**The Force of Pennies**

**Learning Target**- I will use my previously acquired knowledge of the Force Sensor to collect data points for the specific weights of pennies to create a linear graph based on the weight and quantity. I will be able to use the data to predict future measurements from given values of pennies or weight.

**Launch**

Start the class with a discussion about the weight of coins, specifically pennies. The questions could consist of: “What do you think would happen if I weighed pennies in intervals?” “Would the difference in weight between 5 and 10 pennies be different than 100 and 105?”

**Procedures**

1. Get in groups of four and connect the Force Sensor to the end of the string that is attached to the cup.
2. Connect the Force Sensor to a TI calculator and open EasyData.
3. Create a new experiment where the Name is “Pennies.”
4. Wait for the cup to be still and zero out the sensor so that the graph those not include the weight of the cup.
5. Now collect the data for the first value of 0 pennies.
6. Repeat step 5 for the values of 5, 10, 15, 20, and 30 pennies.
7. Stop the data collection and record the data in the following table and sketch the graph including labeling the axis.

|  |  |
| --- | --- |
| Number of Pennies | Weight |
| 0 |  |
| 5 |  |
| 10 |  |
| 15 |  |
| 20 |  |
| 30 |  |
| **Model Equation** |  |
| **Regression Equation** |  |

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**Questions**

1. What do the x-values and y-values represent?
2. From the previous question what can these two values tell us about the slope in term of units? (Slope is the change in y over x)
3. Using the two points from the collected data, determine the slope of the line.
4. Using the slope-intercept form of y=mx+b, create a line that fits the data.
5. Would the change of coin, such as dimes or nickels, affect the slope?
6. If we had $204.76 that we collected over the years of saving change, then how much would that weight in pennies?
7. If we had a jar that contained 132 N of pennies, then calculate the number of pennies when the jar weighs 17 N.