Math Enrichment Program

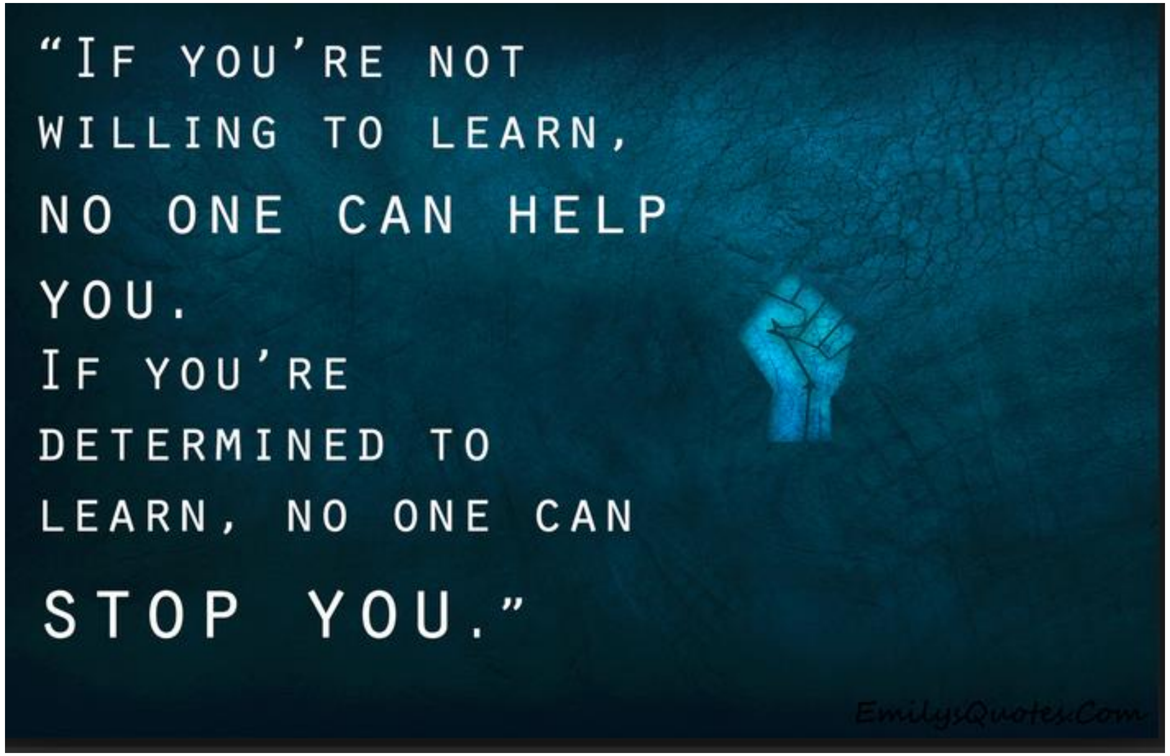
WELCOME!

MRS. PHILLIPS
GENERALIZATIONS

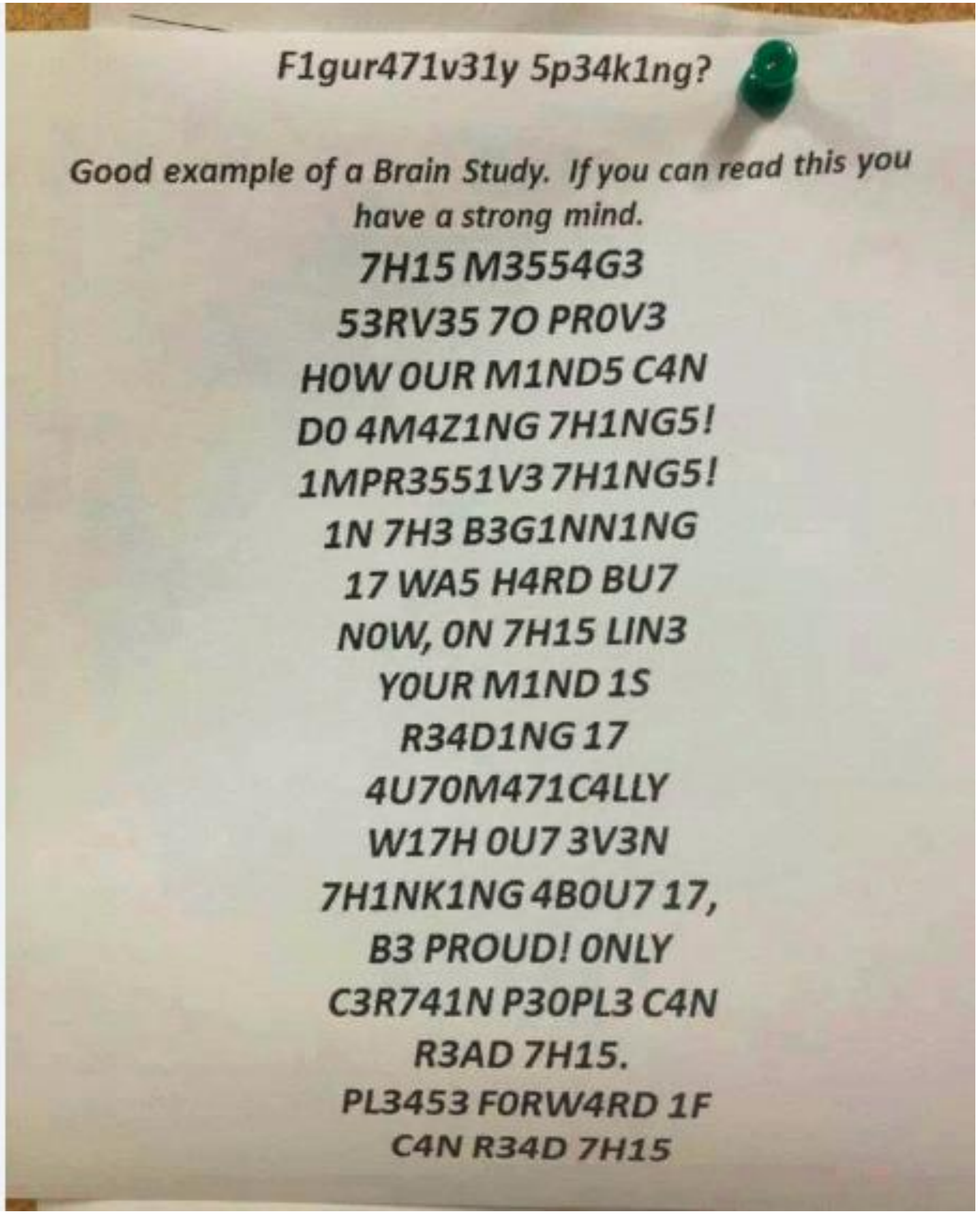
Day 6 Agenda:
- Warm ups
- Pop Up Questions
- Generalizations
- Reflection

This session will be recorded for learning purposes. Learning purposes include: a lesson review for students who are absent, students who want to review for a test, etc.

DISCUSSIONS

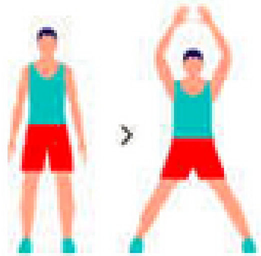


Warm Up

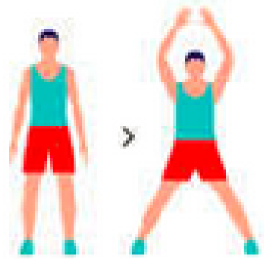

F1gur471v31y 5p34k1ng?

Good example of a Brain Study. If you can read this you have a strong mind.

7H15 M3554G3
53RV35 70 PR0V3
H0W 0UR M1ND5 C4N
D0 4M4Z1NG 7H1NG5!
1MPR3551V3 7H1NG5!
1N 7H3 B3G1NN1NG
17 WA5 H4RD BU7
N0W, 0N 7H15 LIN3
Y0UR M1ND 1S
R34D1NG 17
4U70M471C4LLY
W17H 0U7 3V3N
7H1NK1NG 4B0U7 17,
B3 PR0UD! 0NLY
C3R741N P30PL3 C4N
R3AD 7H15.
PL3453 F0RW4RD 1F
C4N R34D 7H15



Warm Up



WHICH ONE ? CIRCLE YOUR ANSWER

David chooses 16 but not 17; 144 but not 145; 1 but not 2, 100 but not 101.

Which of these next numbers would David choose?

24 49 122

Warm Up

SQUARE ROOTS

$If\ x^2 = 4$, then $x =$ ______ , or $x =$ ______ Why ?

$If\ x^2 = 64$, then $x =$ ______ , or $x =$ ______ Why ?

$If\ x^2 = 121$, then $x =$ ______ , or $x =$ ______ Why ?

POP – UP #1

1) f(x) is a linear function represented by the given table of values; which of the following choices represents f(x)?

A) $f(x) = -5x + 1$

B) $f(x) = 2x - 3$

C) $f(x) = x^2$

D) $f(x) = 5$

x	f(x)
0	-3
1	-1
2	1
3	3
10	17

POP – UP #2

2) Fill in the blank,

1, 1, 4, 2, 9, 3, 16, 4, 25, ____ ,36, 6.

A) 50

B) 100

C) 5

D) there is no pattern

POP – UP #3

For the linear function $y = -2x + 5$; if $x = 0$, then $y = ?$

A) 5

B) -5

C) 2

D) can't be found

POP – UP #4

4) Fill in the blank,

81, 72, 63, ____ , 45, 36, …

A) 54

B) 9

C) 49

D) No pattern

POP – UP #5

5) For the linear function y = 10, for each one unit increase in x the y-value is decreased by 10.

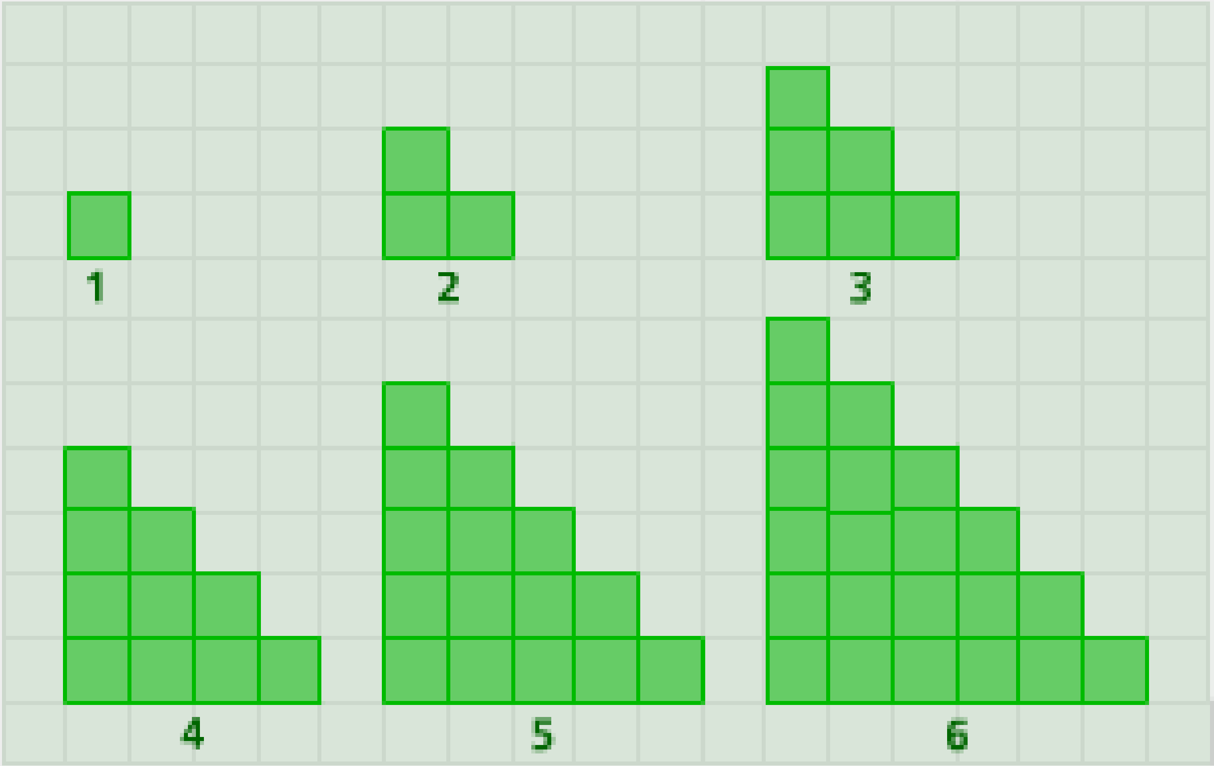
A) True

B) False

REVISIT - STAIR CASES

n = pattern #	t = Total # of tiles
1	
2	
3	
4	
5	
6	
7	
n	

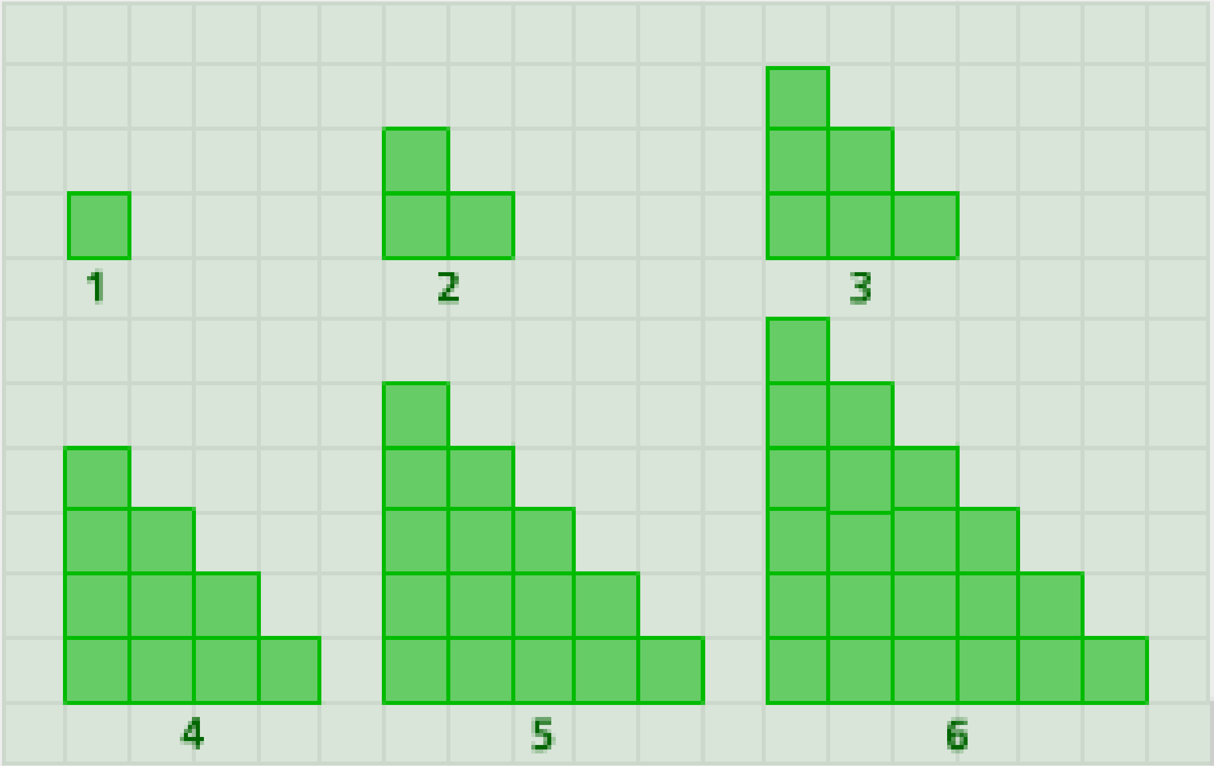
In this exercise, you'll make staircases out of square blocks. Can you figure out a rule or formula for predicting the number of blocks in any staircase?



REVISIT - STAIR CASES

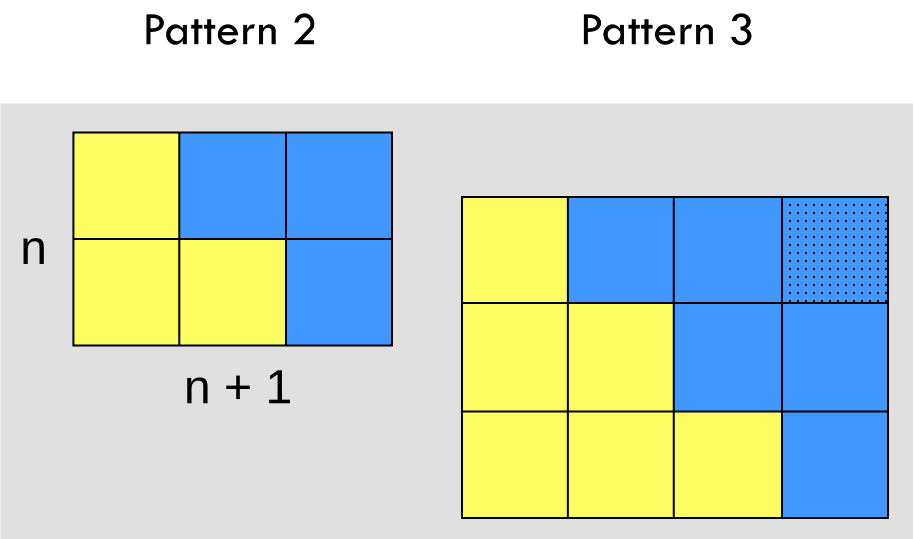
n = pattern #	t = Total # of tiles
1	1
2	3
3	6
4	10
5	15
6	21
7	28
n	$\frac{n(n+1)}{2}$

In this exercise, you'll make staircases out of square blocks. Can you figure out a rule or formula for predicting the number of blocks in any staircase?



What's another way of looking at it?
Make a Rectangle

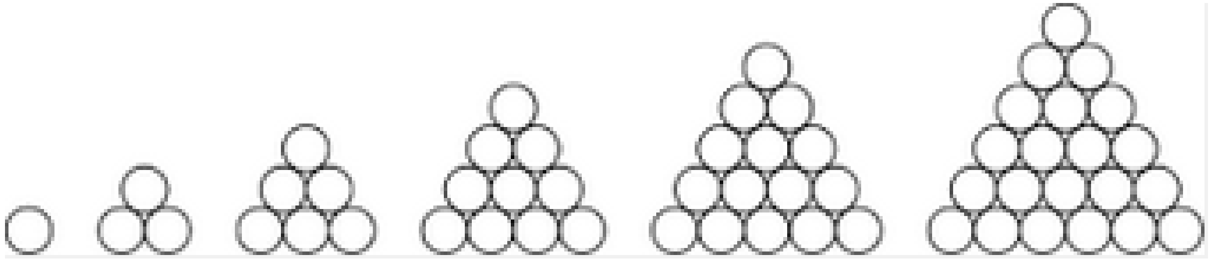
n = pattern #	t = Total # of tiles
1	1
2	3
3	6
4	10
5	15
6	21
7	28
n	$\frac{n(n+1)}{2}$



TRIANGULAR NUMBERS

COMPARE AND CONTRAST

Make a list of triangular numbers



n = pattern #	t = Total # of tiles
1	
2	
3	
4	
5	
6	
7	
n	

What are some similarities between the Stair Cases activity and Triangular Numbers?

So, can we find the 50th triangular number?

Student Question: what is the sum of the first 100 whole numbers?? How am I supposed to work this out efficiently? Thanks

Hi Jo,

The question you asked relates back to a famous mathematician, Gauss. In elementary school in the late 1700's, Gauss was asked to find the sum of the numbers from 1 to 100. The question was assigned as "busy work" by the teacher, but Gauss found the answer rather quickly by discovering a pattern. His observation was as follows:

$$1 + 2 + 3 + 4 + \ldots + 98 + 99 + 100$$

Gauss noticed that if he was to split the numbers into two groups (1 to 50 and 51 to 100), he could add them together vertically to get a sum of 101.

$$\begin{array}{ccccccccc} 1 & +2 & +3 & +4 & +5 & +\ldots & +48 & +49 & +50 \\ \underline{100} & \underline{+99} & \underline{+98} & \underline{+97} & \underline{+96} & \underline{+\ldots} & \underline{+53} & \underline{+52} & \underline{+51} \\ 101 & 101 & 101 & 101 & 101 & 101 & 101 & 101 & 101 \end{array}$$

SUM OF FIRST 100 WHOLE NUMBERS

SO, WHAT DID GAUSS DO?

Gauss realized then that his final total would be 50(101) = 5050.

The sequence of numbers (1, 2, 3, … , 100) is arithmetic and when we are looking for the sum of a sequence, we call it a series.

Thanks to Gauss, there is a special formula we can use to find the sum of a series:

$$S = \frac{n(n+1)}{2}$$

Look familiar?

$$S = \frac{100(100+1)}{2} = 5050$$

SNAP SHOT

Please write on the board

Write TWO things you learned TODAY