

PRE TEST KEY

Designing Patterns: Exploring Shapes and Area (Rhombus Module)

Grade Level 3-5

Math in a Cultural Context*

UNIVERSITY OF ALASKA FAIRBANKS

Student Name:	PRE TEST KEY
Grade:	
Teacher:	
School:	
Location of School:	
Date:	

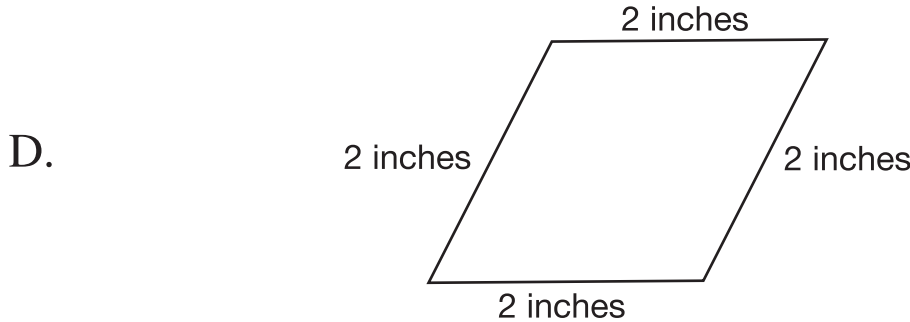
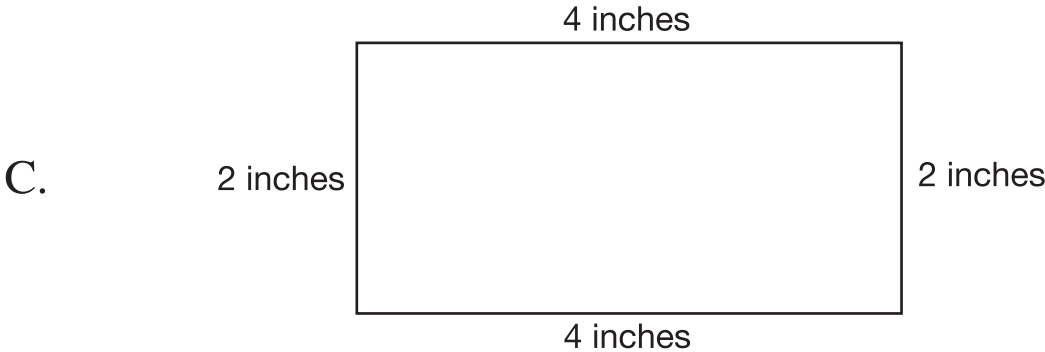
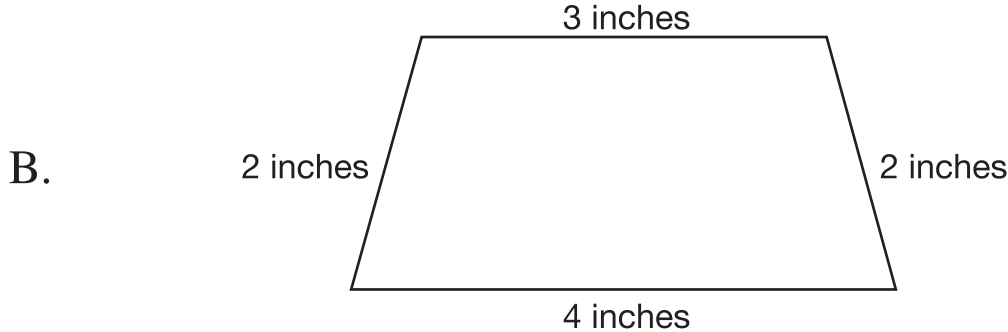
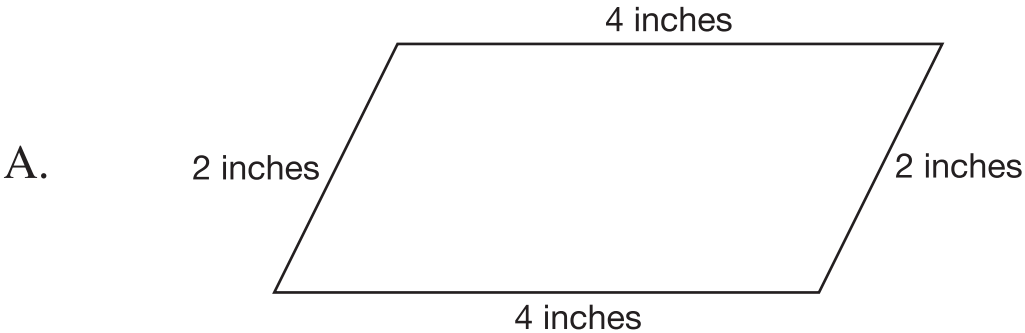
*This project has been funded by the U.S. Department of Education, *Returning the Gift: Systemic Implementation of an Effective Culturally Based Math Curriculum and Professional Development Program*, Jerry Lipka, P.I.

Total Score:

PLEASE NOTE:

STUDENTS WILL NEED TO CUT OUT THE SHAPES ON THE LAST PAGE TO ANSWER QUESTION # 3.

1. Draw a circle around the quadrilateral which is a rhombus.
[1 point for identifying the rhombus]

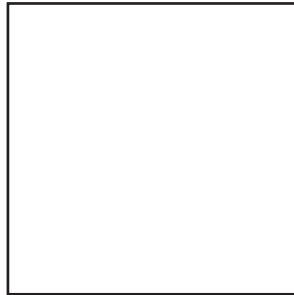


D is correct

2. Find the shapes below that have EXACTLY two lines of symmetry. Draw in those two lines of symmetry.

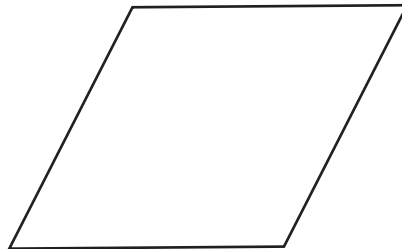
[4 points for correctly drawing in two lines of symmetry for the rhombus and the rectangle—1 point for each line of symmetry]

A.



A is not correct as it has 4 lines of symmetry

B.



B is correct. It has two lines of symmetry (which are the diagonals)

C.



C is correct. It two has lines of symmetry (which are the vertical and horizontal lines of symmetry)

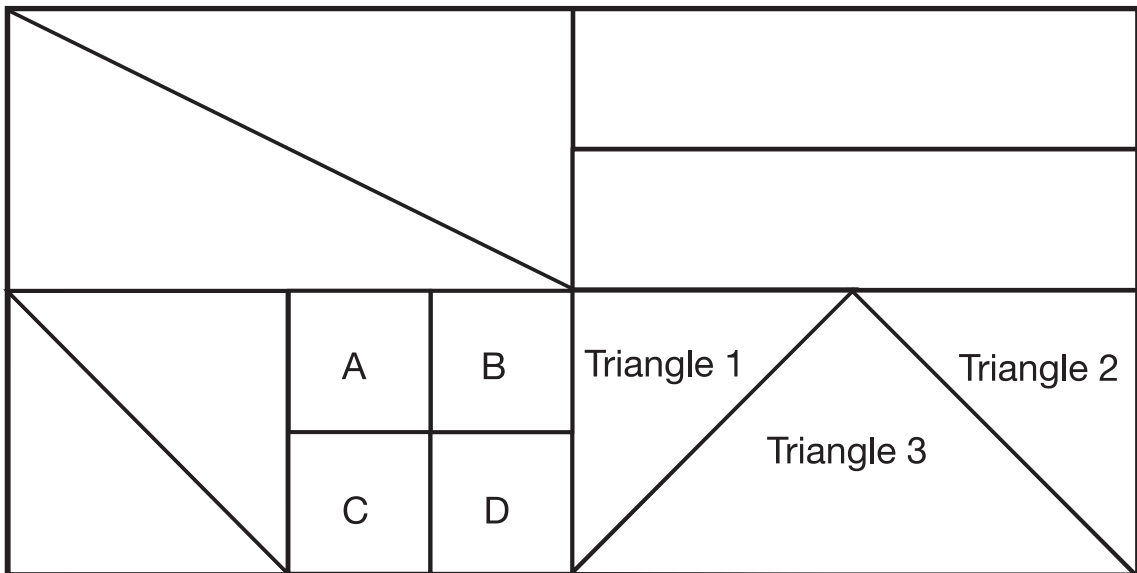
3. Cut out shapes 1, 2, and 3 from the last page of the test.
 Fill out the table.
 Mark “Y” if it is true. Mark an “N” if it is false.

[1 point for each cell]

	All sides are equal	All angles are 90°	Diagonals are equal
Shape 1	N	Y	Y
Shape 2	Y	Y	Y
Shape 3	Y	N	N

4. Use the drawing below to answer the questions.

- a. The small squares (marked A, B, C, and D) are each one unit. How many units is the whole, large rectangle?
 [2 points for correct answer]



Write the answer here 32

- b. What is the relationship of the triangle 3 and the total area of the small rectangles A, B, C, and D?

Circle the correct answer and then explain below.

[2 point for correct answer]

- They are the same.—Correct answer

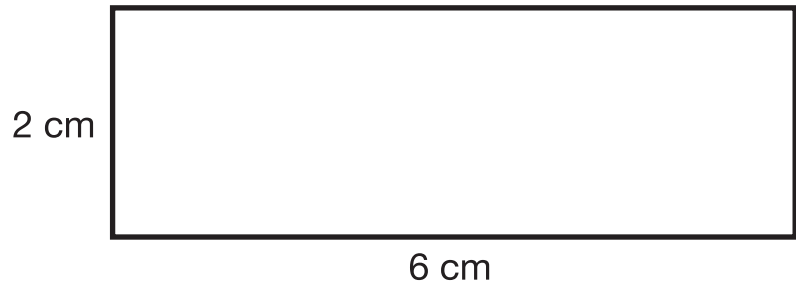
- c. What fraction of the whole picture is the triangle 3?

[2 points for correct answer]

Write the answer here 1/8

5. Find the area of the rectangle given the side lengths. Show your work.

[1 point for correct answer]

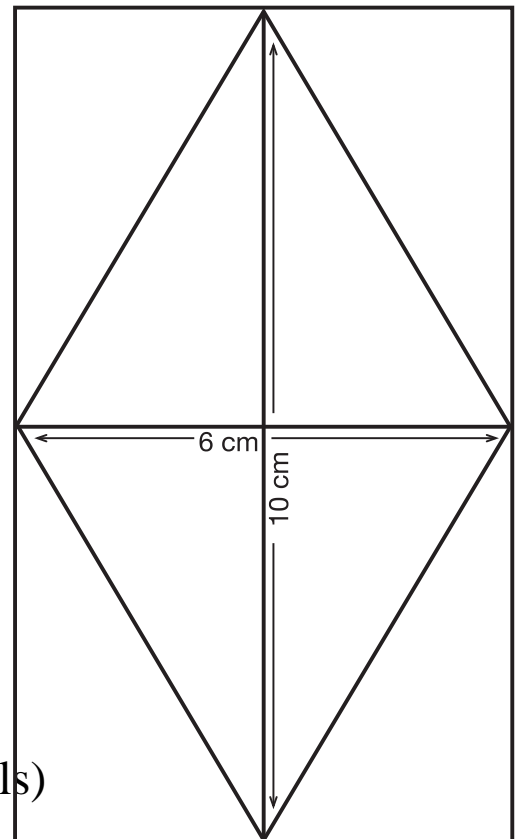


Write the answer here 12 cm²

No deduction for work not shown , no deduction for not including cm²

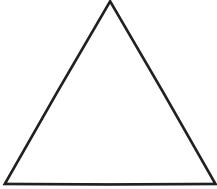
6. Find the area of the rhombus given the diagonal lengths. Show your work.

[1 point correct answer]

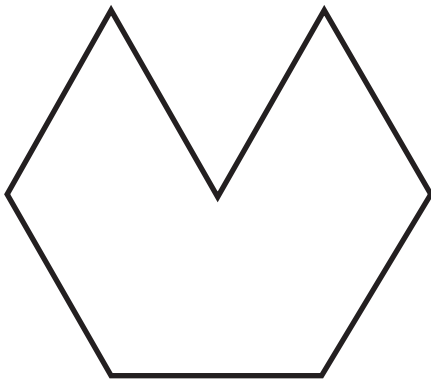


Write the answer here 30
(i.e., one-half the product of the diagonals)

7. [1 point for each correct answer]

How many  fit in each shape?

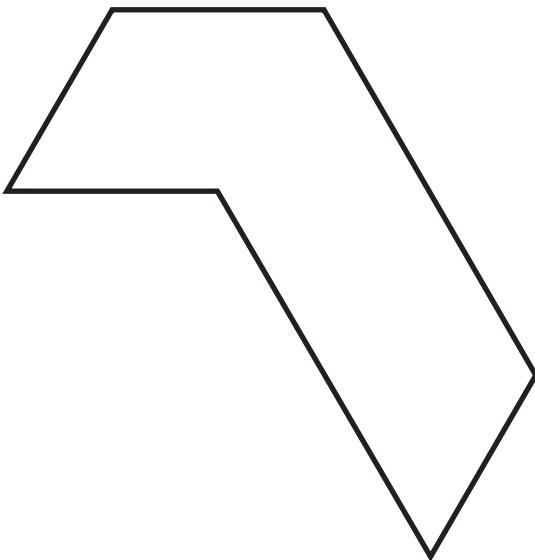
A. How many? 5



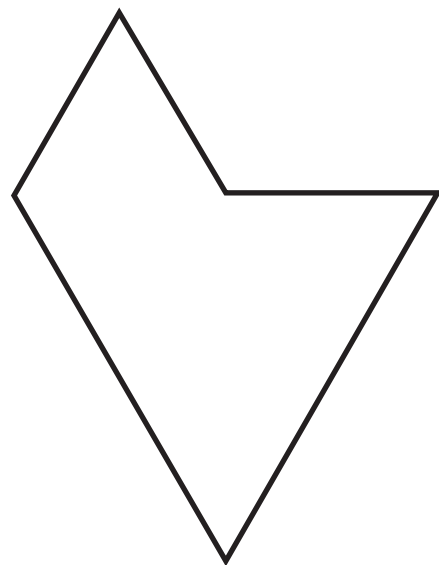
B. How many? 4



C. How many? 6



D. How many? 5



8. Here is the beginning of a pattern of squares.

Fig. 1



Fig. 2

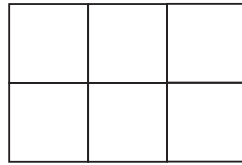


Fig. 3

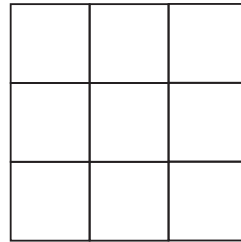
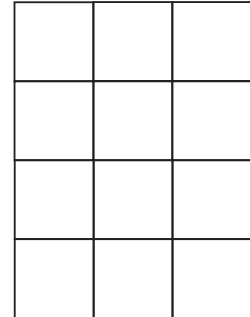


Fig. 4



[1 point for each correct answer]

a. Draw a picture of Fig. 4.

Students should draw a square pattern of 4 rows and 3 columns of squares.

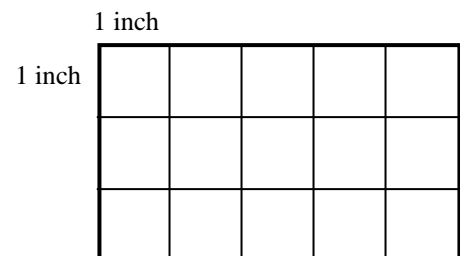
b. How many squares will be in Fig. 4?

Write the answer here 12

9a. What is the total distance around the outside of the large rectangle to the right? Be sure to include the correct units.

[1 point for correct answer]

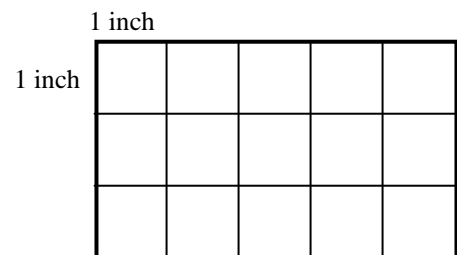
Perimeter = 16 inches or 16 in.



b. What is the total space inside the large rectangle to the right? Be sure to include the correct units.

[1 point for correct answer]

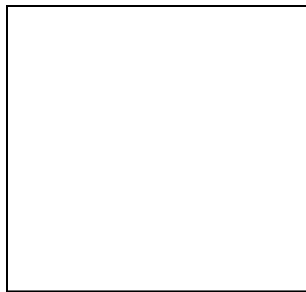
Area = 15 square inches or 15 sq. in.



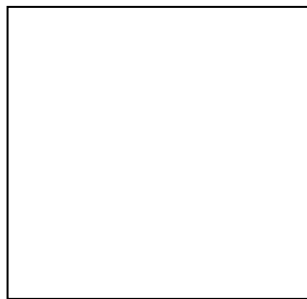
10 a. Use your pencil to draw lines to make the square below have 4 equal parts.

[1 point for correct answer]

Can be divided along the lines of symmetry; diagonals, vertical and horizontal lines of symmetry; 4 equal row or columns, there are other possibilities.



b. Use your pencil to shade $\frac{3}{4}$ of this square.



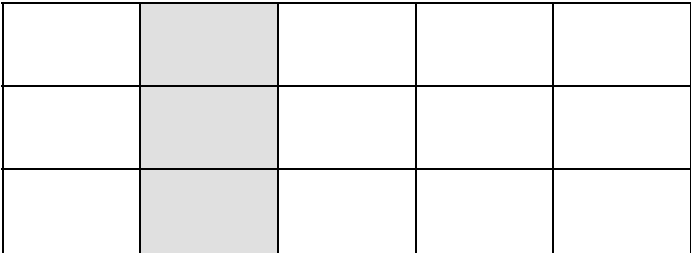
[1 point for correct answer]

Student divides the square into 4 equal parts as in “a” above and shades in 3 of the 4 parts.

11. See the grid below. What fraction is shaded?

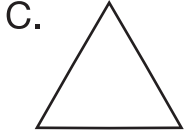
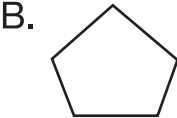
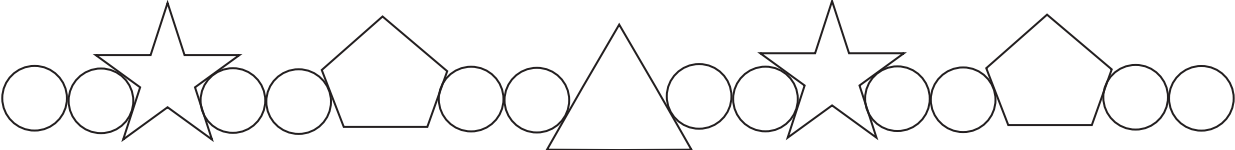
[1 point for correct answer]

b. 3/15 correct answer



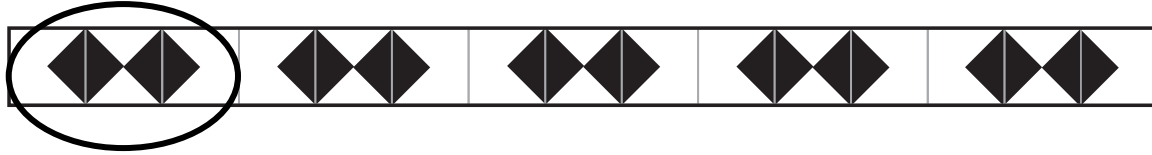
12. Identify a core unit...what comes next?

[1 point for correct answer]



C is correct

13. In each pattern, two or more shapes repeat to make the whole pattern. Circle the shapes or parts that repeat to fill the strip. The first one has been done for you.



a.



b.



c.




d.



[1 point for each correct answer]

- is star-heart repeated;
- is square with black upper left-square with black upper right repeated; said differently the first four columns.
- is paw-leaf-leaf repeated,
- is 1-1-3 repeated.

14. Charlie made this pattern strip . He said to his friend Ted that he can use it to measure. Approximately, how many strips long is the line below.

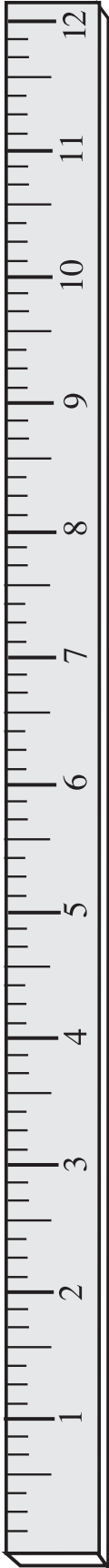
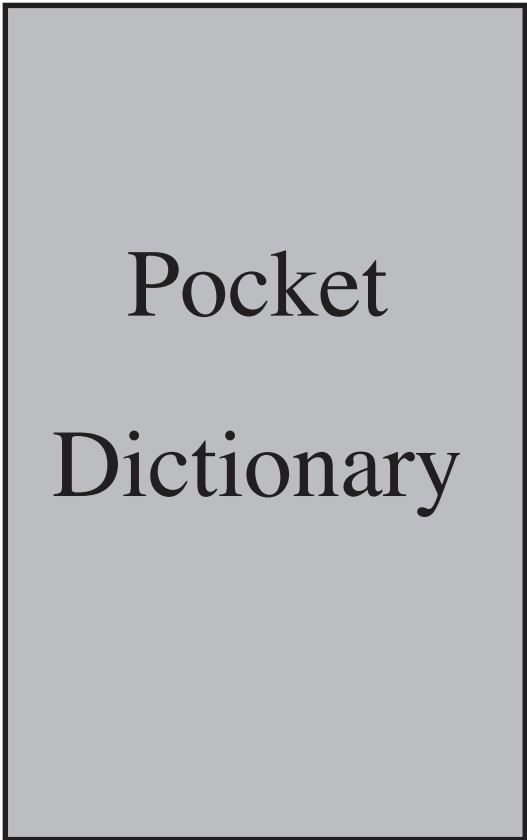
[1 point for correct answer]



Write the answer here: _____4_____

15. Measure the length of this dictionary.

[1 point for correct answer]



Write the answer here: _____ 6 _____.

Cut out shapes 1, 2, and 3 for item #3

