MS Excel Crash Course

There are lots of programs out there that manage data. Excel is not the most sophisticated, but it is fairly simple to use and is handy for dealing with simple data and smaller data sets.

1. Open MS Excel and enter the data below in cells A1 through A8 and B2, so we have some data to work with:

time (s)	velocity (m/s)
0	
1	
2	
3	
4	
5	
6	

2. Formulas and filling down. To get Excel to make a calculation, we enter a formula. Here, we'll assume the velocity follows the formula $v(t) = 3m/s * t$. To enter a formula for this:
    a. Click on cell B2.
    b. Type "=3*A2" and hit enter. Here, the "=" tells Excel you are entering a formula. Cell "A2" contains the time corresponding to that row (in this case t=0).
    c. Now the magic part. Click on Cell B2 again. More the cursor to the lower right hand part of the cell: it should turn into a dark cross (instead of the usual light cross). Double click to "fill down". This will calculate the velocities at all times! Click on cell B3 and examine the formula. Notice how excel has automatically changed the cell reference "A2" in our original formula to "A3" for this row.
3. Averaging. Say you want the average velocity. In cell D2, enter "=average(B2:B8)". Excel will then calculate the average of the cells between B2 and B8.
4. Plotting. We often want to plot two columns of data against each other. To do this, we use scatter plots.
    a. Highlight the columns you want to plot. The best way to do this is to click on the "A" above the first column, hold down the "Crtl" button, and then click on the "B" above the second column. (With multiple columns, using "Crtl" allows you to skip columns). When you select columns like this, the left-most column will be on the x-axis of the resulting graph, and any other columns will be plotted on the vertical axis.
    b. Click on "Insert" at the top of the page, then the "Insert Scatter Chart" Icon (a small chart with just points) and select the cart WITHOUT lines. (NEVER add connecting lines to a plot of data). This should cause a chart to be displayed!
5. Best Fit Lines
    a. Click on the chart you just made and then click on the green cross, and then click the bock that says "Trendline". Excel will insert the line that best fits the data. (Note that Excel will do this for any data, including data that is obviously nonlinear: use common sense when using a linear fit!)

b. Click on the triangle to the left of “Trendline” and select “More options”, scroll to the bottom, and select “Display Equation on chart” and Display R-squared value on chart. Excel will now display the equation of the best fit line, as well as its r^2 value. (The r^2 value is a rough estimate of how linear your data is: a value of 1 indicates a perfect line.)

There are, obviously, a lot more tricks to be learned with Excel. But this should get you started!