1 Visual Patterns

January 11, 2022 7:47 PM

Ch 4: Linear Relations, Day 1: Visual Patterns Name: _____

4.1 Writing Equations to Describe Visual Patterns

Big Ideas: Using words, sketches, table of values, expressions, equations to represent patterns

Vocabulary:

- Pattern: objects or #'s that repeat according to a rule
- Variable: a letter (ex. x) to represent unknown quantity
- Operations: $+, -, \times, \div$
- Relation: relationship between 2 qualities

Expression	versus	Equation
▶ An expression is a mathematical statement made up of numbers and/or variables connected by operations.		▶ An equation is a mathematical statement where two expressions are equal.
▶ It does NOT contain an equal sign!		▶ It has a equal sign!
▶ Example: $3p$		▶ Example: $3n = 9$

$3x^2 + 2$

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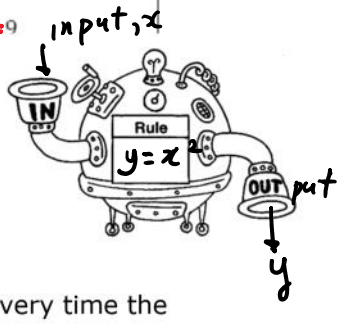
$x - 8$

$4x = 12$



You will learn to describe patterns using:

- **Sketches**
- A table of values (**TOV**)
- **Words**: Ex: the output number, y, increases by 3 every time the input, x, increases by 1
- **Expression**, Ex: $3x + 2$
- **Equation**, Ex: $3x + 2 = 10$
- **Graph**

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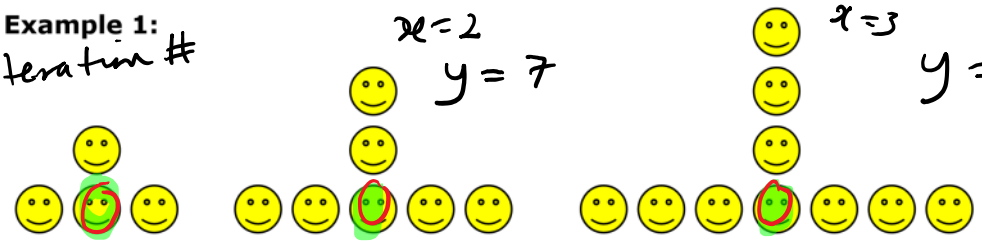
Example 1:

x, iteration #

x = 1 y = 4

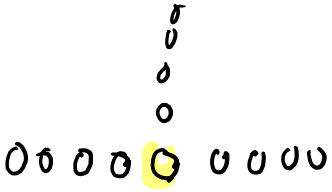
x = 2 y = 7

x = 3 y = 10



Sketch: Build the 1st 4 iterations. Sketch the 10th iteration. How would you sketch the 58th iteration?

x = 4



x = 10 y = 31

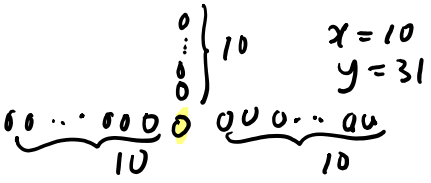


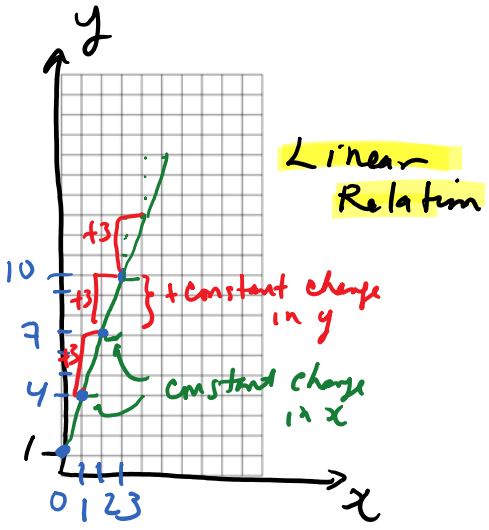
Table of Values (TOV):

x	y
0	1
1	4
2	7
3	10
4	13
⋮ 10	31

+3 +3 +3

3x + 1 = y

Graph:



Description in Words:

y, the # of happy faces, increases by 3 as x, the iteration #, increases by 1.

Expression:

3x + 1

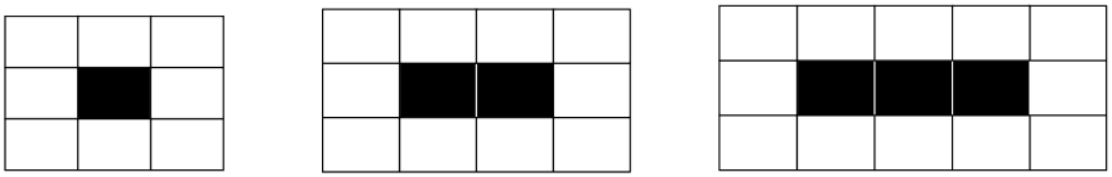
Equation:

3x + 1 = y

iteration # (input)

happy faces (output)

Example 2:

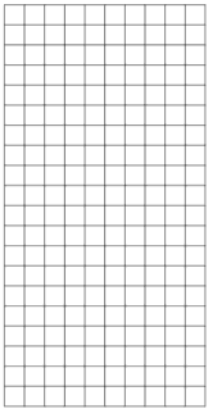


Sketch: Build the 1st 4 iterations. Sketch the 10th iteration. How would you sketch the 58th iteration?

Table of Values (TOV):

x	*y*
0	
1	
2	
3	
4	

Graph:



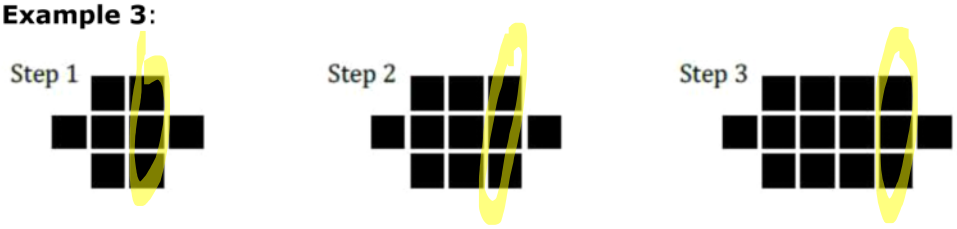
__*x* + __ = *y*

Description in Words:

Expression:

Equation:

Example 3:



Sketch: Build the 1st 4 iterations. Sketch the 10th iteration. How many tiles are in the 58th iteration?

iteration 4

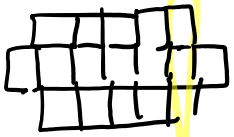
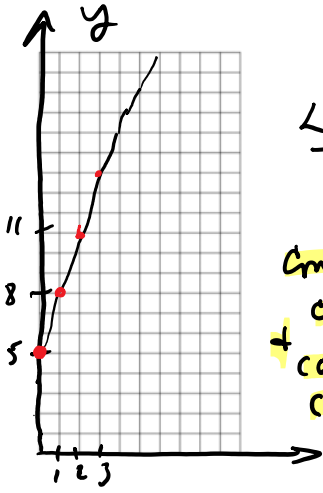


Table of Values (TOV):

x	y
0	5
1	8
2	11
3	14
4	

+3, +3, +3

Graph:



Linear Relation

Constant changing + constant change in x

$3x + 5 = y$

$x = 58$: $y = 3(58) + 5$
$= 179$

Description in Words:

The # of tables, y, ↑ by 3 as x ↑ by 1

Expression:

$3x + 5$

Equation:

$3x + 5 = y$

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