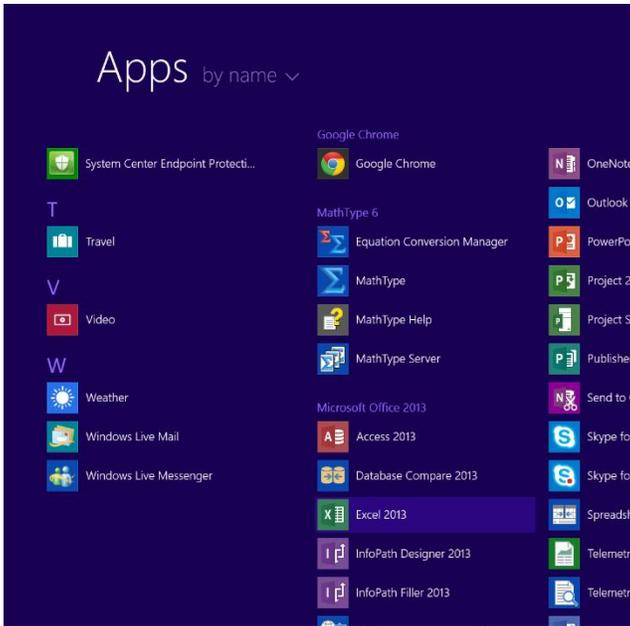


Graphing Linear Data with Microsoft Excel 2013

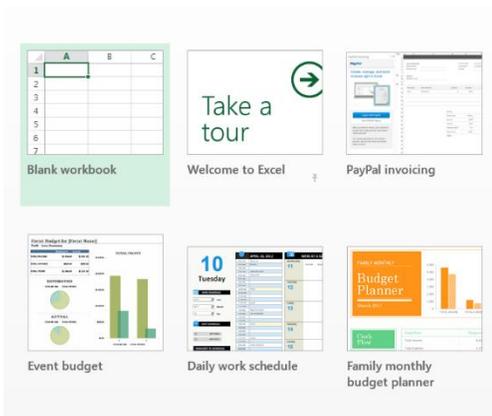
Note: “Click” refers to a left click.

Launch the Program

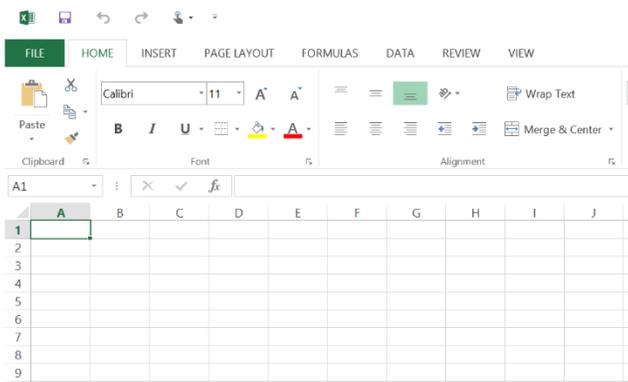
To launch Microsoft Excel 2013, click the Windows icon  in the bottom left of the screen, then click “Excel 2013”, or locate the program using the Start button.



Open a new empty spreadsheet by clicking “Blank Workbook”.



A blank spreadsheet like the one below should appear.

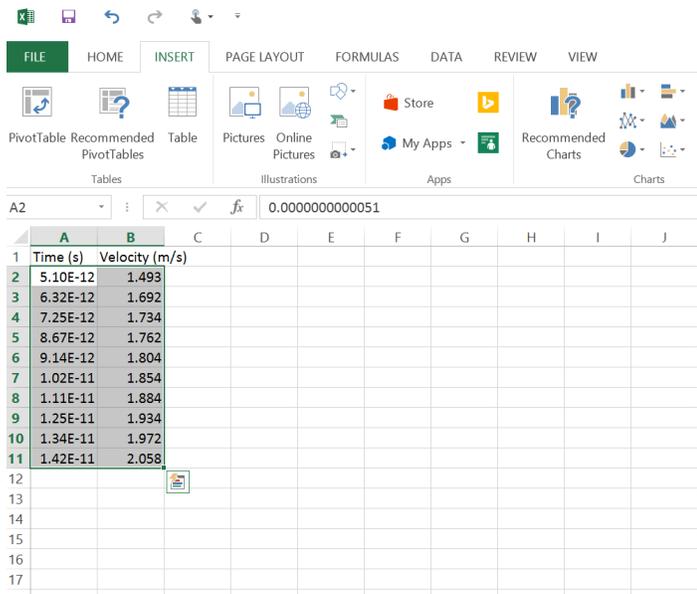


Enter and Highlight the Data

Input the values in the spreadsheet. Use the arrow keys and keyboard “Enter” key to move between cells or use the mouse to click to another cell. When entering values with a base 10 part like 5.10×10^{-12} , use the letter “e” or “E” to replace the base 10 part. For example, 5.10×10^{-12} would be entered as 5.10e-12.

For graphing purposes, the default for the horizontal or X axis is the left column, while the vertical or Y axis is the right column. (The quantity or axis titles used in the example below like Time (s) and Velocity (m/s) are optional at this point, and only need to be used if the table itself is going to be used).

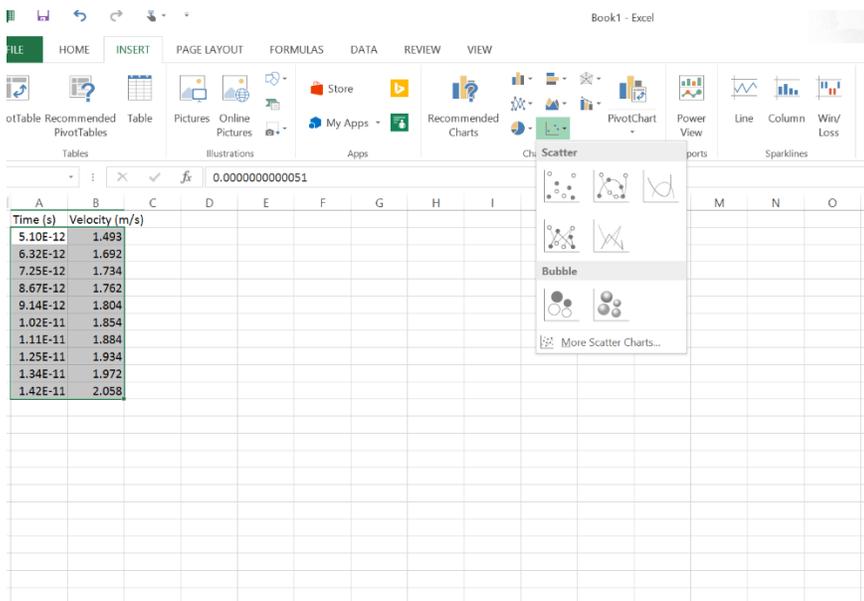
To highlight the number data, click in the upper left most cell (A2) and drag over the desired cells (B11).

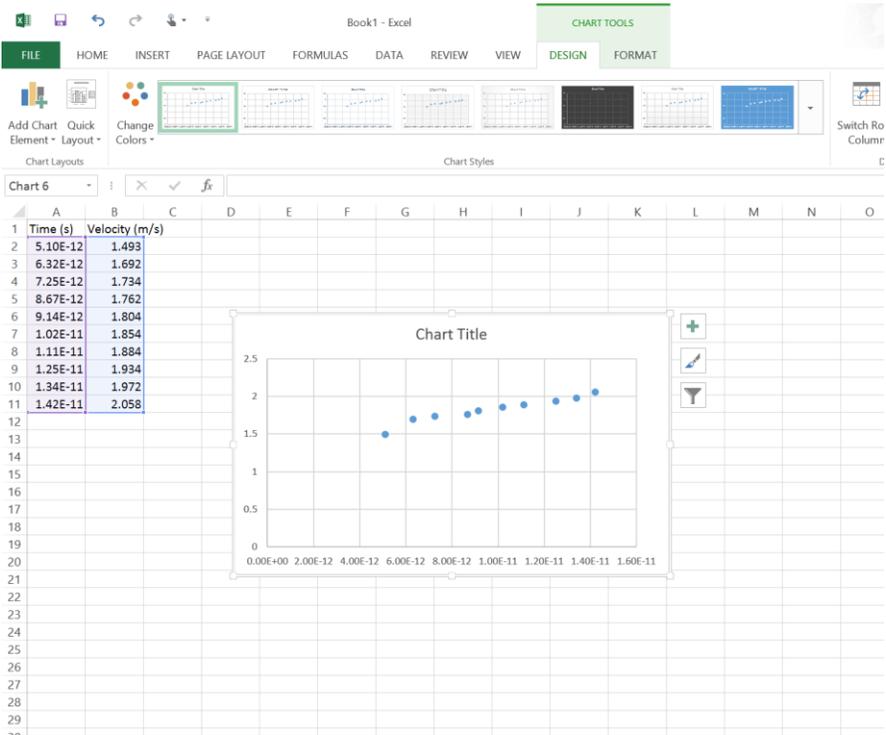
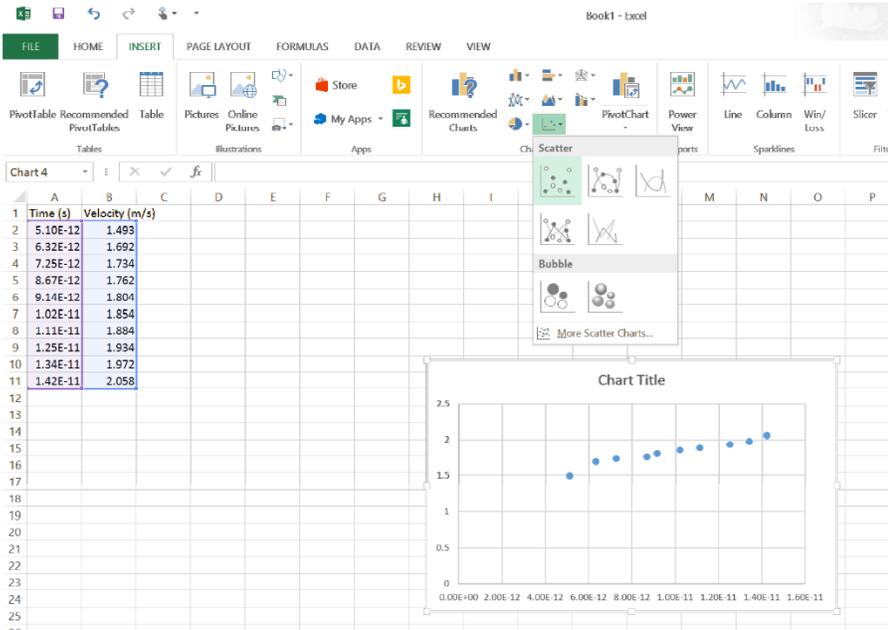


	A	B	C	D	E	F	G	H	I	J
1	Time (s)	Velocity (m/s)								
2	5.10E-12	1.493								
3	6.32E-12	1.692								
4	7.25E-12	1.734								
5	8.67E-12	1.762								
6	9.14E-12	1.804								
7	1.02E-11	1.854								
8	1.11E-11	1.884								
9	1.25E-11	1.934								
10	1.34E-11	1.972								
11	1.42E-11	2.058								
12										
13										
14										
15										
16										
17										

Plot the Points on a Chart

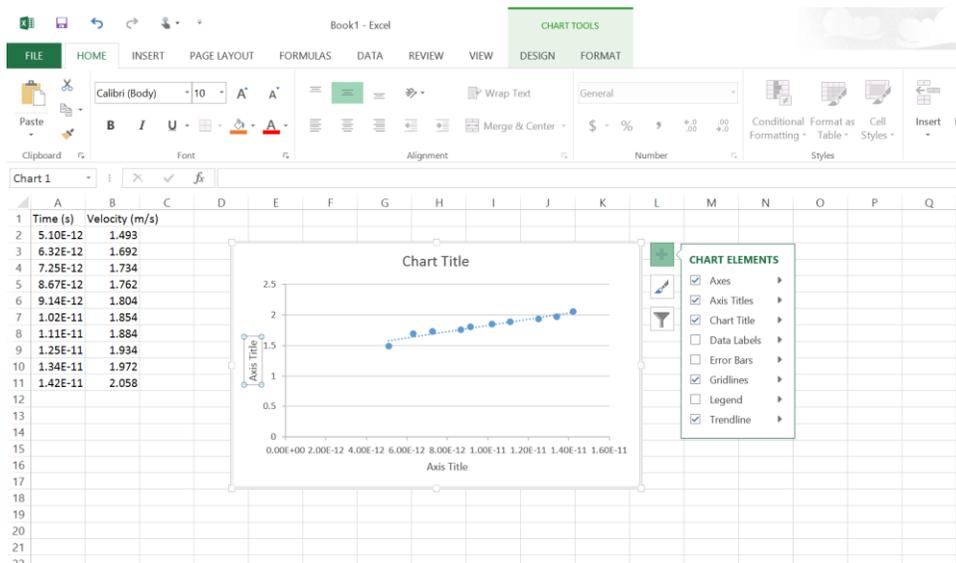
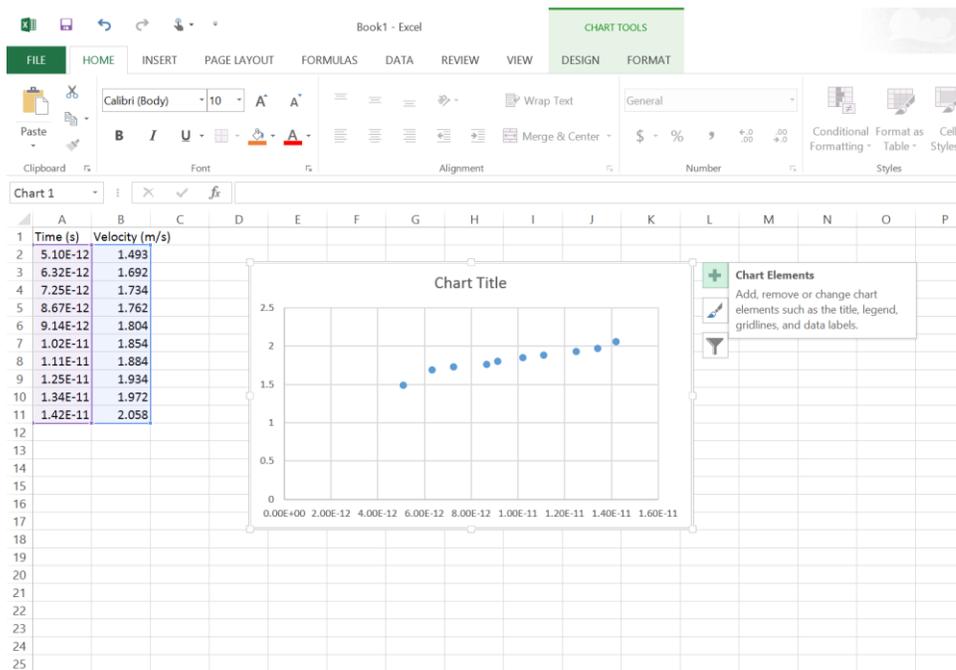
With the data highlighted, from the top menu tabs click “Insert”, then from the “Charts” menu bar click , then click . This should insert a “Scatter Plot” chart on the worksheet.





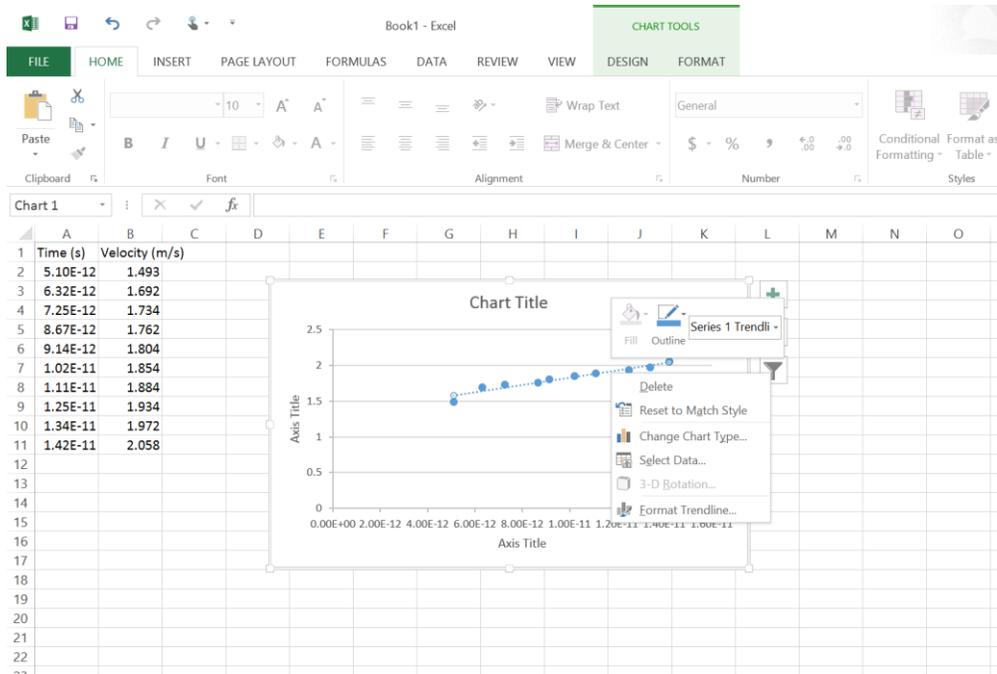
Format the Chart and Add a Trendline

On the right of the chart click the Chart Elements button  , ensure or toggle ON “Axes”, “Axis Titles”, “Chart Title”, “Gridlines”, and “Trendline”.

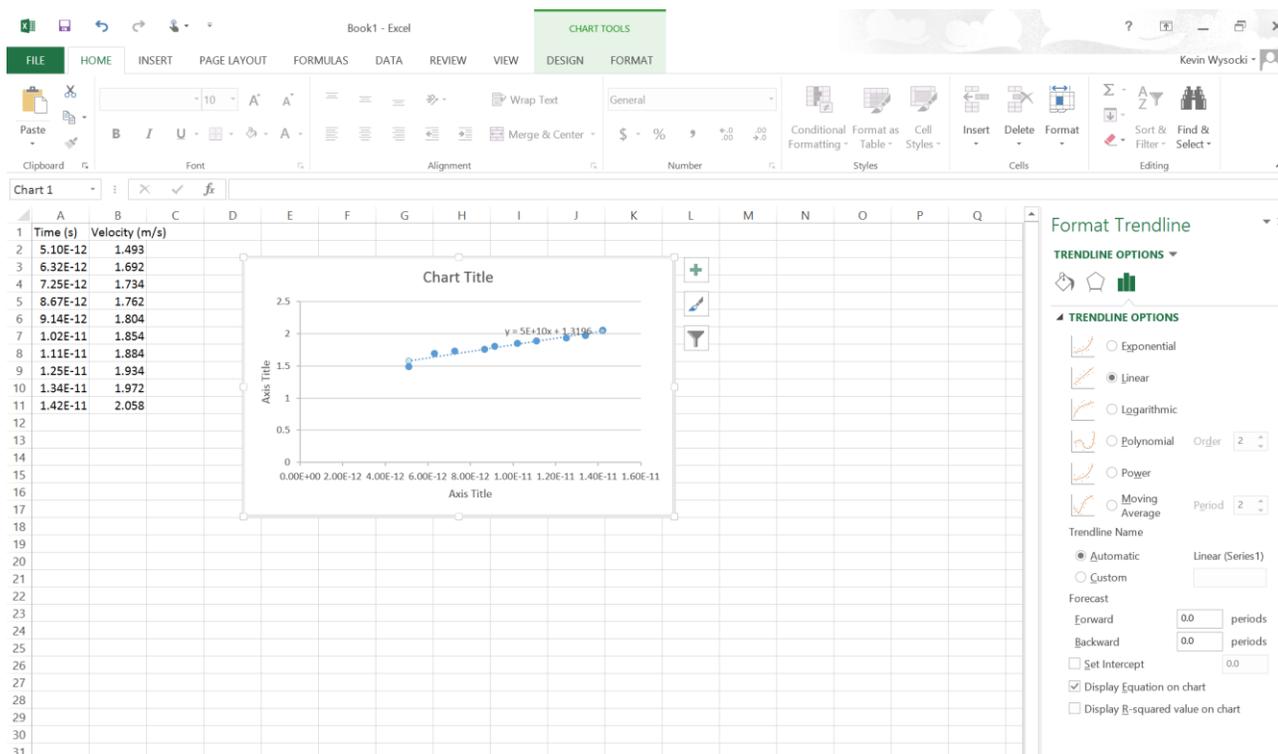


Display the Equation of the Trendline

Right click anywhere on the Trendline, then click “Format Trendline...”.



The “Format Trendline” dialogue box should appear on the right of the screen. Toggle ON “Display Equation on Chart”. The linear equation in $y = mx + B$ form should appear on the chart. ($y=5E-10x+1.3196$)



Click and drag the equation to somewhere legible on the chart. The “Format Trendline Label” dialogue box should appear on the right of the screen.

The screenshot shows an Excel spreadsheet with a scatter plot. The data is as follows:

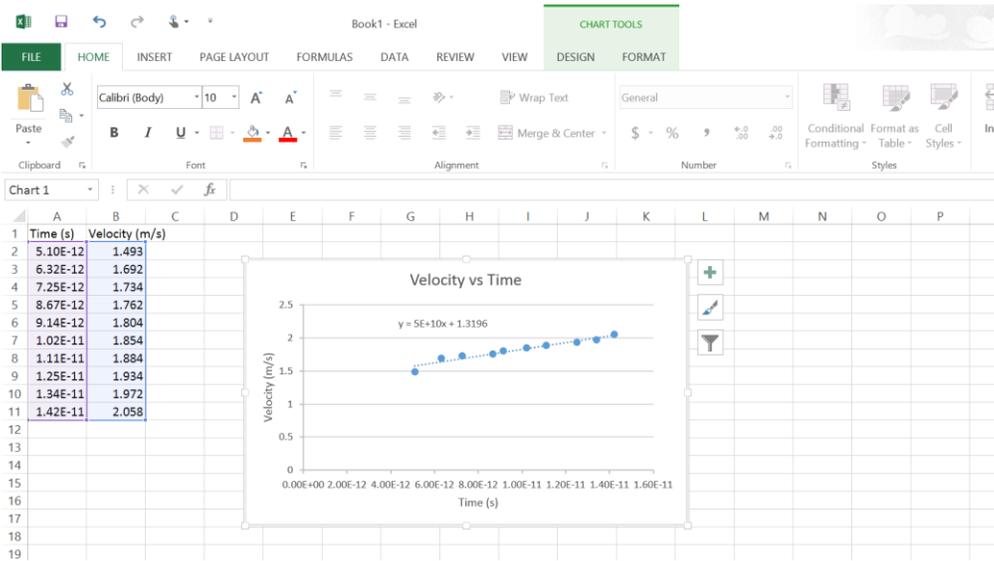
Time (s)	Velocity (m/s)
5.10E-12	1.493
6.32E-12	1.692
7.25E-12	1.734
8.67E-12	1.762
9.14E-12	1.804
1.02E-11	1.854
1.11E-11	1.884
1.25E-11	1.934
1.34E-11	1.972
1.42E-11	2.058

The chart has a title 'Chart Title' and axes labeled 'Axis Title'. A trendline is shown with the equation $y = 5E+10x + 1.3196$. The 'Format Trendline Label' task pane is open on the right, showing alignment options such as 'Vertical alignment: Middle Cen...', 'Text direction: Horizontal', and 'Custom angle: 0°'.

Add Chart Title and Axis Titles

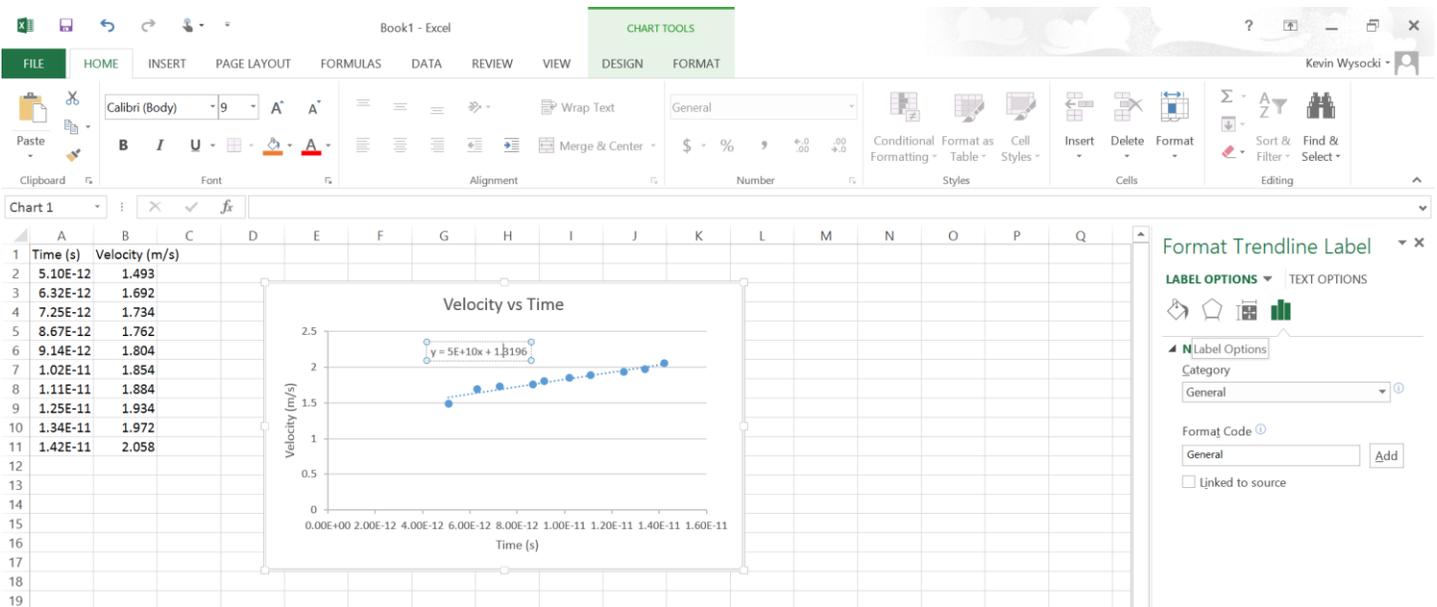
Click and highlight the words “Chart Title”, and type in the name of your Chart. Repeat the process for each “Axis Title”.

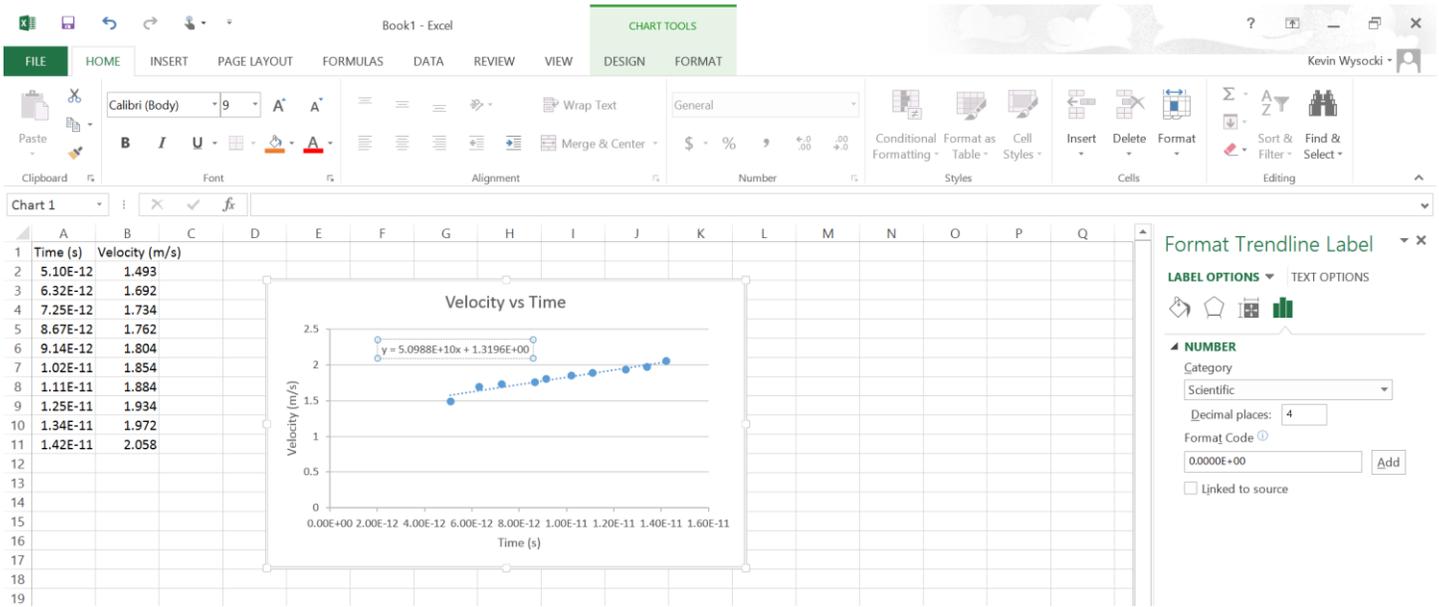
The screenshot shows the same Excel spreadsheet and chart as above. The chart title 'Chart Title' and the axis labels 'Axis Title' are now highlighted with a selection box. The 'Format Trendline Label' task pane is no longer visible.



Format the Trendline Label

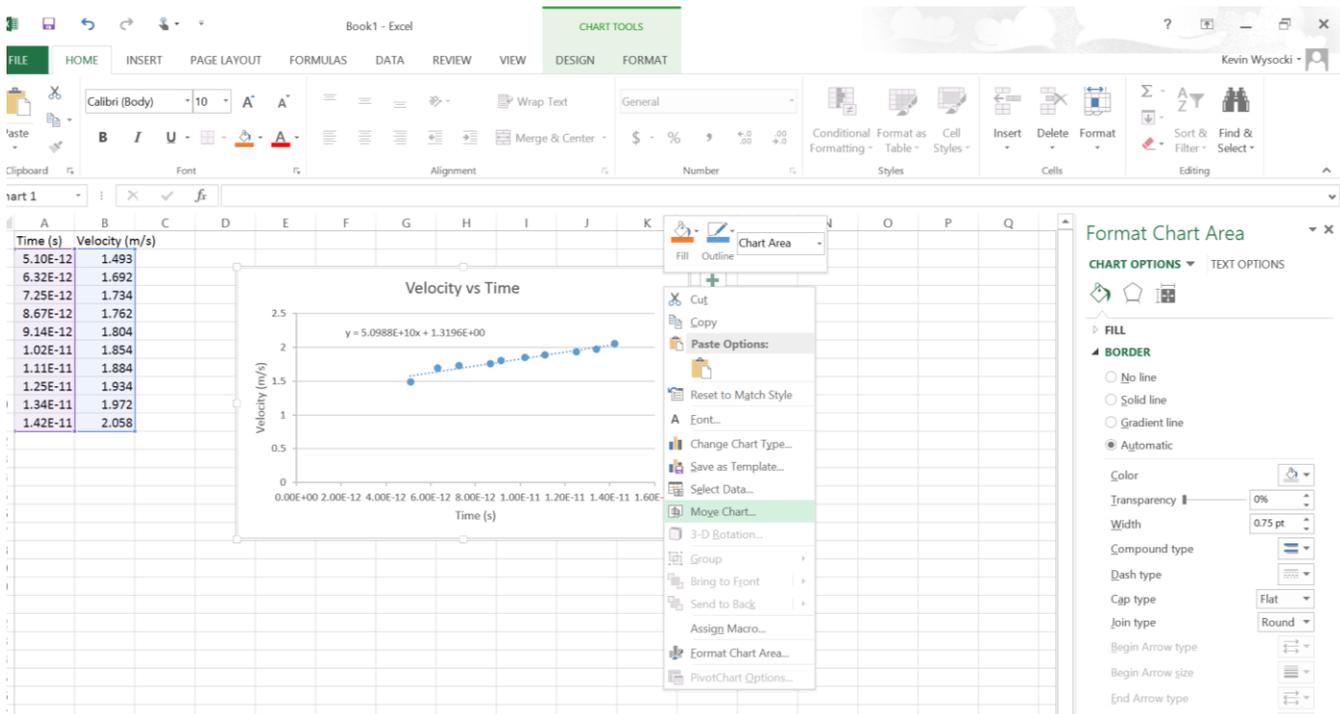
If the constants in the Trendline Equation need to be more precise, they can be adjusted to a desired number of digits. Click on the equation and the “Format Trendline Label” dialogue box should open on the right of the screen; or right click on the equation and choose “Format Trendline Label”. Click the “Label Options” button , and under the “Category” menu, choose Scientific and the desired number of “Decimal Places”. ($y=5.0988E-10x+1.3196E+00$)





Make the Chart Large and on its own Sheet

Click near the outside border of the chart. Right click and click "Move Chart".



The "Move Chart" Dialogue box should appear. Toggle ON New Sheet and click Ok.

The screenshot shows the Microsoft Excel interface with the 'CHART TOOLS' ribbon active. A scatter plot titled 'Velocity vs Time' is displayed on the worksheet. The plot includes a linear trendline with the equation $y = 5.0988E+10x + 1.3196E+00$. The 'Move Chart' dialog box is open, allowing the user to choose where to place the chart. The 'New sheet' option is selected, and the text box contains 'Chart1'. The 'Object in:' dropdown is set to 'Sheet1'. The 'Format Chart Area' task pane is visible on the right side of the screen.

Time (s)	Velocity (m/s)
5.10E-12	1.493
6.32E-12	1.692
7.25E-12	1.734
8.67E-12	1.762
9.14E-12	1.804
1.02E-11	1.854
1.11E-11	1.884
1.25E-11	1.934
1.34E-11	1.972
1.42E-11	2.058

The chart is now complete and can be printed by using the "File" Menu in the upper left corner of the screen.

The screenshot shows the Microsoft Excel interface with the 'CHART TOOLS' ribbon active. The 'Chart Styles' task pane is open, displaying various chart styles and options for customizing the chart's appearance. The 'Velocity vs Time' chart is displayed in a larger view, showing the data points and the linear trendline. The chart is titled 'Velocity vs Time' and has a linear trendline with the equation $y = 5.0988E+10x + 1.3196E+00$. The chart is displayed on a grid with the x-axis labeled 'Time (s)' and the y-axis labeled 'Velocity (m/s)'. The chart is titled 'Velocity vs Time' and has a linear trendline with the equation $y = 5.0988E+10x + 1.3196E+00$.