

Microsoft Excel - Introduction

For Microsoft Office 2007

INTRODUCTION	3
HISTORY	3
THE ENVIRONMENT AND INTERFACE	3
DATA TYPES	5
COLUMN WIDTHS AND HEIGHTS	8
FORMATTING THE CONTENTS OF A CELL	10
INSERTING OBJECTS (IMAGES OR CLIP ART)	13
AUTO-FILL	14
CALCULATIONS	17
OPERATORS	17
BODMAS	17
SIMPLE FORMULAS	19
AUTOSUM BUTTON	23
ABSOLUTE VS RELATIVE REFERENCING	26
CREATE AN ABSOLUTE REFERENCE	28
LINKING.....	29
CONDITIONAL STATEMENTS	36
CONDITIONAL FORMATTING	39
V-LOOKUP / H-LOOKUP	40
ENTER A V-LOOKUP	45
INSERT FUNCTION DIALOGUE BOX	52
SORTING & FILTERING	52
USING THE 'SORT A-Z' BUTTON	52
CUSTOM SORTING	52
FILTERING	52
CHARTING.....	53
ASSESSMENTS.....	60
CERTIFICATE I ASSESSMENT	60
PART 4 (<i>PERFORMANCE CRITERIA 4.3, 4.4, 4.5, 5.1, 5.2, 5.3, 5.4</i>)	62
CERTIFICATE II ASSESSMENT	63

Introduction

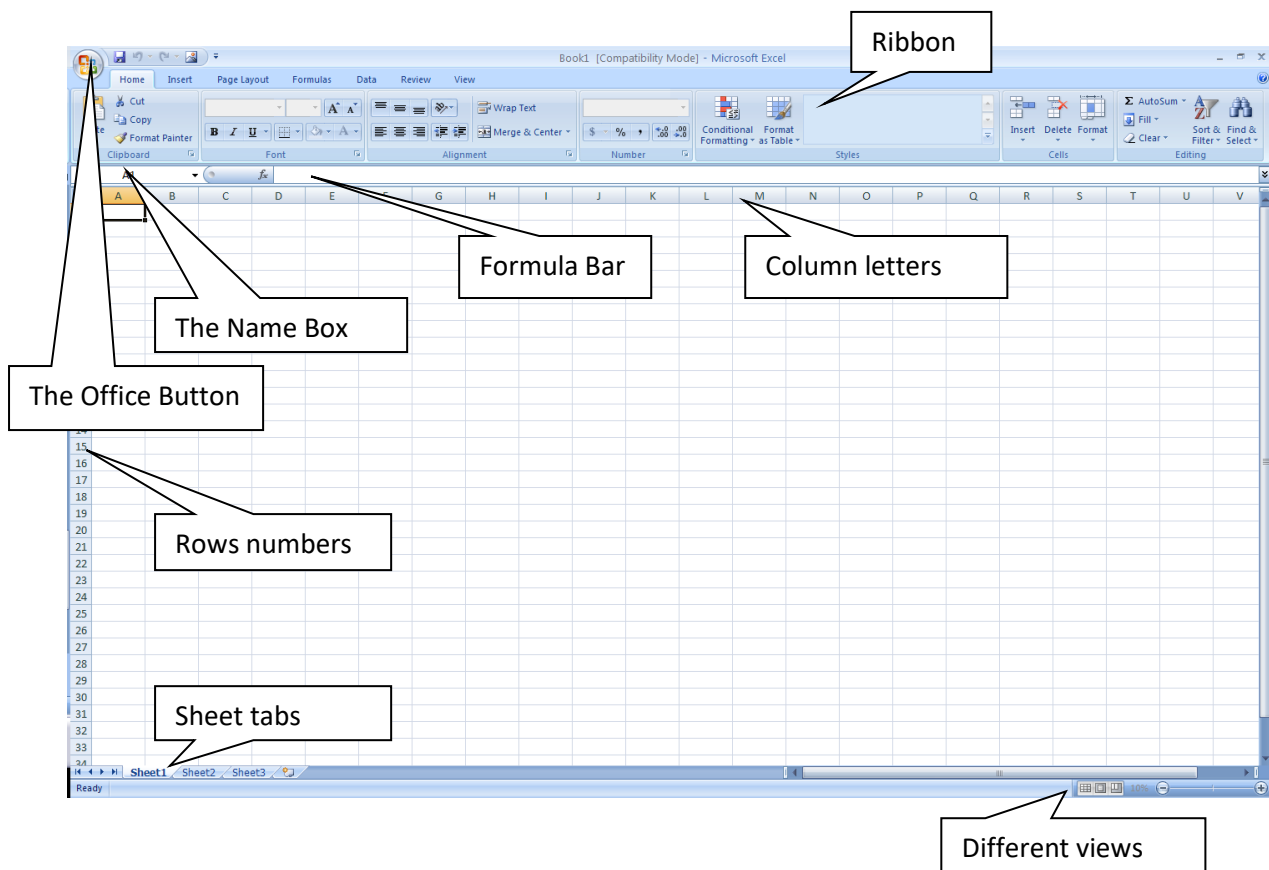
Microsoft Excel is a well respected industry standard accounting and statistical software.

History

Microsoft originally marketed a spreadsheet program called Multiplan in 1982, which became very popular on CP/M systems, but on MS-DOS systems it lost popularity to Lotus 1-2-3. Microsoft released the first version of Excel for the Mac in 1985, and the first Windows version (numbered 2.05 to line up with the Mac and bundled with a run-time Windows environment) in November 1987. Lotus was slow to bring 1-2-3 to Windows and by 1988 Excel had started to outsell 1-2-3 and helped Microsoft achieve the position of leading PC software developer. This accomplishment, dethroning the king of the software world, solidified Microsoft as a valid competitor and showed its future of developing GUI software. Microsoft pushed its advantage with regular new releases, every two years or so. The current version for the Windows platform is Excel 12, also called Microsoft Office Excel 2007. The current version for the Mac OS X platform is Microsoft Excel 2008.

The above text was sourced directly from Wikipedia. To read more about the history of Microsoft Excel follow this link. http://en.wikipedia.org/wiki/Microsoft_Excel

The environment and interface



The Office Button:

The Office Button is where you find document specific functions including Save, Save As, Print, New, Open etc. Also contained in this menu at the bottom is the Excel Options button. Will go over this at a later stage.

The Ribbon:

The new Microsoft Office Ribbon is a new element from Office 2003 to Office 2007. Its aim is to replace the menus with similar functions all contained on a single tab. Each tab is grouped into similar sub-functions.

The Name Box:

The name box is the area where you can define range names, or look up cell references. This can become very useful when creating Vlookups.

The Formula Bar:

Is where a cell's contents data is stored. You can also modify and edit a cell's content or a formula contained in the formula bar.

Column Letters:

Columns are vertical and identified in alphabetical order. Once they reach Z, they then start on AA, then AB etc. The limit of columns is all the way out to XFD! For your information, that is 16384 individual columns – and if you are using this many, chances are you really should be using a different application!

Row Numbers:

Rows are similar to columns, but identified numerically, from row 1 all the way through to row 1,048,576. Rarely will you need to use all these rows.

Sheet Tabs:

A workbook by default will have 3 worksheets. You can manipulate these sheets by right mouse clicking on them and selecting the desired option.

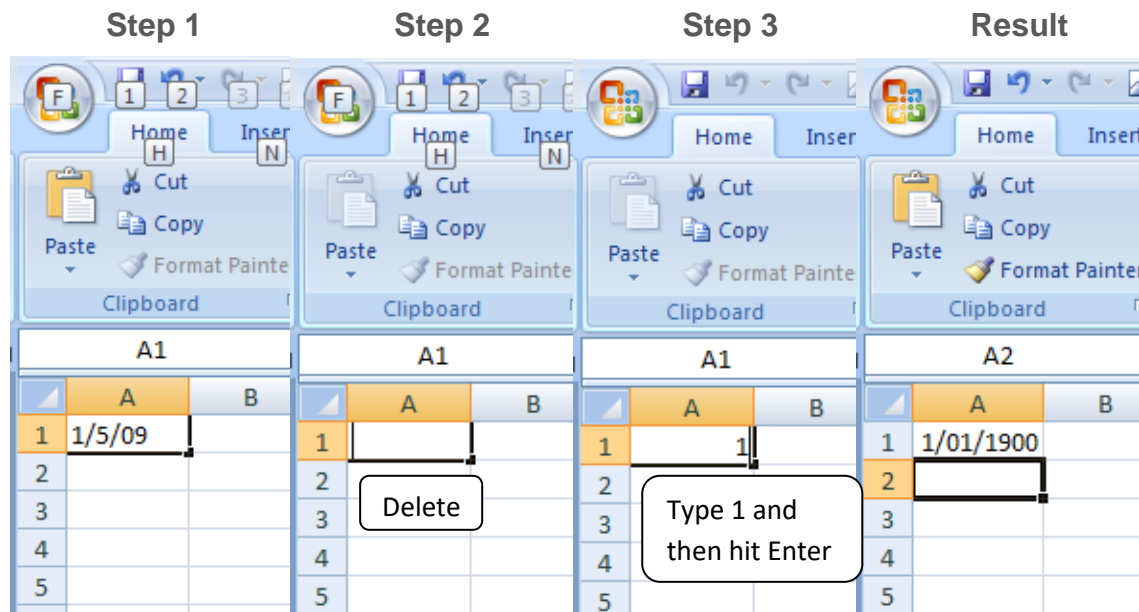
Different Views:

The 'Normal View' is the default view. This is the usual view used when working in Excel. The middle view is 'Page Layout' view – where it actually shows any headers and footers if applied and also page breaks. The right view, 'Page Break' view shows where pages start and finish. In this view you can modify margins etc.

Data Types

Microsoft Excel automatically modifies the data type to what it predicts its intended purpose is. For example, if you typed 11/10/09 into a cell, it would automatically become a date formatted cell.

The problem with this is that even if you select the cell and delete its contents, the formatting remains. Give it a go.



Why did Excel put 1/01/1900 into the cell?

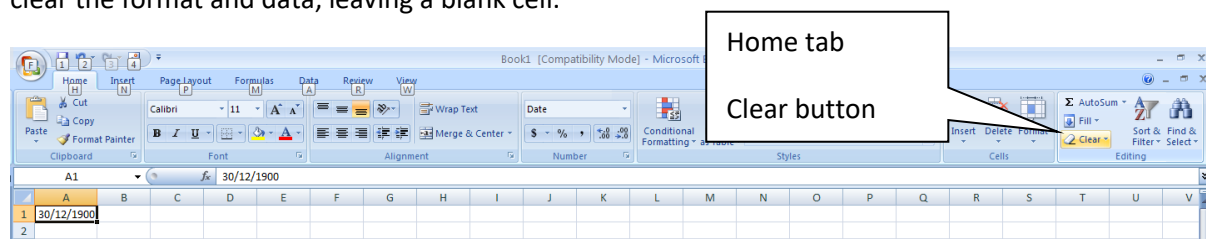
The reason you got this result is because Excel remembered the cell formatting from step 1.

You may be wondering why then did Excel return 1/01/09. Well the answer to this riddle lies in the way Excel works with dates and times internally.

Excel stores all dates and times in a numeric value of how many days since the 1st of January 1900. This is why you got 1/01/1900 for 1. Therefore, if you were to type in 365, you will get: 30/12/1900.

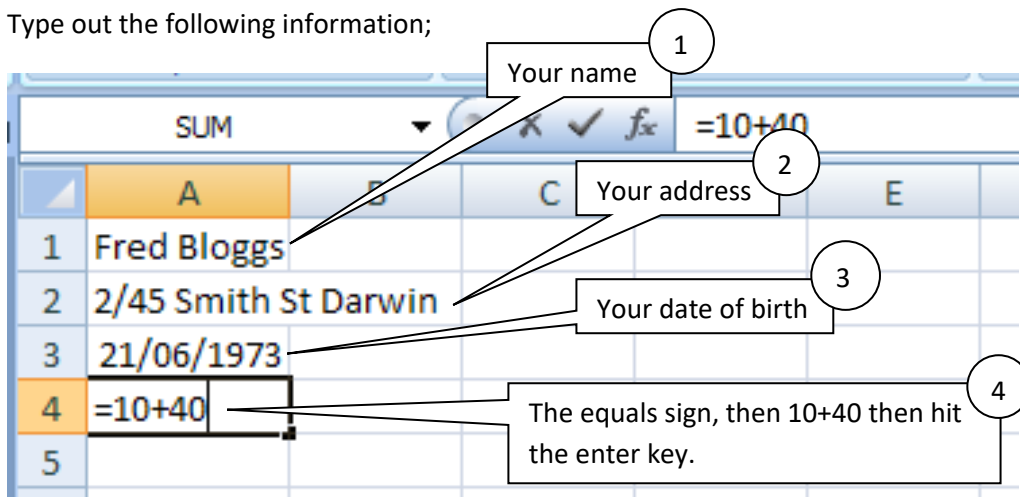
Clearing a cell's format

There will be times where you want to clear a cell's format. There are a couple of options for this and most commonly you can either clear the cell's format, leaving the original raw data, or you can clear the format and data, leaving a blank cell.



Other formats

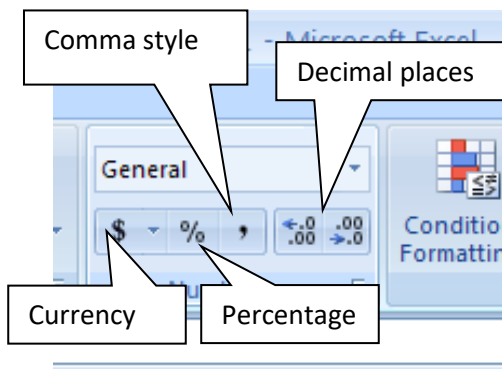
Type out the following information;



- 1 This is a text string. Text automatically aligns left.
- 2 Although this data contains numbers, it is still referenced as a text string.
- 3 As previously mentioned, dates can be formatted in various ways.
Valid formats: 10/2/2002
10/2/02
10/2/2
10-2-02
10 Feb 02
Non-valid formats: 10.2.2002
10\2\02
- 4 This is actually a manual Excel equation.

Note: Depending on how Excel has been installed on your PC, dates must be in the Australian format, for example DD/MM/YYYY and NOT the American format of MM/DD/YYYY.

Other data types



Currency

You can specify specific data types by having the cell selected and then selecting the appropriate option from the Number under the Home tab of the ribbon.

The \$ icon will convert selected cells into currency. This will automatically place a dollar sign in the cell and also make the data accurate to 2 decimal places. This data type will automatically round the displayed amount to a nearest

whole cent. However, no accuracy will be lost when rounding, as any calculations using this data will still be using the un-rounded value.

Percentage

This data type will automatically convert data into a percentage value. Therefore if you had the value 0.45 existing in the cell, then clicked the % icon, it would then display as 45%.

Comma Style

This style will place commas in a numeric value data which usually makes it easier to read.

Decimal Places

By selecting this option you can either increase or decrease the displayed decimal places. If you decrease the number of displayed decimal places, the visible data will automatically round to the nearest whole decimal place, but the value will not lose accuracy. Like the currency type, all subsequent calculations made from the rounded cell will still calculate with the un-rounded value.

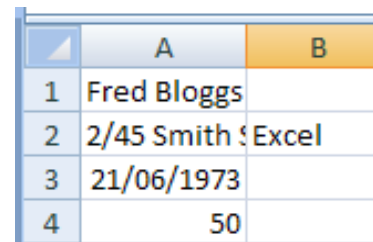
Other types

There are plenty of other display types available in Excel. Click the drop menu which is above the above mentioned icons for more options.

Modifying data

Now, let's look at the example in the last exercise. There are many ways to modify existing data in a cell, but first we must understand how data is actually displayed within cells.

Let's look at the data contained in cell reference A4. It's contents is too large to fit completely in the A2 cell boundaries, but because there is no data in the adjacent cell to the right, the contents from A2 will automatically flow into the adjacent cell. If there was any data at all (including even a space) in B2, this would hide overflow data from A2 and only display the data from B2.



The image shows a small portion of an Excel spreadsheet. The columns are labeled 'A' and 'B'. The rows are numbered 1 through 4. Cell A1 contains 'Fred Bloggs'. Cell A2 contains '2/45 Smith's Excel'. Cell A3 contains '21/06/1973'. Cell A4 contains '50'. The text in cell A2 is too long and wraps into cell B2, which is currently empty.

	A	B
1	Fred Bloggs	
2	2/45 Smith's Excel	
3	21/06/1973	
4	50	

The data contained in A2 has not been lost, only hidden. To display this data all you would need to do would be to widen the column – which is covered later on in this book.

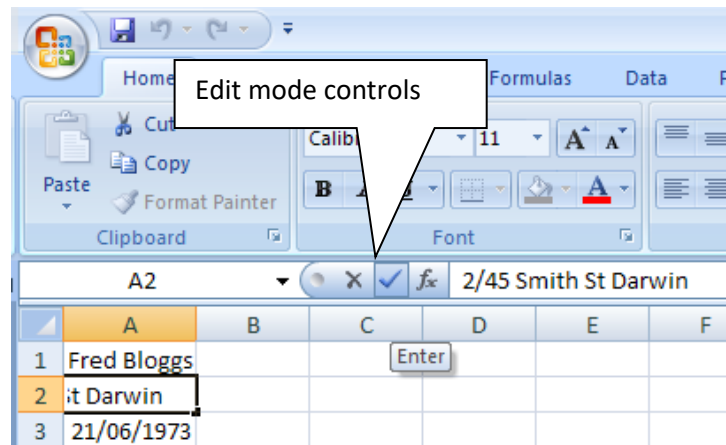
To modify existing data, you can either double click into the cell where you want to modify the data, or alternatively you can single click on to the cell you want to modify and then click into the formula bar and modify directly in the formula bar.

Edit Mode

You will notice that once you start editing, Excel will enter edit mode. While in edit mode, most of the ribbon functions and icons will be greyed out (not available). You will also know you are in edit mode because a cross and a tick will become available next to the formula bar. (See image)

If you are happy with what changes you have made, then you can either hit the 'Enter' button on the keyboard, or alternatively, click the tick icon.

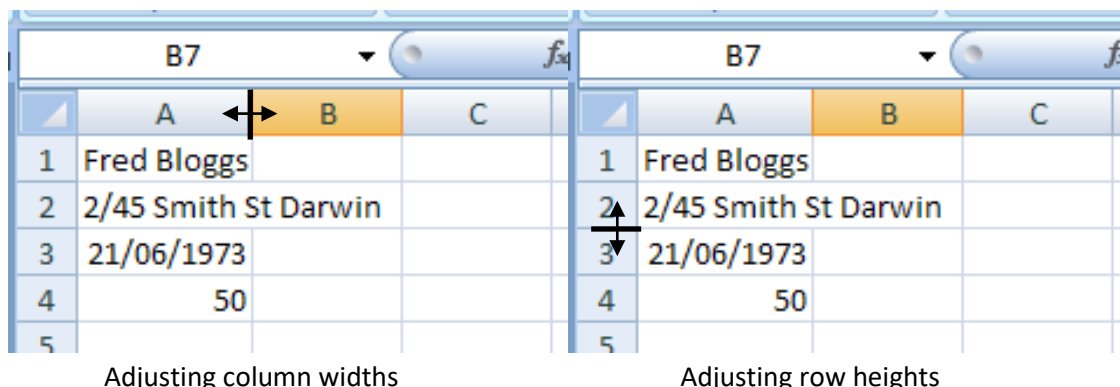
It can sometimes become tricky to edit long entries contained in cells, so another method of editing data is by single clicking into the cell to be changes, and then hitting the F2 (Function 2) key on the keyboard. This automatically turns on edit mode and then locates the cursor at the end of the contents.



Column widths and heights

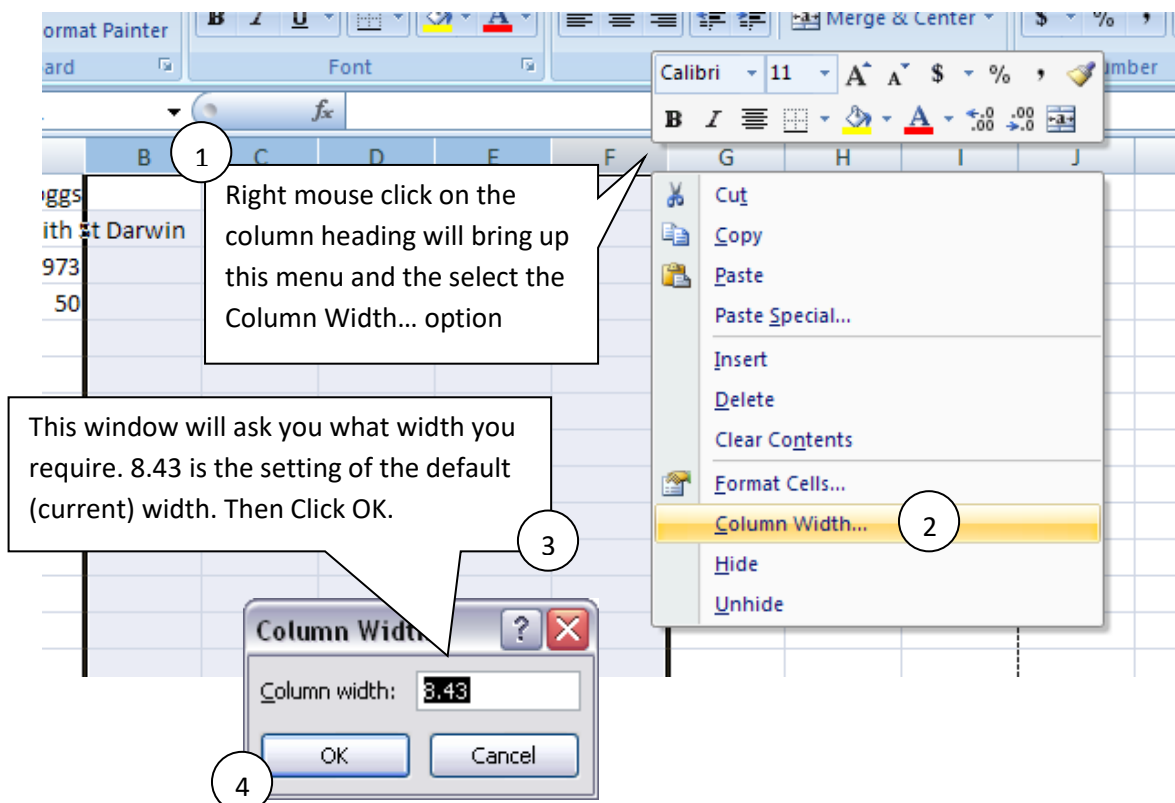
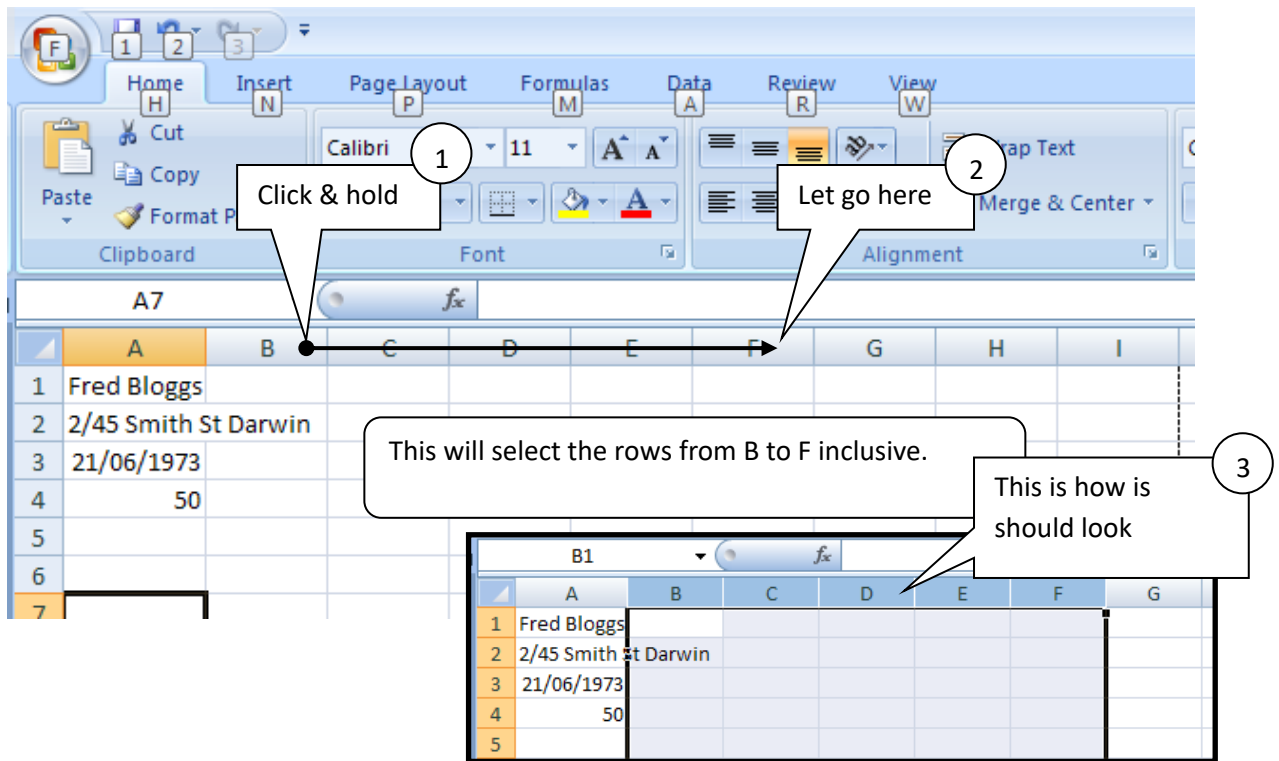
Sometimes it may be necessary to adjust the size of a column or row. You would usually do this to ensure data fits nicely in a cell.

It is quite simple to modify a height or width of any given row or column. All you have to do is place your cursor over the top right label border between the row or column you want to adjust and the adjacent cell to the right or below. You will get a double headed arrow cursor. Once you see the cursor, then you can click, hold and drag the row or column to the height or width desired.



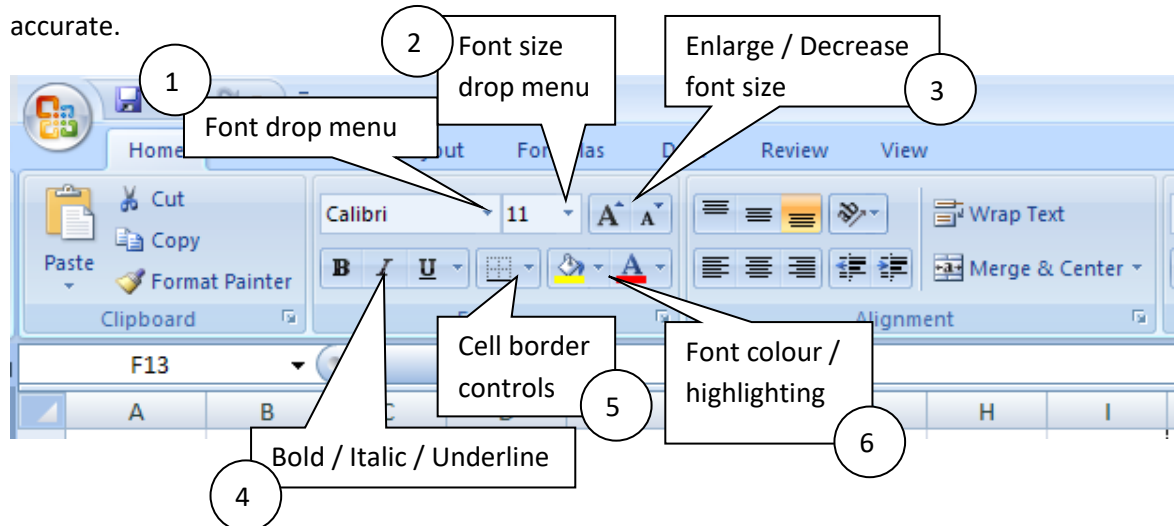
You can also modify the column's width automatically by double clicking between the column labels. This will widen the column to the width of the largest entry.

Sometimes, you may want to have a group of columns or rows exactly the same size. You can do this by selecting the column or row labels and then right clicking and selecting the Column or Row Width option.

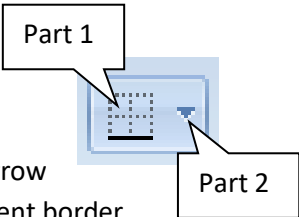


Formatting the contents of a cell

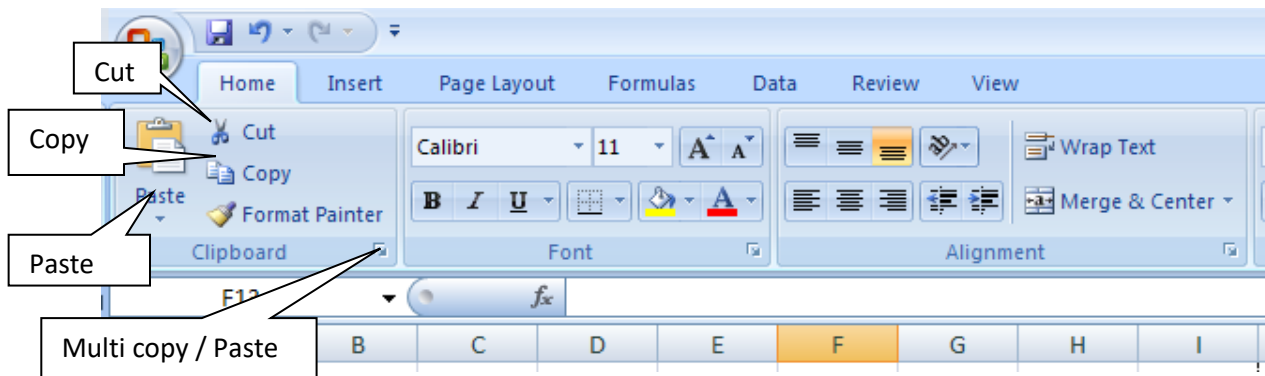
All of the following features are available from the Home tab in the ribbon. These options will only affect how your spreadsheet looks. Saying that, it is very important for your spreadsheet to look professional, and subtle use of colours is recommended. Very bold and bright colours usually will have the affect of removing credibility of the content of your spreadsheet – even if the content is accurate.



Fonts / colours / sizes

- 1 This drop menu will allow you to change the look (the font) of any selected cell or group of cells. Special consideration must be made as to keeping the data easily readable.
- 2 This control will modify the size of the text within a selected cell.
- 3 This feature will automatically increase or decrease the font size in a selected cell by one font size.
- 4 The **B** icon will bold the data contained in a selected cell.
The *I* icon will italicise the data contained in a selected cell.
The U icon will underline the data.
- 5 This control has two parts. The first part, the icon on the left hand side is the last used border control. By clicking this icon, it will apply whatever the icon option that is displayed. To choose a different border option, you will need to click the second part of this control, the down arrow to the right of the icon. This will give you the ability to select many different border display options.
- 6 This option controls the colours of text and the highlight colours of text contained in cells. For example, *this text* has a different font colour, and **this text** has a different highlight colour.

Clipboard



The clipboard section of the Home tab controls the copy / paste functions in Microsoft Excel. These are features that are very frequently used, and behave exactly the same way as they do in other Microsoft Office packages.

Cut

When you have a cell or group of cells selected and click the **'Cut'** icon, this will remove the selected cells from the spreadsheet and place them on the clip board.

Copy

The **'Copy'** icon will place the contents of any selected cell(s) also onto the clipboard, but will leave the original data untouched – hence why it is called 'Copy'.

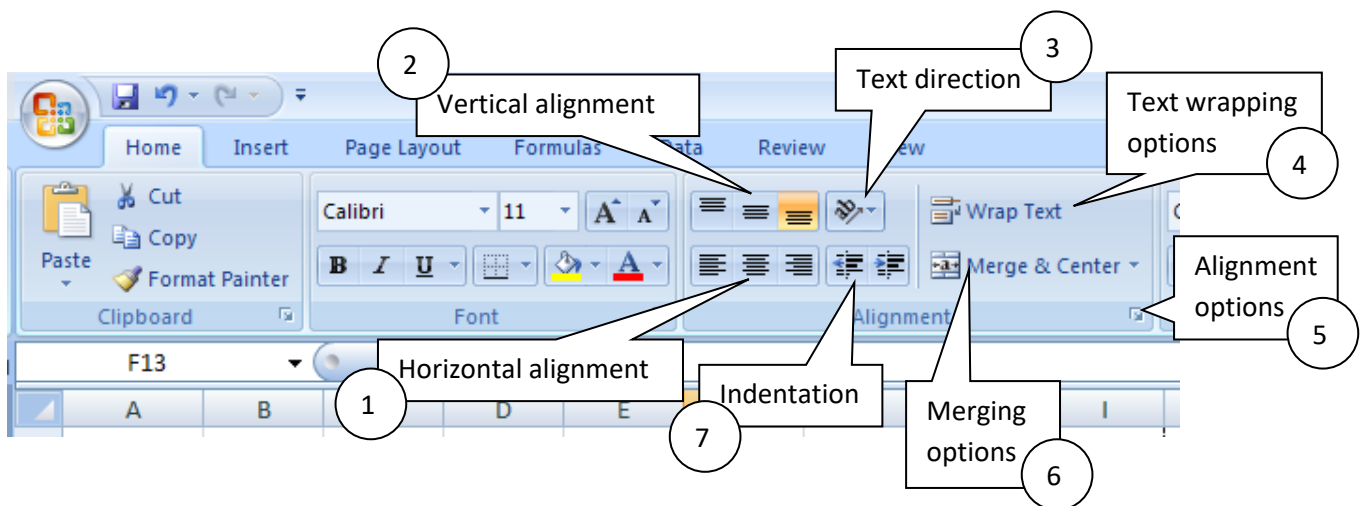
Data on the clipboard will remain there until you cut or copy an additional item. This new data will effectively overwrite the existing clipboard data.

Another thing to remember about the clipboard is that the data stored on the clipboard is available to all applications on your computer, not just Microsoft Excel or Office software and visa-versa. It is completely feasible to select text from a web page, copy it and then paste it into a cell in Microsoft Excel or Word.

Paste

The **'Paste'** option will write what ever the current clipboard data is into the selected cell(s). If you are unsure of the dimensions or number of cells a clipboard item may be, you can select a single cell as the top right starting point of the clipboard item in your worksheet, and then paste as usual.

Alignment

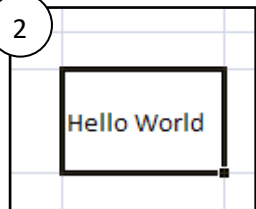
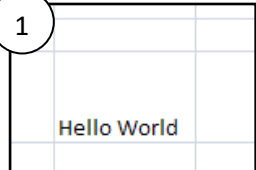


1

The three options here control the horizontal alignment of data within a cell. Left, centre and right alignments. Be warned that if you centre align data, and it is too big for the cell, the data will automatically flow into both left and right adjacent cells.

2

Vertical alignment controls where the data will appear vertically within a cell. Usually, a cell's height is not modified and subsequently, the vertical alignment of a cell is rarely needed. If a cell's height is increased, the data in the cell will remain at the bottom of the cell by default. (See image 1) By selecting the 'Middle Align' option the data will change to image 2. This option is used mostly when creating a heading or title to a spreadsheet.



3

The text direction is used to change the direction of the displayed text usually from horizontal to another angle. See the image to the right. Notice how the days of the week are angled on a slant. You can also use this option to have text display vertically, like tear-off phone numbers on a flyer.

	Monday	Tuesday	Wednesday	Thursday
Fred	38	17.5	38	38
Mike	25	26	40	0
Paul	38	38	25	25

4

Often, there are times when you want to control how text is displayed in a cell if it is too big for a single line. By default, the text will flow into adjacent cells and only display if the adjacent cell is empty. By selecting the 'Wrap Text' option you can control how data which is too big for a cell is displayed. By clicking the button, this will make the large text wrap onto 2 or more lines.

- 5 This little square box, once clicked, will open up the 'Format Cells' dialogue box. From this window, you can modify all the formatting attributes available in Microsoft Excel including all the controls outlined in this section.
- 6 This option is very useful when creating headings or titles for spreadsheets. What it does is merge any selected cells and the centre it's contents. See image 1 with the cells selected, and image 2 after clicking the 'Merge & Center' button.

										1 - Before
ABC Company Hours Worked										
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday			
Fred	38	17.5	38	38	38	38	38			
Mike	25	26	40	0	0	0	0			
Paul	38	38	25	25	25	25	25			

										2 - After
ABC Company Hours Worked										
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday			
Fred	38	17.5	38	38	38	38	38			
Mike	25	26	40	0	0	0	0			
Paul	38	38	25	25	25	25	25			

The tables above illustrate two different ways to represent employee hours worked over a week. The first table shows individual employees' hours by day, while the second table shows the total hours worked per day across all employees.

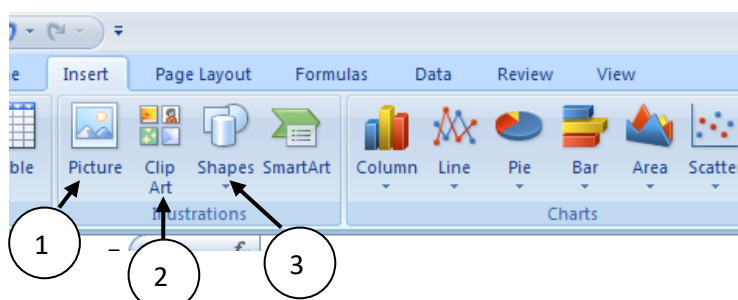
- 7 Indentation is a feature rarely used in Microsoft Excel. It works the same as in other Microsoft Office applications by moving the text (indenting) right a pre-determined space from the left margin of a cell. You can also decrease an indent by clicking the icon on the left.

Inserting Objects (Images or Clip Art)

You can insert pictures into your worksheets by going to the 'Insert' tab in the Ribbon and in the 'Illustrations' group you will find the options to insert a picture, Clip Art, Shape or SmartArt.

The difference between a 'Picture' and a 'Clip Art' is that a picture is a digital image located somewhere on your hard drive. It may be your company's logo, or a digital photograph you have taken. When you click the 'picture' icon (See item 1) a browse dialogue box will open up. Browse for the file you wish to insert and then click the 'OK' button.

Item 2 (in the image) will enable you to insert a clip art image. Clip art images are pre-installed images available for you to use free of charge. These are great if you don't have any images of your own.



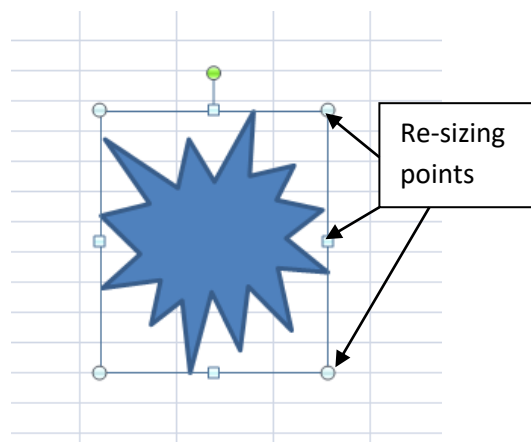
Inserting shapes are a great way to add tips and other items to your page. By clicking on the 'Shapes' icon, see item 3, you will be given a vast variety of shapes and lines for you to choose from. Once you select the type of shape from the drop menu, then you will need to click and drag somewhere in a worksheet where you want the shape to appear.

All images / clip art / shapes once inserted will allow you to modify their shape and size.

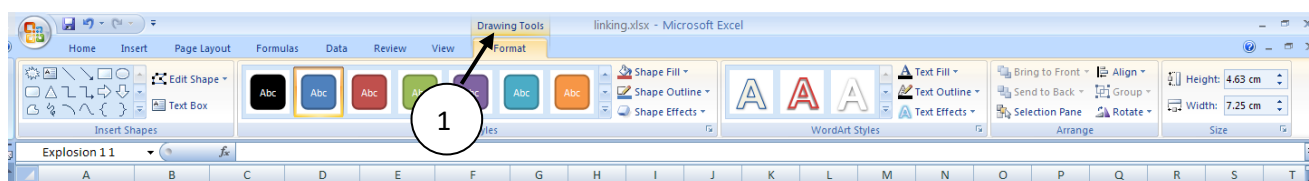
You do this by clicking once on the image / shape and then clicking & holding and then dragging the re-sizing points.

Be careful when re-sizing objects, especially photographs because it is really easy to drag a photograph out of proportions making it look silly.

A way to ensure your image does not re-size out of original proportion is to hold down the 'Shift' key when you drag the bottom right re-sizing point.

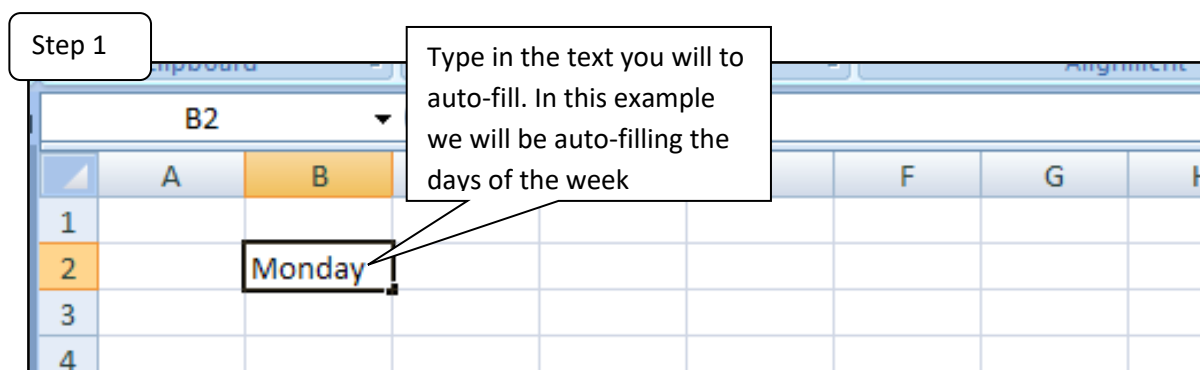


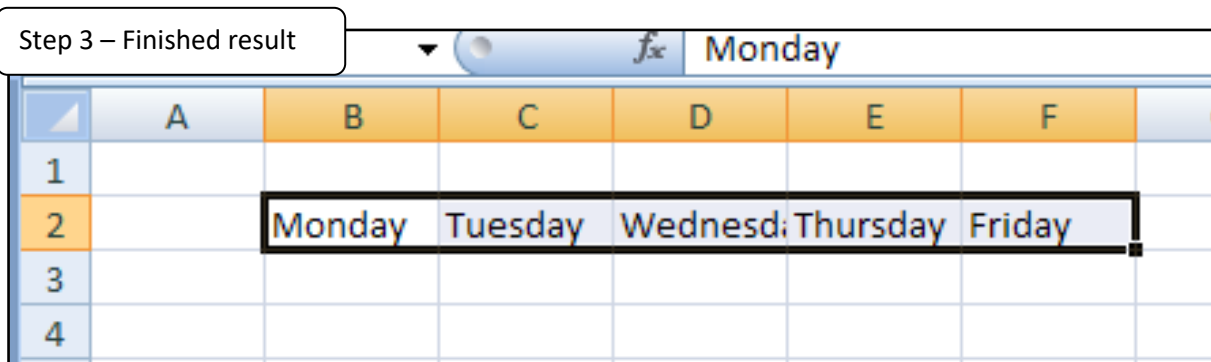
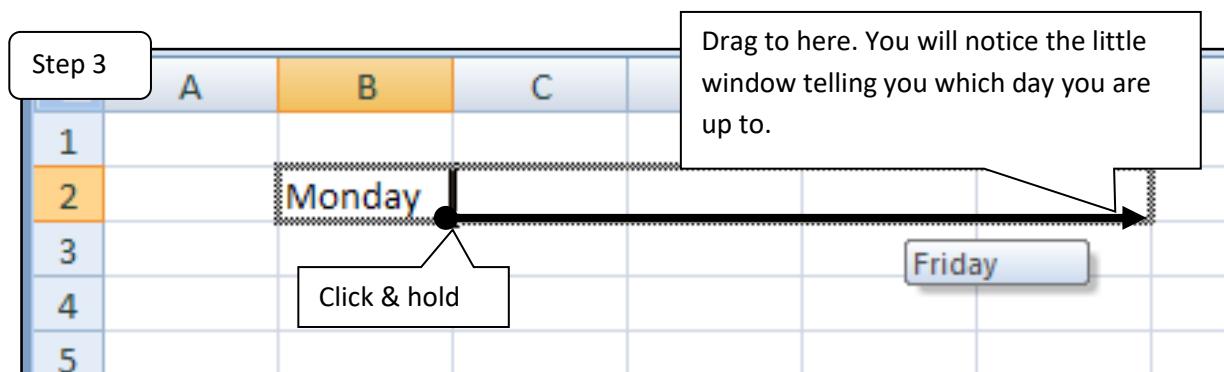
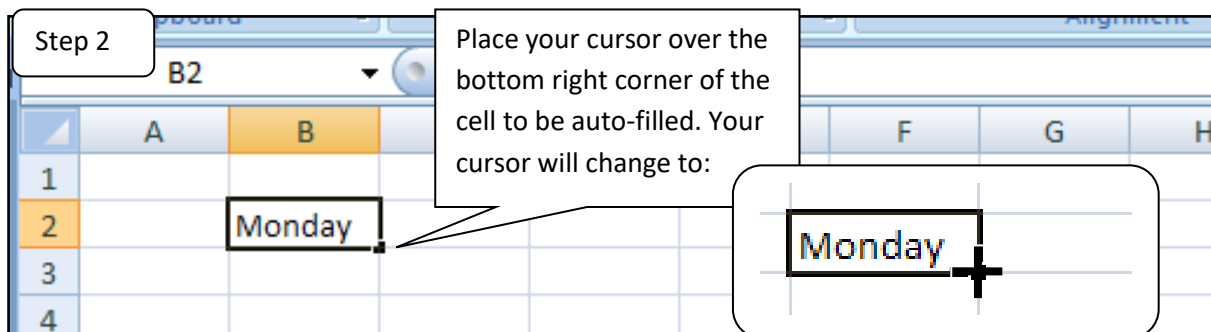
Once you insert an object, a whole set of new tools become available to you called the 'Drawing Tools'. You will notice these when you single click an object. A orange 'Drawing Tools' tab appears at the very top of the ribbon (see item 1). Click on it to reveal many more options that give great control over your objects.



Auto-fill

This is a very useful feature of Microsoft Excel, and once mastered, it will become your best friend. The tool automated mundane tasks such as typing out the days of the week, or month and many other functions.





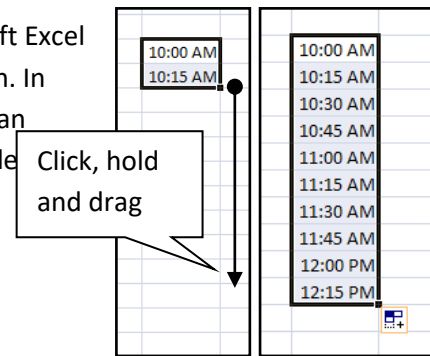
In the above example we did a horizontal auto-fill. This example and all others, auto-fills can also be dragged vertically so they will appear from top to bottom.

Other auto-fills available by default include;

- January, February...
- Jan, Feb...
- Mon, Tue...
- Quarter 1, Quarter 2...
- Qtr 1, Qtr2..

- 9 am, 10am... and many more.

You also have the option to create other types of auto-fills. Microsoft Excel can recognise a pattern, and it will auto-fill according to that pattern. In the below image you can see different types of auto-fills. To create an auto-fill to your pattern, you need to create the first two entries, select both these cells and the auto-fill like normal.



Have a go yourself!

	A	B	C	D	E	F	G	H	I
1									
2		Monday	January	1-Jan	Jan-01	Quarter 1	Qtr 1		1
3		Tuesday	February	2-Jan	Feb-01	Quarter 2	Qtr 2		1.5
4		Wednesday	March	3-Jan	Mar-01	Quarter 3	Qtr 3		2
5		Thursday	April	4-Jan	Apr-01	Quarter 4	Qtr 4		2.5
6		Friday	May	5-Jan	May-01	Quarter 1	Qtr 1		3
7		Saturday	June	6-Jan	Jun-01	Quarter 2	Qtr 2		3.5
8		Sunday	July	7-Jan	Jul-01	Quarter 3	Qtr 3		4
9		Monday	August		Aug-01	Quarter 4	Qtr 4		4.5
10		Tuesday	September		Sep-01				5
11			October						5.5
12			November						
13			December						
14									
15									

Result

Type the first entry of each of these and then auto-fill them down.

Calculations

Microsoft Excel is an exceptional application for working out complex mathematical equations. It strictly adheres to mathematical theory, the same that you will have learnt at school. One thing to note in an Excel equation (called a formula) is that the equals sign always appears at the left of the equation.

Operators

An operator in Microsoft Excel is a symbol that is used in a mathematical equation. Some look the same as the ones you know already, but others are slightly different.

- + Addition, Adds one value to another (example: $20 = 10+10$)
- Subtraction, minus one value from another (example: $10 = 20-10$)
- * Multiplication, multiplies one value to another (example: $50 = 5*10$)
- / Division, dividing one number from another (example: $10 = 100/10$)
- ^ To the power of (example: $100 = 10^2$)
- () Brackets are used in equations needing to implement BODMAS (example: $40 = (10+10)*2$)

BODMAS

BODMAS are the instructions which enables us to know exactly the right sequence of doing things mathematically. In particular electronic calculators have to use a rule to know which answer to calculate when given a string of numbers to add, subtract, multiply, divide etc.

Brackets

According to the rule, the B, for *brackets* must always be done first. If there are multiple sets of brackets, the most inner brackets need to be done first. The brackets part of the BODMAS rule is the most often forgotten rule. Think of brackets as a way of isolating a particular part of an equation to ensure that part of the equation is worked out independently of the rest of the equation first.

Order

Order is actually a poor word to use here, “*Power*” would have been a better choice, but BODMAS just does not have the same ring to it! Some secondary schools have substituted the O, for *Order* with an I for *Indices*, which is a more technical term meaning exactly the same thing. So if you know anyone in high school, they may refer to BODMAS as BIDMAS!

If something is to the order of, it means to the power of. For example, 10 to the order of 2 is the same as 10 to the power of 2, which is the same as 10 squared (10^2). All these terms mean the same thing and they all equal 100! Another example would be 10 to the order of 3. This is really 10 cubed (10^3), which is 10 multiplied by 10 multiplied by 10 which equals 1000.

BODMAS

B – Brackets

O – Order

D – Division

M – Multiplication

A – Addition

S - Subtraction

Division

Division and multiplication have the same ranking in the BODMAS rule. You do each part of the equation as you read it from left to right. Division uses the forward slash key (/) on a computer and an example of this would be $=40/10$ and this would equal 4.

Multiplication

Again, this has the same ranking as Division and is calculated as you read it from left to right. Multiplication uses the Asterisk key (*) on a computer and an example of this would be $=5*10$ and this would equal 50.

Addition

Addition adds two or more numbers together. Like Multiplication and division, Addition and subtraction have the same ranking in the BODMAS rule and are worked out as you read them from left to right. An example would be $=10+5$ and this equals 15.

Subtraction

Subtraction minuses the second number from the first number. An example of this would be $=10-4$ and this would equal 6. Like Multiplication and division, Addition and subtraction have the same ranking in the BODMAS rule and are worked out as you read them from left to right.

You probably understand BODMAS already but just don't know it as BODMAS.

Here is an example of how you would use BODMAS in everyday life. Let's say you make t-shirts for sale at the local markets. You buy your t-shirts in bulk from China for \$4.50 each. You spend about \$0.50 on paint and transfers for each t-shirt, so in reality, each t-shirt's cost price is \$5.00. Now, let's say you sell 10 t-shirts at \$15.00 each. How much profit have you made? If you answered \$100.00 you are correct.

Here are the formulas;

CP- Cost price (\$5.00) = Wholesale price (\$4.50) + Transfer & Paint (\$0.50)
SP – Sale Price (\$15.00) – what you are selling the t-shirts for
US – Units sold (10)

Therefore the correct formula would be (Sale Price – Cost Price) * Units Sold.

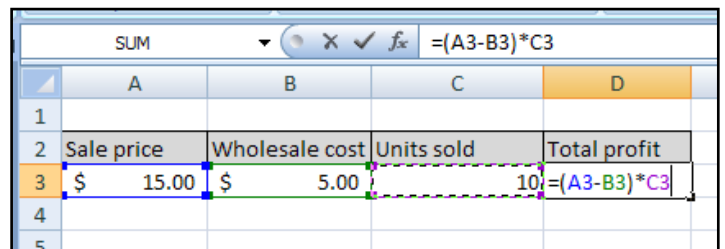
If there were no brackets in the above formula, the order the equation would be worked out would be incorrect and give a wrong answer. The brackets force the equation to work out what the profit per t-shirt is, and then it multiplies that amount by the units sold. If the brackets did not exist, the equation would first multiply the cost price by the units sold, and then minus this amount from the sale price of one t-shirt.

Simple formulas

In Microsoft Excel formulas can be added directly into a cell by starting the equation with an equals sign. This is very effective at working out a very simple problem, but let's say, if the values used in this equation need to be changed at a latter date. You would need to find the cell containing the equation, modify the cell's contents while hoping not to make a mistake or delete other parts of the equation.

A better way is to separate each of the formula's elements into their own cells, and then work out the answer but not referring to the actual value contained in the cell, but the cell's reference. The advantages of this method is that you can actually see the different parts of the equation which make up the overall answer, and also, you can modify the actual values and the formula will not be changed. Therefore, using this method, you can create dynamic spreadsheets which you can use over and over.

You build your formula by first clicking in the cell you want the answer to appear. Then type in the equals sign. The next step is to make the equation. You need to open the bracket, then using your mouse, click into the cell reference A2, then hit the minus key then click into B2 then close the bracket.



	A	B	C	D
1				
2	Sale price	Wholesale cost	Units sold	Total profit
3	\$ 15.00	\$ 5.00	10	= (A3-B3)*C3
4				
5				

After this you need to insert the multiply operator (*) then using your mouse, click into the cell C3. Hit enter, and this will work out your equation.

Have a go yourself!

Try these exercises. Type out this layout, then follow the steps.

The screenshot shows an Excel spreadsheet with the following data and callouts:

Dave's T-Shirt Shoppe					
	Wholesale Price	Mark-up	Retail Price	Units Sold	Gross Profit
Plain White T-Shirt	\$ 4.50	250%			
T-Shirt with 1 Transfer (sml)	\$ 5.00	300%			
T-Shirt with 1 Transfer (lge)	\$ 5.25	300%			
T-Shirt with 2 Transfers (sml)	\$ 5.50	350%			
T-Shirt with 2 Transfers (lge)	\$ 6.00	350%			
Sweat-shirt with transfers	\$ 12.50	300%			
Jumper with painted picture	\$ 17.50	300%			
			Total		
			Average sale price		

Callout boxes and their instructions:

- Title is centred and the cells are merged. Font is Berlin Sans FB size 20.** (Points to the title row)
- Titles have a different background colour** (Points to the title row)
- Solid colour in the background of the title** (Points to the title row)
- Think border around the outside** (Points to the outer border of the spreadsheet)
- Thin borders within the spreadsheet** (Points to the grid lines)
- Middle vertical alignment in these cells** (Points to the 'Total' and 'Average sale price' rows)
- Format the columns appropriately** (Points to the data columns)

Have you missed anything? Once you have completed this task, save it as t-shirt_shop.xlsx. We will be using it latter in another exercise.

The screenshot shows the same Excel spreadsheet with numbered steps for entering a formula:

- Click in this cell once.** (Points to cell B10)
- Click in this cell once. This will let Excel know that is this the first cell to use in your formula** (Points to cell B3)
- Then hit the * key on the keyboard.** (Points to the multiplication key on the keyboard)
- Click in this cell once. This will let Excel know that is this the second cell to use in your formula** (Points to cell B4)
- Then hit the Enter key on the keyboard to complete the formula** (Points to the Enter key on the keyboard)

Additional callouts for formula entry:

- Click in this cell once. Hit the equals (=) sign on the keyboard. Excel now knows you are entering in a formula.** (Points to cell B10)

Your spreadsheet should now look like this;

	A	B	C	D	E	F
1	Dave's T-Shirt Shoppe					
2		Wholesale Price	Mark-up	Retail Price	Units Sold	Gross Profit
3	Plain White T-Shirt	\$ 4.50	250%	\$ 11.25		
4	T-Shirt with 1 Transfer (sml)	\$ 5.00	300%			
5	T-Shirt with 1 Transfer (lge)	\$ 5.25	300%			
6	T-Shirt with 2 Transfers (sml)	\$ 5.50	350%			
7	T-Shirt with 2 Transfers (lge)	\$ 6.00	350%			
8	Sweat-shirt with transfers	\$ 12.50	300%			
9	Jumper with painted picture	\$ 17.50	300%			
10				Total		
11						
12				Average sale price		
13						

Now, work out the remaining retail prices. This will be good revision of the last exercise. Once you have finished that, add the units sold. You can just enter these in link normal.

After the units sold have been entered, we are now ready to work out the gross profit for each category. For the Plain White T-Shirts, the formula will be: $=(D3-B3)*E3$

Work out the rest of the values for Gross Profit.

Retail Price	Units Sold	Gross Profit
11.25	23	
15.00	42	
15.75	17	
19.25	21	
21.00	19	
37.50	32	
52.50	7	

All we have to do now is work out the total units sold by adding up the values in column 'E' and also the Gross Profit and Average sale price.

Clipboard Font Alignment Number						
SUM X ✓ fx =E3+E4+E5+E6+E7+E8+E9						
	A	B	C	D	E	F
1	Dave's T-Shirt Shoppe					
2				Retail Price	Units Sold	Gross Profit
3	Plain White T			11.25	23	\$ 155.25
4	T-Shirt with 1			15.00	42	\$ 420.00
5	T-Shirt with 1			15.75	17	\$ 178.50
6	T-Shirt with 2			19.25	21	\$ 288.75
7	T-Shirt with 2			21.00	19	\$ 285.00
8	Sweat-shirt w			37.50	32	\$ 800.00
9	Jumper with			52.50	7	\$ 245.00
10				=E3+E4+E5+E6+E7+E8+E9		
11						
12				Average sale price		
13						

Click into E10 and the click the equals sign (=) then mouse click into E3, then hit the plus (+) key, the click into the E4 cell, hit the plus key etc. Once you have all the cells in your equation, finish the formula by hitting the Enter key on the keyboard. This should give you 161.

Do the same for the Gross Profit column. This should equal \$2,372.50

The final part of this exercise is to work out the average sale price and have it display in the relevant cell in the spreadsheet.

Follow these steps.

Dave's T-Shirt Shoppe

Retail Price	Units Sold	Gross Profit
\$ 11.25	23	\$ 155.25
\$ 15.00	42	\$ 420.00
\$ 15.75	17	\$ 178.50
\$ 19.25	21	\$ 288.75
\$ 21.00	19	\$ 285.00
\$ 37.50	32	\$ 800.00
\$ 52.50	7	\$ 245.00
Total	161	\$ 2,372.50

First, click where you want the answer to appear, in this case the F12 cell. Start the equation by hitting the equals key (=).
 Now, single click into the total gross profit, cell (F10). Enter the Divide operator (forward slash key on the keyboard - /), then single click into the total units sold cell reference (E10). Finish the formula by hitting the Enter key on the keyboard.
 The correct answer should be \$14.74.

Formula: $\text{Average Sale Price} = \frac{\text{Total Gross Profit}}{\text{Total Units Sold}} = \frac{F10}{E10}$

And that's it! The beauty of this spreadsheet is that the entries are dynamic. This enables you to modify prices and quantities, and the spreadsheet will still return you the correct answer.

We'll give it a go. The supplier in China has had to put their prices up. Enter the following data into your existing spread sheet.

	New Wholesale Price	Units sold
Plain White T-Shirt	\$ 4.75	20
T-Shirt with 1 Transfer (sml)	\$ 5.75	55
T-Shirt with 1 Transfer (lge)	\$ 6.25	19
T-Shirt with 2 Transfers (sml)	\$ 6.50	12
T-Shirt with 2 Transfers (lge)	\$ 7.25	17
Sweat-shirt with transfers	\$ 14.95	40
Jumper with painted picture	\$ 27.50	16

What was your overall profit? _____

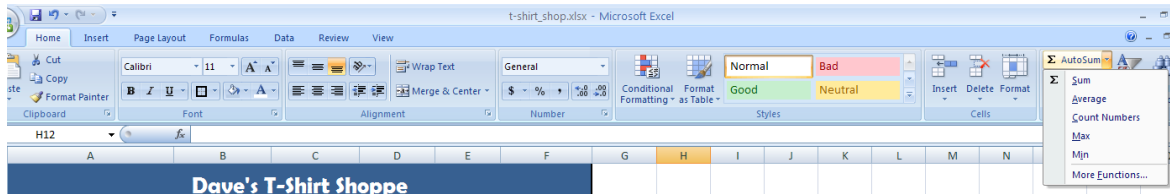
What was your average sale amount? _____

From this, you may identify a need to modify your mark-up percentages and lower them to help keep your retail prices to a minimum. From a business point of view, this is called absorbing costs – something businesses try not to do too much!

Once you have completed this exercise, click the save icon and close the file down.

AutoSum Button

The auto-sum is one of those magnificent functions you will come to love. It automates many tasks in Microsoft Excel. The actual function of auto-sum is only one of many handy little functions that are grouped together in this icon.



There are two parts to this icon which is located on the Home tab of the ribbon. The first part, the left hand side of the icon will, when clicked apply the AutoSum function to wherever the selected cell is. If you want to use one of the many other functions, you will need to click the down arrow on the right side of this icon. As you can see from the above image, there are many features available, and we will be going over some of them in this part of the manual.

Essentially, to AutoSum is to add a group of numbers up. When clicked, the function will look for two or more or more subsequent numeric values above the selected cell. If two or more values don't exist, the function will look horizontally for values to add up. Once it identifies some values to add up, it places a dotted line around the values it predicts you wish to have added. Be careful that you actually check where Excel is predicting because it may include values you were not intending to include.

Have a go yourself!

Type this data out on a new sheet

Type these figures out onto a new workbook.

	A	B	C	D	E	F	G	H
1		Jan	Feb	Mar	Apr	May	Jun	Total
2	Coffee	\$ 42,512.00	\$ 39,520.00	\$ 38,560.00	\$ 40,120.00	\$ 42,563.00	\$ 62,502.00	
3	Cakes	\$ 12,050.00	\$ 11,290.00	\$ 10,589.00	\$ 11,950.00	\$ 12,470.00	\$ 15,478.00	
4	Cold Drinks	\$ 8,002.00	\$ 6,320.00	\$ 6,359.00	\$ 7,590.00	\$ 8,965.00	\$ 9,584.00	
5	Savoury	\$ 6,500.00	\$ 5,980.00	\$ 4,785.00	\$ 6,250.00	\$ 7,489.00	\$ 10,250.00	
6	Internet Café	\$ 850.00	\$ 845.00	\$ 925.00	\$ 1,205.00	\$ 1,520.00	\$ 2,450.00	
7	Total							
8								

Continue...

1 Click into this cell (H2)

Make sure the dotted line is only selecting the values you want to add up

3

Click the AutoSum icon

2

Click Enter to finalise

4

	A	B	C	D	E	F	G	H
1		Jan	Feb	Mar	Apr	May	Jun	Total
2	Coffee	\$ 42,512.00	\$ 39,520.00	\$ 38,560.00	\$ 40,120.00	\$ 42,563.00	\$ 62,502.00	=SUM(B2:G2)
3	Cakes	\$ 12,050.00	\$ 11,290.00	\$ 10,589.00	\$ 11,950.00	\$ 12,470.00	\$ 15,478.00	SUM(number1, (number2), ...)
4	Cold Drinks	\$ 8,002.00	\$ 6,320.00	\$ 6,359.00	\$ 7,590.00	\$ 8,965.00	\$ 9,584.00	
5	Savoury	\$ 6,500.00	\$ 5,980.00	\$ 4,785.00	\$ 6,250.00	\$ 7,489.00	\$ 10,250.00	
6	Internet Café	\$ 850.00	\$ 845.00	\$ 825.00	\$ 1,205.00	\$ 1,520.00	\$ 2,450.00	

This will have automatically added up all the numeric values in Row 2. The actual function will look like this: =SUM(B2:G2)

By placing the word SUM after the equals sign, it instructs Microsoft Excel to call one of its inbuilt functions, the Sum function. The two references separated by a colon mean to include all references from the first reference cell to the second reference cell.

For example =SUM(B2,C2,D2,E2,F2,G2) is exactly the same as writing =SUM(B2:G2). I know which one I'd prefer to use.

Now continue on with doing the second row, and then the third etc.

Continue...

You will need to re-drag to select new values to use in the AutoSum function.

Be careful once you are up to the third row as there are now two values available vertically. The AutoSum looks vertically first by default.

	A	B	C	D	E	F	G	H
1		Jan	Feb	Mar	Apr	May	Jun	Total
2	Coffee	\$ 42,512.00	\$ 39,520.00	\$ 38,560.00	\$ 40,120.00	\$ 42,563.00	\$ 62,502.00	\$ 265,777.00
3	Cakes	\$ 12,050.00	\$ 11,290.00	\$ 10,589.00	\$ 11,950.00	\$ 12,470.00	\$ 15,478.00	\$ 73,827.00
4	Cold Drinks	\$ 8,002.00	\$ 6,320.00	\$ 6,359.00	\$ 7,590.00	\$ 8,965.00	\$ 9,584.00	=SUM(H2:H3)
5	Savoury	\$ 6,500.00	\$ 5,980.00	\$ 4,785.00	\$ 6,250.00	\$ 7,489.00	\$ 10,250.00	SUM(number1, (number2), ...)
6	Internet Café	\$ 850.00	\$ 845.00	\$ 825.00	\$ 1,205.00	\$ 1,520.00	\$ 2,450.00	
7	Total							

Time to use Auto-fill

This is also a great time to use Auto-fill. You really only need to complete the total for the Coffee sales. Once the answer is in the cell, click and drag the auto-fill handle down line in the previous exercises and it will actually automatically complete the rest of the equations.

Another way!

Another method of using the AutoSum button, and probably the quickest and best way is to select all the cells on the spreadsheet up and including where you want the answer to go.

	A	B	C	D	E	F	G	H
1		Jan	Feb	Mar	Apr	May	Jun	Total
2	Coffee	\$ 42,512.00	\$ 39,520.00	\$ 38,560.00	\$ 40,120.00	\$ 42,563.00	\$ 62,502.00	
3	Cakes	\$ 12,050.00	\$ 11,290.00	\$ 10,589.00	\$ 11,950.00	\$ 12,470.00	\$ 15,478.00	
4	Cold Drinks	\$ 8,002.00	\$ 6,320.00	\$ 6,359.00	\$ 7,590.00	\$ 8,965.00	\$ 9,584.00	
5	Savoury	\$ 6,500.00	\$ 5,980.00	\$ 4,785.00	\$ 6,250.00	\$ 7,489.00	\$ 10,250.00	
6	Internet Café	\$ 850.00	\$ 845.00	\$ 925.00	\$ 1,205.00	\$ 1,520.00	\$ 2,450.00	
7	Total							
8								

Once all the cells are selected (including where you want the answers to go) then single click the AutoSum icon.

The result

	B	C	D	E	F	G	H
1	Jan	Feb	Mar	Apr	May	Jun	Total
2	Coffee	\$ 42,512.00	\$ 39,520.00	\$ 38,560.00	\$ 40,120.00	\$ 42,563.00	\$ 265,777.00
3	Cakes	\$ 12,050.00	\$ 11,290.00	\$ 10,589.00	\$ 11,950.00	\$ 12,470.00	\$ 73,827.00
4	Cold Drinks	\$ 8,002.00	\$ 6,320.00	\$ 6,359.00	\$ 7,590.00	\$ 8,965.00	\$ 46,820.00
5	Savoury	\$ 6,500.00	\$ 5,980.00	\$ 4,785.00	\$ 6,250.00	\$ 7,489.00	\$ 41,254.00
6	Internet Café	\$ 850.00	\$ 845.00	\$ 925.00	\$ 1,205.00	\$ 1,520.00	\$ 7,795.00
7	Total	\$ 69,914.00	\$ 63,955.00	\$ 61,218.00	\$ 67,115.00	\$ 73,007.00	\$ 435,473.00
8							

Now, if you had know about the AutoSum function earlier, the exercise which required you to add up all the totals would have been much easier.

Have a go yourself!

Open up the previously saved spreadsheet t-shirt_shop.xlsx. Delete all the total values like the image below.

1		Jan	Feb	Mar	Apr	May	Jun	Total
2	Coffee	\$ 42,512.00	\$ 39,520.00	\$ 38,560.00	\$ 40,120.00	\$ 42,563.00	\$ 62,502.00	
3	Cakes	\$ 12,050.00	\$ 11,290.00	\$ 10,589.00	\$ 11,950.00	\$ 12,470.00	\$ 15,478.00	
4	Cold Drinks	\$ 8,002.00	\$ 6,320.00	\$ 6,359.00	\$ 7,590.00	\$ 8,965.00	\$ 9,584.00	
5	Savoury	\$ 6,500.00	\$ 5,980.00	\$ 4,785.00	\$ 6,250.00	\$ 7,489.00	\$ 10,250.00	
6	Internet Café	\$ 850.00	\$ 845.00	\$ 925.00	\$ 1,205.00	\$ 1,520.00	\$ 2,450.00	
7	Total							
8								

Using the AutoSum function, you should be able to work out all the totals in this spreadsheet in two (2) clicks!

	A	B	C	D	E	F	G	H
1		Jan	Feb	Mar	Apr	May	Jun	Total
2	Coffee	\$ 42,512.00	\$ 39,520.00	\$ 38,560.00	\$ 40,120.00	\$ 42,563.00	\$ 62,502.00	\$ 265,777.00
3	Cakes	\$ 12,050.00	\$ 11,290.00	\$ 10,589.00	\$ 11,950.00	\$ 12,470.00	\$ 15,478.00	\$ 73,827.00
4	Cold Drinks	\$ 8,002.00	\$ 6,320.00	\$ 6,359.00	\$ 7,590.00	\$ 8,965.00	\$ 9,584.00	\$ 46,820.00
5	Savoury	\$ 6,500.00	\$ 5,980.00	\$ 4,785.00	\$ 6,250.00	\$ 7,489.00	\$ 10,250.00	\$ 41,254.00
6	Internet Café	\$ 850.00	\$ 845.00	\$ 925.00	\$ 1,205.00	\$ 1,520.00	\$ 2,450.00	\$ 7,795.00
7	Total	\$ 69,914.00	\$ 63,955.00	\$ 61,218.00	\$ 67,115.00	\$ 73,007.00	\$ 100,264.00	\$ 435,473.00
8								

Absolute Vs Relative referencing

So far during this manual you have been applying relative referencing without even knowing it. Relative referencing is the most common of all references in Microsoft Excel.

To explain how it works, let's look at example 1.

The formula to work out the amount o Super is the Gross Income multiplied by the super rate.

You can actually see the referencing my having the cell D5 selected (where the formula is in the image) and then going to the Formulas Tab, then clicking on the Trace Precedents button. (See example 2)

	C	D	E
Super Rate	9%		
	Gross Income	Super	
Fred Bloggs	\$ 750.00	=C5*C2	
Jane Smiff	\$ 775.00		
Peter Lee	\$ 495.00		

Example 2

Result

Super Rate	9%	
	Gross Income	Super
Fred Bloggs	\$ 750.00	\$ 67.50
Jane Smiff	\$ 775.00	
Peter Lee	\$ 495.00	

Currently there is no problem with our formula. The logic (the maths) is correct, and it has given us the correct answer. Currently the referencing is relative.

A relative reference is one which is understood by Microsoft Excel as being a specific number of cells from the cell which contains the formula. In our superannuation example Microsoft Excel does not pay much attention to the actual cell references contained in your formula, rather, their relative reference. Therefore to Excel, the equation is =1 column to the left * 1 column left and 4 rows up.

Super Rate	9%	
	Gross Income	Super
Fred Bloggs	\$ 750.00	\$ 67.50
Jane Smiff	\$ 775.00	
Peter Lee	\$ 495.00	

You are probably asking why this is so important because up until now, all of our equations have worked. Well, referencing only becomes important when using the AutoFill option on your equations.

	Jan	Feb	Mar	Apr	May	Jun	Total
2 Coffee	\$ 42,512.00	\$ 39,520.00	\$ 38,560.00	\$ 40,120.00	\$ 42,563.00	\$ 62,502.00	\$ 265,777.00
3 Cakes	\$ 12,050.00	\$ 11,290.00	\$ 10,589.00	\$ 11,950.00	\$ 12,470.00	\$ 15,478.00	
4 Cold Drinks	\$ 8,002.00						
5 Savoury	\$ 6,500.00					\$ 10,250.00	
6 Internet Café	\$ 850.00					\$ 2,450.00	
7 Total							
8							

Let's look back at one of our earlier spreadsheets.

The reason the AutoFill worked is because in the first answer all the cell references were in the correct position on all the subsequent AutoFilled cells. They were all calculating what 6 columns to the left through to 1 column to the left added up to. These were all relative referenced cells.

Turning our attention back to our Superannuation spreadsheet, let's see what happens if you try to AutoFill the answers.

As you can see by the result, we ended up with an answer we may not have been expecting, and obviously it is incorrect.

The result under Fred Bloggs's Super amount has a value of '\$ -'. As stated earlier, this is because the cell references being used to calculate the answer are referred to relative from the cell which will display the

Before

Super Rate	9%	
	Gross Income	Super
Fred Bloggs	\$ 750.00	\$ 67.50
Jane Smiff	\$ 775.00	
Peter Lee	\$ 495.00	

Result

Super Rate	9%	
	Gross Income	Super
Fred Bloggs	\$ 750.00	\$ 67.50
Jane Smiff	\$ 775.00	\$ -
Peter Lee	\$ 495.00	#VALUE!

answer. In this case, the formula will be looking for one column left and 4 rows above multiplied by one column to the left.

We need some method of locking a value so it does not move when being auto filled.

Create an Absolute Reference

It is time to create an absolute reference! As demonstrated in the examples previously, there are times when you need to lock a cell's reference so it will not accidentally move during an auto fill task.

There are various ways to create an absolutely referenced cell, but we will show you the two most common ways.

Using a shortcut key

To use a shortcut key, first you must identify the cell in your equation which you wish to absolute reference.

Pay particular attention the formula. In the previous example, the superannuation rate cell C2 is the cell in the equation needing to be absolutely referenced. At the moment, the formula is relatively referenced. See step 1.

Now, in the formula bar, we need to click on the cell reference in the formula bar we wish to absolutely reference. The cursor can be either before the 'C', or in between the 'C' and the '2' or after the '2'. As long as the cursor is touching the cell reference. See step 2.

The final step of this is to click the 'F4' key. This will place a dollar sign before each portion of that cell's reference. There will now be a '\$' symbol before the column reference '\$C' and also a '\$' symbol before the row reference '\$2'. This is telling Microsoft Excel that the cell can not be auto-filled either horizontally nor vertically. See step 3.

If you keep hitting the 'F4' key, this will cycle through all the different references available. This other references are called partial references and are covered in more advanced classes.

The diagram illustrates the process of creating an absolute reference in three steps:

- Step 1:** The formula bar shows `=C5*C2`. The spreadsheet shows a table with columns A, B, C, and D. Row 2 contains 'Super Rate' in B2 and '9%' in C2. Row 5 contains 'Fred Bloggs' in B5, '\$ 750.00' in C5, and '\$ 67.50' in D5. A callout 'Selected cell' points to C2.
- Step 2:** The formula bar shows `=C5*c2`. The cursor is positioned on the 'c2' in the formula bar. A callout says: 'Notice how my cursor is on the cell reference I wish to absolutely reference.'
- Step 3:** The formula bar shows `=C5*C2`. A callout 'F4' points to the formula bar, and another callout says: 'Notice how the cell reference has changed.'

Creating an absolute reference manually

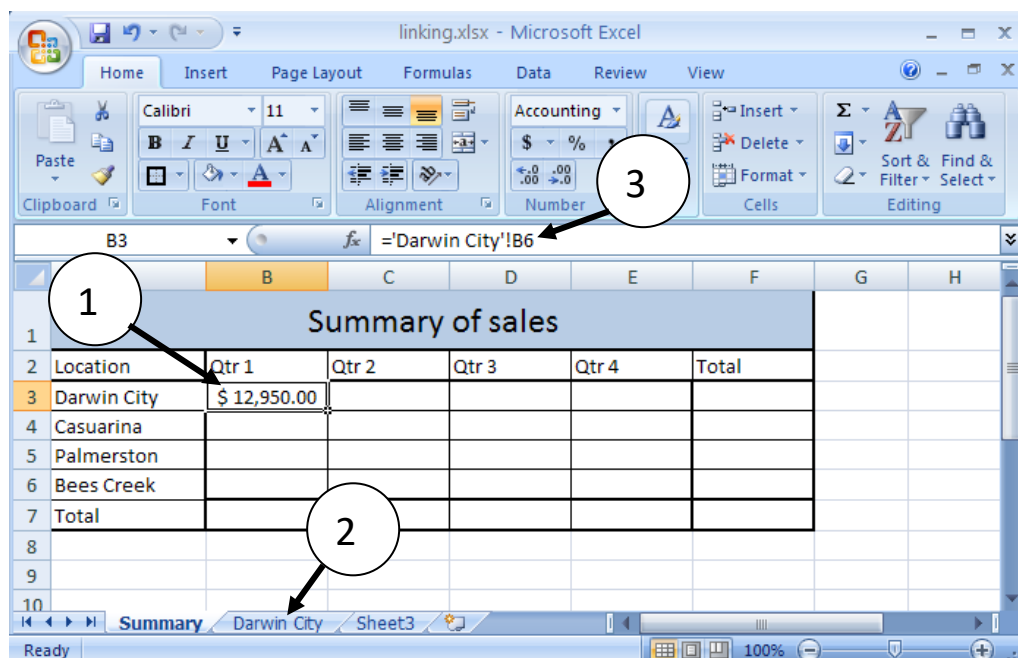
Creating a manual absolute reference is exactly the same as the above procedure, but instead of hitting the 'F4' key, you actually manually type the dollar signs '\$' where you require them in the formula bar.

Linking

Linking is a feature that is useful if you require the value of one cell from a different worksheet or even different workbook to appear in your worksheet.

This task is achieved by clicking into the cell where you want the linked value to appear, then clicking the equals sign '='. You will now need to navigate to the worksheet that contains the cell you wish to link from. You now need to single click into the cell and then click the 'Enter' key.

This will produce a cell reference as illustrated in the below image.



In this reference, the cell 'B3' (see item 1)– the selected cell is displaying the contents of a cell which is located on the 'Darwin City' sheet (see item 2) at a cell reference of 'B6' (see item 3).

Have a go yourself!

Create a set of worksheets for a franchise computer sales / repair company.

Create each of the below sheets. Change each of the worksheet tabs to be the same as the location of the franchise business. You can change these by right clicking on the tab you want to change, and then select the option to rename.

linking.xlsx - Microsoft Excel

Home Insert Page Layout Formulas Data Review View

Calibri 11

General

Summary of sales

Location	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
Darwin City					
Casuarina					
Palmerston					
Bees Creek					
Total					

Summary Darwin City Casuarina Palmerston

linking.xlsx - Microsoft Excel

Home Insert Page Layout Formulas Data Review View

Calibri 11

General

Darwin City Store

Product	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
Systems	\$ 25,600.00	\$ 27,500.00	\$ 22,350.00	\$ 32,500.00	\$ 107,950.00
Parts	\$ 6,500.00	\$ 6,300.00	\$ 6,800.00	\$ 5,220.00	\$ 24,820.00
Labour	\$ 15,600.00	\$ 15,600.00	\$ 15,600.00	\$ 17,250.00	\$ 64,050.00
Total	\$ 47,700.00	\$ 49,400.00	\$ 44,750.00	\$ 54,970.00	\$ 196,820.00

Summary Darwin City Casuarina Palmerston

linking.xlsx - Microsoft Excel

HomeInsertPage LayoutFormulasDataReviewView

Clipboard

Font

Alignment

Number

Styles

Cells

Editing

F9

	A	B	C	D	E	F
1	Casuarina Store					
2	Product	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
3	Systems	\$ 32,500.00	\$ 33,250.00	\$ 31,000.00	\$ 39,250.00	\$ 136,000.00
4	Parts	\$ 7,500.00	\$ 7,250.00	\$ 7,000.00	\$ 7,850.00	\$ 29,600.00
5	Labour	\$ 18,500.00	\$ 18,500.00	\$ 18,500.00	\$ 18,500.00	\$ 74,000.00
6	Total	\$ 58,500.00	\$ 59,000.00	\$ 56,500.00	\$ 65,600.00	\$ 239,600.00
7						
8						
9						
10						
11						

SummaryDarwin CityCasuarinaPalmerston

Ready100%

linking.xlsx - Microsoft Excel

HomeInsertPage LayoutFormulasDataReviewView

Clipboard

Font

Alignment

Number

Styles

Cells

Editing

F9

	A	B	C	D	E	F
1	Palmerston Store					
2	Product	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
3	Systems	\$ 12,560.00	\$ 13,250.00	\$ 13,000.00	\$ 13,250.00	\$ 52,060.00
4	Parts	\$ 2,500.00	\$ 2,250.00	\$ 3,125.00	\$ 3,000.00	\$ 10,875.00
5	Labour	\$ 5,320.00	\$ 5,125.00	\$ 5,125.00	\$ 5,125.00	\$ 20,695.00
6	Total	\$ 20,380.00	\$ 20,625.00	\$ 21,250.00	\$ 21,375.00	\$ 83,630.00
7						
8						
9						
10						
11						

Darwin CityCasuarinaPalmerstonBees Cr

Ready100%

Bees Creek Store					
Product	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
Systems	\$ 6,530.00	\$ 12,500.00	\$ 7,500.00	\$ 10,250.00	\$ 36,780.00
Parts	\$ 4,850.00	\$ 5,250.00	\$ 6,350.00	\$ 6,000.00	\$ 22,450.00
Labour	\$ 4,300.00	\$ 2,980.00	\$ 2,980.00	\$ 4,300.00	\$ 14,560.00
Total	\$ 15,680.00	\$ 20,730.00	\$ 16,830.00	\$ 20,550.00	\$ 73,790.00

Now, we need to link up all the individual store information onto the Summary worksheet.

XYZ Computers Summary of sales					
Location	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
Darwin City					
Casuarina					
Palmerston					
Bees Creek					
Total					

By clicking the equals sign, you will place the cell into edit mode. Not only can you create your own formulas and equations, but you can also tell Microsoft Excel to display the contents of another cell (Linking) in the selected cell.

Start the link

After you have clicked the equals sign, you must now navigate to the worksheet containing the information you wish to link to. In this case, we will click on the Darwin City tab.

Location	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
Darwin City	=				
Casuarina					
Palmerston					
Bees Creek					
Total					

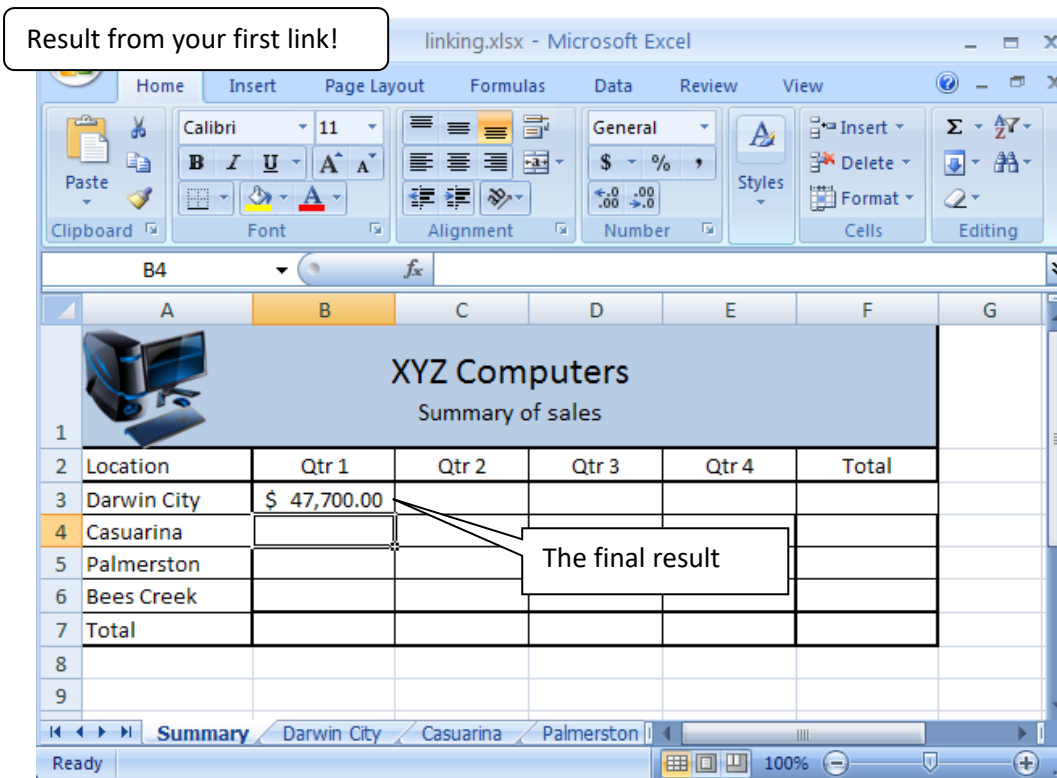
Select the cell

Next you will need to select the data source that will appear on the summary sheet.

Single click into the Qtr 1 total cell (B6)

Notice the formula bar now shows a relative reference to the cell B^ on the 'Darwin City' sheet. The last thing you need to do is hit the 'Enter' key to complete the link.

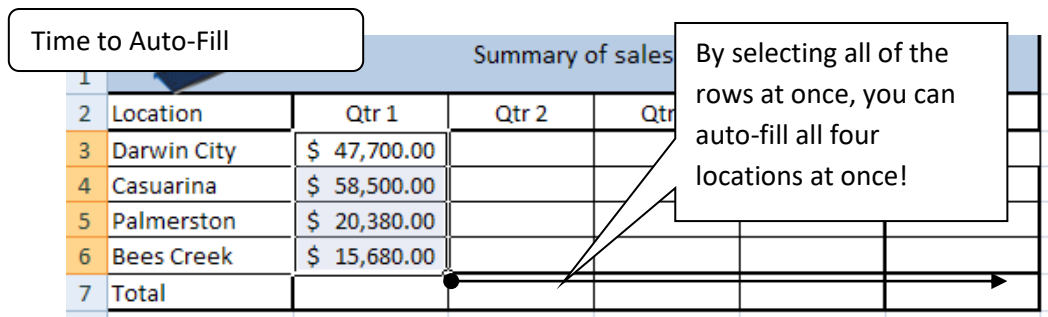
Product	Qtr 1	Qtr 2
Systems	\$ 25,600.00	\$ 27,500.00
Parts	\$ 6,500.00	\$ 6,500.00
Labour	\$ 15,600.00	\$ 15,600.00
Total	\$ 47,700.00	\$ 49,400.00



When ever the data changes in the linked cell contained on the Darwin City tab, the data also changes on the Summary sheet.

Another benefit of linking is that they can also be relative or absolutely referenced. By default, a linked cell will be relatively referenced - ='SheetName'!A1. You can absolutely reference a cell reference in a linked formula exactly the same way as specified in the referencing section of this manual. An absolutely referenced linked reference would look like this - ='SheetName'!\$A\$1.

As the default reference of a linked item is relative, and also because the 'Darwin City' sheet is laid out horizontally just like the summary sheet, you can auto-fill each of the quarters for each location. You can not auto-fill vertically in this sheet because auto-fill does not understand the required linked reference is on a different sheet. So, all you need to do is link the Qtr 1 value for each of the locations, and then auto-fill them across to the total column.



Once you have done this, then all is left to do is AutoSum the total of each of the Qrt columns, then you have finished. It should look something link the graphic below.

The final result

Location	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
Darwin City	\$ 47,700.00	\$ 49,400.00	\$ 44,750.00	\$ 54,970.00	\$196,820.00
Casuarina	\$ 58,500.00	\$ 59,000.00	\$ 56,500.00	\$ 65,600.00	\$239,600.00
Palmerston	\$ 20,380.00	\$ 20,625.00	\$ 21,250.00	\$ 21,375.00	\$ 83,630.00
Bees Creek	\$ 15,680.00	\$ 20,730.00	\$ 16,830.00	\$ 20,550.00	\$ 73,790.00
Total	\$142,260.00	\$149,755.00	\$139,330.00	\$162,495.00	\$593,840.00

Links on different workbooks

Links can be even across different workbooks (different Microsoft Excel files). All you need to do is have both workbooks open and when navigating for the linked cell, first go to the different workbook, then the correct worksheet and then finally, the required cell.

Updating links on different workbooks

By doing this type of link, each time you open your spreadsheet, you will be asked if you want to update the links on the remote workbook. If you say yes, Microsoft Excel will check the linked from file, see if there are any differences (if the values have changed since the last time the file was opened) and then apply the values to the receiving workbook. If you say 'No, you don't want to update' then you workbook will use the last known values from the link. You can update the linked values at any time by going to Data tab in the ribbon and then selecting the Edit Links option. In this dialogue box, click the 'Update Values' button.

Conditional Statements

Conditional statements are a very useful tool in Microsoft Excel because they enable us to differentiate between particular values and depending on a particular values, display a response depending on that value.

Conditional statements are also called 'If Statements'. If statements form the basis of many a computer program and are in all computer programming languages.

Theoretically speaking, there can only be two possible results from a conditional statement; true or false.

Lets look at this example. You want to create a program which judges how a coffee tastes.

Here is the conditional statement;

If the coffee = "Bad", then "Ask for your money back", or else "Smile and be happy"

The conditional statement is the portion coffee = "Bad". The true response, that is if the coffee is Bad, would be "Ask for your money back". If the statement was not true (ie False) then the response would have been "Smile and be happy".

The correct way to write (syntax) an conditional statement in Microsoft Excel is below;

=if(logical_test,true_response,false_response)

Therefore, to write the coffee example would be;

=if(coffee="Bad","Ask for your money back","Smile and be happy")

The above statement is quite straight forward, but it is not very flexible. What if you received a 'Crap' coffee (which I'm sure we all have from time to time). What response would you expect our conditional statement to respond with? If you chose the option "Ask for your money back" you would have been incorrect. The reason for this is the actual conditional statement is very specific and does not lend it's self to any human judgment or flexibility. All the conditional statement is checking is whether any supplied option is the same as "Bad", and Crap and Bad are not the same – according to a computer anyway.

As a Microsoft Excel operator, problems like this often arise. You will need to think of a better way of doing things. A much better way of testing the quality of a coffee would be to come up with some sort of numeric scale, like 1=Very Bad through to 10 = Excellent. Your conditional statement would now look something like this;

=if(coffee<6,"Ask for your money back","Smile and be happy")

By using this type of conditional statement, all values 5 and below will be true and return the expected response. Any value above 5 will return the response "Smile and be happy".

Keep in mind

Some things to note; where the word coffee is in the above examples, this would actually be a reference to a cell on a worksheet (eg. A4).

Where numbers are used in the logical test, they do not need to be contained within quotation marks. Any strings of text must be contained within quotation marks.

You can use any of the below operators in your conditional statements;

=	Equal to
<	Less than
>	Greater than
<=	Less than or equal to
>=	Greater than or equal to
<>	Does not equal

Have a go yourself!

Create the below spreadsheet.

	A	B	C	D	E
1	Coffee Quality			1 = Bad	
2				10 = Excellent	
3					
4	Your response:				
5					

In the cell B4 we are going to insert the conditional statement. So we can see a result immediately, we will start off by placing a value in the cell reference B1. Place any number between 1 and 10 in cell reference 'B1'.

Then we will select the cell B4 and type the below conditional statement (see item 1);

=if(B1<6,"Ask for your money back","Smile and be happy")

Conditional Formatting

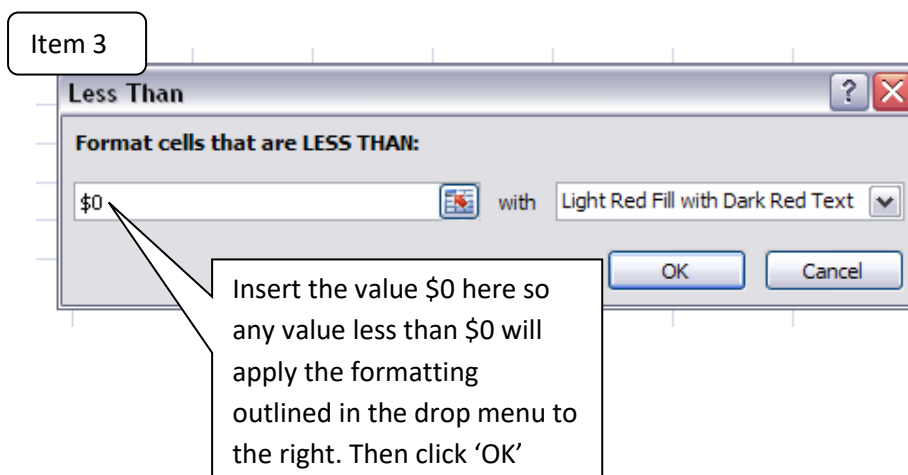
Conditional formatting is similar to conditional statements because it looks at a cell's value and then depending on the value will apply specified cell formatting using colours.

For example, a very common use for the conditional formatting would be in a P&L statement (Profit / Loss). Any value below zero (0) is usually written or displayed in red.

As an example, on our linking document I have added some expenses. Hopefully, most businesses don't run in the red (at a loss) but there are times when businesses do run at a loss for one reason or another. In our example the Darwin City store was re-fitted in the 1st quarter at a cost of \$250,000. In the 2nd quarter the Bees Creek store was also re-fitted at a cost of \$150,000. This has subsequently meant that those two quarters were run at a loss.

To apply conditional formatting to the Cash Flow and Profit / Loss cells, we need to do each individually. So, single click into the Cash Flow of Qtr 1. Then click on the Conditional Formatting option from the Home tab of the ribbon. It will drop down a menu (see item 2)

Select the Highlight Cells Rules and then select the Less than..." option. This will open a new dialogue box where we can specify the rules of when to apply the conditional formatting. (See item 3)

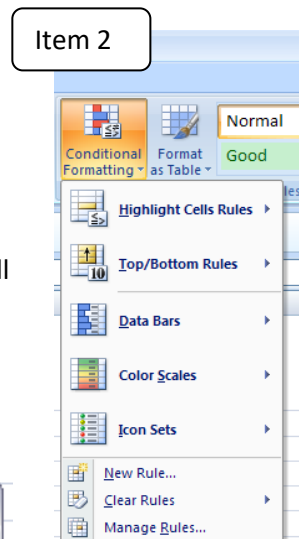


Item 1

XYZ Computers					
Summary of sales					
Location	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
Darwin City	\$ 47,700.00	\$ 49,400.00	\$ 44,750.00	\$ 54,970.00	\$196,820.00
Casuarina	\$ 58,500.00	\$ 59,000.00	\$ 56,500.00	\$ 65,600.00	\$239,600.00
Palmerston	\$ 20,380.00	\$ 20,625.00	\$ 21,250.00	\$ 21,375.00	\$ 83,630.00
Bees Creek	\$ 15,680.00	\$ 20,730.00	\$ 16,830.00	\$ 20,550.00	\$ 73,790.00
Total	\$142,260.00	\$149,755.00	\$139,330.00	\$162,495.00	\$593,840.00

XYZ Computers					
Summary of Expenses					
Location	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
Darwin City	\$250,275.00	\$ 24,600.00	\$ 19,500.00	\$ 27,580.00	\$321,955.00
Casuarina	\$ 27,000.00	\$ 27,500.00	\$ 27,000.00	\$ 29,000.00	\$110,500.00
Palmerston	\$ 12,500.00	\$ 12,590.00	\$ 15,470.00	\$ 13,650.00	\$ 54,210.00
Bees Creek	\$ 4,500.00	\$150,000.00	\$ 5,550.00	\$ 5,250.00	\$165,300.00
Total	\$294,275.00	\$214,690.00	\$ 67,520.00	\$ 75,480.00	\$651,965.00

Cash Flow	-\$152,015.00	-\$ 64,935.00	\$ 71,810.00	\$ 87,015.00	
Profit / Loss					-\$ 58,125.00



Result	Marina	\$ 27,000.00	\$ 27,500.00	\$ 27,000.00	\$ 29,000.00	\$ 110,500.00
14	Palmerston	\$ 12,500.00	\$ 12,590.00	\$ 15,470.00	\$ 13,650.00	\$ 54,210.00
15	Bees Creek	\$ 4,500.00	\$ 150,000.00	\$ 5,550.00	\$ 5,250.00	\$ 165,300.00
16	Total	\$ 294,275.00	\$ 214,690.00	\$ 67,520.00	\$ 75,480.00	\$ 651,965.00
17						
18	Cash Flow	-\$ 152,015.00	-\$ 64,935.00	\$ 71,810.00	\$ 87,015.00	
19						
20						
21					Profit / Loss	-\$ 58,125.00

Now go through and do the rest.

There are plenty of different conditional formatting options available, and you can even add more than one format to a particular cell.


V-lookup / H-lookup

V-lookups are the most common form of a lookup. The 'V' stands for Vertical and the 'H' stands for horizontal. They both do the same thing, just one vertically (the most common) and one horizontally.

What does a V-Lookup do?

Well, they make your life simpler by automating tasks. They do this by comparing a value in your spreadsheet with a list of values in a data set. Think of it as just having to enter a product code in a spreadsheet, then the V-lookup compares the product code to all the products available from the catalogue (the data set) and then returns the required information about that product into your spreadsheet automatically.

In the image to the right, all you will need to do for each new item is enter the Product Code and then the quantity (Qty) and the spreadsheet will work out the rest. The V-Lookup will find the description of the product and place it into cell reference 'C8', another V-lookup will find the unit price and automatically place it into the Unit Price cell. Your spreadsheet will then multiply the unit price with the quantity to find out the Total Price and then it will divide the total price by eleven (11) to work out the GST component.

	A	B	C	D	E	F
1					XYZ Computers	
2					Darwin City Store	
3					Phone: (08) 8989 8989	
4					ABN: 123 123 123 123	
5						
6	TAX INVOICE					
7	Product Code	Qty	Description	Unit Price	Total Price	GST
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24				Total		

Finally, the spreadsheet will total all the Total Price amounts and all the GST amounts and display the results at the bottom of the spreadsheet.

Have a go yourself!

First, make this spreadsheet. (see item 1)

Item 1

	B	C	D	E	F
1				XYZ Computers	
2				Darwin City Store	
3				Phone: (08) 8989 8989	
4				ABN: 123 123 123 123	
5					
6					
7	Product Code	Qty	Description	Unit Price	Total Price
8					GST
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24				Total	

Next, on another sheet, make this dataset of products.

Code	Description	Unit Price
1	Hard Drive, 500Gb, SATA2	\$159.00
2	Hard Drive, 1Tb, SATA2	\$299.00
3	Hard Drive, 1.5Tb, SATA2	\$379.00
4	RAM, DD2, PC800, 1Gb	\$29.00
5	RAM, DD2, PC800, 2Gb	\$39.00

It should look like this:

Item 2			
	A	B	C
1	Code	Description	Unit Price
2	1	Hard Drive, 500Gb, SATA2	\$159.00
3	2	Hard Drive, 1Tb, SATA2	\$299.00
4	3	Hard Drive, 1.5Tb, SATA2	\$379.00
5	4	RAM, DD2, PC800, 1Gb	\$29.00
6	5	RAM, DD2, PC800, 2Gb	\$39.00
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Notice in item 2 that I have placed a boarder around many more rows than the data we entered. This is so at a later stage we can added additional items to our dataset.

Looking at our dataset, we need to identify which column is which. As mentioned earlier, Column 1, in this case the 'Code' column is the index from which a match will be made. The 'Description' column is Column 2, and the 'Unit Price' column is column 3.

It is at this point we need to name our dataset. By naming the dataset, we will be able to identify the dataset easily when completing the V-lookup function. Think of a name you will remember and that describes the dataset. For this example, I will call the dataset 'products'.

The process of naming a range (which is covered in more detail later in the manual) is quite simple and only involves a few steps.

Step 1

Select the dataset making sure you **don't** select the labels at the top of each column. (See item 3)

Notice that I have also selected the blank areas of data where items may be entered in the future.

Item 3

	A	B	C	D
1	Code	Description	Unit Price	
2		1 Hard Drive, 500Gb, SATA2	\$159.00	
3		2 Hard Drive, 1Tb, SATA2	\$299.00	
4		3 Hard Drive, 1.5Tb, SATA2	\$379.00	
5		4 RAM, DD2, PC800, 1Gb	\$29.00	
6		5 RAM, DD2, PC800, 2Gb	\$39.00	
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				

Step 2

Type the word 'products' into the Name Box and then hit the 'Enter' Key. You must finalise this action by hitting the 'Enter' key or else the name you have called the dataset will not have been saved. You will also know it has been entered correctly because it will be centred in the Name Box, while at the same time the dataset will be correctly selected. (See item 4)

Item 4

The screenshot shows the Excel ribbon with the 'Name Box' displaying 'products' and the formula bar showing '1'. A callout box points to the Name Box with the text: 'Notice the word 'products' is centred, while at the same time the correct dataset is selected.'

	A	B	C	D
1	Code	Description	Unit Price	
2		1 Hard Drive, 500Gb, SATA2	\$159.00	
3		2 Hard Drive, 1Tb, SATA2	\$299.00	
4		3 Hard Drive, 1.5Tb, SATA2	\$379.00	
5		4 RAM, DD2, PC800, 1Gb	\$29.00	
6		5 RAM, DD2, PC800, 2Gb	\$39.00	
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				

Step 3

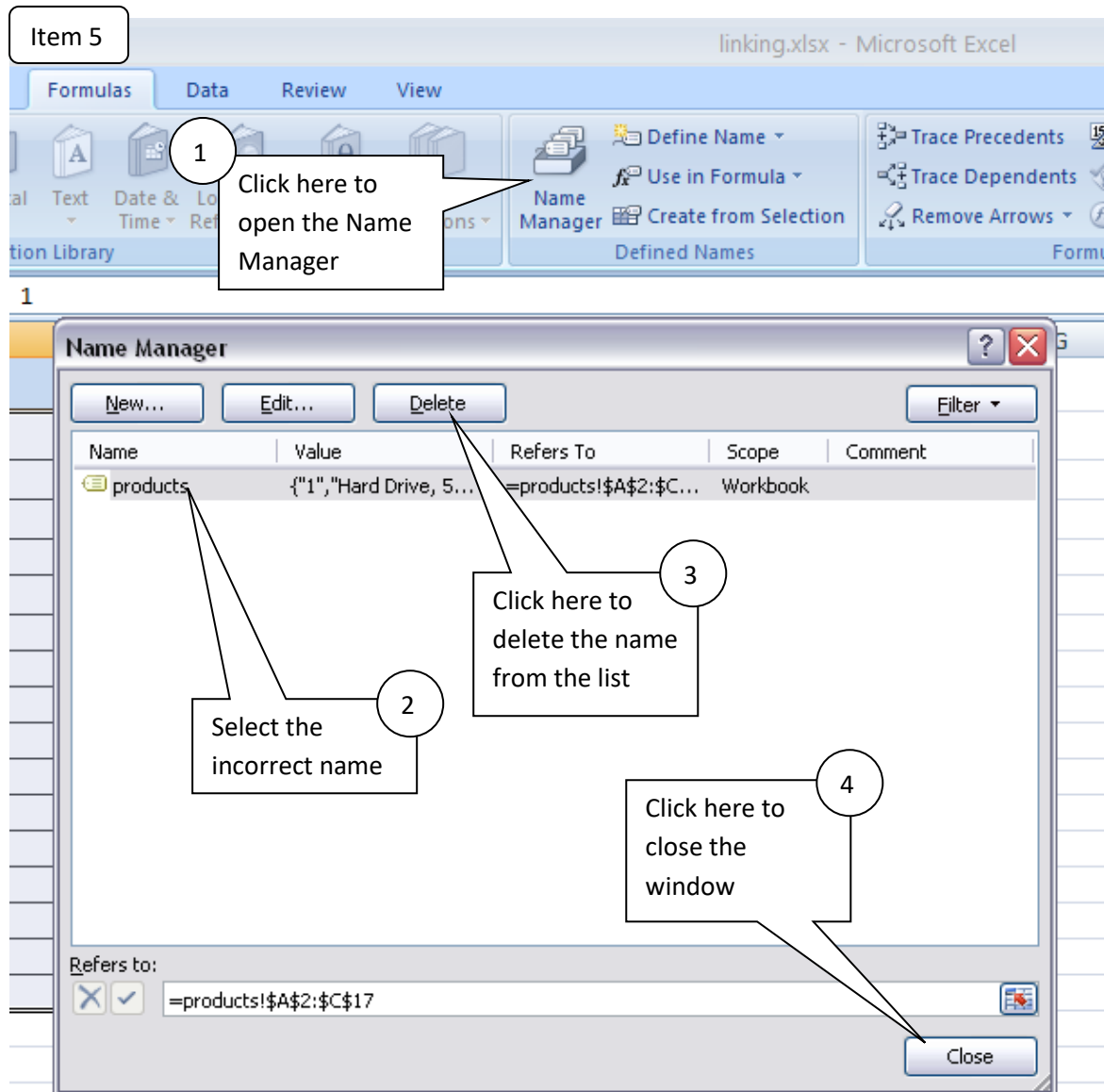
You can check that it all worked correctly by unselecting the dataset (by clicking once anywhere within the spreadsheet) then go back to the Name Box, click the drop arrow on the right hand side of the box and select the item 'products'. This should then select the dataset including all the blank rows.

If it (the word 'products') does not appear in there then it was never finalised properly and it will need to be done again. (Back to step 1)

If the word 'products' exists, but it is not selecting the dataset correctly, then the name will need to be deleted first, then done again.

Deleting Names

To delete the name you need to go to the 'Formulas' tab in the ribbon and then click the 'Name Manager' icon. This will then open up a new dialogue box. You will then need to single click on the incorrect name, then click the delete button. (see item 5)



Enter a V-lookup

Now, once we have set up the initial invoice template, and then the named products list, we can start on setting up the invoice template so it becomes completely dynamic. We will do this by adding the previously mentioned V-lookups and some basic formulas.

When ever doing this sort of function in Microsoft Excel, it often helps to have some sample data in the spreadsheet before we start. This will make the process of entering the functions slightly easier because it will give you results immediately during the creation process.

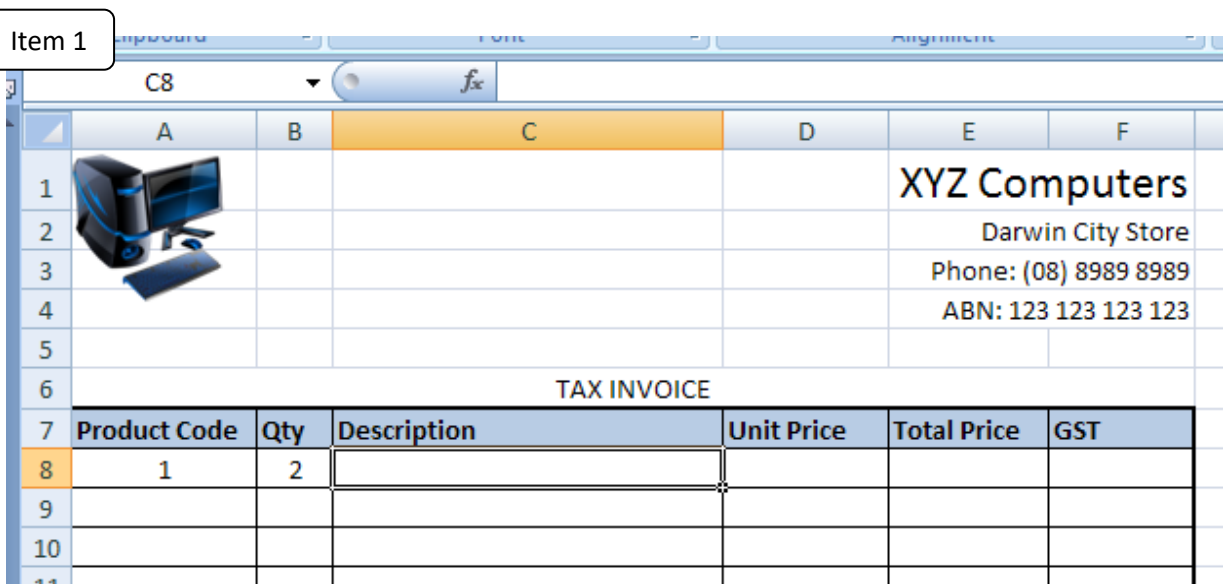
So, I will start by entering a number '1' into the 'Product Code' cell, (A8) and also a number '2' into the Qty cell (B8).


We now need enter our very first V-lookup. This V-lookup will be retrieving the Description of a matched item. Follow the below steps.

Step 1

Click into where you want the result to go (in our case the cell reference C8)

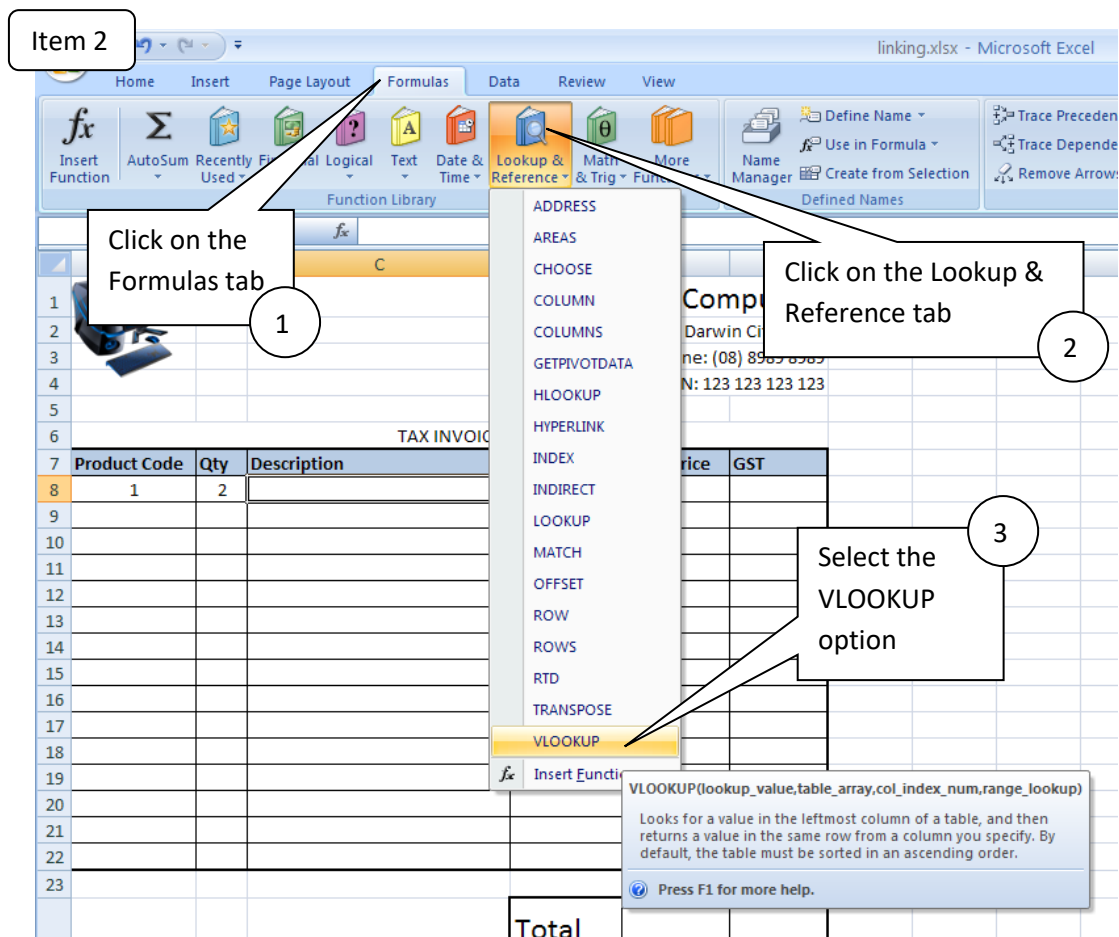
Item 1



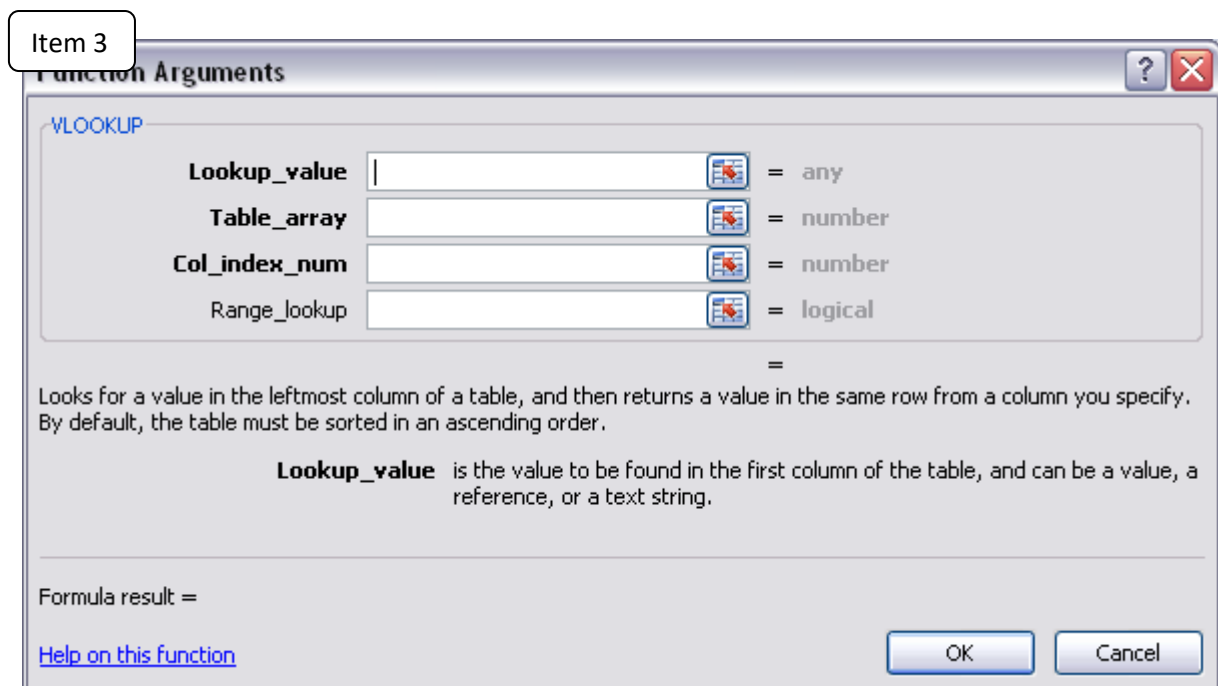
	A	B	C	D	E	F
1					XYZ Computers	
2					Darwin City Store	
3					Phone: (08) 8989 8989	
4					ABN: 123 123 123 123	
5						
6	TAX INVOICE					
7	Product Code	Qty	Description	Unit Price	Total Price	GST
8	1	2				
9						
10						
11						

Step 2

Now click on the 'Formulas' tab on the ribbon, click on the 'Lookup & Reference' Icon and select V-lookup. See item 2.



This will open a new dialogue box, see item 3.



Step 3

We now need to enter the data into the Function Arguments dialogue box (item 4).

- 1 The first field, the **Lookup_value** is where the cell reference to the Product Code will go. It will be the value used to compare against the values in the dataset. All you need to do is click into the field, then click into the 'Product Code' cell on the invoice spreadsheet (A8)
- 2 The **Table_array** field is where you will type the name of the dataset, in our case we will type 'products'
- 3 The **Col_index_num** is the number of the column within the dataset that is to be returned. If we remember back to the earlier part of this exercise, we numbered the columns, '1' being the first column, '2' being the Description column and '3' being the unit price. Because we are wanting the description to be returned for this instance, we will enter a number 2 in this field.
- 4 The final field, the **Range_lookup** is only used if an exact match is required. By default and if left blank, the option will be true. By placing the word 'false' into this field it forces the v-lookup to only return a match if an exact match is found. Using the default option of 'true' or leaving it blank will make the v-lookup find the closest match. For example, if tax scales are used, the v-lookup will find the row from the dataset that is within the correct range, for example if a taxable income is \$540, and the data set has a row at \$500 and then another row at \$550, then the v-lookup will return the result for the \$550 row.

Item 4

Function Arguments

VLOOKUP

Lookup_value = any

Table_array = number

Col_index_num = number

Range_lookup = logical

Looks for a value in the leftmost column of the table, and then returns a value in the same row from a column you specify. By default, the table must be sorted in an ascending order.

Lookup_value is the value to be found in the first column of the table, and can be a value, a reference, or a text string.

Formula result =

[Help on this function](#)

OK Cancel

Here's a tip when entering the **Table_array**. If you have forgotten what or how you spelt your dataset name, a simple shortcut is to place your cursor into the **Table_array** field and then hit the F3 key on the keyboard. This displays all the range names contained on the active workbook. Select the correct range name from the list and then click OK.

Let's check the result before we finalise the lookup function.

You may have noticed that as you were entering the above information into the function arguments dialogue box data was appearing to the right hand side of each field as you entered information. This is because you already had data in the spreadsheet before we started. (See item 5)

You may have also noticed the actual answer at the bottom of the function arguments dialogue box where it has the words 'Formula result = '.

You should expect the correct answer to appear here before clicking the 'OK' button.

Item 5

Function Arguments

VLOOKUP

Lookup_value A8 = 1

Table_array products = {1,"Hard Drive, 500Gb, SATA2",159;2,"I

Col_index_num 2 = 2

Range_lookup = logical

= "Hard Drive, 500Gb, SATA2"

Looks for a value in the leftmost column of a table, and then returns a value in the same row from a column you specify. By default, the table must be sorted in an ascending order.

Col_index_num is the column number in table_array from which the matching value should be returned. The first column of values in the table is column 1.

Formula result = Hard Drive, 500Gb, SATA2

[Help on this function](#)

OK Cancel

Now click the 'OK' button and the result should appear in your 'Invoice' spreadsheet.

6	TAX INVOICE					
7	Product Code	Qty	Description	Unit Price	Total Price	GST
8	1	2	Hard Drive, 500Gb, SATA2			
9						
10						

To see how it works, change the value '1' to something different, let's say, change it to the value 5.

6	TAX INVOICE					
7	Product Code	Qty	Description	Unit Price	Total Price	GST
8	5	2	RAM, DD2, PC800, 2Gb			
9						
10						

Complete the invoice form

What we need to do now is complete the invoice spreadsheet. To do this we now need to create another V-lookup to find the unit price of the product. This is done exactly the same way as the last example, but the V-lookup function is created in the Unit Price cell, and it will return column three (3) from the 'products' dataset.

Once these two v-lookups are complete, your spreadsheet should look similar to item 6.

Item 6

6	TAX INVOICE					
7	Product Code	Qty	Description	Unit Price	Total Price	GST
8	5	2	RAM, DD2, PC800, 2Gb	\$ 39.00		
9						
10						
11						

Now we need to work out the total price for the item. This is simply the Unit Price multiplied by the Qty. (See item 7)

Item 7

7	TAX INVOICE					
7	Product Code	Qty	Description	Unit Price	Total Price	GST
8	5	2	RAM, DD2, PC800, 2Gb	\$ 39.00	=D8*B8	
9						
10						

Result

7	TAX INVOICE					
7	Product Code	Qty	Description	Unit Price	Total Price	GST
8	5	2	RAM, DD2, PC800, 2Gb	\$ 39.00	\$ 78.00	
9						
10						

Now we need to work out the GST component of the Total Price. This is done by dividing the Total Price by 11. (See item 8)

Item 8

7	TAX INVOICE					
7	Product Code	Qty	Description	Unit Price	Total Price	GST
8	5	2	RAM, DD2, PC800, 2Gb	\$ 39.00	\$ 78.00	=E8/11
9						

Result

7	TAX INVOICE					
7	Product Code	Qty	Description	Unit Price	Total Price	GST
8	5	2	RAM, DD2, PC800, 2Gb	\$ 39.00	\$ 78.00	\$ 7.09
9						

For the rest of the invoice form to work, you will need to Auto-Fill Description, Unit Price, Total Price and GST columns down to the bottom of the item area. You will get some unexpected results appear. (See item 9)

Item 9		TAX INVOICE				
7	Product Code	Qty	Description	Unit Price	Total Price	GST
8	5	2	RAM, DD2, PC800, 2Gb	\$ 39.00	\$ 78.00	\$ 7.09
9			#N/A	#N/A	#N/A	#N/A
10			#N/A	#N/A	#N/A	#N/A
11			#N/A	#N/A	#N/A	#N/A
12			#N/A	#N/A	#N/A	#N/A
13			#N/A	#N/A	#N/A	#N/A
14			#N/A	#N/A	#N/A	#N/A
15			#N/A	#N/A	#N/A	#N/A
16			#N/A	#N/A	#N/A	#N/A
17			#N/A	#N/A	#N/A	#N/A
18			#N/A	#N/A	#N/A	#N/A
19			#N/A	#N/A	#N/A	#N/A
20			#N/A	#N/A	#N/A	#N/A
21			#N/A	#N/A	#N/A	#N/A
22			#N/A	#N/A	#N/A	#N/A
23						
24				Total		

The reason for these #N/A errors is because the V-lookups are trying to compare a value of nothing (the empty cells in the left hand side of the invoice form) to the values in the products dataset. The V-lookup requires the lookup value not to be null or empty.

This is where the good ole nested functions come into it again.

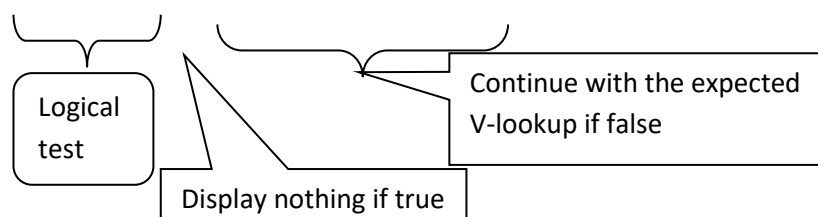
How about we do a logical test to see if there is in fact a value in the lookup value. If there is, then do the V-lookup as normal, but if it is blank, then display nothing.

Here is the pseudo-code:

=if(Product Code is blank, "Do Nothing", "Do the V-lookup)

OK, so here is the real nested function;


=if(ISBLANK(A8), "", VLOOKUP(A8,products,2))



If it is all functioning correctly you should be able to add products anywhere on the invoice form and it should still work.

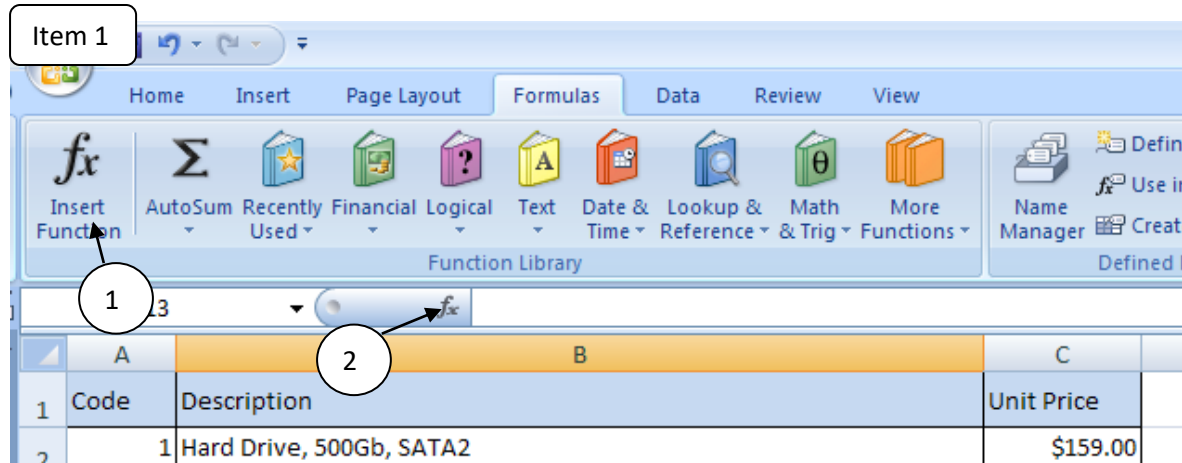
The last thing we need to do is AutoSum the Total Price and the GST into the 'Total' cells at the bottom of the spreadsheet. Once this has been completed it should look similar to item 10.

Without the nested logical test for blank fields, the AutoSum totals at the bottom would not have worked. AutoSum can not add up #N/A because it is not a number.

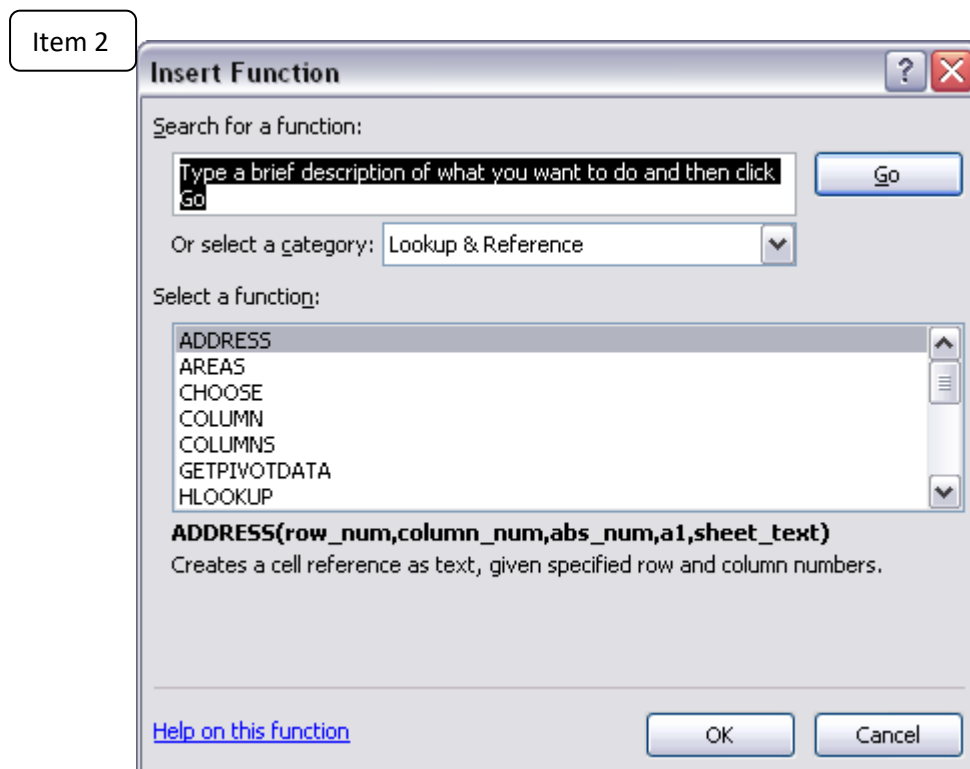
Item 10						
	B	C	D	E	F	
1				XYZ Computers		
2				Darwin City Store		
3				Phone: (08) 8989 8989		
4				ABN: 123 123 123 123		
5						
6	TAX INVOICE					
7	Product Code	Qty	Description	Unit Price	Total Price	GST
8	5	2	RAM, DD2, PC800, 2Gb	\$ 39.00	\$ 78.00	\$ 7.09
9	1	3	Hard Drive, 500Gb, SATA2	\$ 159.00	\$ 477.00	\$ 43.36
10	4	2	RAM, DD2, PC800, 1Gb	\$ 29.00	\$ 58.00	\$ 5.27
11						
12						
13						
14						
15						
16						
17	3	1	Hard Drive, 1.5Tb, SATA2	\$ 379.00	\$ 379.00	\$ 34.45
18						
19						
20						
21						
22						
23						
24				Total	\$ 992.00	\$ 90.18
25						

Insert Function dialogue box

The 'Insert Function' dialogue box is a throw off from Office 2003 days, but still exists. In Microsoft Excel 2007, all of the commonly used functions are available from the 'Formulas' tab on the ribbon. What happens if the function you want does not appear on the ribbon or one of it's sub-menus? Or, lets say you want to browse the available functions. This can all be done by clicking the 'Insert Function' icon from either the very left hand side of the 'Formulas' ribbon (1), or by clicking the Fx icon to the very left of the formula bar (2). (See item 1)



Once you click either of these icons the 'Insert Function' dialogue box will appear. (see item 2)



You can search for a particular function in the top section, or use the drop menu to browse by category, or if you select the option 'All' in the drop menu, you can then browse every function

available in Microsoft Excel. Once you select any function with a single click, a description of what the function does appears underneath the scroll window.

Once you are happy with your selection from the 'Insert Function' dialogue box, the specific function arguments for that particular function are then displayed. Each function will require different entries.

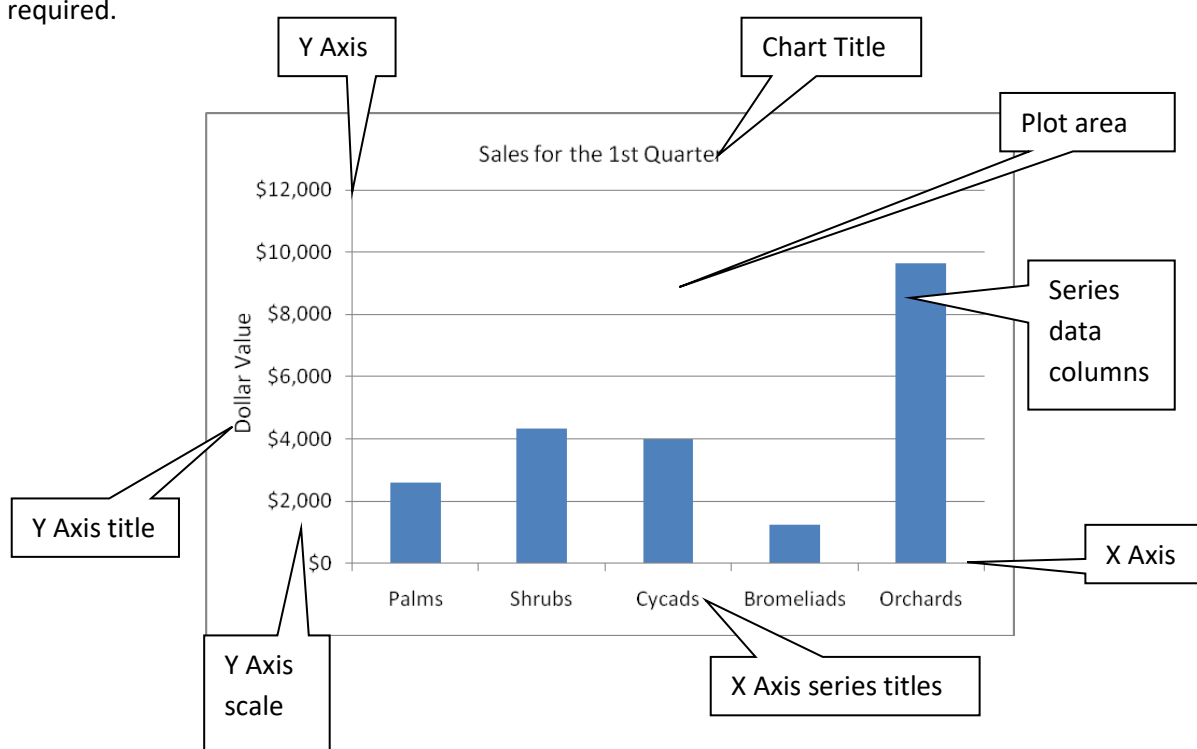
Charting

Much of what Microsoft Excel is about is being able to produce meaningful charts for reports and / or statistical analysis.

A chart is a graphical representation of a large quantity of data, compiled in a way that anyone can easily understand and appreciate without any real knowledge of the raw data from which the chart has been produced.

There are many kinds of charts available to you in Microsoft Excel and many of these charts can be produced in as little as 3 or 4 clicks!

Don't forget to correctly label your charts with titles, and axis labels. Sometimes an axis label is not required.



The three main types of charts covered in this manual are; Bar graph, Line Graph and Pie Chart.

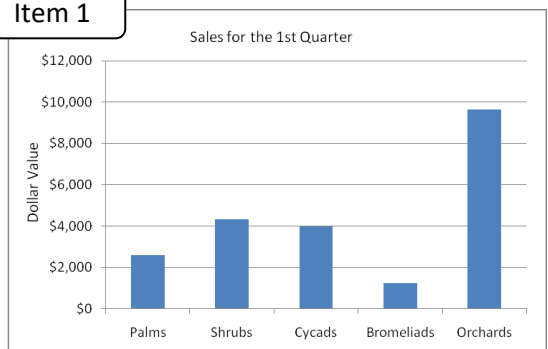
Bar Graph

These can be vertical or horizontal (see item 1&2). The two items show exactly the same data but displayed as a column graph (item 1) and as a bar graph (item 2). It is really down to personal preference as to which type you use, but remember, you should use a format that your audience is expecting.

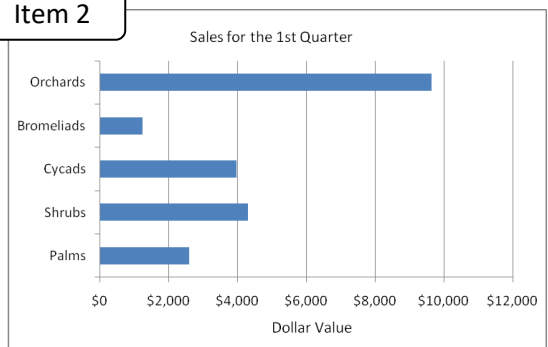
A bar graph's primary purpose is to display the distribution of a selected number of items against a set scale over a single time period. The selected number of items does not need to be every item from a list, rather only the specific ones which need to be analysed.

These graphs can also be used to demonstrate the distribution of items over more than one time period, but a line graph is much better suited for this purpose.

Item 1



Item 2



Line Graph

Line graphs are the most common type of chart you would come across. They are used for comparing one or more values over a given time period. For example, line graphs are used extensively in the stock market (see item 3) tracking one or more stock's rise and fall over time. Because each entry is linked to the previous entry and so on, a visible trend over time can be established.

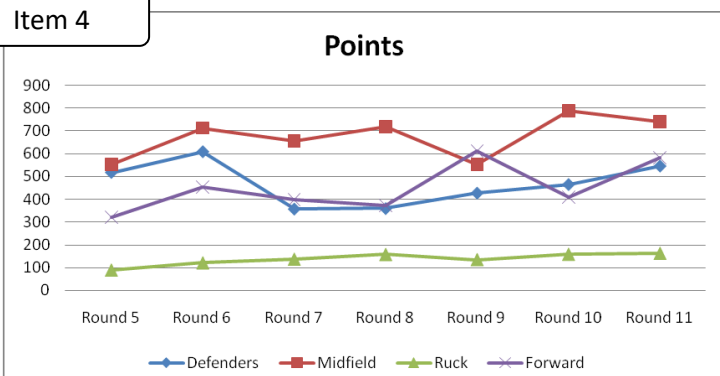
As you can see from the example from the Australian Stock Market, a single commodity is being tracked every minute since 10am. The line between each of the recordings enables a person can draw a conclusion from the 'picture' it represents or give an accurate account of what has happened in the past. An excel line graph can be as complex or as simple as required, but they (line graphs) all do the same thing. They show trends over time. The example item 4 is an Microsoft Excel line graph showing four items being tracked.

Item 3



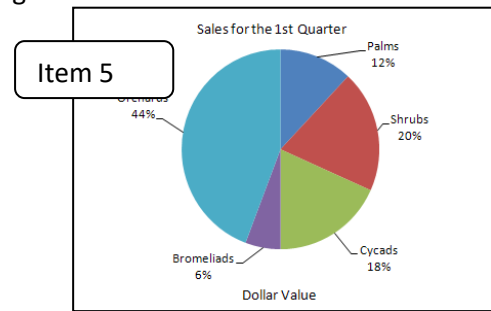
A screen shot from the Australian Stock Market web site <http://www.asx.com.au>

Item 4



Pie Charts

A pie chart shows the distribution of a whole dataset for a single time period. Pie charts give a very easy way to understand distribution of a number of items. From the example item 5, you can easily tell that Orchards are by far the biggest income generator during the 1st Quarter.



OK, how do we make one?

Simple, first we need some data. I will use the data from the bar graphs illustrated previously.

Have a go yourself!

Open a new workbook and create a spreadsheet with the following data outlined in step 1.

So Microsoft Excel knows what data to use when creating any chart or graph you must have it selected.

TIP - Sometimes the data is not in adjacent cells, so to select non-adjacent cells you must first select the first group, then hold down the Ctrl key and then select the other data source.

Now, select the data labels and the actual numeric data to be used in the chart. Pay particular attention **not** to select the title. (See Step 2)

The next step is to go to the 'Insert' tab on the ribbon and here you will find all the different charting options. (See Step 3)

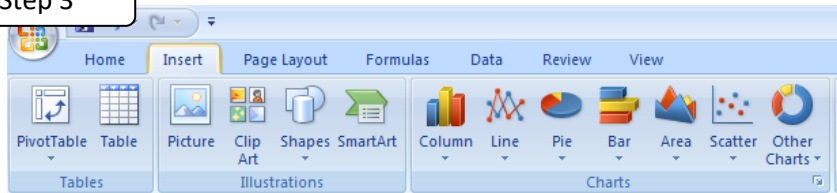
Step 1

Sales	
Palms	\$2,599
Shrubs	\$4,320
Cycads	\$3,980
Bromeliads	\$1,250
Orchards	\$9,650

Step 2

Sales	
Palms	\$2,599
Shrubs	\$4,320
Cycads	\$3,980
Bromeliads	\$1,250
Orchards	\$9,650

Step 3



The first type of chart we will make is a vertical column chart. So, the next step is to select the 'Column' icon. This will give you a drop menu which shows all the different types of column graphs available. For this exercise, we will select the '2D Clustered column' option. (See Step 4)

Step 4

1 You should already have the data selected

2 You should already be on the 'Insert' tab

3 Click on the Column icon

4 Then select the 2D Clustered Column option

Result

The result shows a 2D Clustered Column chart on the spreadsheet. The chart displays the following data:

Category	Value
Palms	\$2,500
Shrubs	\$4,500
Cycads	\$4,000
Bromeliads	\$1,500
Orchards	\$10,000

Once you click the icon outlined in step 4 a chart will appear on your spreadsheet. (See Step 4 Result) You will notice the chart looks pretty good and is what we expected, but on closer examination you will notice it could be a little better. For example, it is missing a chart title. Also, the label 'Series 1' has no real purpose so it can be deleted.

Let's delete the Series 1 label. First single click on the label and dots will appear around the label. Now, hit the 'delete' on the keyboard. (See Step 5)

Step 5

1 Single click the series label

2 Then hit the 'Delete' key

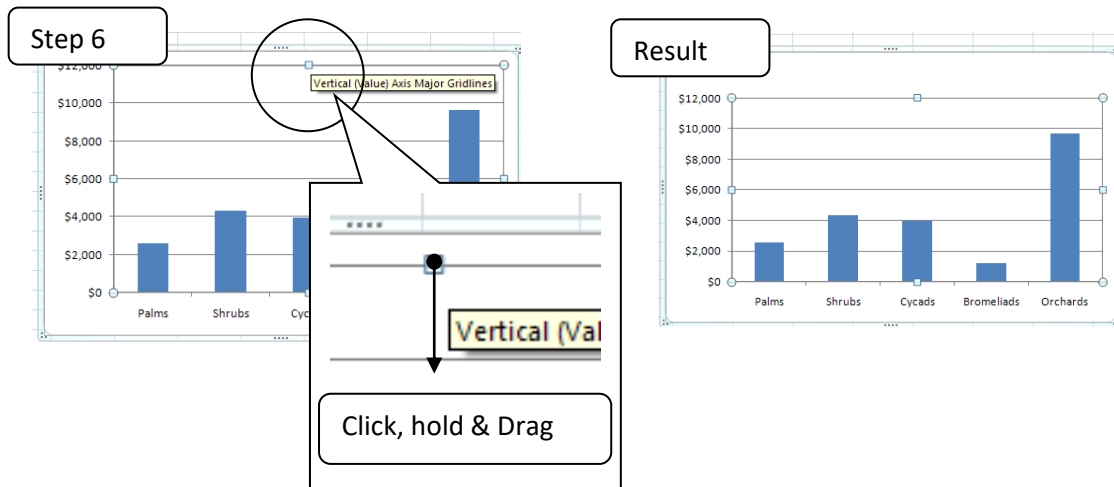
Result

The result shows the chart after the 'Series1' label has been removed. The chart displays the following data:

Category	Value
Palms	\$2,500
Shrubs	\$4,500
Cycads	\$4,000
Bromeliads	\$1,500
Orchards	\$10,000

We now need to add a chart title. Firstly we need to make room on the chart for the title. We do this by single clicking on the plot area and this will bring up the little circles (re-sizing anchors) on the

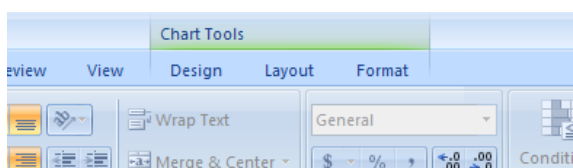
corners of the plot area. Click and hold the top anchor (You will get a double headed arrow cursor) and then drag it down a little, just enough to make room for the chart title. (see Step 6 & result)



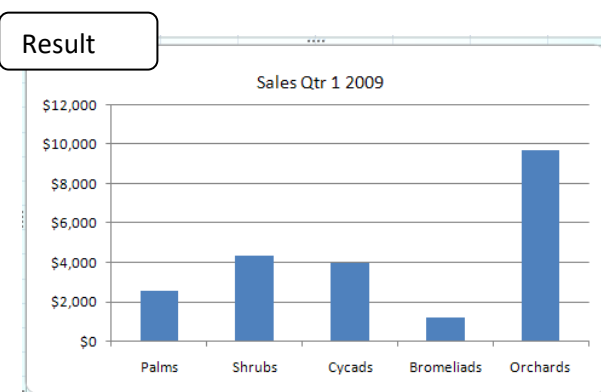
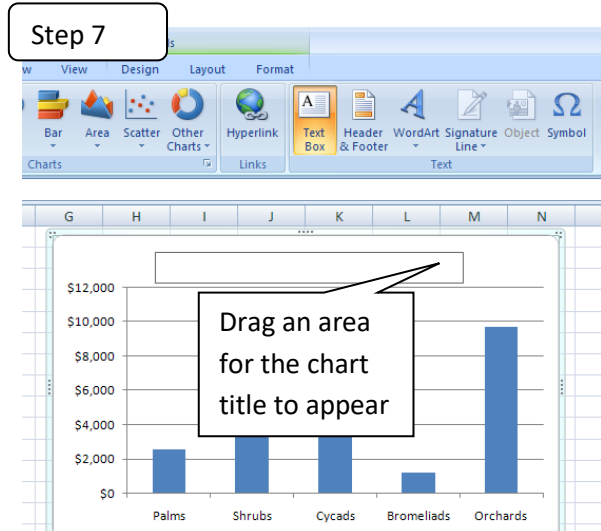
We now need to add a text box where the title will go. You can find the 'Text Box' icon in the 'Insert' tab of the ribbon. Click and drag an area on the chart where you want the title to go. (See Step 7)

Once you let go, a text box will appear where you can add your chart title. For this exercise we will type in: 'Sales Qtr 1 2009' and then format it appropriately.

You may have also noticed the when ever you have a chart selected, and 'Chart Tools' option appears at the very top of the application. (See below)



By clicking this option it opens all the tools and option available to modify the selected chart.



Let's create a Pie Chart

We will use the same data that we used to create the column graph in the previous exercise but this time we will make a pie chart.

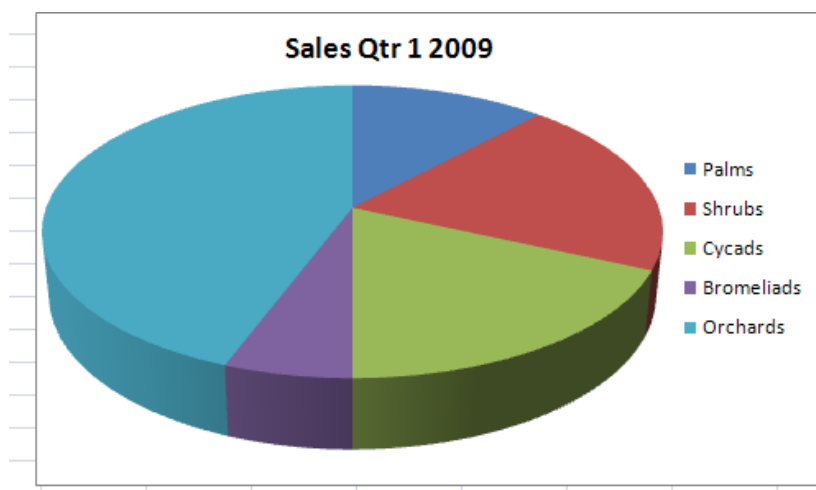
The creation process is nearly exactly the same, but instead of selecting 'Column' icon from the 'Insert' tab of the ribbon, you will select the 'Pie' option instead.

Have a go yourself!

Follow these steps;

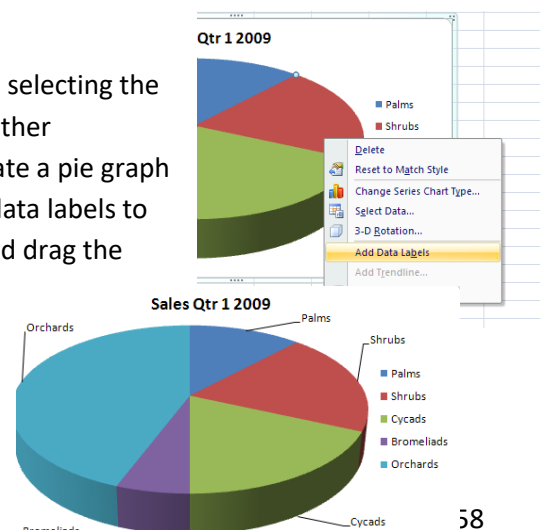
1. Select the data source including each label
2. Go to the 'Insert' tab on the Ribbon
3. Select the 'Pie' option and select an appropriate type of pie chart
4. Add a title

You should have a chart looking similar to the below example.



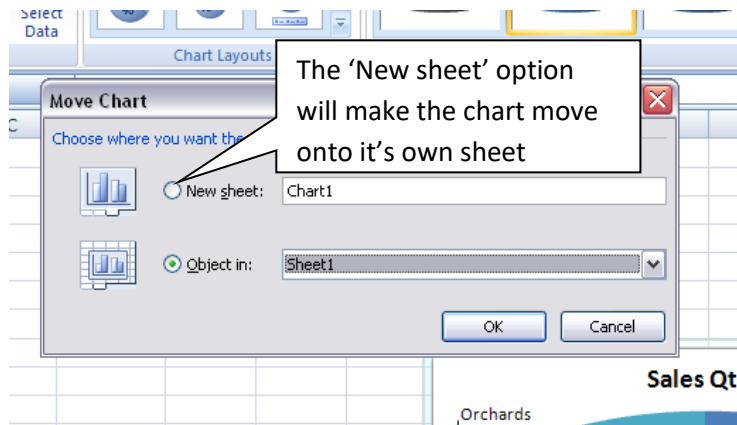
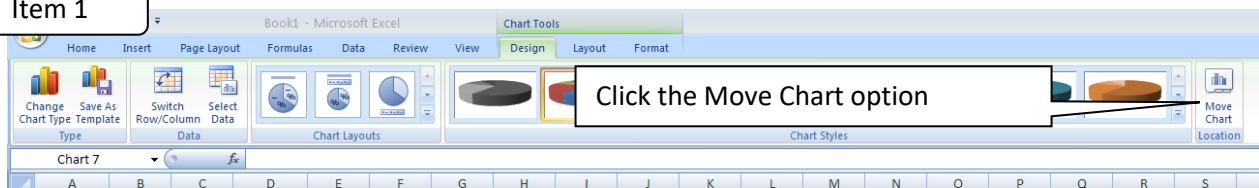
You can add data labels by right clicking on the pie chart and selecting the 'Add Data Labels' option. This gives you the ability to show other information on the chart. Data labels may enable you to create a pie graph which is easier to understand. You may need to format the data labels to get them to look exactly how you want. You can also click and drag the labels to where you want them to appear on your chart.

Currently our charts are displayed as objects within a worksheet. You can make them appear on their own sheet

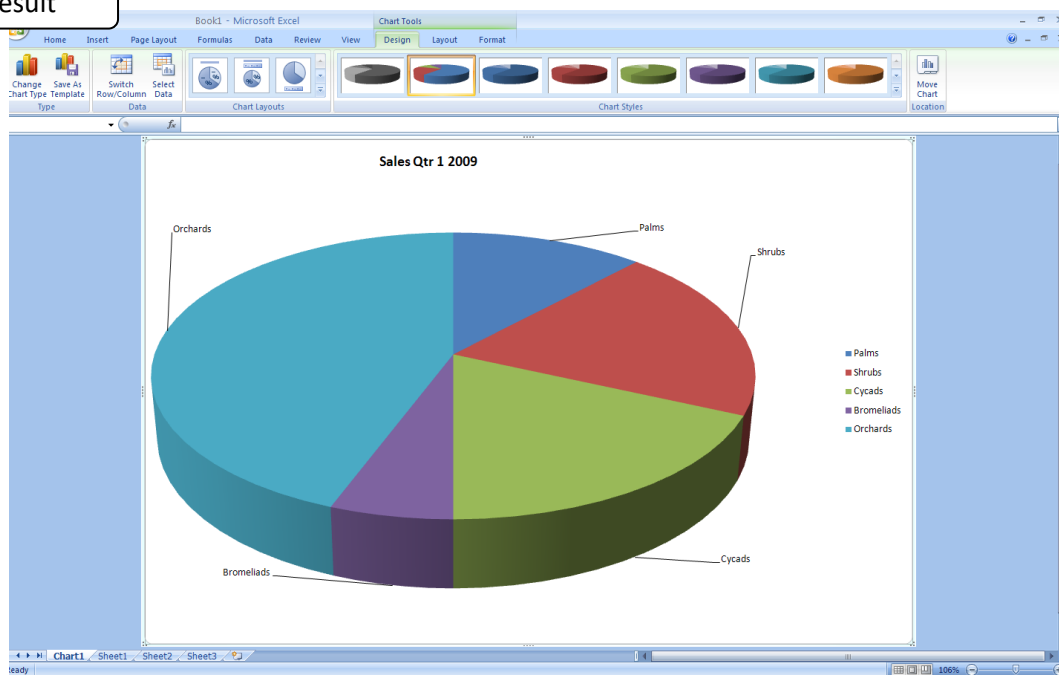


by going to the 'Chart Tools' area and clicking the 'Move Chart' option. (See item 1)

Item 1



Result



Assessments

Certificate I Assessment

This assessment will cover all the requirements of the unit's performance criteria and will be based on several spreadsheets you would be likely to come across in everyday business situations.

It will include a rainfall page, pay roll sheet, and a payroll summary chart.

The assessment must be submitted as one (1) workbook, which includes three named worksheets. These worksheets are to be named: Rainfall, Payroll and Summary.

The assessment must be submitted with a cover sheet and a print out of your pie graph. The excel file is to be emailed to your lecturer by the due date with your name, student number and ICAU1130A Assessment as the subject.

Part 1 (performance criteria 1.1,1.4, 1.5, 1.7, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 3.1, 3.2, 3.3, 3.4, 3.7)

Create a spreadsheet that is formatted the same and containing the below data. It must include the borders, cell fill backgrounds, cell formatting and the answers to the empty cells.

You will need to total the rainfall for each suburb, and also for each month. At the end of each column and row you are to calculate the Average rainfall, the maximum rainfall and the minimum rainfall during the 12 month period.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	Top End Rainfall Data in millimetres (mm)																
2	Suburb	Months												Statistics			
3		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Average	Max	Min
4	Leanyer	428.6	421.2	495	27	0	0	0	0	4	109.6	65.2	355.6				
5	Larrakeyah	428.6	328.4	430	27.6	0	0	0	0	4.5	198	65.9	350.9				
6	Palmerston	379.3	496.1	284.3	14.5	0	0	0	0	1	103.8	80.8	304.4				
7	Darwin River	277.9	493.2	301	56.6	0	0	0	0	3.7	73	243	461.4				
8	Mandorah	384.6	696.9	428.6	26	0	0	0	0	0	77.2	94.8	357.1				
9	Total																
10	Average																
11	Max																
12	Min																
13																	

Part 2 (Performance criteria 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 4.1, 4.2, 4.3)

Create a worksheet which will be used as a pay roll for a fictional company. This spreadsheet is to include an image (any) positioned in the top left of the spreadsheet and resized to not take up any more than 5 standard sized rows.

The spread sheet must be able to be changed when new employees come and go. The spreadsheet must accept an employees name, their pay scale, and their hours worked for that week. The pay rate

must be automatically looked up from the pay rate table. The spreadsheet must absolutely reference the superannuation rate and the tax rate.

The spread sheet must work out the total wage bill for the week and the average pay for the week. Use the data provided in the below image.

	A	B	C	D	E	F	G	H
1	<div>CHANGE YOUR WORLD.</div> <div>CHARLES DARWIN UNIVERSITY</div>							
2								
3								
4								
5								
6								
7	Name	Pay Scale	Hrs Worked	Hr Rate	Gross Pay	Tax	Super	Net Pay
8	David Campese	1	38	\$ 18.50	\$ 703.00	\$ 105.45	\$ 63.27	\$ 597.55
9	Fred Smith	1	38	\$ 18.50	\$ 703.00	\$ 105.45	\$ 63.27	\$ 597.55
10	Hugo Boss	2	25	\$ 19.90	\$ 497.50	\$ 74.63	\$ 44.78	\$ 422.88
11	George Michael	3	40	\$ 22.75	\$ 910.00	\$ 136.50	\$ 81.90	\$ 773.50
12	Mathew Richardson	6	15	\$ 45.90	\$ 688.50	\$ 103.28	\$ 61.97	\$ 585.23
13	Billy Thorpe	5	38	\$ 37.75	\$ 1,434.50	\$ 215.18	\$ 129.11	\$ 1,219.33
14	Karen Turnbull	4	38	\$ 31.50	\$ 1,197.00	\$ 179.55	\$ 107.73	\$ 1,017.45
15								
16								
17								
18								
19								
20								
21				Total	\$ 6,133.50	\$ 920.03	\$ 552.02	\$ 5,213.48
22				Average	\$ 876.21	\$ 131.43	\$ 78.86	\$ 744.78
23								
24	Pay Scales	Rate		Tax Rate	15%		Super	9%
25	1	\$ 18.50						
26	2	\$ 19.90						
27	3	\$ 22.75						
28	4	\$ 31.50						
29	5	\$ 37.75						
30	6	\$ 45.90						
31								
32								

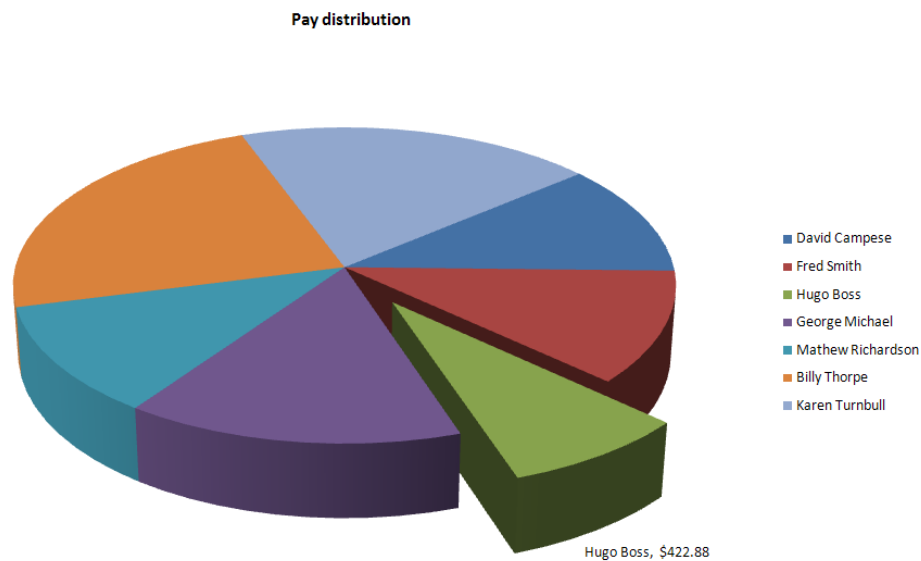
Tips: The Gross pay is the Hours worked multiplied by the hourly rate.
The Tax is the Gross Pay multiplied by the Tax Rate.
The Super is the Gross Pay multiplied by the Super.
The Net Pay is the Gross Pay minus the Tax.

Part 4 (Performance criteria 4.3, 4.4, 4.5, 5.1, 5.2, 5.3, 5.4)

Create a simple 3D pie graph highlighting each employee's net pay. The chart needs to emphasise Hugo Boss's pay.

The chart is to be on it's own work sheet and with it's tab labelled 'Summary'. The chart should have a title and correct labelling.

Give the chart a footer of today's date and make the chart as easy as possible to read. It should look similar to the image below.



Certificate II Assessment

This assessment will cover all the requirements of the unit's performance criteria and will be based on a 'real world' business spreadsheet.

It will include a list of products, an invoice generator, pay roll sheet and a payroll summary chart.

The assessment must be submitted as one (1) workbook, which includes four named worksheets. These worksheets are to be named: Invoice, Products, Payroll and Summary.

The assessment must be submitted with a cover sheet and a print out of your pie graph. The excel file is to be emailed to your lecturer by the due date with your name, student number and ICAU1130A Assessment as the subject.

Part 1 *(performance criteria 1.1,1.4, 1.5, 1.7, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 3.1, 3.2, 3.3, 3.4, 3.7)*

Create a spreadsheet that is nicely formatted containing the below data. The content of the headings **MUST** remain the same as the example. You must use different fonts, headings, bold, italics, different cell colours and different font colours on the spreadsheet. There must be at least two (2) types of borders in your products spreadsheet. This spreadsheet's tab must be named 'Products'.

Code	Description	Cost (inc GST)
usb1gb	USB Drive – 1Gb	\$9.95
usb2gb	USB Drive – 2Gb	\$14.99
usb4gb	USB Drive – 4Gb	\$32.99
usb8gb	USB Drive – 8Gb	\$49.99
hdd250	Hard Disk Drive – 7200rpm – 250 Gb	\$99.90
hdd500	Hard Disk Drive – 7200rpm – 500 Gb	\$149.99
hdd750	Hard Disk Drive – 7200rpm – 750 Gb	\$199.99
hdd1000	Hard Disk Drive – 7200rpm – 1 Tb	\$249.99
hdd25010K	Hard Disk Drive – 10000rpm – 250 Gb	\$249.00
hdd50010K	Hard Disk Drive – 10000rpm – 500 Gb	\$349.00
hdd75010K	Hard Disk Drive – 10000rpm – 750 Gb	\$599.00
hdd100010K	Hard Disk Drive – 10000rpm – 1 Tb	\$1028.99
pccbas	PC – Basic – 2.2Gz CPU, 1Gb RAM	\$699.00
pccbus	PC – Business – 2.8Gz CPU, 2Gb RAM	\$999.00
pccgam	PC – Gamer – 3.2Gz Dual core CPU, 4GB RAM	\$1499.00

Part 2 (Performance criteria 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 3.1, 3.2, 3.3, 3.4, 3.6, 3.7, 5.1, 5.2, 5.3)

Create an invoice template (generator) which will allow a user to enter the customer's information, and also be able to add items to the invoice by just entering the code and the quantity. The invoice will automatically generate the product description, the total price and the GST payable for that particular item. If there is nothing in the code section, that row needs to be blank awaiting the next product to be entered.

It must look like the image below. It must also be formatted like the below image. Feel free to change the business name etc.

Add a footer to the invoice stating that payment terms are 7 days.

The screenshot shows a Microsoft Excel spreadsheet titled "invoice.xls". The spreadsheet is designed as an invoice template. It includes the following sections:

- Business Information:** Fields for "Your Business Name", "Your Business Address line 1", "Your Business Address line 2", "Phone (08) 89898989 | Fax (08) 89898989", and "ABN:". A "Quote Number" field is set to 1, and a "Date" field is set to 8/08/2008.
- Customer Information:** A section labeled "Customer:" with a text area for "Customer details go here".
- Item Table:** A table with 5 columns: "Code", "Description", "Qty", "GST", and "Amount". It contains three rows of data:

Code	Description	Qty	GST	Amount
usb1gb	USB Drive - 1 Gb	1	\$ 0.90	\$ 9.95
hdd1000	Hard Disk Drive - 7200rpm - 1 Tb	1	\$ 22.73	\$ 249.99
pcgam	PC - Gamer - 3.2Gz Dual core CPU, 4GB RAM	1	\$ 136.27	\$ 1,499.00
- Total:** A summary row showing "Total: \$ 159.90" for GST and "\$ 1,758.94" for the total amount.
- Footer:** A footer bar with tabs for "Invoice", "Products", and "Payroll", and a status bar indicating "Ready".

Part 3 (Performance criteria 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 4.1, 4.2, 4.3)

Create a worksheet which will be used as a pay roll for this fictional company. This spreadsheet is to include an image (any) positioned in the top left of the spreadsheet and resized to not take up any more than 5 standard sized rows.

The spread sheet must be able to be changed when new employees come and go. The spreadsheet must accept an employees name, their pay scale, and their hours worked for that week. The pay rate must be automatically looked up from the pay rate table. The spreadsheet must absolutely reference the superannuation rate. The tax rate must be automatically looked up from the tax rate table, also using a vlookup.

The spread sheet must work out the total wage bill for the week and the average pay for the week. Use the data provided in the below image.

Microsoft Excel - solution for assessment.xls

FileEditViewInsertFormatToolsDataWindowHelp

Part 4 (Performance criteria 4.3, 4.4, 4.5, 5.1, 5.2, 5.3, 5.4)

Create a simple 3D pie graph highlighting each employee's net pay. The chart needs to emphasise John Rogers pay.

The chart is to be on its own work sheet and with its tab labelled 'Summary'. The chart should have a title and correct labelling.

Give the chart a footer of today's date and make the chart as easy as possible to read. It should look similar to the image below.

