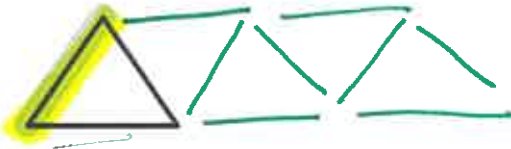


Explore and Analyze

1. **Highlight** the left-hand leg of the equilateral triangle drawn below. Add legs to form a second and then a third equilateral triangle. How many legs did you add to make each new triangle?



started with one leg
add 2 legs to make each new triangle.

2. Complete the table for up to 5 triangles

Number of Triangles (n)	Number of Highlighted Legs	Number of Unhighlighted Legs	Total Number of Legs (L)
1	1	2	3
2	1	4	5
3	1	6	7
4	1	8	9
5	1	10	11

3. Write a formula that defines the total number of legs, L , need to form a given number of equilateral triangles, n .

$$L = 1 + 2n$$

of highlighted legs (what we started with)

of legs added for each new Δ

4. How many legs are needed to form 20 equilateral triangles?

what is L when n=20?

$$L = 1 + 2(20)$$

$$= 1 + 40$$

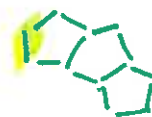
$$= 41$$

5. How would the formula change if you used squares instead of triangles? Pentagons? Explain.



$$L = 1 + 3n$$

add 3 legs each time



$$L = 1 + 4n$$

add 4 legs each time

5 sides

Summary

The equation we created is one way to represent the relationship between the number of triangles created and the total number of legs.

In our equation: for Δ s

$$L = 1 + 2n$$

number of legs (L) depends on the number of Δ s (n)

the coefficient is 2

the constant is 1

the dependent variable is L

the independent variable is n

The relationship between the number of triangles created and the total number of legs can also be represented by a table of values.

A table of values can be arranged either horizontally or vertically.

INDEPENDENT VARIABLE
(first row or first column)

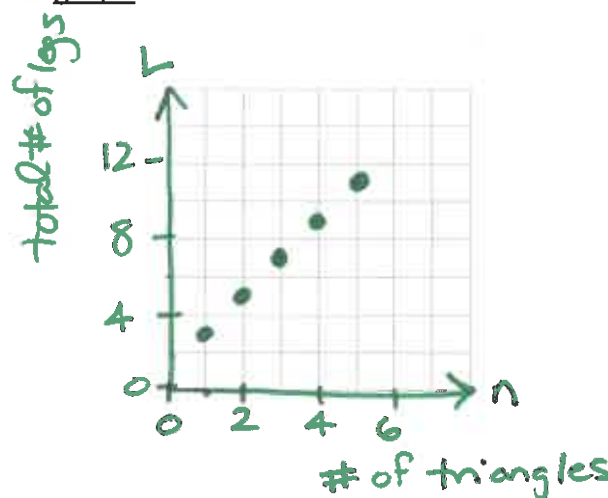
Number of Triangles (n) x	1	2	3	4	5
Total Number of Legs (L) y	3	5	7	9	11

DEPENDENT VARIABLE
(second row or second column)

Number of Triangles (n) x	Total Number of Legs (L) y
1	3
2	5
3	7
4	9
5	11

Another way we can represent the relationship between the number of triangles created and the total number of legs is with a graph.

dependent variable: y
independent variable: x



The relationship between the number of triangles created and the total number of legs is a **linear relation** (the points lie in a straight line).