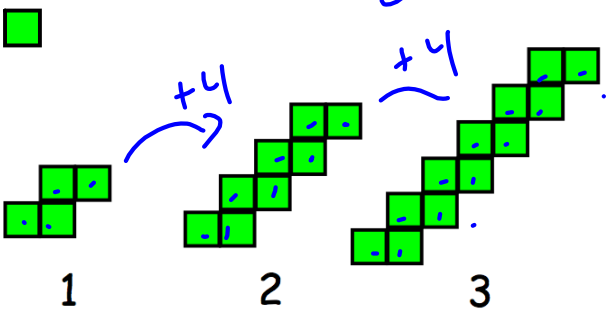
Day 5 - From Patterns to Graphs

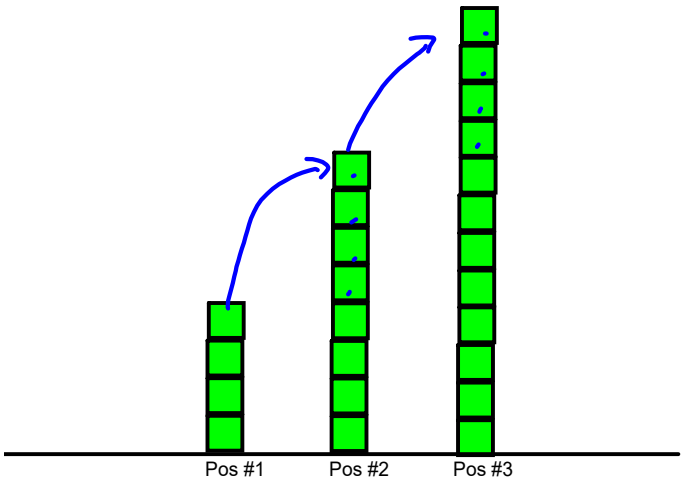
Part 1: Direct Variation

Examine the pattern below.

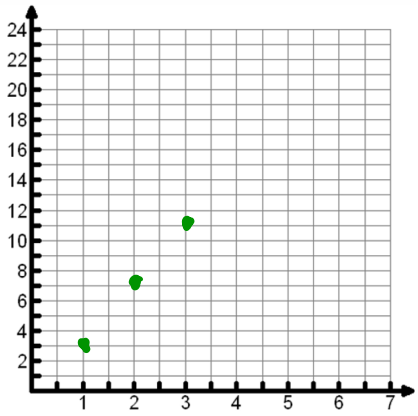
What is the rule? $y = 4x + 0$



x (position number)	y (number of tiles)
1	4
2	8
3	12
4	16



Now, we move from patterns with tiles to graphs!



Work with a partner:

Instructions :

1. Think of three different rules, they are to be direct variation and use a multiplier between 1 and 6.
   Record your rules here :

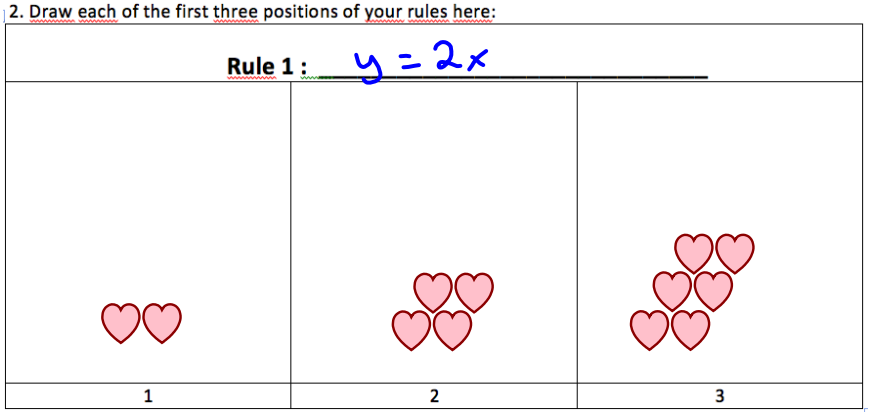
Rule 1: $y = 2x$

Rule 2: $y = 4x$

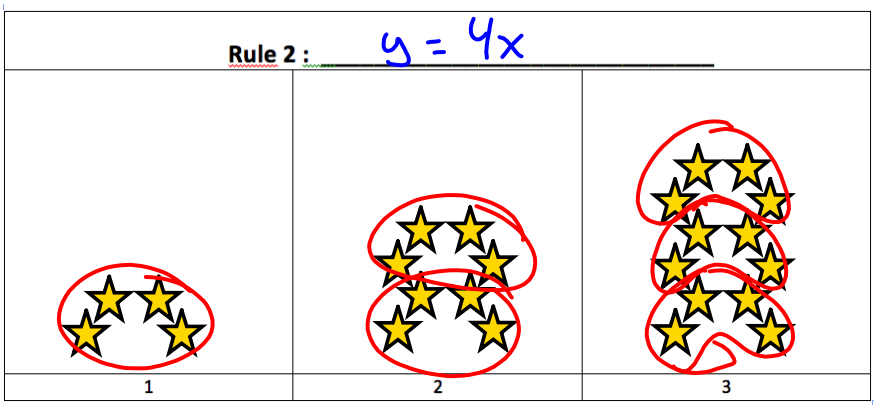
Rule 3: $y = 6x$

2. Draw each of the first three positions of your rules here:

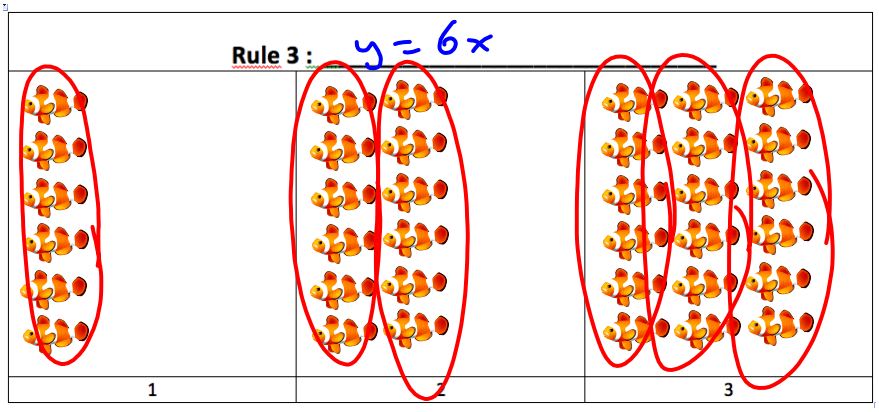
Rule 1 : $y = 2x$



Rule 2 : $y = 4x$



Rule 3 : $y = 6x$



3. Your teacher will give you a big sheet of graph paper to graph all 3 rules. All rules will be graphed on the same axis. Graph each rule using a different colour and be sure to include a legend that shows what colour goes with what rule. Also, extend your graph to the y-axis.

4. Continue your graph to position 5.

Questions:

1. Why do you think the points form a straight line?

going up by the same amount each time. Multiplier stays the same

2. Why do you think that some lines are steeper than others?

multplier.

3. (a) Which rule made the steepest trend line? biggest multiplier

(b) Which rule made the flattest trend line? lowest multplier

(c) What connections can you make between the multiplier and the steepness of the trend line?

bigger the multiplier, steeper the line.

Pull

Pull

Pull

The multiplier (aka rate of change) is also called slope **.**

The point where the graph crosses the y-axis is called y-intercept **.**

starting value
initial value

Part 2 : Partial Variation

1. With your partner, construct the models for each rule given (use positions 0 to 4). Then, create a graph on the axis provided.

# of tiles = position #x 2 + 1

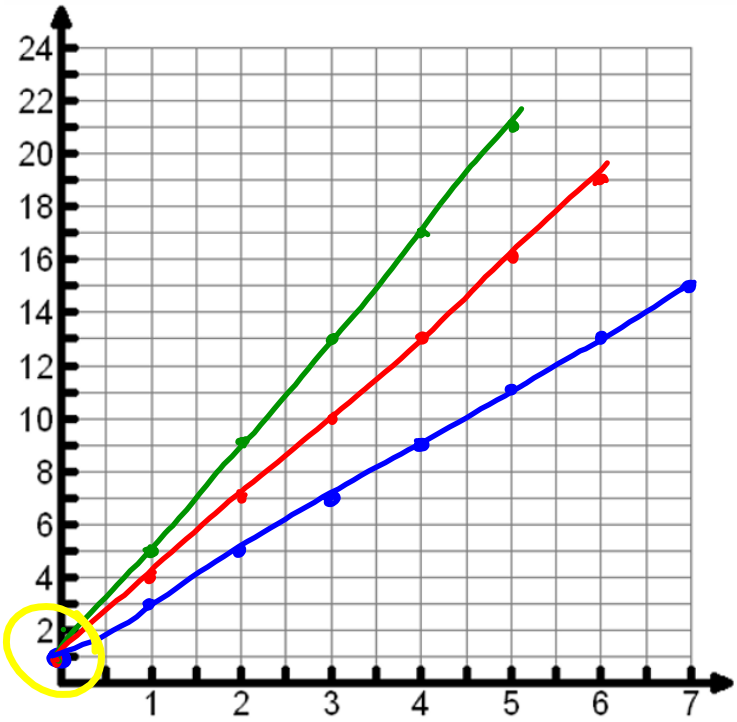
x (position number)	y (number of tiles)
0	1
1	3
2	5
3	7
4	9

# of tiles = position # x 4 + 1

x (position number)	y (number of tiles)
0	1
1	5
2	9
3	13
4	17

# of tiles = position # x 3 + 1

x (position number)	y (number of tiles)
0	1
1	4
2	7
3	10
4	13



How are these graphs different?

slope

How are these graphs the same?

y-int (graph)

constant (eqn)

Pull

Pull

2. With your partner, construct the models for each rule given (use positions 0 to 4). Then, create a graph on the axis provided.

# of tiles = position # x 3 + 2

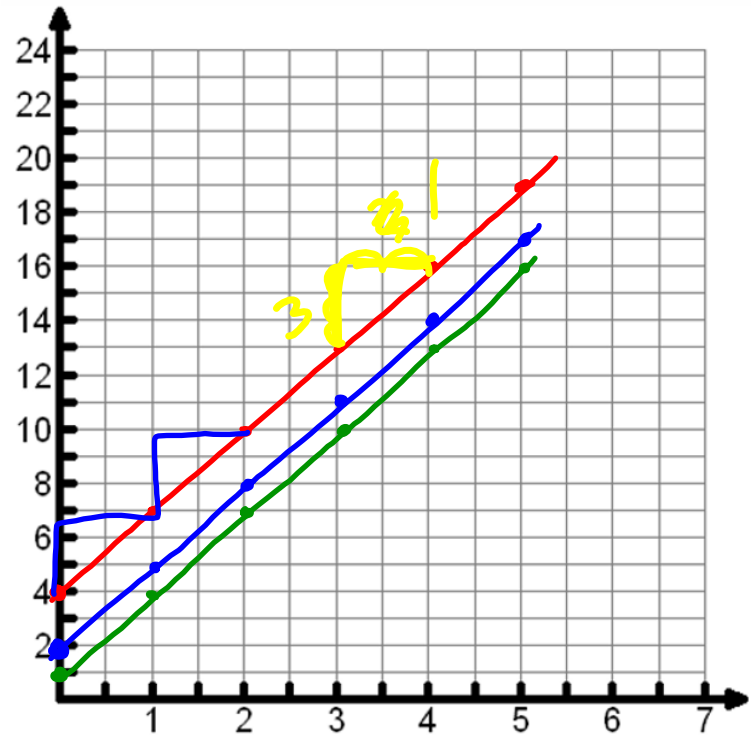
x (position number)	y (number of tiles)
0	2
1	5
2	8
3	11
4	14

# of tiles = position # x 3 + 1

x (position number)	y (number of tiles)
0	1
1	4
2	7
3	10
4	13

# of tiles = position # x 3 + 4

x (position number)	y (number of tiles)
0	4
1	7
2	10
3	13
4	17



How are these graphs different?

constant y-int.

Pull

How are these graphs the same?

multiplier. slopes.

Pull