Curriculum Outcomes:

(PR1) Generalize a pattern arising from a problem-solving context using linear equations and verify by substitution.

(PR2) Graph linear relations, analyze the graph and interpolate or extrapolate to solve problems.

Student Friendly: Being able to identify a linear pattern in a t-table.

Warm Up
Grade 9

Given the following t-table
i) Complete the table
ii) Describe a the pattern
iii) Write the equations and Expression
iv) Use your equation to determine how many circles would be in figure 500.

f Figure #	C # Circles
1 (5)	7
2 (5)	12
3 (5)	17
4	22
5	27
6	32
⋮	
500	

Pattern

+1 ( ) +5
+1 ( ) +5
+1 ( ) +5

Equations

$C = \frac{5}{1} f + 2$

Expression

$5f + 2$

$C = 5f + 2$

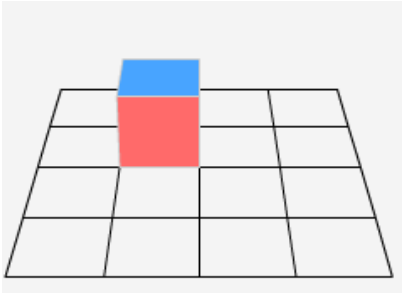
$C = 5(500) + 2$

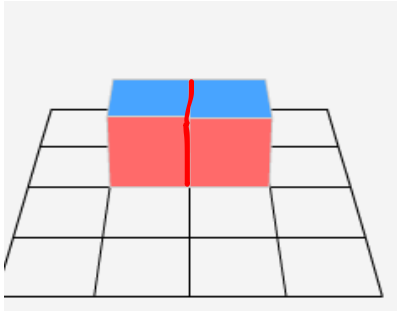
$C = 2500 + 2$

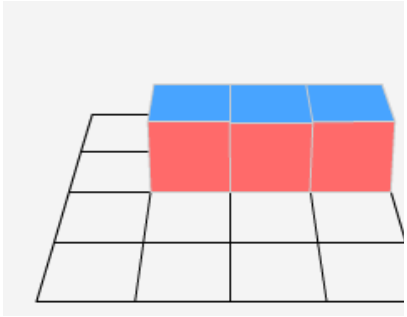
$C = 2502$

Remember Connecting Cubes

MIGHT BE TOO HARD
SO Might remove







x # of cubes	y # of faces exposed
1	6
2	10
3	14
4	18
5	22
25	

+1 (4) +1 (4) +1 (4) +1

6 +4, 10 +4, 14 +4, 18 +4

$y = \frac{\Delta y}{\Delta x} x \pm \#$

$y = \frac{4}{1} x + 2$

$y = 4x + 2$

$y = 4(25) + 2$

$y = 100 + 2$

$y = 102$

T- Tables or Input/Output tables

x	y
0	5
2	9
4	13
6	17
8	21
.	
.	
.	
100	

(2) (2) +2 +2 +2 +4 +4 +4

Write an equations

$y = \frac{\Delta y}{\Delta x} x \pm \#$

$y = \frac{4}{2} x \pm \#$

$y = 2x + 5$

Write an expression for the relationship

$2x + 5$

A large water tower holds 15000 liters of water, however during the winter the water tower was damaged and started to leak. This table shows the amount of water every hour after it sprung the leak. The level of water changes at a constant rate.

Time (t hours)	Amount (*A* Liters)
0	15 000
1	14 800
2	14 600
3	14 400
4	14 200

x y (-200) +1 -200 -200 -200 -200

ii) Write an ***equation*** that relates the amount of water to the time since it started leaking.

$y = \frac{\Delta y}{\Delta x} x \pm b$

$y = \frac{-200}{1} x + 15000$

i) Write an ***expression*** for the amount in terms of the time since the water tower began to leak.

$-200x + 15000$

iii) How much water in the water tower after 10 hours?

$y = -200x + 15000$

$y = -200(10) + 15000$

$y = -2000 + 15000$

$y = 13000$

iv) When will the water tower be empty?

$y = -200x + 15000$

$0 = -200x + 15000$ (−15000)

$\frac{-15000}{-200} = \frac{-200x}{-200}$

$75 = x$

Try these

For n = 2, solve for each of the following

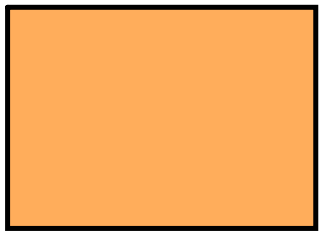
1) P = 5n +6

P=5(2) +6

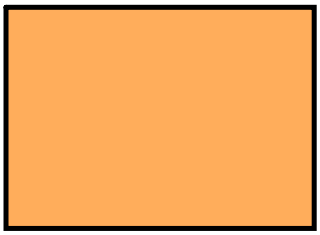
p= 10+6

p= 16

2) K = 4n-1



3) W= 10n - 5



For n = -5, solve for each of the following

1) P = 5n +6

P= 5(-5)+6

P=-25+6

p=-19

2) K = 4n-1

3) W= 10n - 5

Class/Homework

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Questions

4,5,6,7,8,9,11, 12,

Must Show ALL WORK

14, 15, 16, 17,18, 19, 20, 21