* table
* 1st/2nd Difference
* y intercept
* graph

Lesson 1 Something to Talk About

A Develop Understanding Task

Cell phones often indicate the strength of the phone's signal with a series of bars. The logo below shows how this might look for various levels of service.

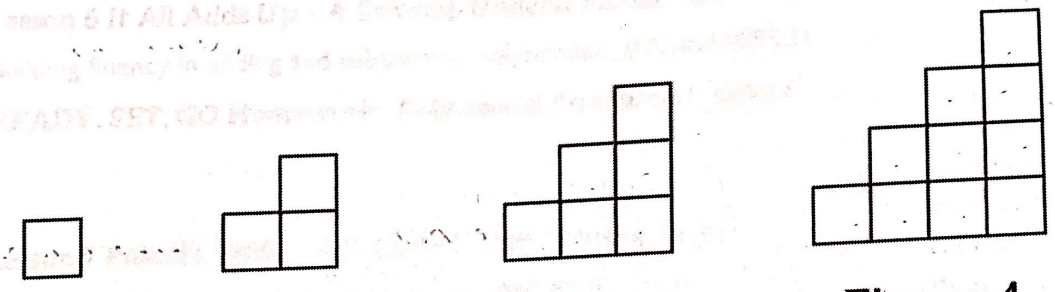


Figure 1 (1)

Figure 2 (3)

Figure 3 (6)

Figure 4 (10)

1. Assuming the pattern continues, draw the next figure in the sequence.

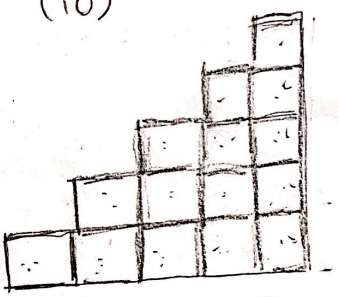


figure 5 (15)

y-int

2. How many blocks will be in the figure 10?

Figure #	1	2	3	4	5	6	7	8	9	10
# Blocks (area)	1	3	6	10	15	21	28	36	45	55

0
0

X Examine the sequence of figures and find a rule or formula for the number of tiles in any figure number.

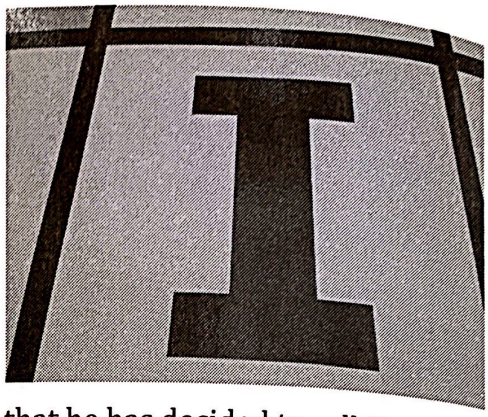
① Create a table. ② What type of function

③ How do you know? (graph, 1st Difference).

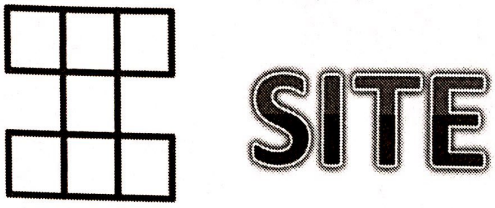
mathematics vision project

Lesson 2 I Rule!

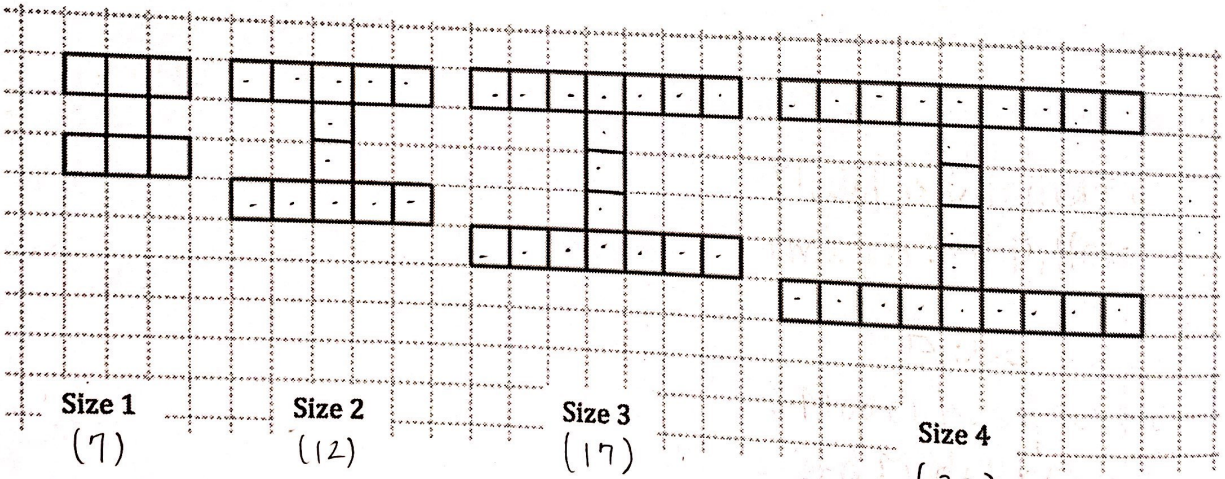
A Solidify Understanding Task



Marco has started a new blog about sports at Imagination High School (mascot: the fighting unicorns) that he has decided to call "I Site". He created a logo for the web site that looks like this:



He is working on creating the logo in various sizes to be placed on different pages on the website. Marco developed the following designs:



1. How many squares will be needed to create the size 100 logo?

Size	1	2	3	4	...	100	n
#Blocks	7	12	17	22		502	5n+2

**LINEAR ⇒ Common difference

2. Develop a mathematical model for the number of squares in the logo for size *n*.

(table)(Equation)
(See above)

n = Size
#Blocks = 5n + 2

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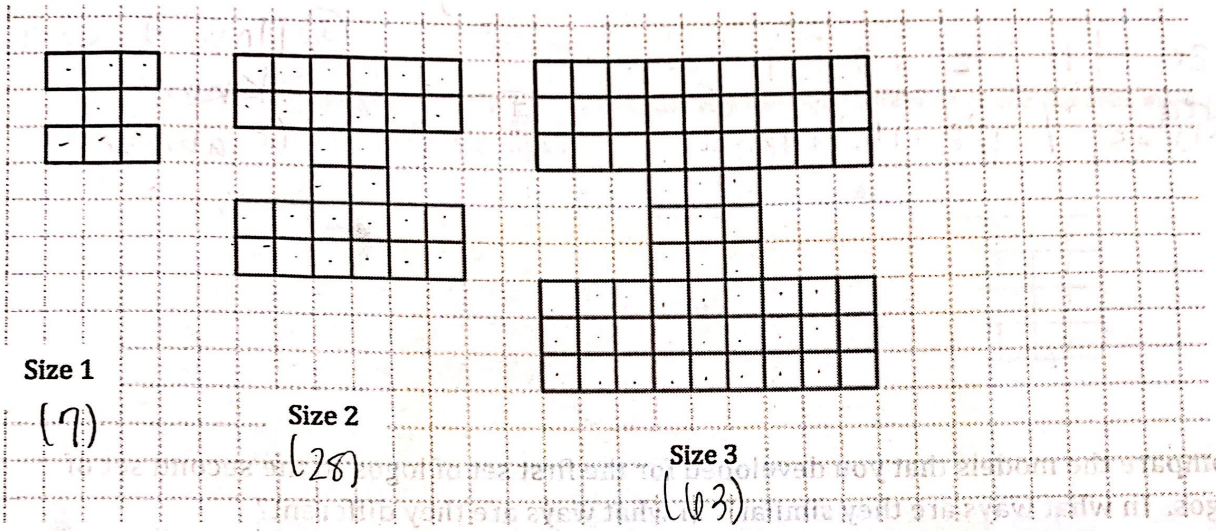
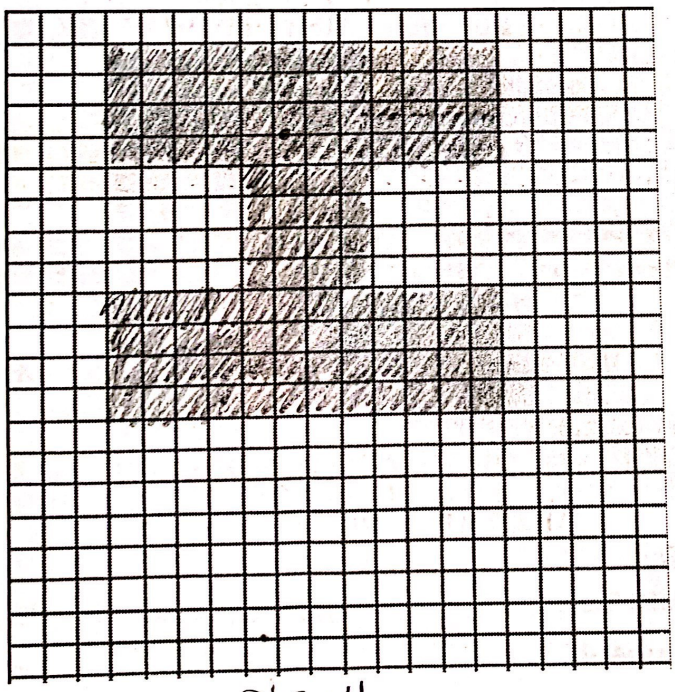
Marco decides to experiment with making his logo "blockier" so that it looks stronger. Here's what he came up with:



3. Assuming that Marco continues with the pattern as it has begun, draw the next figure, size 4, and find the number of blocks in the figure.



Size 4
(112)

4. **Develop a mathematical model for the number of blocks in a logo of size *n*.**

① (table) ② What type of function ③ How do you know (graphing 2nd Difference)

Size	1	2	3	4	...	n
# Blocks (area)	7	28	63	112		$7n^2$

5. **Compare the models that you developed for the first set of logos to the second set of logos. In what ways are they similar? In what ways are they different?**

SIMILAR

① Both are increasing

② Both have 7 blocks in figure size 1

DIFFERENT

① 1st Model is Linear (Common 1st Difference)
2nd Model is Quadratic (Common 2nd Difference)

② y intercepts are Different. 1st Model has y-int of 2 while 2nd Model has y-int of 0.

③ The quadratic increases faster than the linear.