

## EXCEL GRAPHING FOR SCIENCE!!!

(Ramp Lab as example)

I measure a ball rolling down a ramp. I get a set of points for distance and time.

I want to graph them, and maybe even get the best fit line.

FIRST:

Decide which is the INDEPENDENT (Cause) and DEPENDENT (effect)

This is your X & Y.

In a NEW excel spreadsheet:

In Row 1, label the columns A & B with your variables, including units, in this case TIME and DISTANCE.

Type in your data: DO NOT INCLUDE ANYTHING BUT NUMBERS!!

TIME (s)	DISTANCE(cm)
0	0
0.6	20
0.92	40
1.23	60
1.41	80
1.62	100
1.73	120
1.871	140
2.01	160
2.15	180
2.25	200

Now..... HIGHLIGHT YOUR NUMBERS! You can include the top labels.

You need at least 2 columns to make a correct line graph.

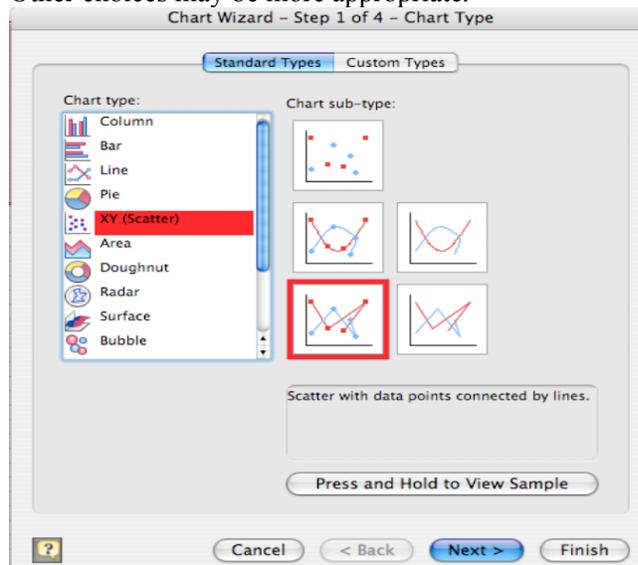
You can plot more than one Y... but only 1 X... You can pick more than one y to highlight using the CONTROL key (Windows) or COMMAND key (MAC).

Hit the bar graph icon or go to INSERT menu, CHART.

\*\*\*\*\* PICK SCATTER GRAPH NOT LINE GRAPH IN SCIENCE/MATH!!!

The third sub graph is almost always what you want... scatter with data points connected by lines.

Other choices may be more appropriate.

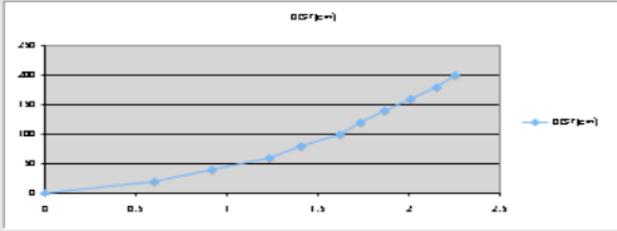


Your data is arranged by columns (chart Wizard step 2)

Series Tab: Identify the NAME of your series (y values) by typing it in, or having it refer to a cell.

Chart Wizard - Step 2 of 4 - Chart Source Data

Data Range Series



Series

**DIST(cm)**

Name:

X values:

Y:

Add Remove

Cancel < Back Next > Finish

Chart Wizard Step 3: Options:

Title Tab: Chart Title should refer to both measurements:

(Distance in cm as a function of Time in sec).

Value x & y are the bottom and side labels for the graph.

(Time (sec) for x, and Distance (cm) for y)

Chart Wizard - Step 3 of 4 - Chart Options

Titles Axes Gridlines Legend Data Labels

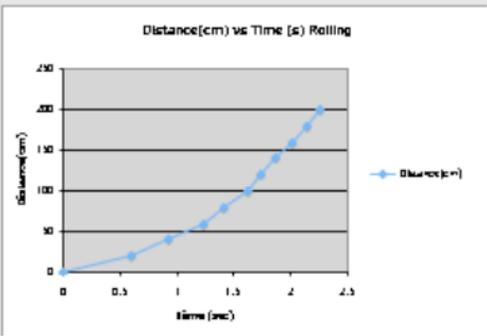
Chart title:

Value (X) axis:

Value (Y) axis:

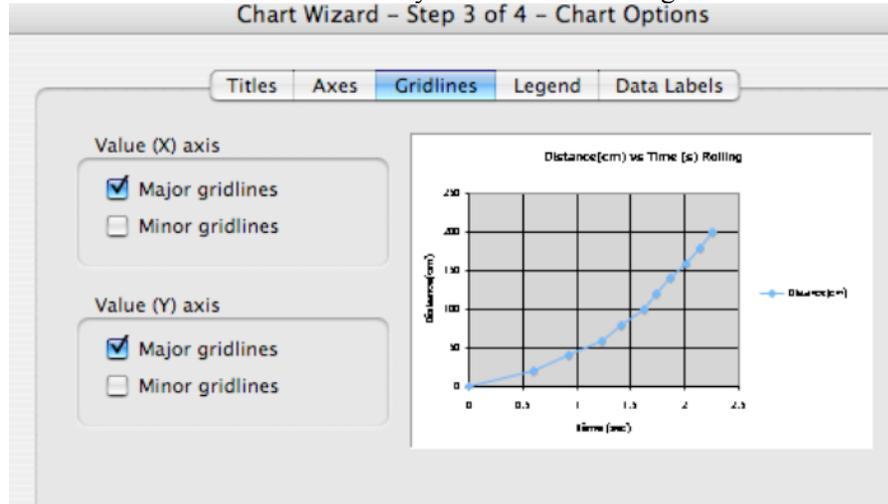
Second category (X) axis:

Second value (Y) axis:



Axes Tab: Both turned on

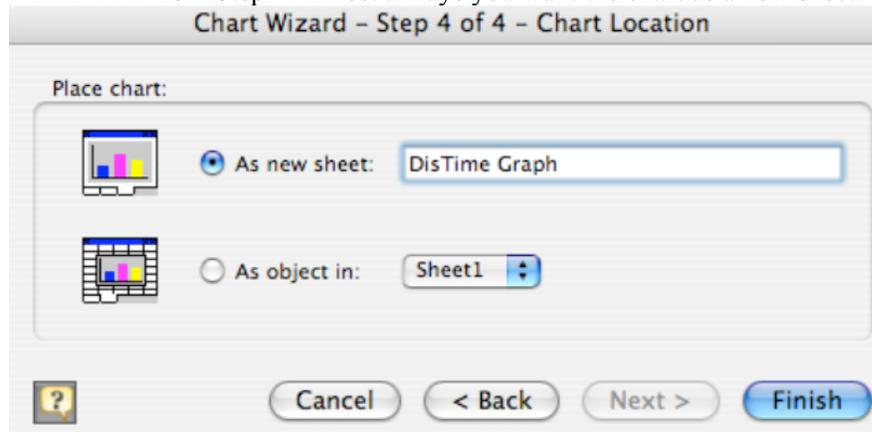
Gridlines Tab: In science we usually want both MAJOR gridlines turned on.



Legend Tab: Only use if there is more than one series. Remember the NAME of the legend will have been set in the series tab in step 2.

Data Labels: Only turn on if you want numbers ON the graph, usually too confusing.

NEXT→FINISH Step 4 Almost always you want the chart as a new sheet.

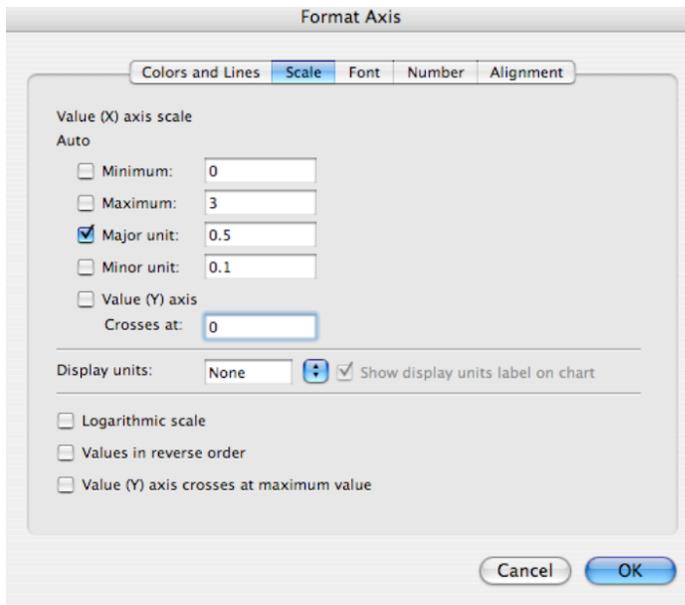


Next: Double Click on the different parts of the graph to change it!

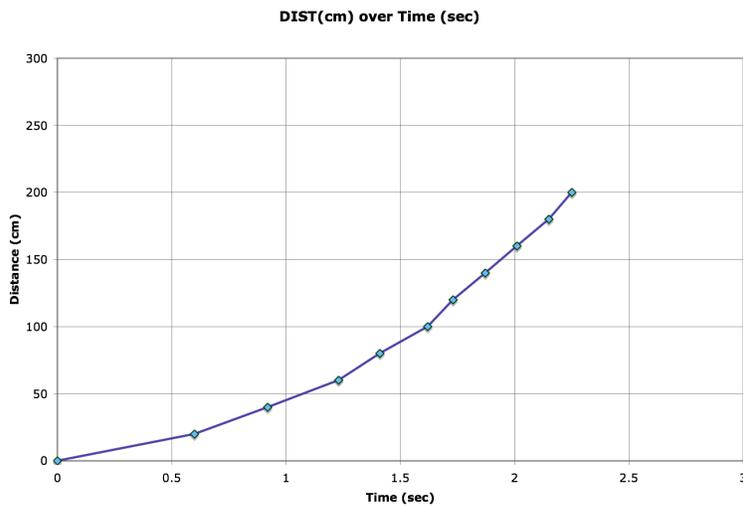
Especially important is to double click the NUMBERS of the axes to set a meaningful maximum and minimum.

Under FORMAT AXES, Scale:

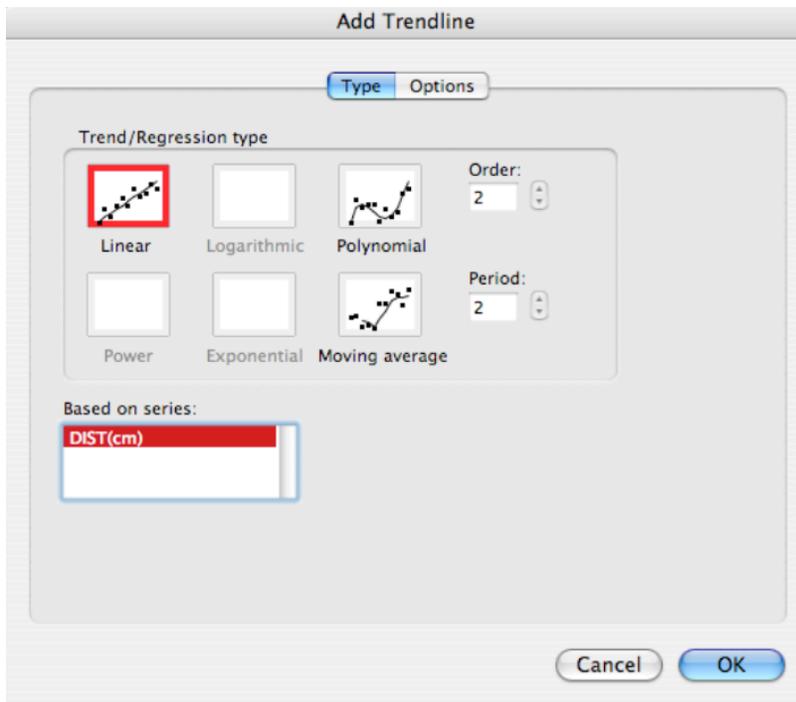
UNCLICK the check boxes and type in your own minimum and maximum. The major units are the gridlines of your graph.



Often, double clicking the background to change it from a grey color, and double clicking the line to make it a dark color is more helpful as well.  
Here's what this graph looks like so far:



I could click on it, then copy and paste it into a Word document if I wanted!  
How to find a best fit line?  
Click on the line. Go to chart Add trend line.  
If you think the line is linear..... pick linear

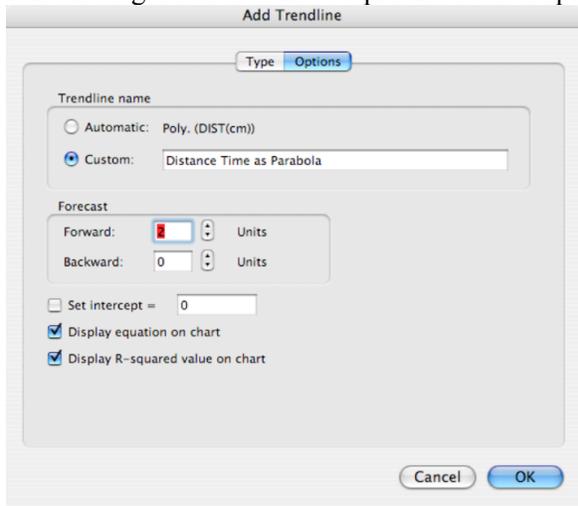


In this case.... It is a parabola, I think so I pick polynomial, order 2.

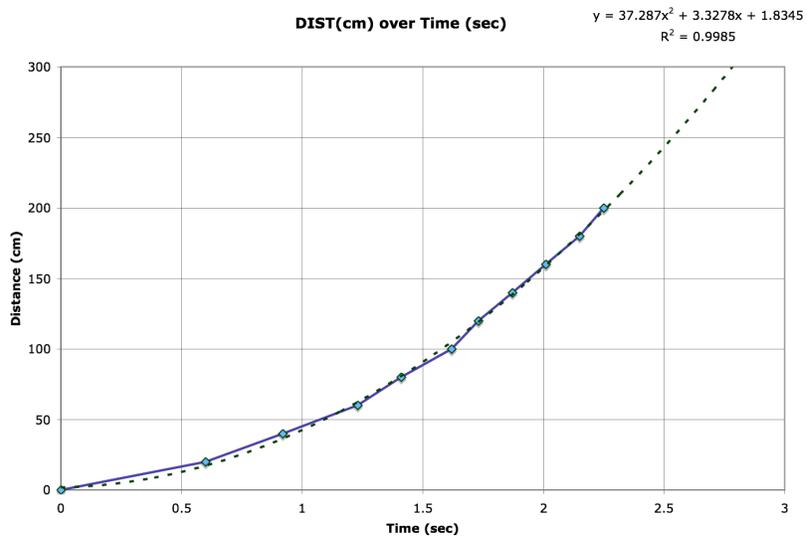
Then for options: give it a name, and decide whether you want to show the equation and the correlation coefficient. Remember that the closer the  $r$  is to 1 the better the fit.

An important decision is to decide to FORCE the trend line to go through zero.

It is also a good idea to have it predict out a couple of values:



So Here's my graph!



Notice, I have double clicked on my trend line to make it dashed, and the equation shows up at the top!