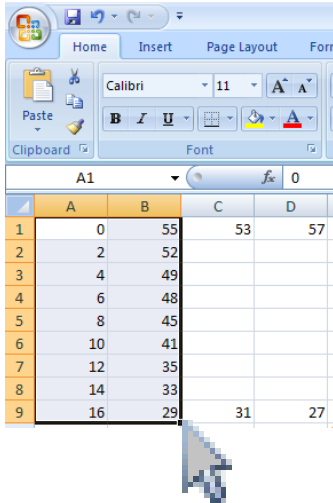
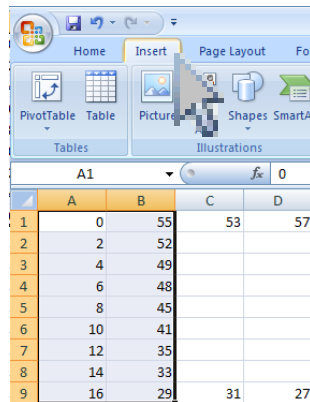


## GRAPHING YOUR DATA ON EXCEL

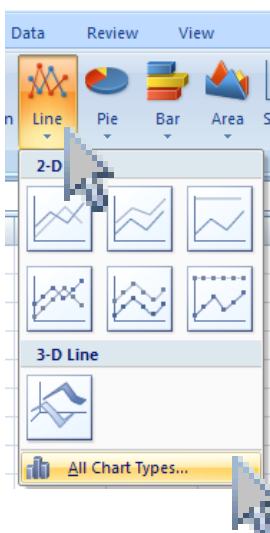
- 1) Enter data in an Excel worksheet.
- 2) Drag and highlight your x and y columns.



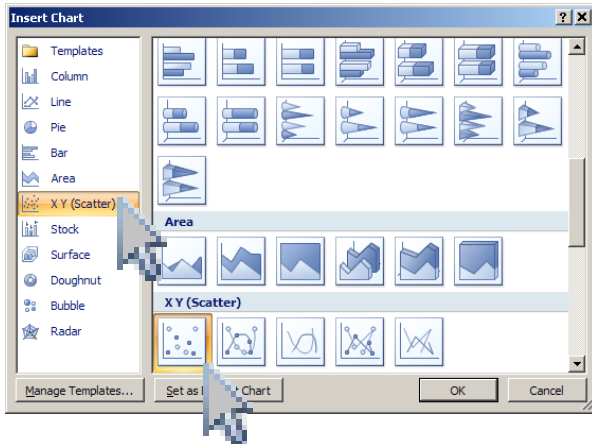
- 3) Click the Insert tab.



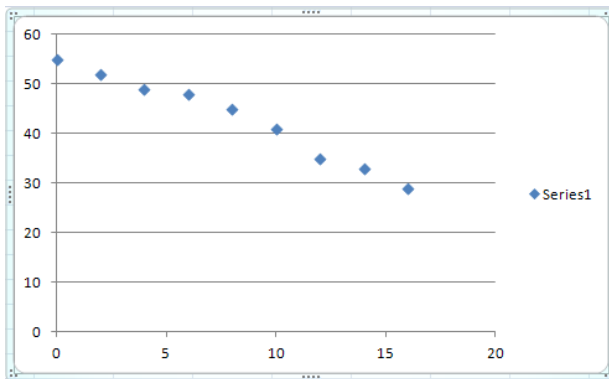
- 4) From the Insert menu choose Line, and then choose All Chart Types.



5) Choose XY (Scatter) and then choose the **non-connected** subset.

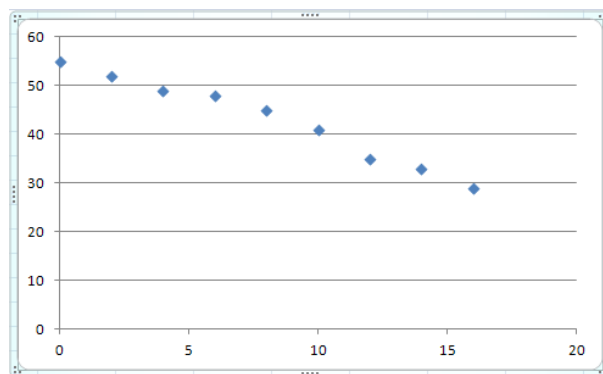
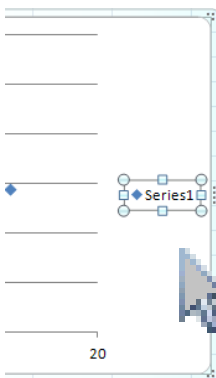


6) This is what you will see...

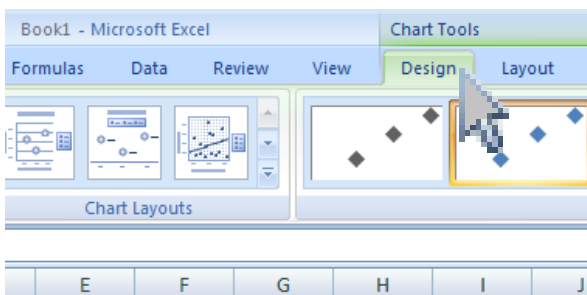


7) Highlight the “Series 1” key by single-clicking it. Then delete it. This action will stretch out your graph so it looks better.

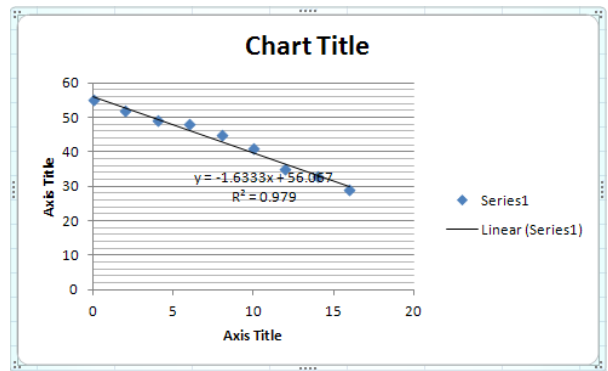
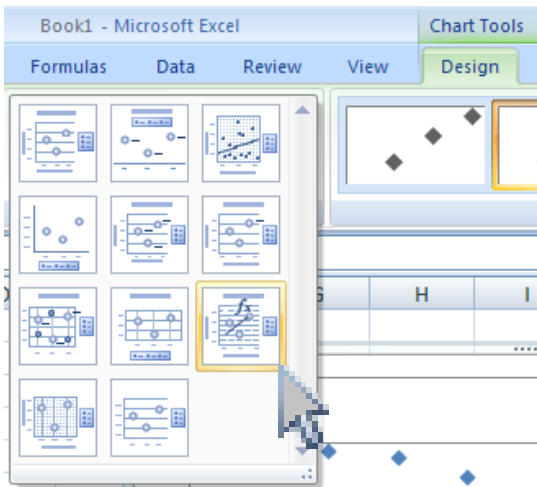
This is what you will see...



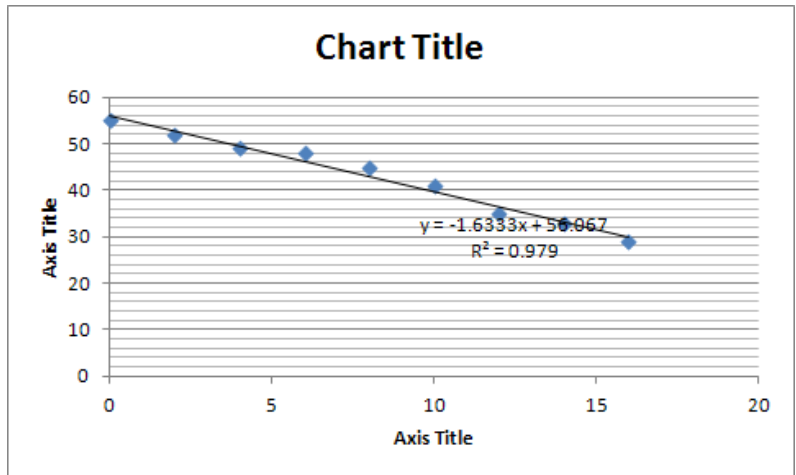
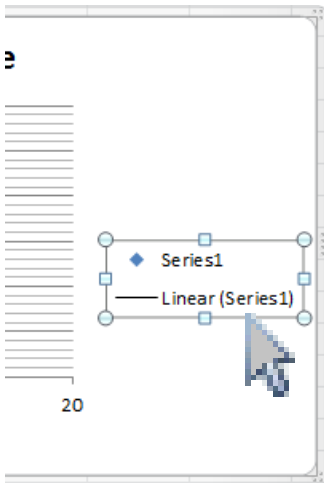
8) Select the Design tab.



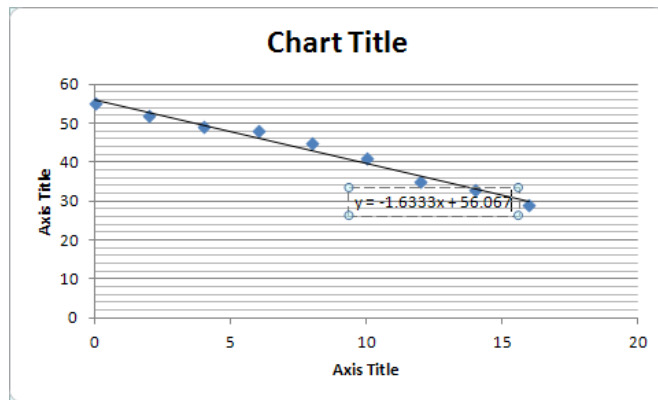
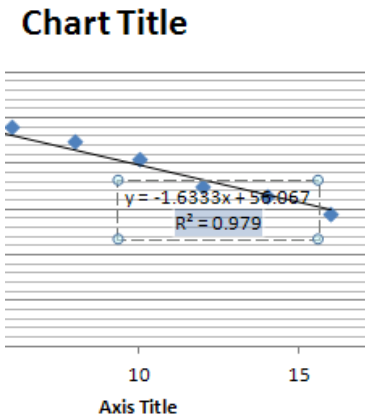
9) In the Chart Layouts portion select the *fx* one. This is what you will see...



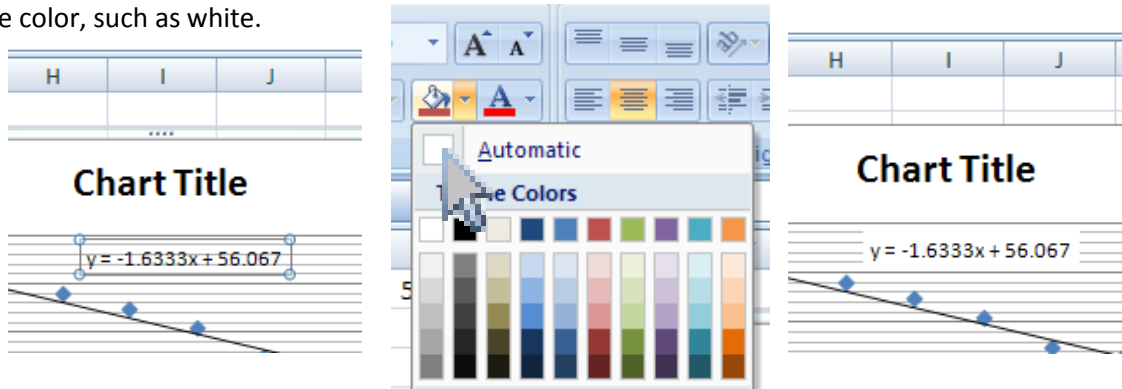
12) Now highlight and delete the key on the right to expand the graph. This is what you will see...



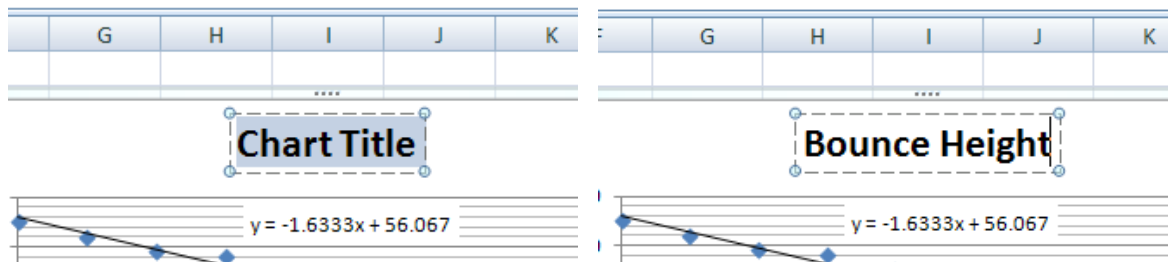
13) Select the " $R^2 = 0.979$ " and delete it. This is what you will see... You can also reposition the textbox by dragging it to a new location.



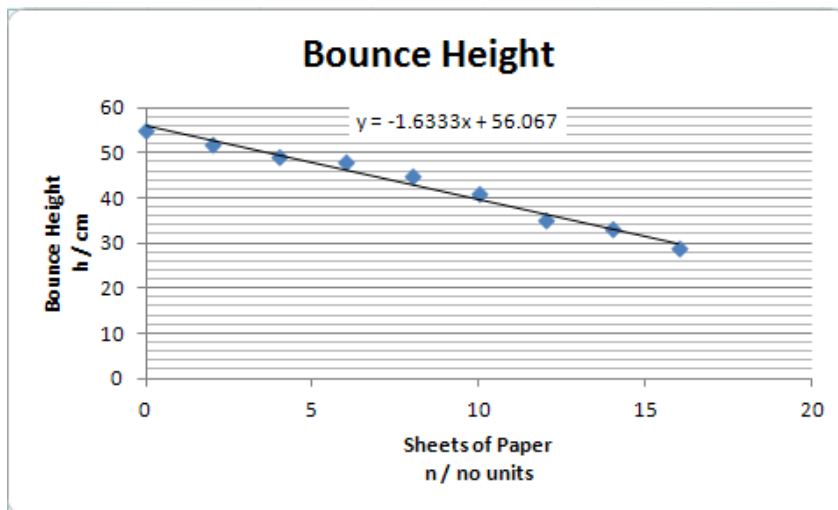
- 14) Reposition the equation in the textbox so it is not so close to the best fit line. Then fill it with an opaque color, such as white.



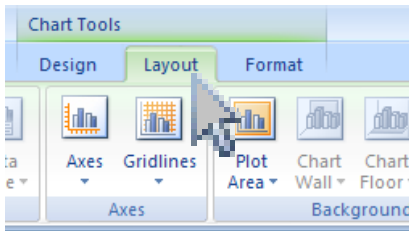
- 15) Highlight "Chart Title" and enter "Bounce Height".



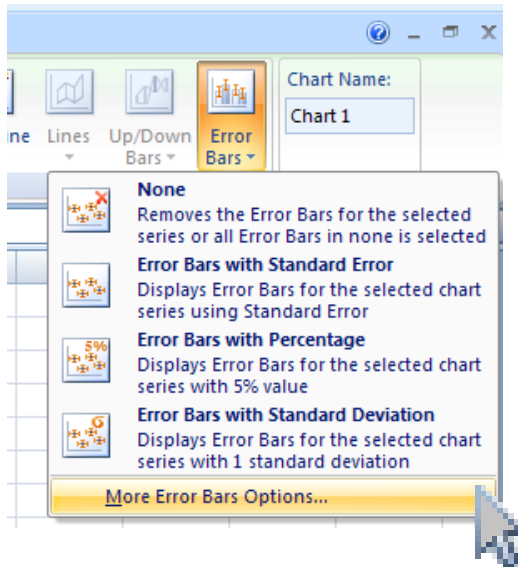
- 16) Change the other graph labels to suit your needs.



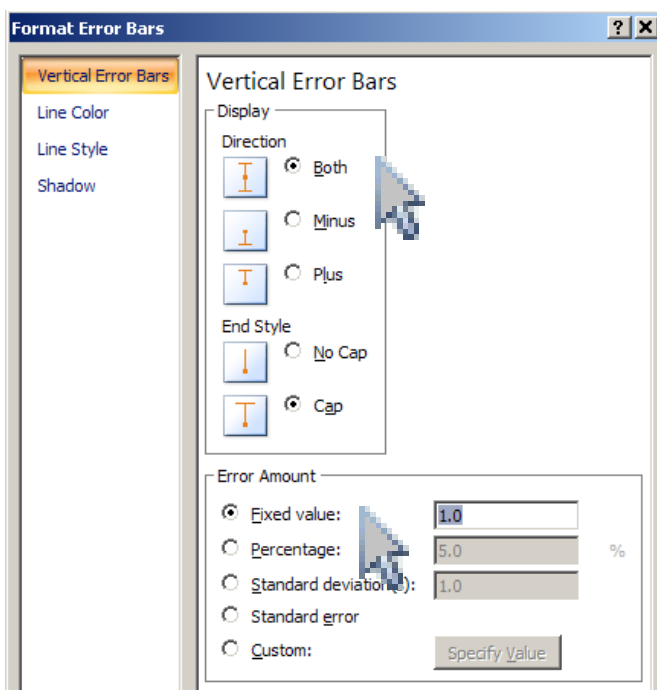
- 17) With your graph highlighted, choose the Layout tab. Note that it won't show up unless you have a graph highlighted...



- 18) Next select Error Bars and More Error Bar Options....



- 19) You will see this Format error Bars box. Click the Both and the Fixed value radio buttons.

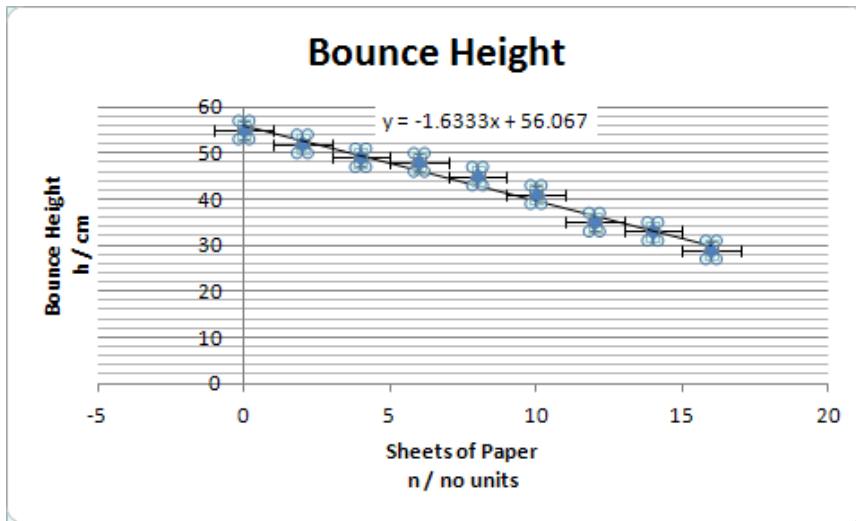


20) Since your height uncertainty was 2, enter this as your fixed value.

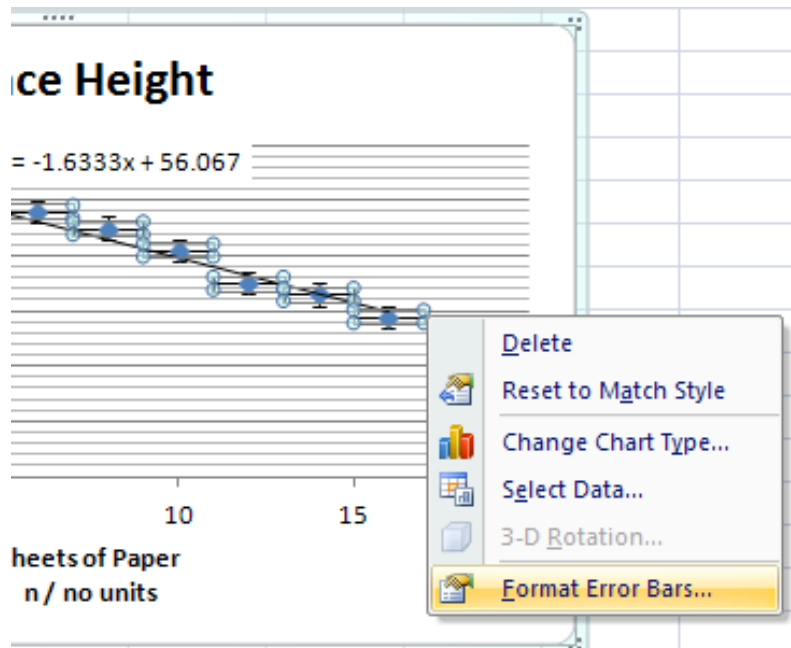
Error Amount

<input checked="" type="radio"/> Fixed value:	2.0	
<input type="radio"/> Percentage:	5.0	%
<input type="radio"/> Standard deviation(s):	1.0	

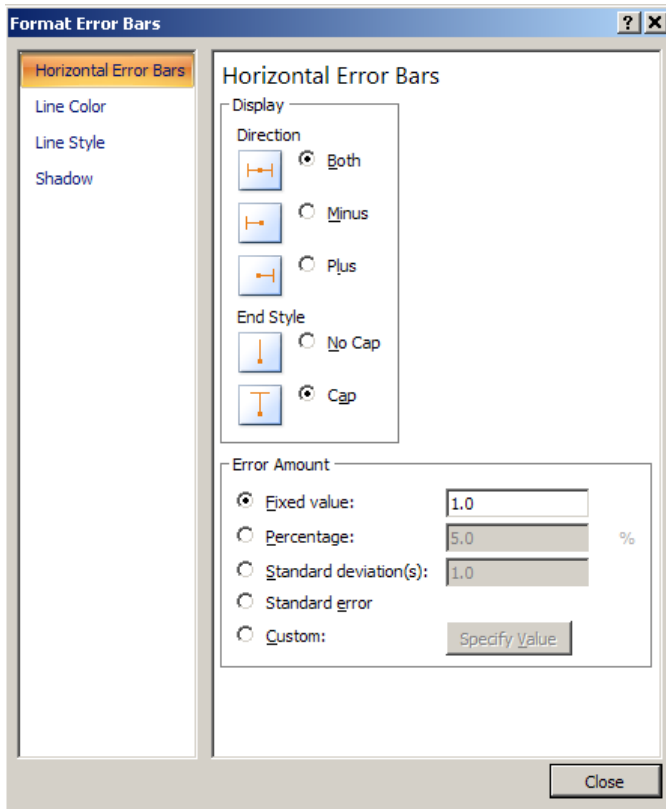
21) Select the Close button and this is what you will see... Note that both vertical and horizontal error bars show up.



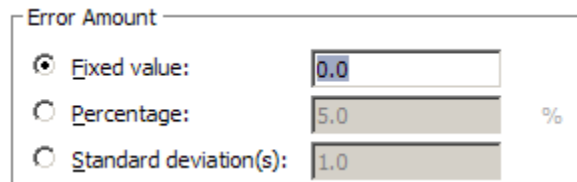
22) Right-click one of the horizontal error bars then select the Format Error Bars...



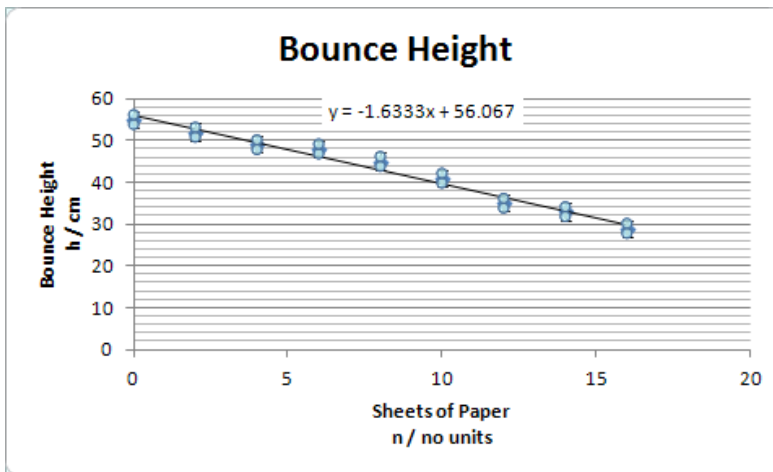
23) The Format Error Bars box for the horizontal error bars will show up.



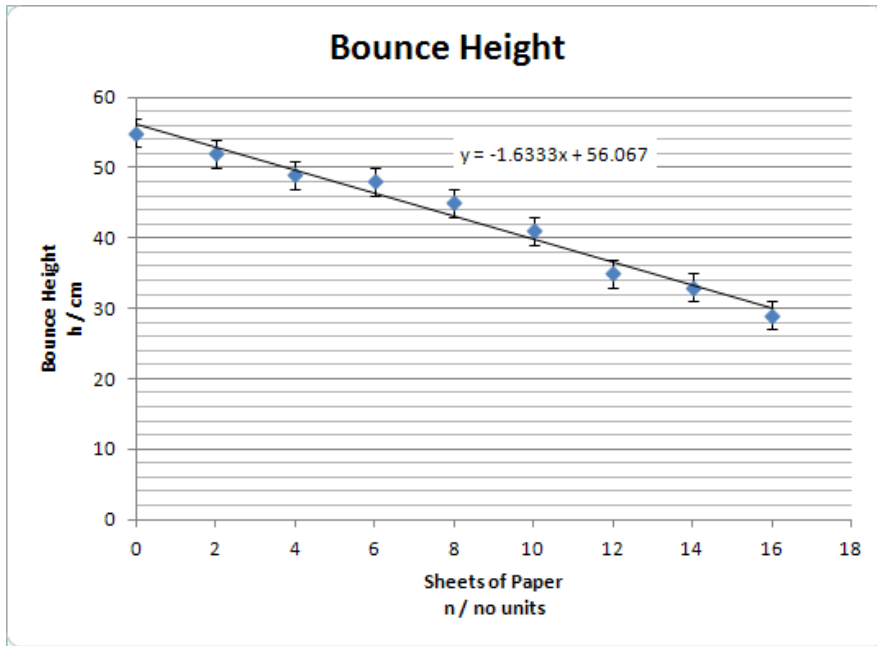
24) Set the Fixed Value to 0.



25) Your graph is complete!



26) Stretch it out so you can look at it in detail. The graph can now be copied and pasted into your Word document.

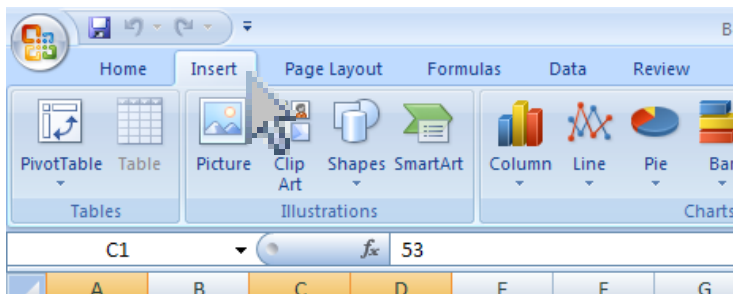


MAKING YOUR SLOPE-UNCERTAINTY GRAPHS

27) It is recommended that your **slope uncertainty graph** be separate from your main graph. To this end, select the first, third and fourth columns using the Ctrl key and dragging the mouse...

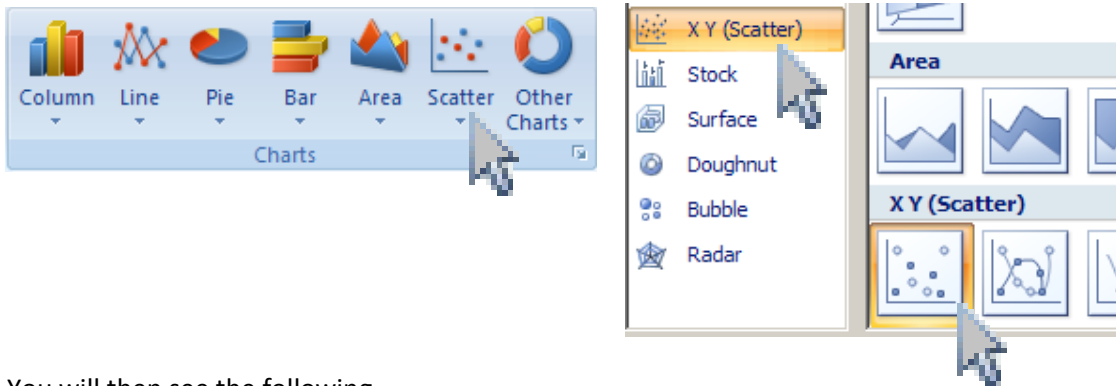
	A	B	C	D	E
1	0	55	53	57	
2	2	52			
3	4	49			
4	6	48			
5	8	45			
6	10	41			
7	12	35			
8	14	33			
9	16	29	31	27	
10					
11					

28) Select the Insert tab so that we can choose a graph...

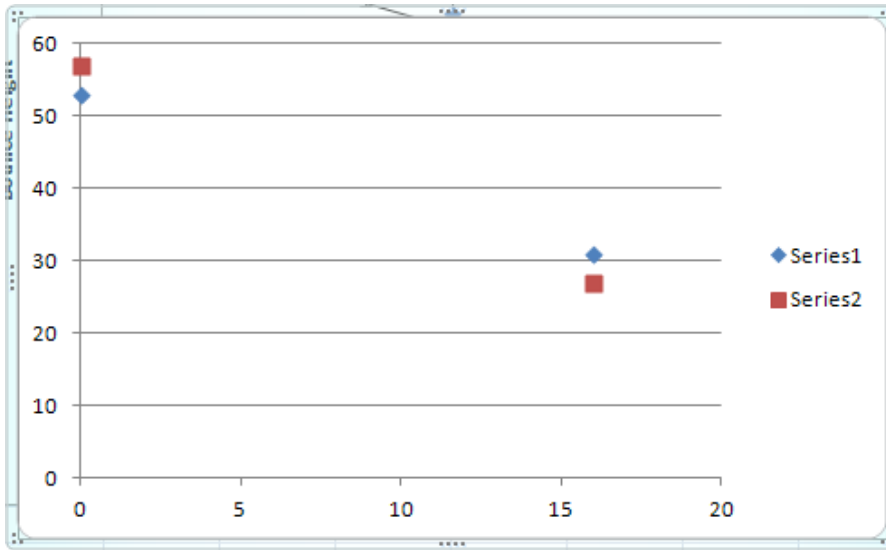




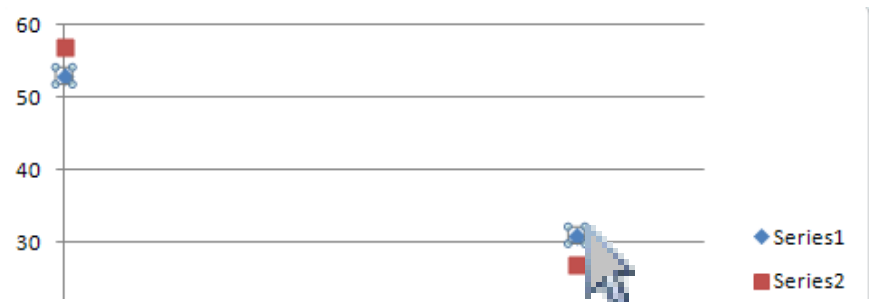
29) Select Scatter and then X Y (Scatter) and *then* the X Y (Scatter) unconnected icon.



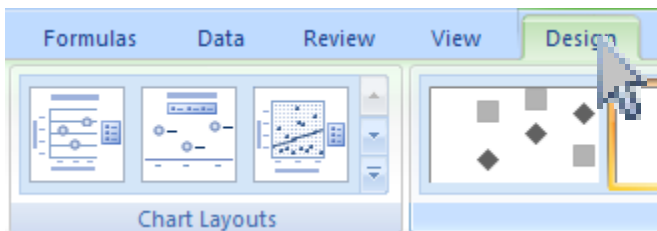
30) You will then see the following...



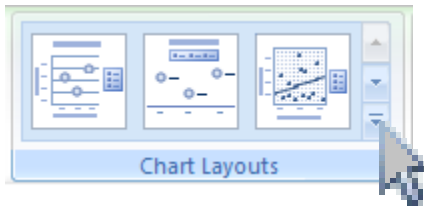
31) Click one of your data points so that the correct tools show up at the top of your worksheet.



32) Select the Layout tab.



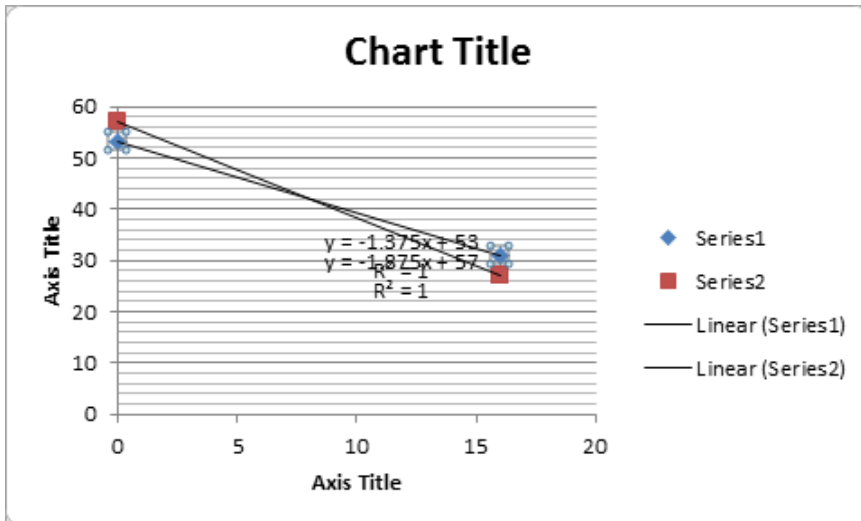
33) Choose Chart Layouts.



You will see this:



34) As before, select the  $fx$  choice (shown above) so that the line equations show up...



35) Clean it up so it looks like this. Use skills that you learned above. Your final graph should look like this:

