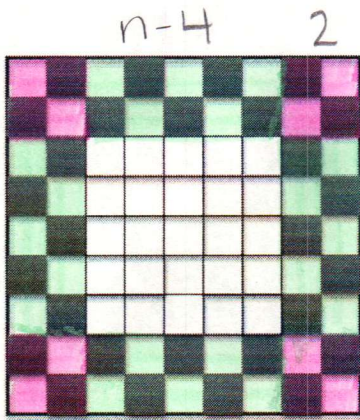


Notes 1.3 – Arithmetic Sequences

Warmup

Checkerboard Problem: You should have found the 9 by 9 room had 28 color tiles, and the 29 by 29 room had 108 tiles.

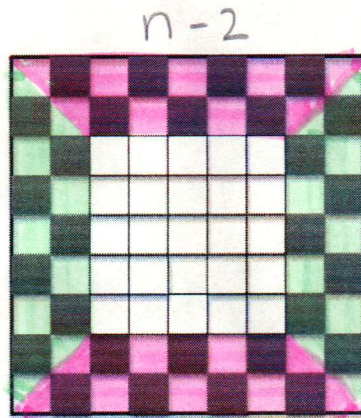
Try to find three different ways that you can break up the tiles to try to help you make a general rule for the number of color tiles based on the length of a side.



$$4(n-4) + 4(2)$$

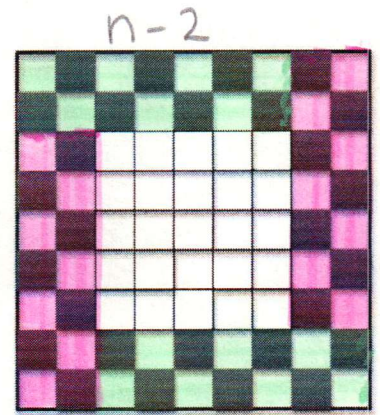
$$4n - 16 + 8$$

$$4n - 8$$



$$4(n-2)$$

$$4n - 8$$



$$4(n-2)$$

$$4n - 8$$

Try to determine how many tiles will be in a 12 by 12 foot room: 40 tiles
 $4(12) - 8$

Lesson

Word	Meaning/Notation	Example
Arithmetic Sequence	A pattern that increases or decreases by adding or subtracting a specific value	15, 11, 7, 3, ... $\begin{matrix} \curvearrowright & \curvearrowright & \curvearrowright \\ -4 & -4 & -4 \end{matrix}$ subtract 4 each time
Common Difference	The amount that is repeatedly added or subtracted	3, 6, 9, 12, 15, ... $\boxed{+3}$

Using multiple representations to represent a problem, not every problem can be represented in every way, but all can be represented in more than one way.

Growing Dots Problem																		
Visual																		
Table (one type)	<table border="1"> <tr> <td>Time</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>Dots</td> <td>1</td> <td>5</td> <td>9</td> <td>13</td> <td>17</td> </tr> </table>	Time	0	1	2	3	4	Dots	1	5	9	13	17	<table border="1"> <tr> <td>Independent Variable</td> <td>Data</td> </tr> <tr> <td>Dependent Variable</td> <td>Data</td> </tr> </table>	Independent Variable	Data	Dependent Variable	Data
Time	0	1	2	3	4													
Dots	1	5	9	13	17													
Independent Variable	Data																	
Dependent Variable	Data																	
Graph																		
Words/ Description	<p>After starting with one dot, 4 more dots get added each minute.</p>	<p>Describe the pattern using context and explaining what the rule is.</p>																
Equations	<p>To be discussed next class.</p>																	

1. Use the models we created above to determine how many dots there will be at each of the following times.

a. 5 minutes

21 dots

b. 20 minutes

81 dots

c. 100 minutes

401 dots

2. How did you find your answer for 100 minutes?

4 dots per minute plus one

$$4(100) + 1 = 401$$

3. Look at each of the given tables, determine what the common difference is, and then use it to extend the pattern.

a.

Term	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th
Value	66	50	34	18	2	-14	-30	-46
Change		-16	-16	-16	-16	-16	-16	-16

Common Difference: -16

b.

Term	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th
Value	-9	-2	5	12	19	26	33	40
Change		+7	+7	+7	+7	+7	+7	+7

Common Difference: +7

c. You have borrowed \$100 from your mom. The agreement is that you will pay her back \$15 per week until it is paid off.

Week	0	1	2	3	4	5	6	7
Money	100	85	70	55	40	25	10	-5
Change		-15	-15	-15	-15	-15	-15	-15

In the given information, what is the common difference? -\$15

Translate the table onto the given graph.

