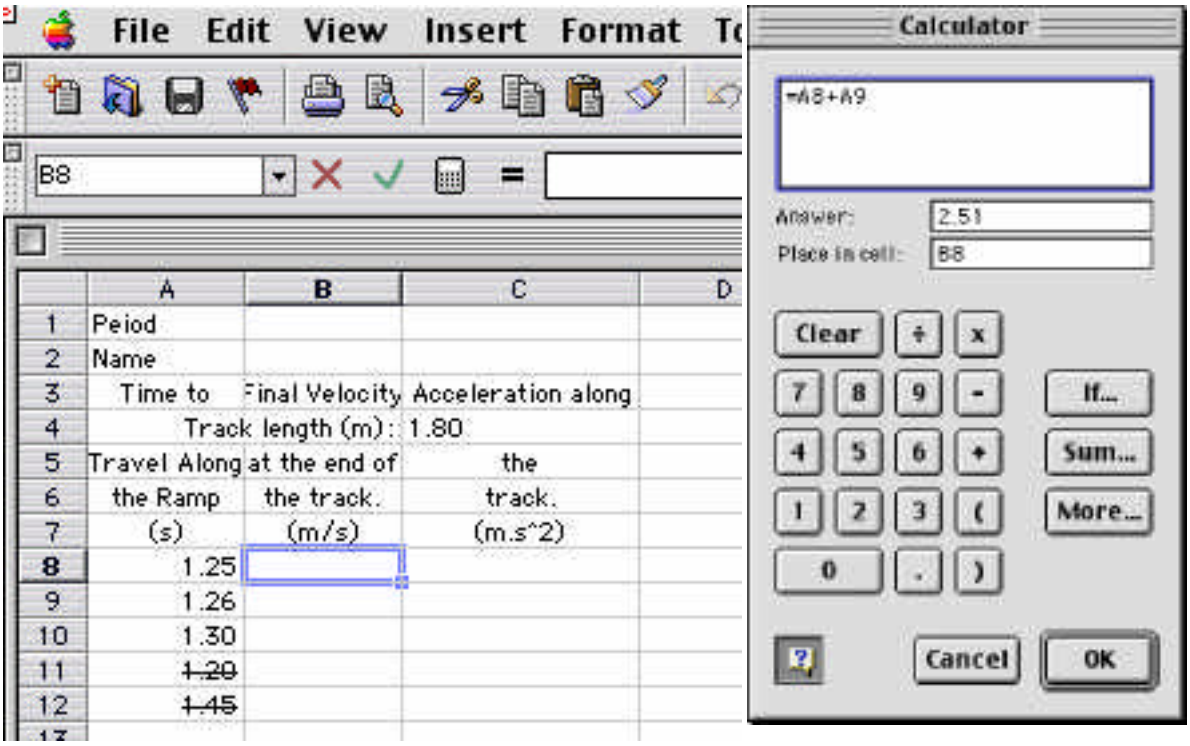
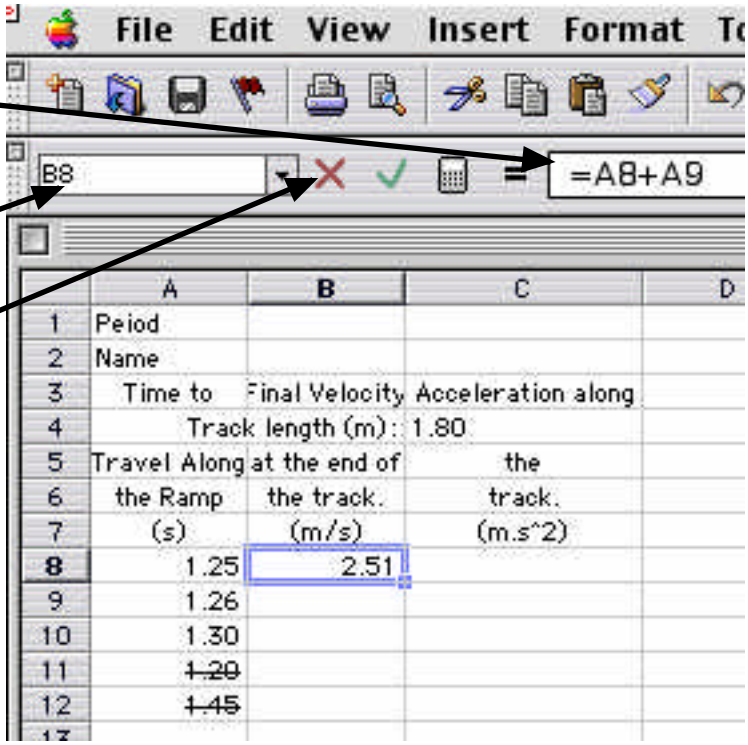
3 Click on cells A8 and A9. Notice the calculator automatically adds the contents of the cells you click on. You can override the addition by choosing a different math function before clicking on the cell.



The formula you just entered on the calculator is written in this space. to edit the formula click on the calculator again or edit the formula as it is written in this space.

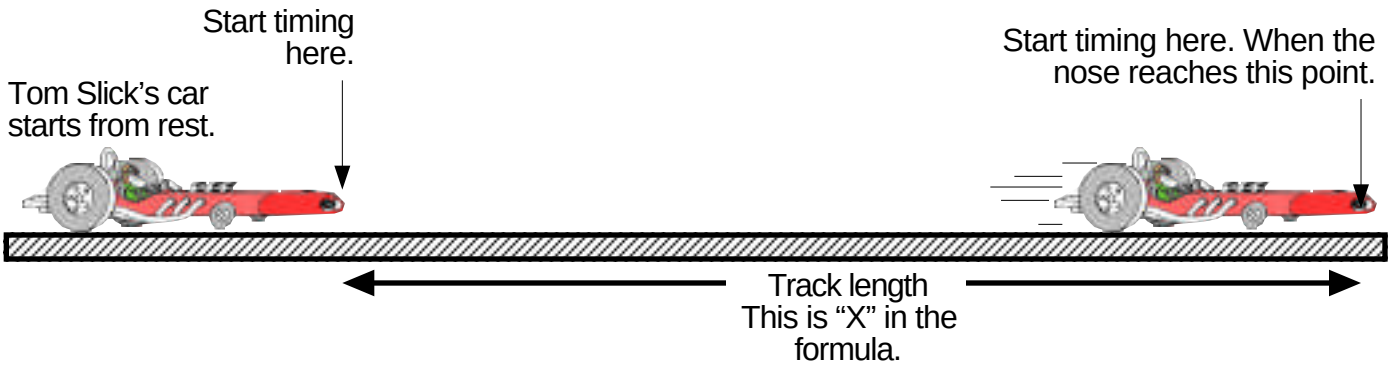
The cell where the formula's answer appears is shown here.

If you type a formula and find out that the you need to go back to the original formula that was present before you typed, click on the "X."



If the values in the cells in the formula "=A8+A9" change then so does the answer. More later about how this can save you time. For now let's switch the focus to a physics formula that will be used in lab.

Below is a picture of the lab where the data comes from. A toy car is wound up all the way and accelerates down the track.



The data that is in the spreadsheet came from this pretend lab.

The final velocity at the end of the track is found from,

$$\left(v_{final}\right)t = (2)(x)$$

Where "X" is the length of track the car traveled: "t" is the time for the car to travel this distance, and v_{final} is the velocity at the end of the track. The first step is to isolate the variable you are solving for. In this example that is the final velocity. Therefore

$$\left(v_{final}\right)t = (2)(x)$$

$$v_{final} = \frac{(2)(x)}{t}$$

Rethink the formula in terms of the cells.

$$\mathbf{v_{final} = \frac{(2)(Track\ Length)}{time}}$$

$$\mathbf{v_f\ will\ go\ in\ \underline{cell\ B8}}$$

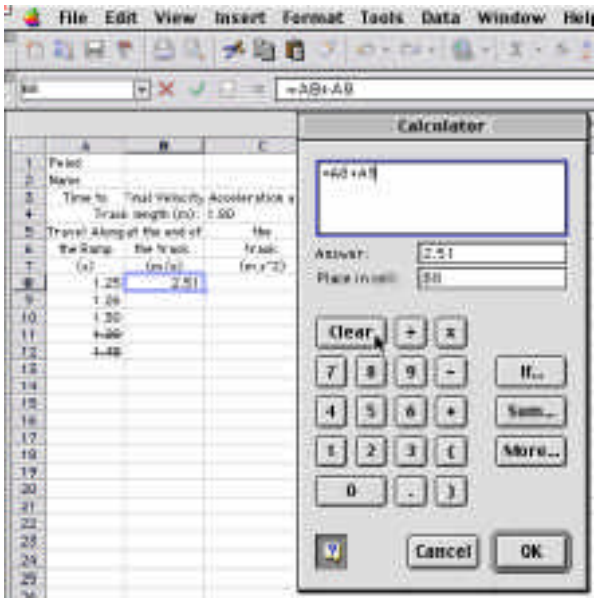
$$\mathbf{\therefore\ \underline{cell\ B8} = \frac{2*cell\ C3}{cell\ A8}}$$

Click in the cell where you want the formula to appear, B8. Click on calculator icon as before. **Type the following**

=2*C3/A8

Remember you do not need to type the cell designations. You only need to click the mouse. Follow the steps on the next pages.

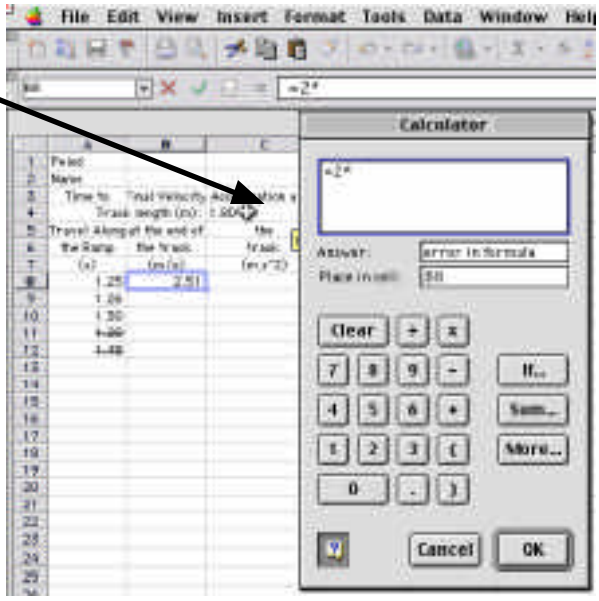
Click on the “Clear” button on the calculator.



Click on the “2” button on the calculator.

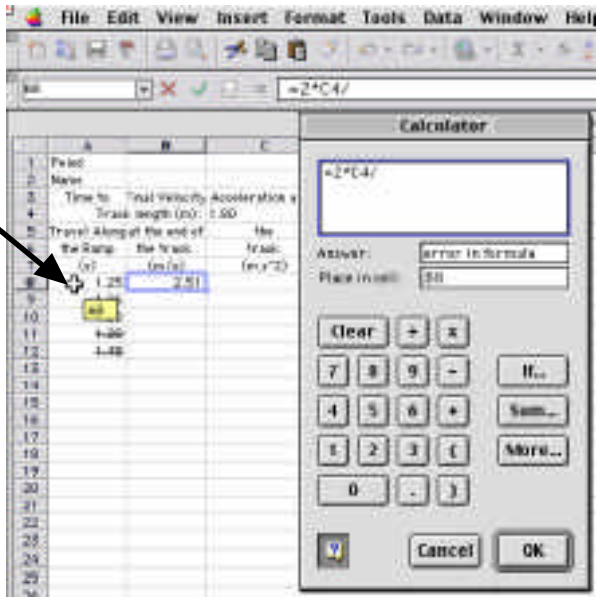
Click on the “x” button on the calculator.

Click on the cell containing the track length in the spreadsheet.



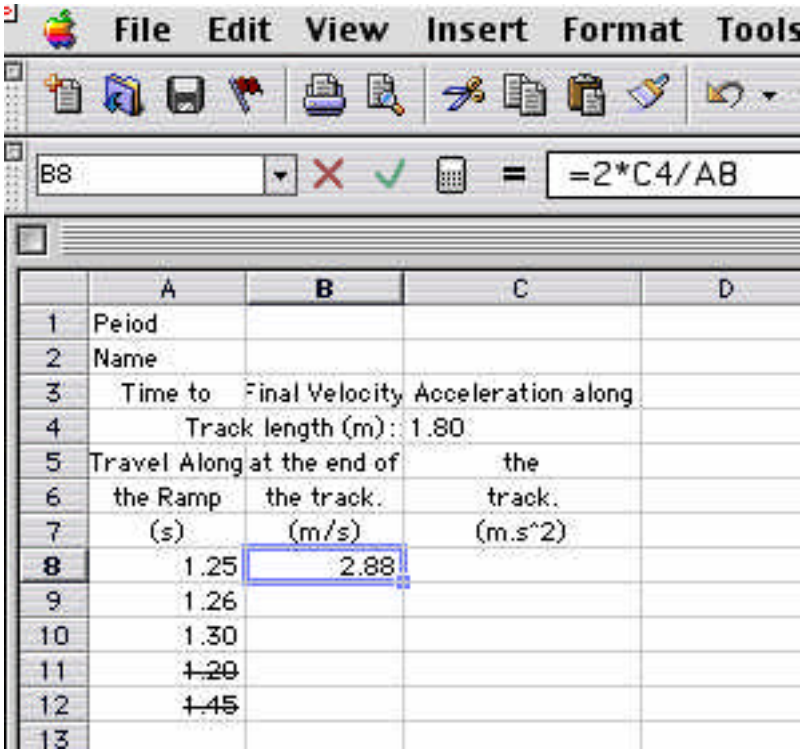
Click on the "/" button on the calculator.

Click on the cell in the spreadsheet containing the time corresponding to cell B8. This is cell A8.



Click on the calculators “OK” button to signify that you are finished entering the formula.

When you are done, the screen should look something like the one below.



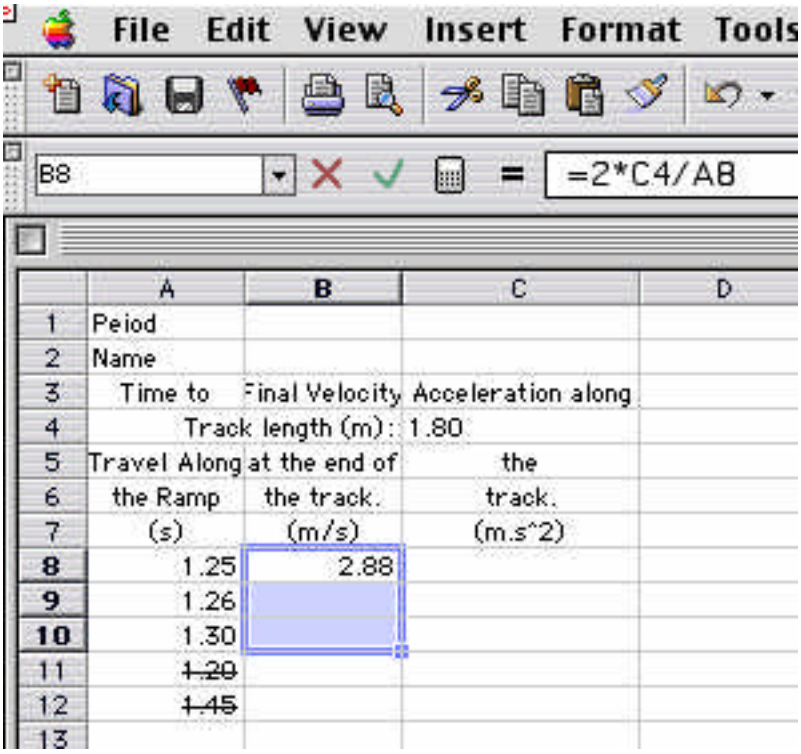
	A	B	C	D
1	Peiod			
2	Name			
3	Time to	Final Velocity	Acceleration along	
4	Track	length (m):	1.80	
5	Travel Along	at the end of	the	
6	the Ramp	the track.	track.	
7	(s)	(m/s)	(m.s^2)	
8	1.25	2.88		
9	1.26			
10	1.30			
11	~~1.20~~			
12	~~1.45~~			
13				

Doing the data table on a spreadsheet is not only neat, but it can save you time. One of the ways to save time is to copy the formula over and over in the cells below. This is done easiest with the fill down command.

FILL DOWN COMMAND

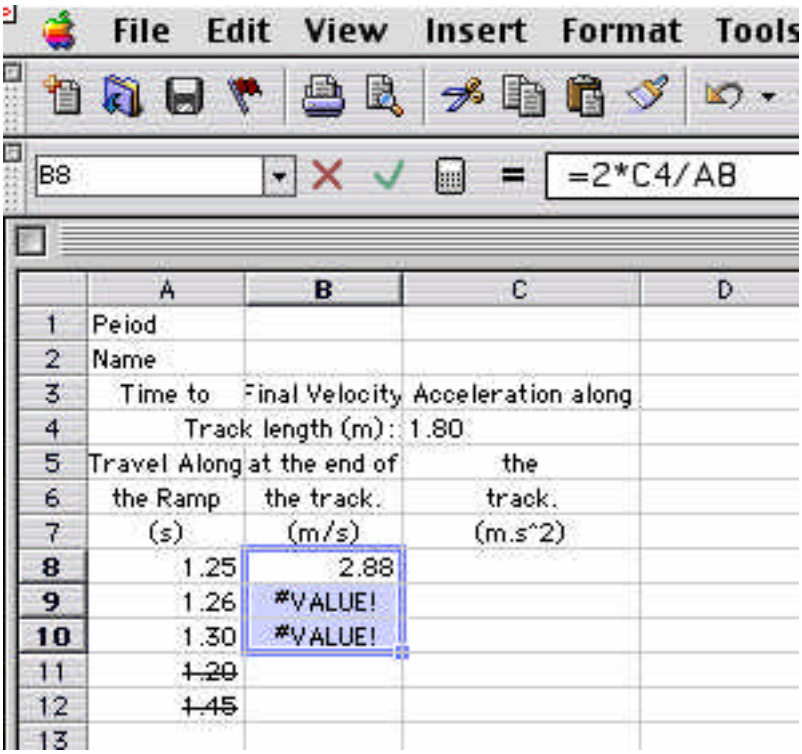
The goal is to copy the contents of cell B8 into the cells below it.

Starting in cell B8, drag the mouse down to highlight cells B8 through B10.



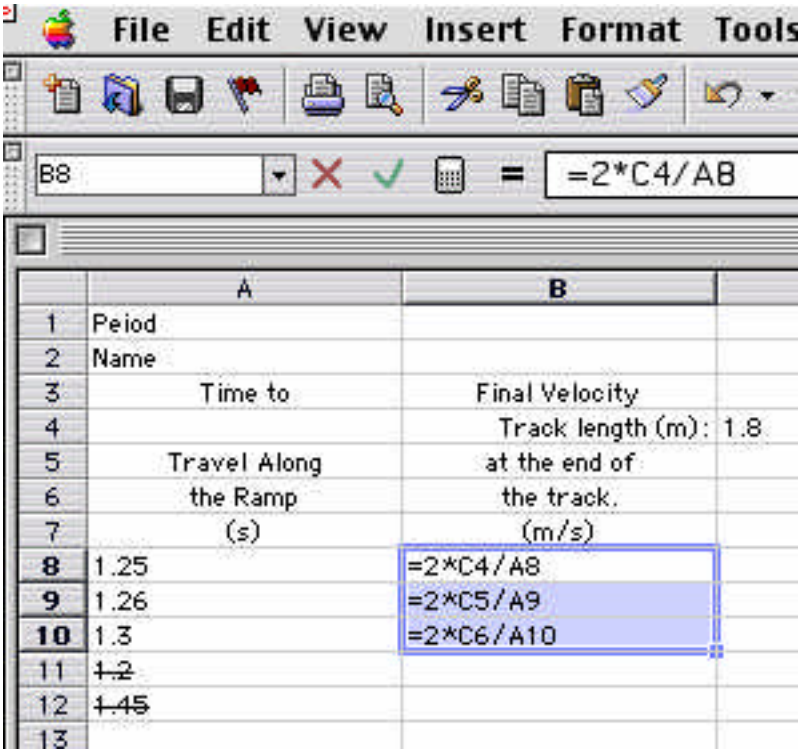
From the **Edit** menu select **Fill** -> **Down** as shown to the right.

The screen will look like this one. It shows an error, "**#VALUE**."



If you could look at the formulae in the cells, You would see the formulae shown at the right.

But cells' formulae won't work. They all need to C4 in them. This is because C4 is the length of the track and it stays the same for every final velocity calculation.

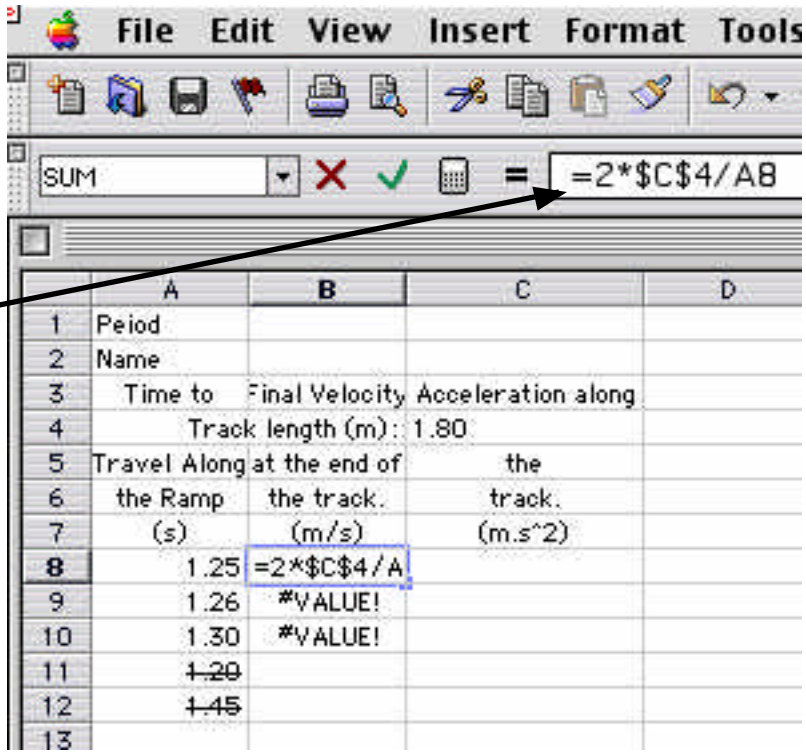


To correct this problem, we need a way of telling the computer not to change C4 when the formula is copies to the other cells. This is done when the cell reference is changed to an absolute reference on the next page.

Before the fill down command is used, the reference to C4 needs to change. "C4" needs to be converted from a relative reference to an absolute reference. To do this **C4** in the top formula needs to be changes to "**C4**." The "$" signs tell the computer not to change these cells in formulae when the cells are copied.

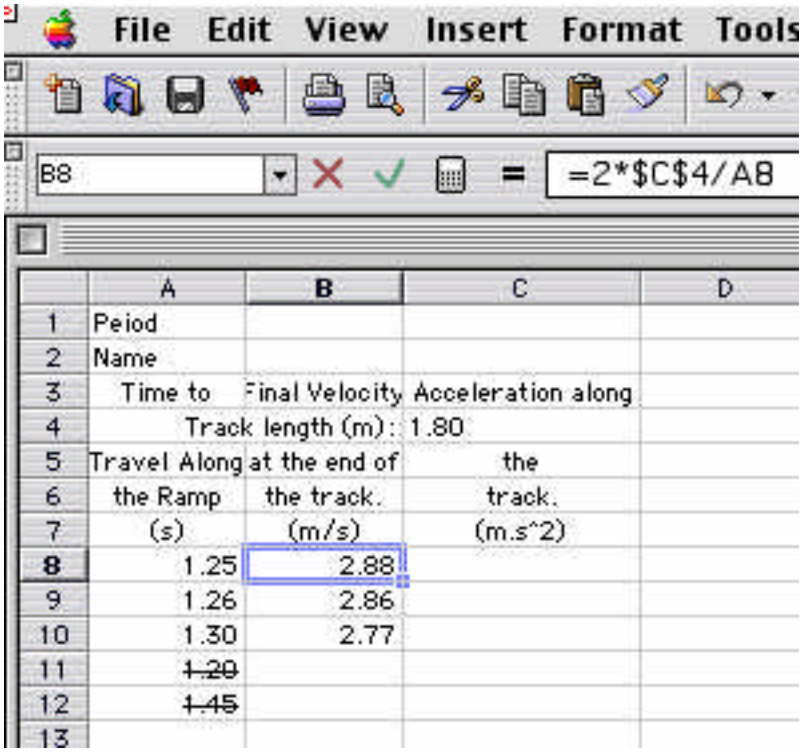
To do this click on the cell to be changed, B8 in this example. At the top of the screen where the formula is displayed, change **C4** to **C4**.

Press the "return" or "enter" key.



Use the "**Fill Down**" command as before. Below is what the screen should now look like.

If you getting numbers but there are different from the one's shown. Make sure your times in the "A" column match the times shown here.

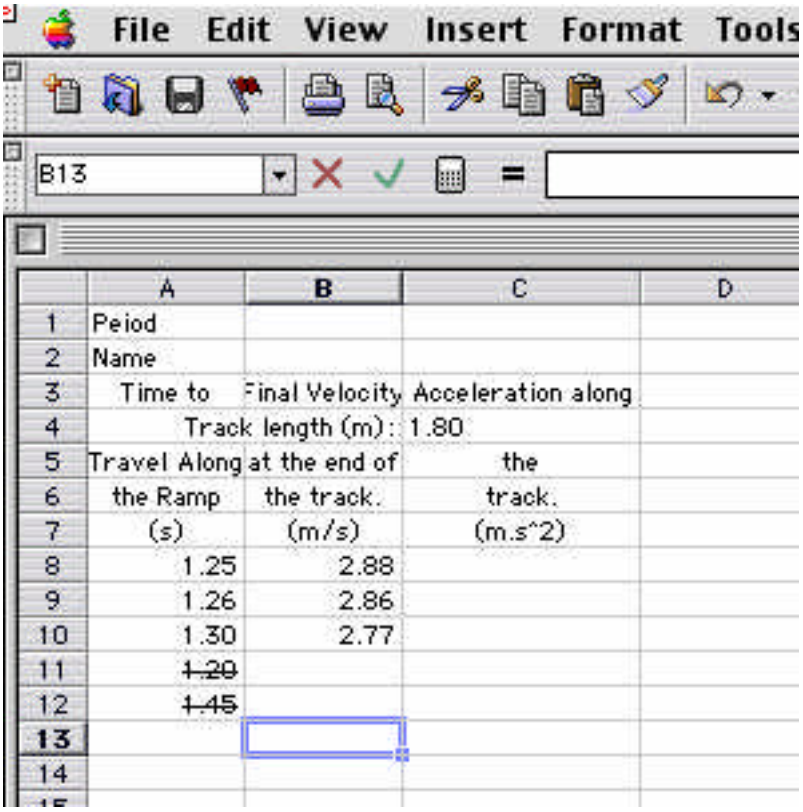


CALCULATING THE AVERAGE AND THE STANDARD DEVIATION

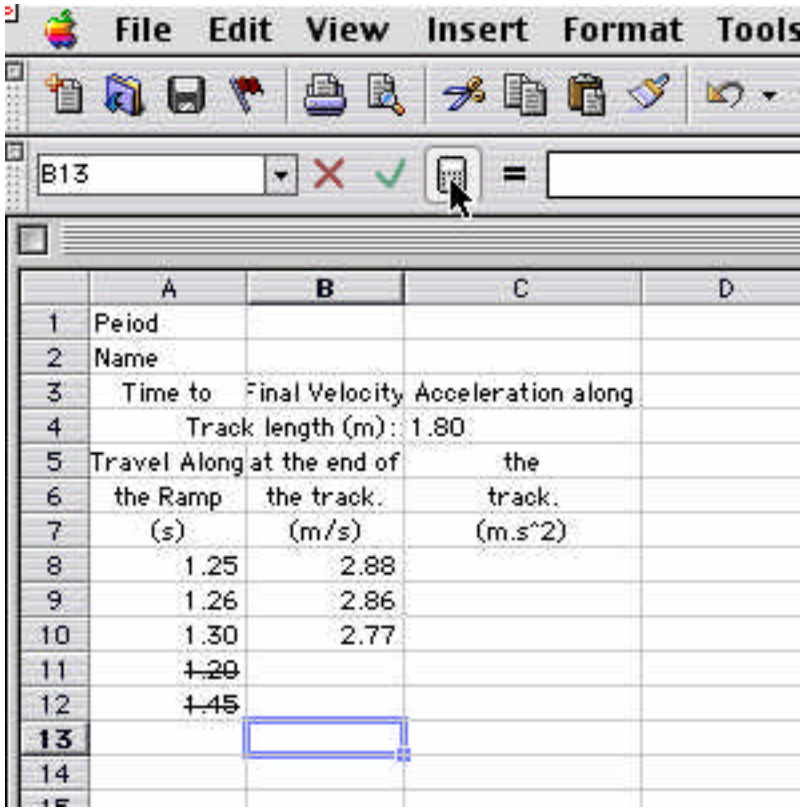
A data table has the average for every column at the bottom of the column.

The spreadsheet can calculate this automatically. To do this we will use something called built in function. It is the "AVERAGE" function.

We want the average of the first column to appear in cell B13. Click in the cell once to highlight it.



Click on the calculator icon.....



Click on the “More...” button. .....

From there a series of built in functions like the list below will be shown. Select the “**AVERAGE**” function.