**Patterning Meets Algebra – Independent Note**

* When we graphed our patterns, we discovered that they made straight lines. The equation for a straight line is: **y = mx+b**
* This matches with our pattern, where the **m** (slope) is our **pattern number** and **b** (y-intercept) is the **term value at term 0** (ie: where it starts)
* How do you find term 0?

\*\* **Subtract the pattern number from term 1**





Knowing this information means that we can easily create an equation for each pattern so that we can find term values of the pattern without continuing the pattern. Ie: if I wanted to know what the value at Term Number 100 was, I could use my equation to solve for it instead of writing out the entire pattern.

**Example 1:**

|  |  |
| --- | --- |
| **Term Number** | **Term Value**  |
| 0 | 11 |
| 1 | *9* |
| 2 | *7* |
| 3 | *5* |

Pattern: 9, 7, 5…

1. Convert this to a table of values.

9 – (-2)

1. Determine what the pattern number is.

-2

1. Subtract the pattern number from term 1 to
determine the value at term 0.
2. Use this information to replace m and b.

The pattern number is -2. The value at term 0 is 11. Therefore, the equation is **y = -2x + 11**

**Your Turn**

Pattern 1: ***6, 11, 16 …***

|  |  |
| --- | --- |
| **Term Number** | **Term Value**  |
| 0 |  |
| 1 |  |
| 2 |  |
| 3 |  |

1. Convert this to a table of values.
2. Determine what the pattern number is.

1. Subtract the pattern number from term 1 to
determine the value at term 0.
2. Use this information to replace m and b.

The pattern number is \_\_\_\_\_. The value at term 0 is \_\_\_\_\_. Therefore, the equation is \_\_\_\_\_\_\_

**Instructions**: for each pattern, determine the equation that could be used to find the nth term. Follow the same steps as the previous pattern.

Pattern 2: ***12, 16, 20 …***

|  |  |
| --- | --- |
| **Term Number** | **Term Value**  |
| 0 |  |
| 1 |  |
| 2 |  |
| 3 |  |

Pattern 3: ***3, 5, 7 …***

|  |  |
| --- | --- |
| **Term Number** | **Term Value**  |
| 0 |  |
| 1 |  |
| 2 |  |
| 3 |  |

Pattern 4: 3, 8, 13 …

|  |  |
| --- | --- |
| **Term Number** | **Term Value**  |
| 0 |  |
| 1 |  |
| 2 |  |
| 3 |  |

Graph one of the patterns from the above activity.