Direct Variation Exploration Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Congrats! You’ve just been hired at FedEx, loading the delivery trucks. Your first task is to stack boxes that are each 12 inches high.**

****1) Complete the table and make a graph of the data points.

|  |  |
| --- | --- |
| **Number of Boxes****(x)** | **Height of the Stack****(y)** |
| 0 |  |
| 1 |  |
| 2 |  |
|  | 60 |
| 6 |  |
|  | 96 |

2) What pattern do you notice about the data in the table?

3) What are TWO things you notice about your graph?

 a. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 b. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4) a. Does the **number of boxes** (the **x** value) ALWAYS stay the same? Yes No

 b. Does the **height of the stack** (the **y** value) ALWAYS stay the same? Yes No

 c. The only value that ALWAYS stays the same is the **height of each box**, which is \_\_\_\_\_\_\_\_\_ inches.

 This is the **CONSTANT OF VARIATION (a.k.a. constant of proportionality)**, or the **k** value.

5) A direct variation EQUATION is written as **y = kx**, where **k** is the **constant**. Since your constant is **12**, your

 equation is y = \_\_\_\_\_\_\_x

6) a. What does the **y** in your equation represent? (Hint: look back at your table and graph!)

 b. What does the **x** in your equation represent? (Hint: look back at your table and graph!)

7) Which is the dependent variable (which variable depends on the other)? Circle your answer.

 x, the number of boxes, or y, the height of the stack

8) Which is the independent variable? Circle your answer.

 x, the number of boxes, or y, the height of the stack

9) You can also see that as the number of boxes **increases**, the height of the stack also \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

 This is always true with a **direct variation**!

10) **Great job so far! Now, your boss gives you this graph. Use the graph to fill in the table and write the**

 **equation!**

 **Here’s your graph: Fill in the data table: Find the equation:**

|  |  |
| --- | --- |
| **Number of Boxes****(x)** | **Height of the Stack****(y)** |
| 0 |  |
| 1 |  |
| 2 |  |
|  | 30 |
| 4 |  |
|  | 50 |
| 6 |  |



 What’s the height of

 1 box?

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_

 The height of 1 box

 is your constant, k.

 So, what is your

 equation?

**y = \_\_\_\_\_\_x**



9) **This time, the boss lady gives you the equation. If each of these boxes is 5 inches tall,**

 **fill in the table and graph your data! Pay close attention to the numbers in the table!!**

  **Here’s your equation: Fill in your data table: Complete your graph:**

|  |  |
| --- | --- |
| **Number of Boxes****(x)** | **Height of the Stack****(y)** |
| 0 |  |
| **1** | **5** |
| 4 |  |
| 5 |  |
| 8 |  |
|  | 50 |



 **y = 5x**

 What’s the height of 1 box?

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_