**Lab: How do Phones Charge?**

**Motivation:** Sometimes phenomena can be misleading and appear to have a linear model, but with some data gathering/analyzing, we can determine whether a linear model is appropriate or whether we need to use a different function to model the phenomena.

**Objectives:** Students will be able to find the equation of the line of best fit.

**Materials:** Phone/tablet that needs to be charged; charging cable; data collecting table for Activity 1

**Activity 1:**

You will need the Data Collecting Table to record your data.

Start with a cell-phone or tablet that has a depleted or very low battery. Yes, that means you must drain your battery in your phone or tablet. To gather your data, charge your phone and record the percentage of battery you have at equal time intervals until your phone is fully charged. Note: Your phone should be on (to see the percentage) but for accurate data, you should refrain from using your phone until all the data is collected.

**Activity 2:**

Graph your data and determine the equation of a line of best fit. Sketch this line on the same axis as the data.

Use your line of best fit to predict what percentage your battery will be at

1. 7 minutes after you begin charging it.
2. 24 minutes after you begin charging it.
3. 1 hour and 12 minutes after you begin charging it.

**Activity 3:**

1. Does your curve look linear? Is it a good idea to use a linear model to represent this data?
2. Were your predictions from Activity 2 over estimates or underestimates?
3. Are your predictions reliable?
4. What could make your line of best fit better?