

How to Make a Chart with Error Bars using Excel 2007

1. Input data into an Excel spreadsheet. Be sure to label the data so that you know what the numbers represent.

	A	B	C	D
1	Exam Grades			
2				
3		Exam 1	Exam 2	Exam 3
4	Alice	89	78	85
5	Bob	85	88	90
6	Charles	88	76	80
7	Dave	92	90	95
8	Erin	86	85	88
9	Fred	87	72	80
10	Grace	90	95	92
11				

2. Calculate the average for each data set in the row underneath the input data. In this example, we would calculate the average of Exam 1 scores by using the formula `=AVERAGE(B4:B10)`, where B4 is the first value in the data set and B10 is the last value. Push "Enter" to calculate. *Note: If you want to calculate the average for cells that are not in succession, separate the cell numbers with commas in the formula [e.g. `=AVERAGE(B4,B6,B8,B10)`].*

	A	B	C	D	E
1	Exam Grades				
2					
3		Exam 1	Exam 2	Exam 3	
4	Alice	89	78	85	
5	Bob	85	88	90	
6	Charles	88	76	80	
7	Dave	92	90	95	
8	Erin	86	85	88	
9	Fred	87	72	80	
10	Grace	90	95	92	
11					
12	Average	=AVERAGE(B4:B10)			
13					

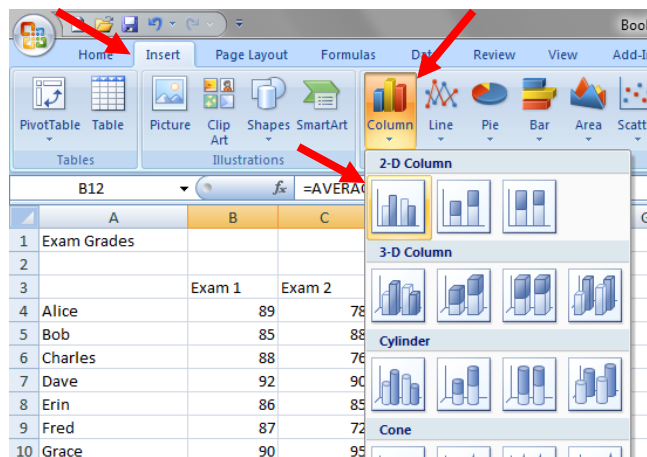
3. Click on the bottom right hand corner of the cell containing the average for Exam 1 (cursor should turn into a black cross) and drag to highlight the rest of the cells in the row in which you would like to calculate the averages. You should now have the averages calculated for all three data sets.

5	Bob	85	88	90
6	Charles	88	76	80
7	Dave	92	90	95
8	Erin	86	85	88
9	Fred	87	72	80
10	Grace	90	95	92
11				
12	Average	88.1428571	83.4285714	87.1428571
13				
14				

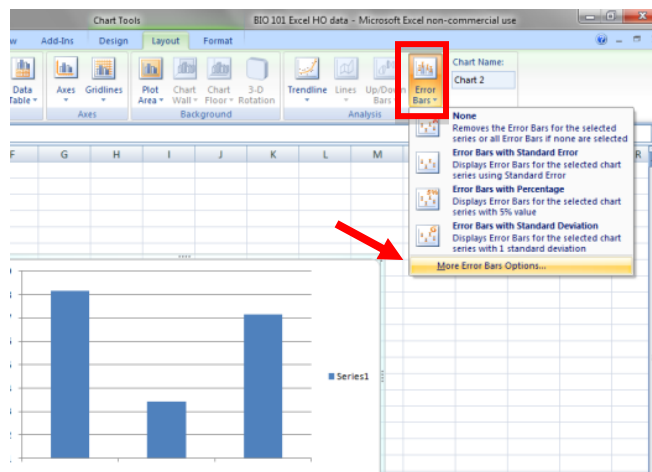
- Make a row underneath the averages that is called “Standard Deviation”. In the cell underneath the average for Exam 1, calculate the standard deviation for that data set. In this example, we would do this by first clicking on cell B13. Then input the following formula: $=STDEV(B4:B10)$, where B4 is the first score and B10 is the last score listed for Exam 1. Click on the bottom right hand corner and drag until you have highlighted the cells for the other two data sets (like we did when we calculated the averages).

		SUM		
		X	✓	f_x
		$=STDEV(B4:B10)$		
	A	B	C	D
1	Exam Grades			
2				
3		Exam 1	Exam 2	Exam 3
4	Alice	89	78	85
5	Bob	85	88	90
6	Charles	88	76	80
7	Dave	92	90	95
8	Erin	86	85	88
9	Fred	87	72	80
10	Grace	90	95	92
11				
12	Average	88.1428571	83.4285714	87.1428571
13	Standard Deviation	$=STDEV(B4:B10)$		

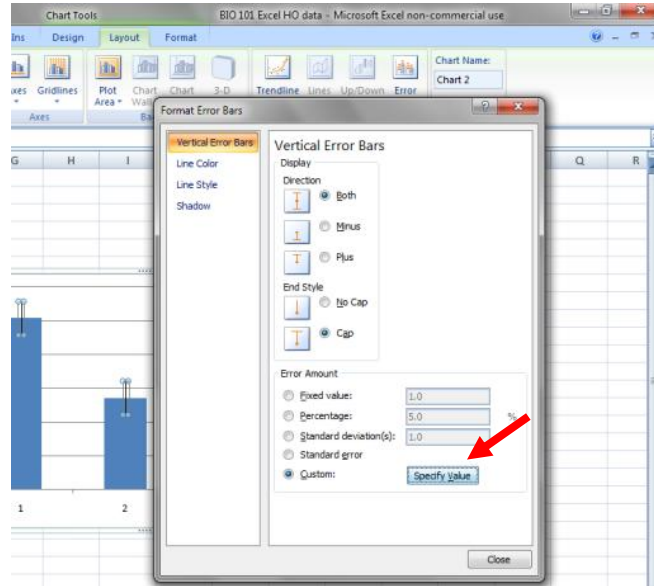
- We want to make a graph of the averages of the three exams. Highlight the averages for all three exams. Click on the “Insert” tab at the top of the window. Then click on the “Chart” button and select “2-D Column” from the drop down menu. A chart should appear in your spreadsheet.



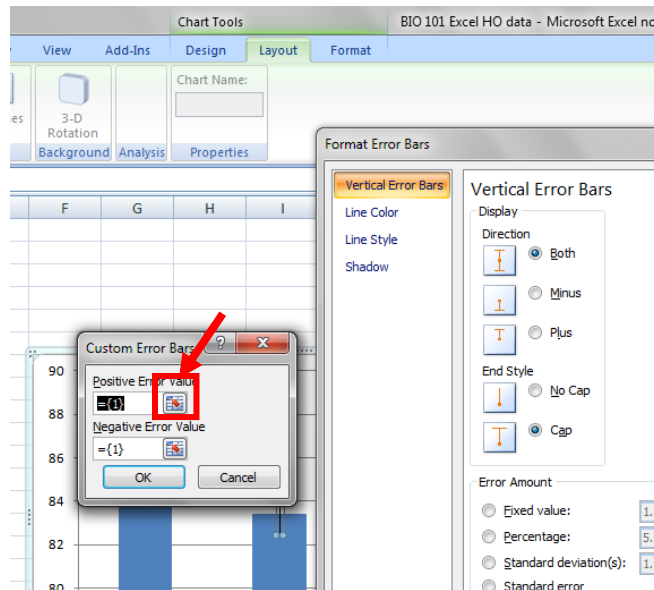
- Next we will add error bars to the chart using the standard deviations we calculated. Click on the “Layout” tab at the top of the window. Then click on the “Error Bars” button in the right side of the Layout options. Select “More Error Bar Options” from the drop down menu.



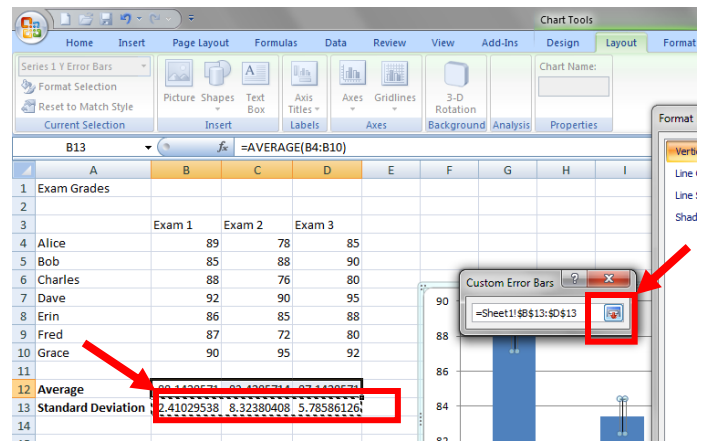
7. Select “Custom” under “Error Amount” in the “Format Error Bars” pop-up window. This will open the “Custom Error Bars” pop-up window.



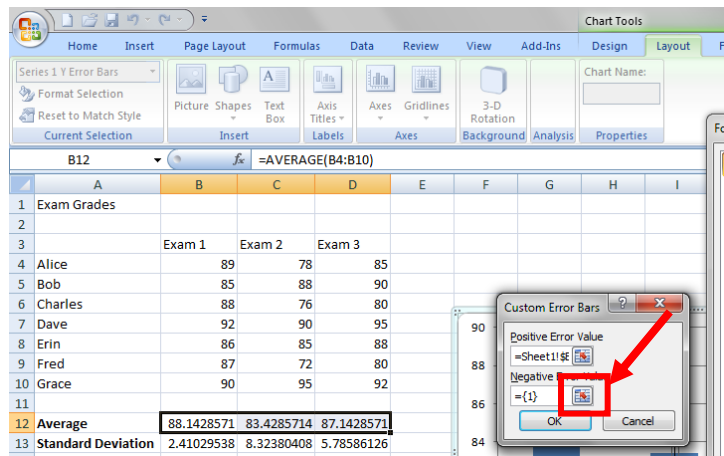
8. Click on the button under “Positive Error Value” in the “Custom Error Bars” pop-up window. This will allow you to select data from your spreadsheet that you want to use as the positive error values in your chart.



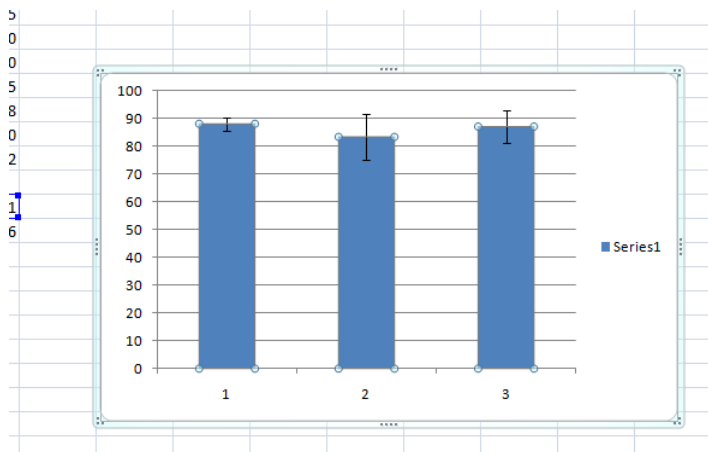
- In the spreadsheet, select the standard deviation values for each data set. For this example, you would select cells B13, C13, and D13. Then click on the button in the window to return to the full “Custom Error Bars” window.



- Click on the button under “Negative Error Value” in the “Custom Error Bars” window. Then select the standard deviations for each data set in the spreadsheet (as we did for the positive error value), and click on the button in the window to return to the full “Custom Error Bars” window. Click “OK”. Close the “Format Error Bars” window.



- Your chart should now have error bars.



How to Format a Chart

Formatting Options in the “Design” tab:

Chart Layouts

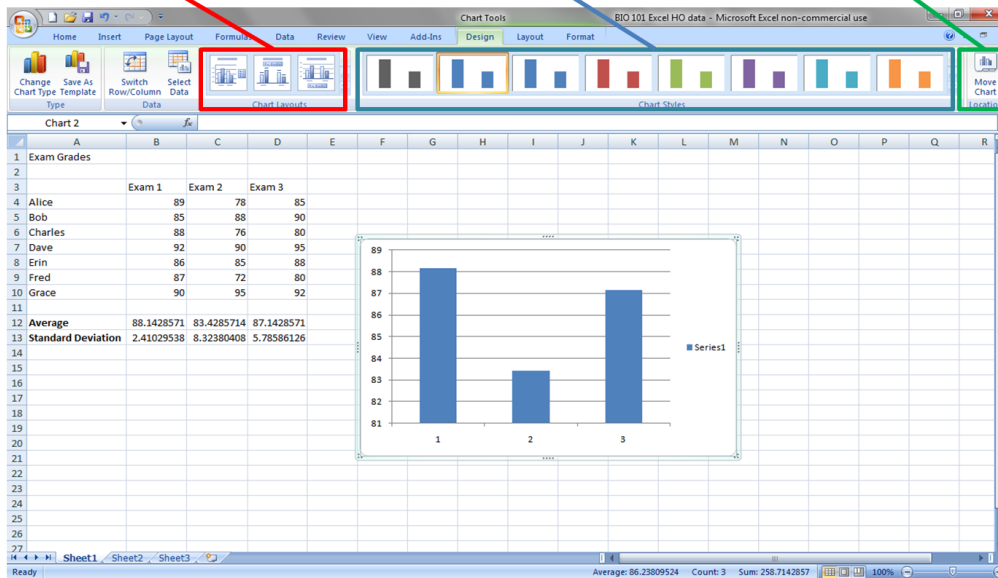
Use these buttons to add a title and/or change the layout of your chart.

Chart Styles

Use these buttons to add change the appearance of the bars in your chart.

Move Chart

Use this button to move the chart to its own page or to a different page.



Formatting options in the “Layout” tab:

Labels

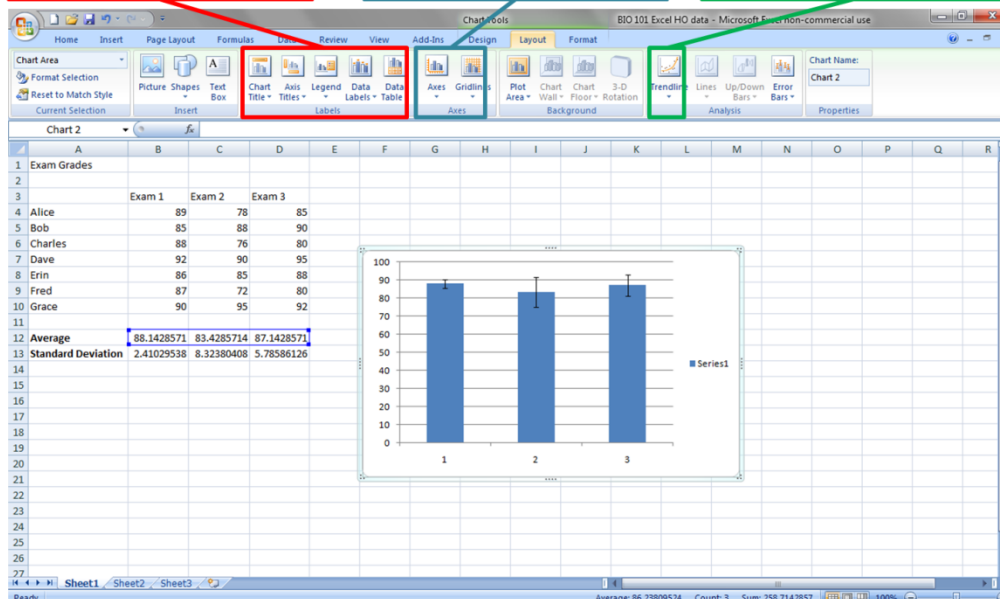
Use these buttons to insert or edit chart titles, axis labels, legend, data labels, and data tables

Axes

Use these buttons to alter axes and gridlines.

Trendlines

Use this button to insert trendlines



How to Create a Chart with Error Bars using Excel 2008 for Mac

1. Input data into Excel spreadsheet. Be sure to label the data so that you know what the numbers represent.

	A	B	C	D	E
1	Exam Grades				
2					
3		Exam 1	Exam 2	Exam 3	
4	Alice	89	78	85	
5	Bob	85	88	90	
6	Charles	88	76	80	
7	Dave	92	90	95	
8	Erin	86	85	88	
9	Fred	87	72	80	
10	Grace	90	95	92	
11					
12					

2. Calculate the average for each data set in the row underneath the input data. In this example, we would calculate the average of Data Set 1 by using the formula `=AVERAGE(B2:B4)`, where B2 is the first value in the data set and B4 is the last value.

	A	B	C	D	E
1	Exam Grades				
2					
3		Exam 1	Exam 2	Exam 3	
4	Alice	89	78	85	
5	Bob	85	88	90	
6	Charles	88	76	80	
7	Dave	92	90	95	
8	Erin	86	85	88	
9	Fred	87	72	80	
10	Grace	90	95	92	
11					
12	Average	<code>=AVERAGE(B4:B10)</code>			
13					
14					

3. Click on the bottom right hand corner of the cell containing the average for Exam 1 (cursor should turn into a black cross) and drag to highlight the rest of the cells in the row in which you would like to calculate the averages. You should now have the averages calculated for all three data sets.

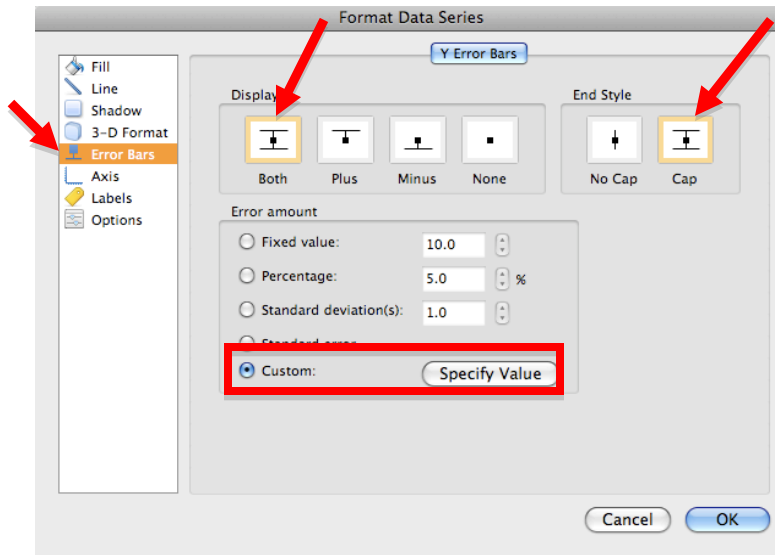
	A	B	C	D	E
1	Exam Grades				
2					
3		Exam 1	Exam 2	Exam 3	
4	Alice	89	78	85	
5	Bob	85	88	90	
6	Charles	88	76	80	
7	Dave	92	90	95	
8	Erin	86	85	88	
9	Fred	87	72	80	
10	Grace	90	95	92	
11					
12	Average	88.1428571	83.4285714	87.1428571	
13					
14					

4. Make a row underneath the averages that is called "Standard Deviation". In the cell underneath the average for Exam 1, calculate the standard deviation for that data set. In this example, we would do this by first clicking on cell B13. Then input the following formula: **=STDEV(B4:B10)**, where B4 is the first score and B10 is the last score listed for Exam 1. Click on the bottom right hand corner and drag until you have highlighted the cells for the other two data sets (like we did when we calculated the averages).

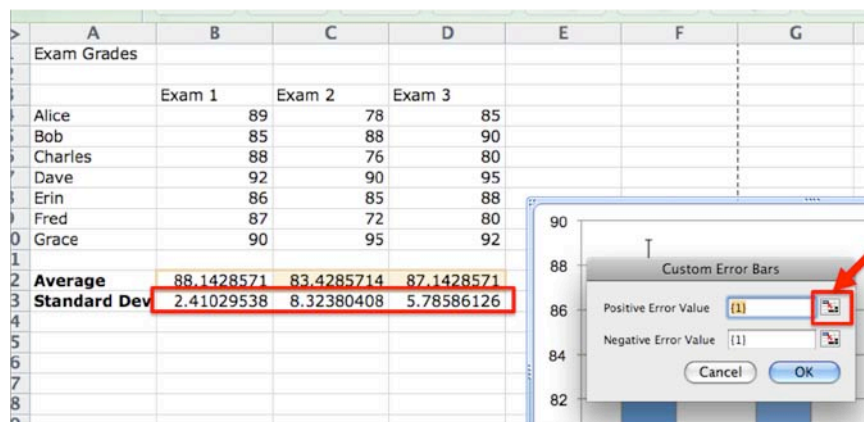
	A	B	C	D
1	Exam Grades			
2				
3		Exam 1	Exam 2	Exam 3
4	Alice	89	78	85
5	Bob	85	88	90
6	Charles	88	76	80
7	Dave	92	90	95
8	Erin	86	85	88
9	Fred	87	72	80
10	Grace	90	95	92
11				
12	Average	88.1428571	83.4285714	87.1428571
13	Standard Dev	=STDEV(B4:B10)		
14				
15				
16				
17				
18				

5. We want to make a graph of the averages of the three exams. Highlight the averages for all three exams. Click on the "Chart" tab. The Chart menu bar should appear. In this example, we want to create a bar graph. Click on the "Column" button to see the column (bar) graph options. Select the basic column graph option (first option). The chart should appear in your spreadsheet.

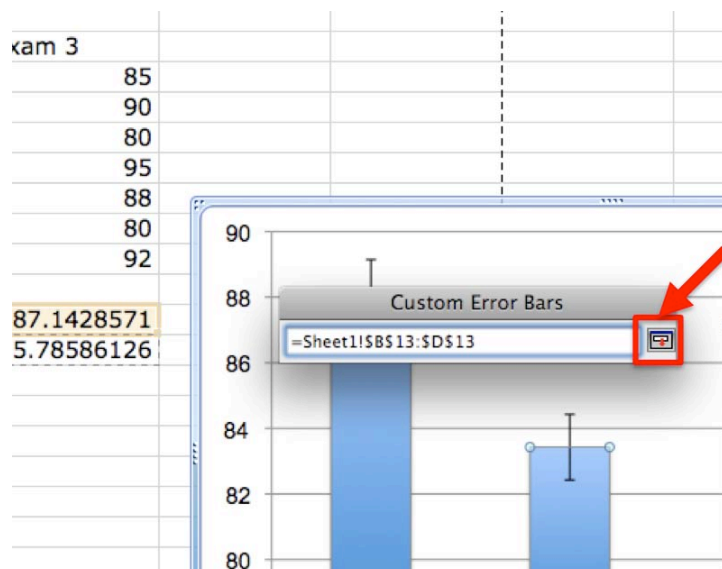
- Next we will add error bars to the chart using the standard deviations we calculated. Double click on the data (i.e. one of the bars). This will prompt a window with the title "Format Data Series". Select "Error Bars" from the left hand menu. Select the error bar labeled "Both". Under "End Style", select "Cap". Then select "Custom" in the Error Amount options. Click on the "Specify Value" button. A pop-up window called "Custom Error Bars" will open.



- In the "Custom Error Bars" window, click on the button to the right of the "Positive Error Value" box. This will allow you to select positive error values (the top portion of the error bar). Highlight the standard deviation values for each data set in the spreadsheet.

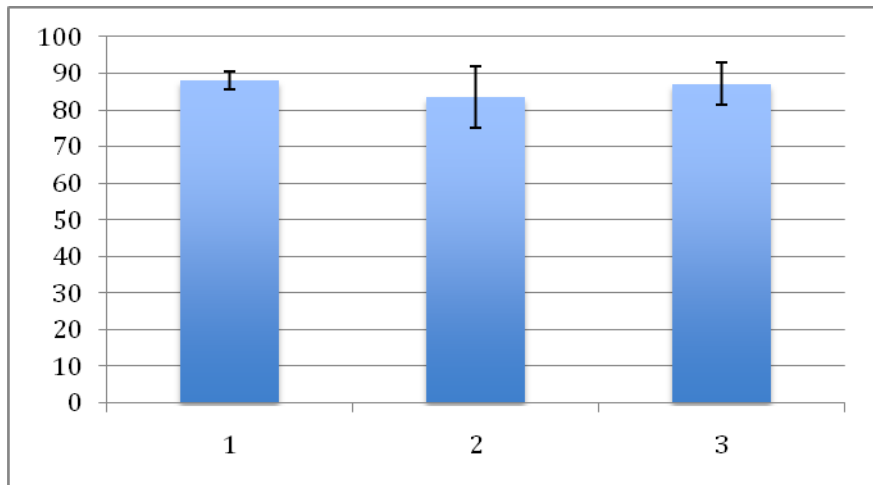


- Click on the button to the right of the data selection box. This will return the "Custom Error Bars" window to its original form. Click on the button to the right of the "Negative Error Value" box (as you did for the positive error values previously). Highlight the standard deviation values for each data set in the spreadsheet. Click on the button to the right of the data selection box to return to the original "Custom Error Bars" window. Click "OK". Click



“OK” again to close all pop-up windows.

9. You should now have a chart with error bars.



10. Format your chart by using the options in the “Formatting Palette.” If the “Formatting Palette” is not open, click on “View” in the top toolbar. Then select “Formatting Palette.” Remember that your charts should always be properly labeled with a title, axis labels, and units.

