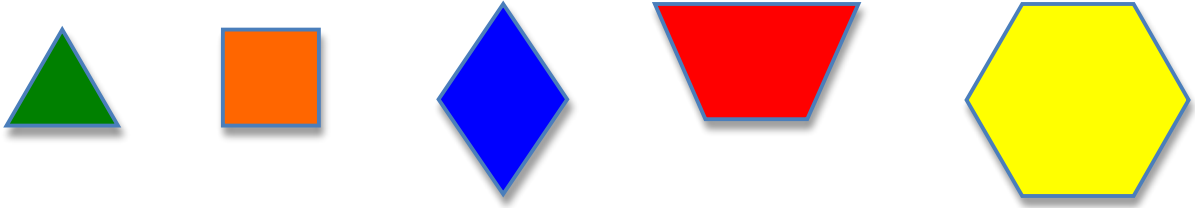
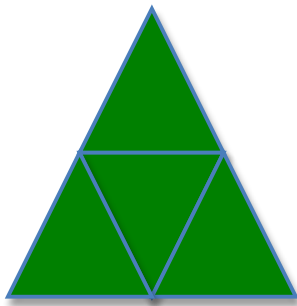


## Investigating Dilations Using Pattern Blocks

1. In pairs, using pattern blocks as shown below, create new figures with one shape at a time so that the new figure is the same shape as the original.




For example, for the equilateral triangle, the next shape one can construct looks like this:



Fill in the table below to investigate lengths and areas of figures made from the equilateral triangle. Assume the length of one equilateral triangle is 1 unit.

Laying the larger triangle on a table, take a single triangle and hold it over the larger one so that when you look down the single triangle covers the larger one exactly. Have your partner measure a) the distance from your eye to the single triangle; and b) the distance from your eye to the enlargement. Put these values in the table as well.

| Figure  | Length of one side in units | Area in square units or # triangles needed to cover figure | Distance from eye to small triangle | Distance from eye to enlargement |
|---|-----------------------------|--|-------------------------------------|----------------------------------|
|  | 1 unit                      | 1 triangle or $\sqrt{3}/4$ square units                    |                                     |                                  |

|  |         |  |  |  |
|--|---------|--|--|--|
|  | 2 units |  |  |  |
|  | 3 units |  |  |  |

2. Now do the same thing for the square, letting 1 square equal 1 square unit of area. Alternate who is doing the measuring.



3. Repeat for the blue rhombus, finding the area of one rhombus and the enlarged rhombus or counting the # of rhombi in the new figure to represent its area.



4. Conjecture what happens to the area of all figures as you double the length. What about if you triple the length? Can you generalize?
5. As you make the enlargement from 1 unit length to 2 unit lengths, what is the ratio of  
Distance from eye to small triangle ?  
 Distance from eye to larger triangle

What about if you enlarge from 1 unit length to 3 units in length? What is the corresponding distance ratio?

Explain how these ratios are related to making the larger shapes.

6. What if you try this with the trapezoid or the hexagon? Can you use only trapezoids/hexagons to create a new trapezoid or hexagon of the same shape? Explain.