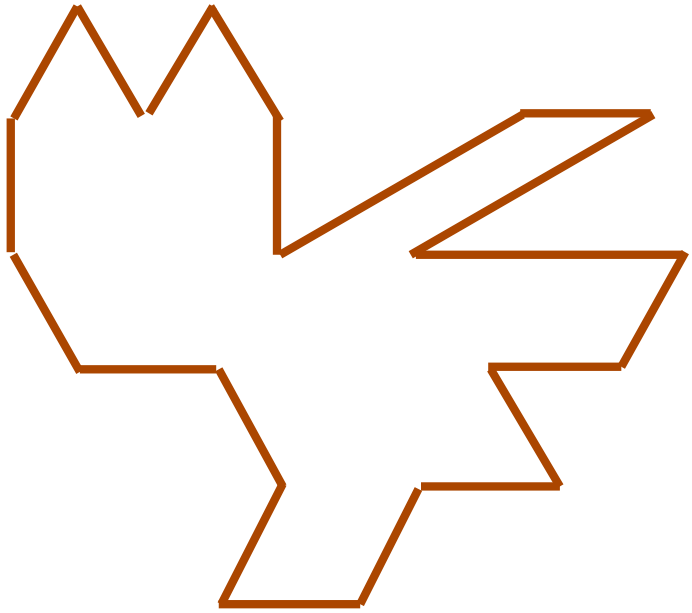
Problem of the Month
Between the Lines

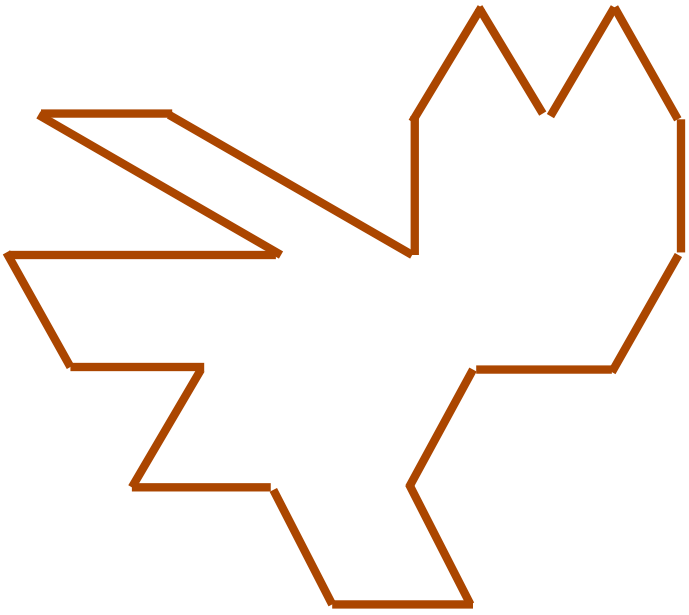
Level A

Brian has created a new animal using pattern blocks. He traced the outside of his animal. Below is the outline of his animal. Which pattern blocks did he use to make his animal? Show how he made his animal.



Can you make the same animal again using some different pattern blocks?

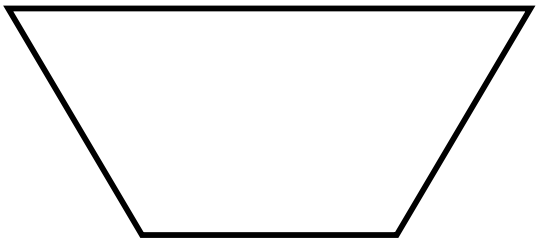
Now it is facing in the other direction, show a different way to make the animal with pattern blocks.



Level B

Start with an isosceles trapezoid, the same size as the pattern block.

1. Use only the pattern block trapezoids to tile and cover the trapezoid drawn below:



How many pattern block trapezoids does it take to tile the above trapezoid? How are the blocks arranged? Is there more than one arrangement you can make?

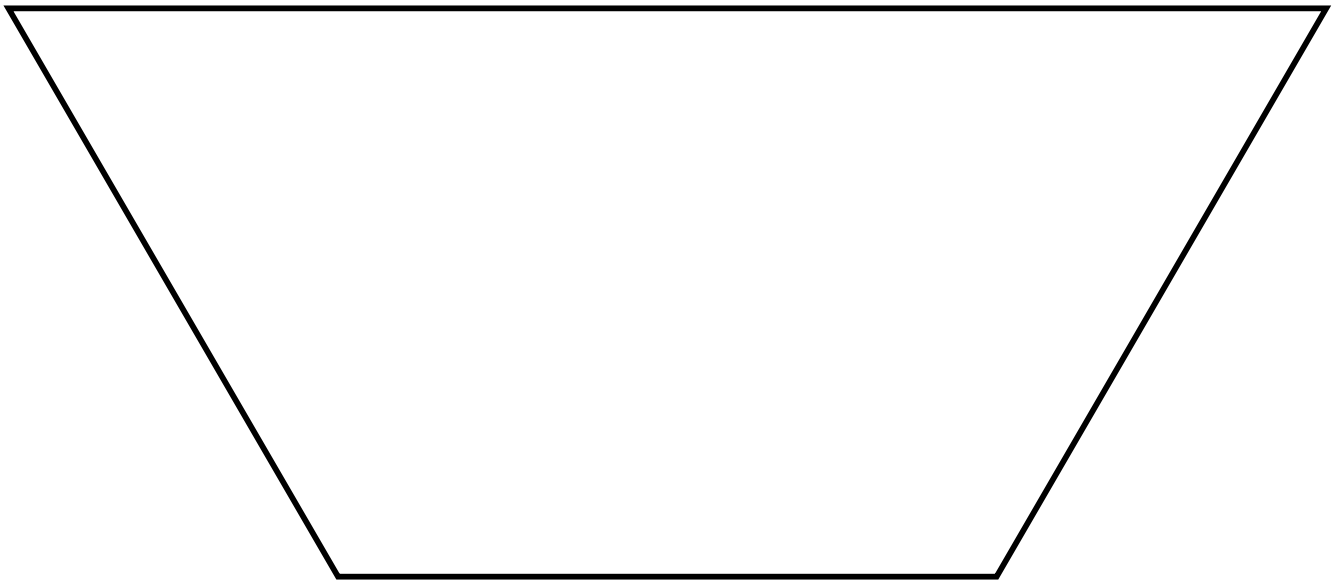
2. Use only the pattern block trapezoids to tile and cover the trapezoid drawn below:

How many pattern block trapezoids does it take to tile the above trapezoid? How are the blocks arranged? Is there more than one arrangement you can make?

3. Use the pattern block trapezoids to tile and cover the trapezoid drawn below:

How many pattern block trapezoids does it take to tile the above trapezoid? How are the blocks arranged? Is there more than one arrangement you can make?

4. Use the pattern block trapezoids to tile and cover the trapezoid drawn below:

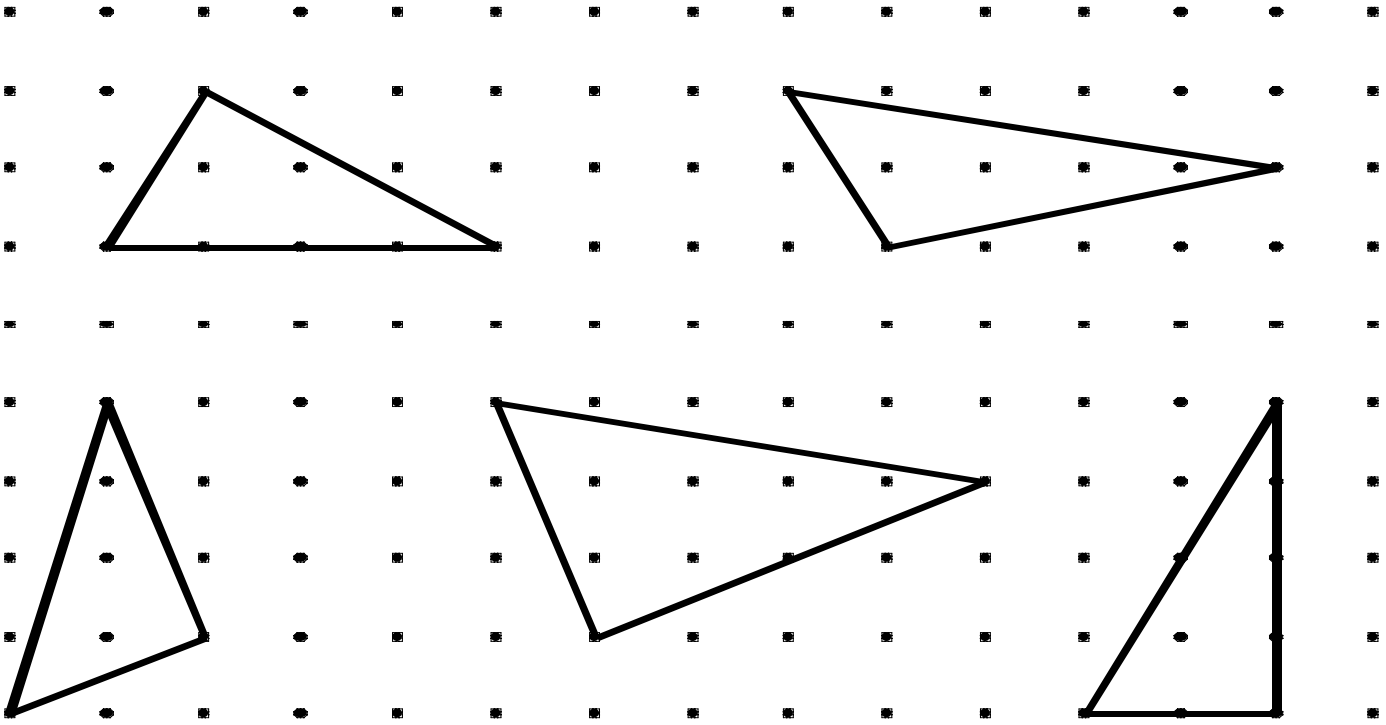


How many pattern block trapezoids does it take to tile the above trapezoid? How are the blocks arranged? Is there more than one arrangement you can make?

Examine the tiling arrangements you made in figures 1 – 4, what patterns can you see? How is the area growing? Explain why the patterns make sense.

Level C

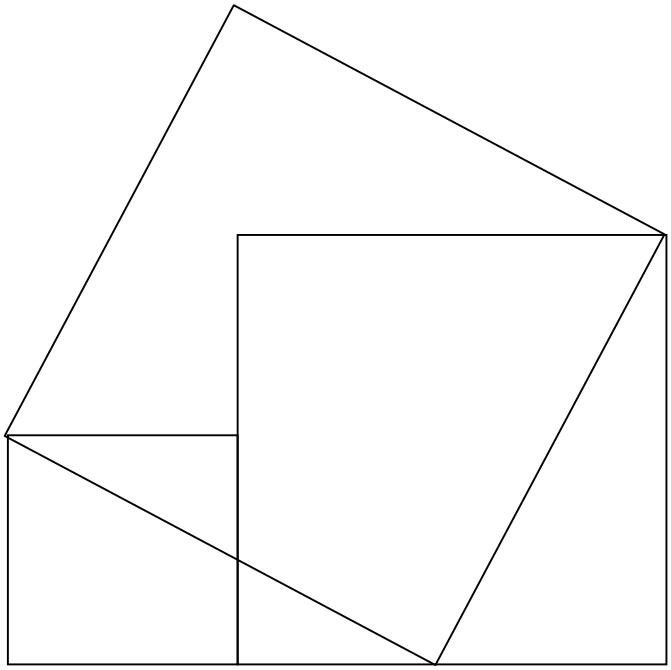
Find the area of these triangles.



Explain your reasoning.

Level D

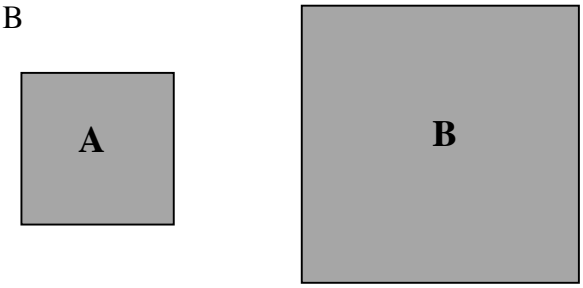
A high tech company has designed a new company logo using three squares. What is the relationship between the sizes of the three squares?



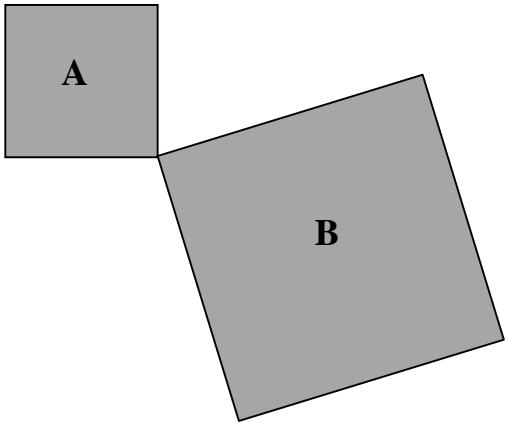
Explain your findings.

Level E

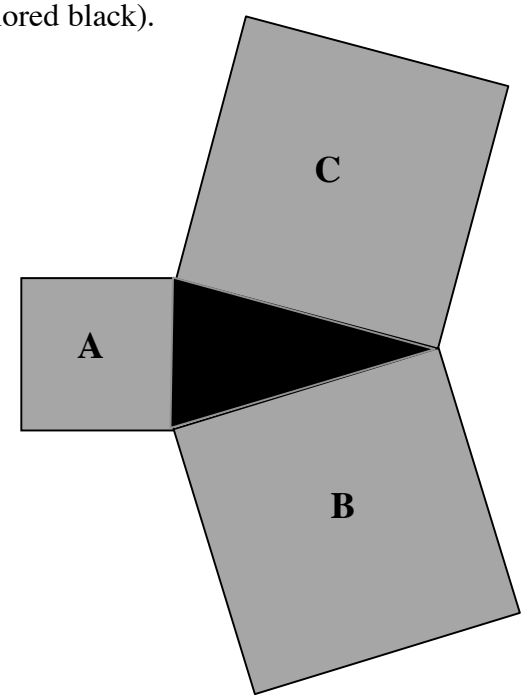
Given any two squares A and B



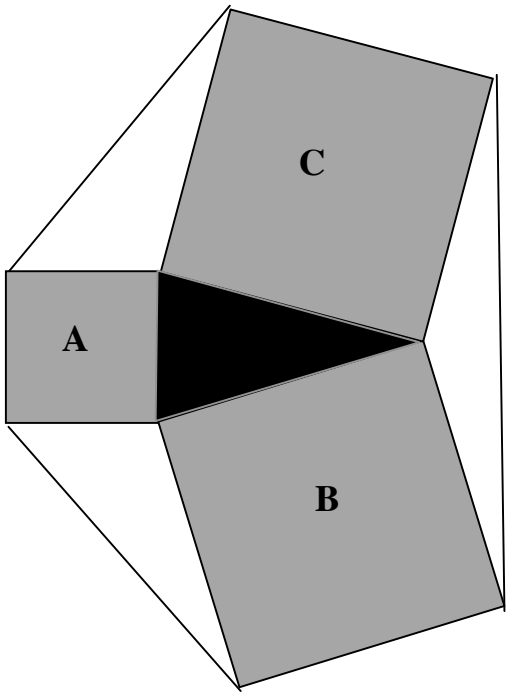
They can be arranged to share one vertex that forms an angle between 0º and 180º.



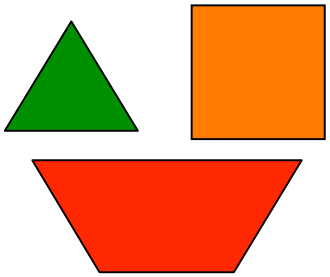
A third square C can be found which has a side length equal to the distance between a different vertex of square A to a different vertex of square B (shown below), thus forming a triangular region between the three squares (colored black).



A line segment can be drawn between the vertices of the squares, forming three more triangles (each shaded white).

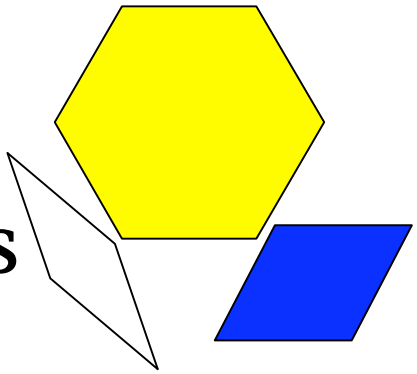


What are the relationships between the three white triangles? What is the relationship between the black triangle and the three white triangles? Explain and justify what you know.



Problem of the Month

Between the Lines



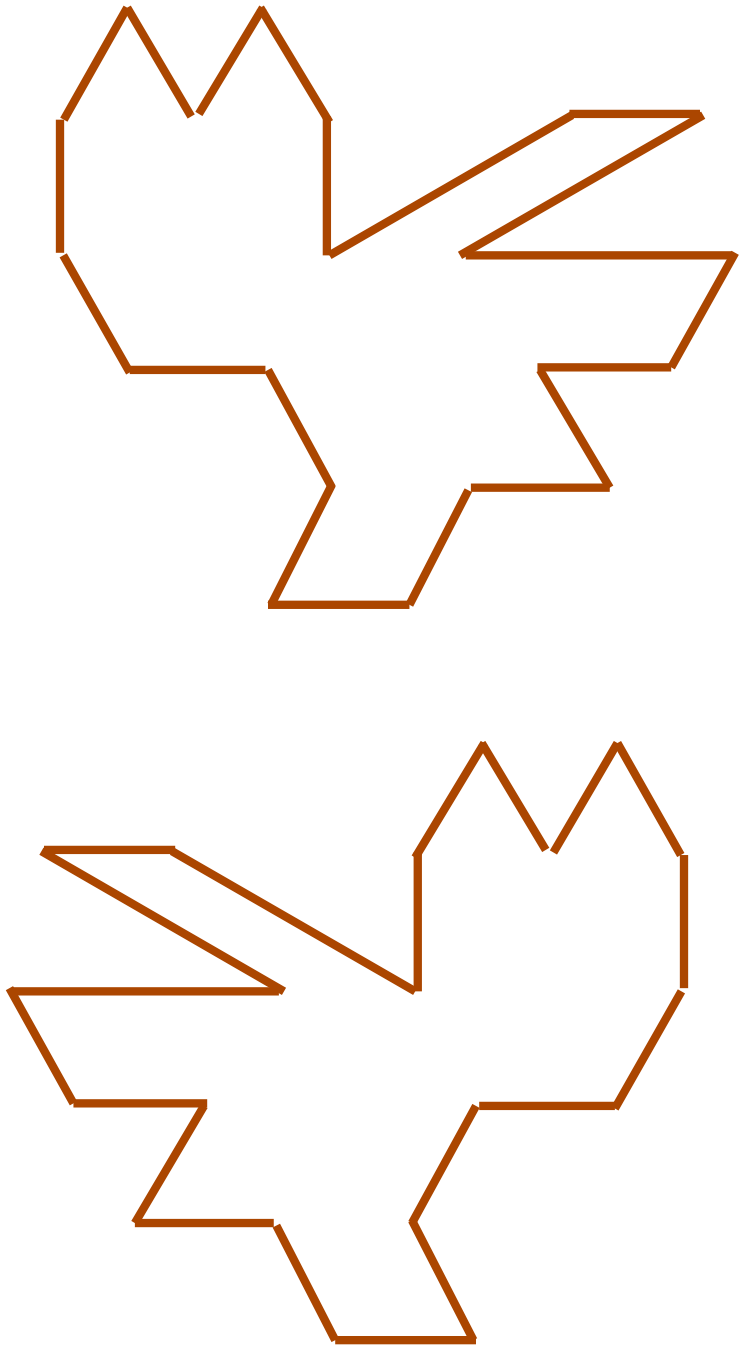
Primary Version Level A

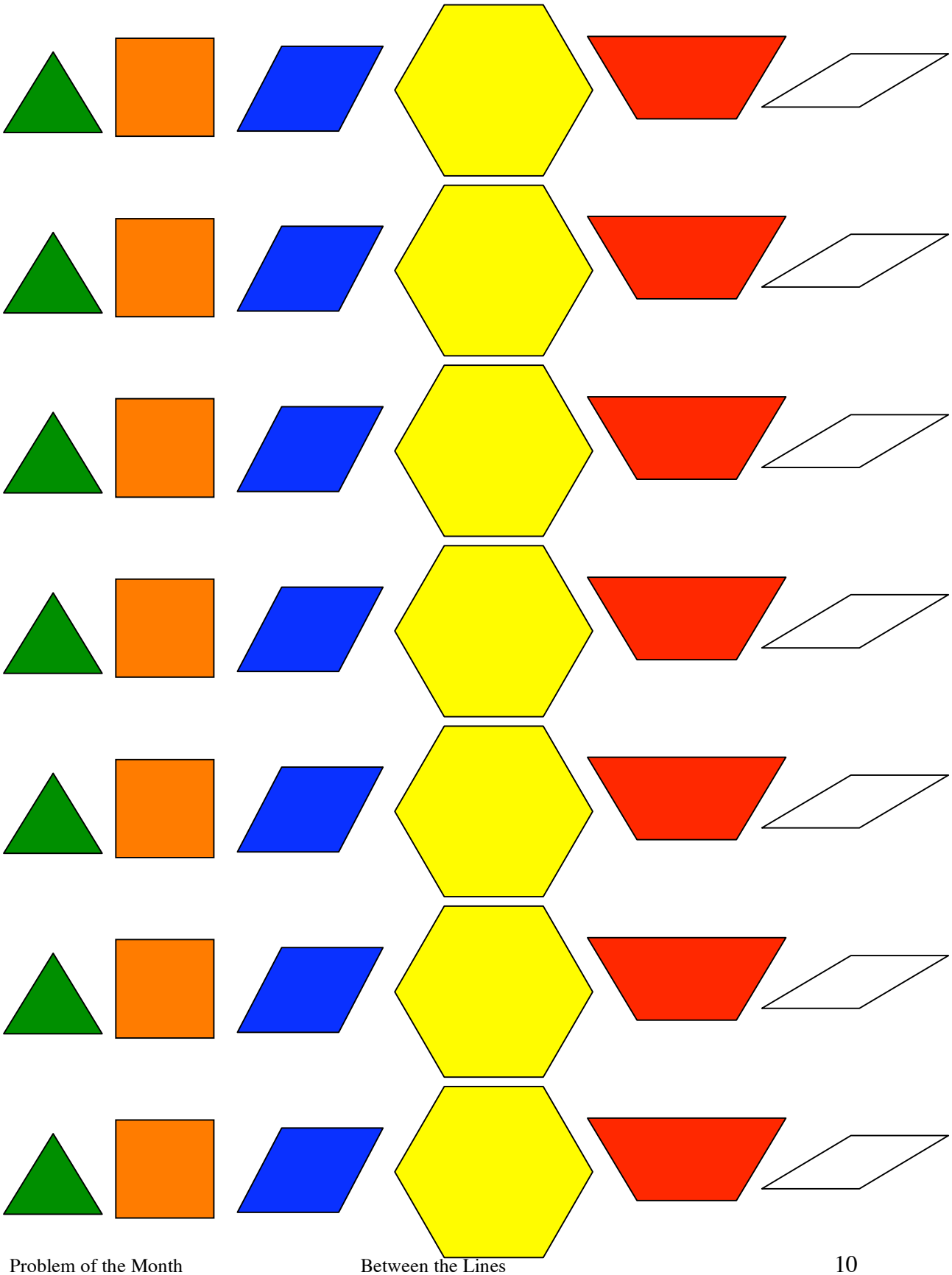
Materials: A set of pattern blocks for each pair or a page of the printed pattern blocks cut out, a copy of the outline of the animal facing both directions, glue stick, pencil and paper.

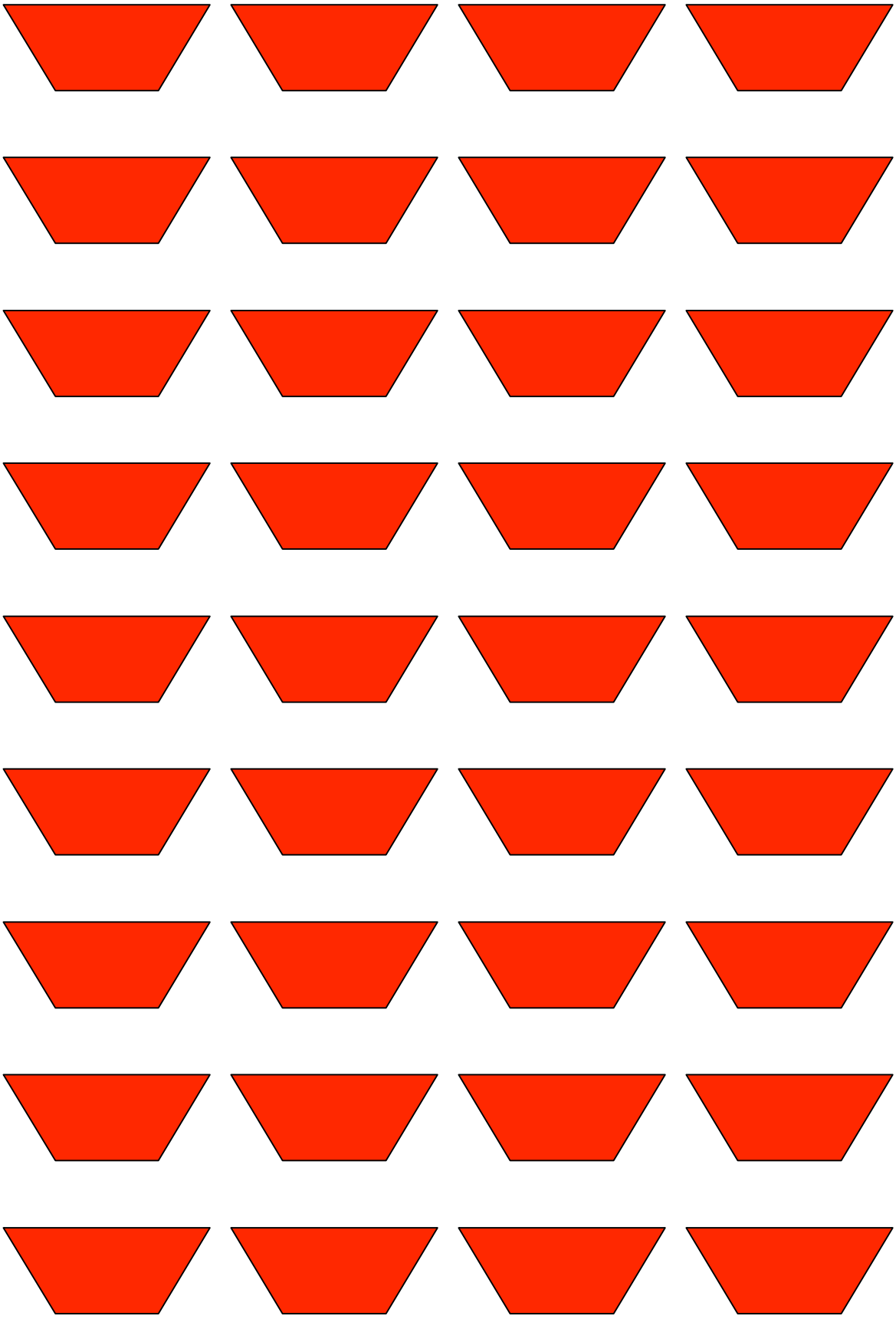
Discussion on the rug: (Teacher shows the pattern blocks) "Here are the pattern blocks. What do you notice about them?" (Teacher continues to ask children to notice that they are different colors, shapes, sizes and different length. The teacher encourages the students to play with them and make different things.)

In small groups: (Each group has a set of pattern blocks)

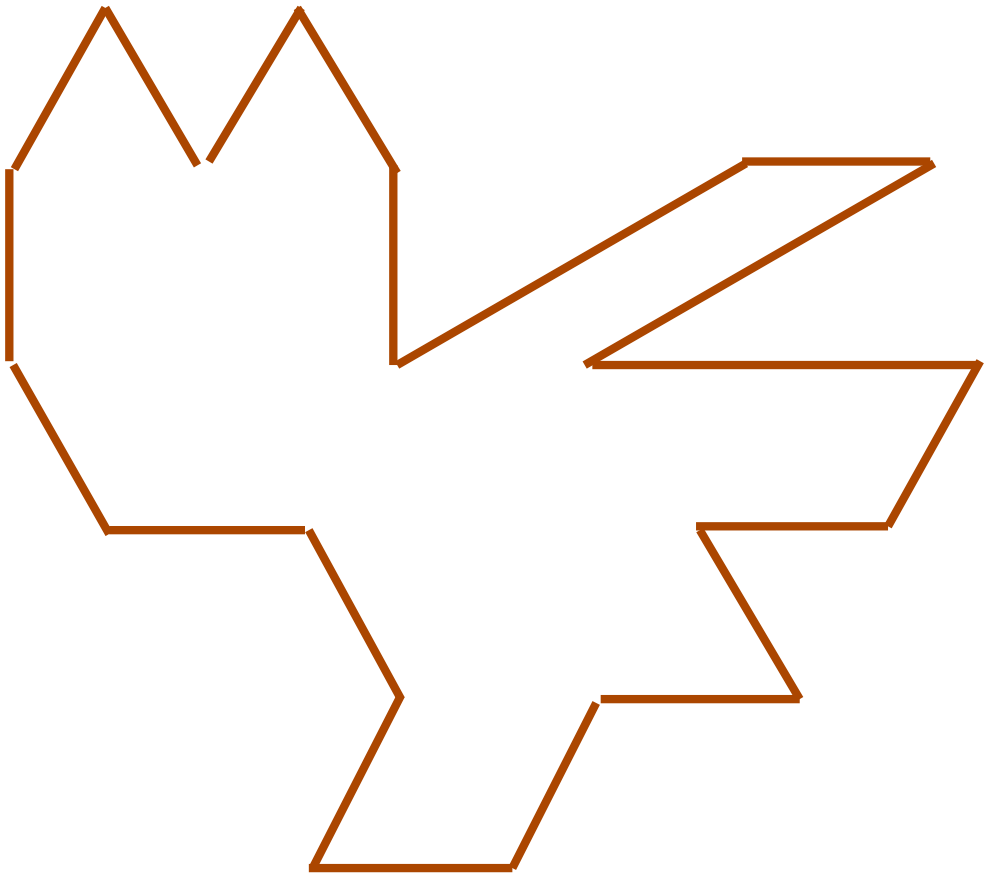
1. Which of these blocks do we know? What is its name? How many sides does it have? How many corners does it have? (Introduce the name of blocks, if the students demonstrate knowledge of its attributes).
2. A boy named Brian made a picture of a new animal using pattern blocks. Here is the outline of the animal. Can you make Brian's animal using pattern blocks? Show me how you made it.
3. There is a second picture of the animal. It is looking in a different direction. Can you make Brian's animal using pattern blocks? Show me how you made it. (At the end of the investigation have students either draw a picture, paste a picture or dictate a response to represent their solution.)



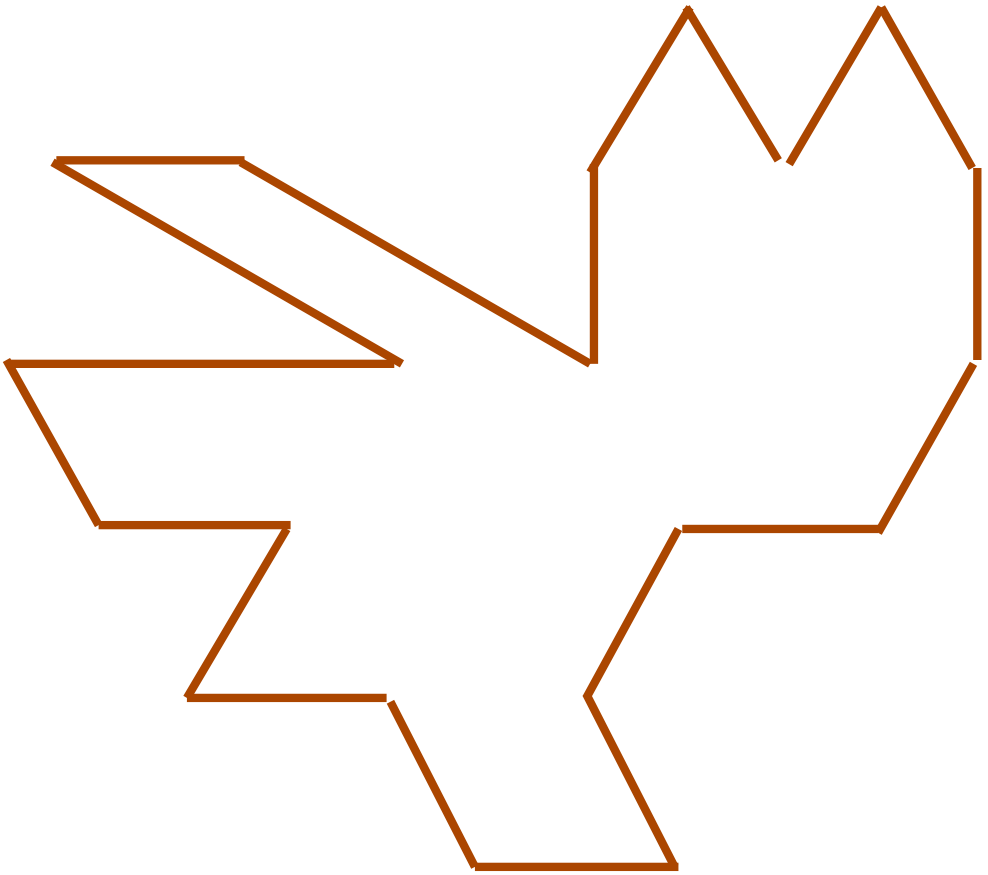




Level A (Actual Pattern Block Template)



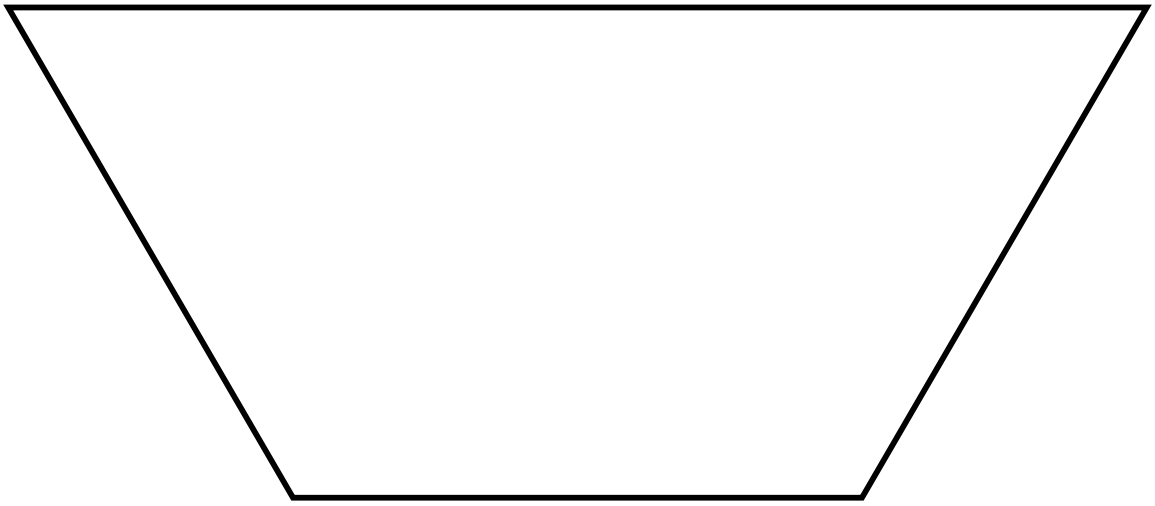
Level A part 2 (Actual Pattern Block Template)



Level B (Actual Pattern Block Template)

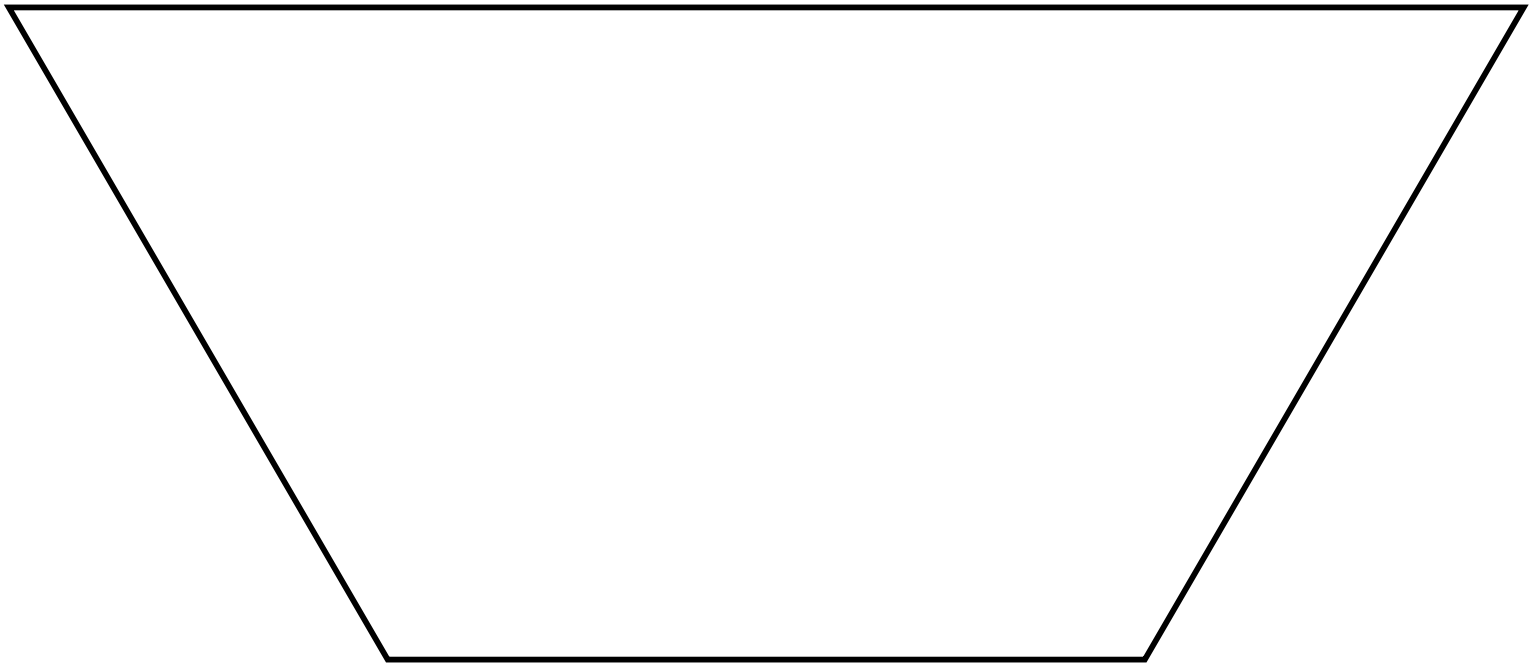
Part 1

Part 2



Level B (Actual Pattern Block Template)

Part 3



Level B (Actual Pattern Block Template)

Part 4