confirm the area by multiplying. Rectangle A has been sketched for you.

a. **Rectangle A:**



Rectangle A is

_____ units long × _____ units wide

Area = _____ units^2

b. **Rectangle B:**

Rectangle B is

$2\frac{1}{2}$ units long × $\frac{3}{4}$ unit wide

Area = _____ units^2

c. **Rectangle C:**

Rectangle C is

$3\frac{1}{3}$ units long × $2\frac{1}{2}$ units wide

Area = _____ units^2

d. **Rectangle D:**

Rectangle D is

$3\frac{1}{2}$ units long $\times$ $2\frac{1}{4}$ units wide

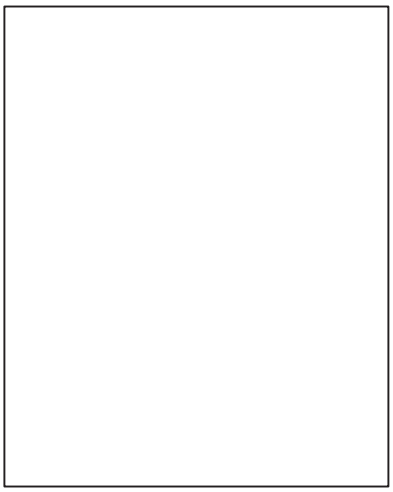
Area = _____ units^2

2. A square has a perimeter of 25 inches. What is the area of the square?

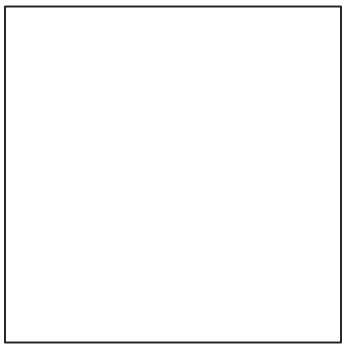
Name _____ Date _____

1. Measure each rectangle to the nearest $\frac{1}{4}$ inch with your ruler, and label the dimensions. Use the area model to find each area.

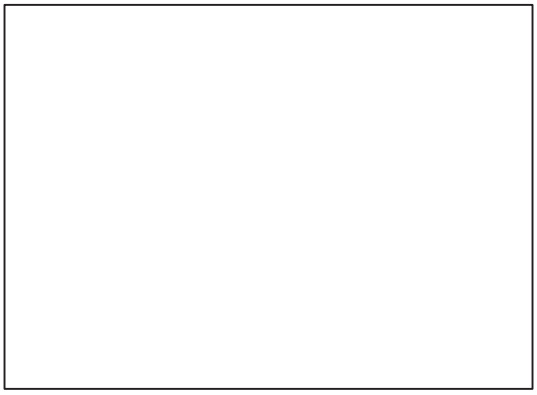
a.



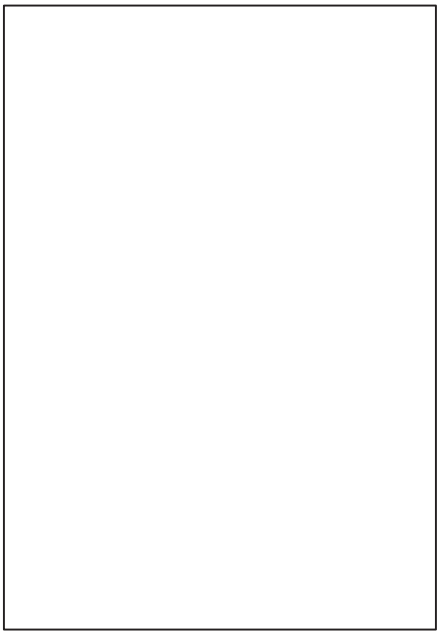
b.



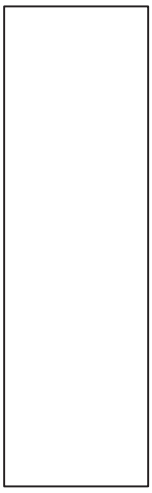
c.



d.



e.



f.

2. Find the area of rectangles with the following dimensions. Explain your thinking using the area model.

a. $1 \text{ ft} \times 1\frac{1}{2} \text{ ft}$

b. $1\frac{1}{2} \text{ yd} \times 1\frac{1}{2} \text{ yd}$

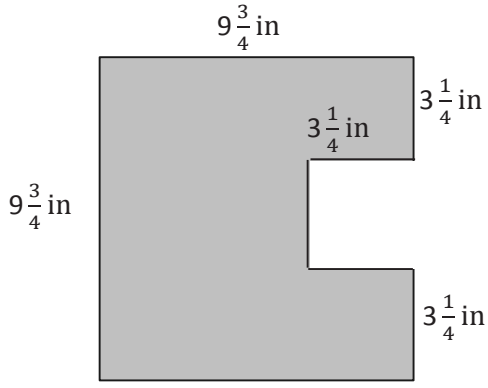
c. $2\frac{1}{2} \text{ yd} \times 1\frac{3}{16} \text{ yd}$

3. Hanley is putting carpet in her house. She wants to carpet her living room, which measures 15 ft × $12\frac{1}{3}$ ft. She also wants to carpet her dining room, which is $10\frac{1}{4}$ ft × $10\frac{1}{3}$ ft. How many square feet of carpet will she need to cover both rooms?

4. Fred cut a $9\frac{3}{4}$-inch square of construction paper for an art project. He cut a square from the edge of the big rectangle whose sides measured $3\frac{1}{4}$ inches. (See the picture below.)

   a. What is the area of the smaller square that Fred cut out?

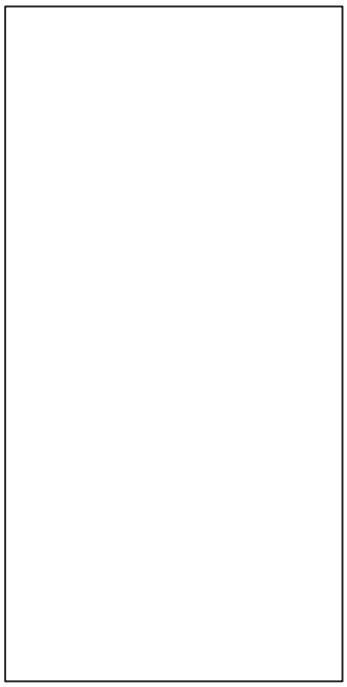
   b. What is the area of the remaining paper?



Name _____ Date _____

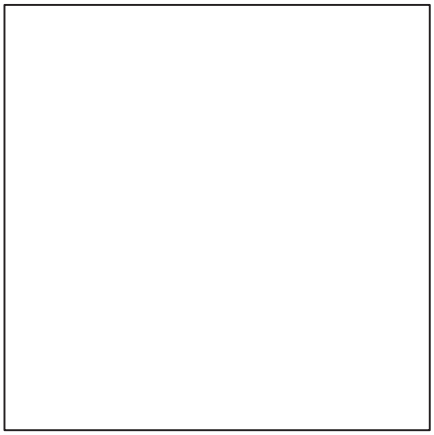
1. Measure each rectangle to the nearest $\frac{1}{4}$ inch with your ruler, and label the dimensions. Use the area model to find the area.

a.

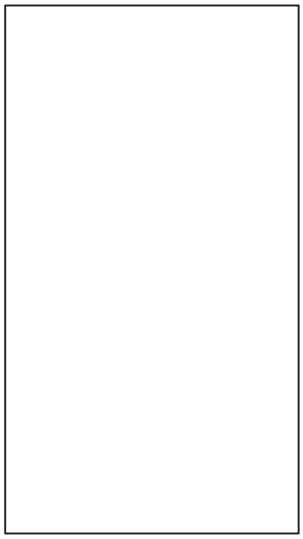


b.

c.



d.



e.

2. Find the area of rectangles with the following dimensions. Explain your thinking using the area model.

   a. $2\frac{1}{4}$ yd × $\frac{1}{4}$ yd

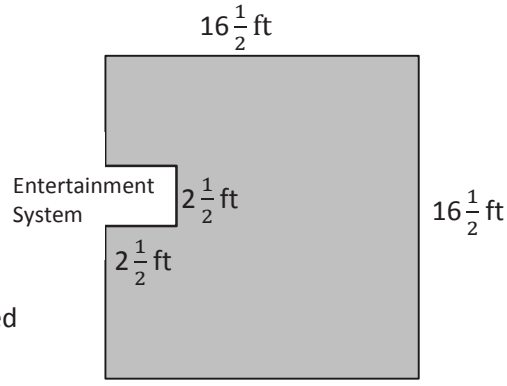
   b. $2\frac{1}{2}$ ft × $1\frac{1}{4}$ ft

3. Kelly buys a tarp to cover the area under her tent. The tent is 4 feet wide and has an area of 31 square feet. The tarp she bought is $5\frac{1}{3}$ feet by $5\frac{3}{4}$ feet. Can the tarp cover the area under Kelly's tent? Draw a model to show your thinking.

4. Shannon and Leslie want to carpet a $16\frac{1}{2}$-ft by $16\frac{1}{2}$-ft square room. They cannot put carpet under an entertainment system that juts out. (See the drawing below.)

   a. In square feet, what is the area of the space with no carpet?

   b. How many square feet of carpet will Shannon and Leslie need to buy?



Name _____ Date _____

1. Find the area of the following rectangles. Draw an area model if it helps you.

a. $\frac{5}{4}$ km × $\frac{12}{5}$ km

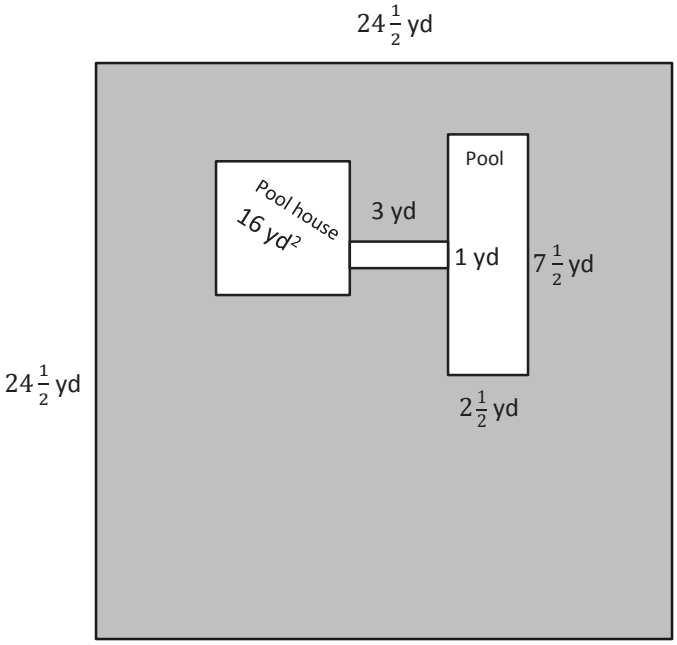
b. $16\frac{1}{2}$ m × $4\frac{1}{5}$ m

c. $4\frac{1}{3}$ yd × $5\frac{2}{3}$ yd

d. $\frac{7}{8}$ mi × $4\frac{1}{3}$ mi

2. Julie is cutting rectangles out of fabric to make a quilt. If the rectangles are $2\frac{3}{5}$ inches wide and $3\frac{2}{3}$ inches long, what is the area of four such rectangles?

3. Mr. Howard's pool is connected to his pool house by a sidewalk as shown. He wants to buy sod for the lawn, shown in gray. How much sod does he need to buy?



Name _____ Date _____

1. Find the area of the following rectangles. Draw an area model if it helps you.

a. $\frac{8}{3}$ cm × $\frac{24}{4}$ cm

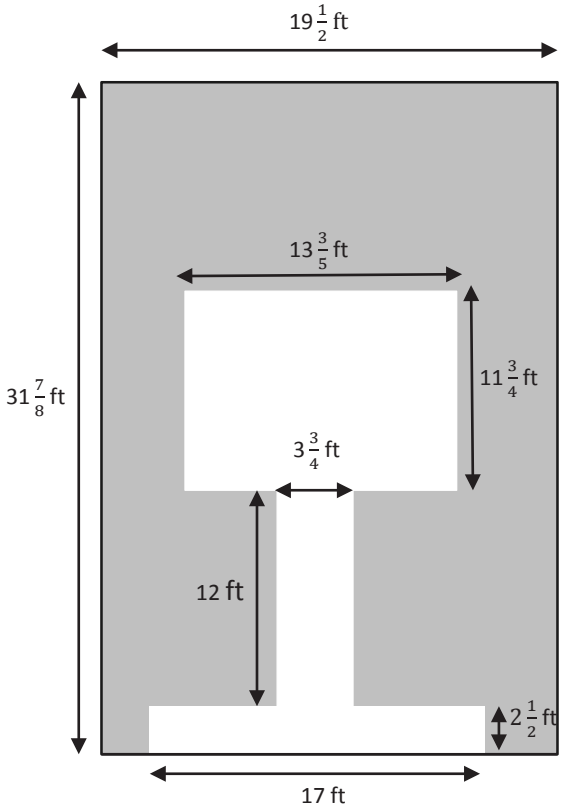
b. $\frac{32}{5}$ ft × $3\frac{3}{8}$ ft

c. $5\frac{4}{6}$ in × $4\frac{3}{5}$ in

d. $\frac{5}{7}$ m × $6\frac{3}{5}$ m

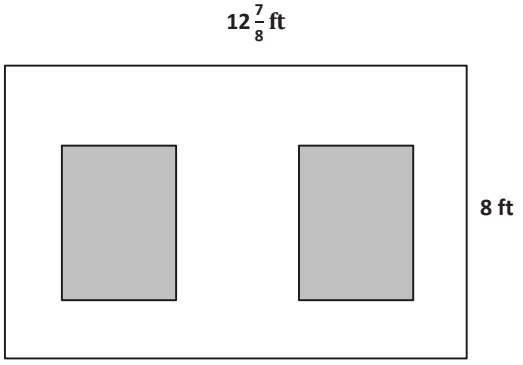
2. Chris is making a tabletop from some leftover tiles. He has 9 tiles that measure $3\frac{1}{8}$ inches long and $2\frac{3}{4}$ inches wide. What is the greatest area he can cover with these tiles?

3. A hotel is recarpeting a section of the lobby. Carpet covers the part of the floor as shown below in gray. How many square feet of carpeting will be needed?

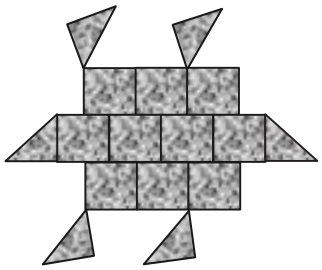


Name _____ Date _____

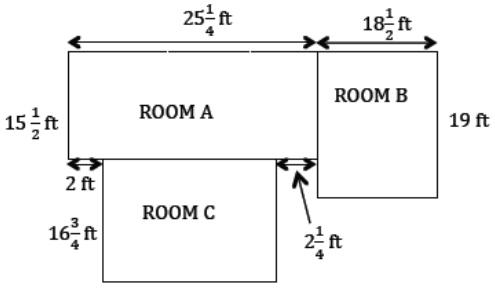
1. George decided to paint a wall with two windows. Both windows are $3\frac{1}{2}$-ft by $4\frac{1}{2}$-ft rectangles. Find the area the paint needs to cover.



2. Joe uses square tiles, some of which he cuts in half, to make the figure below. If each square tile has a side length of $2\frac{1}{2}$ inches, what is the total area of the figure?



3. All-In-One Carpets is installing carpeting in three rooms. How many square feet of carpet are needed to carpet all three rooms?



4. Mr. Johnson needs to buy sod for his front lawn.

   a. If the lawn measures $36\frac{2}{3}$ ft by $45\frac{1}{6}$ ft, how many square feet of sod will he need?

   b. If sod is only sold in whole square feet, how much will Mr. Johnson have to pay?

Sod Prices

Area	Price per Square Foot
First 1,000 sq ft	$0.27
Next 500 sq ft	$0.22
Additional square feet	$0.19

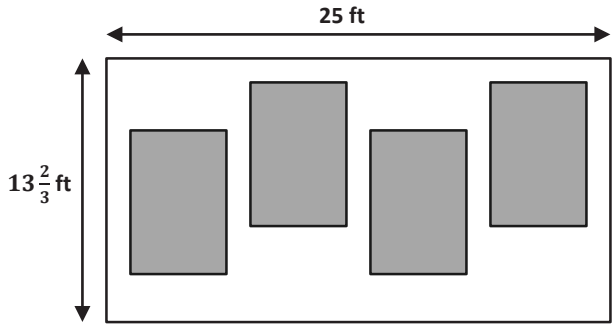
5. Jennifer's class decides to make a quilt. Each of the 24 students will make a quilt square that is 8 inches on each side. When they sew the quilt together, every edge of each quilt square will lose $\frac{3}{4}$ of an inch.

   a. Draw one way the squares could be arranged to make a rectangular quilt. Then, find the perimeter of your arrangement.

   b. Find the area of the quilt.

Name _____ Date _____

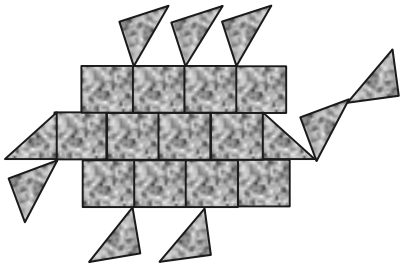
1. Mr. Albano wants to paint menus on the wall of his café in chalkboard paint. The gray area below shows where the rectangular menus will be. Each menu will measure 6-ft wide and $7\frac{1}{2}$-ft tall.



   - How many square feet of menu space will Mr. Albano have?

   - What is the area of wall space that is not covered by chalkboard paint?

2. Mr. Albano wants to put tiles in the shape of a dinosaur at the front entrance. He will need to cut some tiles in half to make the figure. If each square tile is $4\frac{1}{4}$ inches on each side, what is the total area of the dinosaur?



3. A-Plus Glass is making windows for a new house that is being built. The box shows the list of sizes they must make.

15 windows $4\frac{3}{4}$-ft long and $3\frac{3}{5}$-ft wide
7 windows $2\frac{4}{5}$-ft wide and $6\frac{1}{2}$-ft long

How many square feet of glass will they need?

4. Mr. Johnson needs to buy seed for his backyard lawn.

   - If the lawn measures $40\frac{4}{5}$ ft by $50\frac{7}{8}$ ft, how many square feet of seed will he need to cover the entire area?

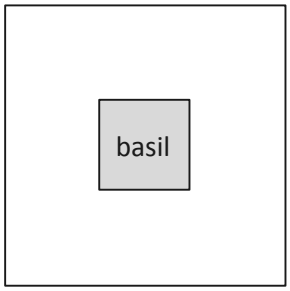
   - One bag of seed will cover 500 square feet if he sets his seed spreader to its highest setting and 300 square feet if he sets the spreader to its lowest setting. How many bags of seed will he need if he uses the highest setting? The lowest setting?

Name _____ Date _____

1. The length of a flowerbed is 4 times as long as its width. If the width is $\frac{3}{8}$ meter, what is the area?

2. Mrs. Johnson grows herbs in square plots. Her basil plot measures $\frac{5}{8}$ yd on each side.

   a. Find the total area of the basil plot.



   b. Mrs. Johnson puts a fence around the basil. If the fence is 2 ft from the edge of the garden on each side, what is the perimeter of the fence in feet?

c. What is the total area, in square feet, that the fence encloses?

3. Janet bought 5 yards of fabric $2\frac{1}{4}$-feet wide to make curtains. She used $\frac{1}{3}$ of the fabric to make a long set of curtains and the rest to make 4 short sets.

a. Find the area of the fabric she used for the long set of curtains.

b. Find the area of the fabric she used for each of the short sets.

4. Some wire is used to make 3 rectangles: A, B, and C. Rectangle B's dimensions are $\frac{3}{5}$ cm larger than Rectangle A's dimensions, and Rectangle C's dimensions are $\frac{3}{5}$ cm larger than Rectangle B's dimensions. Rectangle A is 2 cm by $3\frac{1}{5}$ cm.

   a. What is the total area of all three rectangles?

   b. If a 40-cm coil of wire was used to form the rectangles, how much wire is left?

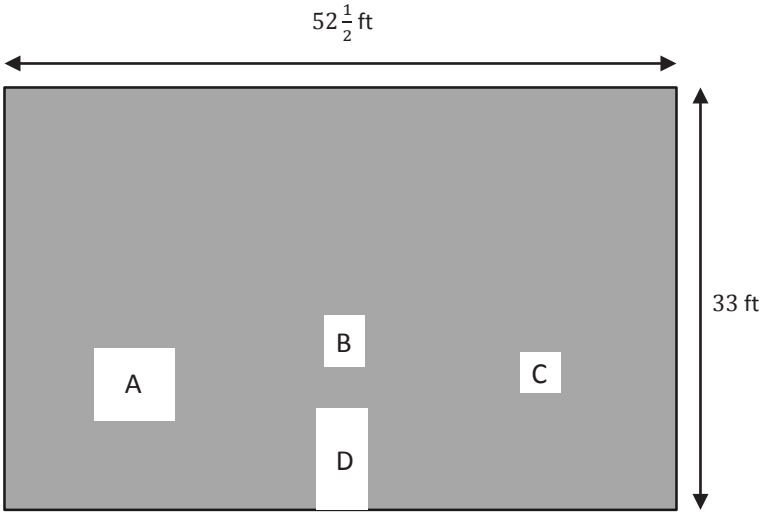
Name _____ Date _____

1. The width of a picnic table is 3 times its length. If the length is $\frac{5}{6}$-yd long, what is the area of the picnic table in square feet?

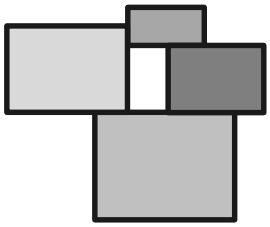
2. A painting company will paint this wall of a building. The owner gives them the following dimensions:

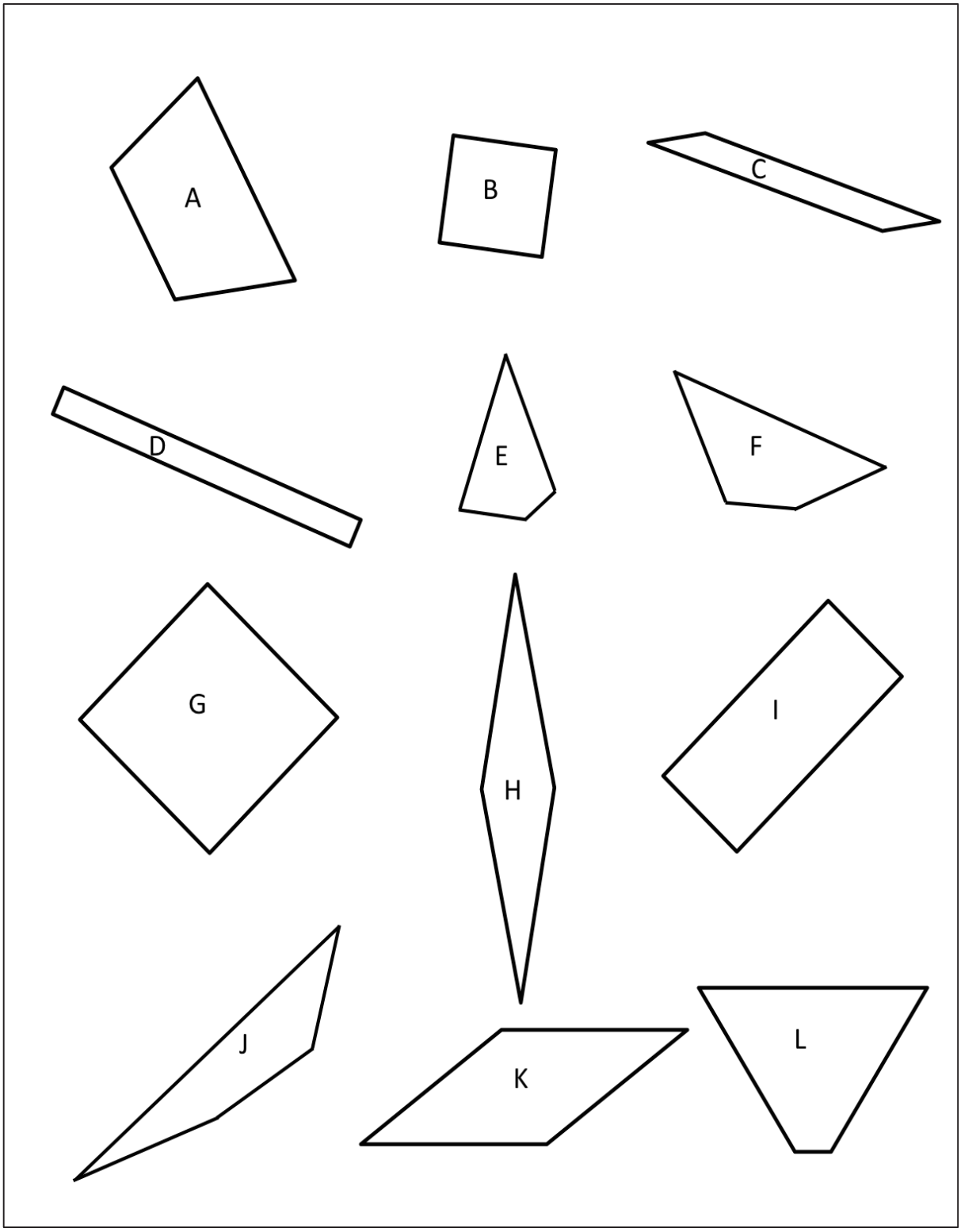
   Window A is $6\frac{1}{4}$ ft × $5\frac{3}{4}$ ft.
   Window B is $3\frac{1}{8}$ ft × 4 ft.
   Window C is $9\frac{1}{2}$ ft^2.
   Door D is 4 ft × 8 ft.

   What is the area of the painted part of the wall?



3. A decorative wooden piece is made up of four rectangles as shown to the right. The smallest rectangle measures $4\frac{1}{2}$ inches by $7\frac{3}{4}$ inches. If $2\frac{1}{4}$ inches are added to each dimension as the rectangles get larger, what is the total area of the entire piece?





shape sheet

Name _____ Date _____

1. Draw a pair of parallel lines in each box. Then, use the parallel lines to draw a trapezoid with the following:

a. No right angles.	b. Only 1 obtuse angle.
c. 2 obtuse angles.	d. At least 1 right angle.

2. Use the trapezoids you drew to complete the tasks below.

   a. Measure the angles of the trapezoid with your protractor, and record the measurements on the figures.

   b. Use a marker or crayon to circle pairs of angles inside each trapezoid with a sum equal to 180°. Use a different color for each pair.

3. List the properties that are shared by all the trapezoids that you worked with today.

4. When can a quadrilateral also be called a trapezoid?

5. Follow the directions to draw one last trapezoid.

   a. Draw a segment $\overline{AB}$ parallel to the bottom of this page that is 5 cm long.

   b. Draw two 55° angles with vertices at A and B so that an isosceles triangle is formed with $\overline{AB}$ as the base of the triangle.

   c. Label the top vertex of your triangle as C.

   d. Use your set square to draw a line parallel to $\overline{AB}$ that intersects both $\overline{AC}$ and $\overline{BC}$.

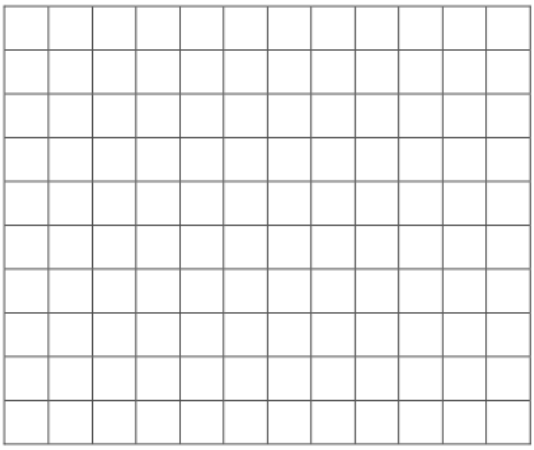
   e. Shade the trapezoid that you drew.

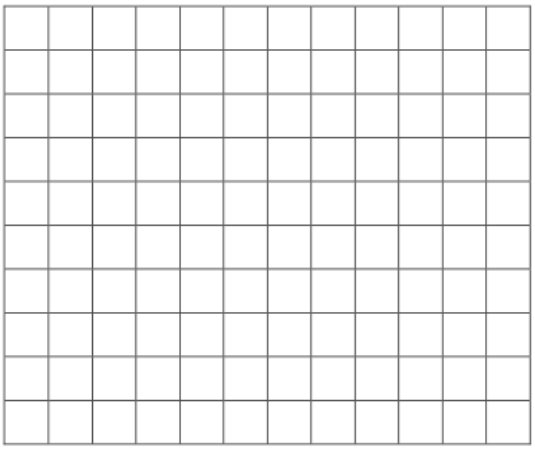
Name _____ Date _____

1. Use a straightedge and the grid paper to draw:

   a. A trapezoid with exactly 2 right angles.

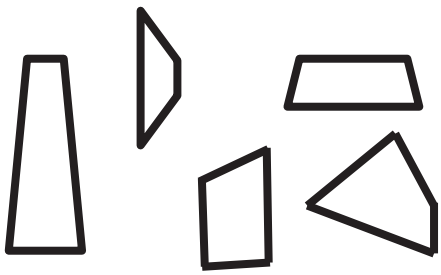
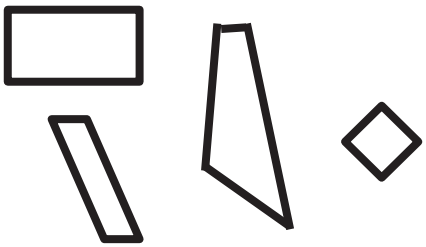
   b. A trapezoid with no right angles.





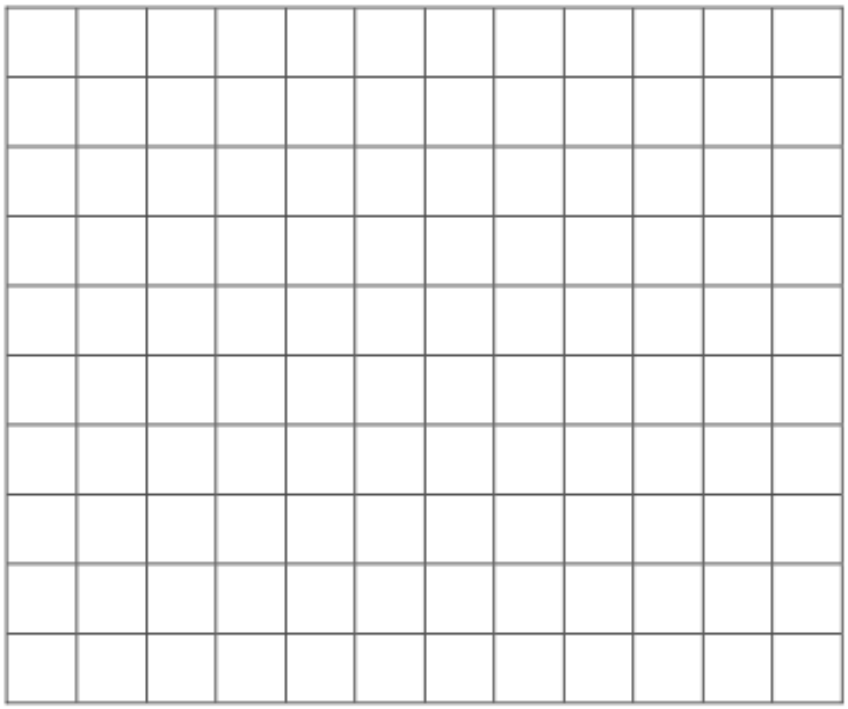
2. Kaplan incorrectly sorted some quadrilaterals into trapezoids and non-trapezoids as pictured below.

   a. Circle the shapes that are in the wrong group, and tell why they are sorted incorrectly.

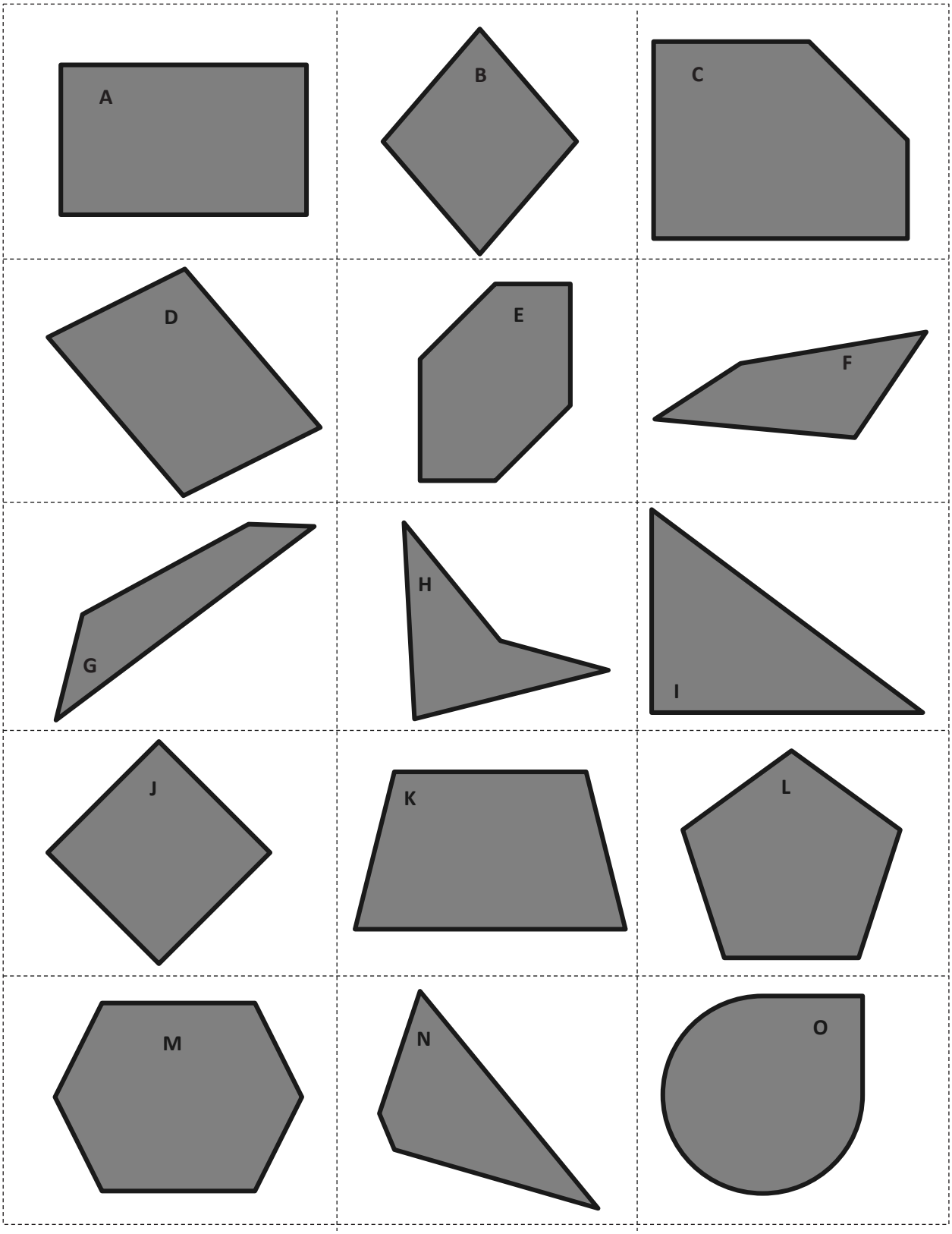
Trapezoids	Non-Trapezoids
	

   b. Explain what tools would be necessary to use to verify the placement of all the trapezoids.

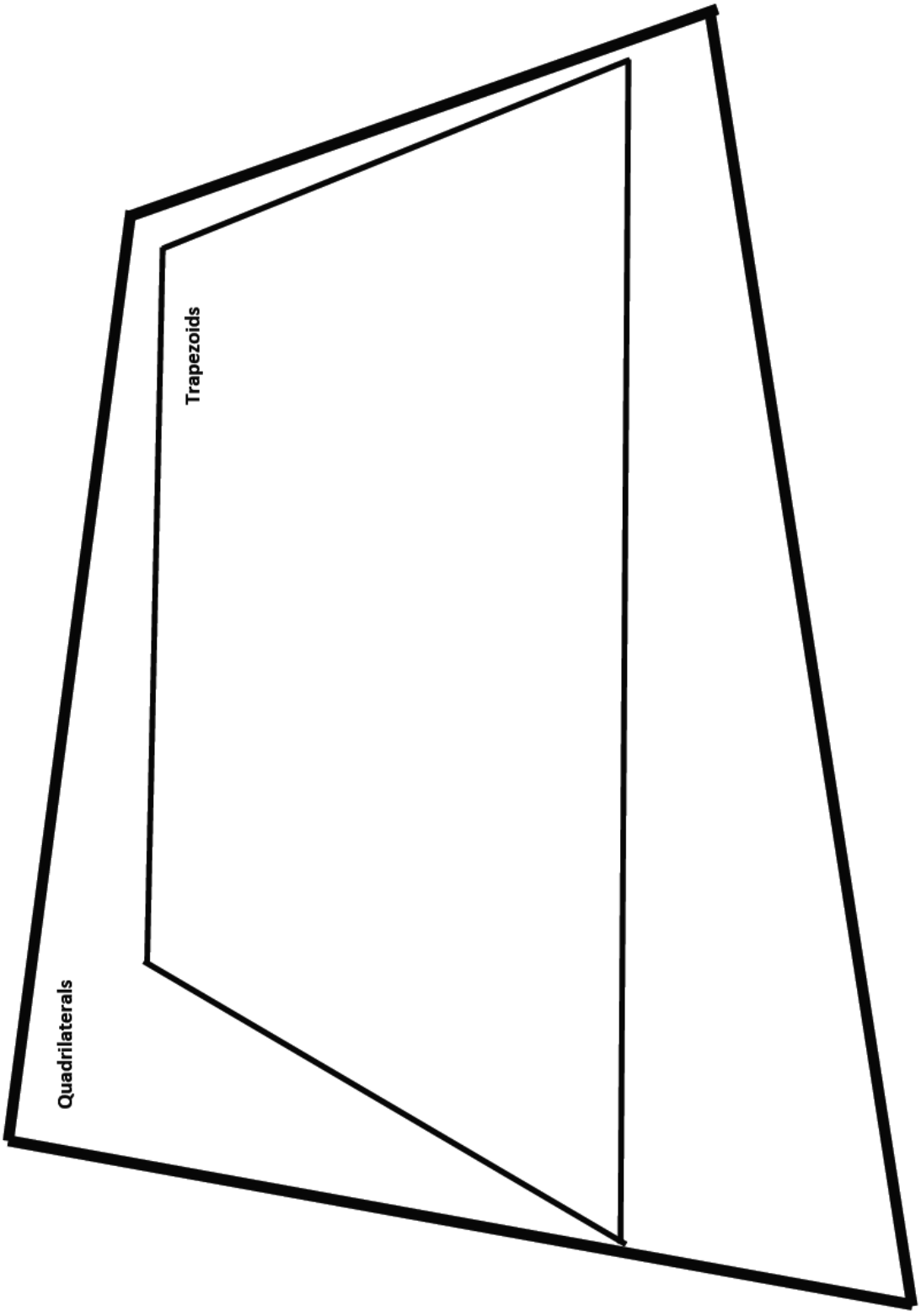
3. a. Use a straightedge to draw an isosceles trapezoid on the grid paper.



b. Why is this shape called an isosceles trapezoid?



collection of polygons



quadrilateral hierarchy

Name _____ Date _____

1. Draw a parallelogram in each box with the attributes listed.

a. No right angles.	b. At least 2 right angles.
c. Equal sides with no right angles.	d. All sides equal with at least 2 right angles.

2. Use the parallelograms you drew to complete the tasks below.

   a. Measure the angles of the parallelogram with your protractor, and record the measurements on the figures.

   b. Use a marker or crayon to circle pairs of angles inside each parallelogram with a sum equal to 180°. Use a different color for each pair.

3. Draw another parallelogram below.

   a. Draw the diagonals, and measure their lengths. Record the measurements to the side of your figure.

   b. Measure the length of each of the four segments of the diagonals from the vertices to the point of intersection of the diagonals. Color the segments that have the same length the same color. What do you notice?

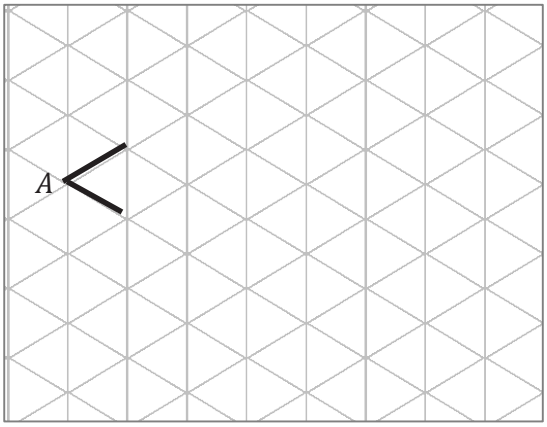
4. List the properties that are shared by all of the parallelograms that you worked with today.

   a. When can a quadrilateral also be called a parallelogram?

   b. When can a trapezoid also be called a parallelogram?

Name _____ Date _____

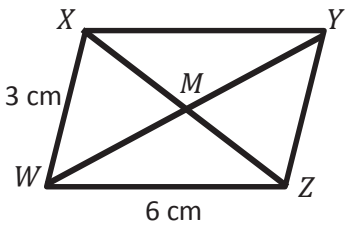
1. $\angle A$ measures 60°.



a. Extend the rays of $\angle A$, and draw parallelogram $ABCD$ on the grid paper.

b. What are the measures of $\angle B$, $\angle C$, and $\angle D$?

2. $WXYZ$ is a parallelogram not drawn to scale.



a. Using what you know about parallelograms, give the measure of sides XY and YZ.

b. $\angle WXY = 113°$. Use what you know about angles in a parallelogram to find the measure of the other angles.

$\angle XYZ =$ _____° $\angle YZW =$ _____° $\angle ZWX =$ _____°

3. Jack measured some segments in Problem 2. He found that $\overline{WY} = 8$ cm and $\overline{MZ} = 3$ cm.

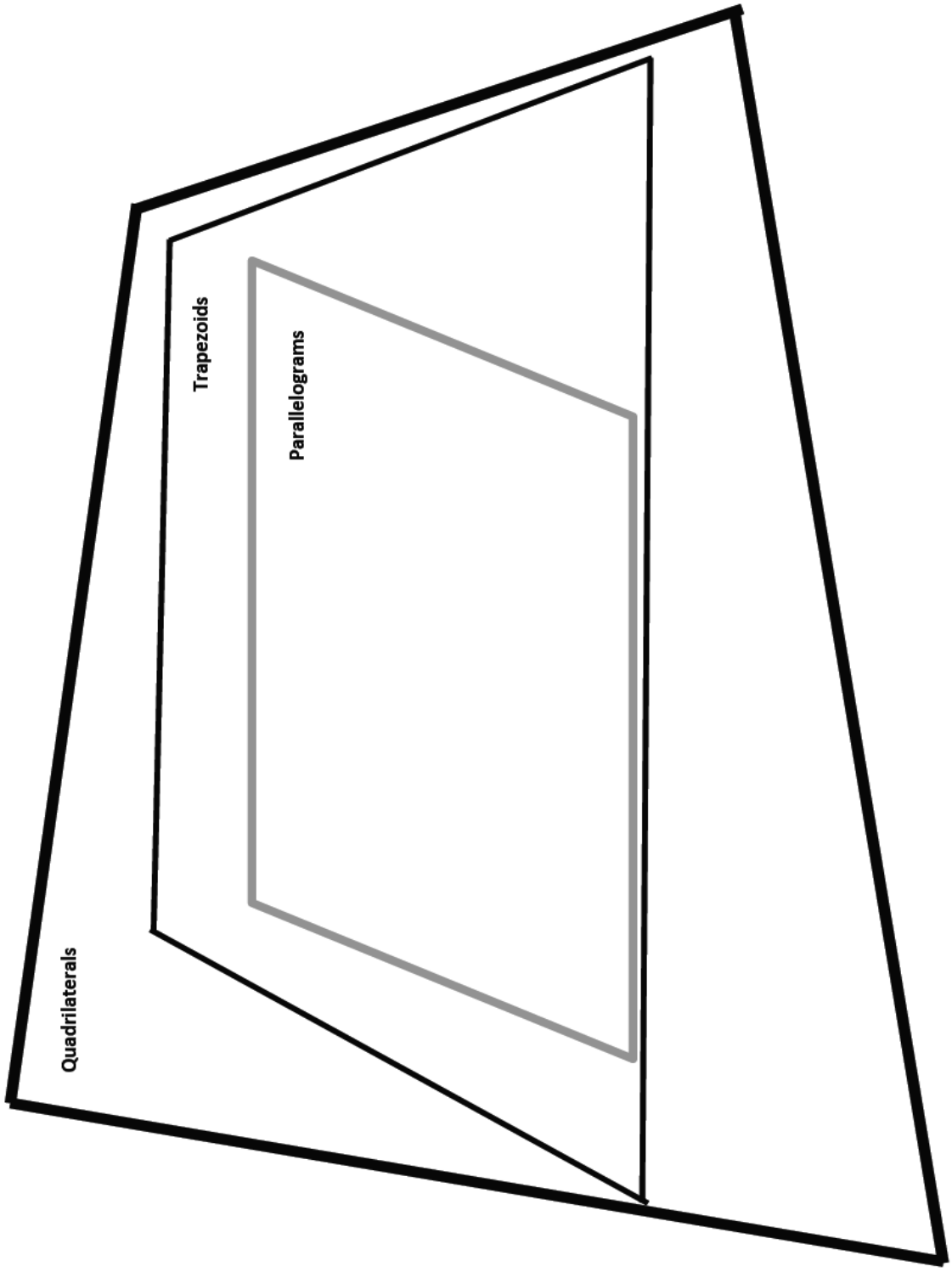
Give the lengths of the following segments:

$WM =$ _____ cm $MY =$ _____ cm

$XM =$ _____ cm $XZ =$ _____ cm

4. Using the properties of shapes, explain why all parallelograms are trapezoids.

5. Teresa says that because the diagonals of a parallelogram bisect each other, if one diagonal is 4.2 cm, the other diagonal must be half that length. Use words and pictures to explain Teresa's error.



quadrilateral hierarchy with parallelogram

Name _____ Date _____

1. Draw the figures in each box with the attributes listed.

a. Rhombus with no right angles	b. Rectangle with not all sides equal
c. Rhombus with 1 right angle	d. Rectangle with all sides equal

2. Use the figures you drew to complete the tasks below.

   a. Measure the angles of the figures with your protractor, and record the measurements on the figures.

   b. Use a marker or crayon to circle pairs of angles inside each figure with a sum equal to 180°. Use a different color for each pair.

3. Draw a rhombus and a rectangle below.

   a. Draw the diagonals, and measure their lengths. Record the measurements on the figure.

   b. Measure the length of each segment of the diagonals from the vertex to the intersection point of the diagonals. Using a marker or crayon, color segments that have the same length. Use a different color for each different length.

4. a. List the properties that are shared by all of the rhombuses that you worked with today.

   b. List the properties that are shared by all of the rectangles that you worked with today.

   c. When can a trapezoid also be called a rhombus?

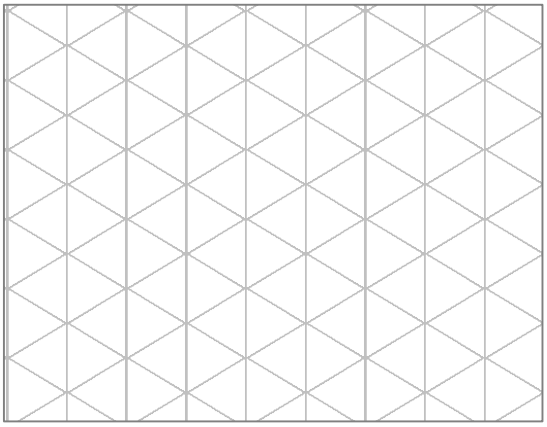
   d. When can a parallelogram also be called a rectangle?

   e. When can a quadrilateral also be called a rhombus?

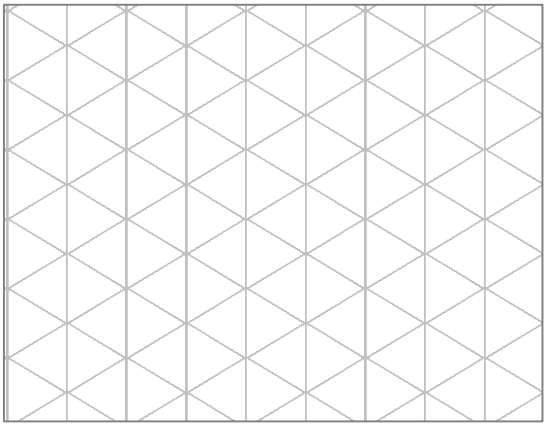
Name _____ Date _____

1. Use the grid paper to draw.

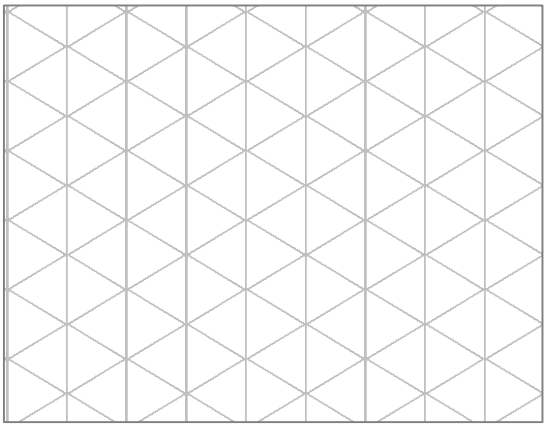
a. A rhombus with no right angles



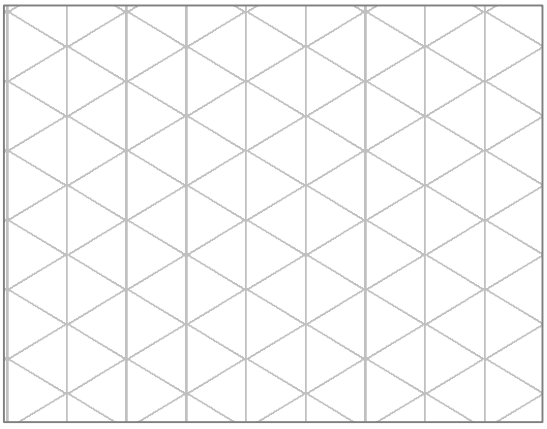
b. A rhombus with 4 right angles



c. A rectangle with not all sides equal



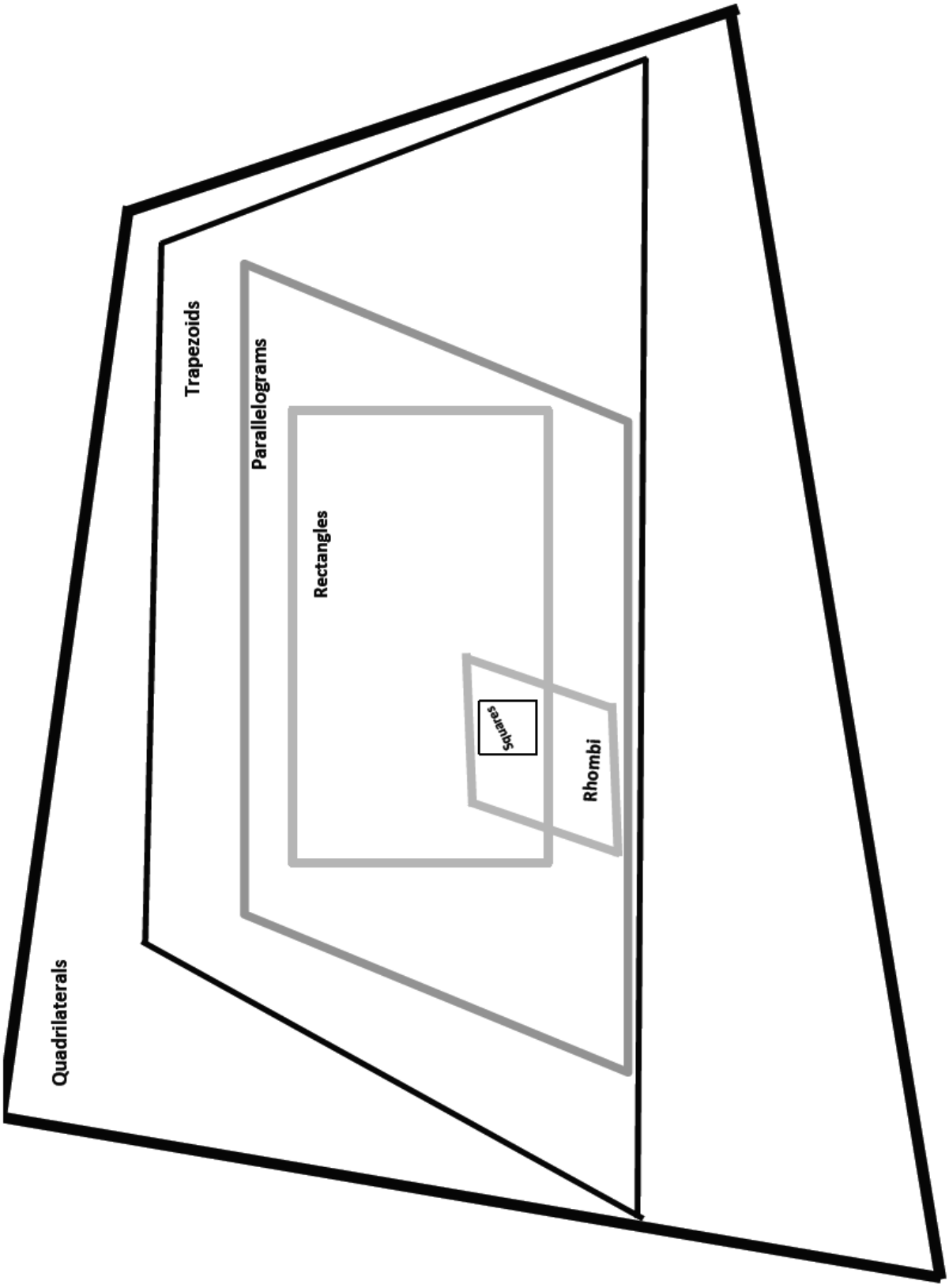
d. A rectangle with all sides equal



2. A rhombus has a perimeter of 217 cm. What is the length of each side of the rhombus?

3. List the properties that all rhombuses share.

4. List the properties that all rectangles share.



quadrilateral hierarchy with square

Name _____ Date _____

1. Draw the figures in each box with the attributes listed. If your figure has more than one name, write it in the box.

a. Rhombus with 2 right angles	b. Kite with all sides equal
c. Kite with 4 right angles	d. Kite with 2 pairs of adjacent sides equal (The pairs are not equal to each other.)

2. Use the figures you drew to complete the tasks below.

   a. Measure the angles of the figures with your protractor, and record the measurements on the figures.

   b. Use a marker or crayon to circle pairs of angles that are equal in measure, inside each figure. Use a different color for each pair.

3. a. List the properties shared by all of the squares that you worked with today.

b. List the properties shared by all of the kites that you worked with today.

c. When can a rhombus also be called a square?

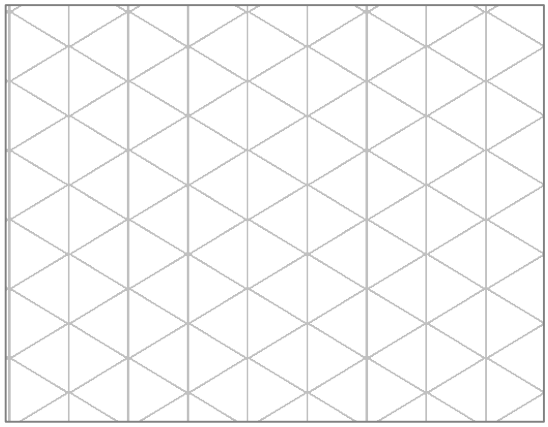
d. When can a kite also be called a square?

e. When can a trapezoid also be called a kite?

Name _____ Date _____

1. a. Draw a kite that is not a parallelogram on the grid paper.

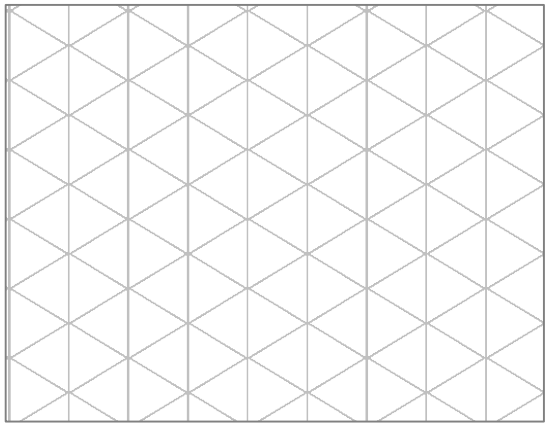
b. List all the properties of a kite.



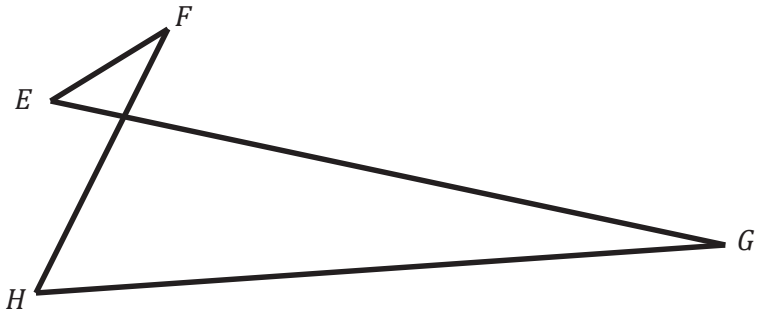
c. When can a parallelogram also be a kite?

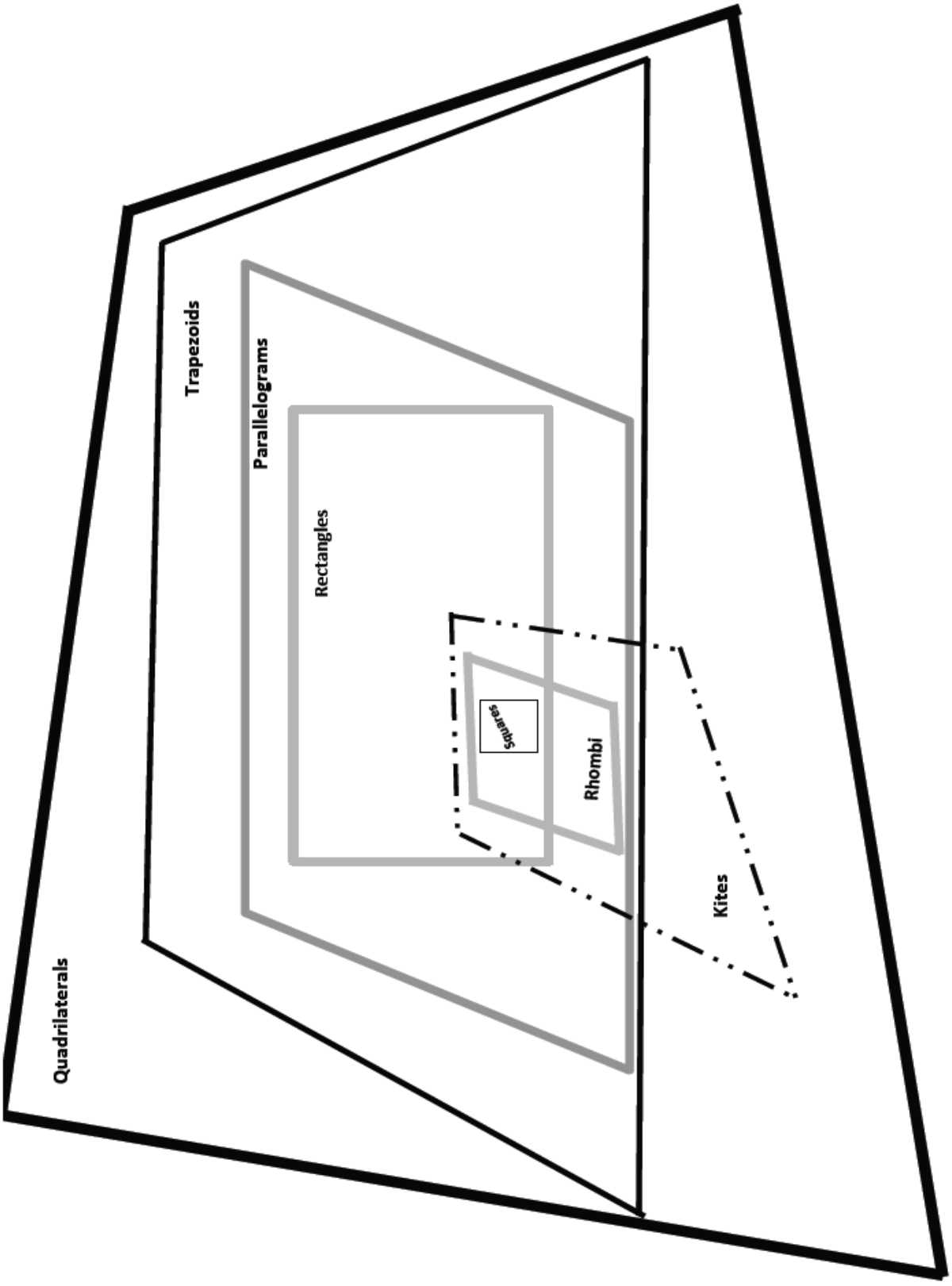
2. If rectangles must have right angles, explain how a rhombus could also be called a rectangle.

3. Draw a rhombus that is also a rectangle on the grid paper.



4. Kirkland says that figure $EFGH$ below is a quadrilateral because it has four points in the same plane and four segments with no three endpoints collinear. Explain his error.





quadrilateral hierarchy with kite

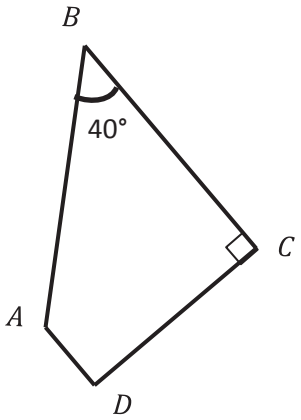
Name _____ Date _____

1. True or false. If the statement is false, rewrite it to make it true.

	T	F
a. All trapezoids are quadrilaterals.		
b. All parallelograms are rhombuses.		
c. All squares are trapezoids.		
d. All rectangles are squares.		
e. Rectangles are always parallelograms.		
f. All parallelograms are trapezoids.		
g. All rhombuses are rectangles.		
h. Kites are never rhombuses.		
i. All squares are kites.		
j. All kites are squares.		
k. All rhombuses are squares.		

2. Fill in the blanks.

a. $ABCD$ is a trapezoid. Find the measurements listed below.



$\angle A$ = _____°

$\angle D$ = _____°

What other names does this figure have?

b. $RECT$ is a rectangle. Find the measurements listed below.

Line TE = _____

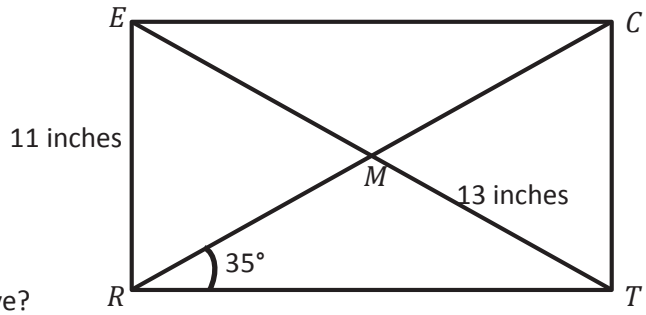
Line RC = _____

Line CT = _____

$\angle ERM$ = _____°

$\angle CTR$ = _____°

What other names does this figure have?



c. $PARL$ is a parallelogram. Find the measurements listed below.

Line AL = _____

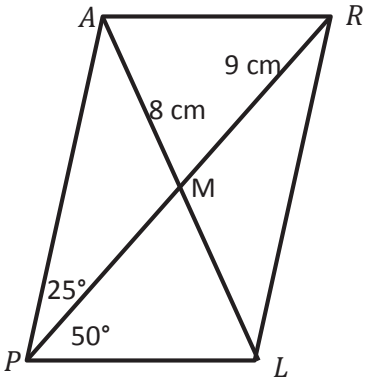
Line PR = _____

$\angle ARL$ = _____°

$\angle PAR$ = _____°

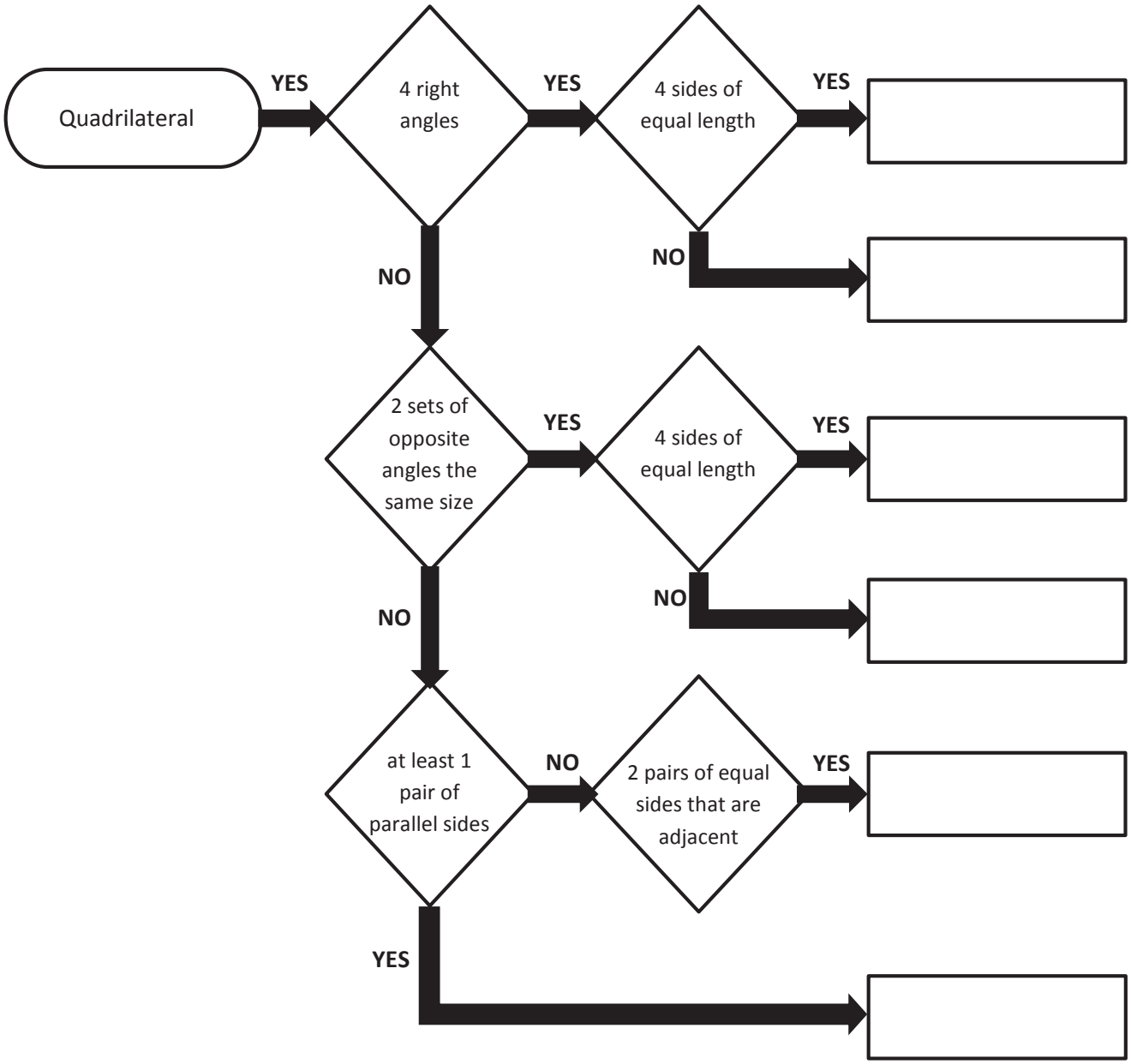
$\angle RLP$ = _____°

What other names does this figure have?

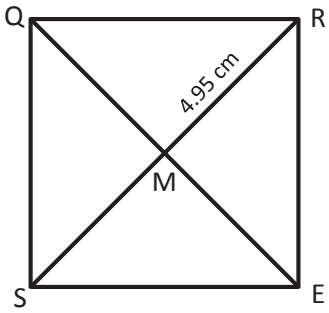


Name _____ Date _____

1. Follow the flow chart, and put the name of the figure in the boxes.



2. $SQRE$ is a square with an area of 49 cm^2, and RM = 4.95 cm. Find the measurements using what you know about the properties of squares.



a. RS = _____cm

b. QE = _____cm

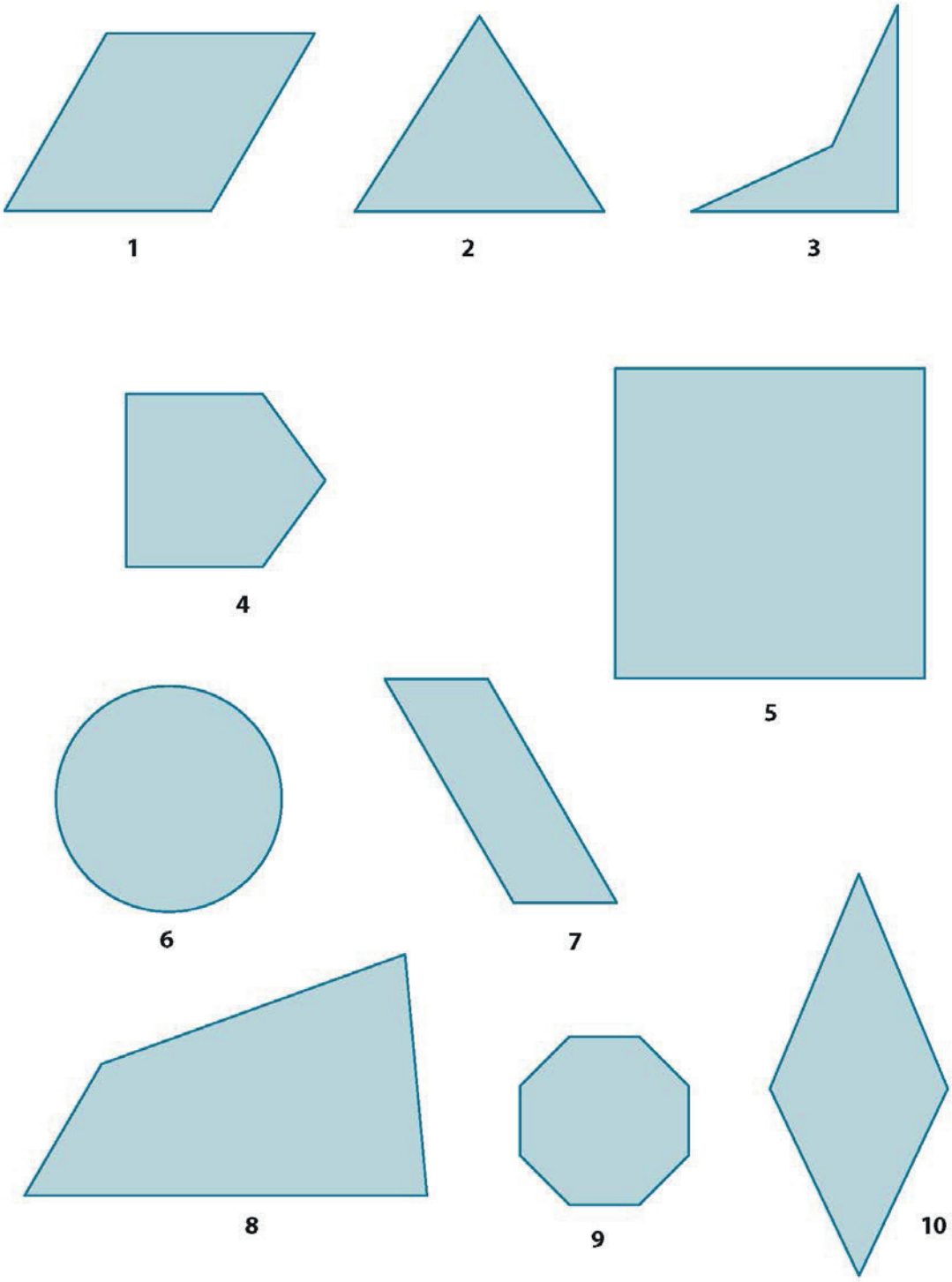
c. Perimeter = _____cm

d. $m\angle QRE$ = _____°

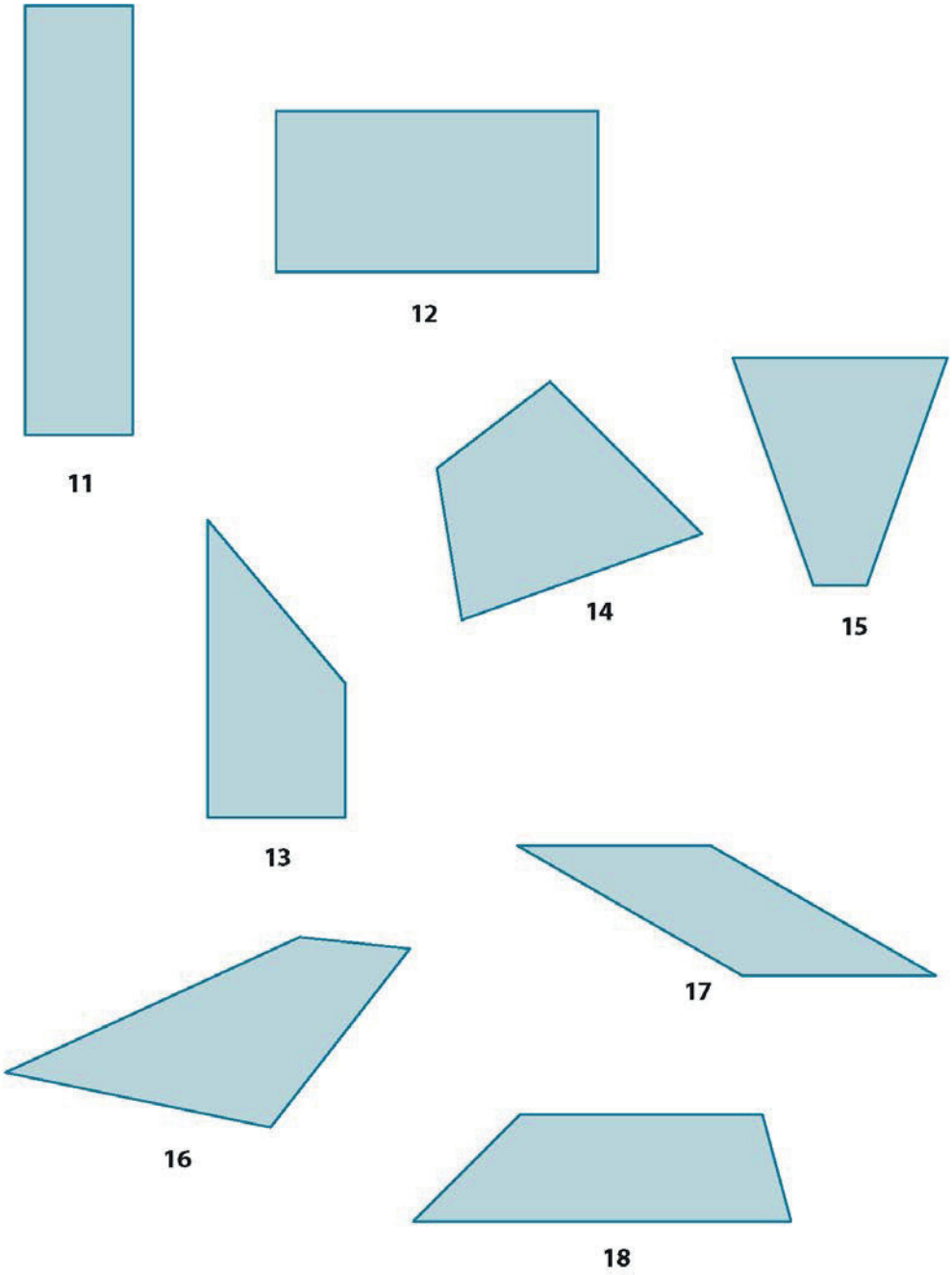
e. $m\angle RMQ$ = _____°

Quadrilaterals	**Trapezoids**
Parallelograms	**Rectangles**
Rhombuses	**Kites**
Squares	**Polygons**

shape name cards



shapes for sorting (page 1)



shapes for sorting (page 2)

Name _____ Date _____

1. Write the number on your task card and a summary of the task in the blank. Then, draw the figure in the box. Label your figure with as many names as you can. Circle the most specific name.

Task #___: _____	Task #___: _____
Task #___: _____	Task #___: _____
Task #___: _____	Task #___: _____

2. John says that because rhombuses do not have perpendicular sides, they cannot be rectangles. Explain his error in thinking.

3. Jack says that because kites do not have parallel sides, a square is not a kite. Explain his error in thinking.

Name _____ Date _____

1. Answer the questions by checking the box.

	Sometimes	Always
a. Is a square a rectangle?		
b. Is a rectangle a kite?		
c. Is a rectangle a parallelogram?		
d. Is a square a trapezoid?		
e. Is a parallelogram a trapezoid?		
f. Is a trapezoid a parallelogram?		
g. Is a kite a parallelogram?		

h. For each statement that you answered with *sometimes*, draw and label an example that justifies your answer.

2. Use what you know about quadrilaterals to answer each question below.

a. Explain when a trapezoid is not a parallelogram. Sketch an example.

b. Explain when a kite is not a parallelogram. Sketch an example.

Task 3: Draw a quadrilateral with 2 pairs of equal sides and no parallel sides.	Task 2: Draw a rectangle with a length that is twice its width.	Task 1: Draw a trapezoid with a right angle.
Task 6: Draw a rhombus with 4 equal angles.	Task 5: Draw a parallelogram with two pairs of perpendicular sides.	Task 4: Draw a rhombus with right angles.

task cards (1–6)

Task 7: Draw a quadrilateral with four equal sides.	Task 8: Draw a parallelogram with right angles.	Task 9: Draw a parallelogram with a side of 4 cm and a side of 6 cm.
Task 10: Draw an isosceles trapezoid.	Task 11: Draw a parallelogram with no right angles.	Task 12: Draw a rectangle that is also a rhombus.

task cards (7–12)

Task 13: Draw a quadrilateral that has at least one pair of equal opposite angles.	Task 14: Draw a quadrilateral that has only one pair of equal opposite angles.	Task 15: Draw a trapezoid with four right angles.
Task 16: Draw a kite that is also a parallelogram.	Task 17: Draw a parallelogram with a 60° angle.	Task 18: Draw a rectangle that is not a rhombus.

task cards (13–18)

Task 19: Draw a rhombus that is not a rectangle.	Task 20: Draw a parallelogram that is not a rectangle.	Task 21: Draw a kite that is not a parallelogram.
Task 22: Draw a quadrilateral whose diagonals bisect each other at a right angle.	Task 23: Draw a trapezoid that is not a parallelogram.	Task 24: Draw a quadrilateral whose diagonals do not bisect each other.

task cards (19–24)