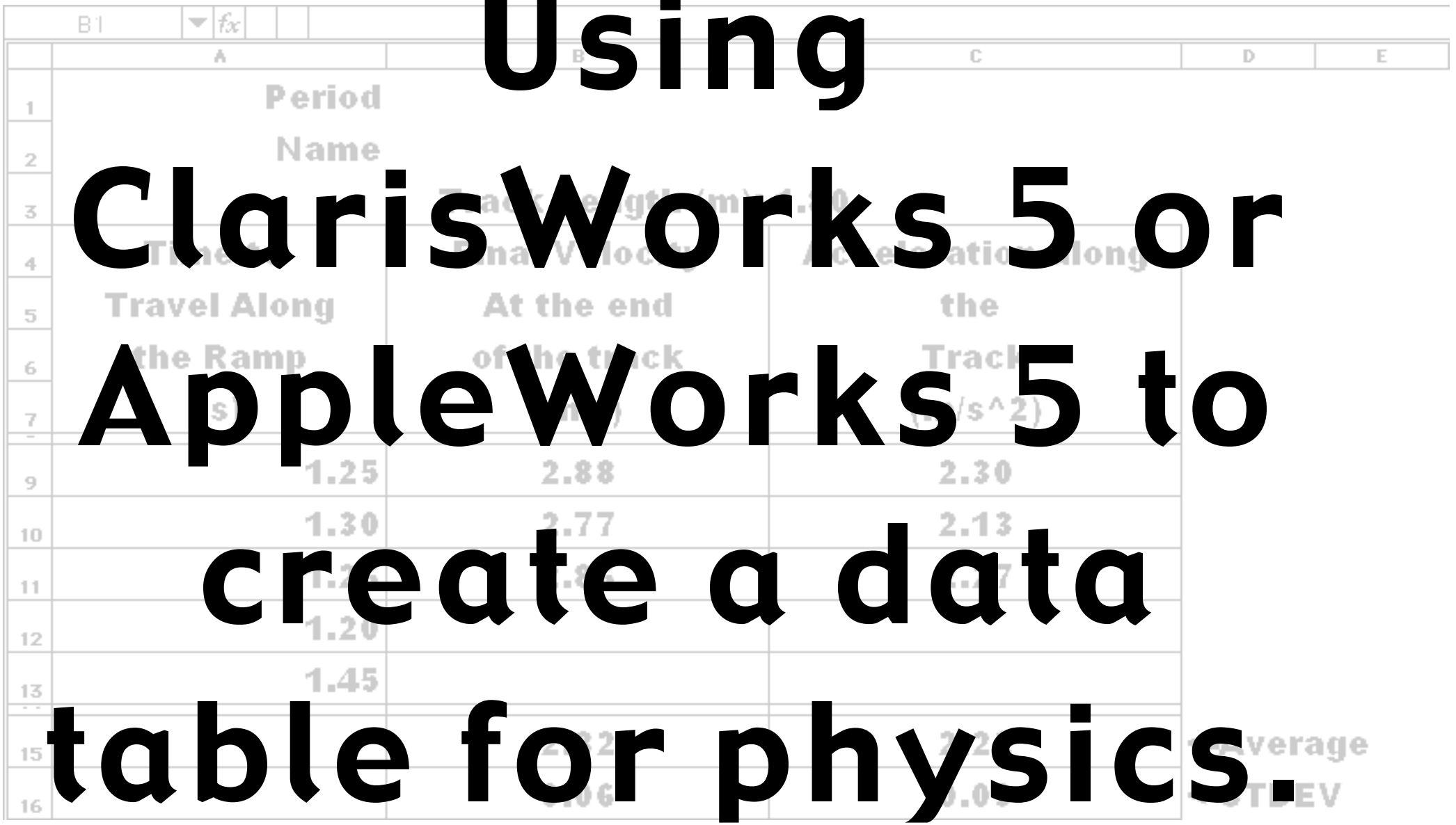
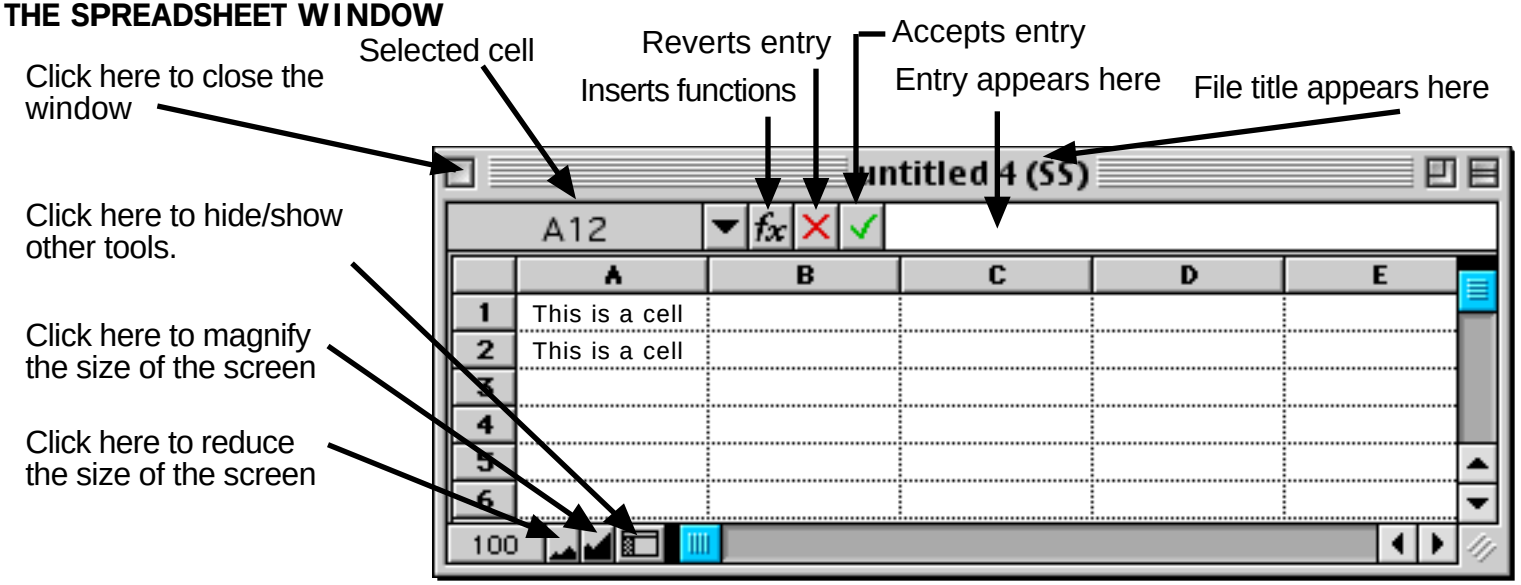


Using ClarisWorks 5 or AppleWorks 5 to create a data table for physics.

By T. Wayne
4/25/2001

Table of Contents

ANATOMY OF THE SPREADSHEET WINDOW



The instructions in this short document refer to the mini-spreadsheet to the right.

→ →

Begin by entering in the information shown below exactly as it appears.

A1	Period				
	A	B	C	D	E
1	Period				
2	Name				
3	Time to	Final Velocity	Acceleration along		
4	Travel Along	At the end	the		
5	the Ramp	of the track	Track		
6	(s)	(m/s)	(m/s^2)		
7					

HOW DO I WRITE TEXT IN A CELL?

Click the mouse in a cell or use the arrow keys to move to a cell. Type the text you want to enter. The text will not show up in the cell until you press the "return" key. It will appear above the spread sheet. See the anatomy of the spreadsheet, above. Make your spread sheet look like the one to the right.

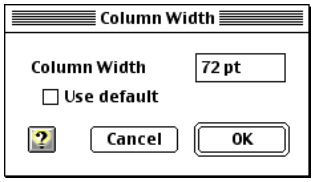
A1	Period				
	A	B	C	D	E
1	Period				
2	Name				
3	Time to	Final Velocity	Acceleration along		
4	Travel Along	At the end	the		
5	the Ramp	of the track	Track		
6	(s)	(m/s)	(m/s^2)		
7					

HOW DO I CHANGE THE WIDTH OF A COLUMN?

SLOWLY, move the cursor horizontally along the letters at the top of the columns. The cursor will change from "✥" to "↔." When the cursor change to a "↔", hold the mouse button down and drag the line that defines the sides of the column to widen or narrow the column. Do this for column "C."

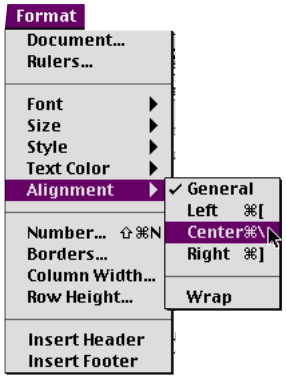
HOW DO I CHANGE THE WIDTH OF A GROUP OF COLUMNS SO THEY ARE THE SAME WIDTH?

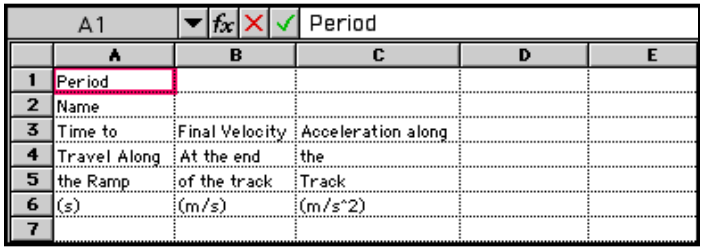
Drag the mouse through any row to select the columns you want to make the same. From the **Format** menu select "**Column Width...**" When the dialog box appears enter the number of points for the column's width. (36 pts = 0.5 inches, 72 pts = 1 inch, 144 pts = 2 inches.) for this example set the column widths of column "A" and "B" to 68 points.

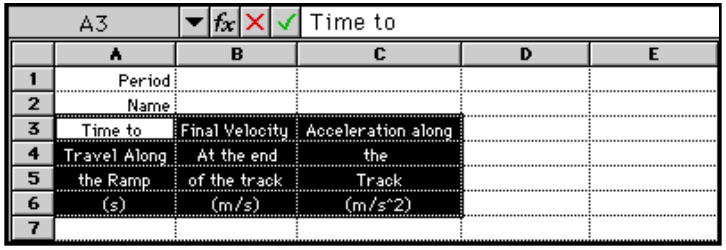


HOW DO I CHANGE THE JUSTIFICATION OF MY CELLS TO CENTER ALL THE TEXT?

Drag the mouse through across or diagonally to highlight the cells you want to change. From the **Format** menu go down to **Alignment** and then over to **Center**. Use this method to center the cells shown at the right. then right align cells 1A and 2A.







HOW DO I ENTER DATA INTO THE CELLS?

To type information into a spreadsheet cell, click in the cell you want the information to appear in. Type the information. Press the Return key. Pressing the Return key will drop you down into the cell below. Below is table of keys and how they move you in the spreadsheet.

Return:	drops down a cell
Shift-Return:	raises up a cell
Tab:	moves to the right
Shift-Tab:	moves to the left
Enter:	does not move the cursor

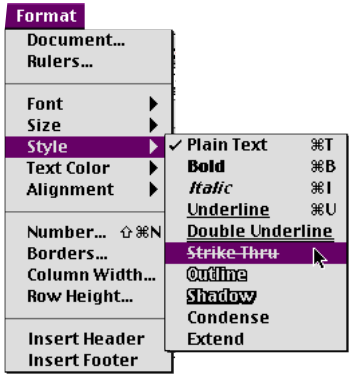
Enter the data shown to the right.

A14

	A	B	C	D	E
1	Period				
2	Name				
3	Time to	Final Velocity	Acceleration along		
4	Travel Along	At the end	the		
5	the Ramp	of the track	Track		
6	(s)	(m/s)	(m/s^2)		
7	1.25				
8	1.3				
9	1.2				
10	1.45				
11	1.26				

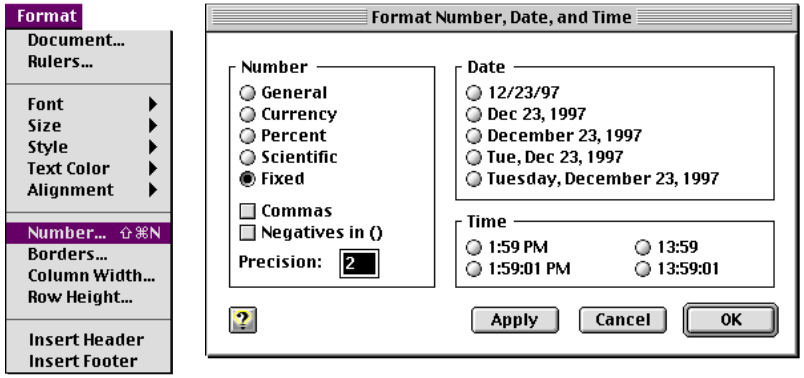
HOW DO YOU WANT THE DATA TO APPEAR TO SHOW THE HIGH AND LOW DROPPED VALUES?

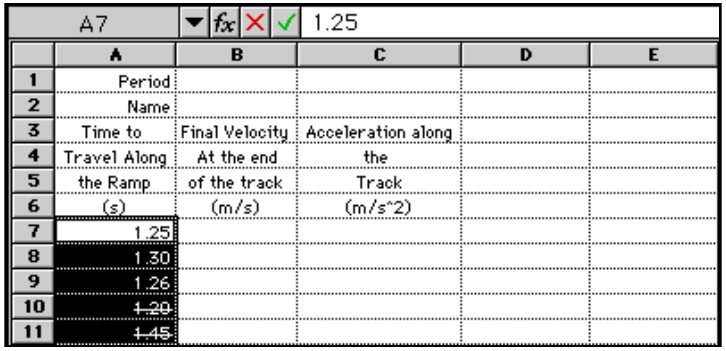
Rearrange or enter the data so the high and low values are at the bottom of the list. Then highlight these cells and change the font's **Style** to **Strike Thru**. the high and low values are 1.45 and 1.2 respectively. They will be the ones to appear at the bottom of the list.



A13

	A	B	C	D	E
1	Period				
2	Name				
3	Time to	Final Velocity	Acceleration along		
4	Travel Along	At the end	the		
5	the Ramp	of the track	Track		
6	(s)	(m/s)	(m/s^2)		
7	1.25				
8	1.3				
9	1.26				
10	~~1.2~~				
11	~~1.45~~				



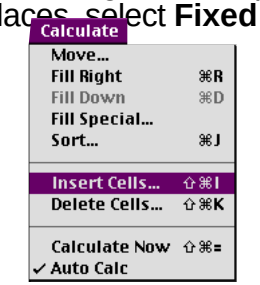


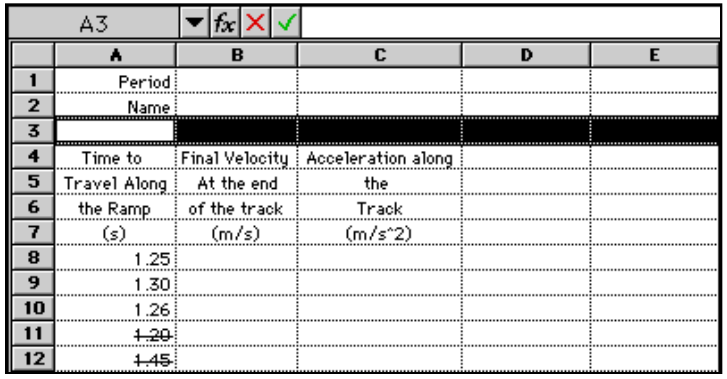
A7 | 1.25

	A	B	C	D	E
1	Period				
2	Name				
3	Time to	Final Velocity	Acceleration along		
4	Travel Along	At the end	the		
5	the Ramp	of the track	Track		
6	(s)	(m/s)	(m/s^2)		
7	1.25				
8	1.30				
9	1.26				
10	1.29				
11	1.45				

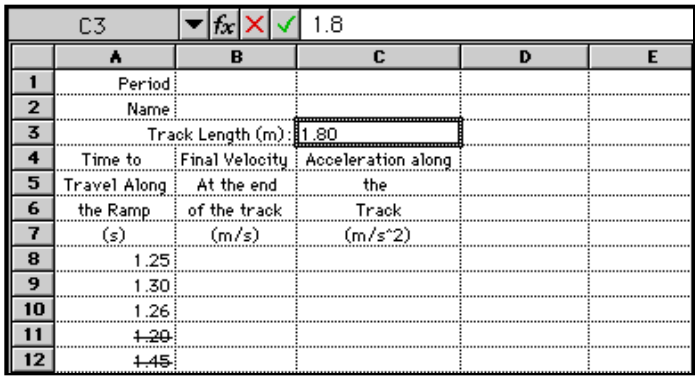
HOW CAN I MAKE ALL MY NUMBERS HAVE THE SAME NUMBER OF DECIMAL PLACES?"

Highlight the cells you want to adjust. From the **Format** menu select **Number**. You have lots of choice from the dialog box that pops up. To fix the number of decimal places, select **Fixed** and in the **Precision** box, enter "**2**."





	A	B	C	D	E
1	Period				
2	Name				
3					
4	Time to	Final Velocity	Acceleration along		
5	Travel Along	At the end	the		
6	the Ramp	of the track	Track		
7	(s)	(m/s)	(m/s^2)		
8	1.25				
9	1.30				
10	1.26				
11	~~1.20~~				
12	~~1.45~~				



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

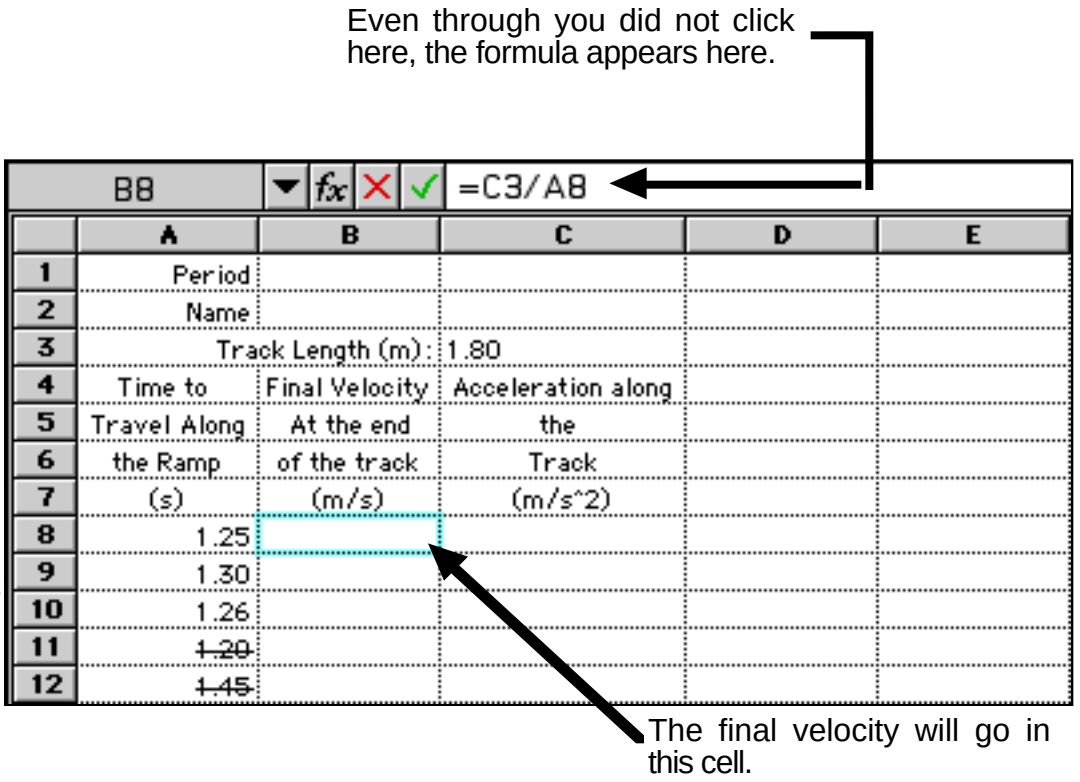
HOW DO I INSERT A ROW SO I CAN LIST MY VARIABLE MEASURED ONLY ONCE?

Click on the row number *BELOW* where you want the row to be inserted. From the **Calculate** menu, select **Insert Cells**.

We want to enter the information that the track length is 1.80 m. And some how indicate that this information was only measured once.

To indicate the information was only measured once, do not put it in a column. To make your spreadsheet look like the one to the right, follow these steps.

- In cell B3 type "**Track Length (m):**"
- Highlight cell B3. From the **Format** menu go down to **Alignment** and over to **Right**.
- In cell C3 type "**1.80**."
- Highlight cell C3. From the **Format** menu go down to **Alignment** and over to **Left**.
- Highlight cell C3. From the **Format** menu go down to **Number**. A new dialog box will appear. To fix the number of decimal places, select **Fixed** and in the **Precision** box, enter "**2**."



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

HOW DO I WRITE A FORMULA IN A CELL?

Every formula begins with an "**=**" sign in the cell. think of the equals sign as saying "cell A1 = ...formula." The average velocity is found from,

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

Click in the cell where you want the formula to appear. Rethink the formula in terms of cells.

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

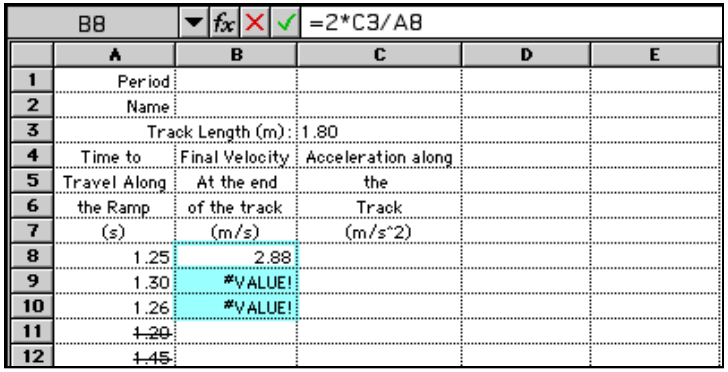
$$v_f \text{ will go in } \underline{\text{cell B8}}$$

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

In cell B8 type the following

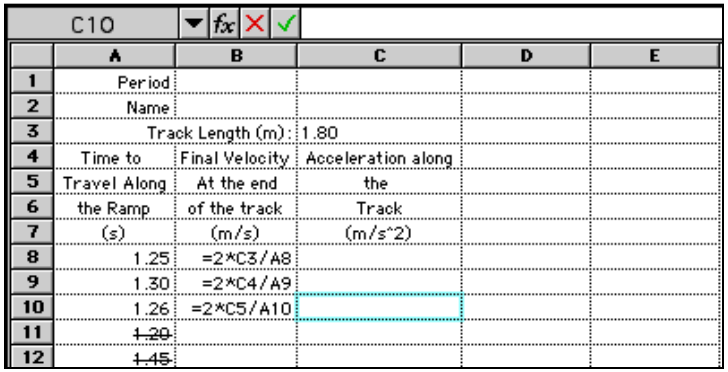
=2*C3/A8

Use the fill down command to copy this formula into the cells below B8. See the next page to do this.



B8 =2*C3/A8

	A	B	C	D	E
1	Period				
2	Name				
3	Track Length (m):		1.80		
4	Time to	Final Velocity	Acceleration along		
5	Travel Along	At the end	the		
6	the Ramp	of the track	Track		
7	(s)	(m/s)	(m/s^2)		
8	1.25	2.88			
9	1.30	#VALUE!			
10	1.26	#VALUE!			
11	~~1.20~~				
12	~~1.45~~				



C10

	A	B	C	D	E
1	Period				
2	Name				
3	Track Length (m):		1.80		
4	Time to	Final Velocity	Acceleration along		
5	Travel Along	At the end	the		
6	the Ramp	of the track	Track		
7	(s)	(m/s)	(m/s^2)		
8	1.25	=2*C3/A8			
9	1.30	=2*C4/A9			
10	1.26	=2*C5/A10			
11	~~1.20~~				
12	~~1.45~~				

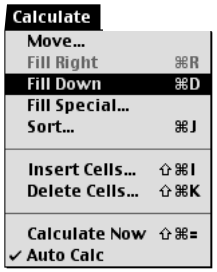
8	1.25	2.88
9	1.30	2.769230769
10	1.26	2.857142857
11	~~1.20~~	
12	~~1.45~~	

This is what the filled cells look like.

8	1.25	=2*$C$3/A8
9	1.30	=2*$C$3/A9
10	1.26	=2*$C$3/A10
11	~~1.20~~	
12	~~1.45~~	

HOW DO I COPY A FORMULA TO OTHER CELLS?

Now suppose you want to copy the formula in cell B8 to the other cells below it, (down through cell B10). Click the mouse in B8 and drag through all cells down to B10. (B8 is the cell whose formula you want to duplicate.) Choose the "**Fill down**" command from the **Calculate** menu. Viola' the formula is now copied to these other cells.



WHAT DOES IT MEAN WHEN THE SPREAD SHEET SAYS "#VALUE!"?

It means something is wrong. Look at the formulae in the cells. That's not what I meant when I typed the formula. This formula has the number first cell being divided by the TEXT cell in another cell. The computer doesn't like to do math with text. In the formulae, the A8, A9, & A10, **cells** are correct. But the C3, C4, & C5, cells should all be the same. Then should all be the same track length. There are two ways to accomplish.

Method 1

Retype each cell with the A8.

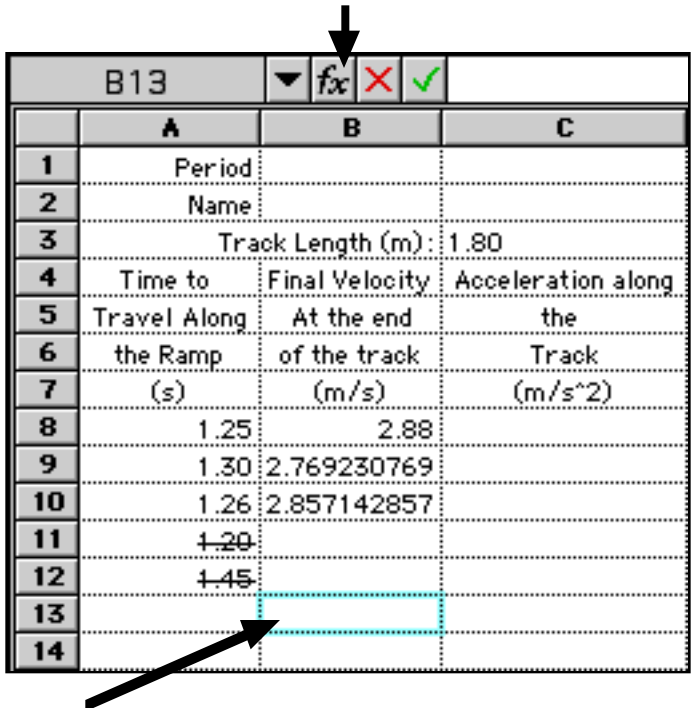
Method 2

In the first cell that was copied change the way it is written. Type the text below

=2*$C$3/A8

The dollar, $, signs tells the computer not to change the "C" column and the "3" row when being copied. Make the change and fill down. This method will can save a lot of time.

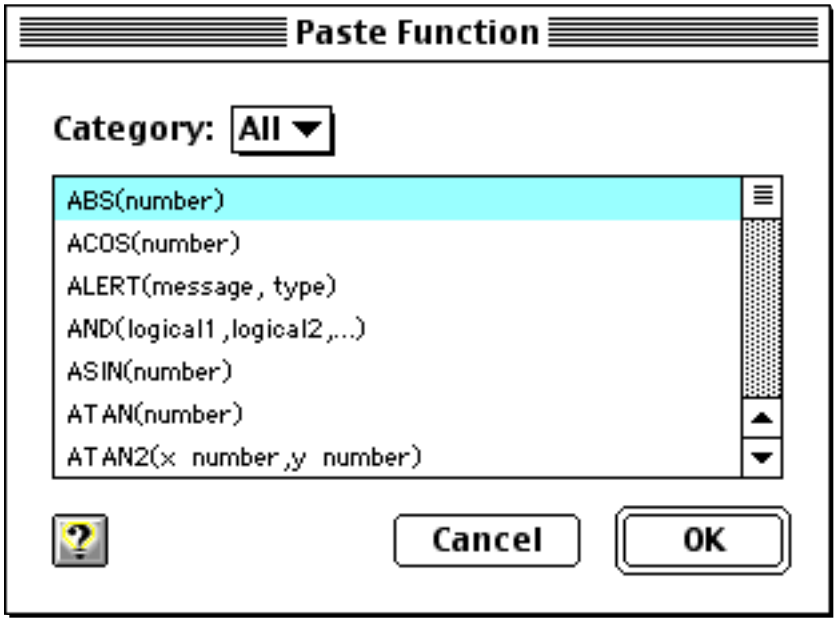
Click here to access the functions.

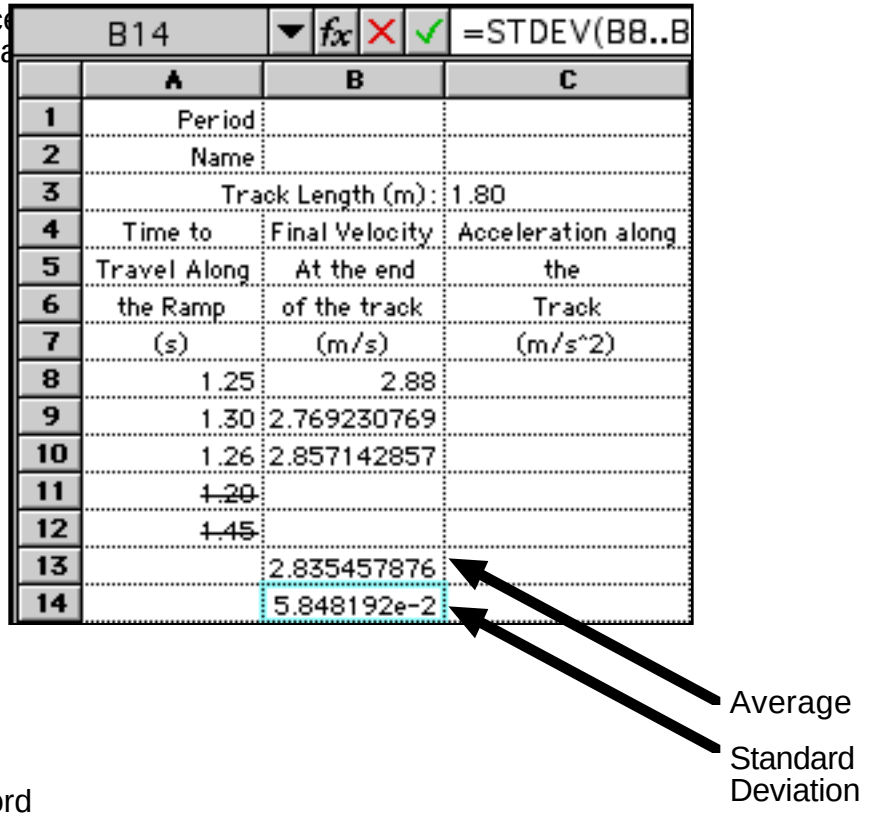


Put the average in this cell and the standard deviation in the cell below.

IS THERE AN EASY WAY TO CALCULATE THE AVERAGE AND STANDARD DEVIATION?

Yes. It is done with functions. First, click the cursor in the ce where you want to use the function. Access the functions menu a shown to the right. The dialog box show below will appear





Once this dialog box appears either scroll down to the word "Average" or type "av" to jump down to the word average. After selecting, "Average," click on the "OK" button. Now edit the formula **as shown on the next page**.

This is done my highlighting the phrase "**number1, number2, ...**" in

AVERAGE(number1,number2,...)

Press the delete key. Drag the cursor from cell B8 down to cell B10. The formula should now look like.

=AVERAGE(B8..B10)

Press the return key. Below the average cell insert the function for the standard deviation called "STDEV." When finished it whould look like

=STDEV(B8..B10)

D15

	A	B	C	D	E
1	Period				
2	Name				
3	Track Length (m):		1.80		
4	Time to	Final Velocity	Acceleration along		
5	Travel Along	At the end	the		
6	the Ramp	of the track	Track		
7	(s)	(m/s)	(m/s^2)		
8	1.25	2.88	2.30		
9	1.30	2.77	2.13		
10	1.26	2.86	2.27		
11	~~1.20~~				
12	~~1.45~~				
13		2.84	2.23	<-Average	
14		0.06	0.09	<-STDEV	

SOME OF MY NUMBERS END IN "e-2." WHAT DOES THIS MEAN?

The "e" in the cell means exponent to the power of 10. For example

5.464e-2 is 5.464 x 10^{-2} which is 0.05464

2.345e-4 is 2.345 x 10^{-4} which is 0.0002345

Make the necessary editing changes to make the spread sheet look like the one to the right.

Hints:

The formula for Acceleration is

$$a = \frac{v_f}{t} \text{ for this exercise}$$

Where the velocity is in the "B" column and the time is in the "A" column.

Use the fill down command to copy the new formula.

Center align the numbers.

Change the number format to Fixed 2 decimal places.

Left align the average and standard deviation labels.

	A	B	C	D	E
1	Period				
2	Name				
3	Track Length (m):		1.80		
4	Time to	Final Velocity	Acceleration along		
5	Travel Along	At the end	the		
6	the Ramp	of the track	Track		
7	(s)	(m/s)	(m/s^2)		
8					
9	1.25	2.88	2.30		
10	1.30	2.77	2.13		
11	1.26	2.86	2.27		

E17

	A	B	C	D	E
1	Period				
2	Name				
3	Track Length (m):		1.80		
4	Time to	Final Velocity	Acceleration along		
5	Travel Along	At the end	the		
6	the Ramp	of the track	Track		
7	(s)	(m/s)	(m/s^2)		
9	1.25	2.88	2.30		
10	1.30	2.77	2.13		
11	1.26	2.86	2.27		
12	~~1.20~~				
13	~~1.45~~				
15		2.84	2.23	<-Average	
16		0.06	0.09	<-STDEV	
17					

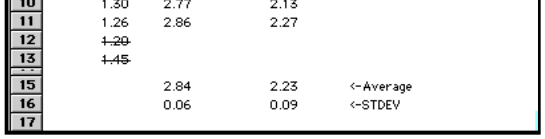
HOW CAN I "DRESS UP" THE SPREAD SHEET?

This can be done by inserting blank skinny rows. Insert a row above the number in row 8. (If you forgot how to insert a row, see the instructions on page 5.)

Change the the inserted rows' height to 6 pts. To do this click on the number "8" at the left. From the **Format** menu select **Row Height...**.

Do the same thing above the row containing the averages. Your spreadsheet should look like the one to the right.

	A	B	C	D	E
1	Period				
2	Name				
3		Track Length (m):	1.80		
4	Time to	Final Velocity	Acceleration along		
5	Travel Along	At the end	the		
6	the Ramp	of the track	Track		
7	(s)	(m/s)	(m/s^2)		
9	1.25	2.88	2.30		
10	1.30	2.77	2.13		
11	1.26	2.86	2.27		
12	~~1.20~~				
13	~~1.45~~				
15		2.84	2.23	<-Average	
16		0.06	0.09	<-STDEV	
17					

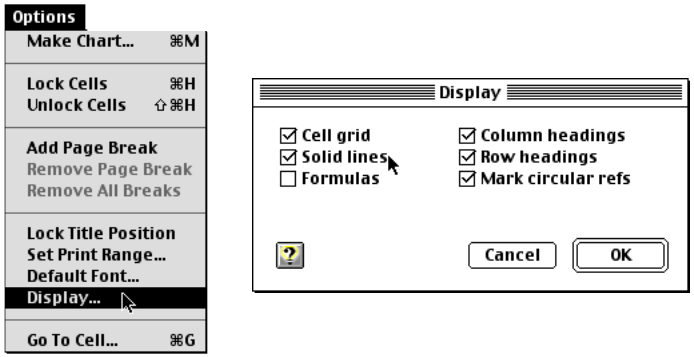


	A	B	C	D	E
1	Period				
2	Name				
3		Track Length (m):	1.80		
4	Time to	Final Velocity	Acceleration along		
5	Travel Along	At the end	the		
6	the Ramp	of the track	Track		
7	(s)	(m/s)	(m/s^2)		
9	1.25	2.88	2.30		
10	1.30	2.77	2.13		
11	1.26	2.86	2.27		
12	~~1.20~~				
13	~~1.45~~				
15		2.84	2.23	<-Average	
16		0.06	0.09	<-STDEV	
17					

	A	B	C	D	E
1	Period				
2	Name				
3		Track Length (m):	1.80		
4	Time to	Final Velocity	Acceleration along		
5	Travel Along	At the end	the		
6	the Ramp	of the track	Track		
7	(s)	(m/s)	(m/s^2)		
9	1.25	2.88	2.30		
10	1.30	2.77	2.13		
11	1.26	2.86	2.27		
12	~~1.20~~				
13	~~1.45~~				
15		2.84	2.23	<-Average	
16		0.06	0.09	<-STDEV	
17					

How do I make the grid into solid lines?

From the **Options** menu select **Display...**. Select solid Lines in the dialog box.



F17

Period
Name
Track Length (m): 1.80

Time to Travel Along the Ramp (s)	Final Velocity At the end of the track (m/s)	Acceleration along the Track (m/s^2)	
1.25	2.88	2.30	
1.30	2.77	2.13	
1.26	2.86	2.27	
~~1.20~~			
~~1.45~~			
	2.84	2.23	<-Average
	0.06	0.09	<-STDEV

HOW CAN I OUTLINE SOME BUT NOT ALL OF CELLS?

STEP 1: Get rid of ALL the lines.

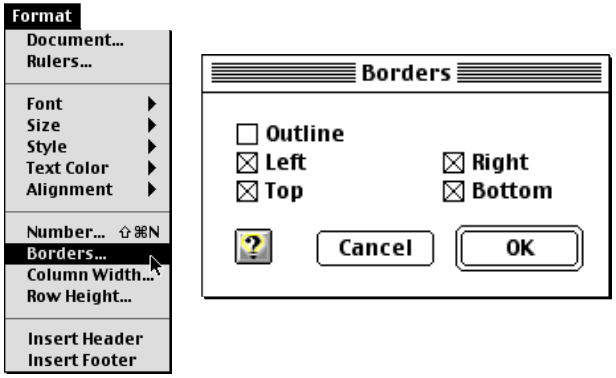
Go back and *uncheck* the **Solid lines** AND **Cell Grid**. The spread sheet will look like the one to the right.

F17

Period
Name
Track Length (m): 1.80

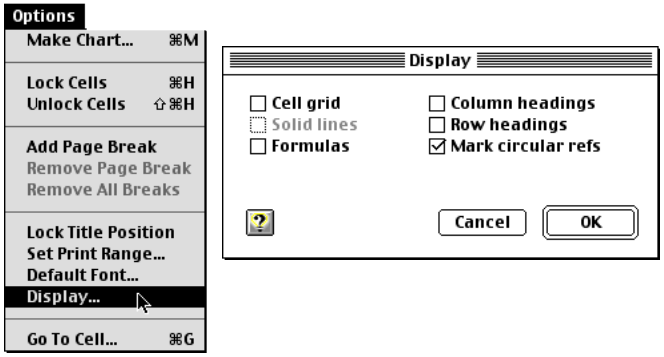
Time to Travel Along the Ramp (s)	Final Velocity At the end of the track (m/s)	Acceleration along the Track (m/s^2)	
1.25	=2*$C$3/A9	=B9/A9	
1.30	=2*$C$3/A10	=B10/A10	
1.26	=2*$C$3/A11	=B11/A11	
~~1.20~~			
~~1.45~~			
	VERAGE(B9..B1	=AVERAGE(C9..C11)	<-Average
	STDEV(B9..B11	=STDEV(C9..C11)	<-STDEV

STEP 2: Put back the lines you want.
Starting at Cell "A4" drag the cursor down to "C16." From the **Format** menu select **Borders...**.



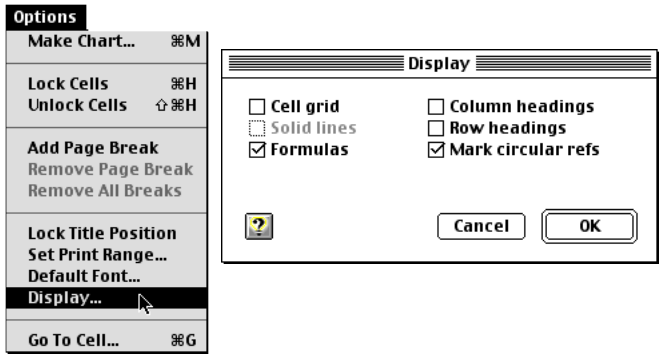
How can I get rid of the row and column letters and numbers?

From the format menu, select **Display**. Uncheck **Column Headings** and **Row Headings**.



How do I print a copy of the spread sheet with the formulae showing?

From the **Options** menu select Display. Click on the box next to **Formulas**. Then print.



What is a “header” and how do I create one?

A “header” is apiece of text that appears at the top of every page. to create a header. From the **Format** menu select **Header**. A The cursor will be placed at the top of the page. You can type anything you like in this space. This text will appear on every page.

The Spreadsheet is too wide for the printer, how can it be printed it sideways?

Printing a page sideways is called prinint in landscape mode. On macs, select Page Setup... from the File menu. Click on the sideways picture labeled “Landscape.” Below is a picture of the screen for an Epson printer. Hunt for the lanscape button for your computer when you do this.