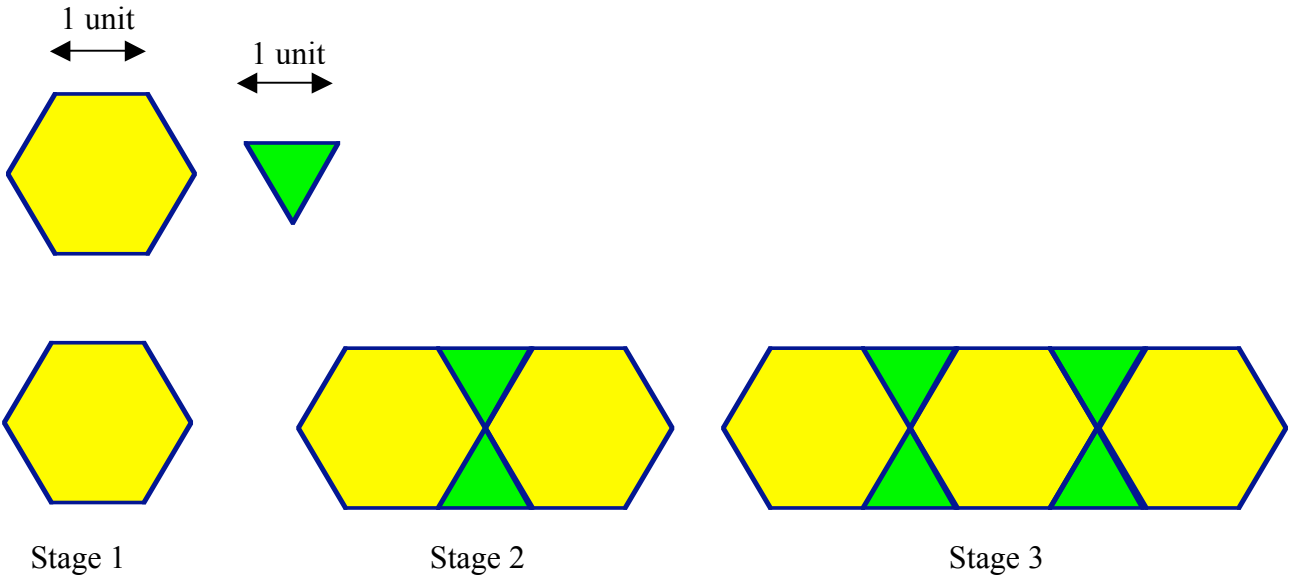# Perimeter Pattern

The edges of the regular hexagon and the regular triangle have a measure of one unit each. Therefore, the perimeter of the hexagon is 6 units and the perimeter of the triangle is 3 units.

1 unit

1 unit

Stage 1   Stage 2   Stage 3

1. Build the above figures and the next three in the sequence using pattern blocks. Record the perimeter of each stage in the following chart.

2. Complete the table, using the process column to write a function for stage *n* that expresses the relationship between the stage number and the perimeter of the figure.

Stage Number	Process	Perimeter
1		
2		
3		
4		
5		
6		
n		

3. What is the independent variable in this situation? The dependent?

4. Enter the ordered pairs (stage number, perimeter) from your table in your graphing calculator.

4. What are reasonable domain and range values for this situation? Justify your choices.

5. Find a viewing window for the problem situation. Do a scatter plot of your data.

Sketch your graph: Note your window:

Xmin:
 Xmax:
 Xscl:
 Ymin:
  Ymax:
  Yscl:

Justify your window choices.

6. Describe the shape of the graph. Explain why you think the graph takes this shape.

7. Write a statement (in your own words) describing the relationship between the variables in this situation.

7. Write a function rule for the perimeter of the figure of the nth term. Enter this function into y_1 on your calculator and graph. How does the function graph compare to your scatter plot?

8. What does the ordered pair (3, 14) mean in this problem?

9. What is the perimeter of the 8th stage? Write an equation and solve. Use your graph and table to verify your answer.

10. If the perimeter of the figure is 106 units, what is the stage number? Write an equation and solve. Use your graph and table to verify your answer.

11. Could you have a figure with a perimeter of 164? If so, what is the stage number? If not, explain why.