

Island Numeracy Assessment

Grade 6+: Patterning

Collaborative Task 1

Complete the following problems

(if the students can easily solve the first problem then have them solve the second one or have them choose which problem they would like to try):

$$\square\square + x = \square\square$$

Using the digits 1 to 9 **at most once**, create an equation where x has the greatest value.

$$12 + X = 97 \quad X = 85$$

$$11 + x = 97 \quad (\text{non-example digit repeated})$$

$$13 + 85 = 98 \quad (\text{non-example digit repeated})$$

$$\square\square + x = \square\square$$

$$x = \square\square$$

Using the digits 1 to 9 **at most one time each**, place a digit in each box to make the equation true.

$$21 + 36 = 57$$

$$X = 36$$

$$36 + 21 = 57$$

$$X = 21$$

$$38 + 21 = 59$$

$$X = 21$$

and so on....

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Collaborative Task 2

A student has five cubes. Each one is 2 cm taller than the previous one. The largest cube is the same height as a tower built of the two smallest cubes.

How high would a tower of all five cubes be?

Solution is 50 cm

$$\text{cube 1} = n$$

$$\text{cube 2} = n+2$$

$$\text{cube 3} = n+4$$

$$\text{cube 4} = n+6$$

$$\text{cube 5} = n+8$$

$$n + 8 = n + n + 2$$

Students could use interlocking cubes to model.

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Assessment Question	Answer Key												
<p>1. Solve for x. Show your thinking.</p> $5 + 7 = x + 3$	$x = 9$												
<p>2. Solve for x. Show your thinking.</p> $16 + x = 74$	$x = 58$												
<p>3. Using the pattern rule, $4n + 3$ fill in the table below.</p> <table border="1"><thead><tr><th>Input</th><th>Output</th></tr></thead><tbody><tr><td>1</td><td>7</td></tr><tr><td>2</td><td>11</td></tr><tr><td>3</td><td>15</td></tr><tr><td>4</td><td>19</td></tr><tr><td>5</td><td>23</td></tr></tbody></table>	Input	Output	1	7	2	11	3	15	4	19	5	23	
Input	Output												
1	7												
2	11												
3	15												
4	19												
5	23												
<p>4. Determine what the pattern rule might be using the information in the table of values below.</p> <table border="1"><thead><tr><th>Input</th><th>Output</th></tr></thead><tbody><tr><td>1</td><td>3</td></tr><tr><td>2</td><td>5</td></tr><tr><td>3</td><td>7</td></tr><tr><td>4</td><td>9</td></tr><tr><td>5</td><td>11</td></tr></tbody></table>	Input	Output	1	3	2	5	3	7	4	9	5	11	$2n + 1$
Input	Output												
1	3												
2	5												
3	7												
4	9												
5	11												

5. Power is measured in Watts (W).

120 W

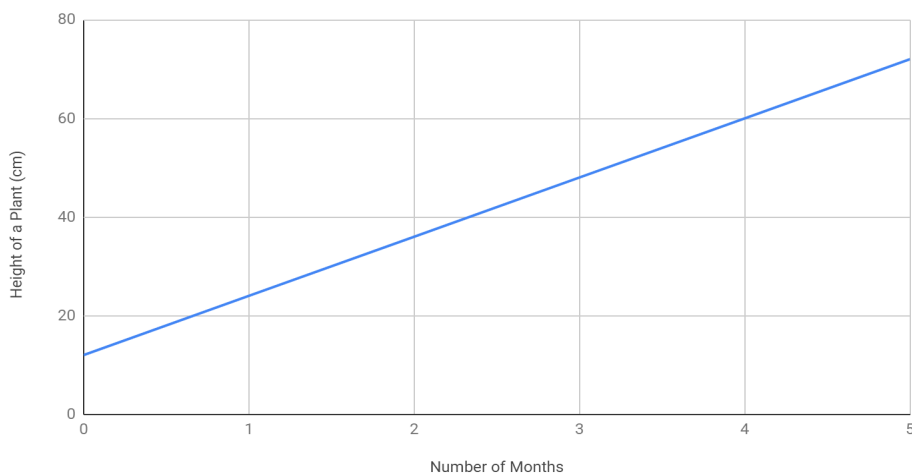
Using the information in the chart below, determine the amount of power one solar panel would produce in one day.

Number of Solar panels	Total Amount of Power produced per day
5	600 W
4	480 W
3	360 W
2	240 W
1	?

6. When a student bought a plant, it was 13 cm tall. How much did the plant grow in the 4 months after buying the plant?

47 cm

Height of a Plant Over Time



7. Using the number pattern below, predict the 7th term (number) of the sequence.

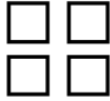
128

2, 4, 8, 16,...

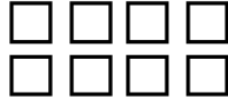
Term 1



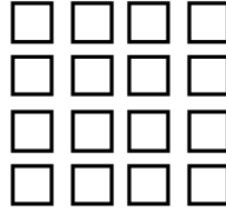
Term 2



Term 3



Term 4



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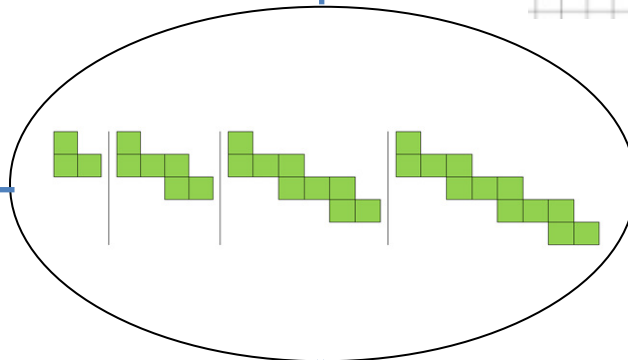
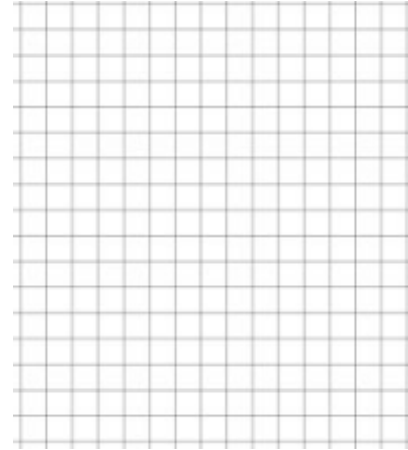
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Performance Task:

In the center of the page you will see the first 4 terms in a pattern series. Look at the pattern and determine how it changes for each term and then using that information complete the table below.

Make a t-table for the pattern showing the first 6 terms.

Graph the first 6 terms of the pattern.



Determine the pattern rule (equation) for the pattern.

Draw the 6th term of the pattern.

Describe the pattern in words
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term (n)	value
1	3
2	6
3	9
4	12
5	15
6	18

Pattern Rule = $3n$ or $(n-1) \times 3 + 3$

In words - value increases by 3 each time

Drawing

Graph