Doing Calculations in MS Excel

MS Excel makes it very easy to do calculations using formulas. You need to remember only a few simple rules.

- Always begin formulas (and functions) with an equal sign (=). This tells Excel that you expect it to do some calculations.
- Use normal arithmetic symbols for adding (+), subtracting (-), and dividing (/). Use the asterisk (*) for multiplication.

For example, to add data in two different columns as in the example to the right, click on the first cell where you would like your results to appear. Write the formula, beginning with an equal sign and using only cell addresses in that row. Click Enter.

You can then Copy and Paste that formula to the other cells.

More complex calculations requiring a series of arithmetic operations can be done by using parenthesis to indicate which operation to perform first. For example, if the total possible points were 120, the percent score could have been calculated using the following formula: 

\[ \text{Percent Score} = \left( \frac{D3}{120} \right) \times 100. \]
Using Functions To Do Simple Statistics

Functions are really just formulas already written for you. When entered, they must also begin with an equal sign (=). Since they are designed to do calculations on strings of data, you must input a range of cells, like A3:A10.

1. To calculate the average or arithmetic mean: =AVERAGE(range). This is shown to the right.

2. To add a string of data: =SUM(range)

3. To calculate the standard deviation: =STDEV(range)

4. Many other functions can be found under the Insert menu.

Time saving tips:
If you have a number of columns for which you wish to calculate mean or standard deviation, insert the function for the first column, then copy and paste to the rest. You can also position your cursor over the black square in the lower right of the active cell. When your cursor becomes a +, drag over the cells you want copied, and it is done automatically.

Remember significant figures. Don’t report any calculated data like means or standard deviation that has more significant figures than your least accurate measurement.
Adding Error Bars

Begin by right-clicking or double-clicking on the bar (or line) to which you wish to add error bars. Select Format Data series. When you get to the "Format Data Series" box, choose the "Y Error Bars" tab.

Under the Display category, click on "Both".

Move down to the Error Amount category and click on "Custom."

You need to enter information into both the + and − boxes to get correct error bars above and below the columns (or lines if you are doing that type of graph).

Move your mouse to the + box and click on the red arrow to the right of the box. You can then find the data on the spreadsheet, highlight it, and click on the red arrow again. When you highlight the standard deviation for the error bars, highlight the cells in the order that the columns appear from left to right—Excel will insert them on the correct columns (or data points). Repeat the procedure for the − box. The reason that you have to enter the numbers twice is that the + box creates error bars above the column (or point) and the − box creates the line below.

Click "OK." Your graph should look somewhat like the one on the next page. When you see your graph, check to make sure that the error bars are the same length above and below the column AND that the length of the error bars is correct.
Figure 1. Time to floating of *Spinacia oleracea* discs in two solutions

- **0.2% sodium bicarbonate**
- **0.1% sodium bicarbonate**

Seconds to floating