Data Collection and Analysis

Part A

Obtain about 100 pennies from the penny supply. Do not use any selection criteria; simply grab the pennies as randomly as possible. Weigh each penny individually (to 0.01 g) and record its mass and its date of minting. Using the Graphical Analysis program available on the computers in the lab, enter each penny's mass and prepare a histogram of # of observations vs penny mass. By examining your data table and the histogram, explain the odd behavior of the plot. What are possible reasons for the behavior?

Part B

Choose about 10-15 pennies from one region of the histogram. Record the mass of pennies cumulatively and prepare, using graph paper, a plot of # of pennies vs mass. Draw the best straight line through the points and determine the equation of the line. Enter the data into the Graphical Analysis program and compute the best straight line equation using linear least-squares analysis. Are they the same? Calculate the predicted mass for 7 pennies using the calculated best line equation and compare the value to your actual measurement for 7 pennies. How much would 350 weigh?

Part C

Choose 6-10 pennies all minted after 1990. Individually weigh each one. Determine the mean, standard deviation, and average deviation for the data. Compare your mean, average deviation and standard deviation to other groups in the class. How many pennies weigh exactly what an "average" penny weighs?

Part D

We will use the pennies to understand average atomic weight as reported on the periodic chart. This will be discussed in class after everyone has completed Parts A-C.