Variables and Expressions
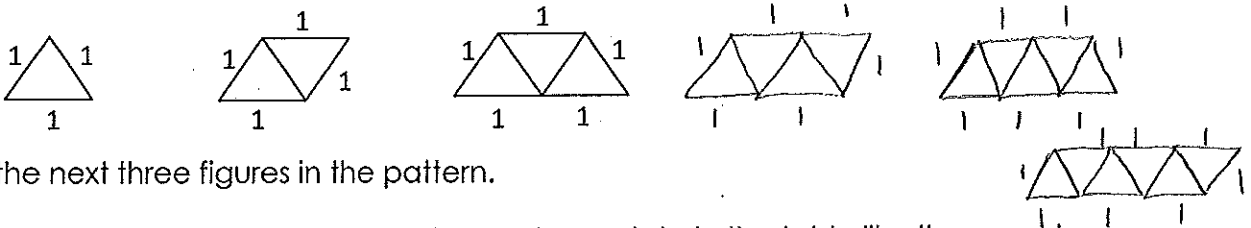
Below is a pattern made up of triangles, each with a side length of 1.

1. Draw the next three figures in the pattern.

2. Find the perimeter of each figure and record your data in the table like the ones shown below.

Number of Triangles	1	2	3	4	5	6
Perimeter	3	4	5	6	7	8

3. Without drawing the figure, determine the perimeter of a figure made up of 10 triangles. Check by making the drawing.

10's perimeter = 12

* add 2 *
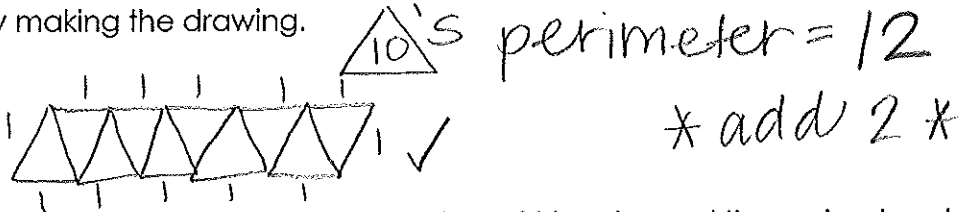
4. Find the relationship between the number of triangles and the perimeter at each stage of the pattern. Write a sentence about what you observe.

The perimeter is... 2 more than the number of triangles in the figure.

A __variable__ is a symbol that represents an unknown ~~quality~~ quantity.

An __algebraic expression__ contains variables, numbers, and at least one operation. Write an algebraic expression to represent the perimeter if we had n number of triangles.

$n + 2$ (comes from "2 more than")

Evaluate each expression below if $n=6$ and $m=-2$. * must SHOW substitution!!

$n + 2$
$\rightarrow 6 + 2$
$\boxed{8}$

$m + -1$
$\rightarrow (-2) + (-1)$
$\boxed{-3}$

$n + m$
$(6) + (-2)$
$\boxed{4}$

$m + n$
$(-2) + 6$
$\boxed{4}$

$n - 2 + m$
$* 6 - 2 + (-2)$
$4 + (-2)$
$\boxed{2}$

In algebra, the multiplication sign is often omitted. For example 6d, 9st, mn. The numerical factor in an algebraic expression is often called the __coefficient__. $\rightarrow 6d$

Evaluate $8w - 2v$ if $w = 5$ and $v = 3$.
$8(5) - 2(3)$
$40 - 6$
$\boxed{34}$

* don't forget *
order of operations!

Evaluate $2y^2 + 2$ if $y = 3$.
$2(3)^2 + 2$
$2 \cdot 9$
$18 + 2 = \boxed{20}$

Let's Practice!!!   *SHOW SUBSTITUTION*

Evaluate each expression if a = 4 and b = 3.

$9a - 6b$ $\dfrac{ab}{2}$ $2a^2 + 5$ $a + \text{-}7$ $b - (\text{-}3)$

$9(4) - 6(3)$
$36 - 18$
$\boxed{18}$

Evaluate each expression if _a_ = 3 and _b_ = 5.

$a + 7$ $8 - b$ $b - a$ $a - b$ ab

The standard formula for finding your maximum heart rate is $220 - a$, where a represents the person's age in years. What is <u>your maximum heart rate</u>? $a = $ your age!

The expression $5n + 2$ can be used to find the total cost in dollars of bowling where n is the number of games bowled. How much will it cost Vincent to bowl 3 games?

A nurse can use the expression $110 + \dfrac{A}{2}$, where A is a person's age, to estimate a person's normal blood pressure. Estimate the normal blood pressure for a 16-year old.

Evaluate each expression if x = 3.2, y = 6.1 and z = 0.2.

$x + y - z = \boxed{9.1}$ $8 - y + x$ $y - z + 5$

$(3.2) + (6.1) - (0.2)$

```
3.2
0.1
1.3
  .2
1.1
```

Complete each table.

Quarts (q)	Gallons ($\frac{q}{4}$)
4	1
6	1.5
8	
10	
12	

Dollars (d)	Quarters (4d)
1	4
2	8
3	
4	
5	