

Graphing with Vernier

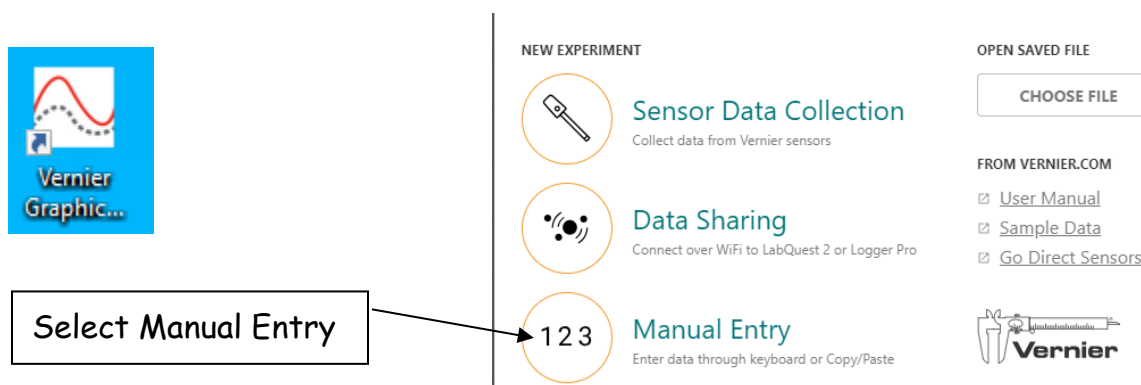
Graphical Analysis

In this lesson you will learn to fit a data set to an equation using Vernier Graphical analysis. You will be inputting the following data into computer and generating a graph of the data and using a curve fitting application to calculate the slope of the line.

Time (sec)	Displacement (meters)
0.1	0.25
0.2	0.48
0.3	0.76
0.4	0.99
0.5	1.26

Time (sec)	Displacement (meters)
0.6	1.50
0.7	1.74
0.8	2.02
0.9	2.24
1.0	2.49

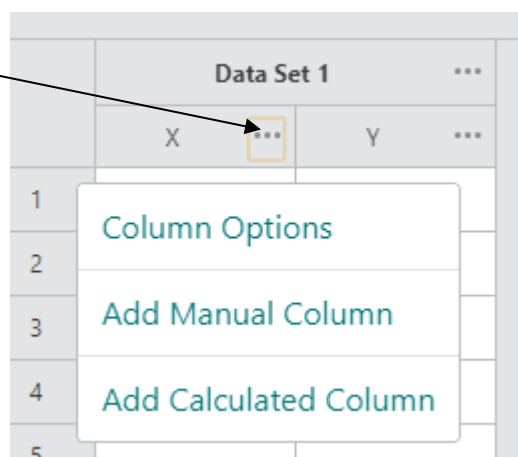
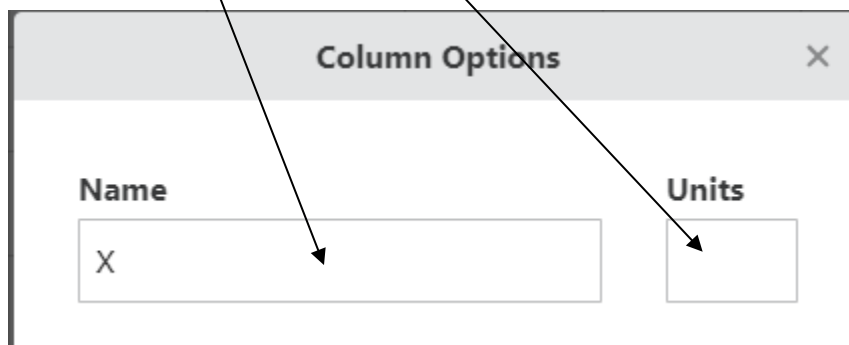
1) On the desk top open Graphical Analysis. You should get a screen that looks like the following:



2) The first step is to set up your data table with labels and units. To do so, you will need to set up the data table with the independent variable data label and its units on the “X” axis.

Open up column options by selecting here then select column options

Add data Label and units, then apply



3) Repeat the process for the dependent variable “Y-axis”

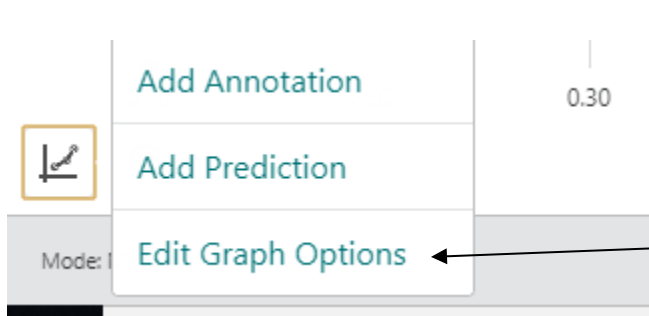
4) Enter your data from the table above.

You may notice the following things about the graph:

- The graph may not be properly scaled to a full page.
- The axis scales may not go to zero.
- The graph might automatically “connects the dots” and we want a best fit line.
- We need to add a title to the graph.

5) In this step we will fix these items by reformatting the graph.

Select the graph tools icon at the bottom left of the screen



Then open the “Edit Graph Options” window

Add your title
(Dependent Variable Vs. Independent Variable)

Choose “Points” for appearance

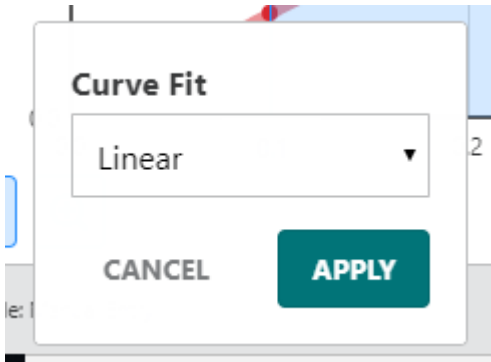
Select “Always Show 0” for scaling
on the pulldown menu

6) Find the “line of best fit” on the graph and obtain the relationship for your data.

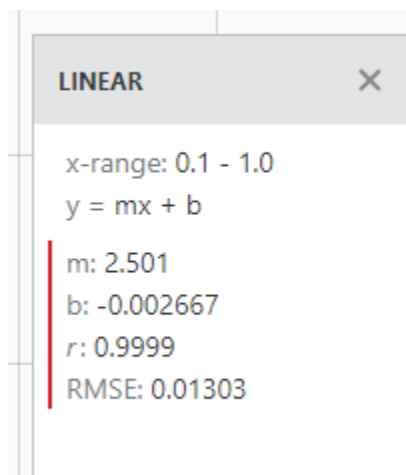
Use the Graph Tools Icon to Select “Apply Curve Fit”



Apply a Linear fit



Use the Linear Fit information to find your relationship.



7) Now you can write the equation for the relationship between the dependent and independent variables.

The general form of your equation is $y = mx + b$.

Where:

y = Displacement

m = slope = 2.5

x = time

b = -0.00267 (This is approximately zero and will be ignored)

This gives us the following equation for our relationship:

$$\text{Displacement} = 2.5(\text{Time})$$