

**Introduction to Natural Sciences
CAL Workshop
Linear Correlation Lab**

Introduction:

In this lab you will examine the relationships between paired data sets and determine the strength of the correlation between them. When the data has a strong correlation you will find the line of best fit and give a physical or biological interpretation of the slope and intercept of that line.

Procedure:

Collect the following Data:

- Find a tree with a branch that is longer than 2 meters. Measure the distance from the trunk to a point on the branch and then measure the circumference of the branch at that point. Repeat the measurement at 10 different places along the branch (with approximately even spacing).
- Measure your hand span and height and record the values on the same row of the class table. (Your hand span is the distance from the tip of the thumb to the tip of the pinky when the hand is stretched.)
- Calculate your body mass index (mass in kg divided by the square of your height in meters). Measure your pulse rate at rest. Record your values on the same row of the class table.
- Select a clean empty beaker and measure its diameter. Partially fill your beaker with water at room temperature from the reservoir in the lab. Then carefully place it on an analytical balance to measure an initial mass. Re-measure the mass at 30 second intervals for a total of five minutes.

Create a spreadsheet with naming convention Lastname_Firstname_Lab_3.xls. Then for each set of data:

- Identify the independent variable (if one exists) and the dependent variable.
- Create a scatter diagram
- Find the mean value of each variable.
- Find the correlation coefficient for each scatter diagram and comment on its value.
- Find the equation of the line of best-fit. for the cases where there is a strong correlation. Identify the slope and intercept of the line of best fit giving the units for both quantities. Interpret the slope and intercept physically for each case.
- Make short summative comments about each scatter diagram. Then copy your excel file to the drop box by Nov 1st at 9:00 am

Mini-Paper:

Write a mini-paper about one set of paired data. Hand in on Nov 13th at 9:00 am