Introduction

Microsoft Excel 2013 is a spreadsheet program that is used to manage, analyze, and present data. It includes many powerful tools that can be used to organize and manipulate large amounts of data, perform complex calculations, create professional-looking charts, enhance the appearance of worksheets, and more. This handout provides an overview of the Excel 2013 user interface and covers how to perform basic tasks such as starting and exiting the program; creating, saving, opening, and closing workbooks; selecting cells; entering and editing data; formatting text and numbers; positioning cell contents; applying cell styles; and getting help.

Starting Excel

You can start Excel 2013 from the Start menu (in Windows 7) or by double-clicking an existing Excel file. When you start the program without opening a specific file, the *Start* screen appears, prompting you to open an existing workbook or create a new workbook.

To start Excel 2013 from the Start menu:

1. Click the **Start** button, click **All Programs**, click **Microsoft Office 2013**, and then click **Excel 2013**. The **Start** screen appears (see Figure 1).
2. In the right pane, click **Blank workbook**. A new, blank workbook opens in the program window.

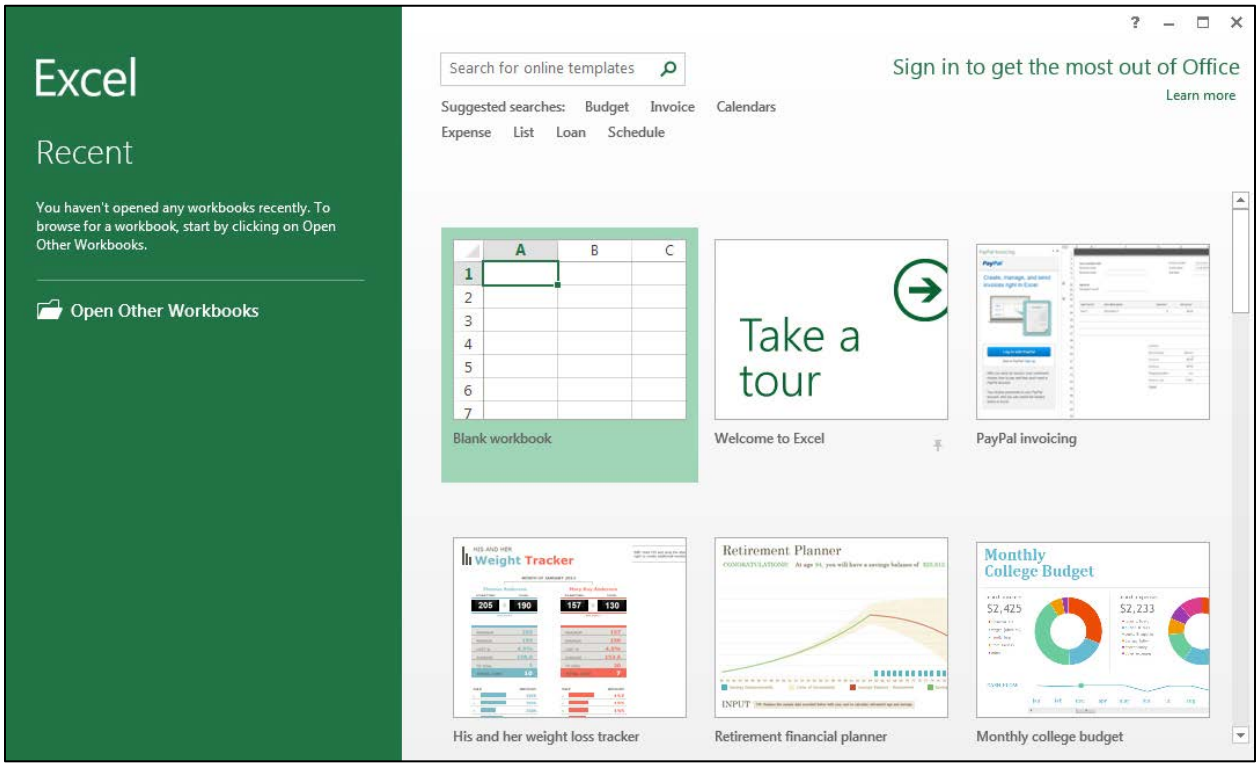


Figure 1 – Excel 2013 Start Screen

Overview of the User Interface

All the Microsoft Office 2013 programs share a common user interface so you can apply basic techniques that you learn in one program to other programs. The Excel 2013 program window is easy to navigate and simple to use (see Figure 2 and Table 1).

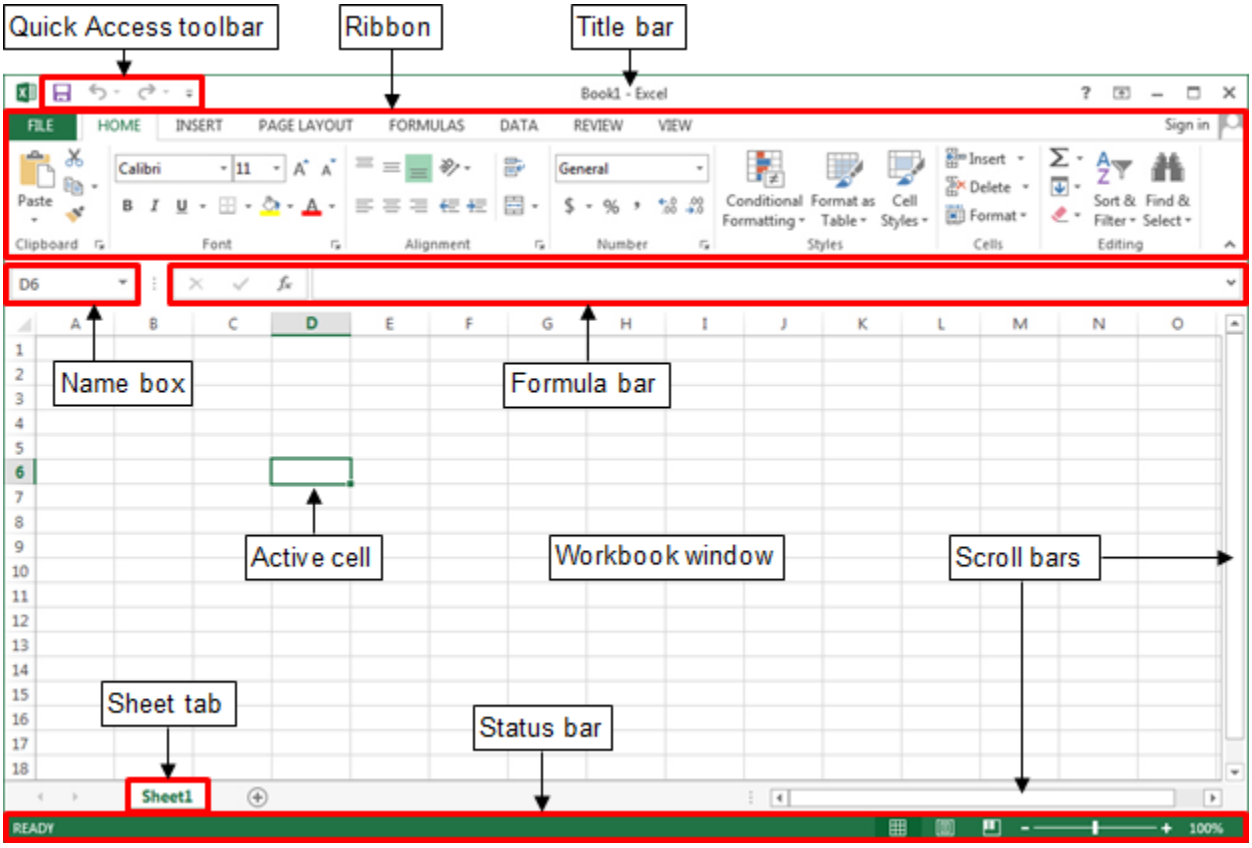


Figure 2 – Excel 2013 Program Window

Table 1 – Excel 2013 Program Window Elements

Name	Description
Title bar	Appears at the top of the program window and displays the name of the workbook and the program. The buttons on the right side of the Title bar are used to get help; change the display of the Ribbon; and minimize, restore, maximize, and close the program window.
Quick Access toolbar	Appears on the left side of the Title bar and contains frequently used commands that are independent of the tab displayed on the Ribbon.
Ribbon	Extends across the top of the program window, directly below the Title bar, and consists of a set of tabs, each of which contains groups of related commands.
Formula bar	Appears below the Ribbon and displays the data or formula stored in the active cell. It can also be used to enter or edit cell contents.
Name box	Appears on the left side of the Formula bar and displays the active cell address or the name of the selected cell, range, or object.
Workbook window	Appears below the Formula bar and displays a portion of the active worksheet.
Sheet tab	Each worksheet has a tab that appears below the workbook window and displays the name of the worksheet.
Scroll bars	Appear along the right side and bottom of the workbook window and enable you to scroll through the worksheet.
Status bar	Appears at the bottom of the program window and displays the status of Excel (such as *Ready*). The tools on the right side of the Status bar can be used to display the worksheet in a variety of views and to change the zoom level.

Ribbon

The *Ribbon* is designed to help you quickly find the commands that you need to complete a task. It consists of a set of task-specific tabs (see Figure 3 and Table 2). The standard tabs are visible at all times. Other tabs, known as *contextual tabs*, appear only when you create or select certain types of objects (such as images or charts). These tabs are indicated by colored headers and contain commands that are specific to working with the selected object. Clicking a tab displays a set of related commands that are organized into logical groups. Commands generally take the form of buttons and lists; some appear in galleries. Pointing to an option in most lists or galleries displays a live preview of that effect on the selected text or object. You can apply the previewed formatting by clicking the selected option, or you can cancel previewing without making any changes by pressing the *Esc* key. Some commands include an integrated or separate arrow. Clicking the arrow displays a menu of options available for the command. If a command on the Ribbon appears dimmed, it is unavailable. Pointing to a command on the Ribbon displays its name, description, and keyboard shortcut (if it has one) in a ScreenTip.

A *dialog box launcher* appears in the lower-right corner of most groups on the Ribbon (see Figure 3). Clicking it opens a related dialog box or task pane that offers additional options or more precise control than the commands available on the Ribbon.

You can collapse the Ribbon by clicking the *Collapse the Ribbon* button on the right side of the Ribbon (see Figure 3) or by double-clicking the current tab. When the Ribbon is collapsed, only the tab names are visible. You can expand the Ribbon by double-clicking any tab.

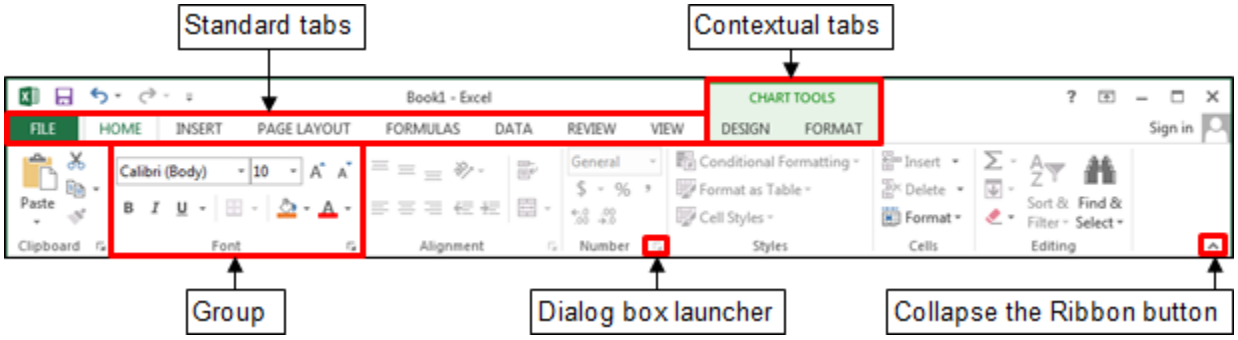


Figure 3 – Ribbon

Table 2 – Ribbon Tabs

Name	Description
File	Displays the Backstage view which contains commands related to managing files and customizing the program.
Home	Contains the most frequently used commands. The Home tab is active by default.
Insert	Contains commands related to all the items that you can insert into a worksheet.
Page Layout	Contains commands that affect the overall appearance and layout of a worksheet.
Formulas	Contains commands used to insert formulas, define names, and audit formulas.
Data	Contains commands used to manage data and import or connect to external data.
Review	Contains commands used to check spelling, track changes, add comments, and protect worksheets.
View	Contains commands related to changing the view and other aspects of the display.

Quick Access Toolbar

The *Quick Access* toolbar provides one-click access to commonly used commands and options. By default, it is located on the left side of the Title bar and displays the Save, Undo, and Redo buttons (see Figure 4). You can change the location of the Quick Access toolbar as well as customize it to include commands that you use frequently.

Figure 4 – Quick Access Toolbar

To add a command to the Quick Access toolbar:

1. On the **Ribbon**, right-click the command that you want to add, and then click **Add to Quick Access Toolbar** on the shortcut menu.

To remove a command from the Quick Access toolbar:

1. On the **Quick Access** toolbar, right-click the command that you want to remove, and then click **Remove from Quick Access Toolbar** on the shortcut menu.

NOTE: Clicking the arrow on the right side of the **Quick Access** toolbar displays a menu which includes additional commands and options that can be used to customize the toolbar. A check mark next to an item indicates that the item is selected (see Figure 5).

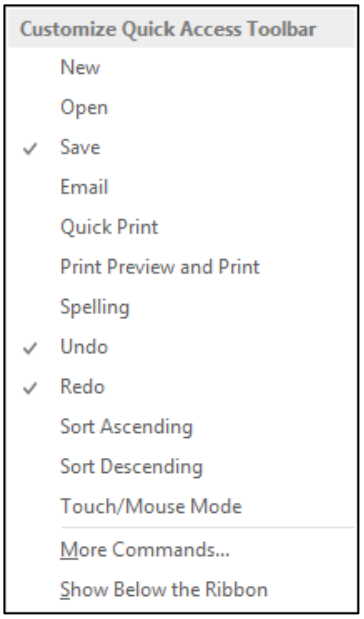


Figure 5 – Customize Quick Access Toolbar Menu

Mini Toolbar

The *Mini* toolbar provides quick access to frequently used commands and appears whenever you right-click a cell or an object (see Figure 6).

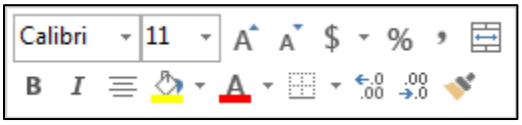


Figure 6 – Mini Toolbar

Shortcut Menus

Excel 2013 includes many shortcut menus that appear when you right-click an item. Shortcut menus are context-sensitive, meaning they list commands that pertain only to the item that you right-clicked (see Figure 7).

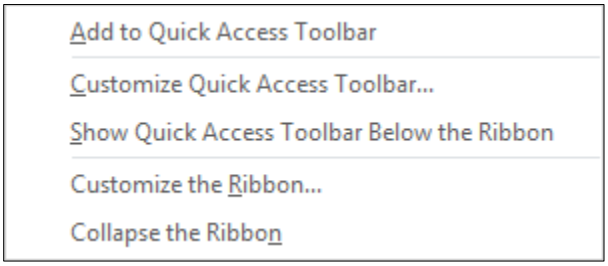


Figure 7 – Ribbon Shortcut Menu

Backstage View

The *File* tab (the first tab on the Ribbon) is used to display the *Backstage* view which contains all the commands related to managing files and customizing the program. It provides an easy way to create, open, save, print, share, export, and close files; view and update file properties; set permissions; set program options; and more. Commands available in the Backstage view are organized into pages which you can display by clicking the page tabs in the left pane.

To display the Backstage view:

1. Click the **File** tab on the **Ribbon** (see Figure 8).

Figure 8 – File Tab

To exit the Backstage view:

1. Click the **Back** button in the upper-left corner of the **Backstage** view (see Figure 9). Or, press the **Esc** key.

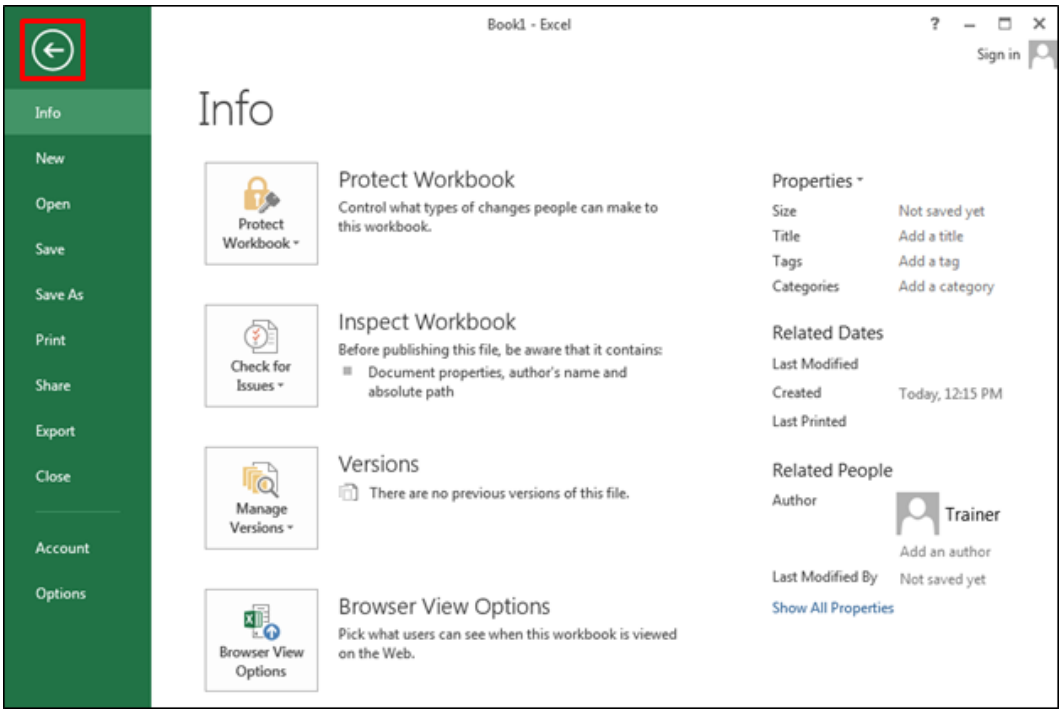


Figure 9 – Info Page of the Backstage View

Formula Bar

The *Formula* bar displays the contents of the active cell and can be used to enter or edit cell contents. The Formula bar contains three buttons (see Figure 10). The Insert Function button is always available, but the other two buttons are active only while you are entering or editing data in a cell. Clicking the *Cancel* button cancels the changes you make in the cell, which is the same as pressing the *Esc* key. Clicking the *Enter* button completes the changes you make in the cell, which is the same as pressing the *Enter* key. Clicking the *Insert Function* button opens a dialog box that helps you construct formulas.

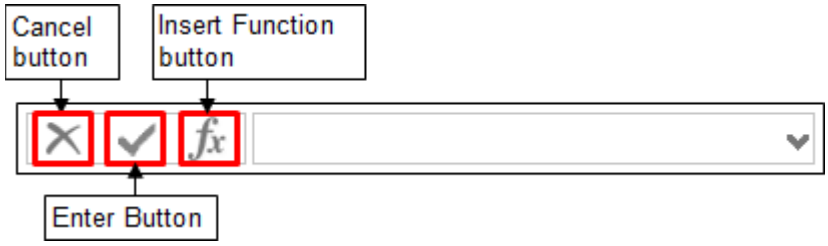


Figure 10 – Formula Bar

Overview of Workbooks

An Excel file is called a *workbook*. Each new workbook contains one blank *worksheet* (see Figure 11). You can add additional worksheets or delete existing worksheets as needed. By default, a new workbook is named *Book1* and the worksheet it contains is named *Sheet1*. Each worksheet consists of 1,048,576 rows (numbered 1 through 1,048,576) and 16,384 columns (labeled A through XFD). The box formed by the intersection of a row and a column is called a *cell*. Cells are used to store data. Each cell is identified by its address which consists of its column letter and row number (e.g., cell A1 is the cell in the first column and first row). A group of cells is called a *range*. A range is identified by the addresses of the cells in the upper-left and lower-right corners of the selected block of cells, separated by a colon (e.g., A1:C10). Only one cell can be active at a time. The *active cell* has a green border around it and its address appears in the Name box on the left side of the Formula bar. The row and column headers of the active cell appear in a different color to make it easier to identify. A worksheet also has an invisible *draw layer* which holds charts, images, and diagrams.

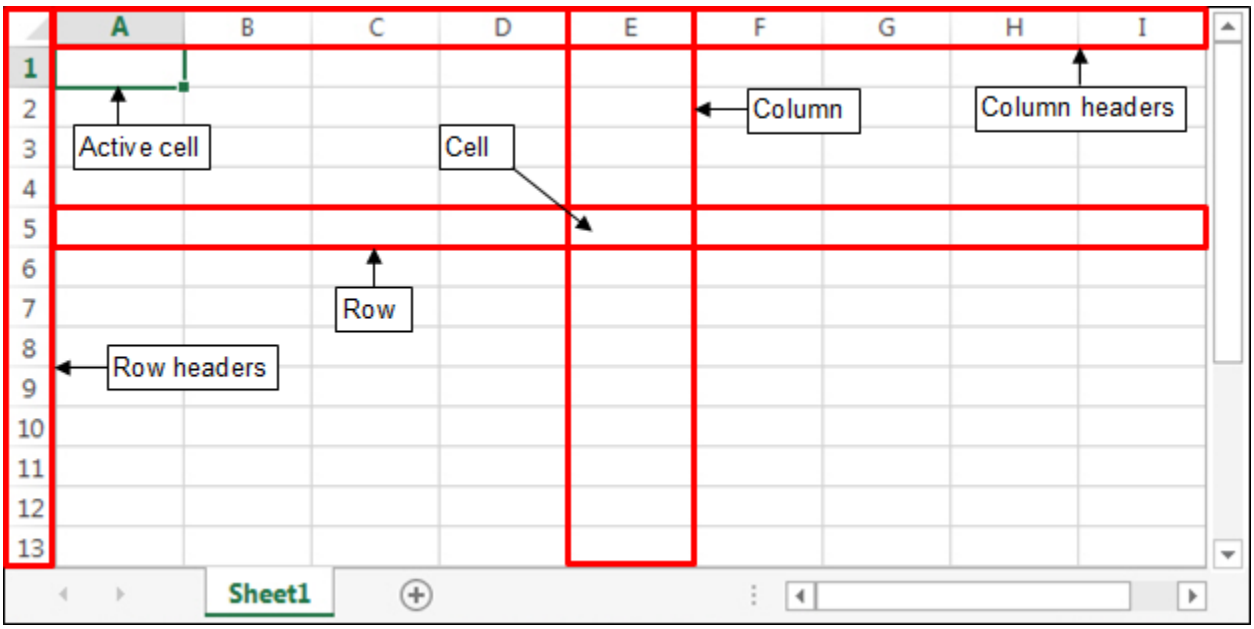


Figure 11 – Worksheet

Creating Workbooks

When you start Excel 2013 and click *Blank workbook* on the *Start* screen, a new workbook opens in the program window, ready for you to enter your data. You can also create a new workbook while Excel 2013 is running. Each new workbook displays a default name (such as *Book1*, *Book2*, and so on) on the Title bar until you save it with a more meaningful name.

To create a new workbook:

1. Click the **File** tab, and then click **New**. The **New** page of the **Backstage** view opens, displaying thumbnails of the available templates (see Figure 12).
2. In the right pane, click **Blank workbook**. A new, blank workbook opens in a new window.

   NOTE: You can also create a new workbook by pressing **Ctrl+N**.

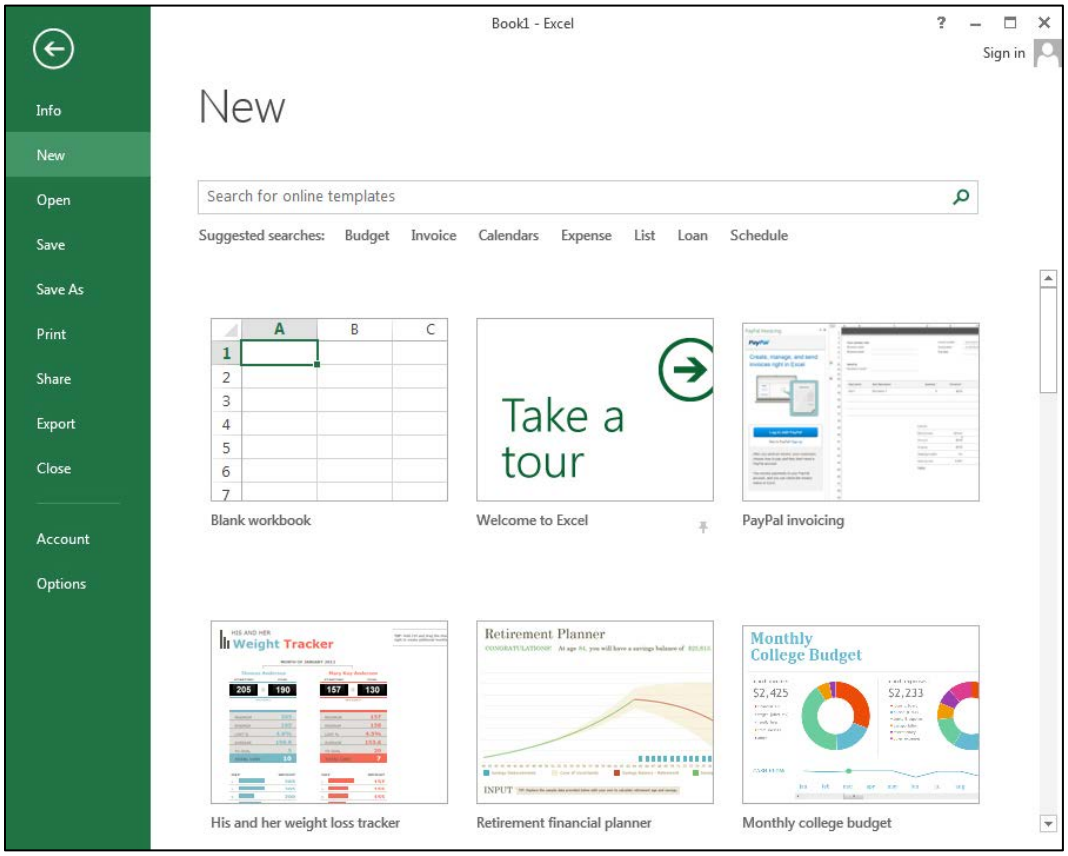


Figure 12 – New Page of the Backstage View

Saving Workbooks

After creating a workbook, you can save it on your computer. Use the *Save As* command when you save a workbook for the first time or if you want to save a copy of a workbook in a different location, with a different file name, or in a different file format. Use the *Save* command to save changes to an existing workbook.

NOTE: Excel 2013's file format is called *Excel Workbook* and is the same as Excel 2007 and 2010. This format has the *.xlsx* file extension and is not backward compatible with Excel versions prior to 2007. You can use Excel 2013 to save a workbook in the *Excel 97-2003 Workbook* format with the *.xls* file extension to make it compatible with earlier versions of Excel, but you will not have access to all of Excel 2013's features.

To save a workbook for the first time:

1. Click the **File** tab, and then click **Save As**. The **Save As** page of the **Backstage** view opens (see Figure 13).
2. Click **Computer** in the center pane, and then click the **Browse** button or a recent folder in the right pane.

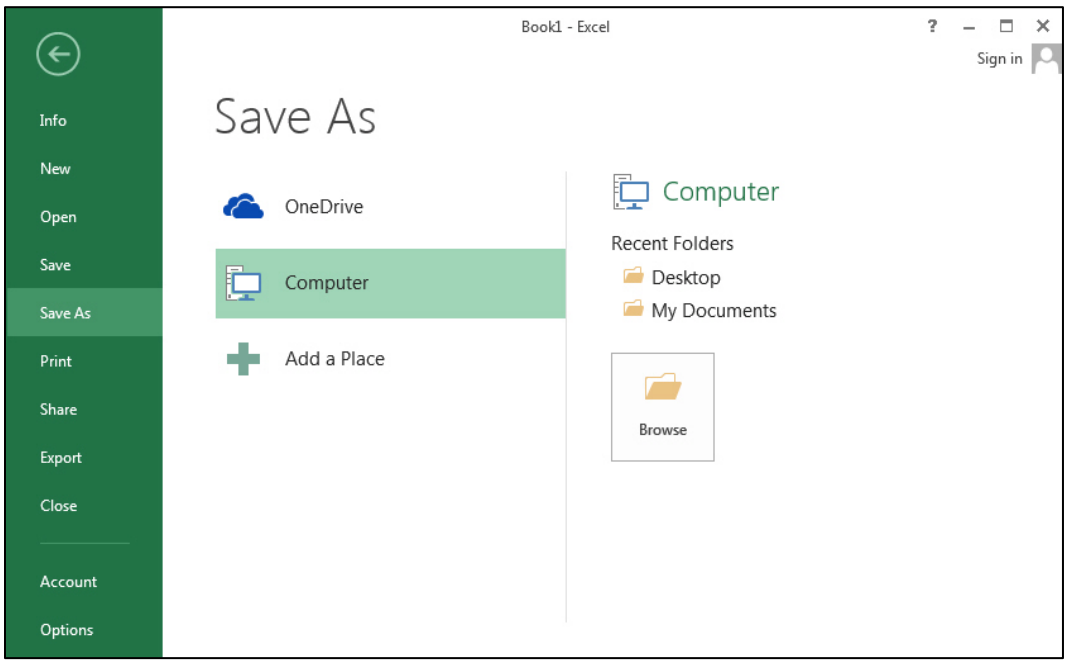


Figure 13 – Save As Page of the Backstage View

3. In the **Save As** dialog box, select a location to save the file, type a name in the **File name** box, and then click the **Save** button (see Figure 14).

   NOTE: By default, Excel 2013 workbooks are saved in the **Excel Workbook** format. To save a document in a different format, click the **Save as type** arrow and select the desired file format from the list.

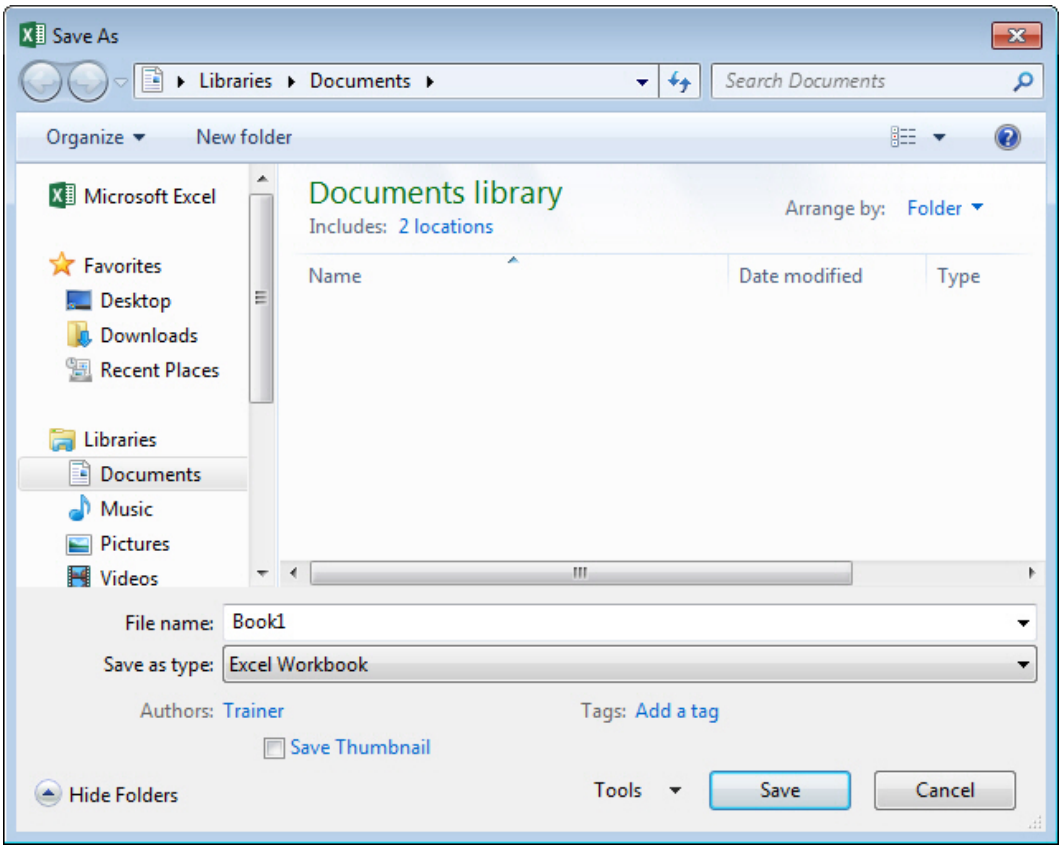


Figure 14 – Save As Dialog Box

To save changes to a workbook:

1. Do one of the following:
   - Click the **File** tab, and then click **Save**.
   - On the **Quick Access** toolbar, click the **Save** button .
   - Press **Ctrl+S**.

Closing Workbooks

When you finish working on a workbook, you can close it, but keep the program window open to work on more workbooks. If the workbook contains any unsaved changes, you will be prompted to save the changes before closing it.

To close a workbook without exiting Excel:

1. Click the **File** tab, and then click **Close**. Or, press **Ctrl+W**.

Opening Workbooks

You can locate and open an existing workbook from the Start screen when Excel 2013 starts or from the Open page of the Backstage view. The Start screen and the Open page also display a list of recently used workbooks which you can quickly open by clicking them. Each workbook opens in its own window, making it easier to work on two workbooks at once.

To open a workbook:

1. Click the **File** tab, and then click **Open**. Or, press **Ctrl+O**. The **Open** page of the **Backstage** view opens, displaying a list of recently used workbooks in the right pane.
2. If the workbook you want is in the **Recent Workbooks** list, click its name to open it. Otherwise, proceed to step 3.
3. Click **Computer** in the center pane, and then click the **Browse** button or a recent folder in the right pane (see Figure 15).

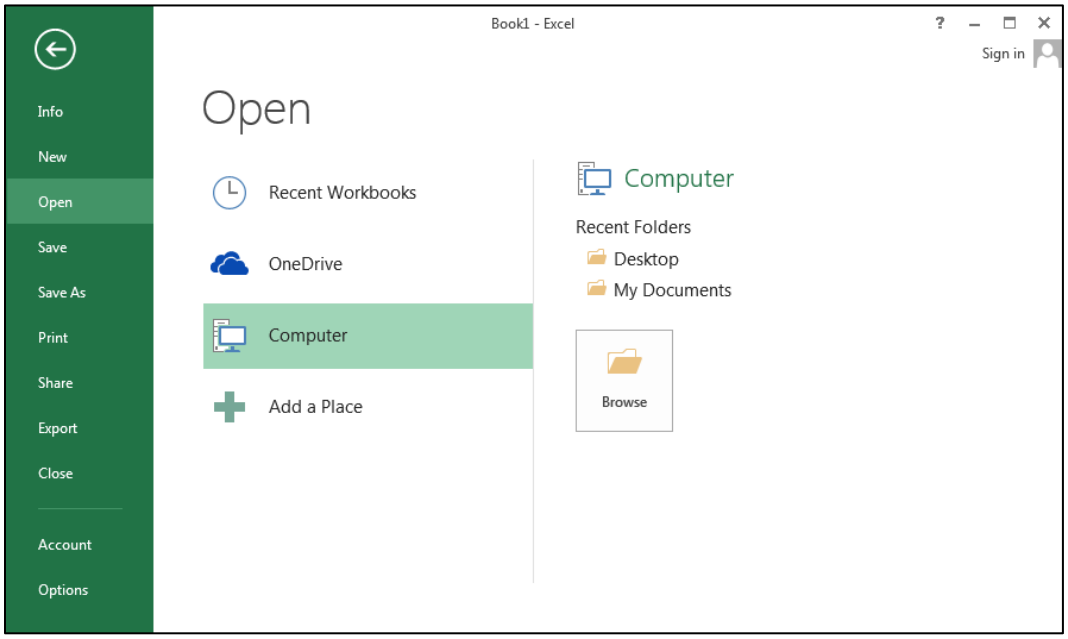


Figure 15 – Open Page of the Backstage View

4. In the **Open** dialog box, locate and select the file that you want to open, and then click the **Open** button (see Figure 16).

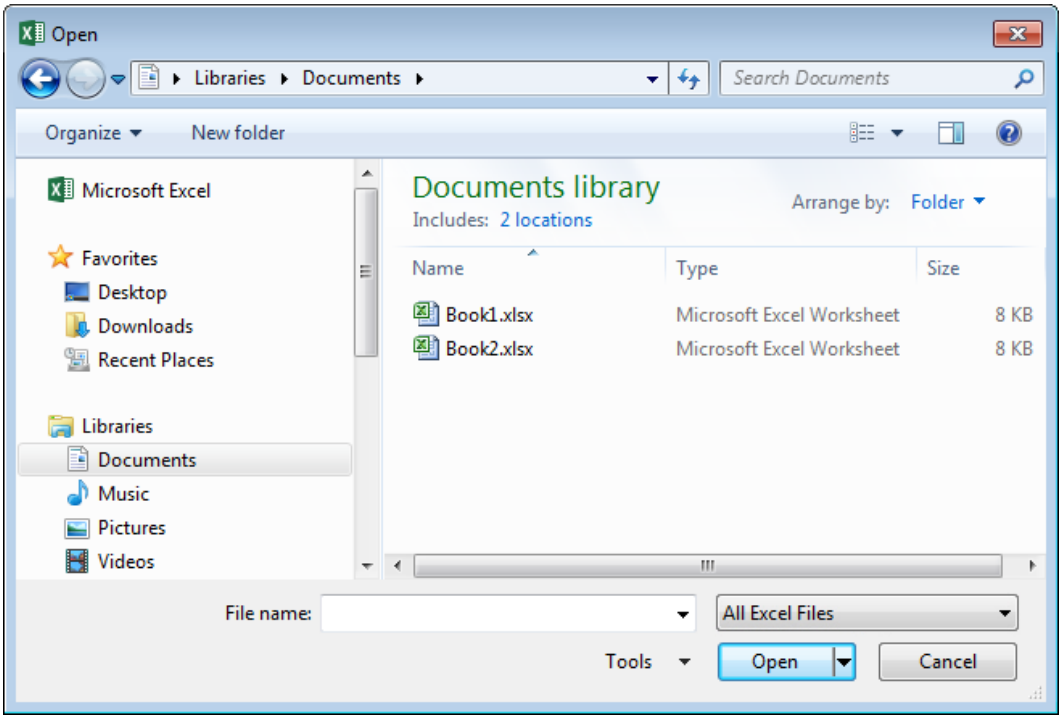


Figure 16 – Open Dialog Box

NOTE: When you open a workbook created with earlier versions of Excel in Excel 2013, the workbook opens in compatibility mode (indicated on the Title bar) with some of the new features of Excel 2013 disabled. You can easily convert the workbook to the Excel 2013 file format by clicking the *Convert* button on the *Info* page of the *Backstage* view (see Figure 17).

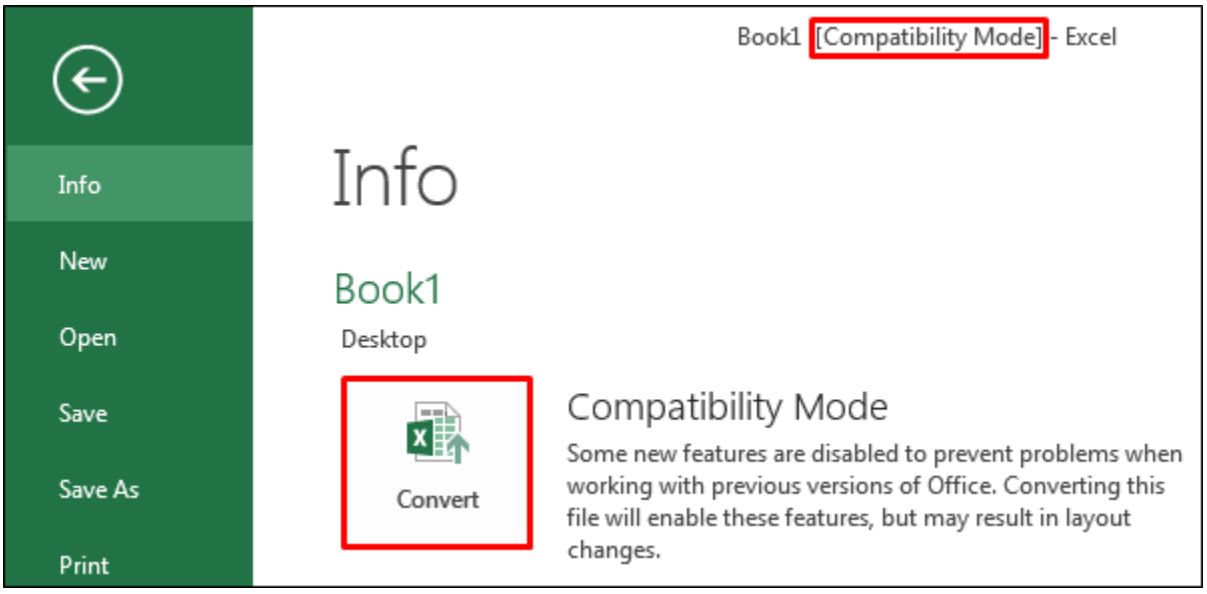


Figure 17 – Convert Button on the Info Page of the Backstage View

Moving Around and Making Selections

This section covers how to perform basic tasks such as moving around worksheets and selecting cells, rows, and columns.

Moving Around Worksheets

There are various ways to navigate through a worksheet. Using the mouse and the scroll bars, you can scroll through the worksheet in any direction. Using the navigational keys on the keyboard, you can move from cell to cell, move up or down one page at a time, or move to the first or last used cell in the worksheet (see Table 3). You can also navigate to a specific cell in the worksheet by entering its address in the Name box.

NOTE: Scrolling with the mouse does not change the location of the active cell. To change the active cell, you must click a new cell after scrolling.

Table 3 – Navigation Keyboard Shortcuts

Key	Action
Down arrow or Enter	Moves the active cell one cell down.
Up arrow or Shift+Enter	Moves the active cell one cell up.
Right arrow or Tab	Moves the active cell one cell to the right.
Left arrow or Shift+Tab	Moves the active cell one cell to the left.
Page Down	Moves the active cell down one page.
Page Up	Moves the active cell up one page.
Alt+Page Down	Moves the active cell right one page.
Alt+Page Up	Moves the active cell left one page.
Ctrl+Home	Moves the active cell to cell A1.
Ctrl+End	Moves the active cell to the last used cell in the worksheet.

Selecting Cells, Rows, and Columns

In order to work with a cell, you must first select it. When you want to work with more than one cell at a time, you can quickly select ranges, rows, columns, or the entire worksheet.

To select a single cell:

1. Click the desired cell (see Figure 18).

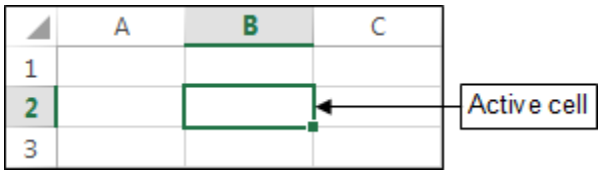


Figure 18 – Active Cell

To select a range of cells:

1. Click the first cell that you want to include in the range, hold down the **Shift** key, and then click the last cell in the range (see Figure 19). Or, drag from the first cell in the range to the last cell.

   NOTE: When a range is selected, every cell in the range is highlighted, except for the active cell. You can deselect a range by pressing any arrow key or by clicking any cell in the worksheet.

To select nonadjacent cells or ranges:

1. Select the first cell or range, hold down the **Ctrl** key, and then select the other cells or ranges (see Figure 20).

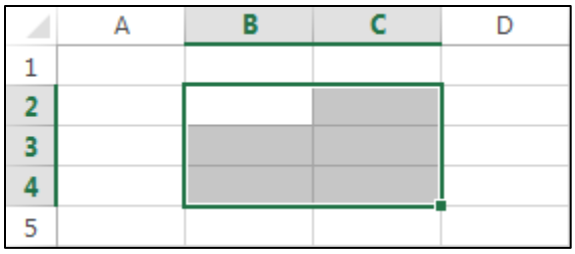


Figure 19 – Selected Range

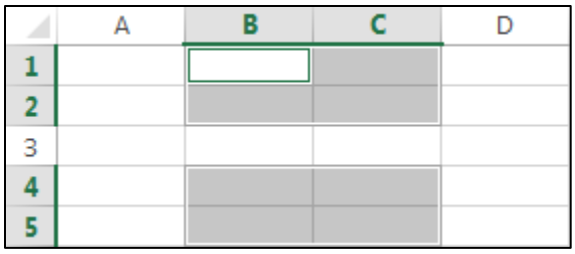


Figure 20 – Selected Nonadjacent Ranges

To select a single row or column:

1. Click the header of the row or column that you want to select (see Figure 21 and Figure 22).

   NOTE: When a row or column is selected, every cell in the row or column is highlighted, except for the active cell. You can deselect a row or column by pressing any arrow key or by clicking any cell in the worksheet.

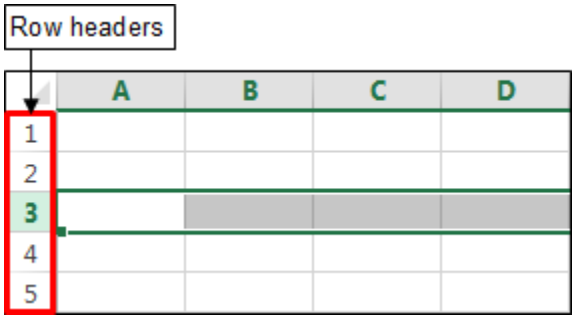


Figure 21 – Selected Row

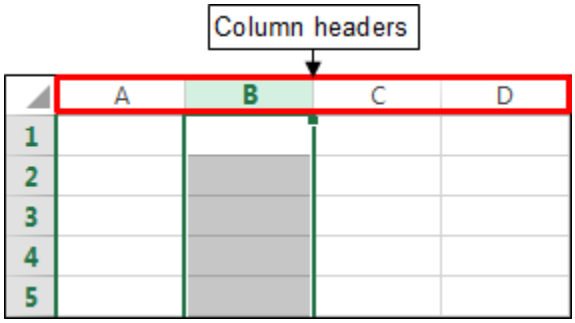


Figure 22 – Selected Column

To select multiple adjacent rows or columns:

1. Click the header of the first row or column that you want to select, hold down the **Shift** key, and then click the header of the last row or column. Or, drag across the headers of the rows or columns that you want to select.

To select multiple nonadjacent rows or columns:

1. Hold down the **Ctrl** key, and then click the headers of the rows or columns that you want to select.

To select all cells in a worksheet:

1. Click the **Select All** button in the upper-left corner of the worksheet (see Figure 23). Or, press **Ctrl+A**.

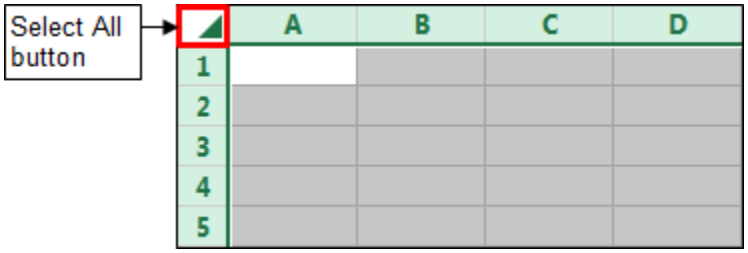


Figure 23 – Select All Button

Editing Worksheets

After creating a workbook, you can start adding data to a worksheet. If you need to make changes, you can easily edit the data to correct errors, update information, or remove information you no longer need.

Entering Data

You can add data by entering it directly in a cell or by using the Formula bar. A cell can contain a maximum of 32,767 characters and can hold any of three basic types of data: text, numbers, or formulas.

NOTE: If you make a mistake while entering data, simply press the **Backspace** key to delete all or a portion of your entry and enter the correct data.

Entering Text

You can enter text in a worksheet to serve as labels for values, headings for columns, or instructions about the worksheet. Text is defined as any combination of letters and numbers. Text automatically aligns to the left in a cell. If you enter text that is longer than its column's current width, the excess characters appear in the next cell to the right, as long as that cell is empty (see Figure 24). If the adjacent cell is not empty, the long text entry appears truncated (see Figure 25). The characters are not actually deleted and will appear if the width of the column is adjusted to accommodate the long text entry.

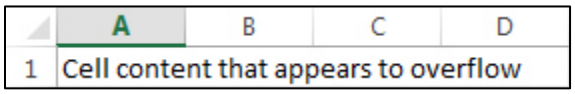


Figure 24 – Overflowing Text Entry

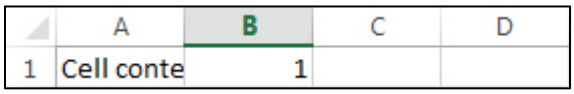


Figure 25 – Truncated Text Entry

To enter text:

1. Select the cell in which you want to enter text.
2. Type the desired text, and then press the **Enter** key.

   NOTE: To enter a line break in a cell, press **Alt+Enter** (see Figure 26).

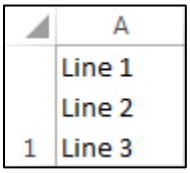


Figure 26 – Cell with Line Breaks

Entering Numbers

Numeric entries contain only numbers and are automatically aligned to the right in a cell. Numbers can exist as independent values, or they can be used in formulas to calculate other values. You can enter whole numbers (such as 5 or 1,000), decimals (such as 0.25 or 5.15), negative numbers (such as -10 or -5.5), percentages (such as 20% or 1.5%), and currency values (such as $0.25 or $20.99).

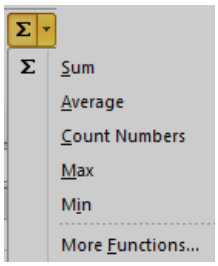
NOTE: A number that does not fit within a column is displayed as a series of pound signs (#####). To accommodate the number, increase the column width.

To enter a number:

1. Select the cell in which you want to enter the number.
2. Type the desired number, and then press the **Enter** key.

- Protect sheet – enter a password and protect the entire or a part of a sheet (cell range)
- Rename Sheet - enter a name and press the Enter key
- Lock cell – functional only if we protect the worksheet first

Enter function:



1. select a cell range
2. enter a function via menu shown on the right

Or: 1. select the cell in which you want to enter function value

2. enter the symbol „=“

3. enter the function manually (e.g. „sum“), and the cell range to which the function will apply, respecting syntax

Most often used functions:

=SUM(cell range) → adding the numbers in selected cells

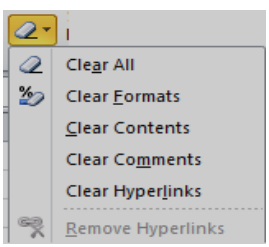
=AVERAGE(cell range) → finds the average value

=MIN(cell range) → finds the smallest value

=MAX(cell range) → finds the biggest value

Deleting options:

- Clear All
- Clear Contents
- Clear Formats



Sort A to Z - sort data within a table from minimum to maximum value, or

Sort Z to A – sort data within a table from maximum to minimum values

Find: enter a word or phrase and press the Find button

Replace: - Find What – field to enter the word we are searching for;

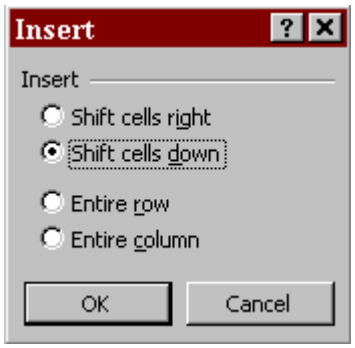
- Replace With - field to enter the word that we want to use as a replacement

Format Painter  - copy formatting from one part of the text to another

Help in MS Excel  , or F1 on the keyboard

INSERTING, DELETING, AND MERGING CELLS

Inserting Cells:



1. Select the cell(s) above or to the left of the cells you want to move.
2. Click on the **INSERT** menu.
3. Click on **CELLS**.
4. Click on appropriate selection.
5. Click **OK**.

OR

1. Select the cell(s) above or to the left of the cells you want to move.
2. Right-click.
3. Click on **INSERT**.
4. Follow steps 3-5 from above.

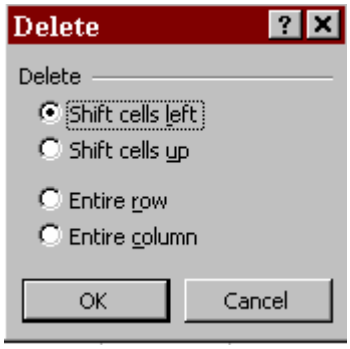
Inserting Rows and Columns:

1. Select a cell to the left of the column or above the row that will be moved.
2. Click on the **INSERT** menu.
3. Click on **COLUMNS** or **ROWS**

OR

1. Right-click the column or row heading.
2. Follow steps 2-3 from above.

Deleting Cells:

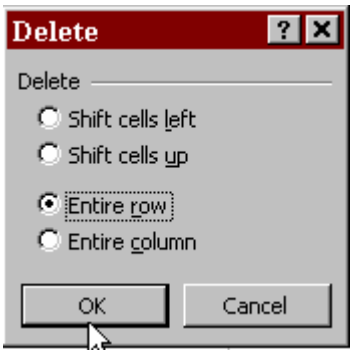


1. Select the cell(s) to delete.
2. Click on the **EDIT** menu.
3. Click on **DELETE**.
4. Click on appropriate selection.
5. Click **OK**.

OR

1. Select the cell(s) to delete.
2. Right-click.
3. Follow steps 3-5 from above.

Deleting Rows and Columns:



1. Select at least one cell in the column or row.
2. Click on the **EDIT** menu.
3. Click on **DELETE**
4. Click on appropriate selection.
5. Click **OK**.

Merging Cells:

1. Select the cells you want to merge.
2. Click the **MERGE AND CENTER** button  on the toolbar.

Tip

Click the **Undo** button  to reverse the last change made. To "undo the undo" click the **Redo** button  .

PRINTING WORKSHEETS AND WORKBOOKS

Previewing a Worksheet:

To preview the worksheet before you print it, click the **PRINT PREVIEW** button  .

To exit the Print Preview screen, click on **CLOSE**.

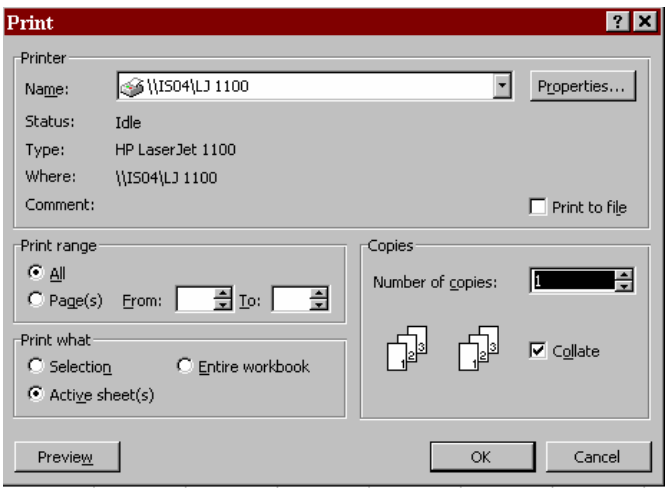
Setting the Print Area:

1. Select the area of the worksheet that is to be printed.
2. Click on the **FILE** menu.
3. Click on **PRINT AREA**.
4. Click on **SET PRINT AREA**.

Clearing the Print Area:

1. Click on the **FILE** menu.
2. Click on **PRINT AREA**.
3. Click on **CLEAR PRINT AREA**.

Printing:



1. Click on the **FILE** menu.
2. Click on **PRINT**. A dialog box will appear.
3. Select the options you wish to change (page name, name of printer, etc.)
4. Select the number of copies.
5. Click **OK**.

OR

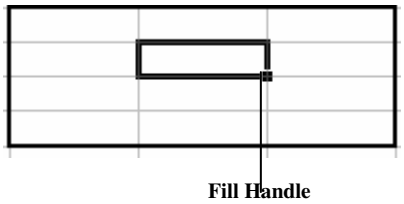
1. Click the **PRINT** button  on the toolbar.

Copying a Formula:

1. Select the cell with the formula you want to copy.

2. Point to the fill handle.

3. Move the fill handle to the last cell in the range.



Tip

The fill handle can be used to complete a series of years, dates, days, etc.

Editing a Formula:

1. Click on the appropriate cell.

2. Position the insertion point in the **FORMULA BAR**, or click on the **EDIT FORMULA** button = on the formula bar.

3. Make the changes and press **ENTER**.

Deleting a Formula:

1. Click on the appropriate cell

2. Press **DELETE**.

MOVING DATA

Cutting, Copying, and Pasting :

Cutting text removes data from a cell while copying duplicates the data so that it can be pasted to another location.

1. Select the cell(s) that contain the data to be cut or copied.
2. Click on the **CUT** or **COPY** button.  
3. Select the cell(s) where the data will be pasted.
4. Click on the **PASTE** button. 

Copying Data Using the Fill Handle:

1. Select the cell(s) that contain the data to be copied.
2. Drag the fill handle to the desired cells.

Paste Special:

Paste Special allows you to choose which parts of a cell you want to paste. You can paste only the cell's formatting, formula, or width if desired.

1. Select the cells that you want to cut or copy.
2. Click on the **CUT** or **COPY** button.
3. Select the cell(s) where the data will be pasted.
4. Click on the **EDIT** menu.
5. Click on **PASTE SPECIAL**
6. Click on the desired pasteoption.
7. Click **OK**.

FIND AND REPLACE

Find:

1. Go to the beginning of the document by pressing **[Ctrl] [Home].**

2. Click on the **EDIT** menu.

3. Click on **FIND**.

4. Click on the **FIND** tab in the dialog box that opens.

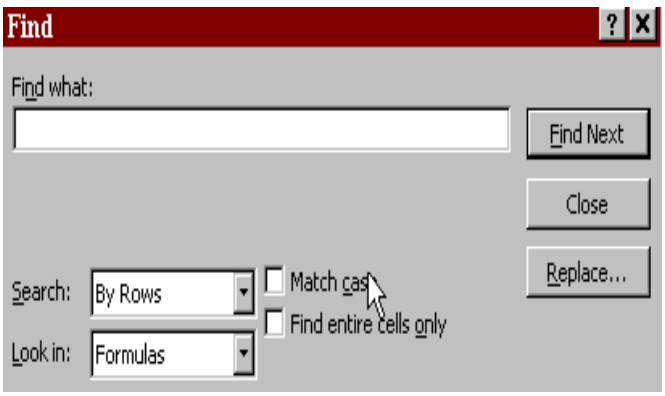
5. Enter the word or number you wish to find in the **"FIND WHAT"** text box.

6. Click on the **SEARCH** drop-down menu and click on rows or columns.

7. Click on the **LOOK IN** drop-down menu and click on formulas, values, or comments.

8. Click on **FIND NEXT**.

9. Click **OK** when finished.



Replace:

1. Repeat steps 1thru 3 from above.

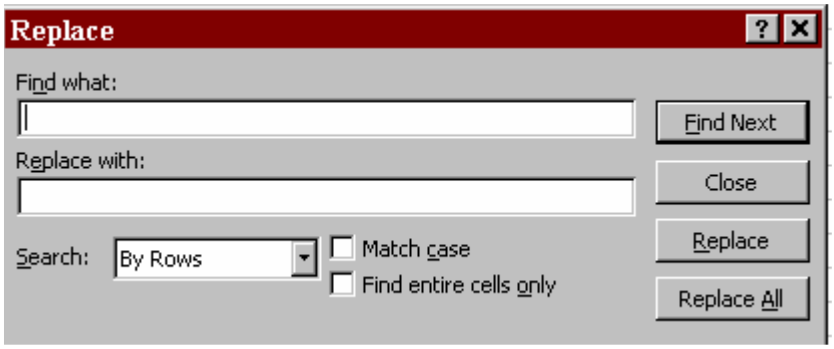
2. Click on the **REPLACE TAB** in the dialog box that opens.

3. Enter the word or number you wish to find in the **"FIND WHAT"** text box.

4. Enter the word or number you wish to replace it with in the **"REPLACE WITH"** text box.

5. Click on the **SEARCH** drop-down menu and click on rows or columns.

6. Click on **REPLACE ALL** to replace every occurrence.



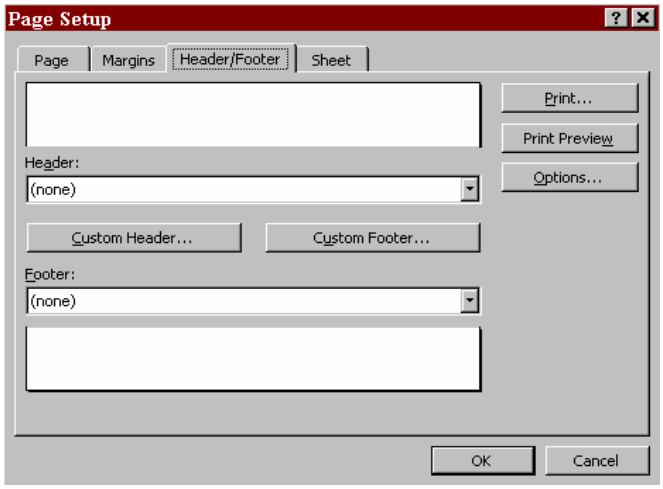
ADDING HEADERS AND FOOTERS

1. Click on the **VIEW** menu.

2. Click on **HEADER AND FOOTER.**

3. Click on the header or footer drop-down menu and select the desired header and footer.

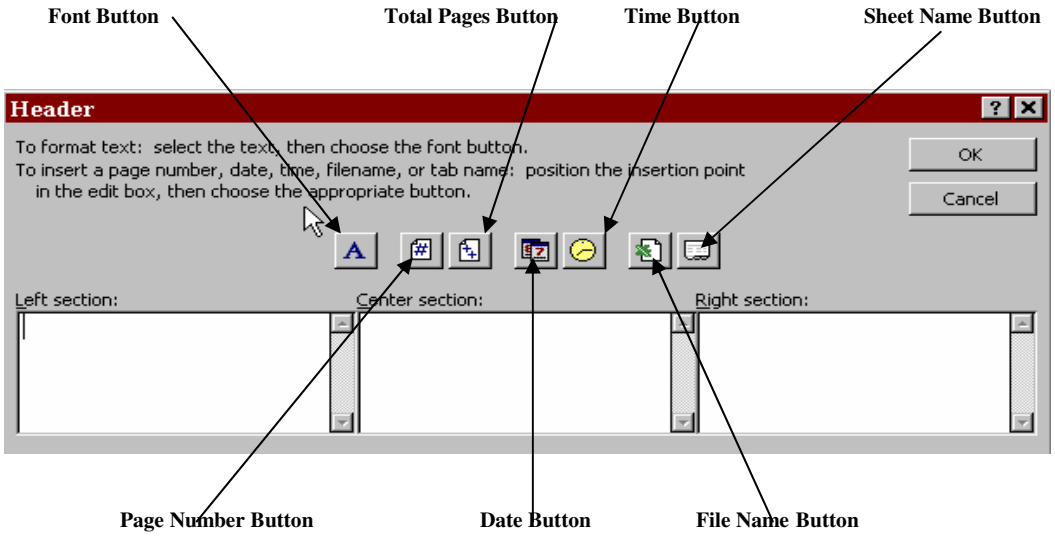
4. Click **OK**.



Customizing Headers and Footers:

1. Repeat steps 1 & 2 from above.

2. Click on the **CUSTOM HEADER** or **CUSTOM FOOTER** button.



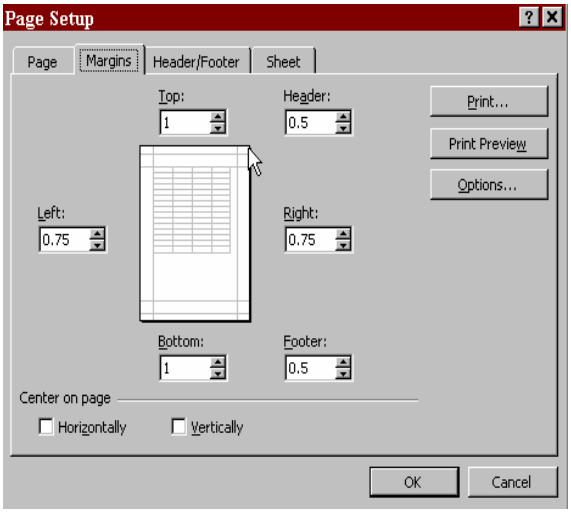
3. Type desired text and field codes into the appropriate sections.

4. Click **OK** in the Header/Footer dialog box.

5. Click **OK** in the Page Setup dialog box.

MAKING CHANGES TO THE PAGE LAYOUT

Changing Margins:



1. Click on the **FILE** menu.
2. Click on **PAGE SETUP**.
3. Click on the **MARGINS** tab.
4. Change the margins by clicking on the arrows or typing a new setting into the text box.
5. Click **OK**.

Inserting and Deleting Page Breaks:

Insert

1. Select a cell below and to the right of where you want the page break to be added.
2. Click on the **INSERT** menu.
3, Click on **PAGE BREAK**.

Delete

1. Follow steps 1 & 2 from above.
2. Click on **REMOVE PAGE BREAK**.

Previewing Page Breaks:

1. Click on the **VIEW** menu.
2. Click on **PAGE BREAK PREVIEW**.

Adding Rows and Columns

Rows are cells that run horizontally across the document. You can insert an extra row of cells like this:

1. Drag select along the row of cells where you want your new row to appear.
2. Click Home Tab > Insert > Insert Sheet Rows. (Figure 10).The row will automatically be placed on the spreadsheet and any data that was selected in the original row will be moved down below the new row.

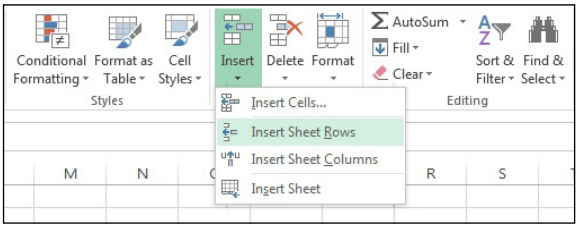


Figure 10. Inserting Rows

Columns are cells that run vertically down the document. You can insert an extra column of cells like this:

1. Drag select along the column of cells where you want your new column to appear.
2. Go to Home Tab > Insert > Insert Sheet Column.The column will automatically be place on the spreadsheet and any data to the right of the new column will be moved more to the right. (Figure 11)

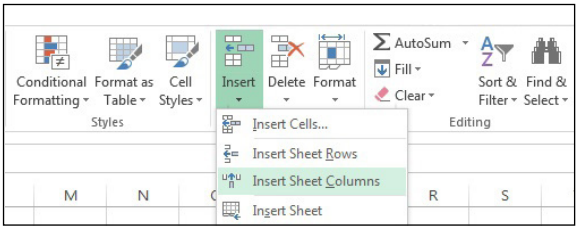


Figure 11. Inserting Columns

Working With Charts

Charts are an important part to being able to create a visual for spreadsheet data.

1. In order to create a chart within Excel the data that is going to be used for it needs to be entered already into the spreadsheet document. Once the data is entered, the cells that are going to be used for the chart need to be highlighted so that the software knows what to include. Next, click on the Insert Tab that is located at the top of the screen. (Figure 12)

Figure 12. Charts Tab

2. You may choose the chart that is desired by clicking the category of the chart you will use. Once the category is chosen the charts will appear as small graphics within a drop down menu. To choose a particular chart just click on its icon and it will be placed within the spreadsheet you are working on.

3. To move the chart to a page of its own, select the border of the chart and Right Click. This will bring up a drop down menu, navigate to the option that says Move Chart. This will bring up a dialog box that says Chart Location. From here you will need to select the circle next to As A New Sheet and name the sheet that will hold your chart. The chart will pop up larger in a separate sheet but in the same workbook as your entered data. (Figure 13)

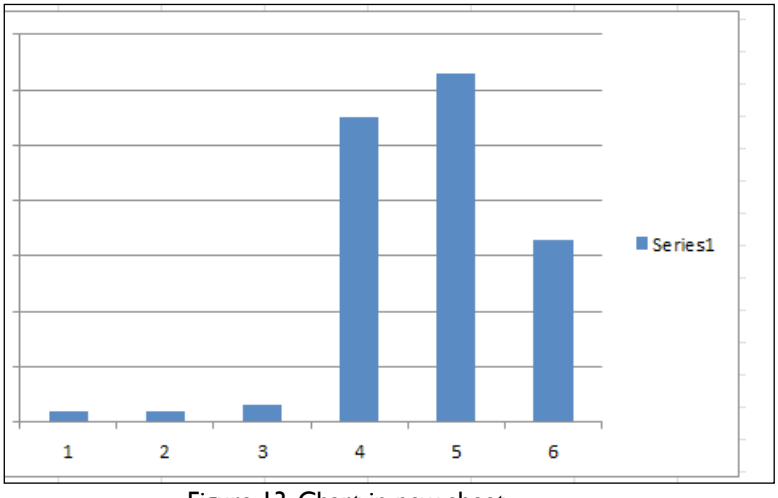


Figure 13. Chart in new sheet

Chart Design

There are features that you can change to make your chart more appealing. To be able to make these changes you will need to have the chart selected or be viewing the chart page that is within your workbook. Once you have done that the Design Tab will appear highlighted with various different options to format your graphic. (Figure 14)

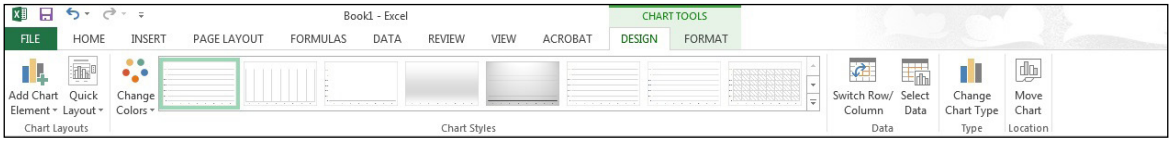


Figure 14. Design Tab for chart design.

5. FORMATTING CONT.

Chart Options

Titles: Within the new chart Design tab, click the Add Chart Element icon. Here, you will see the option to title the chart as well as various components of the chart.

Change Chart Type: You can change your chart easily by selecting this icon and navigating to a more desirable chart. This feature is very convenient for someone who chose the wrong chart and doesn't wish to reselect all their data and go through the process a second time.

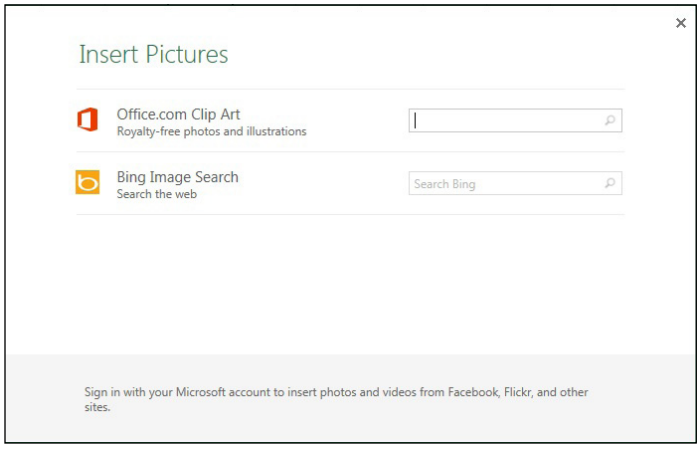
Format Chart Area: This allows for changes to be made to the chards border, style, fill, shadows, and more. To get this option you will need to right click on the charts border and navigate to the Format Chart Area option. Once this is clicked a dialog box will appear.

6. INSERTING SMART ART GRAPHICS

Pictures

To insert Pictures:
Go to the Insert Tab> Picture, a dialog box will appear and then you can select the desired picture from the location that is it stored. The picture will be inserted directly onto your document, where you can change the size of it as desired.

Inserting Clipart:
To insert Clip Art you will need to go to the Insert Tab > Online Pictures. A window will appear giving you the options to either pull clip art from the Microsoft Office website or search for more options using a Bing image search engine. (Figure 15)



Creating Functions

When creating a function in Excel you must first have the data that you wish to perform the function with selected.

1. Select the cell that you wish for the calculation to be entered in (i.e.: if I want to know the sum of B1:B5 I will highlight cell B6 for my sum to be entered into). (Figure 17)

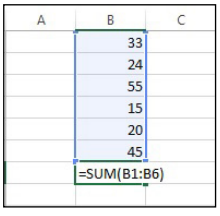


Figure 17. Choosing calculation cell

2. Once you have done this you will need to select the Formulas Tab located at the top of the screen.
3. A list of Most Recently Used, Financial, Logical, Text, Date and Time, Math and Trig formulas will appear. To choose one of the formulas click the icon that holds the formula you are looking for.
4. Once you have clicked your formula this will display a dialog box on your screen. (Figure 18)

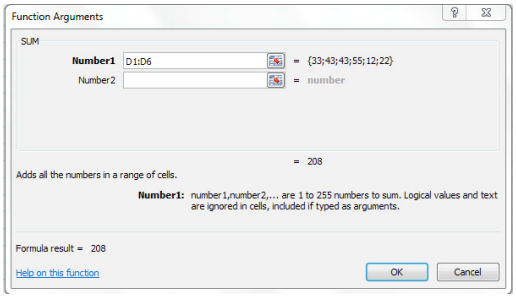


Figure 18. First calculation display

In this screen it lists the cells that are being calculated, the values within the cells, and the end result.

5. To accept that calculation you can press OK and the result will show up in the selected cell.

7. PRINTING

It is important to always save your document before you print!

Printing

To print your document, go to File Tab > Print, select your desired settings, and then click OK. You can also do this by using the shortcut CTRL + P

To be able to change the orientation of your page for printing you can click on the Portrait Orientation button under the option under Print then click the change the layout. (Figure 19)

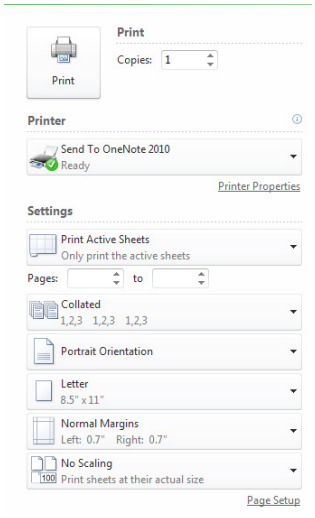


Figure 19. Page Setup button and printing

8. OTHER HELPFUL FUNCTIONS

Undo and Redo

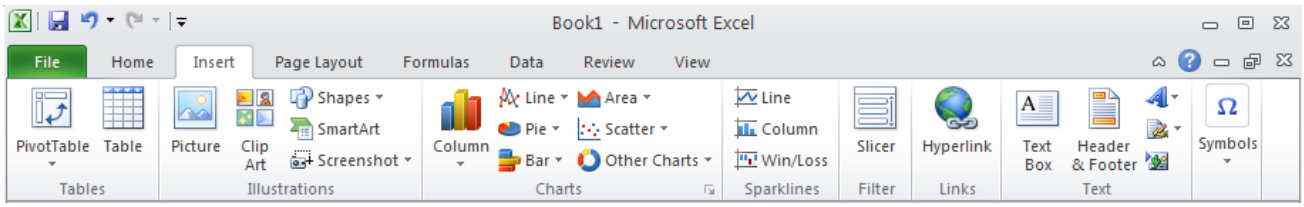
In order to undo an action, you can click on the blue arrow icon that is pointing to the left at the top of the screen. To redo an action, you can click on the blue arrow icon pointing to the right. It is important to note that not all actions are undoable, thus it is important to save before you make any major changes in your document so you can revert back to your saved document. (Figure 20)

Figure 20. Undo/Redo butons

Quitting

Before you quit, it's a good idea to save your document one final time. You will need to double click the the Excel icon in the upper lefthand corner. This is better than just closing the window, as it insures your document quits correctly.

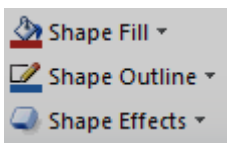
Insert tab



Shapes 

– after selecting a shape, we can insert it in the sheet using the drag-and-drop method, which automatically defines its size and position.

Arrange – sets elements in front of (option Bring forward) or behind (option Send to back) other elements.



- opens color palette

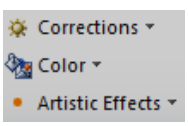
- opens color palette and options for choosing type and thickness of lines

- effects: 3D, shadow, reflection, rotation etc.

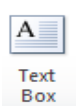
Pictures 

- to select a picture: press the left mouse button on it, the picture will get squares on the border called control points which allows the size of the image to be manipulated.
- set object size:
  - manually: select an object, move some of the control points using the drag-and-drop method
  - enter values: press the right mouse button on the object and choose the Format Picture option; on the Size tab, enter values for height and width

While the object is selected, we can open the Format tab, that contains some new formatting options



- Corrections - tool for contrast, brightness, sharpness correction
- Color - change color of the images in order to better match the rest of the content
- Artistic effects - tools that can make an image appear as if it was a drawing or painting

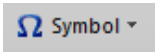


- tool for inserting a text box; after selecting this tool, we can set the position and the size of the text box in the worksheet via the drag-and-drop method

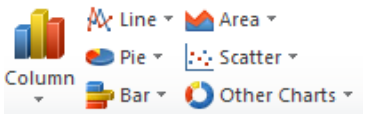
Header and Footer - edit: press the left mouse button within the header or footer field, or: press the right mouse button and from the quick menu, choose the Edit Text option

 - insert date and time

 - insert page number

Insert symbol 

€ £ © ∞ ☺ ≠ etc.

Chart 

Charts are graphical representaitons of table data in various forms, like column graph. Tabular data and graph are connected - therefore changes in the table are reflected in the chart

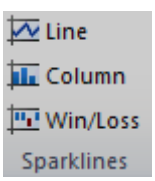
- when we insert a chart, a table for data entry opens in Microsoft Excel and we can enter data. Also, if we select a cell range filled with data, the chart will be automatically filled with the selected data.
- to change chart size: select a chart and move (drag-and-drop) the control points to the desired direction
- changes in the chart can be done via the Chart Tools toolbar, that appears when the chart is selected; via the quick menu or by double-click with the left mouse button on the chart
    - Format Chart Area – effects like color fill, 3D, rotation, shadow etc. are accessible
    - Change Chart Type – choose chart type
- move the chart: within the Chart Tools toolbar, select the Design and choose tool Move chart:
  > New sheet (and there is a field to enter the worksheet's name), or
  > Object in > on the drop-down menu, choose the worksheet in which you want to place the chart

„SmartArt“ 

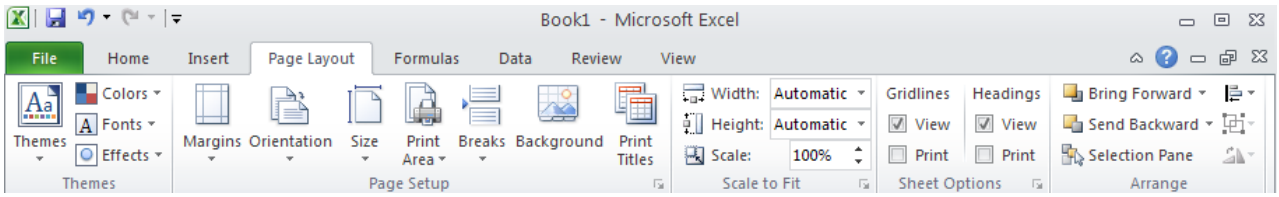
- fields can be moved in order to edit its structure: press the left mouse button on the fields border, via the drag-and-drop method, move it to the desired position
- add new field: press the right mouse button over the field, upon which you want to add a new field and choose the Add Shape option on the quick menu, then choose where to add it “below” or “above” (hierarchal)
- deleting: select a field and press the Delete button

Sparklines

- chart within one cell;
- needs to have a defined position (cell address that contains it) and data cell range (data to display)



Tab name: Page Layout



The *Page Layout* settings change the look of the Excel file when it is printed.

Margins: - Normal - Narrow - Wide

Orientation: Portrait (vertical) and Landscape (horizontal)

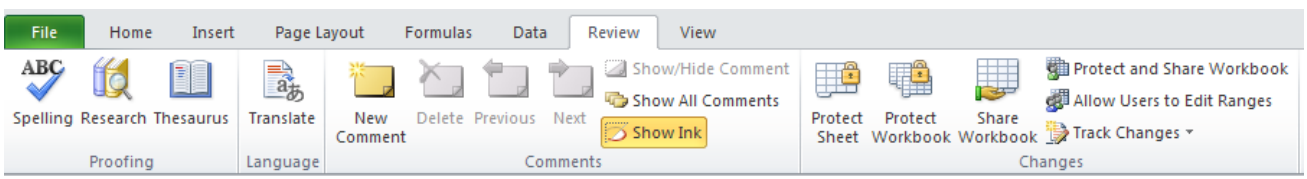
Scale: tool for fitting data for print to a paper

Breaks – it is recommended that user sets the breaks manually:

- Insert Page Break
- Remove Page Break

Tools for organizing content: - Bring Forward
- Send Backward

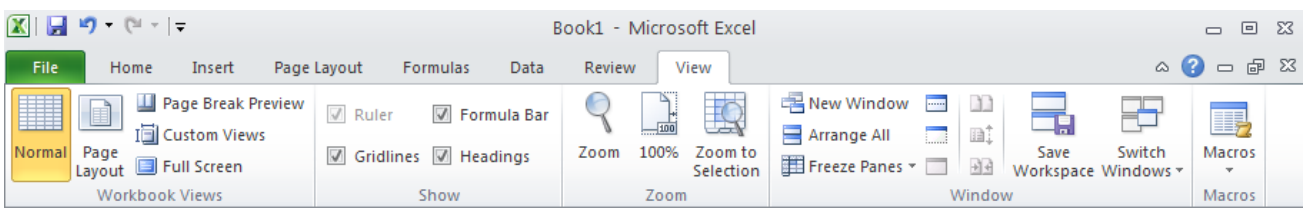
Review tab



Spelling  - opens a dialog box with options: Ignore once, Ignore all, Change, Change all

- the word that is not in the dictionary can be added: press the right mouse button over it and choose the Add to dictionary option

View tab



Normal - for creating a worksheet

Page Layout – for print preview of the data set for printing, header and footer

Zoom – choose offered or enter value

Freeze and unfreeze rows and columns in order to always be visible. This is useful when the data in the worksheet does not fit on the computer screen but the user needs to see the row and column labels:

- freezing columns and rows: select a cell within the sheet and choose the Freeze Panes button. Columns to the left and rows above will be "frozen" meaning that as the user scrolls left and right in the worksheet, the frozen cells always remain visible.
- freezing top row: choose the Freeze Panes button and choose freeze top row
- freezing first column: choose the Freeze Panes button and choose freeze first column

FORMULAS

Formula uses numerical data found in the chosen cell range (the value entered in a cell range)

Enter the formula:

1. select the cell where you want to enter a formula
2. enter the sign „="
3. enter numeric values or cell addresses and arithmetic operator
4. press the Enter key to complete

Basic arithmetic operators:

- addition = A1 + A2
- multiplication = A3 * C5
- division = C5/C3
- exponentiation = F15^ A2

Microsoft Excel follows the mathematical order of calculation operations.
Formula can be seen in the formula bar when the cell, that contains it, is selected or if we position the cursor with a double click in the cell, that contains the formula (that way it will be visible in the cell and edited too). The formula result will be displayed in the cell that contains the formula and where the cursor is not positioned.

Relative cell referencing (e.g. C5)

- when the formula is copied with AutoFill and it has relative cell references, cell references are going to adapt, for example:

If we use Auto fill to copy the following formula: =C5+B5, it will change to: =C6+B6, =C7+B7 etc.

Absolute cell referencing (e.g. $C$5)

If the cell is referenced absolutely in a formula, then applying the Auto fill tool will result in: =$C$5+B5, =$C$5+B6, =$C$5+B7 etc.

You can change the selected cell reference from relative to absolute and vice versa by using the F4 key

Logical function if

= logical function that compares cell values with some expression or value. We define the appropriate action depending on the result

Entering Dates and Times

Excel treats dates and times as special types of numeric values.

To enter a date:

1. Select the cell in which you want to enter the date.
2. Type the month, day, and year, with each number separated by a forward slash (/) or a hyphen (-), and then press the **Enter** key.

To enter a time:

1. Select the cell in which you want to enter the time.
2. Type the hour, a colon (:), and the minutes, press the **Spacebar**, type **a** for A.M. or **p** for P.M., and then press the **Enter** key.

Editing Data

If a cell contains a long entry and you only want to change a few characters, it is faster to edit the data than to retype the entire entry. You can edit the contents of a cell directly in the cell or by using the Formula bar.

To edit data:

1. Double-click the cell that contains the data you want to edit. The cursor (a blinking vertical line) appears in the cell in the location that you double-clicked.
2. To insert characters, click where you want to make changes, and then type the new characters.

   NOTE: You can also move the cursor by pressing the **Home**, **End**, or arrow keys.

3. To delete characters, click where you want to make changes, and then press the **Backspace** or **Delete** key.

   NOTE: Pressing the **Backspace** key deletes the character to the left of the cursor; pressing the **Delete** key deletes the character to the right of the cursor.

4. When you are finished, press the **Enter** key.

   NOTE: If you are editing data and decide not to keep your edits, press the **Esc** key to return the cell to its previous state.

Replacing Data

You can replace the entire contents of a cell with new data. Any formatting applied to the cell remains in place and is applied to the new data.

To replace data:

1. Select the cell that contains the data you want to replace.
2. Type the new data, and then press the **Enter** key.

Deleting Data

You can delete the entire contents of a cell if the data is no longer needed. Deleting data does not remove any formatting applied to the cell.

To delete data:

1. Select the cell that contains the data you want to delete, and then press the **Delete** key.

Moving and Copying Cells

When editing a worksheet, you may want to duplicate a cell in another location or remove (cut) a cell from its original location and place it in a new location. A copied cell can be pasted multiple times; a cut cell can be pasted only once.

NOTE: Cut or copied data is stored on the **Clipboard**, a temporary storage area. You can access it by clicking the dialog box launcher in the **Clipboard** group on the **Home** tab of the **Ribbon** (see Figure 27).

To move or copy a cell:

1. Select the cell that you want to move or copy.
2. On the **Home** tab, in the **Clipboard** group, do one of the following:
   - To move the cell, click the **Cut** button. Or, press **Ctrl+X**.
   - To copy the cell, click the **Copy** button. Or, press **Ctrl+C**.
3. Select the cell where you want to paste the cut or copied cell.
4. On the **Home** tab, in the **Clipboard** group, click the **Paste** button. Or, press **Ctrl+V**.

   NOTE: When you cut or copy cells, a *marquee* (scrolling dotted line) appears around the cells. You can remove the marquee by pressing the **Esc** key (see Figure 28).

Figure 27 – Clipboard Group on the Home Tab

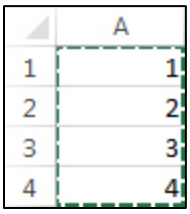


Figure 28 – Cells with Marquee

Using Paste Special

The *Paste Special* command is a very useful editing feature. It allows you to control which aspect of the copied cell to paste into the target cell. For example, you can choose to paste only the copied cell's formula, only the result of the formula, only the cell's formatting, etc. You must copy to use the Paste Special command; when you cut, the Paste Special command is not available.

To use the Paste Special command:

1. Select the cell that contains the value, formula, or formatting you want to copy.
2. On the **Home** tab, in the **Clipboard** group, click the **Copy** button.
3. Select the cell where you want to paste the value, formula, or formatting.
4. On the **Home** tab, in the **Clipboard** group, click the **Paste** arrow and select the desired option from the menu (see Figure 29).

   NOTE: Pointing to a command on the **Paste** menu displays its name in a ScreenTip. You can access more options by clicking **Paste Special** at the bottom of the menu.

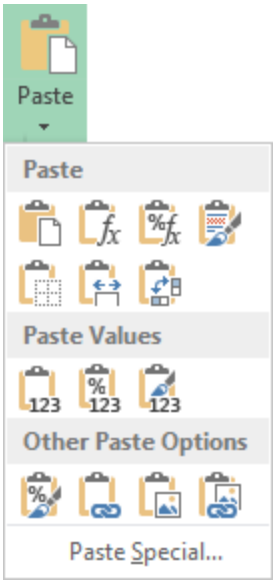


Figure 29 – Paste Menu

Clearing Cells

You can clear a cell to remove its contents, formats, or comments. When clearing a cell, you must specify whether to remove one, two, or all three of these elements from the cell.

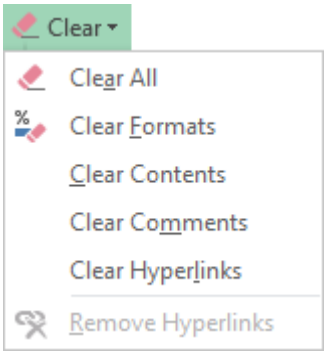


Figure 30 – Clear Menu

To clear a cell:

1. Select the cell that you want to clear.
2. On the **Home** tab, in the **Editing** group, click the **Clear** button and select the desired option from the menu (see Figure 30).

Undoing and Redoing Changes

Whenever you make a mistake, you can easily reverse it with the *Undo* command. After you have undone one or more actions, the *Redo* command becomes available and allows you to restore the undone actions.

To undo an action:

1. On the **Quick Access** toolbar, click the **Undo** button  . Or, press **Ctrl+Z**.

To redo an action:

1. On the **Quick Access** toolbar, click the **Redo** button  . Or, press **Ctrl+Y**.

Formatting Worksheets

Excel 2013 includes a number of features that can be used to easily format a worksheet. Formatting enhances the appearance of a worksheet and makes it look professional.

Formatting Cells and Cell Contents

You can format cells and cell contents by changing the font, font size, font style, and font color, as well as adding cell borders and changing the background color of cells. Since formatting is attached to the cell and not to the entry, you can format a cell before or after you enter the data. The *Font* group on the *Home* tab of the *Ribbon* contains the most commonly used formatting commands (see Figure 31). You can also format cells using the *Format Cells* dialog box which can be opened by clicking the dialog box launcher in the *Font* group.

Figure 31 – Font Group on the Home Tab

Changing the Font and Font Size

A font defines the overall appearance or style of text lettering. Font size controls the height of the font. The default font in new Excel 2013 workbooks is Calibri; the default font size is 11 points.

To change the font:

1. Select the cell that you want to format.
2. On the **Home** tab, in the **Font** group, click the **Font** arrow and select the desired font from the list (see Figure 32).

To change the font size:

1. Select the cell that you want to format.
2. On the **Home** tab, in the **Font** group, click the **Font Size** arrow and select the desired font size from the list (see Figure 33). If a font size you want is not listed in the **Font Size** list, click in the **Font Size** box, type the desired number, and then press the **Enter** key.

   NOTE: You can also change the font size by clicking the **Increase Font Size** button or **Decrease Font Size** button in the **Font** group on the **Home** tab of the **Ribbon**.

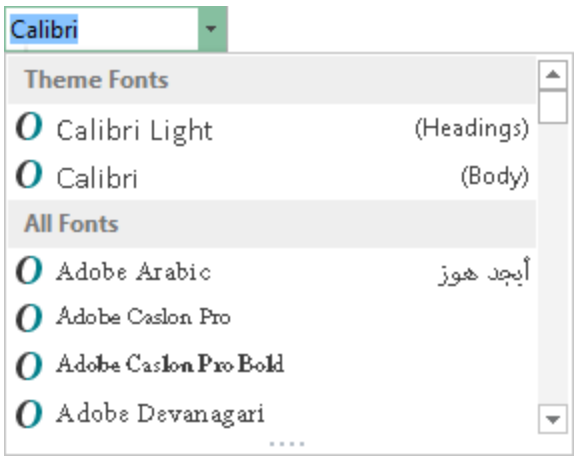


Figure 32 – Font List

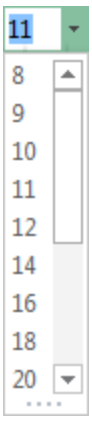


Figure 33 – Font Size List

Changing the Font Color and Fill Color

You can change the font color of cell contents or the background color of cells to emphasize important data or add visual impact to a worksheet.

To change the font color:

1. Select the cell that you want to format.
2. On the **Home** tab, in the **Font** group, click the **Font Color** button to apply the most recently used color, or click the **Font Color** arrow and select a different color from the color palette (see Figure 34).

To change the fill color:

1. Select the cell that you want to format.
2. On the **Home** tab, in the **Font** group, click the **Fill Color** button to apply the most recently used color, or click the **Fill Color** arrow and select a different color from the color palette (see Figure 35).

   NOTE: You can remove the fill color from a selected cell by clicking the **Fill Color** arrow, and then clicking **No Fill** on the palette.

Figure 34 – Font Color Palette

Figure 35 – Fill Color Palette

Applying Font Styles

You can apply one or more font styles to emphasize important data in a worksheet. Font styles are attributes such as bold, italic, and underline. Bolding makes the characters darker. Italicizing slants the characters to the right. Underlining adds a line below the cell contents, not the cell itself.

To bold or italicize data:

1. Select the cell that you want to format.
2. On the **Home** tab, in the **Font** group, click the **Bold** button B or **Italic** button *I*.

To underline data:

1. Select the cell that you want to format.
2. On the **Home** tab, in the **Font** group, do one of the following (see Figure 36):
   - To apply a single underline, click the **Underline** button.
   - To apply a double underline, click the **Underline** arrow, and then click **Double Underline** on the menu.

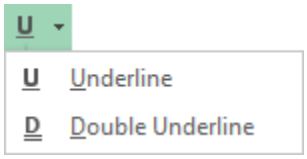


Figure 36 – Underline Menu

NOTE: The **Bold**, **Italic**, and **Underline** buttons are toggles. If you select a cell to which one of these formats has been applied, and then click the corresponding button, that format is removed.

Adding Cell Borders

You can add borders to any or all sides of a single cell or range. Excel 2013 includes several predefined border styles that you can use.

To add cell borders:

1. Select the cell to which you want to add borders.
2. On the **Home** tab, in the **Font** group, click the **Borders** button to apply the most recently used border, or click the **Borders** arrow and select a different border from the menu (see Figure 37).

   NOTE: You can remove all borders from a selected cell by clicking the **Borders** arrow, and then clicking **No Border** on the menu.

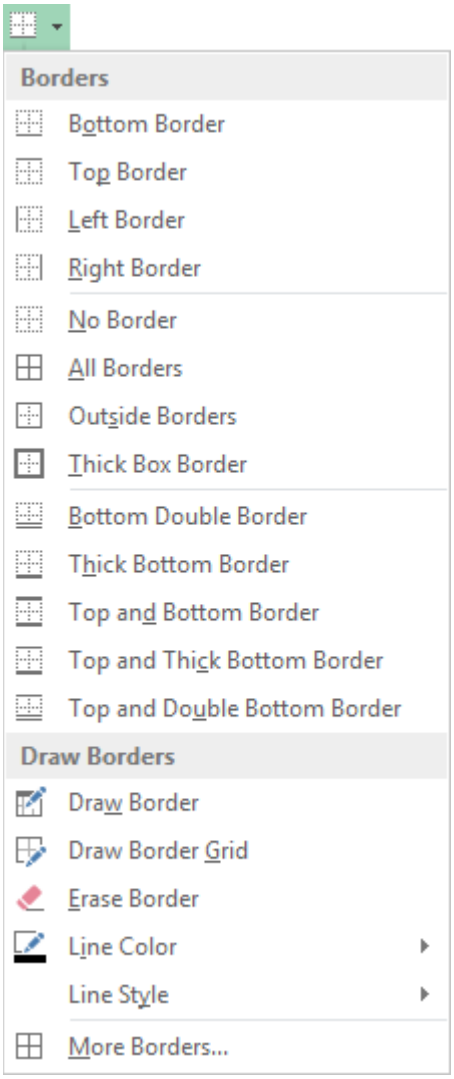


Figure 37 – Borders Menu

Formatting Numbers

You can apply number formats to cells containing numbers to better reflect the type of data they represent. For example, you can display a numeric value as a percentage, currency, date or time, etc. The *Number* group on the *Home* tab of the *Ribbon* contains the most commonly used commands for formatting numbers (see Figure 38). You can also format numbers using the *Number* tab of the *Format Cells* dialog box which can be opened by clicking the dialog box launcher in the *Number* group.

NOTE: Formatting does not change the actual value stored in a cell. The actual value is used in calculations and is displayed in the Formula bar when the cell is selected.

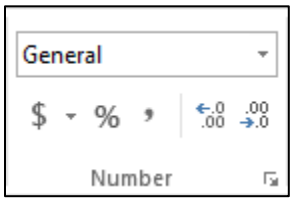


Figure 38 – Number Group on the Home Tab

To format numbers:

1. Select the cell that you want to format.
2. On the **Home** tab, in the **Number** group, do one of the following (see Figure 38):
   - Click the **Accounting Number Format** button $ to display the number with a dollar sign, comma separators, and two decimal places.

     NOTE: You can select a different currency symbol by clicking the **Accounting Number Format** arrow and selecting the desired symbol from the menu.

   - Click the **Percent Style** button % to convert the number to a percentage and display it with a percent sign and no decimal places.
   - Click the **Comma Style** button , to display the number with comma separators and two decimal places.

     NOTE: You can access additional number formats by clicking the **Number Format** arrow and selecting the desired option from the menu (see Figure 39).

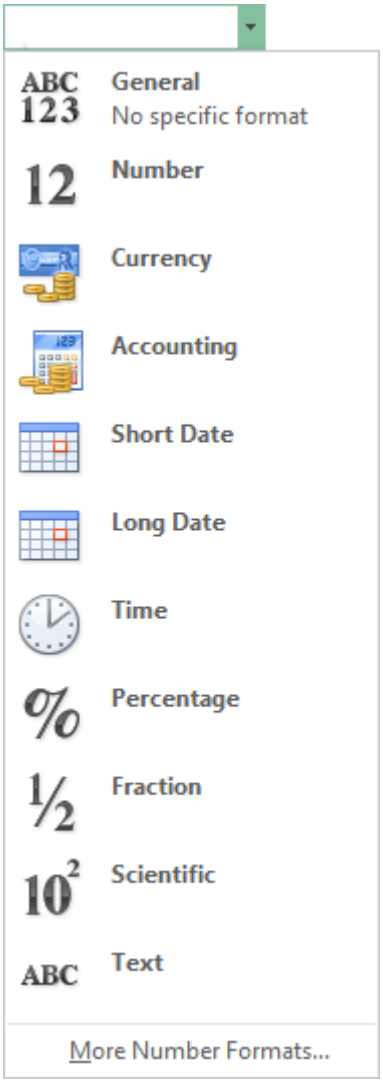


Figure 39 – Number Format Menu

To change the number of decimal places:

1. Select the cell that you want to format.
2. On the **Home** tab, in the **Number** group, do one of the following (see Figure 38):
   - Click the **Increase Decimal** button to increase the number of decimal places.
   - Click the **Decrease Decimal** button to decrease the number of decimal places.

Positioning Cell Contents

You can change the alignment, indentation, and orientation of cell contents, wrap the contents within a cell, and merge cells. The *Alignment* group on the *Home* tab of the *Ribbon* contains the most commonly used commands for positioning cell contents (see Figure 40). You can also position cell contents using the *Alignment* tab of the *Format Cells* dialog box which can be opened by clicking the dialog box launcher in the *Alignment* group.

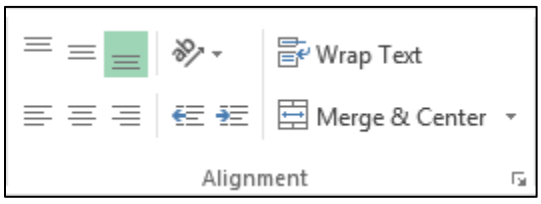


Figure 40 – Alignment Group on the Home Tab

Aligning Data

By default, Excel 2013 aligns numbers to the right and text to the left, and all cells use bottom alignment. The *Alignment* group on the *Home* tab of the *Ribbon* includes six alignment buttons that can be used to change the horizontal and vertical alignment of cell contents.

- The **Align Left** button aligns the cell contents with the left edge of the cell.
- The **Center** button centers the cell contents horizontally within the cell.
- The **Align Right** button aligns the cell contents with the right edge of the cell.
- The **Top Align** button aligns the cell contents with the top edge of the cell.
- The **Middle Align** button centers the cell contents vertically within the cell.
- The **Bottom Align** button aligns the cell contents with the bottom edge of the cell.

To align data:

1. Select the cell that contains the data you want to align.
2. On the **Home** tab, in the **Alignment** group, click the desired alignment button.

Indenting Data

Indenting moves data away from the edge of the cell. This is often used to indicate a level of less importance (such as a subtopic) (see Figure 41).

	A	B	C
1	Topic		
2	Subtopic		
3	Subtopic		
4	Subtopic		
5			

Figure 41 – Indented Data

To indent data:

1. Select the cell that contains the data you want to indent.
2. On the **Home** tab, in the **Alignment** group, click the **Increase Indent** button  . Each click increments the amount of indentation by one character.

   NOTE: You can decrease the indentation of data by clicking the **Decrease Indent** button  in the **Alignment** group on the **Home** tab of the **Ribbon**.

Rotating Data

You can rotate data clockwise, counterclockwise, or vertically within a cell. This is often used to label narrow columns or to add visual impact to a worksheet.

To rotate data:

1. Select the cell that contains the data you want to rotate.
2. On the **Home** tab, in the **Alignment** group, click the **Orientation** button and select the desired option from the menu (see Figure 42). The row height automatically adjusts to fit the rotated data (see Figure 43).

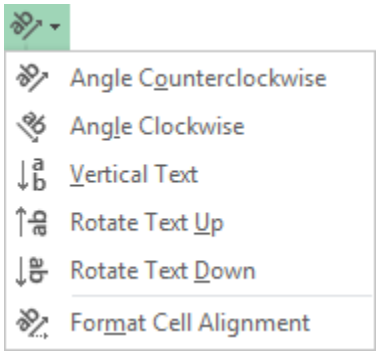


Figure 42 – Orientation Menu

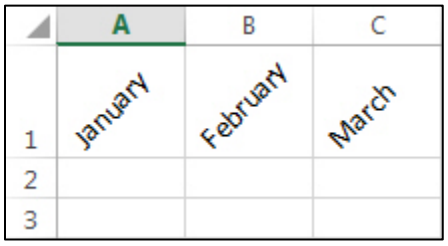


Figure 43 – Rotated Data

NOTE: You can restore the data to its default orientation by clicking the **Orientation** button and selecting the currently selected orientation.

Wrapping Data

Wrapping displays data on multiple lines within a cell. The number of wrapped lines depends on the width of the column and the length of the data.

To wrap data:

1. Select the cell that contains the data you want to wrap.
2. On the **Home** tab, in the **Alignment** group, click the **Wrap Text** button  . The row height automatically adjusts to fit the wrapped data (see Figure 44).

   NOTE: You can restore the data to its original format by clicking the **Wrap Text** button again.

	A	B	C
	January	February	March
1	2014	2014	2014
2			
3			

Figure 44 – Wrapped Data

Merging Cells

Merging combines two or more adjacent cells into one larger cell. This is a great way to create labels that span several columns.

NOTE: If the cells you intend to merge have data in more than one cell, only the data in the upper-left cell remains after you merge the cells.

To merge cells:

1. Select the cells that you want to merge.
2. On the **Home** tab, in the **Alignment** group, click the **Merge & Center** button to merge the selected cells into one cell and center the data, or click the **Merge & Center** arrow and select one of the following options (see Figure 45):
   - **Merge Across:** Merges each row of the selected cells into a larger cell.
   - **Merge Cells:** Merges the selected cells into one cell.

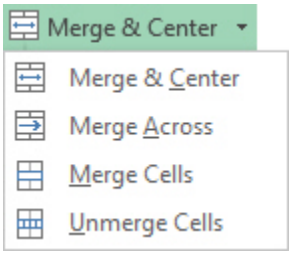


Figure 45 – Merge & Center Menu

NOTE: You can split a merged cell by clicking the **Merge & Center** arrow, and then clicking **Unmerge Cells** on the menu.

Copying Cell Formatting

You can copy the formatting of a specific cell and apply it to other cells in the worksheet. This can save you time and effort when multiple formats have been applied to a cell and you want to format additional cells with all the same formats.

To copy cell formatting:

1. Select the cell that has the formatting you want to copy.
2. On the **Home** tab, in the **Clipboard** group, click the **Format Painter** button  . The mouse pointer changes to a plus sign with a paintbrush  .
3. Select the cell to which you want to apply the copied formatting.

   NOTE: If you want to apply the copied formatting to more than area, double-click the **Format Painter** button instead of single-clicking it. This keeps the **Format Painter** active until you press the **Esc** key.

Applying Cell Styles

A *cell style* is a set of formatting characteristics (such as font, font size, font color, cell borders, and fill color) that you can use to quickly format the cells in a worksheet. In addition to saving you time, cell styles can help you keep formatting consistent throughout a worksheet. Excel 2013 includes several predefined styles that can be used to format headings, numbers, notes, etc.

CONDITIONAL FORMATTING

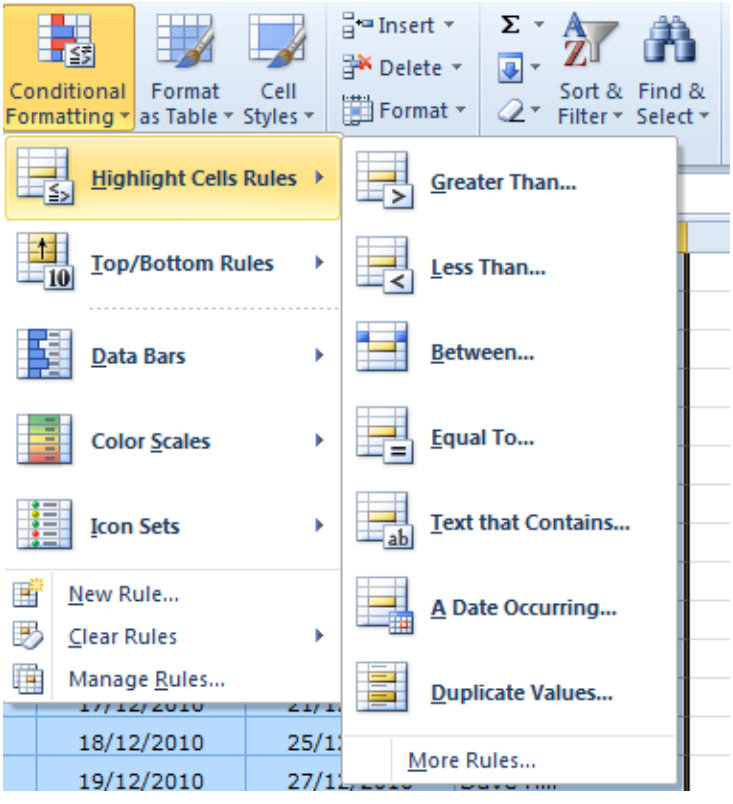
Excel can be used to highlight data that meets conditions that you specify. To highlight formula results or other cell values that you want to monitor, you can identify the cells by applying 'Conditional Formats'.

Setting A Conditional Format

For instance, in an Orders data set, Excel can apply red shading to the cell, if the 'Total Price' is greater than £1,000 or blue shading if the 'Total Price' is less than £1,000. To apply conditional formats to cells ;

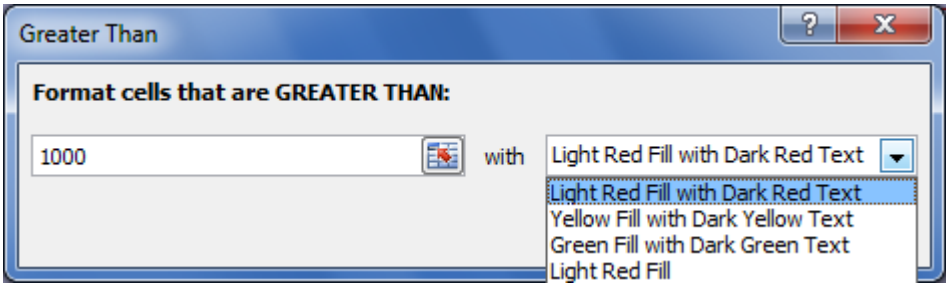
1 Select the cells you want to format. In this example, select the 'Total Order' cells only.

2 Select 'Conditional Formatting' from the 'Home' tab.



3 Select 'Highlight Cell Rules'.

4 Then select an appropriate option e.g. 'Greater than…



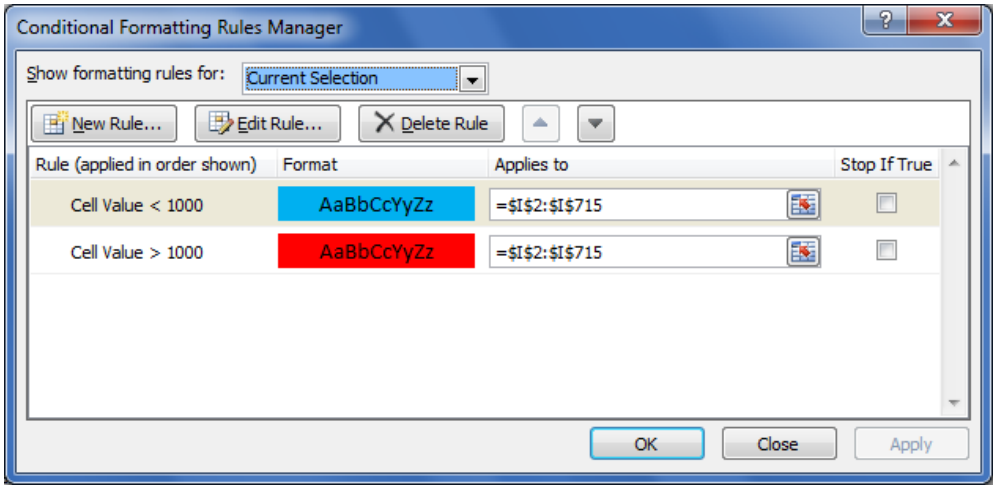
5 Enter the amount in the first dialogue box & then select the drop down option in the second dialogue box, to set the appropriate formatting options. Use 'Custom Format' if you want to set your own formatting options.

6 Select the font style, font colour, underlining, borders, shading, or patterns you want to apply.

7 To add another condition, repeat the steps above.

8 To review the conditional formats applied to the cells, use 'Conditional Formatting….Manage Rules' from the 'Home' tab.

9 Here you can create new rules or modify / delete existing rules.



Using Formulae As Conditions

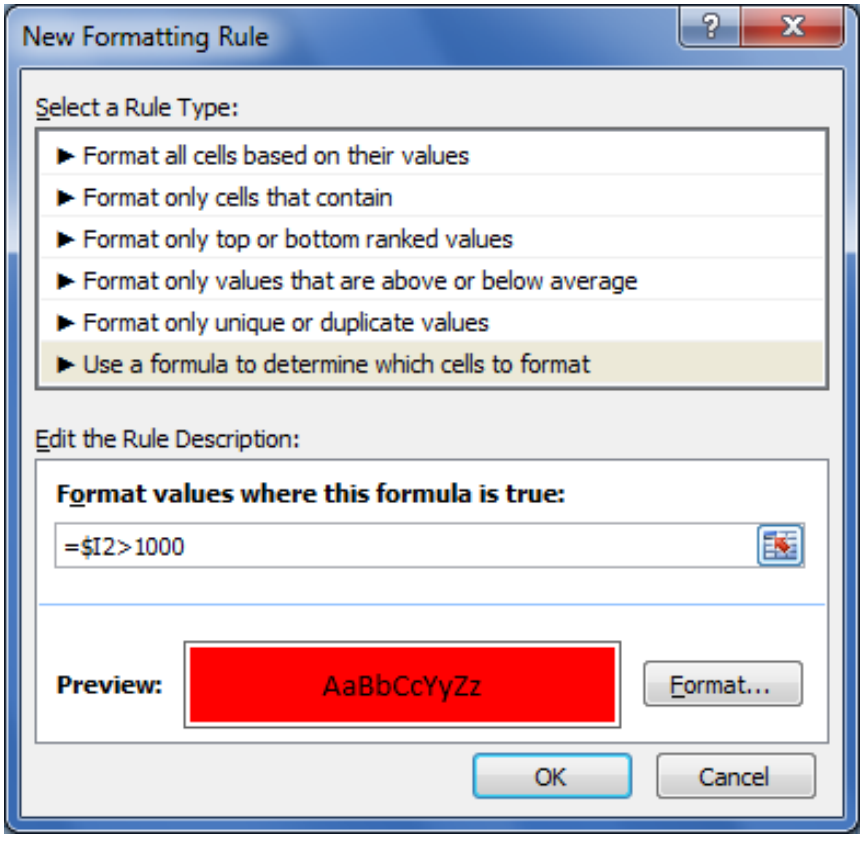
In the previous example, the cell colour in a single column (Total Order) was changed. In order to apply the cell colour all the way across a row, then a formula could be used.

1 Select the cells you want to format (the whole data set).

2 Select 'Conditional Formatting….New Rule' from the 'Home' tab.

3 Select 'Use a formula to determine which cells to format'.

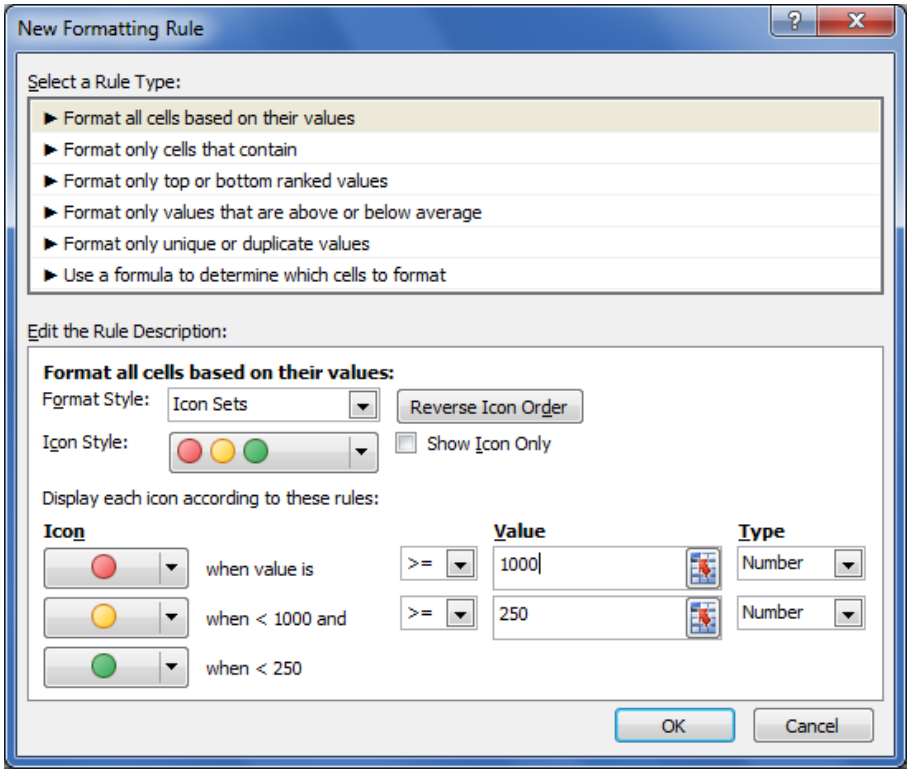
4 Enter a suitable formula & format for the cells & click 'OK'.

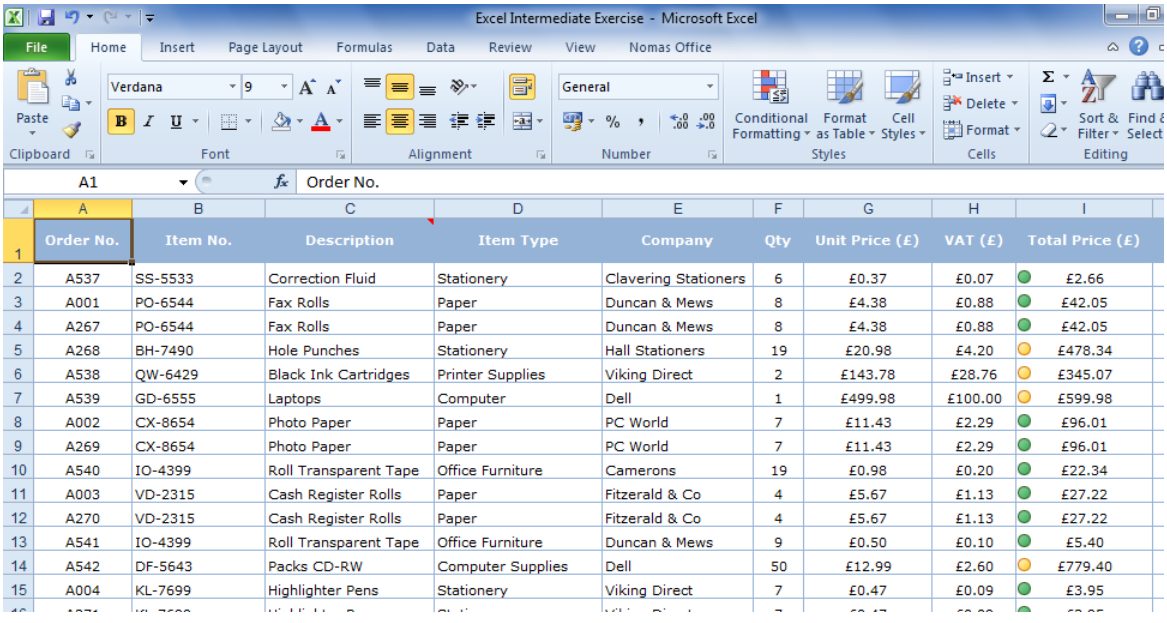


5 In this example, the formula would be =$I2 > 1000.

Style Sets

Data Bars, Colour Scales & Icon Sets can also be used to format cells. In the example below, 'Total Prices' can be marked with 'Traffic Lights' to indicate whether the Total is less than £250, between £250 - £1,000 or over £1,000.





	A	B	C	D	E	F	G	H	I
1	Order No.	Item No.	Description	Item Type	Company	Qty	Unit Price (£)	VAT (£)	Total Price (£)
2	A537	SS-5533	Correction Fluid	Stationery	Clavering Stationers	6	£0.37	£0.07	£2.66
3	A001	PO-6544	Fax Rolls	Paper	Duncan & Mews	8	£4.38	£0.88	£42.05
4	A267	PO-6544	Fax Rolls	Paper	Duncan & Mews	8	£4.38	£0.88	£42.05
5	A268	BH-7490	Hole Punches	Stationery	Hall Stationers	19	£20.98	£4.20	£478.34
6	A538	QW-6429	Black Ink Cartridges	Printer Supplies	Viking Direct	2	£143.78	£28.76	£345.07
7	A539	GD-6555	Laptops	Computer	Dell	1	£499.98	£100.00	£599.98
8	A002	CX-8654	Photo Paper	Paper	PC World	7	£11.43	£2.29	£96.01
9	A269	CX-8654	Photo Paper	Paper	PC World	7	£11.43	£2.29	£96.01
10	A540	IO-4399	Roll Transparent Tape	Office Furniture	Camerons	19	£0.98	£0.20	£22.34
11	A003	VD-2315	Cash Register Rolls	Paper	Fitzerald & Co	4	£5.67	£1.13	£27.22
12	A270	VD-2315	Cash Register Rolls	Paper	Fitzerald & Co	4	£5.67	£1.13	£27.22
13	A541	IO-4399	Roll Transparent Tape	Office Furniture	Duncan & Mews	9	£0.50	£0.10	£5.40
14	A542	DF-5643	Packs CD-RW	Computer Supplies	Dell	50	£12.99	£2.60	£779.40
15	A004	KL-7699	Highlighter Pens	Stationery	Viking Direct	7	£0.47	£0.09	£3.95

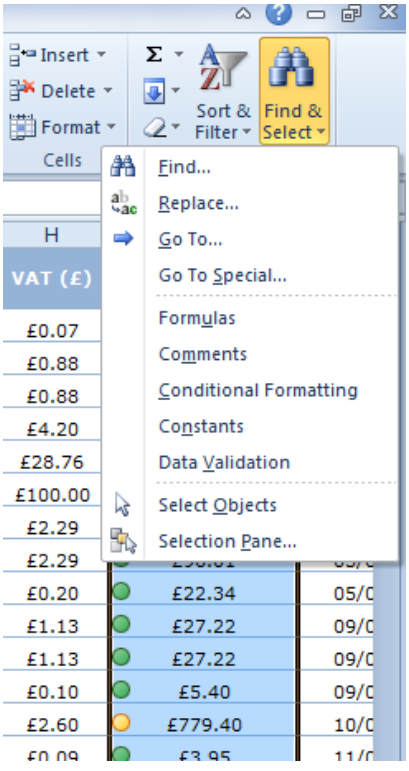
Identifying All Cells With Conditional Formatting

If your worksheet has one or more cells with a conditional format, you can quickly locate them so that you can change or delete the conditional formats. You can use the 'Go To Special' command, to either find only cells with a specific conditional format or find all cells with conditional formats.

1 Click any cell without a conditional format.

2 In the 'Home' tab, click the drop down arrow under 'Find & Select'.

3 Select 'Conditional Formatting'.



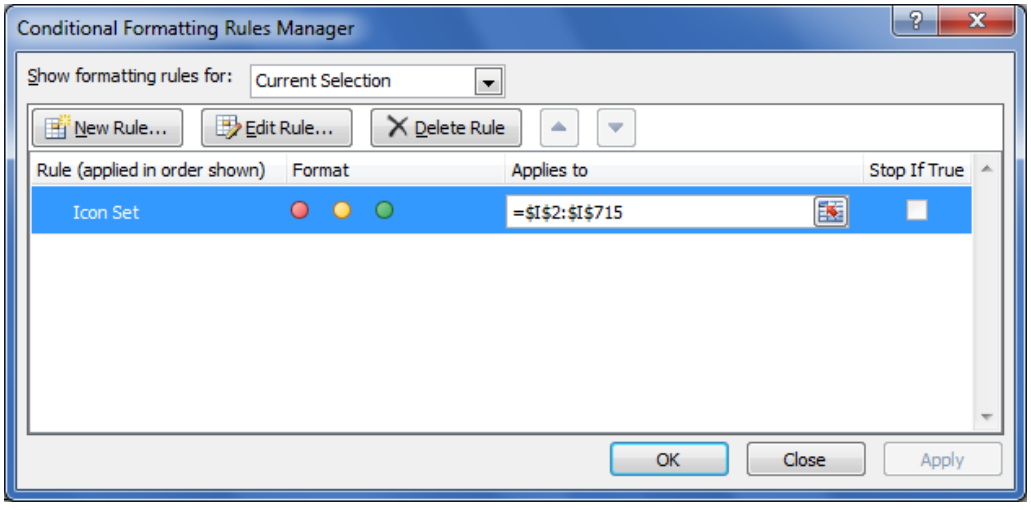
4 Any Conditionally formatted cells will be selected.

Editing / Deleting Conditions

To delete a condition ;

1 Select your 'Conditionally Formatted' cells.

2 Select 'Conditional Formatting….Manage Rules' from the 'Home' tab.



3 Select the format to delete & click 'Delete Rule'.

4 Edit a Conditional Format, in the same manner, by clicking 'Edit Rule'.

SORTING AND FILTERING DATA

Sorting A List By A Single Column

To sort data in ascending / descending order based on values in a single column ;

1 Click a cell in the column you want to 'sort'.

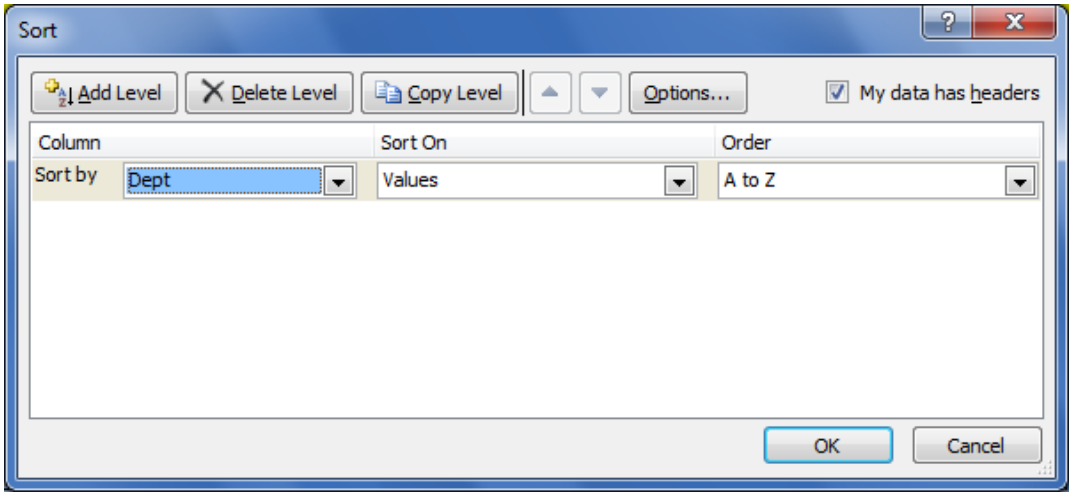
DO NOT HIGHLIGHT MULTIPLE CELLS

2 Click the 'Sort Ascending' or 'Sort Descending' icon on the 'Data' tab.

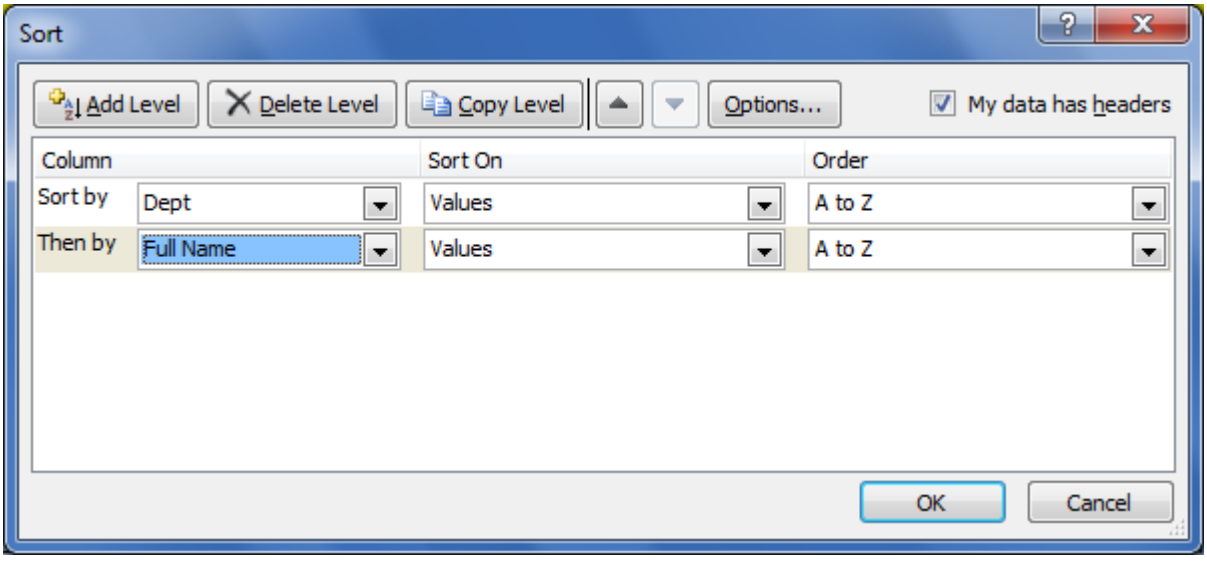
Sorting A List By Multiple Columns

If you require a more complicated sorting procedure i.e. you want to sort by more than one column, you will need the 'Sort' icon on the 'Data' tab. When you sort by more than one column, the rows with duplicate items in the first column are sorted according to the second column you specify. To do this ;

1 Click a cell in the column you want to 'sort'.
2 Click the 'Sort' icon on the 'Data' tab.

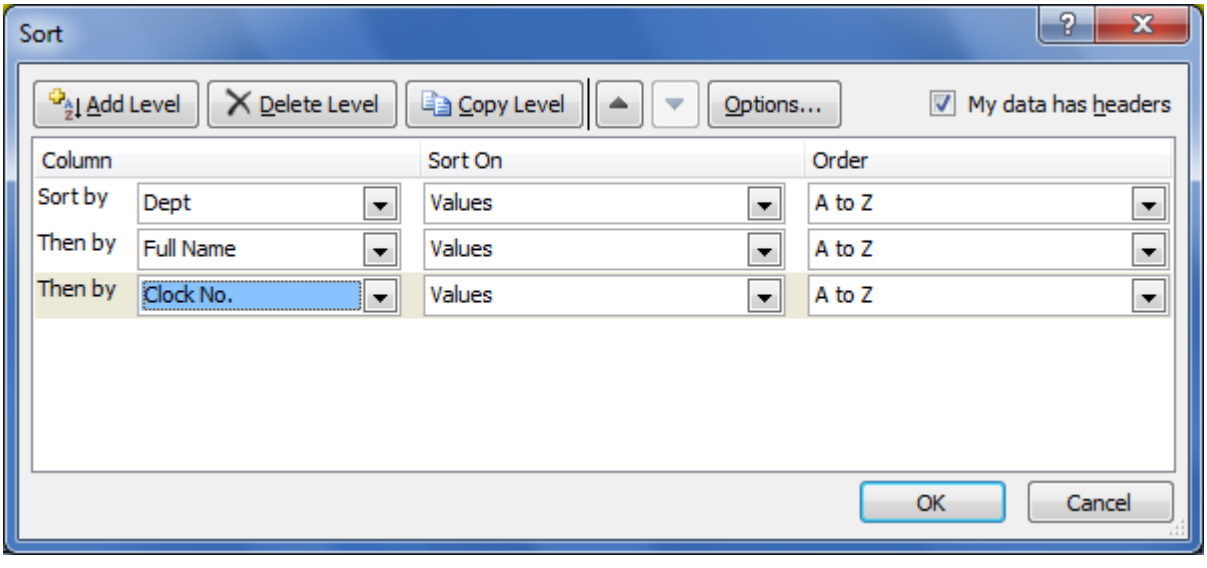


3 Select the 1st sort options you want e.g. above, list is sorted by 'Dept'.
4 Click 'Add Level'.



5 Repeat the selection process, for the 2nd level.

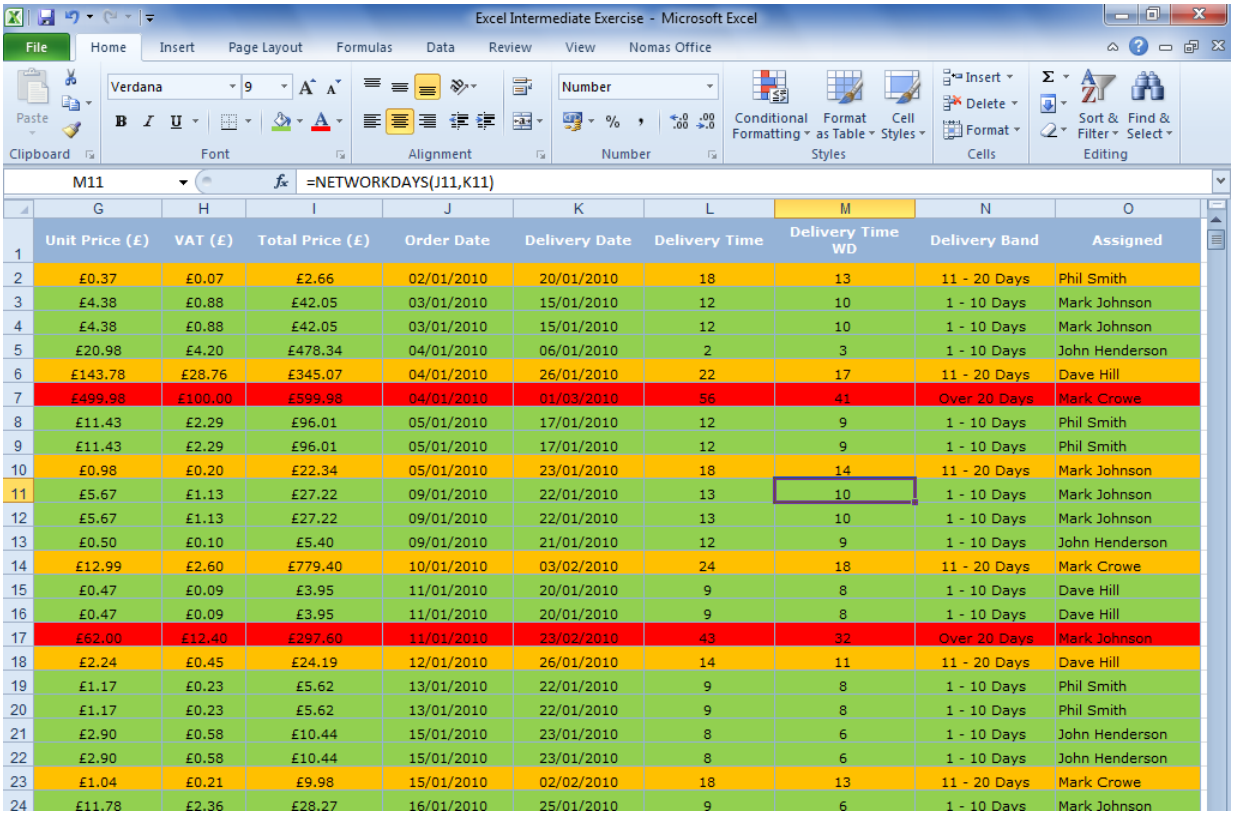
The list above will be sorted by 'Dept' first, then within each department, by 'Full Name'.



6 Potentially, extra levels may be required, until you obtain the 'Sort' order you require.

Sorting A List By Colour

If you have manually or conditionally formatted a range of cells, by cell colour or font colour, you can also sort by these colours. You can also sort by an icon set created through a conditional format.



	G	H	I	J	K	L	M	N	O
1	Unit Price (£)	VAT (£)	Total Price (£)	Order Date	Delivery Date	Delivery Time	Delivery Time WD	Delivery Band	Assigned
2	£0.37	£0.07	£2.66	02/01/2010	20/01/2010	18	13	11 - 20 Days	Phil Smith
3	£4.38	£0.88	£42.05	03/01/2010	15/01/2010	12	10	1 - 10 Days	Mark Johnson
4	£4.38	£0.88	£42.05	03/01/2010	15/01/2010	12	10	1 - 10 Days	Mark Johnson
5	£20.98	£4.20	£478.34	04/01/2010	06/01/2010	2	3	1 - 10 Days	John Henderson
6	£143.78	£28.76	£345.07	04/01/2010	26/01/2010	22	17	11 - 20 Days	Dave Hill
7	£499.98	£100.00	£599.98	04/01/2010	01/03/2010	56	41	Over 20 Days	Mark Crowe
8	£11.43	£2.29	£96.01	05/01/2010	17/01/2010	12	9	1 - 10 Days	Phil Smith
9	£11.43	£2.29	£96.01	05/01/2010	17/01/2010	12	9	1 - 10 Days	Phil Smith
10	£0.98	£0.20	£22.34	05/01/2010	23/01/2010	18	14	11 - 20 Days	Mark Johnson
11	£5.67	£1.13	£27.22	09/01/2010	22/01/2010	13	10	1 - 10 Days	Mark Johnson
12	£5.67	£1.13	£27.22	09/01/2010	22/01/2010	13	10	1 - 10 Days	Mark Johnson
13	£0.50	£0.10	£5.40	09/01/2010	21/01/2010	12	9	1 - 10 Days	John Henderson
14	£12.99	£2.60	£779.40	10/01/2010	03/02/2010	24	18	11 - 20 Days	Mark Crowe
15	£0.47	£0.09	£3.95	11/01/2010	20/01/2010	9	8	1 - 10 Days	Dave Hill
16	£0.47	£0.09	£3.95	11/01/2010	20/01/2010	9	8	1 - 10 Days	Dave Hill
17	£62.00	£12.40	£297.60	11/01/2010	23/02/2010	43	32	Over 20 Days	Mark Johnson
18	£2.24	£0.45	£24.19	12/01/2010	26/01/2010	14	11	11 - 20 Days	Dave Hill
19	£1.17	£0.23	£5.62	13/01/2010	22/01/2010	9	8	1 - 10 Days	Phil Smith
20	£1.17	£0.23	£5.62	13/01/2010	22/01/2010	9	8	1 - 10 Days	Phil Smith
21	£2.90	£0.58	£10.44	15/01/2010	23/01/2010	8	6	1 - 10 Days	John Henderson
22	£2.90	£0.58	£10.44	15/01/2010	23/01/2010	8	6	1 - 10 Days	John Henderson
23	£1.04	£0.21	£9.98	15/01/2010	02/02/2010	18	13	11 - 20 Days	Mark Crowe
24	£11.78	£2.36	£28.27	16/01/2010	25/01/2010	9	6	1 - 10 Days	Mark Johnson

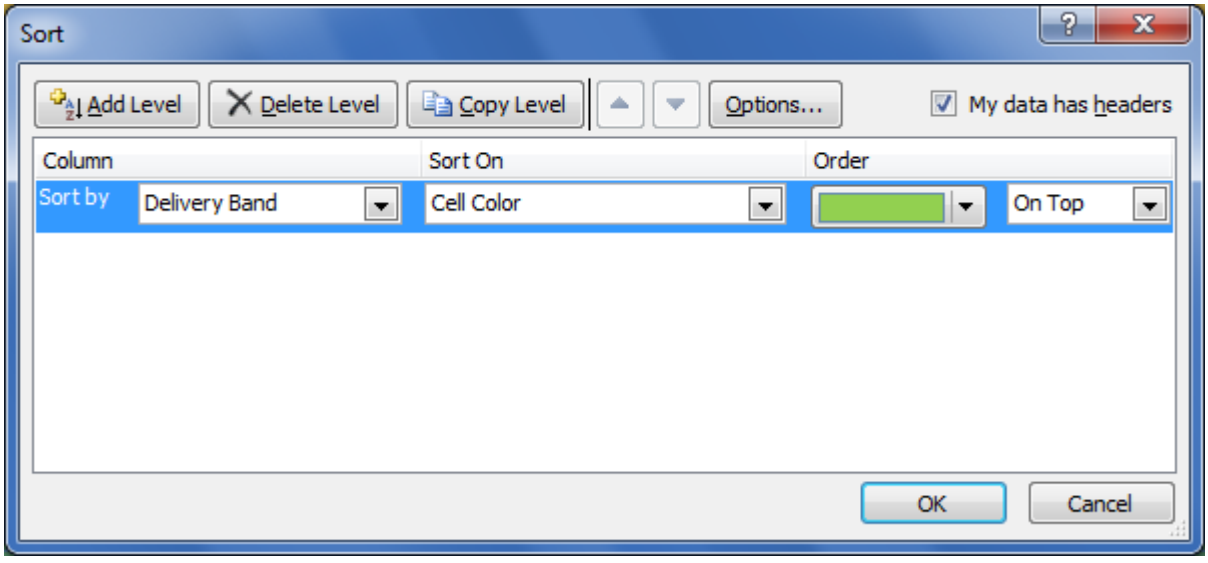
In the above example, a Conditional Format has been applied to highlight 'Delivery Bands' ;

1 - 10 Days	Green
11 - 20 Days	Amber
Over 20 Days	Red

Using the 'Sort' option, you can sort by colour ;

1 Click a cell in the data you want to 'sort'.

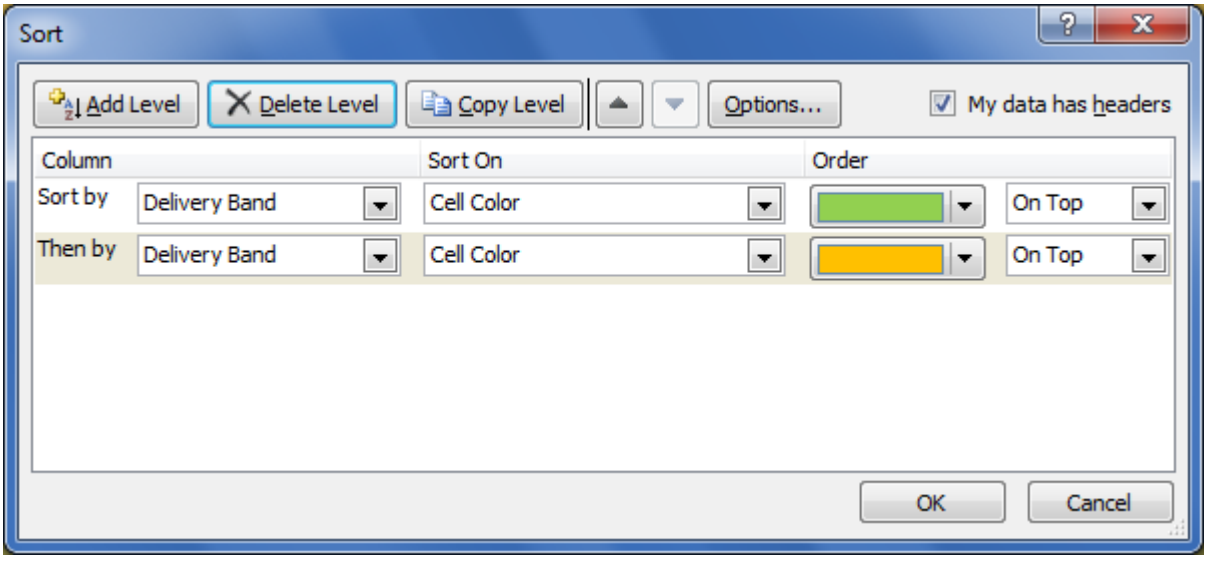
2 Click the 'Sort' icon on the 'Data' tab.



3 Select the 1st sort option, e.g. 'Delivery Band', then in the 'Sort On' column, select the 'Cell Colour' option.

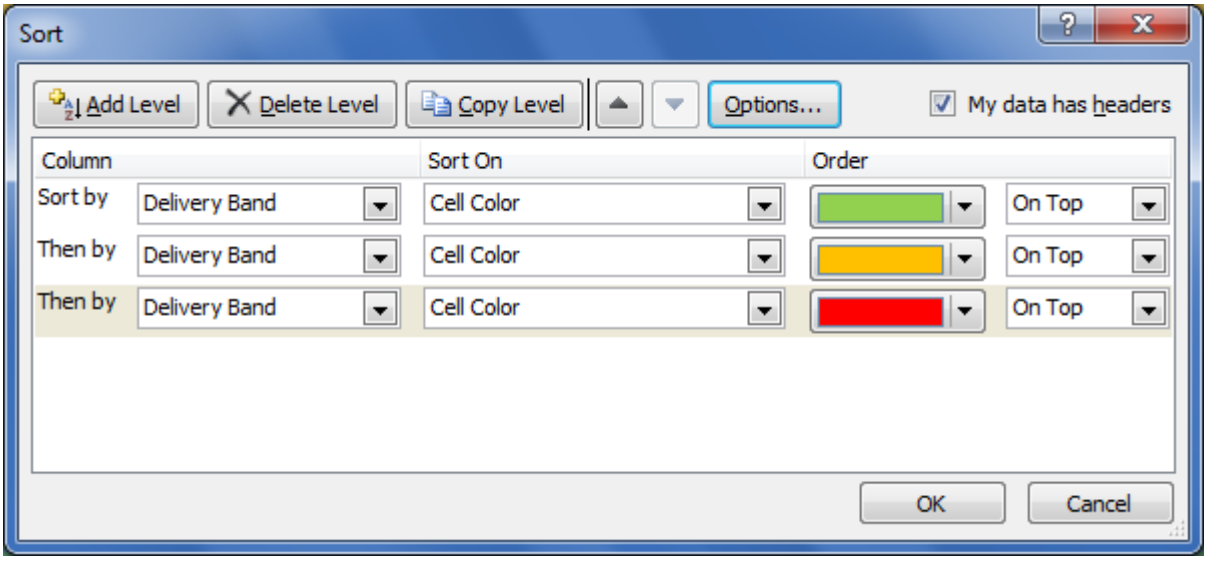
4 In the 'Order' column, select the colour & whether it is to be sorted 'On Top' or 'On Bottom'.

5 Then click 'Add Level' & repeat the process.



6 Make sure that you select the same column in the 'Then by' box and that you make the same 'On Top' selection for your next colour.

7 Keep repeating for each additional cell colour, that you want included in the sort.



The above settings, will sort the list with 'Green' at the top of the list, followed by 'Amber' then 'Red'.

Filter A List

By filtering a list, you can display just the rows that meet the criteria you specify. For example, in a list of names and addresses, you can see only the names of people who live in Newcastle. There are two ways to filter a list in Microsoft Excel i) using the 'AutoFilter' command or ii) the 'Advanced Filter' command, both on the 'Data' tab.

The 'AutoFilter' command displays arrows next to the column labels in a list, so you can select the item you want to display. Use the 'AutoFilter' command to quickly filter rows using criteria in a single column.

The 'Advanced Filter' command, filters your list, as 'AutoFilter' does, but it does not display arrows in column labels for criteria selection. Instead, you type criteria in a criteria range on your worksheet.

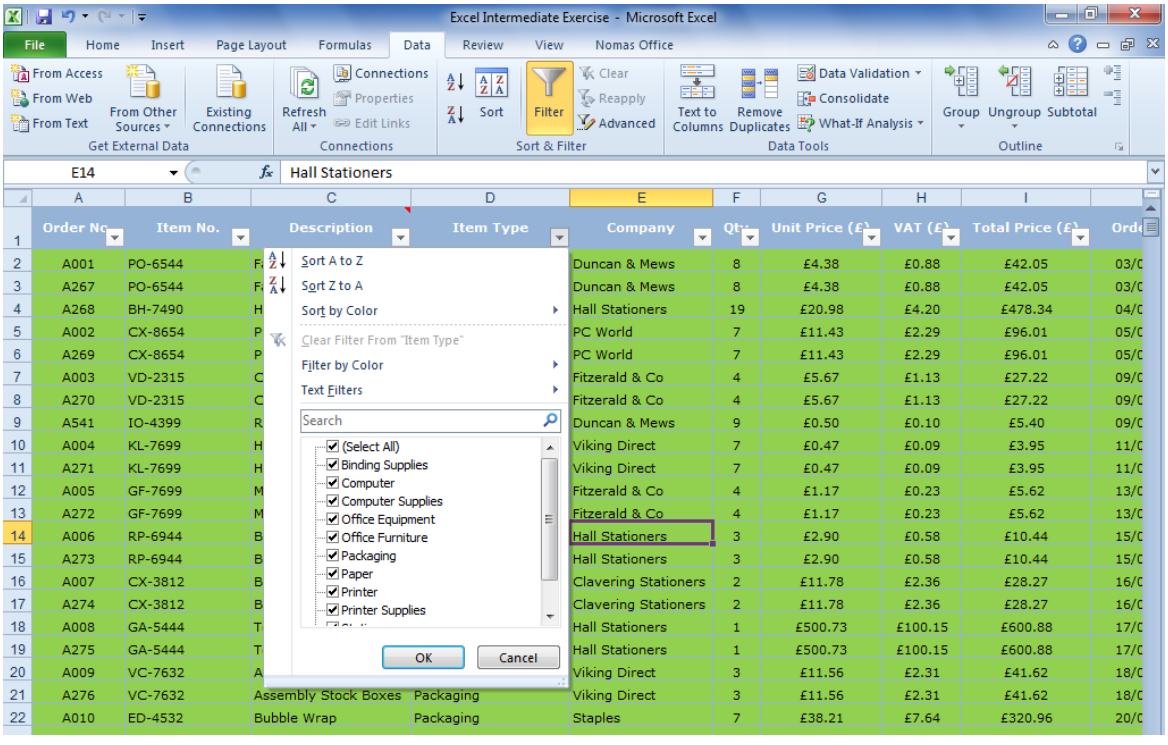
Filter A List Using AutoFilter

For this procedure to work, your list must have 'column labels'.

1 Select a cell in the list you want to filter.

2 Select 'Filter' from the 'Data' tab.

3 Click the arrow in the column, that contains the data you want to filter.



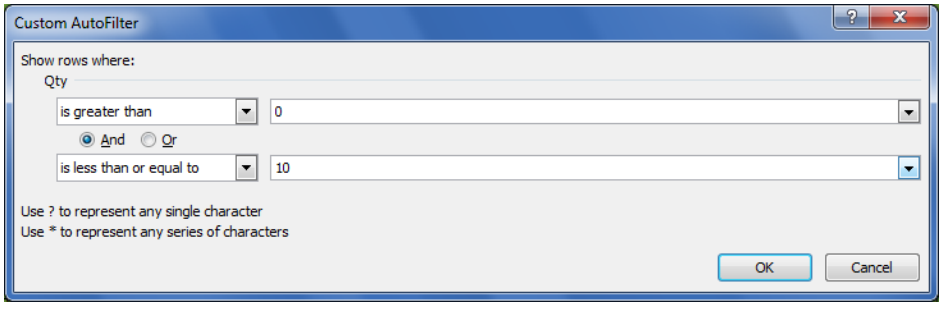
4 Remove the check mark from 'Select All'.

5 Select the check box for the entry you want to filter & then click 'OK'.

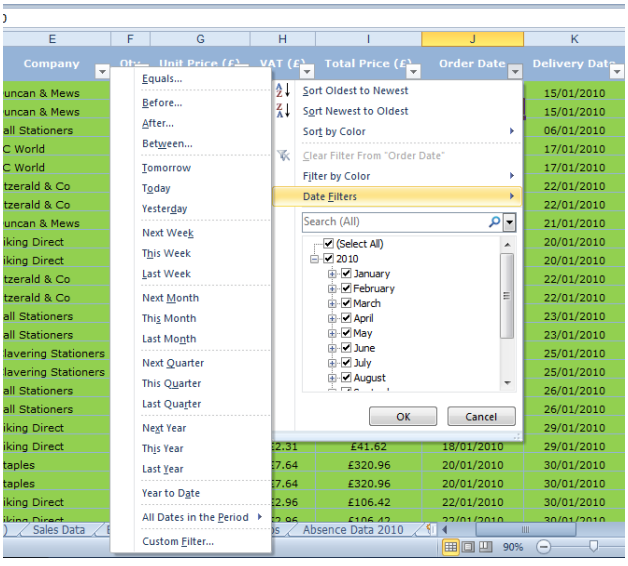
6 You can select multiple check boxes to filter on two or more items.

7 Alternatively, type your criteria in the 'Search' box.

8 You can create 'Custom' filters by using 'Text Filters….Custom Filter'.

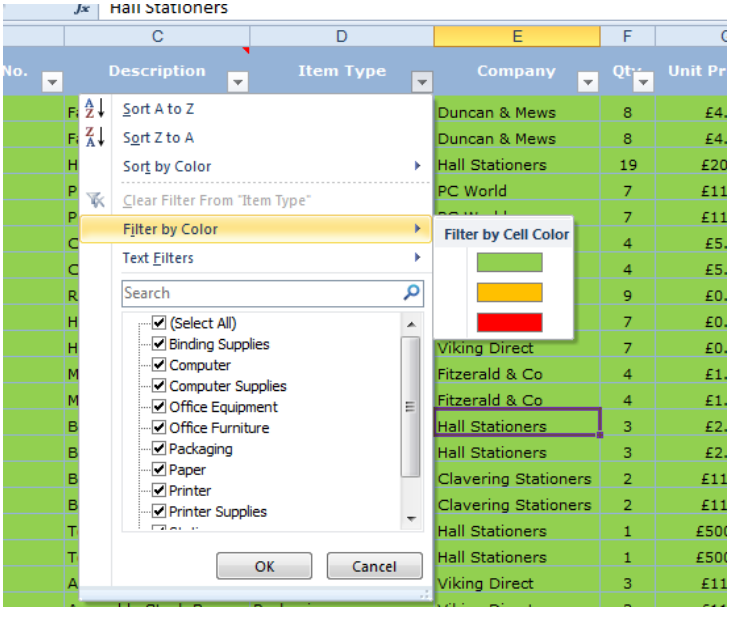


9 If you have 'Date' data, then a particular set of filters are available, by using 'Date Filters……'



10 Similarly, numeric data has it's own set of filters.

11 You can also filter by 'Colour'.



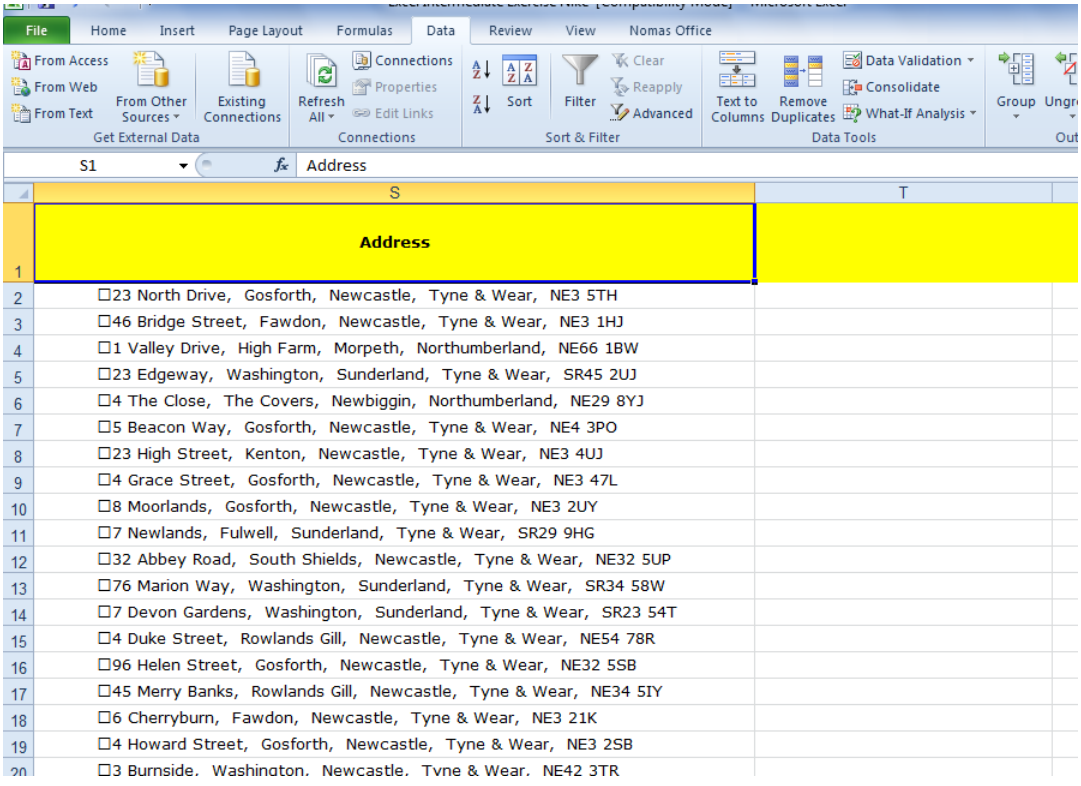
You can also copy & paste a 'Filtered' list to another part of the worksheet or to another worksheet altogether.

RE-ORGANISING DOWNLOADED DATA

When data is downloaded (exported) from other database applications, there can be several problems with the data ;

- Data is contained within one column.
- Data contains unwanted spaces (normally at the front of the data).
- Data contains non-printing characters.

The spreadsheet below, demonstrates all of these problems.

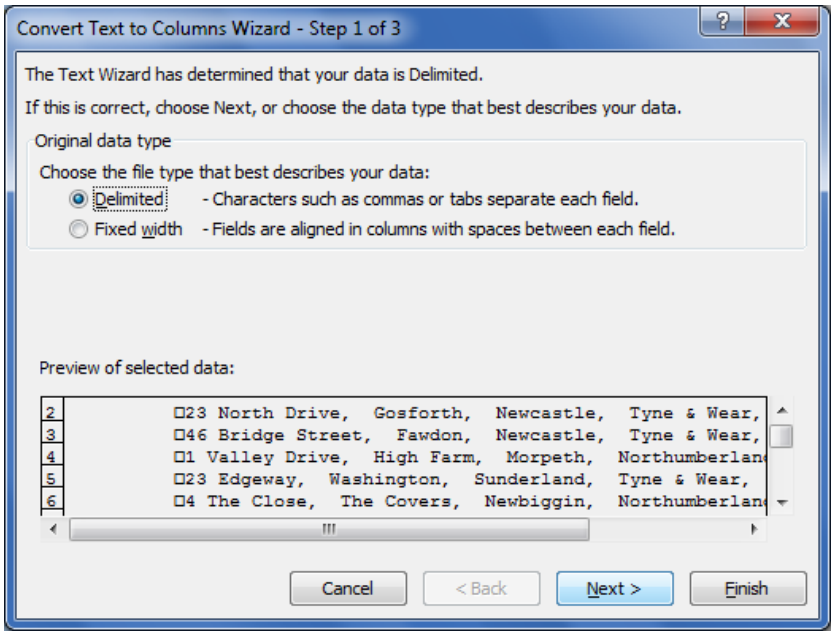


Converting Text To Columns – Parsing Data

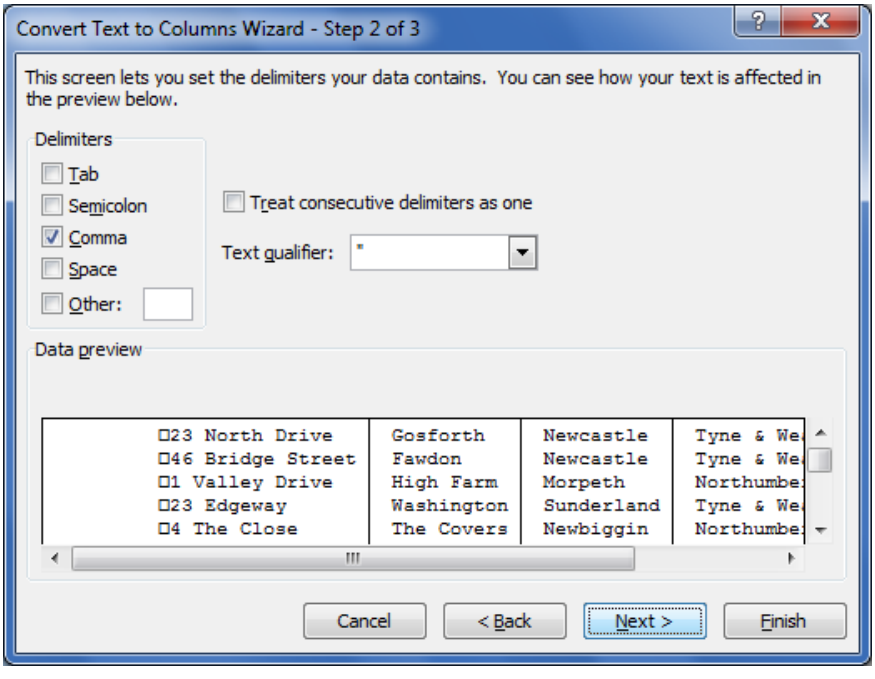
The data above is separated by a ‘,’ character & contains 5 parts of the address in the same column. This data therefore needs to be spilt up (parsed) into 5 separate columns.

1 Ensure you have sufficient (new) blank columns, to the right of the column containing data. In the above example, 4 new columns are required.

2 Select all of the data in the column & then in the 'Data' tab, select 'Text To Columns'.

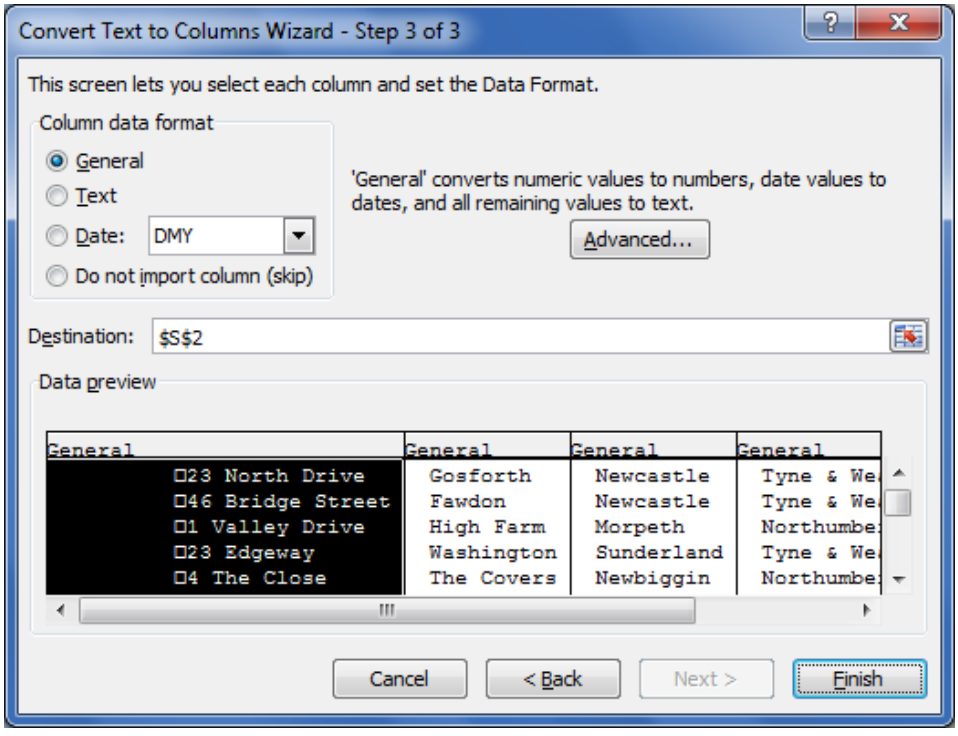


3 If the data has 'separators' e.g. ' , ', select 'Delimited', then click 'Next'.



4 Either select the 'Delimiter', or type it in the 'Other' box.

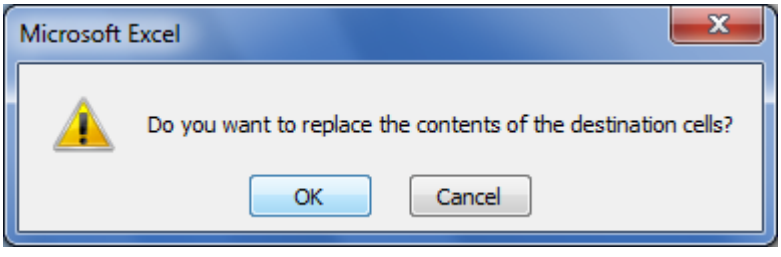
5 Click 'Next'



6 Each column can be formatted before splitting the data.

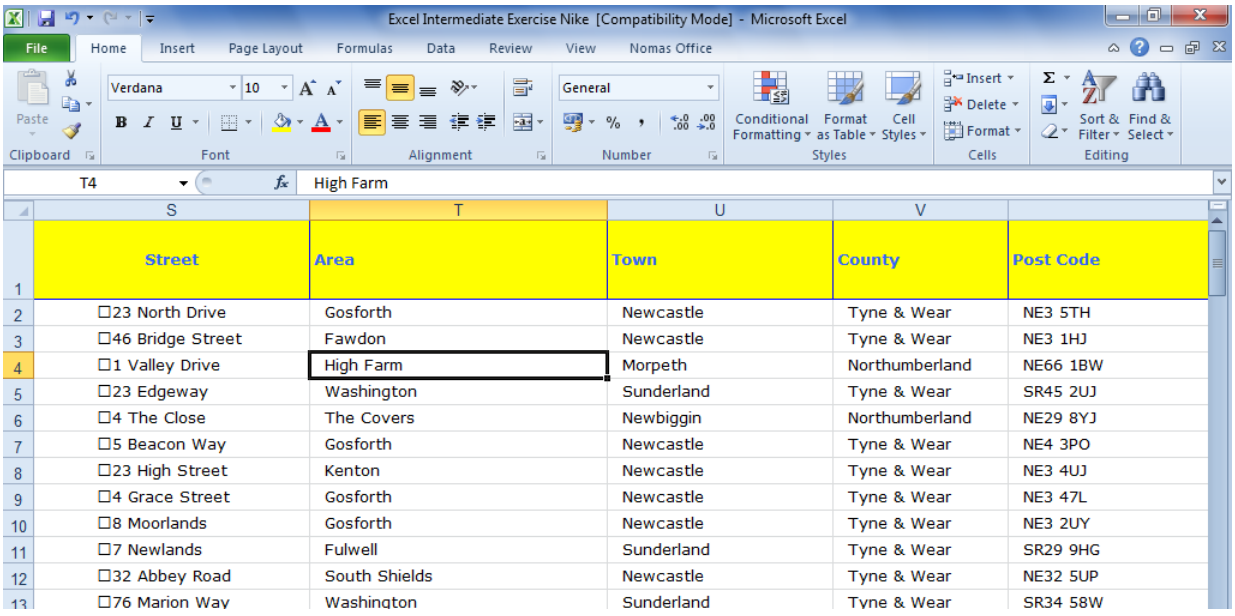
7 Click 'Finish'.

8 Assuming you have entered the required number of empty columns (as described previously), click 'OK'.



9 If you have not entered new columns, you will have to click 'Cancel' at this point, insert the blank columns & then go through the procedure again.

10 The data will then be separated into the required number of columns & in this example, the address will be split into the appropriate parts.



	S	T	U	V	
1	Street	Area	Town	County	Post Code
2	23 North Drive	Gosforth	Newcastle	Tyne & Wear	NE3 5TH
3	46 Bridge Street	Fawdon	Newcastle	Tyne & Wear	NE3 1HJ
4	1 Valley Drive	High Farm	Morpeth	Northumberland	NE66 1BW
5	23 Edgeway	Washington	Sunderland	Tyne & Wear	SR45 2UJ
6	4 The Close	The Covers	Newbiggin	Northumberland	NE29 8YJ
7	5 Beacon Way	Gosforth	Newcastle	Tyne & Wear	NE4 3PO
8	23 High Street	Kenton	Newcastle	Tyne & Wear	NE3 4UJ
9	4 Grace Street	Gosforth	Newcastle	Tyne & Wear	NE3 47L
10	8 Moorlands	Gosforth	Newcastle	Tyne & Wear	NE3 2UY
11	7 Newlands	Fulwell	Sunderland	Tyne & Wear	SR29 9HG
12	32 Abbey Road	South Shields	Newcastle	Tyne & Wear	NE32 5UP
13	76 Marion Way	Washington	Sunderland	Tyne & Wear	SR34 58W

Removing Spaces

Use the TRIM function to remove all spaces from text, except for single spaces between words.

=TRIM(S2)

The formula would need to be entered in a new column & then copied & pasted (use 'Paste Special') to paste the 'Values' over the existing data.

Removing Non-Printing Characters

Occasionally, data which has been exported from another application, may contain non-printing characters.

Use the CLEAN function to remove these characters from text.

=CLEAN(S2)

These 2 functions could be combined, in to a single formula.

=TRIM(CLEAN(S2))

In order that both operations are performed in a single formula, without the need to enter 2 separate formulae.

CALCULATIONS USING FORMULAE

Excel can perform calculations on your data. This can be done by using 'formulae' within your spreadsheet. All formulae within Excel have the equals sign (=) as the first character.

All formulae within Excel have the equals sign (=) as the first character.

All standard arithmetic operators can be used ;

Operation	Excel Key	Example
Addition	+ (plus sign)	=A1+B3
Subtraction	- (minus sign)	=A1-B3
Multiplication	* (star or asterisk)	=A1*B3
Division	/ (forward slash)	= A1/B3
Exponential	^ (caret)	=A1^2 (equiv to A1 squared)
Brackets	( ) (open / close brackets)	=(A1+B3)/C4

The order that a calculation is performed is important to remember. Excel follows the standard mathematical rules i.e. the following order is adopted ;

1	Anything in brackets is done first,….. then	**B**
2	Orders e.g. squared, square root etc.	**O**
3	Division.	**D**
4	Multiplication.	**M**
5	Addition.	**A**
6	Subtraction.	**S**

Thus, the following formulae ;

= 5+7*3 Produces the answer 26.
= (5+7)*3 Produces the answer 36.

Creating A Simple Formula

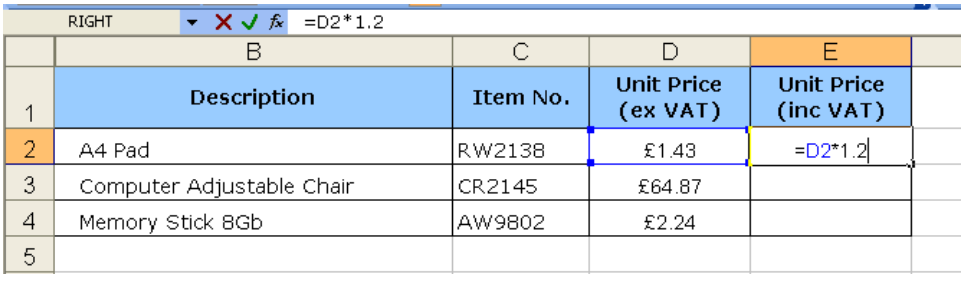
To create your own formula ;

1 Start with an equals sign =.
2 Enter the formula e.g. =54 / 7.
3 Press the 'green tick' on the toolbar or press the 'ENTER' key.
4 The cell will display the result of the formula.
5 The actual formula itself, will be visible in the 'Formula Bar'.

Formulae Involving Cell References

Excel has the ability to perform calculations based on the content of other cells in a spreadsheet (as in the example below).

1 Make the active cell, the cell where you want to put your formula.
2 Start with an equals sign =.
3 As you are using cell references, click in the first cell you require in your formula (D2, in the example below).

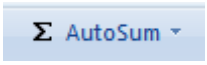


	B	C	D	E
1	Description	Item No.	Unit Price (ex VAT)	Unit Price (inc VAT)
2	A4 Pad	RW2138	£1.43	=D2*1.2
3	Computer Adjustable Chair	CR2145	£64.87	
4	Memory Stick 8Gb	AW9802	£2.24	
5				

4 Enter the required arithmetic operator e.g. *
5 Complete the remaining formula
6 Press the 'green tick' on the toolbar or press the 'ENTER' key.
7 The cell will display the result of the formula.
8 The actual formula itself, will be visible in the 'Formula Bar'.

Addition Of Columns Or Rows

To add a whole group of cells together, a formula such as '=A1+A2+A3….etc.' could be used, however, this would be rather tedious if there were hundreds of cells to add.

Using the 'AutoSum' button 

on the 'Formulas' or 'Home' tab, is the quickest method. To use the 'AutoSum' button ;

1 Move to the cell where the answer will be displayed.
2 Press the 'AutoSum' button
3 Excel makes a 'best guess' at which cells you are going to add up and displays them in the formula bar. It does this by looking at the cells directly above the active cell or if no data are present, to the left of the active cell.
4 If it has not chosen the correct 'cell range', select it using the mouse.
5 Press 'Enter'.

Copying Formulae – Relative & Absolute References

Formula can be copied into other cells and can be made either a ;

1 **Relative** reference, or
2 **Absolute** reference

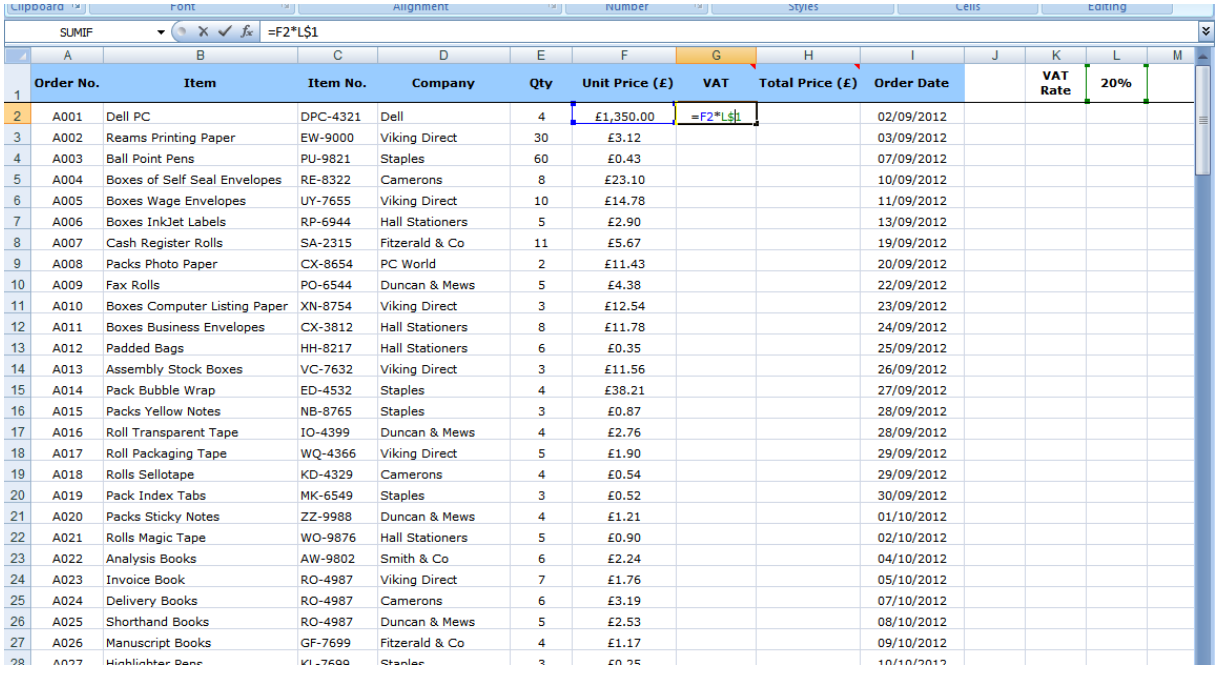
A **relative reference** e.g. F5, should be used if you always want to refer to cells relative to the cell containing the formula, even if you copy the formula. When you copy a formula, Excel automatically adjusts itself to look at the correct cells.

If you have a formula ;

=B6 * 7 and copy this down a column, the formulae below it, will become
=B7 * 7
=B8 * 7
=B9 * 7
=B10*7……..and so on.

If however, you want to refer to the same cell regardless of where the formula is on the worksheet, use an **absolute reference**.

A '$' sign should be placed before the column letter or row number (whichever is appropriate), in order to 'freeze' the cell reference when it is copied.



	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Order No.	Item	Item No.	Company	Qty	Unit Price (£)	VAT	Total Price (£)	Order Date		VAT Rate	20%	
2	A001	Dell PC	DPC-4321	Dell	4	£1,350.00	=F2*L$1		02/09/2012				
3	A002	Reams Printing Paper	EW-9000	Viking Direct	30	£3.12			03/09/2012				
4	A003	Ball Point Pens	PU-9821	Staples	60	£0.43			07/09/2012				
5	A004	Boxes of Self Seal Envelopes	RE-8322	Camerons	8	£23.10			10/09/2012				
6	A005	Boxes Wage Envelopes	UY-7655	Viking Direct	10	£14.78			11/09/2012				
7	A006	Boxes InkJet Labels	RP-6944	Hall Stationers	5	£2.90			13/09/2012				
8	A007	Cash Register Rolls	SA-2315	Fitzerald & Co	11	£5.67			19/09/2012				
9	A008	Packs Photo Paper	CX-8654	PC World	2	£11.43			20/09/2012				
10	A009	Fax Rolls	PO-6544	Duncan & Mews	5	£4.38			22/09/2012				
11	A010	Boxes Computer Listing Paper	XN-8754	Viking Direct	3	£12.54			23/09/2012				
12	A011	Boxes Business Envelopes	CX-3812	Hall Stationers	8	£11.78			24/09/2012				
13	A012	Padded Bags	HH-8217	Hall Stationers	6	£0.35			25/09/2012				
14	A013	Assembly Stock Boxes	VC-7632	Viking Direct	3	£11.56			26/09/2012				
15	A014	Pack Bubble Wrap	ED-4532	Staples	4	£38.21			27/09/2012				
16	A015	Packs Yellow Notes	NB-8765	Staples	3	£0.87			28/09/2012				
17	A016	Roll Transparent Tape	IO-4399	Duncan & Mews	4	£2.76			28/09/2012				
18	A017	Roll Packaging Tape	WQ-4366	Viking Direct	5	£1.90			29/09/2012				
19	A018	Rolls Sellotape	KD-4329	Camerons	4	£0.54			29/09/2012				
20	A019	Pack Index Tabs	MK-6549	Staples	3	£0.52			30/09/2012				
21	A020	Packs Sticky Notes	ZZ-9988	Duncan & Mews	4	£1.21			01/10/2012				
22	A021	Rolls Magic Tape	WO-9876	Hall Stationers	5	£0.90			02/10/2012				
23	A022	Analysis Books	AW-9802	Smith & Co	6	£2.24			04/10/2012				
24	A023	Invoice Book	RO-4987	Viking Direct	7	£1.76			05/10/2012				
25	A024	Delivery Books	RO-4987	Camerons	6	£3.19			07/10/2012				
26	A025	Shorthand Books	RO-4987	Duncan & Mews	5	£2.53			08/10/2012				
27	A026	Manuscript Books	GF-7699	Fitzerald & Co	4	£1.17			09/10/2012				

If, in the above example, in Column G, cell F2 is multiplied by the contents of L1 and you want all the subsequent cells, to be multiplied by L1, then you should use the formula =F2*L$1. In this example, L1 has become an absolute reference and when you copy this formula, it will always retain L1, although changing the cell numbers of column F.

=F2 * L$1

=F3 * L$1

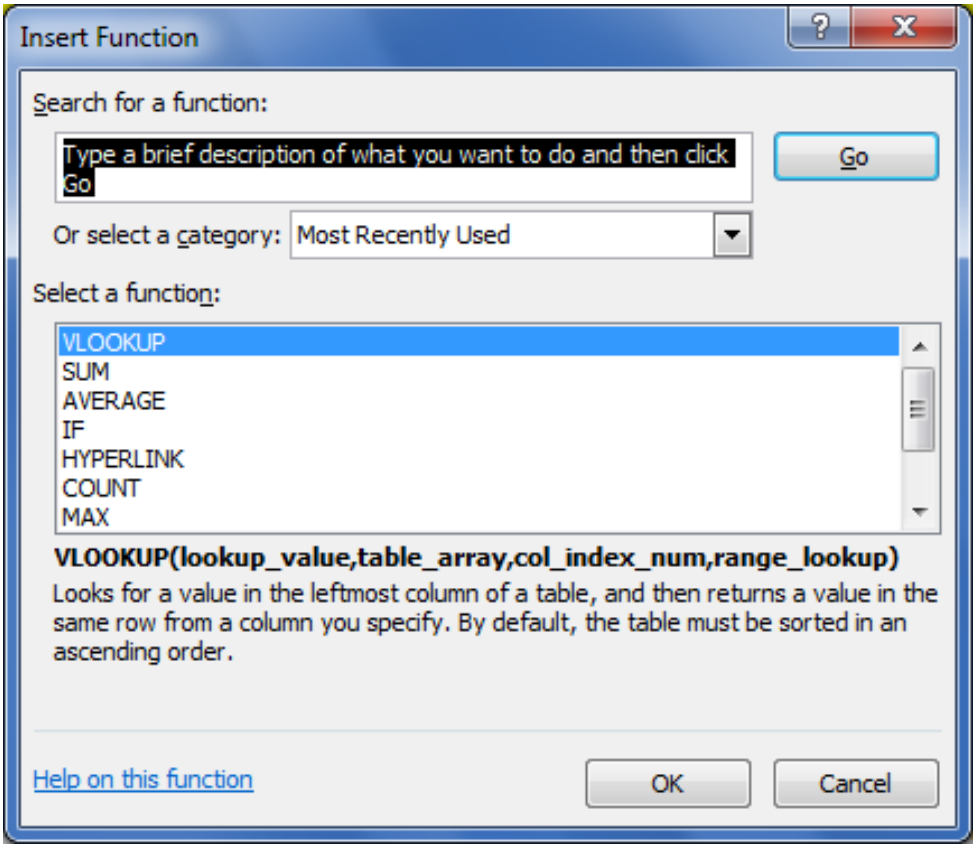
=F4 * L$1

=F5 * L$1

=F6 * L$1……and so on.

Formulae Using Functions

In addition to simple mathematical operators e.g. multiplication, subtraction etc., Excel has a variety of 'Functions', these are available via the 'Insert Function' icon, on the 'Formulas' tab or the f_x button, to the left of the 'Formula Bar'.

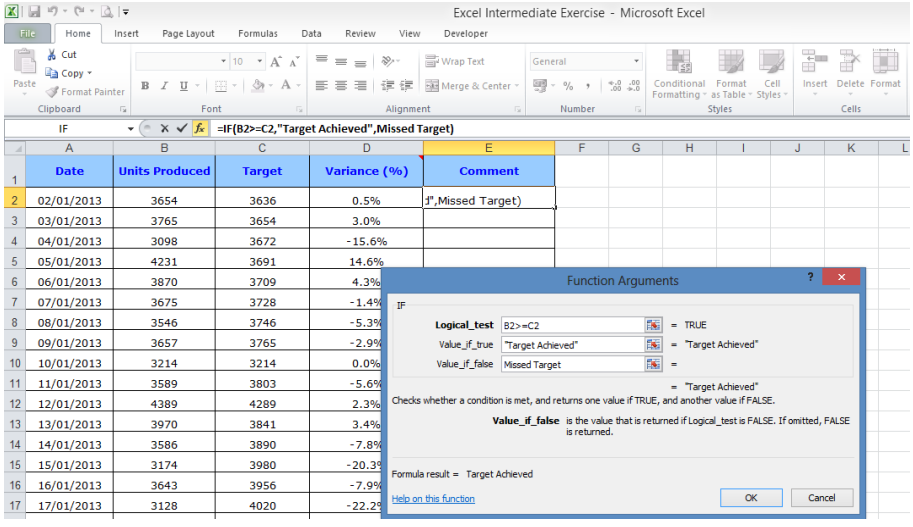


The use of several of the most commonly used functions e.g. SUM, AVERAGE, COUNT, were discussed in the 'Introduction' course.

Due to the large number of functions available, it is beyond the scope of this guide to cover all of these functions, however, the following examples show how to use some of the more commonly used functions. You can search for a function by typing the function name, in the 'Search for a function' box & clicking the 'GO' button.

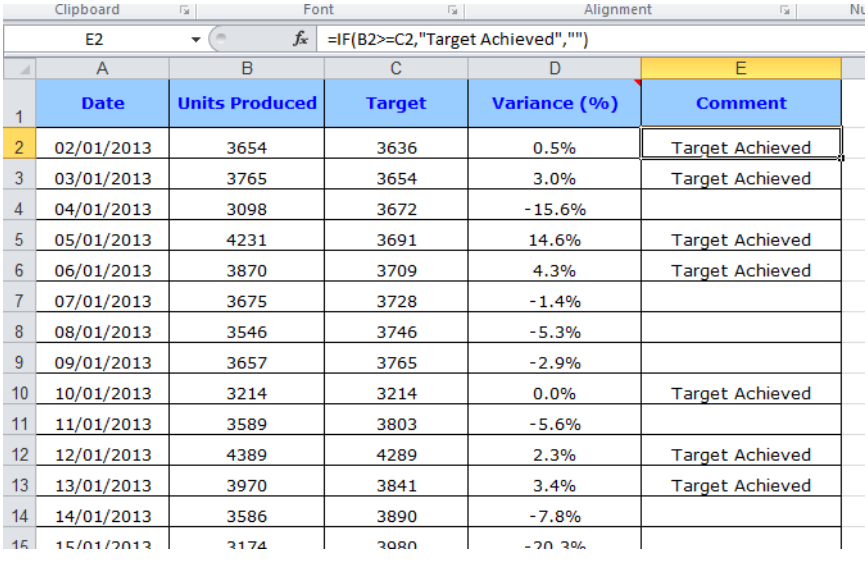
Using IF Statements

You can use the IF statement to determine if a particular 'criteria' is true or not, and then produce a response depending on the outcome. For example, if you had a 'Production' worksheet, detailing daily production figures & targets, you could use an IF function, to check whether production targets, have been achieved.



The example above, uses an IF function (column 'E') to check production figures.

If you do not want both the 'True' & 'False' text to appear, you must use a blank set of speech marks "" in the box, otherwise FALSE will be displayed in the cell.



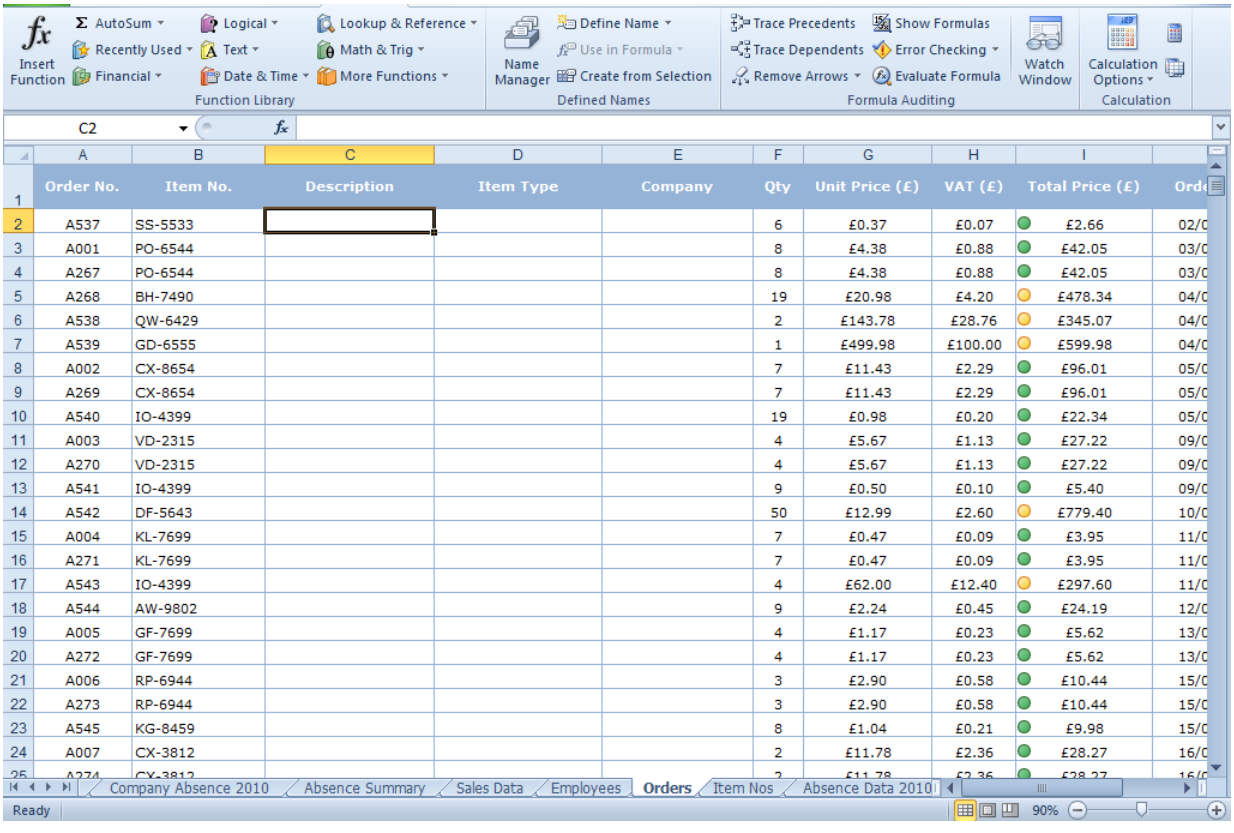
	A	B	C	D	E
1	Date	Units Produced	Target	Variance (%)	Comment
2	02/01/2013	3654	3636	0.5%	Target Achieved
3	03/01/2013	3765	3654	3.0%	Target Achieved
4	04/01/2013	3098	3672	-15.6%	
5	05/01/2013	4231	3691	14.6%	Target Achieved
6	06/01/2013	3870	3709	4.3%	Target Achieved
7	07/01/2013	3675	3728	-1.4%	
8	08/01/2013	3546	3746	-5.3%	
9	09/01/2013	3657	3765	-2.9%	
10	10/01/2013	3214	3214	0.0%	Target Achieved
11	11/01/2013	3589	3803	-5.6%	
12	12/01/2013	4389	4289	2.3%	Target Achieved
13	13/01/2013	3970	3841	3.4%	Target Achieved
14	14/01/2013	3586	3890	-7.8%	
15	15/01/2013	3174	3980	-20.3%	

Looking Up Values In A Table

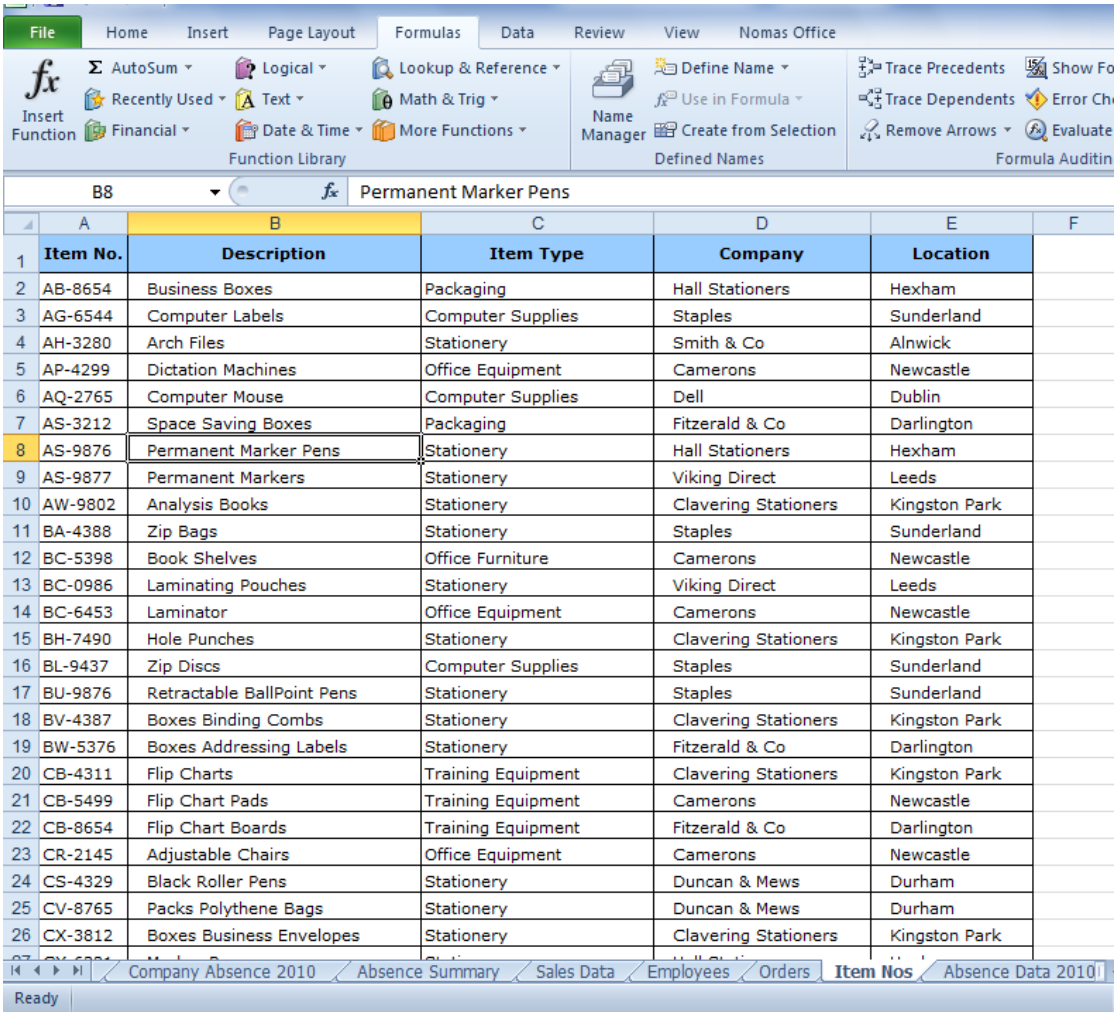
You can look up the contents of various cells within a data set. For example, if an item has a particular code, you simply enter the code number and the name of the item, will be displayed.

Using VLOOKUP

This function looks down a vertical column of data until an appropriate value is found. In the example below, an orders sheet is set up, so that when the 'Item No. is present in column 'B', it 'looks up' the 'Description', 'Item Type' & 'Company' & enters these into columns 'C', 'D' & 'E' respectively.



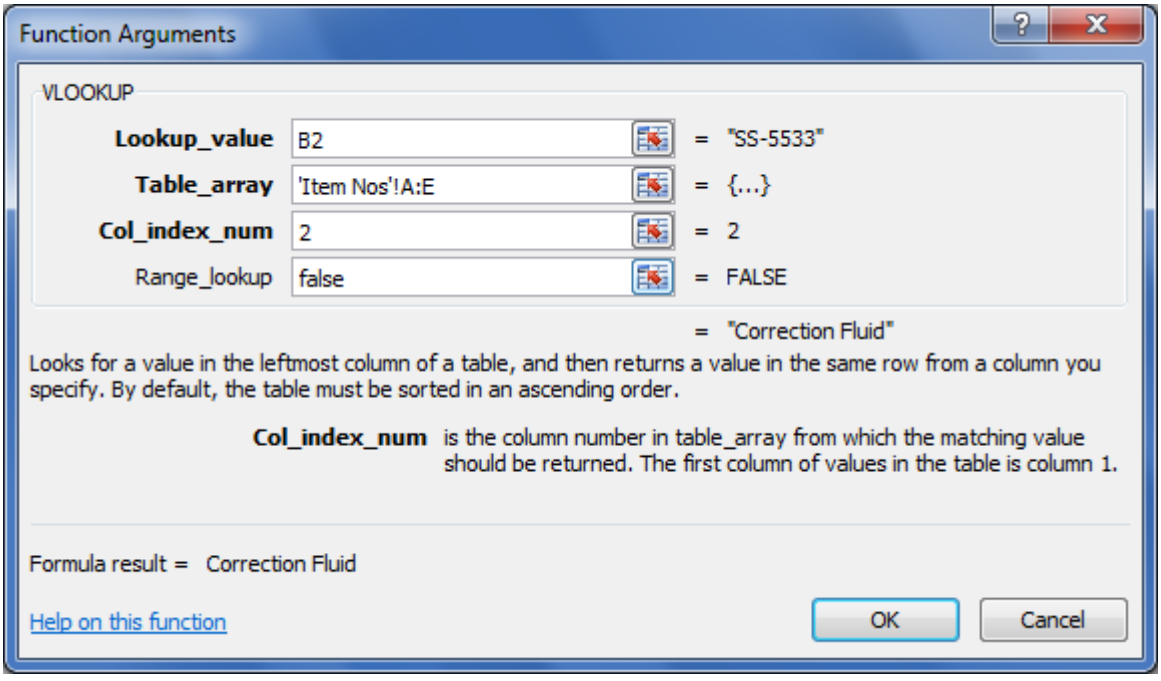
The 'Description', 'Item Type' & 'Company' are stored on a separate sheet 'Item Nos' (above).



	A	B	C	D	E	F
1	**Item No.**	**Description**	**Item Type**	**Company**	**Location**	
2	AB-8654	Business Boxes	Packaging	Hall Stationers	Hexham	
3	AG-6544	Computer Labels	Computer Supplies	Staples	Sunderland	
4	AH-3280	Arch Files	Stationery	Smith & Co	Alnwick	
5	AP-4299	Dictation Machines	Office Equipment	Camerons	Newcastle	
6	AQ-2765	Computer Mouse	Computer Supplies	Dell	Dublin	
7	AS-3212	Space Saving Boxes	Packaging	Fitzerald & Co	Darlington	
8	AS-9876	Permanent Marker Pens	Stationery	Hall Stationers	Hexham	
9	AS-9877	Permanent Markers	Stationery	Viking Direct	Leeds	
10	AW-9802	Analysis Books	Stationery	Clavering Stationers	Kingston Park	
11	BA-4388	Zip Bags	Stationery	Staples	Sunderland	
12	BC-5398	Book Shelves	Office Furniture	Camerons	Newcastle	
13	BC-0986	Laminating Pouches	Stationery	Viking Direct	Leeds	
14	BC-6453	Laminator	Office Equipment	Camerons	Newcastle	
15	BH-7490	Hole Punches	Stationery	Clavering Stationers	Kingston Park	
16	BL-9437	Zip Discs	Computer Supplies	Staples	Sunderland	
17	BU-9876	Retractable BallPoint Pens	Stationery	Staples	Sunderland	
18	BV-4387	Boxes Binding Combs	Stationery	Clavering Stationers	Kingston Park	
19	BW-5376	Boxes Addressing Labels	Stationery	Fitzerald & Co	Darlington	
20	CB-4311	Flip Charts	Training Equipment	Clavering Stationers	Kingston Park	
21	CB-5499	Flip Chart Pads	Training Equipment	Camerons	Newcastle	
22	CB-8654	Flip Chart Boards	Training Equipment	Fitzerald & Co	Darlington	
23	CR-2145	Adjustable Chairs	Office Equipment	Camerons	Newcastle	
24	CS-4329	Black Roller Pens	Stationery	Duncan & Mews	Durham	
25	CV-8765	Packs Polythene Bags	Stationery	Duncan & Mews	Durham	
26	CX-3812	Boxes Business Envelopes	Stationery	Clavering Stationers	Kingston Park	

To work through the VLOOKUP function, the worksheet that holds the reference data i.e. the 'Item Nos' sheet, must have the reference column i.e. 'Item No.' as the first column, on the left of the main data (see above).

You would enter the following parameters, in the VLOOKUP function ;



You will thus end up with the following formula, in your cell.

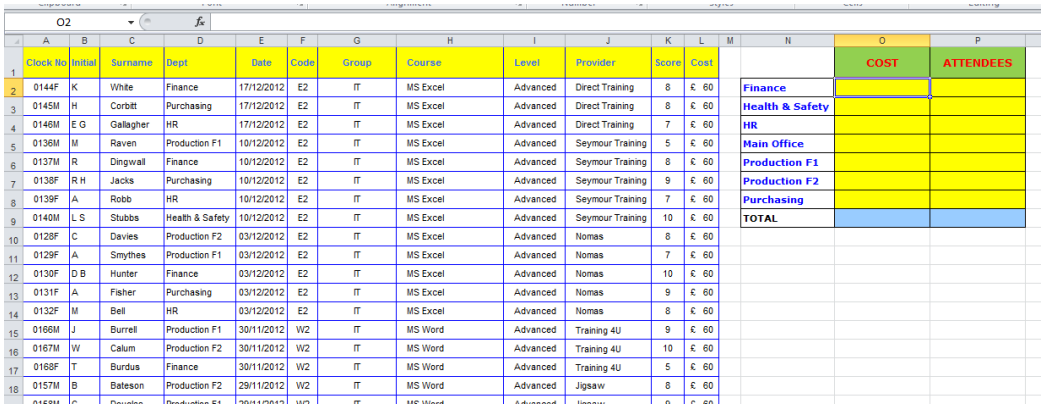
=VLOOKUP(B2, 'Item Nos'!A:E,2,FALSE)

Where :

Lookup_value	=	Cell where Item No. is entered (**B2**)
Table_array	=	Area where Item No & Description are stored (**Item Nos'!A:E**)
Col_index_num	=	Second column, along to the right of column 'A' (**2**)
Range_lookup	=	Ensures an exact match is found (**False**)

Conditional Sums

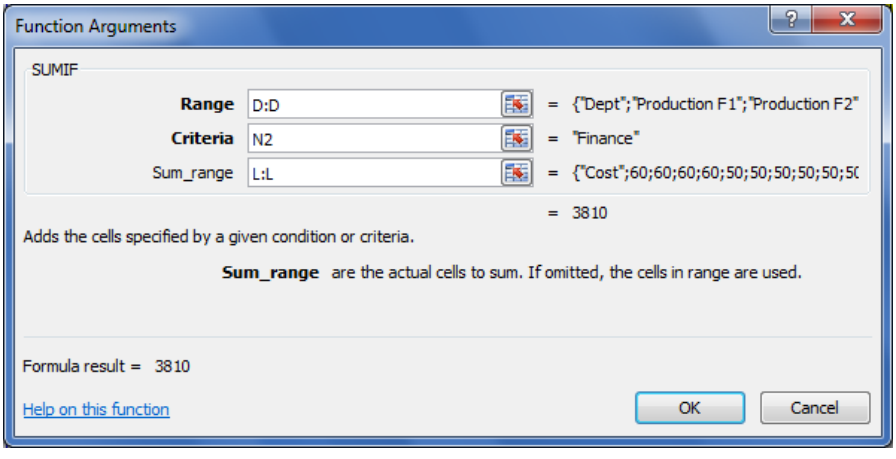
To 'Sum' values in a list (that meet specific conditions) use the 'SUMIF' function.



Clock No	Initial	Surname	Dept	Date	Code	Group	Course	Level	Provider	Score	Cost
0144F	K	White	Finance	17/12/2012	E2	IT	MS Excel	Advanced	Direct Training	8	£ 60
0145M	H	Corbitt	Purchasing	17/12/2012	E2	IT	MS Excel	Advanced	Direct Training	8	£ 60
0146M	E G	Gallagher	HR	17/12/2012	E2	IT	MS Excel	Advanced	Direct Training	7	£ 60
0136M	M	Raven	Production F1	10/12/2012	E2	IT	MS Excel	Advanced	Seymour Training	5	£ 60
0137M	R	Dingwall	Finance	10/12/2012	E2	IT	MS Excel	Advanced	Seymour Training	8	£ 60
0138F	R H	Jacks	Purchasing	10/12/2012	E2	IT	MS Excel	Advanced	Seymour Training	9	£ 60
0139F	A	Robb	HR	10/12/2012	E2	IT	MS Excel	Advanced	Seymour Training	7	£ 60
0140M	L S	Stubbs	Health & Safety	10/12/2012	E2	IT	MS Excel	Advanced	Seymour Training	10	£ 60
0128F	C	Davies	Production F2	03/12/2012	E2	IT	MS Excel	Advanced	Nomas	8	£ 60
0129F	A	Smythes	Production F1	03/12/2012	E2	IT	MS Excel	Advanced	Nomas	7	£ 60
0130F	D B	Hunter	Finance	03/12/2012	E2	IT	MS Excel	Advanced	Nomas	10	£ 60
0131F	A	Fisher	Purchasing	03/12/2012	E2	IT	MS Excel	Advanced	Nomas	9	£ 60
0132F	M	Bell	HR	03/12/2012	E2	IT	MS Excel	Advanced	Nomas	8	£ 60
0166M	J	Burrell	Production F1	30/11/2012	W2	IT	MS Word	Advanced	Training 4U	9	£ 60
0167M	W	Calum	Production F2	30/11/2012	W2	IT	MS Word	Advanced	Training 4U	10	£ 60
0168F	T	Burdus	Finance	30/11/2012	W2	IT	MS Word	Advanced	Training 4U	5	£ 60
0157M	B	Bateson	Production F2	29/11/2012	W2	IT	MS Word	Advanced	Jigsaw	8	£ 60

	COST	ATTENDEES
Finance		
Health & Safety		
HR		
Main Office		
Production F1		
Production F2		
Purchasing		
TOTAL		

The formula below, calculates the total cost of all courses, attended by Finance employees.

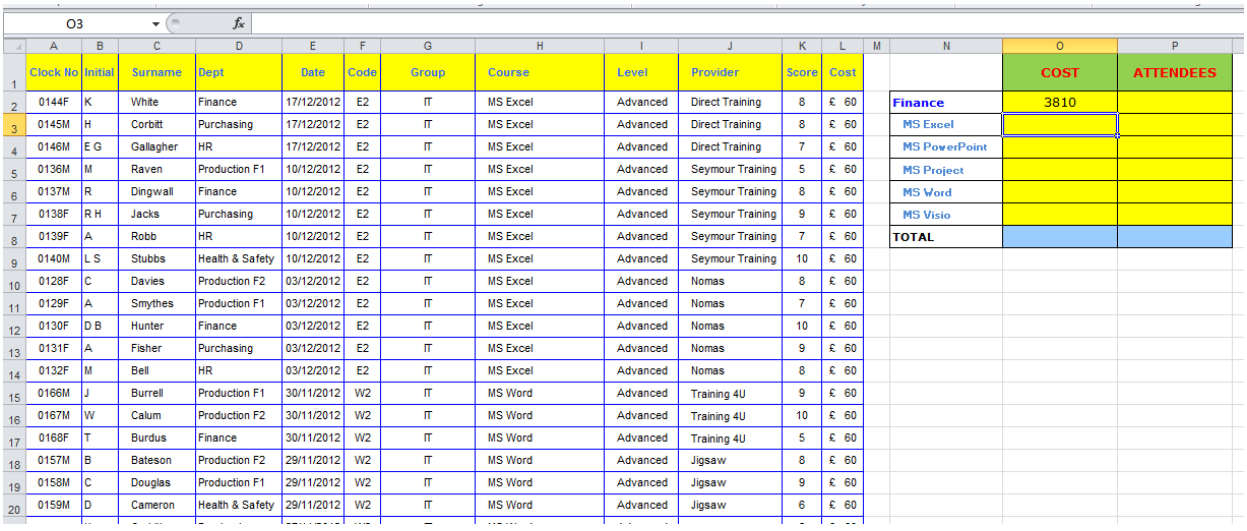


=SUMIF(D:D,N2,L:L)

Where ;

Range	Is the range of cells you want evaluated (**D:D**)
Criteria	Is the criteria, in the form of a cell reference that defines which cells will be added. E.g. in the above example, the Total Cost is calculated, using a cell reference of '**N2**', for the criteria.
Sum_range	Are the actual cells to sum. The cells in 'sum_range' are summed only if their corresponding cells in 'range', match the criteria (**L:L**).

There is a new function in Excel 2010 (**SUMIFS**), which allows the addition of cells in a range that meet multiple criteria.

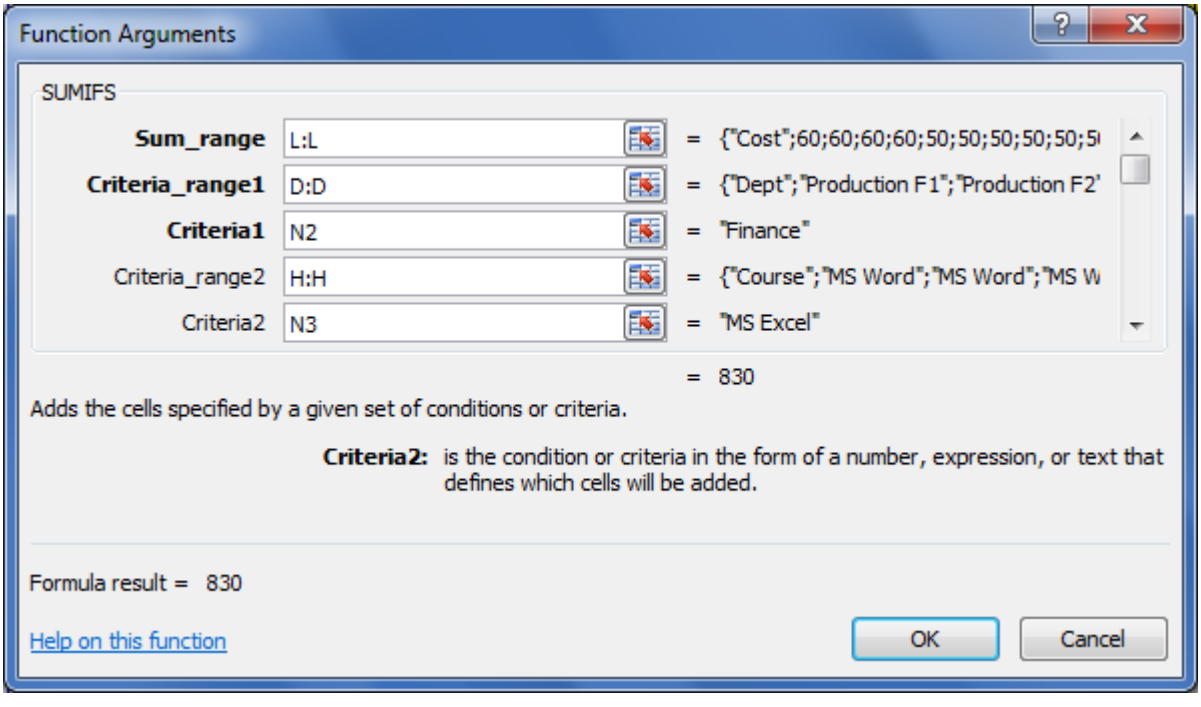


Clock No	Initial	Surname	Dept	Date	Code	Group	Course	Level	Provider	Score	Cost
0144F	K	White	Finance	17/12/2012	E2	IT	MS Excel	Advanced	Direct Training	8	£ 60
0145M	H	Corbitt	Purchasing	17/12/2012	E2	IT	MS Excel	Advanced	Direct Training	8	£ 60
0146M	E G	Gallagher	HR	17/12/2012	E2	IT	MS Excel	Advanced	Direct Training	7	£ 60
0136M	M	Raven	Production F1	10/12/2012	E2	IT	MS Excel	Advanced	Seymour Training	5	£ 60
0137M	R	Dingwall	Finance	10/12/2012	E2	IT	MS Excel	Advanced	Seymour Training	8	£ 60
0138F	R H	Jacks	Purchasing	10/12/2012	E2	IT	MS Excel	Advanced	Seymour Training	9	£ 60
0139F	A	Robb	HR	10/12/2012	E2	IT	MS Excel	Advanced	Seymour Training	7	£ 60
0140M	L S	Stubbs	Health & Safety	10/12/2012	E2	IT	MS Excel	Advanced	Seymour Training	10	£ 60
0128F	C	Davies	Production F2	03/12/2012	E2	IT	MS Excel	Advanced	Nomas	8	£ 60
0129F	A	Smythes	Production F1	03/12/2012	E2	IT	MS Excel	Advanced	Nomas	7	£ 60
0130F	D B	Hunter	Finance	03/12/2012	E2	IT	MS Excel	Advanced	Nomas	10	£ 60
0131F	A	Fisher	Purchasing	03/12/2012	E2	IT	MS Excel	Advanced	Nomas	9	£ 60
0132F	M	Bell	HR	03/12/2012	E2	IT	MS Excel	Advanced	Nomas	8	£ 60
0166M	J	Burrell	Production F1	30/11/2012	W2	IT	MS Word	Advanced	Training 4U	9	£ 60
0167M	W	Calum	Production F2	30/11/2012	W2	IT	MS Word	Advanced	Training 4U	10	£ 60
0168F	T	Burdus	Finance	30/11/2012	W2	IT	MS Word	Advanced	Training 4U	5	£ 60
0157M	B	Bateson	Production F2	29/11/2012	W2	IT	MS Word	Advanced	Jigsaw	8	£ 60
0158M	C	Douglas	Production F1	29/11/2012	W2	IT	MS Word	Advanced	Jigsaw	9	£ 60
0159M	D	Cameron	Health & Safety	29/11/2012	W2	IT	MS Word	Advanced	Jigsaw	6	£ 60

	COST	ATTENDEES
Finance	3810	
MS Excel		
MS PowerPoint		
MS Project		
MS Word		
MS Visio		
TOTAL		

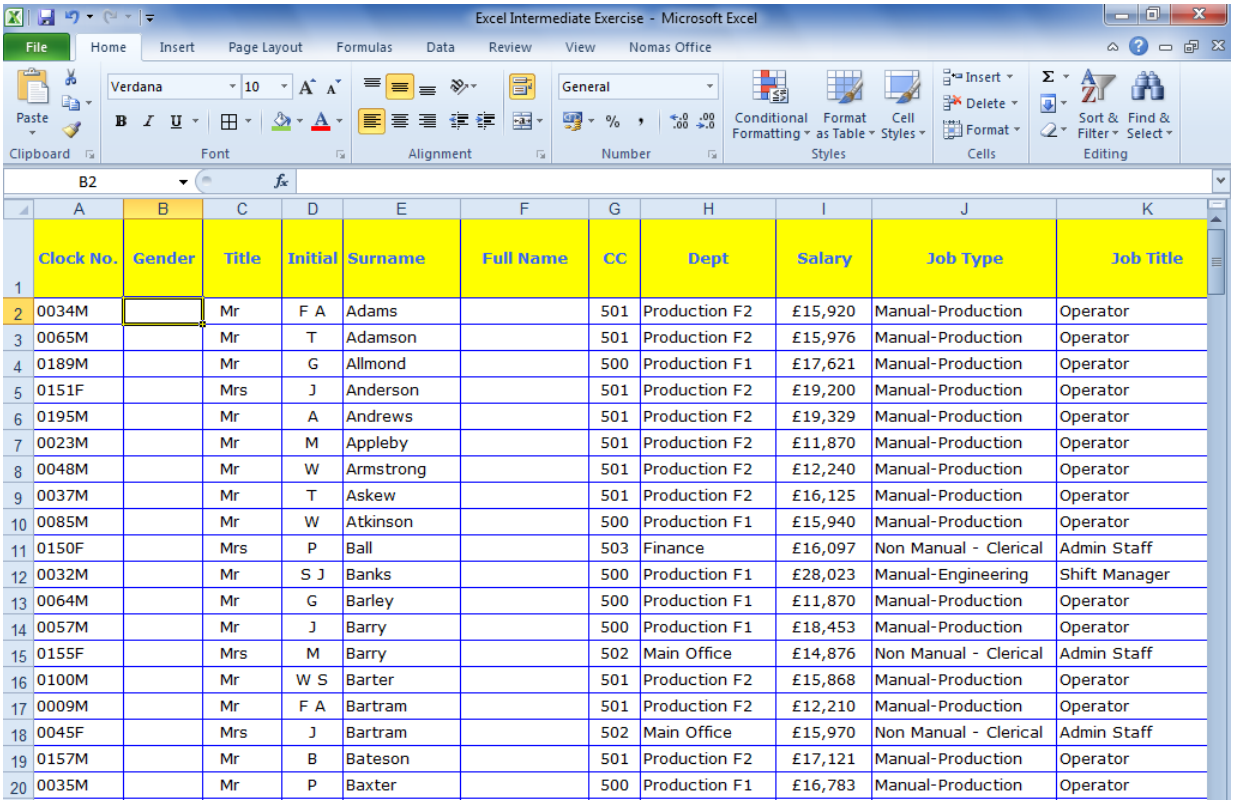
For example, in the above data set, you could calculate the total cost (Column L) of all Excel courses (Column H), attended by Finance employees (Column D).

The expression would look like ;



Extracting Data from the Left or Right of a Cell

If data in a cell, needs to be 'split up' or certain characters extracted from either end of a data set, then the 'Left' or 'Right' function can be used. For example, if an employees number was in the format 0045M, where the last character denoted the gender of the person and the data was stored in Column A, then the final character could be extracted using the formula ;



	A	B	C	D	E	F	G	H	I	J	K
1	Clock No.	Gender	Title	Initial	Surname	Full Name	CC	Dept	Salary	Job Type	Job Title
2	0034M		Mr	F A	Adams		501	Production F2	£15,920	Manual-Production	Operator
3	0065M		Mr	T	Adamson		501	Production F2	£15,976	Manual-Production	Operator
4	0189M		Mr	G	Allmond		500	Production F1	£17,621	Manual-Production	Operator
5	0151F		Mrs	J	Anderson		501	Production F2	£19,200	Manual-Production	Operator
6	0195M		Mr	A	Andrews		501	Production F2	£19,329	Manual-Production	Operator
7	0023M		Mr	M	Appleby		501	Production F2	£11,870	Manual-Production	Operator
8	0048M		Mr	W	Armstrong		501	Production F2	£12,240	Manual-Production	Operator
9	0037M		Mr	T	Askew		501	Production F2	£16,125	Manual-Production	Operator
10	0085M		Mr	W	Atkinson		500	Production F1	£15,940	Manual-Production	Operator
11	0150F		Mrs	P	Ball		503	Finance	£16,097	Non Manual - Clerical	Admin Staff
12	0032M		Mr	S J	Banks		500	Production F1	£28,023	Manual-Engineering	Shift Manager
13	0064M		Mr	G	Barley		500	Production F1	£11,870	Manual-Production	Operator
14	0057M		Mr	J	Barry		500	Production F1	£18,453	Manual-Production	Operator
15	0155F		Mrs	M	Barry		502	Main Office	£14,876	Non Manual - Clerical	Admin Staff
16	0100M		Mr	W S	Barter		501	Production F2	£15,868	Manual-Production	Operator
17	0009M		Mr	F A	Bartram		501	Production F2	£12,210	Manual-Production	Operator
18	0045F		Mrs	J	Bartram		502	Main Office	£15,970	Non Manual - Clerical	Admin Staff
19	0157M		Mr	B	Bateson		501	Production F2	£17,121	Manual-Production	Operator
20	0035M		Mr	P	Baxter		500	Production F1	£16,783	Manual-Production	Operator

=RIGHT(A2,1)

Where ;

Text = cell containing data e.g. Clock No. (**A2**)

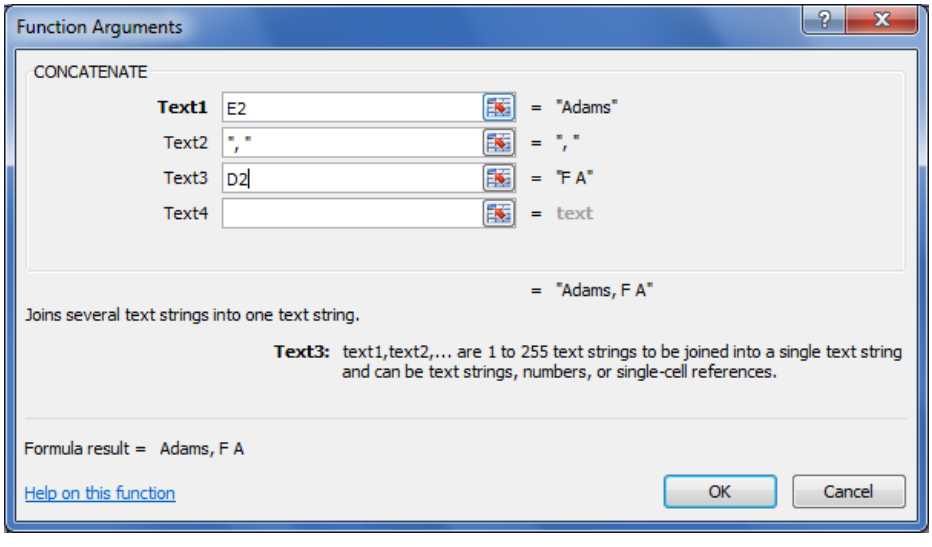
Num_chars = no. of charatcers from the right of this cell, to extract (**1**)

Combining Cell Content

It is possible to combine or join together information, from different columns on a spreadsheet, using the 'Concatenate' function. E.g. if the employees 'Surname' & 'Initial', are stored in separate columns in a worksheet.

	A	B	C	D	E	F	G	H	I	J	
1	Clock No.	Gender	Title	Initial	Surname	Full Name	CC	Dept	Salary	Job Type	
2	0034M	M	Mr	F A	Adams	=CONCATENATE(E2,", ",D2)	501	Production F2	£15,920	Manual-Production	Oper
3	0065M	M	Mr	T	Adamson		501	Production F2	£15,976	Manual-Production	Oper
4	0189M	M	Mr	G	Allmond		500	Production F1	£17,621	Manual-Production	Oper
5	0151F	F	Mrs	J	Anderson		501	Production F2	£19,200	Manual-Production	Oper
6	0195M	M	Mr	A	Andrews		501	Production F2	£19,329	Manual-Production	Oper
7	0023M	M	Mr	M	Appleby		501	Production F2	£11,870	Manual-Production	Oper
8	0048M	M	Mr	W	Armstrong		501	Production F2	£12,240	Manual-Production	Oper
9	0037M	M	Mr	T	Askew		501	Production F2	£16,125	Manual-Production	Oper
10	0085M	M	Mr	W	Atkinson		500	Production F1	£15,940	Manual-Production	Oper
11	0150F	F	Mrs	P	Ball		503	Finance	£16,097	Non Manual - Clerical	Adm
12	0032M	M	Mr	S J	Banks		500	Production F1	£28,023	Manual-Engineering	Shift
13	0064M	M	Mr	G	Barley		500	Production F1	£11,870	Manual-Production	Oper
14	0057M	M	Mr	J	Barry		500	Production F1	£18,453	Manual-Production	Oper
15	0155F	F	Mrs	M	Barry		502	Main Office	£14,876	Non Manual - Clerical	Adm
16	0100M	M	Mr	W S	Barter		501	Production F2	£15,868	Manual-Production	Oper
17	0009M	M	Mr	F A	Bartram		501	Production F2	£12,210	Manual-Production	Oper

=CONCATENATE(E2," , ",D2)



Where ;

Text 1, 2, 3 etc = Cells to be combined (**E2, D2**)

" " = Use " " to indicate space between cells.

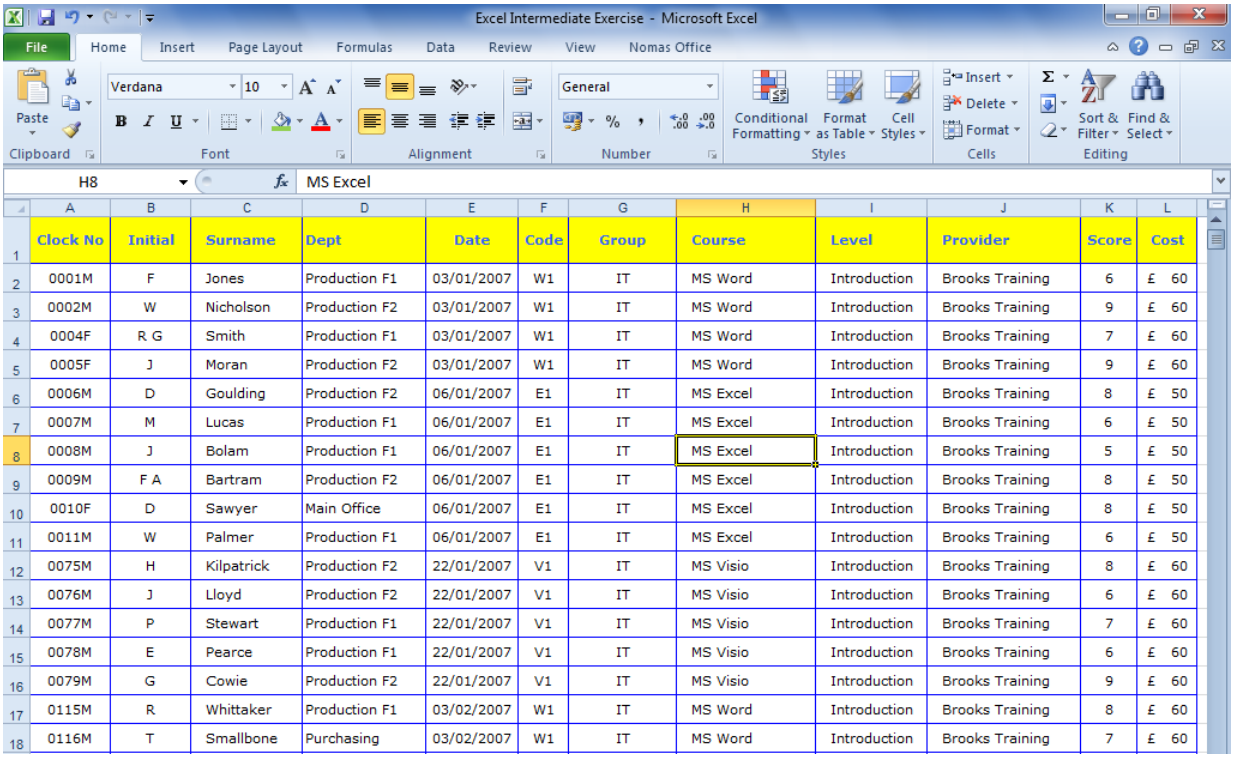
PIVOT TABLE

What Is A Pivot Table ?

A Pivot Table is an interactive worksheet table that summarises and analyses data from an existing list. You decide which of the fields (in the list) are to be arranged in rows and columns. You can re-arrange the table very easily, in effect 'twisting' the data around - hence the name Pivot Table.

Most Excel spreadsheets are generally of the same format i.e. they contain a series of fields (column headings) containing data in rows.

The following example shows a spreadsheet that contains information on the training carried out within a company, from 2007-2013. It lists the delegate details, training provider, course and cost of training. It contains a lot of information & it is very difficult to get an overall 'summarised' view. This is where the 'power' of a Pivot Table lies. They effectively display the result of a 'database analysis'.

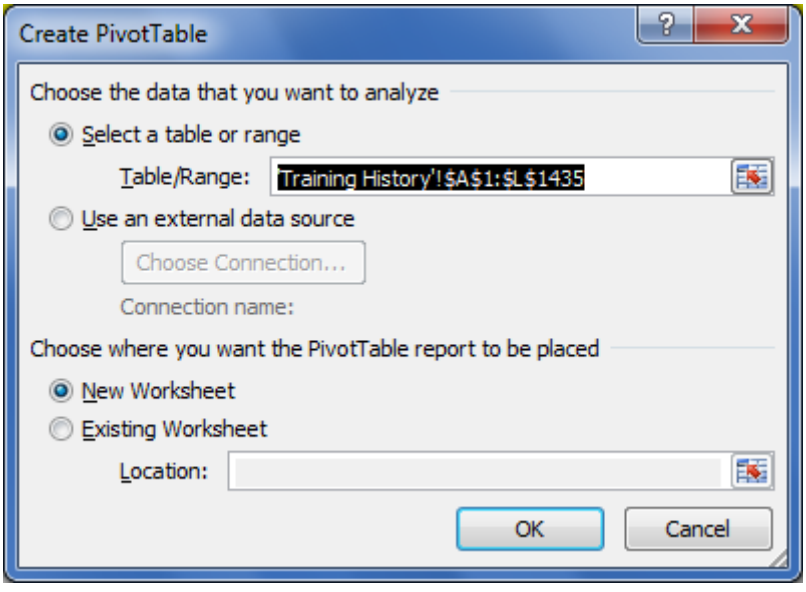


	A	B	C	D	E	F	G	H	I	J	K	L
1	Clock No	Initial	Surname	Dept	Date	Code	Group	Course	Level	Provider	Score	Cost
2	0001M	F	Jones	Production F1	03/01/2007	W1	IT	MS Word	Introduction	Brooks Training	6	£ 60
3	0002M	W	Nicholson	Production F2	03/01/2007	W1	IT	MS Word	Introduction	Brooks Training	9	£ 60
4	0004F	R G	Smith	Production F1	03/01/2007	W1	IT	MS Word	Introduction	Brooks Training	7	£ 60
5	0005F	J	Moran	Production F2	03/01/2007	W1	IT	MS Word	Introduction	Brooks Training	9	£ 60
6	0006M	D	Goulding	Production F2	06/01/2007	E1	IT	MS Excel	Introduction	Brooks Training	8	£ 50
7	0007M	M	Lucas	Production F1	06/01/2007	E1	IT	MS Excel	Introduction	Brooks Training	6	£ 50
8	0008M	J	Bolam	Production F1	06/01/2007	E1	IT	MS Excel	Introduction	Brooks Training	5	£ 50
9	0009M	F A	Bartram	Production F2	06/01/2007	E1	IT	MS Excel	Introduction	Brooks Training	8	£ 50
10	0010F	D	Sawyer	Main Office	06/01/2007	E1	IT	MS Excel	Introduction	Brooks Training	8	£ 50
11	0011M	W	Palmer	Production F1	06/01/2007	E1	IT	MS Excel	Introduction	Brooks Training	6	£ 50
12	0075M	H	Kilpatrick	Production F2	22/01/2007	V1	IT	MS Visio	Introduction	Brooks Training	8	£ 60
13	0076M	J	Lloyd	Production F2	22/01/2007	V1	IT	MS Visio	Introduction	Brooks Training	6	£ 60
14	0077M	P	Stewart	Production F1	22/01/2007	V1	IT	MS Visio	Introduction	Brooks Training	7	£ 60
15	0078M	E	Pearce	Production F1	22/01/2007	V1	IT	MS Visio	Introduction	Brooks Training	6	£ 60
16	0079M	G	Cowie	Production F2	22/01/2007	V1	IT	MS Visio	Introduction	Brooks Training	9	£ 60
17	0115M	R	Whittaker	Production F1	03/02/2007	W1	IT	MS Word	Introduction	Brooks Training	8	£ 60
18	0116M	T	Smallbone	Purchasing	03/02/2007	W1	IT	MS Word	Introduction	Brooks Training	7	£ 60

The Pivot Table Wizard

You create Pivot Tables by using the Pivot Table Wizard. Although this only takes a few moments, it is worth spending some time to decide how you want to summarise your data. To create a Pivot Table ;

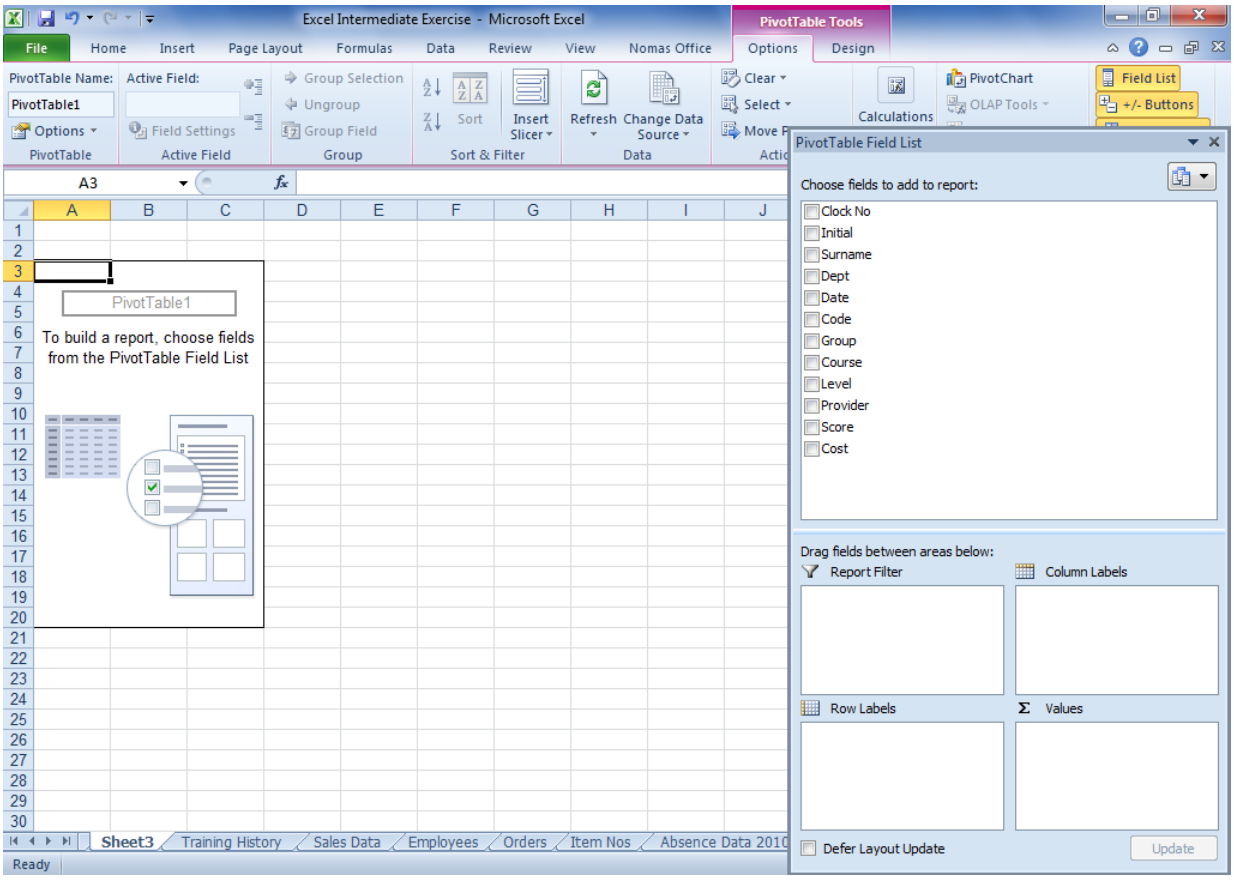
1 Select a cell in your data & select 'Pivot Table' from the 'Insert' tab.



2 The range of your data should be entered automatically, modify, if not correct.

3 Select whether the pivot table is to be placed on a new worksheet or within your existing worksheet.

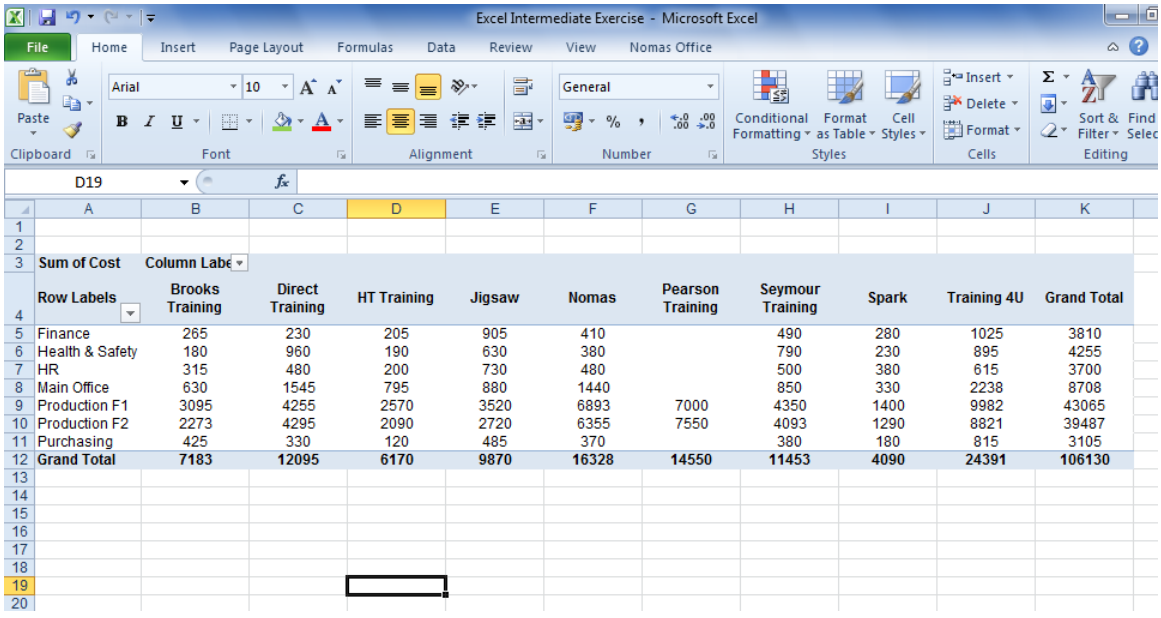
4 Click 'OK'.



5 You need to drag (or tick) the 'Fields' from the right hand side, onto the appropriate lower part of the table (areas marked 'Drag Fields Between Areas Below') & into the 'Row', 'Column', 'Values' areas.

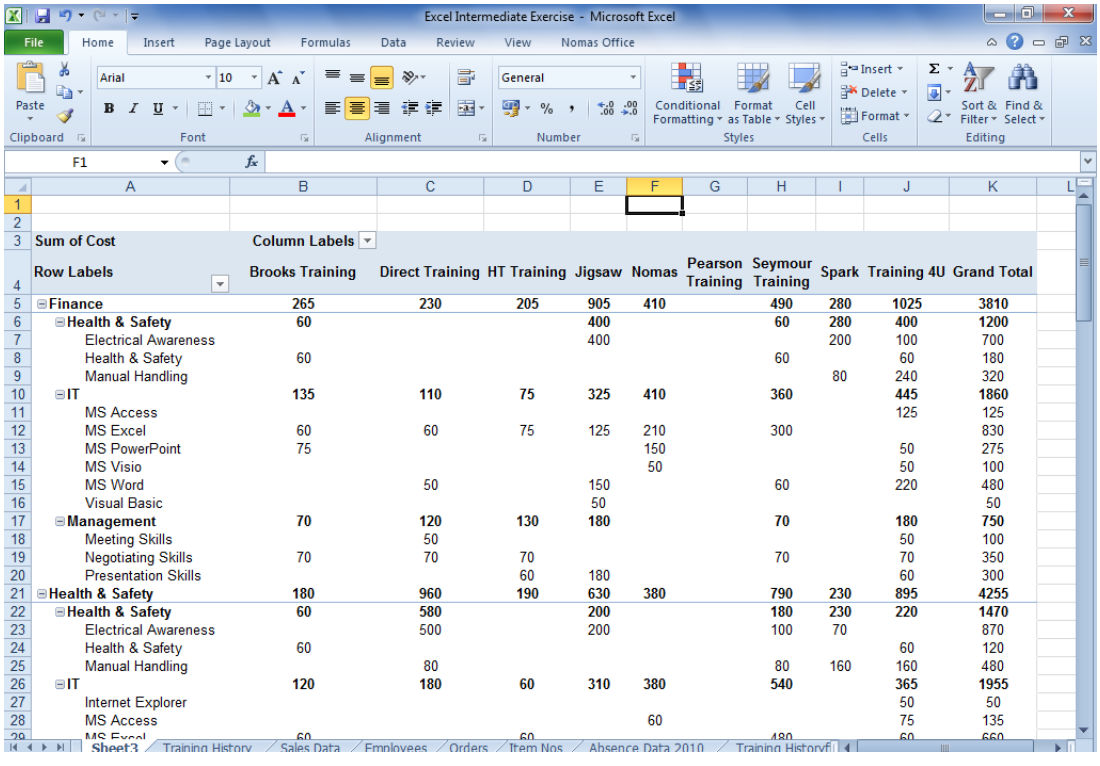
VALUES	This field contains the data that you want to summarise (often a numeric field).
ROW	This is the field that you want to appear as rows with labels down the side of the table.
COLUMN	This is the field that you want to appear as columns with labels across the top of the table.
REPORT FILTER	See later.

6 The Pivot Table is created (next page).



Sum of Cost	Column Labe									
Row Labels	Brooks Training	Direct Training	HT Training	Jigsaw	Nomas	Pearson Training	Seymour Training	Spark	Training 4U	Grand Total
Finance	265	230	205	905	410		490	280	1025	3810
Health & Safety	180	960	190	630	380		790	230	895	4255
HR	315	480	200	730	480		500	380	615	3700
Main Office	630	1545	795	880	1440		850	330	2238	8708
Production F1	3095	4255	2570	3520	6893	7000	4350	1400	9982	43065
Production F2	2273	4295	2090	2720	6355	7550	4093	1290	8821	39487
Purchasing	425	330	120	485	370		380	180	815	3105
Grand Total	**7183**	**12095**	**6170**	**9870**	**16328**	**14550**	**11453**	**4090**	**24391**	**106130**

7 You can have several field headings, in any one of these areas. Example below has 'Dept', 'Group' & 'Course', in the 'Row' area.



Sum of Cost	Column Labels									
Row Labels	Brooks Training	Direct Training	HT Training	Jigsaw	Nomas	Pearson Training	Seymour Training	Spark	Training 4U	Grand Total
Finance	**265**	**230**	**205**	**905**	**410**		**490**	**280**	**1025**	**3810**
Health & Safety	**60**			**400**			**60**	**280**	**400**	**1200**
Electrical Awareness				400				200	100	700
Health & Safety	60						60		60	180
Manual Handling								80	240	320
IT	**135**	**110**	**75**	**325**	**410**		**360**		**445**	**1860**
MS Access									125	125
MS Excel	60	60	75	125	210		300			830
MS PowerPoint	75				150				50	275
MS Visio					50				50	100
MS Word		50		150			60		220	480
Visual Basic				50						50
Management	**70**	**120**	**130**	**180**			**70**		**180**	**750**
Meeting Skills		50							50	100
Negotiating Skills	70	70	70				70		70	350
Presentation Skills			60	180					60	300
Health & Safety	**180**	**960**	**190**	**630**	**380**		**790**	**230**	**895**	**4255**
Health & Safety	**60**	**580**		**200**			**180**	**230**	**220**	**1470**
Electrical Awareness		500		200			100	70		870
Health & Safety	60								60	120
Manual Handling		80					80	160	160	480
IT	**120**	**180**	**60**	**310**	**380**		**540**		**365**	**1955**
Internet Explorer									50	50
MS Access					60				75	135

Creating Pivot Filters

As it is not possible to read text in three-dimensions, all the fields that you want to see in a pivot Table are 'squashed' into the row or column positions.

However, it is possible to create a third dimension to provide added flexibility to your data. This is done by creating a Pivot Filter.

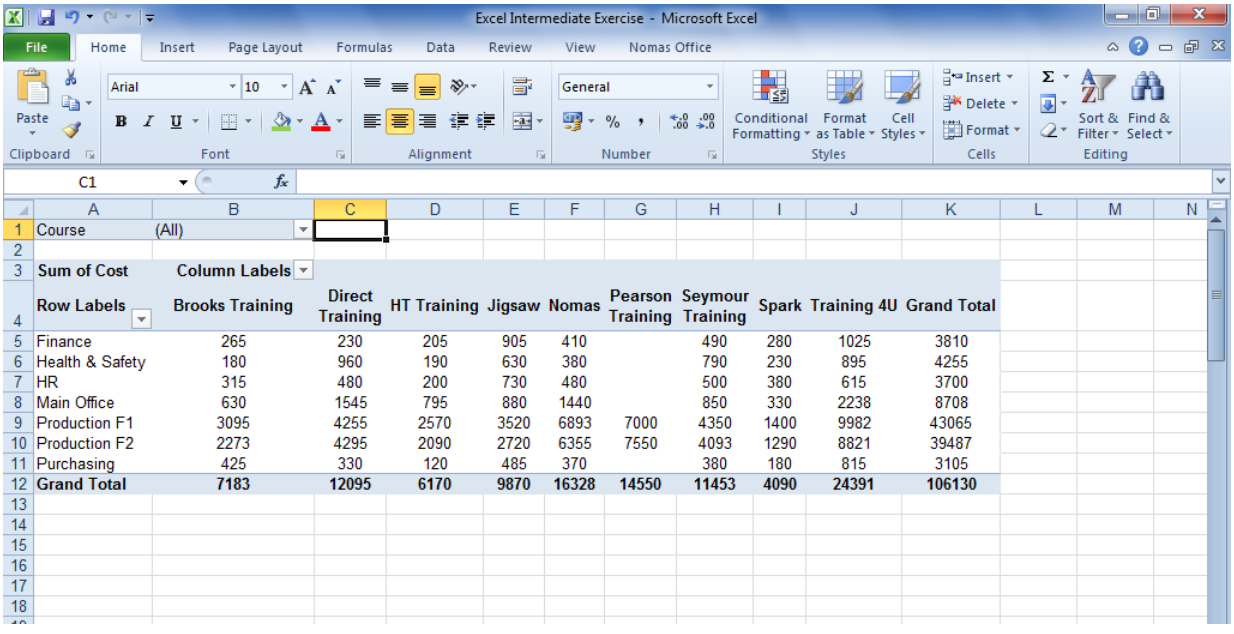
To create a Pivot Filter ;

1 Start the Pivot Table Wizard.

2 Complete steps as described previously.

3 In Step 5, move the field that you want to filter to the 'Report Filter' area.

4 Continue as described previously.

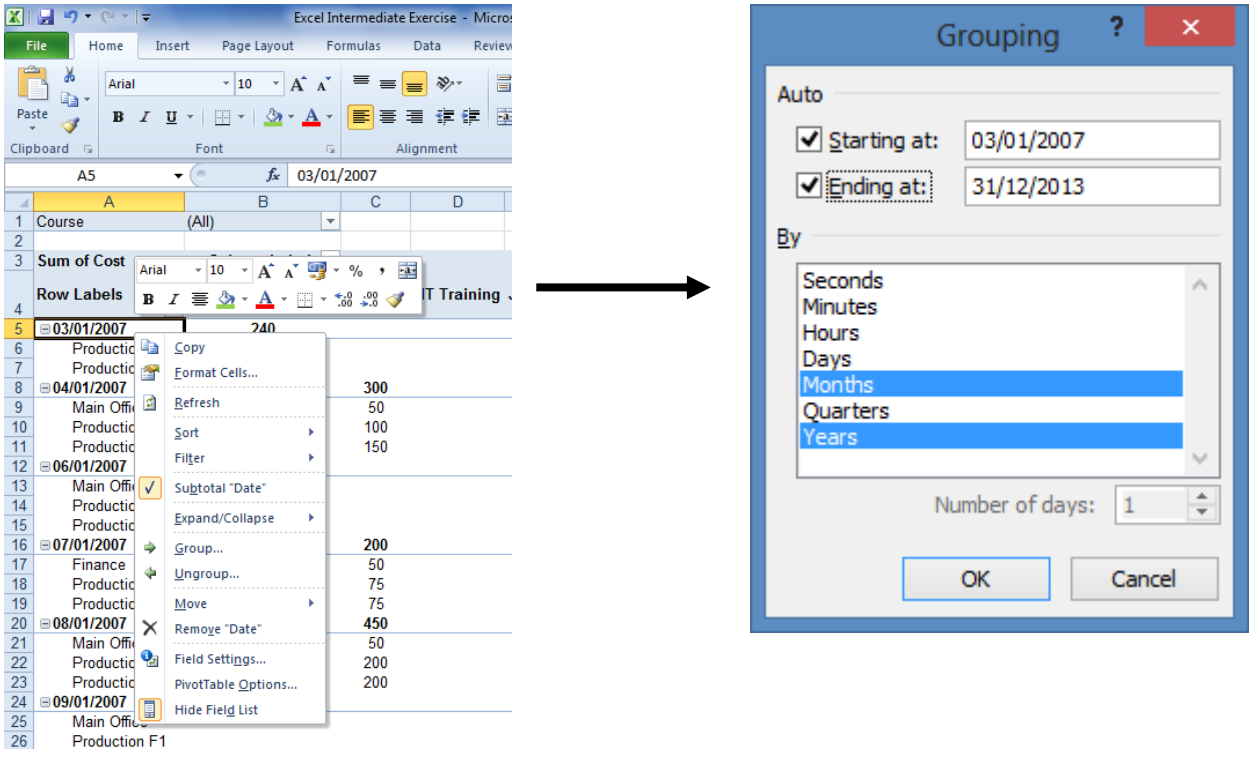


	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Course	(All)												
2														
3	Sum of Cost	Column Labels												
4	Row Labels	Brooks Training	Direct Training	HT Training	Jigsaw	Nomas	Pearson Training	Seymour Training	Spark	Training 4U	Grand Total			
5	Finance	265	230	205	905	410		490	280	1025	3810			
6	Health & Safety	180	960	190	630	380		790	230	895	4255			
7	HR	315	480	200	730	480		500	380	615	3700			
8	Main Office	630	1545	795	880	1440		850	330	2238	8708			
9	Production F1	3095	4255	2570	3520	6893	7000	4350	1400	9982	43065			
10	Production F2	2273	4295	2090	2720	6355	7550	4093	1290	8821	39487			
11	Purchasing	425	330	120	485	370		380	180	815	3105			
12	**Grand Total**	**7183**	**12095**	**6170**	**9870**	**16328**	**14550**	**11453**	**4090**	**24391**	**106130**			
13														
14														
15														
16														
17														
18														

5 In the above example the 'Course' field has been added to the 'Filter field, so that the training can be filtered by 'Course'.

Changing Date Grouping

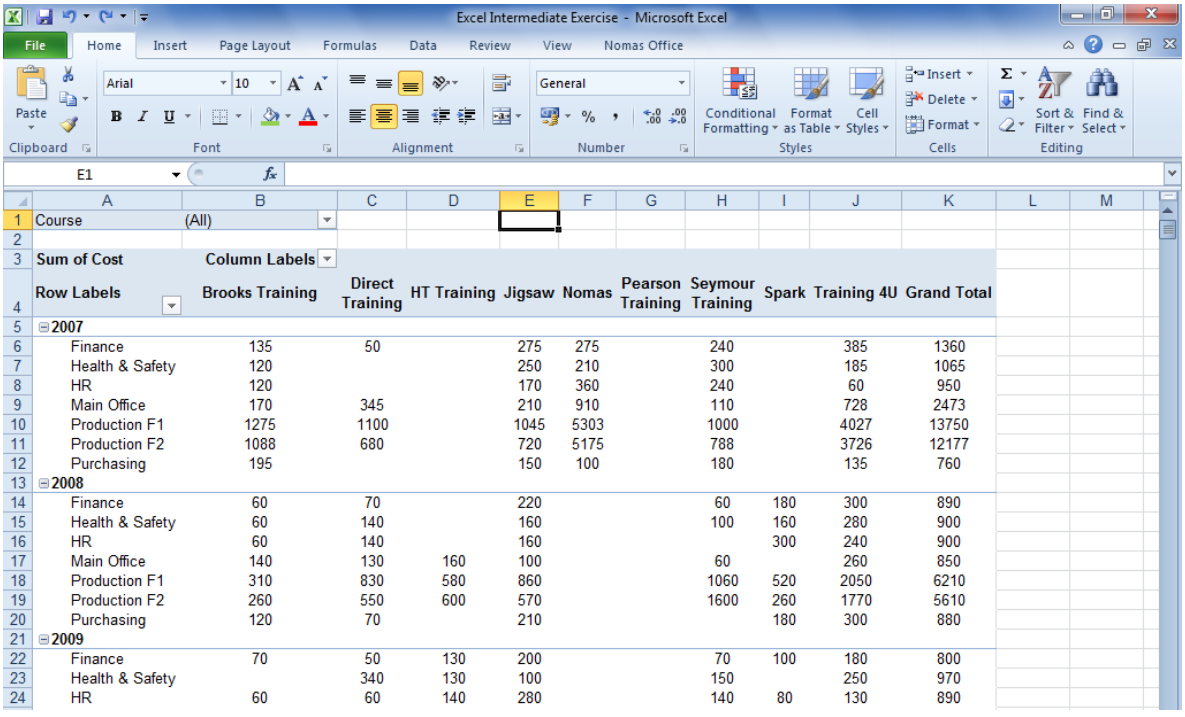
If a 'Date' field is used in a Pivot Table, it does not automatically 'group' data by month or year. Therefore, you need to set the grouping level, by right clicking on the 'Date' area & selecting 'Group'.



You can then set the level required, e.g. 'Months', 'Quarters' etc.

Adding Sub Totals

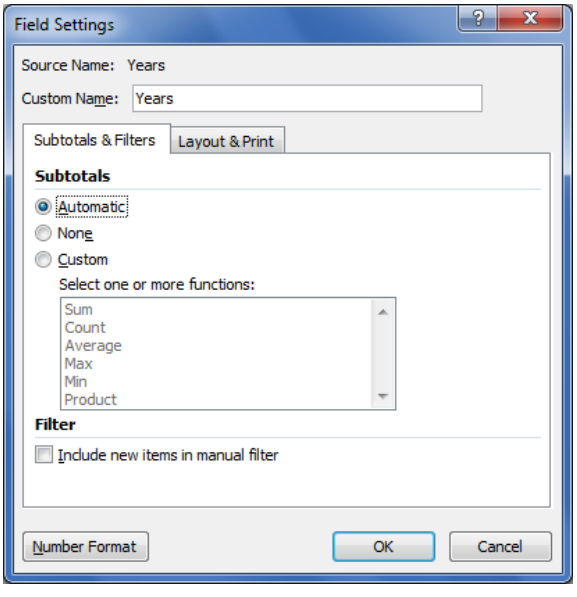
If 'Sub-Totals' are not automatically displayed, it is possible to add them manually, in the example (over) the 'Annual' sub-totals do not appear automatically.



	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Course	(All)											
2													
3	Sum of Cost	Column Labels											
4	Row Labels	Brooks Training	Direct Training	HT Training	Jigsaw	Nomas	Pearson Training	Seymour Training	Spark	Training 4U	Grand Total		
5	2007												
6	Finance	135	50		275	275		240		385	1360		
7	Health & Safety	120			250	210		300		185	1065		
8	HR	120			170	360		240		60	950		
9	Main Office	170	345		210	910		110		728	2473		
10	Production F1	1275	1100		1045	5303		1000		4027	13750		
11	Production F2	1088	680		720	5175		788		3726	12177		
12	Purchasing	195			150	100		180		135	760		
13	2008												
14	Finance	60	70		220			60	180	300	890		
15	Health & Safety	60	140		160			100	160	280	900		
16	HR	60	140		160				300	240	900		
17	Main Office	140	130	160	100			60		260	850		
18	Production F1	310	830	580	860			1060	520	2050	6210		
19	Production F2	260	550	600	570			1600	260	1770	5610		
20	Purchasing	120	70		210				180	300	880		
21	2009												
22	Finance	70	50	130	200			70	100	180	800		
23	Health & Safety		340	130	100			150		250	970		
24	HR	60	60	140	280			140	80	130	890		

To add them ;

1 Right click onto the relevant 'Field' heading – 'Years' in this example & select 'Field Settings'.



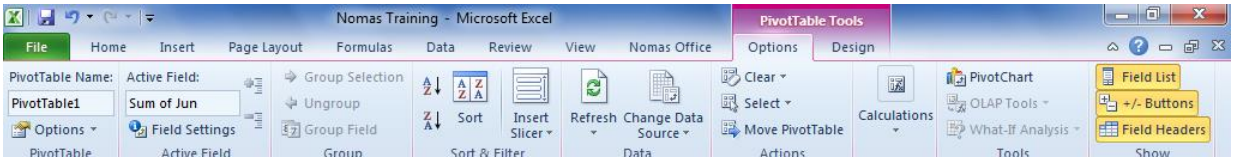
2 Select 'Subtotals….Automatic'

3 Click 'OK'.

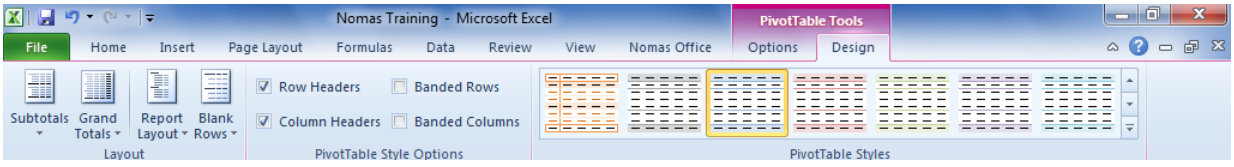
Re-Designing A Pivot Table

There are 2 Custom Tabs, that are available when using a Pivot Table.

Pivot Table Tools – Options



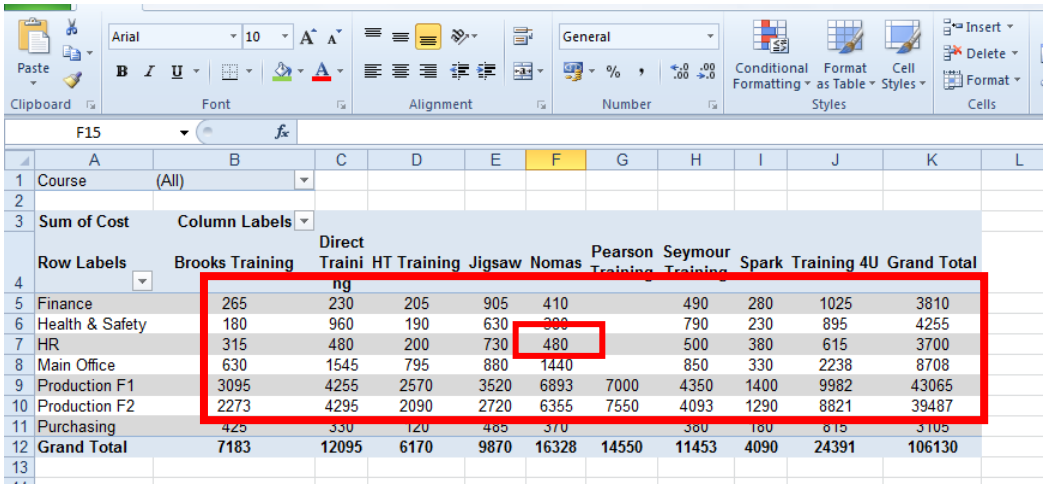
Pivot Table Tools – Design



Commonly, this tab is used for selecting a particular colour scheme, 'PivotTable Style', for your pivot table.

Drilling Down Into The Data In A Pivot Table

To see the 'underlying' data, in the Pivot Table, simply double click in the Pivot Table data. For example, to see the 'Employees Trained' in HR, by the 'Nomas' training provider, double click in the appropriate cell e.g. 480 (below) & the data will be copied into a new sheet.



	A	B	C	D	E	F	G	H	I	J	K	L
1	Course	(All)										
2												
3	Sum of Cost	Column Labels										
4	Row Labels	Brooks Training	Direct Training	HT Training	Jigsaw	Nomas	Pearson Training	Seymour Training	Spark	Training 4U	Grand Total	
5	Finance	265	230	205	905	410		490	280	1025	3810	
6	Health & Safety	180	960	190	630	380		790	230	895	4255	
7	HR	315	480	200	730	480		500	380	615	3700	
8	Main Office	630	1545	795	880	1440		850	330	2238	8708	
9	Production F1	3095	4255	2570	3520	6893	7000	4350	1400	9982	43065	
10	Production F2	2273	4295	2090	2720	6355	7550	4093	1290	8821	39487	
11	Purchasing	425	330	120	485	370		360	180	815	3105	
12	Grand Total	7183	12095	6170	9870	16328	14550	11453	4090	24391	106130	
13												

I21

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Clock No	Initial	Surname	Dept	Date	Code	Group	Course	Level	Provider	Score	Cost	
2	0132F	M	Bell	HR	03/12/2010	E2	IT	MS Excel	Advanced	Nomas	8	60	
3	0139F	A	Robb	HR	20/11/2010	W2	IT	MS Word	Advanced	Nomas	8	60	
4	0132F	M	Bell	HR	30/10/2007	P1	IT	MS PowerPoint	Introduction	Nomas	7	50	
5	0125F	P	Potts	HR	30/05/2007	P1	IT	MS PowerPoint	Introduction	Nomas	8	50	
6	0118F	K	Murrayfield	HR	30/05/2007	P1	IT	MS PowerPoint	Introduction	Nomas	8	50	
7	0111F	E	Long	HR	30/05/2007	P1	IT	MS PowerPoint	Introduction	Nomas	7	50	
8	0139F	A	Robb	HR	19/02/2007	P1	IT	MS PowerPoint	Introduction	Nomas	8	50	
9	0139F	A	Robb	HR	07/02/2007	V1	IT	MS Visio	Introduction	Nomas	7	50	

Slicers

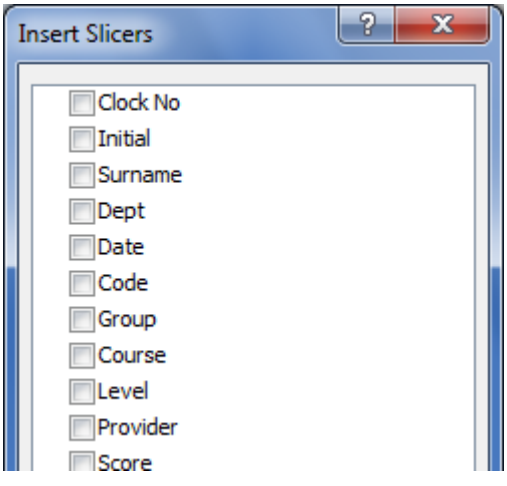
Slicers are easy-to-use filtering components, that contain a set of buttons that enable you to quickly filter the data in a PivotTable, without the need to open drop-down lists to find the items that you want to filter.

When you use a regular PivotTable filter to filter on multiple items, the filter indicates only that multiple items are filtered, and you have to open a drop-down list to find the filtering details. However, a slicer clearly labels the filter that is applied and provides details so that you can easily understand the data that is displayed in the filtered PivotTable report.

Create A Slicer In An Existing Pivot Table

1 Click anywhere in the PivotTable, for which you want to create a slicer.

2 On the 'Options' tab, click 'Insert Slicer'.

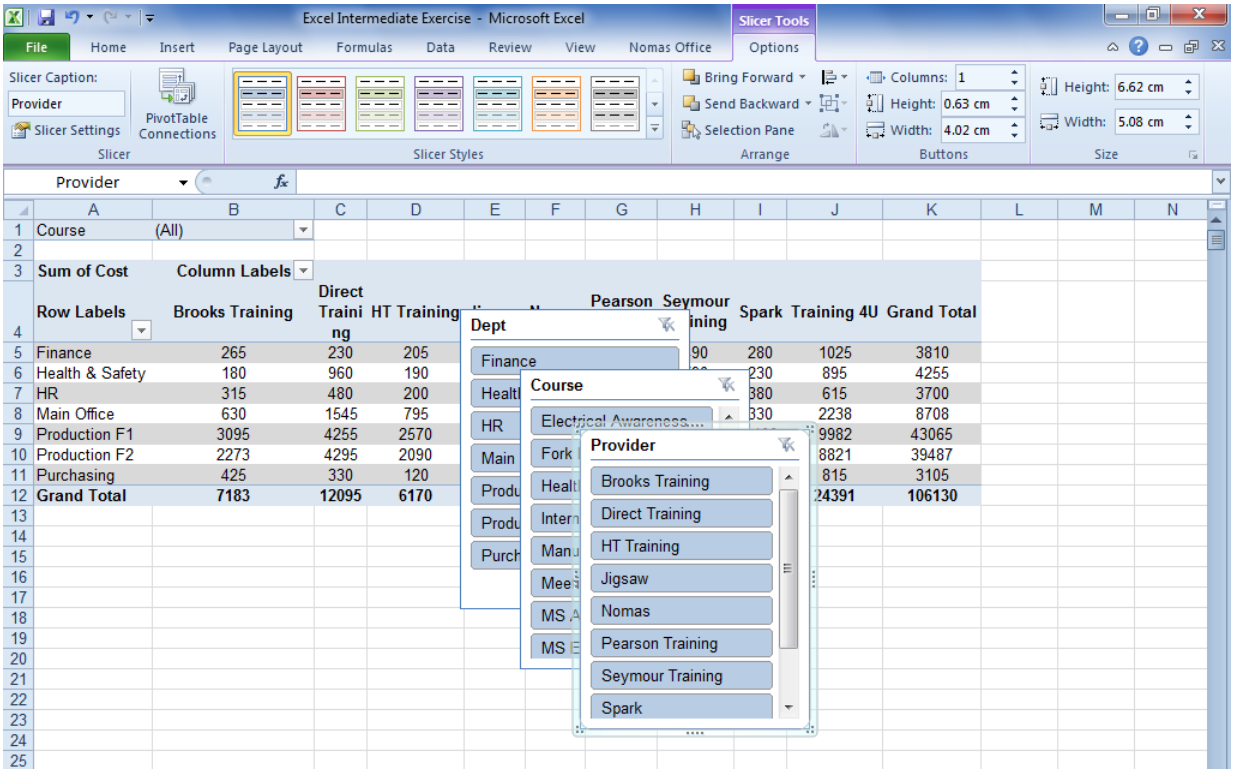


3 In the 'Insert Slicers' dialog box, select the check box of the PivotTable fields for which you want to create a slicer.

4 Click 'OK'.

5 A 'slicer' is displayed for every field that you selected.

6 In each slicer, click the items on which you want to filter.



7 To select more than one item, hold down CTRL, and then click the items on which you want to filter.

8 Click an item in the 'Slicer', to see the Pivot Table data.

Format A Slicer

1 Click the slicer that you want to format.

2 This displays the 'Slicer Tools', adding an 'Options' tab.

3 On the 'Options' tab, click the style that you want.

Delete A Slicer

Do one of the following ;

1 Click the slicer, and then press 'DELETE'.
2 Right-click the slicer, and then click 'Remove <Name of slicer>'.

Updating A Pivot Table

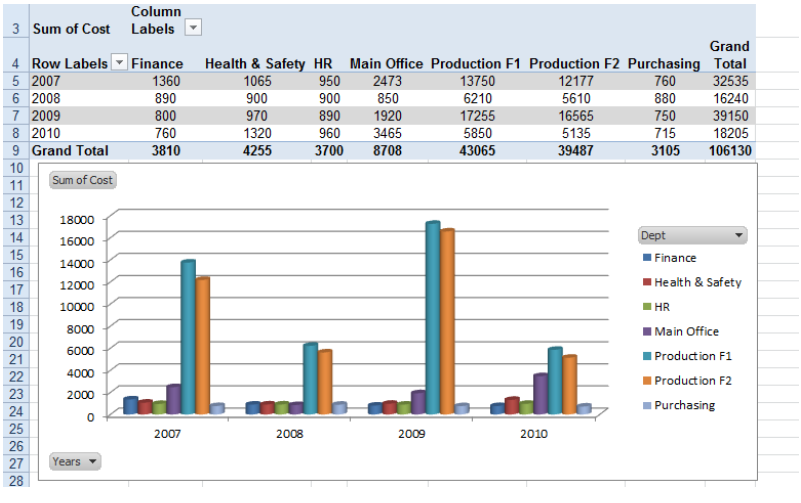
The Pivot Table does not change when you update your data in the source list. You can update your Pivot Table, by ;

1 Selecting any cell within the Pivot Table.
2 Click the 'Refresh' icon, in the 'Pivot Table Tools' tab.

Creating A Chart From A Pivot Table

You can create a chart linked to a pivot Table.

1 Select a cell within the Pivot Table data - avoid selecting any of the field tabs as this will move them within the table.
2 Click the 'Pivot Chart' icon, in the 'Pivot Table Tools' tab.
3 Select the type of chart you require & click 'OK'.
4 The chart will be created on your existing sheet.



Re-Organising The Pivot Table

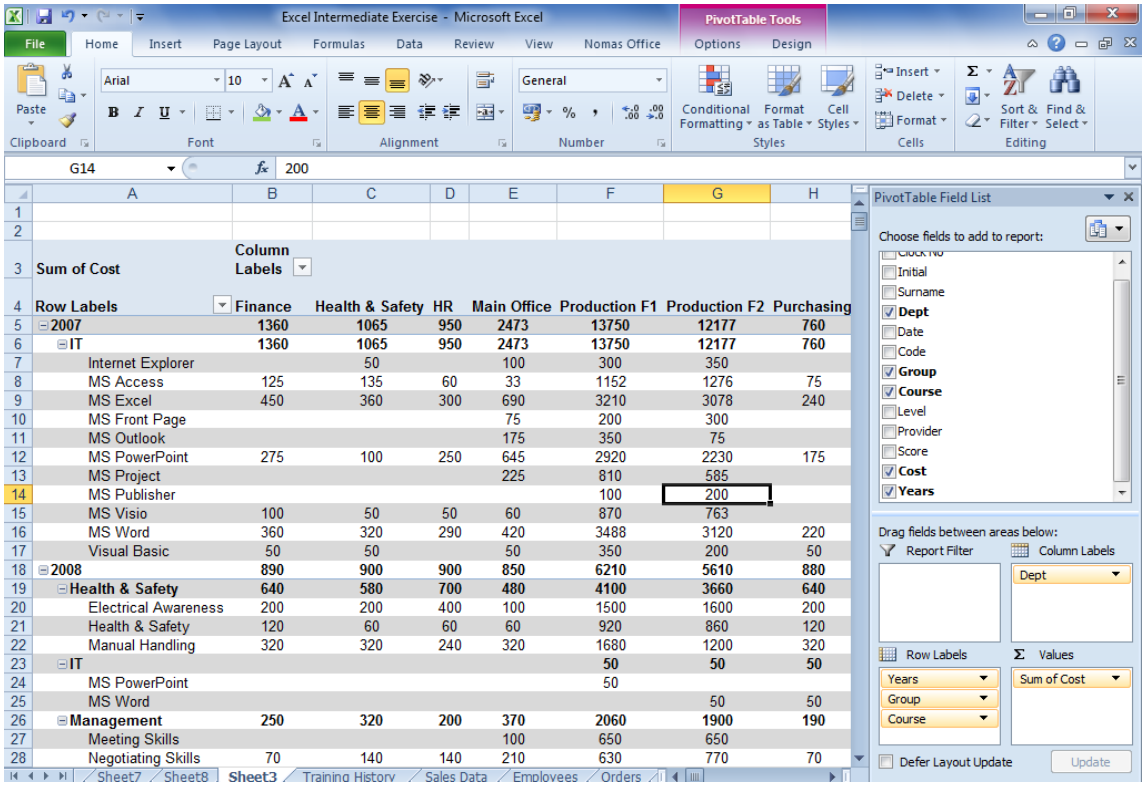
Adding Columns And Rows

To enhance the amount of detail available in your Pivot Table, you can add more fields. Adding row and column fields expands the table and widens the view. In contrast to adding a Filter, which narrows the scope.

To add a column or row ;

1 Select a cell in your Pivot Table.

2 Move the 'Field' that you want to move into the appropriate area (ROW, COLUMN etc).



Sum of Cost	Column Labels						
Row Labels	Finance	Health & Safety	HR	Main Office	Production F1	Production F2	Purchasing
2007	1360	1065	950	2473	13750	12177	760
IT	1360	1065	950	2473	13750	12177	760
Internet Explorer		50		100	300	350	
MS Access	125	135	60	33	1152	1276	75
MS Excel	450	360	300	690	3210	3078	240
MS Front Page				75	200	300	
MS Outlook				175	350	75	
MS PowerPoint	275	100	250	645	2920	2230	175
MS Project				225	810	585	
MS Publisher					100	200	
MS Visio	100	50	50	60	870	763	
MS Word	360	320	290	420	3488	3120	220
Visual Basic	50	50		50	350	200	50
2008	890	900	900	850	6210	5610	880
Health & Safety	640	580	700	480	4100	3660	640
Electrical Awareness	200	200	400	100	1500	1600	200
Health & Safety	120	60	60	60	920	860	120
Manual Handling	320	320	240	320	1680	1200	320
IT					50	50	50
MS PowerPoint					50		
MS Word						50	50
Management	250	320	200	370	2060	1900	190
Meeting Skills				100	650	650	
Negotiating Skills	70	140	140	210	630	770	70

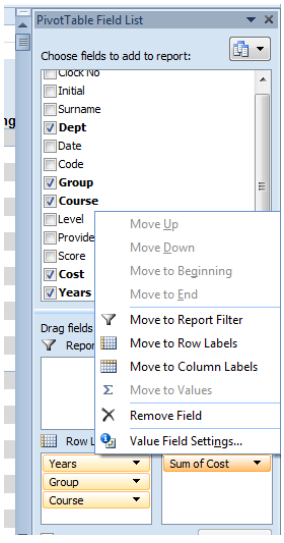
Removing Columns And Rows

1 To remove a row or column, drag it back onto the top half of the 'Field List'.

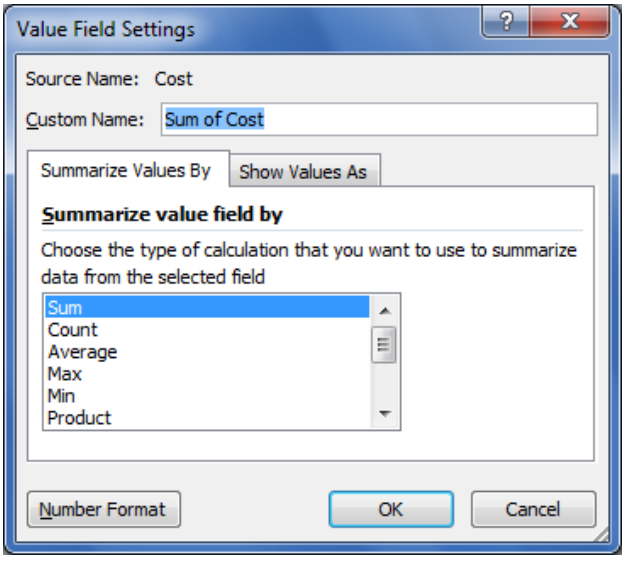
Changing The Summary Functions

Excel summarises data by summing numeric values (if the data fields contain text, the Pivot Table displays counts of the values). You can change the summary function or calculation type ;

1 Select a heading in the 'Values' area of the 'Field List'.



2 Click the drop down arrow & select 'Value Field Settings'.

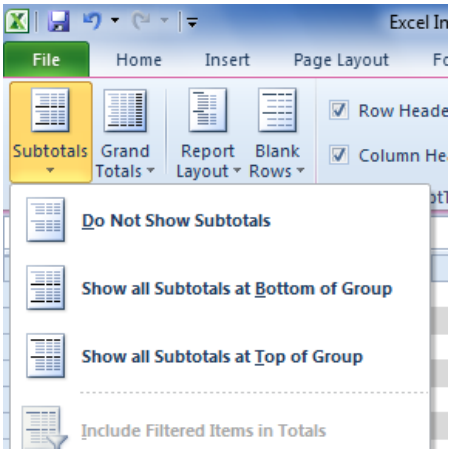


3 In the 'Summarise by' list, select the desired summary function.

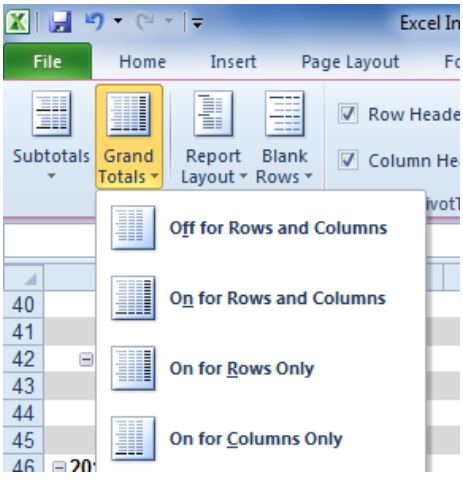
Hiding / Displaying Sub & Grand Totals

The 'Sub Totals' & 'Grand Totals' can be controlled from the 'Design' tab.

Sub – Totals



Grand Totals



RELATIVE & ABSOLUTE ADDRESSING

There are different sorts of cell references. These are:

- Relative
- Absolute
- Mixed

A relative reference will change column and row numbers as it is copied to other cells. Think of it as an original instruction being to go in a certain direction e.g. 2 rows up and 2 columns across from your current position. When this instruction is copied elsewhere, it will still refer to 2 rows up and 2 columns across from your new current position.

An absolute reference is one that does not change. If you refer to a cell in a certain row and column and then copy that reference elsewhere, it will still refer to exactly the same cell or range.

A mixed reference is one that is half relative and half absolute.

An absolute address is defined with the use of the "**$**" symbol. This can be typed in at the time of creating the formula, or by editing the cell afterwards.

Examples of relative and absolute addressing:

Relative	A4	A4:B5
Absolute	$A$4	$A$4:$B$5
Mixed	$A4 or A$4	$A4:B$5

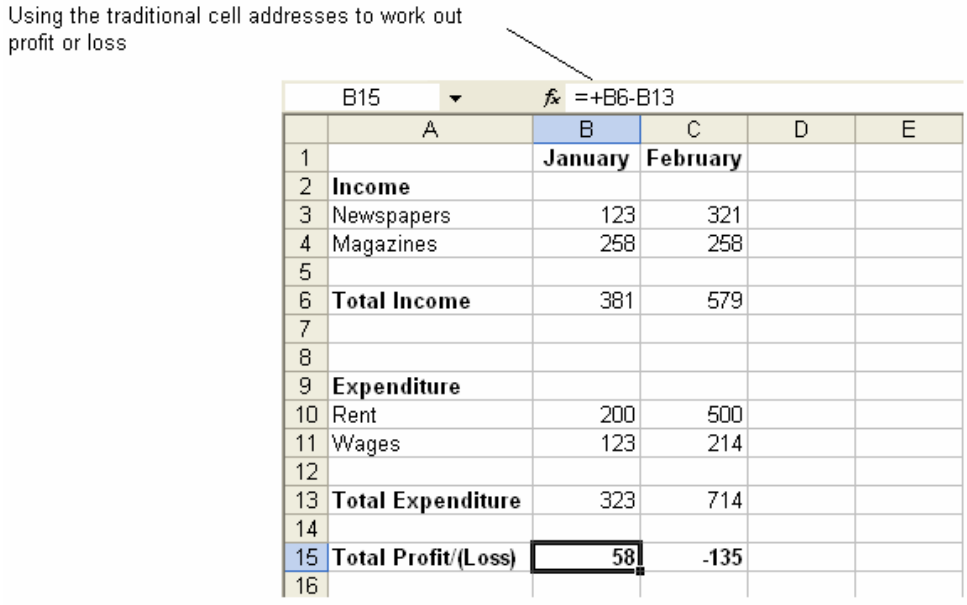
The "**$**" sign can be hand typed or inserted by pressing the keyboard shortcut **F4**. As you press **F4** the cell address will cycle between the four variations of an address – for example A4 would cycle between:

A4
$A4
A$4
$A$4

NAMING CELLS AND RANGES

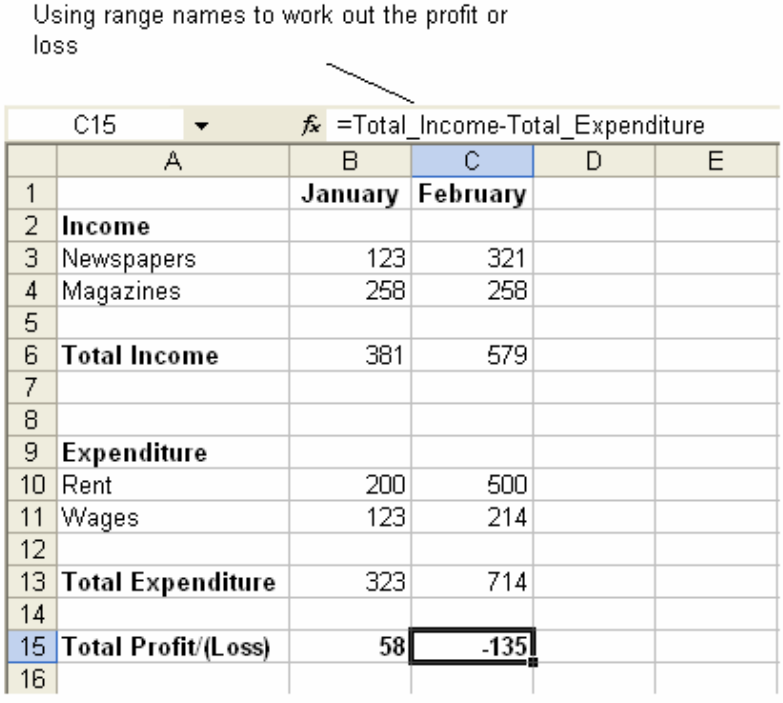
Cells and ranges can be given a name so that when you need to refer to that cell or range of cells, you can refer to its name rather than an address.

Example In the screenshot below, traditional cell addresses have been used for working out January's profit or loss.



	A	B	C	D	E
1		**January**	**February**		
2	**Income**				
3	Newspapers	123	321		
4	Magazines	258	258		
5					
6	**Total Income**	381	579		
7					
8					
9	**Expenditure**				
10	Rent	200	500		
11	Wages	123	214		
12					
13	**Total Expenditure**	323	714		
14					
15	**Total Profit/(Loss)**	**58**	**-135**		
16					

In the screenshot below, row 6 has been given the name **Total_Income** and Row 15 the name **Total_Expenditure**. When the formula for February was done, the syntax was **Total_Income – Total_Expenditure**. Using names may make it easier to understand what the formula is doing – it might make more sense to some, than saying **B6 – B13**.



	A	B	C	D	E
1		**January**	**February**		
2	**Income**				
3	Newspapers	123	321		
4	Magazines	258	258		
5					
6	**Total Income**	381	579		
7					
8					
9	**Expenditure**				
10	Rent	200	500		
11	Wages	123	214		
12					
13	**Total Expenditure**	323	714		
14					
15	**Total Profit/(Loss)**	**58**	**-135**		
16					

There are a couple of ways to create a range name. They both require that you select the cell or range or before creating the name.

Method 1: INSERT, NAME, DEFINE option (or CTRL + F3)

1. Go to the INSERT, NAME, DEFINE dialog box (or press the keyboard shortcut CTRL + F3). The DEFINE NAME dialog box will appear;

2. Give the cell or range you selected a name (quite often, as in the example screenshot below, the name suggested by Excel is more than adequate);

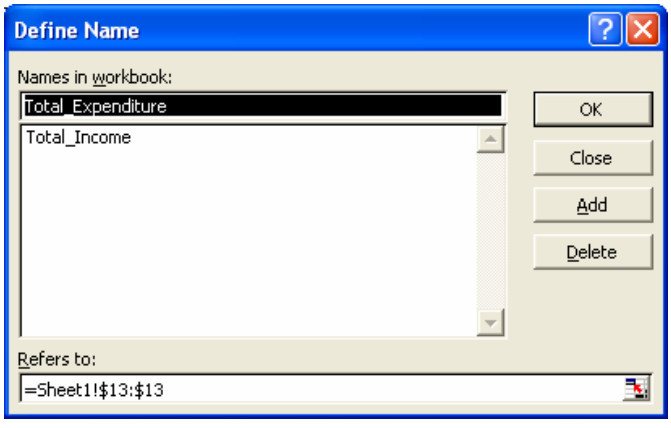
3. Click on ADD, then click on CLOSE.

NOTES:

- Range names must be one word – if you require 2 words, join them with an underscore as in the example below.

- The names can be a combination of numbers and letters, but must not start with a number.

- The default is to show the address as being ABSOLUTE. By clicking in the REFERS TO text box, this can be edited to what is required.



- As a default, names are workbook level i.e. the name you create is available throughout the whole workbook.

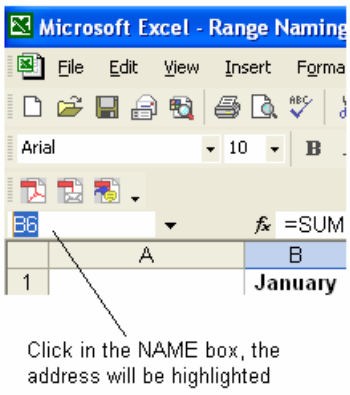
- If the worksheet has been named with a name that includes spaces, the worksheet name will have to be enclosed in single quotation marks.

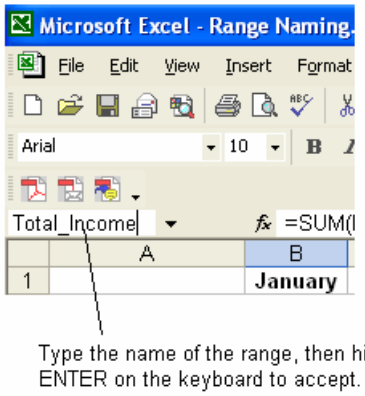
Method 2: Using the NAME box

1. Highlight the cell or range(s) that is going to be named;

2. Click in the NAME box (see the following screenshot). The contents of the name box will be highlighted;

3. Type the RANGE NAME you want and ENTER to accept the name.



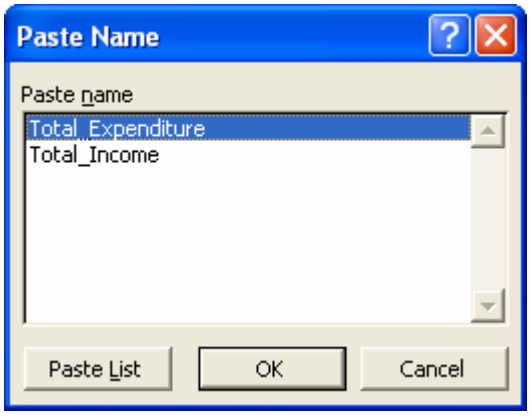


Applying a Range Name in a Formula

To use the RANGE NAME in a formula either:

1. Type the name – make sure you use the correct spelling or else the function will not recognise the name; or

2. When you are in the part of the formula that requires the RANGE NAME, press the keyboard shortcut **F3**. This brings up the PASTE NAME dialog box. Select the name and click on OK.



When working with many names, you can have a list of these names and the cells or ranges they refer to placed in your workbook by using the PASTE LIST option (located in the PASTE NAME dialog box - see screenshot above). Make sure you are in an empty cell and have 2 columns free and as many rows as there are names before using this option.

The first column will list the RANGE NAMES, the second column shows the range address that the range name refers to.

H	I
Total_Expenditure	=Sheet1!$13:$13
Total_Income	=Sheet1!$6:$6

USING NAMES FOR CONSTANTS OR FORMULAS

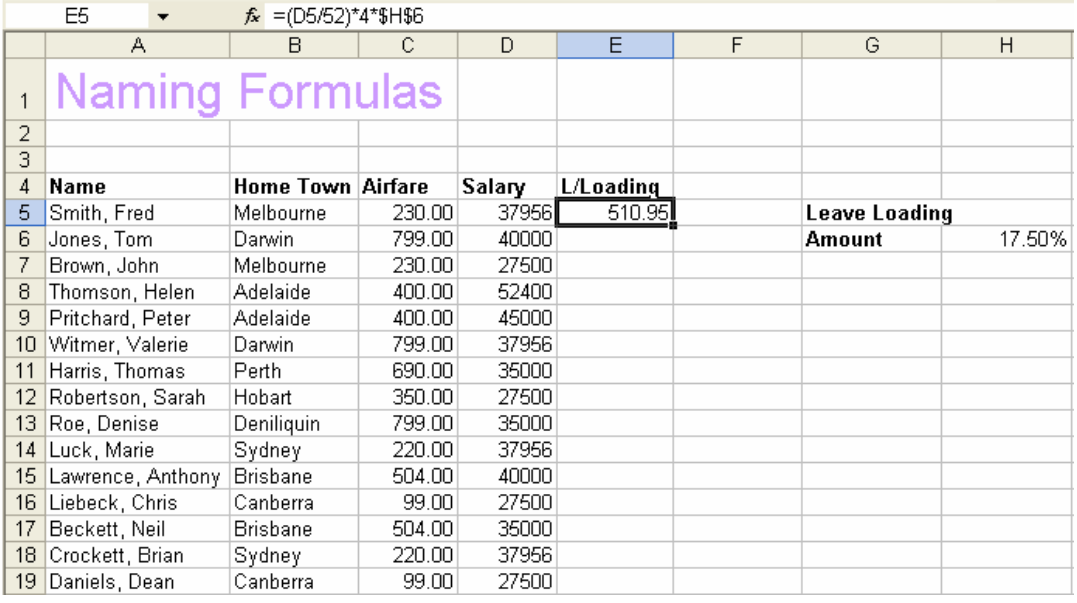
In addition to using Names to name cells or ranges, you can also name constants or formulas, these constants or formulas don't have to appear in a cell. This is a good way of storing a constant or a formula that may have to be used several times.

An example worksheet called NAMING FORMULAS has been created in the Advanced Excel Exercises workbook, should you wish to try out this feature.

Naming a constant

Imagine having to work out someone's holiday leave loading. You might have the leave loading in a cell (**H6** in the example below), so that you can use this value in a formula. By having the value in a separate cell, if the leave loading rate ever changes you would only have to change the value in **H6** and all formulas referring to this cell would update.

The formula in this case is **=(D5/52)*4*$H$6**, i.e. the salary divided by 52 weeks, multiplied by 4 weeks and then multiplied by 17.5%.



E5 =(D5/52)*4*$H$6

	A	B	C	D	E	F	G	H
1	Naming Formulas							
2								
3								
4	**Name**	**Home Town**	**Airfare**	**Salary**	**L/Loading**			
5	Smith, Fred	Melbourne	230.00	37956	510.95		**Leave Loading**	
6	Jones, Tom	Darwin	799.00	40000			**Amount**	17.50%
7	Brown, John	Melbourne	230.00	27500				
8	Thomson, Helen	Adelaide	400.00	52400				
9	Pritchard, Peter	Adelaide	400.00	45000				
10	Witmer, Valerie	Darwin	799.00	37956				
11	Harris, Thomas	Perth	690.00	35000				
12	Robertson, Sarah	Hobart	350.00	27500				
13	Roe, Denise	Deniliquin	799.00	35000				
14	Luck, Marie	Sydney	220.00	37956				
15	Lawrence, Anthony	Brisbane	504.00	40000				
16	Liebeck, Chris	Canberra	99.00	27500				
17	Beckett, Neil	Brisbane	504.00	35000				
18	Crockett, Brian	Sydney	220.00	37956				
19	Daniels, Dean	Canberra	99.00	27500				

By using a name in the formula rather than a cell address, you save space in the spreadsheet and make the formula more readable i.e. what is easier to read?

=(D5/52)*4*$H$6; or
=(D5/52)*4*loading

To give the leave loading of 17.5% (which is a constant) a name you:

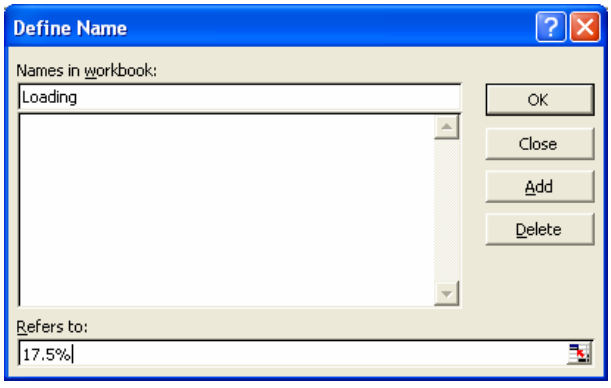
1. Open the DEFINE NAME dialog box (INSERT, NAME, DEFINE or CTRL + F3).

2. Give the constant a name i.e. **Loading**

3. In the REFERS TO: section enter the amount of the constant (without an "=" sign, Excel will add this in for you).

4. Click on ADD, then CLOSE to close the DEFINE NAME dialog box.

5. When creating the formula, use **F3** when it is time to refer to the loading, select the name **Loading** and ENTER to accept the setting (or click on OK), then continue creating the formula in the normal way. (As mentioned previously, you can type the name of the range but if spelled incorrectly, this formula will not work).



Naming a Formula

Take the above example one step further - instead of referring to the leave loading to do the last bit of multiplying, why not put the whole part of working out the leave loading into one name? i.e. Take the cell containing the salary and multiply it by loading. The formula would look like: **=Loading**

To name a formula you:

1. Open the DEFINE NAME dialog box (INSERT, NAME, DEFINE or CTRL + F3).

2. Give the formula a name i.e. **Loading**

3. In the REFERS TO: section

   - type an "**=**" sign to start off the formula
   - open a left bracket "**(**"
   - in the spreadsheet click on the cell containing the salary (i.e. **D5** in the example used previously)
   - NOTE: this cell address is ABSOLUTE (i.e. it says **$D$5**). Use the F4 key to make the reference relative i.e. **D5**. If you don't, when you copy the formula to all the other staff members, each formula will refer to Fred Smith's salary.
   - type **/52)*4*17.5%**
   - the formula should read **=('NAMING FORMULAS'!D5/52)*4*17.5**% (if you used the exercise provided). If you used a new sheet it will look something like **=(Sheet1!D5/52)*4*17.5%**

4. Click on ADD, then CLOSE to close the DEFINE NAME dialog box.

5. When creating the formula make sure you are in appropriate cell, then either:

   - use **F3** to select the name 'LOADING' and ENTER to accept the setting (or click on OK), ENTER again or click on the green ✓ to finish the formula; or

   - Type **=loading** then ENTER or click on the green ✓ to accept.

REFERENCING OTHER WORKSHEETS AND WORKBOOKS

Referencing Other Worksheets

The easiest and most accurate way to reference a cell or range in another worksheet is to use the point method (i.e. physically go to the worksheet and select the cell or range whilst you are creating your formula). Excel then refers to that worksheet in the correct syntax which is the sheet name, followed by an exclamation mark (!), followed by the cell or range, e.g. **Sheet1!A1:B4**.

- If the worksheet has been renamed, the name is used instead of the sheet and number, e.g. for a sheet that is named Budget it would be **Budget!A1:B4**.

- If the sheet name includes spaces, the sheet name must be enclosed within single quotation marks, e.g. a sheet that is named Budget 2004 would be '**Budget 2004**'**!A1:B4**.

The following steps show how to use the pointing method to make a reference to another worksheet in a formula. An exercise has been set up in the workbook - Referencing other workbooks and sheets.xls:

1. Click in **B7** on the sheet called "Budget". An amount from the "Recurring Expenses" sheet is to go here.

2. Type an equal sign (**=**). This tells Excel you are starting a function, at the same time it 'anchors' you to this cell so that you can go to other worksheets or workbooks and be able to point at cell references in those worksheets/workbooks.

3. Click on the **Recurring Expenses** sheet tab and click on **B7**, which is the total of recurring expenses.

4. Press ENTER on the keyboard to finish the function off or if you prefer, click on the green ✓ next to the formula bar.

The amount of the total recurring expenses is now placed in Cell B7 on the Budget sheet. Notice the formula in **B7** reads **='Recurring Expenses'!B7**

5. Click in **B8** on the sheet called "Budget". A small formula that works out 5% of salary (located on the **Recurring Expenses** worksheet) is to go here.

6. Type an equal sign (**=**) and then click on cell **B11** on the Recurring Expenses sheet.

7. Now type an asterisk (*****) to multiply the total income by 5%.

8. Type **.05** (i.e. 5/100) and press ENTER on the keyboard to click on the green ✓ to finish the function (typing 5% will also work)

Your function should read **='Recurring Expenses'!B11*0.05** or
='Recurring Expenses'!B11*5%

Keep this workbook open for the "Referencing Other Workbooks" example.

Referencing Other Workbooks

The easiest way to reference another workbook is to have that workbook open while you are making reference to it. If you do not have the workbook open you will have to type in the full name and path of the workbook when referring to it, which can be quite tedious. The syntax for referring to a worksheet is the name of the worksheet enclosed in square brackets, followed by the sheet name, an exclamation mark, then cell addresses or ranges. e.g. **[worksheet.xls]Sheet1!Cell reference**

If the workbook name includes spaces, the workbook AND sheet name must be enclosed within single quotation marks, e.g. to refer to a cell in a workbook called "Yearly Expenses.xls" you would type: **'[Yearly Expenses.xls]Sheet1'!A1**

If the workbook you are referencing is closed at the time of building the function, you must include the full path name of the workbook. e.g.

'd:\excel files\[Yearly Expenses.xls]Sheet1'!A1

By having the worksheet that you are working on, and the worksheet you are going to refer to open at the same time, you can use the point method to reference the worksheet. The following instructions place a reference in "Referencing other workbooks and sheets.xls" from the workbook "Yearly Expenses.xls". These should be open at the same time: *(Hint – use the WINDOW, ARRANGE command to place the worksheets side by side).*

1. In cell **B14** of "Referencing other workbooks and files", type an equal sign (=) to start off a formula (which also anchors you to this cell while you go to another workbook).

2. Either using the taskbar or the WINDOWS menu, go to the workbook called "Yearly Expenses". Click in cell **B4**. (if you have arranged the worksheets side by side, this is where you can simply click in B4 of the Yearly Expenses workbook)

3. To finish referring to this cell, press the ENTER key on the keyboard or use the green ✓.

   Notice the syntax of the formula is: **='[Yearly expenses.xls]Sheet1'!$B$4**

   Excel makes the cell or range reference ABSOLUTE when you point and click on another workbook. If you need to copy this to other cells you will need to change the reference so it is RELATIVE (no $ signs) – see Page **Error! Bookmark not defined.** for a quick way to change the reference between RELATIVE and ABSOLUTE.

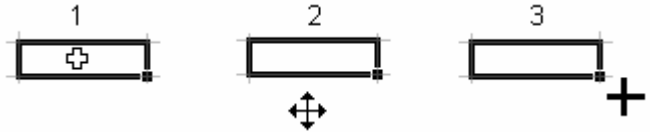
4. Repeat for cells **B15**, **B16** and **B17** *(Hint: use the fill handle – see Page 14)*

5. If you have both workbooks open, have a look at the syntax of this formula in the formula bar of the "Referencing other workbooks and sheets" window. Now close 'Yearly Expenses.xls', click in cell B14 in 'Referencing other workbooks and sheets' and have another look at the formula bar. The syntax has automatically changed to include the full pathname of the closed file, which as you can see is very long and would be awkward to type accurately.

='S:\Common\Special Projects\Training\Client Services\Advanced Excel Exercises\[Yearly expenses.xls]Sheet1'!B4

FILL HANDLE AND FILL SERIES COMMAND

There are three ways to click and drag on a cell – each having a different effect.



1. When you have the mouse inside a cell, the cursor will be shaped like the Swiss Cross. If you click and drag when this symbol is showing you will select a range of cells.

2. When you point to any border of a cell the cursor changes to a 4-sided arrow (in Excel XP) or an arrow (versions prior to XP). Clicking and dragging with this symbol will drag and drop the contents of the cell (to copy instead of move, hold down the CTRL key as you drag the contents of the cell).

3. In the right-hand bottom corner of every cell there is a small square. If you hold the mouse above this, the cursor changes into a thick plus sign. In this mode, if you click and drag, you are using the FILL HANDLE to fill cells you drag over.

If the fill handle is not showing, go to TOOLS, OPTIONS, EDIT and ensure the ALLOW CELL DRAG AND DROP option is enabled.

The fill handle is a copying tool for copying formulas, and values, however it is also used to fill in a variety of series such as sequential numbers, dates and mixed text.

Examples:

This Entry	**Can be extended to**
1,2,3	4,5,6,7 etc
January	February, March, April etc
Jan	Feb, Mar, Apr etc
Monday	Tuesday, Wednesday, Thursday etc
Mon	Tue, Wed, Thu etc
Qtr 1	Qtr2, Qtr3, Qtr4
1 June	2 June, 3 June, 4 June etc
01/04/04	02/04/04, 03/04/04, 04/04/04 etc.
1st Period,	2nd Period, 3rd Period etc.
9:00 AM	10:00 AM, 11:00 AM etc.

Using the Fill Handle

The following screenshot shows some typical uses of the fill handle. Open a blank worksheet and try the following fill handle techniques:

	A	B	C	D	E	F	G	H
1	1	1	Monday	MON	Monday	1/04/2004	5	January
2	1	2	Tuesday	TUE	Monday	1/05/2004	10	February
3	1	3	Wednesda	WED	Monday	1/06/2004	15	March
4	1	4	Thursday	THU	Monday	1/07/2004	20	April
5	1	5	Friday	FRI	Monday	1/08/2004	25	May
6	1	6	Saturday	SAT	Monday	1/09/2004	30	June
7	1	7	Sunday	SUN	Monday	1/10/2004	35	July
8	1	8	Monday	MON	Monday	1/11/2004	40	August
9	1	9	Tuesday	TUE	Monday	1/12/2004	45	September
10	1	10	Wednesda	WED	Monday	1/01/2005	50	October
11	1	11	Thursday	THU	Monday	1/02/2005	55	November
12	1	12	Friday	FRI	Monday	1/03/2005	60	December
13								

A. Type a #1 in A1. Drag down to A12. You should end up with all number ones. This is because Excel has no idea you want to have a series, i.e. 1,2,3 etc.

B. Type a #1 in B1. Hold down the CTRL key and drag down to B12. You now have a series. The CTRL key makes Excel do the opposite of its natural function when using the fill handle.

C. Monday will drag down the days of the week

D. The fill handle is case sensitive and will recognise abbreviations.

E. Here the CTRL key was held down while dragging Monday, hence Excel did its opposite function.

F. Type in a date. Drag down with the RIGHT mouse button. When you release the mouse, you can select different options from the shortcut menu. FILL MONTHS was selected in this example.

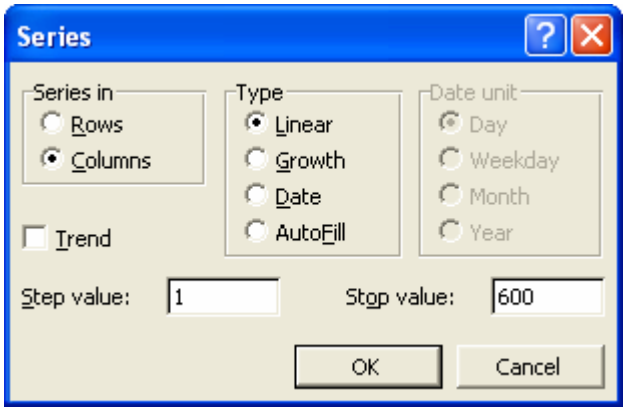
G. To get a series such as this you need to give Excel a bit of a hand. In G1 type #5, in G2 type #10. Now select both these cells and drag down with the fill handle. Excel now recognises the sequence.

H. Finally, a trick which is handy especially if it is a very long list you have to drag. Type the first entry and then DOUBLE CLICK on the fill handle. The series will fill as far down as the column next to it, so this will not work if there isn't any data in the column next door.

Using the Fill Series Command

If you have a specialised or very long list, it may be more efficient to use the EDIT, FILL, SERIES option.

Examples If you had to have a column numbered 1 to 600, it would be quicker to use the EDIT, FILL, SERIES command. Another example is if you had to have a monthly date entered for 25 years (for a mortgage repayment schedule??)



The screenshot above shows the example of having a column numbered from 1 to 600.

1. Type a #**1** in a blank cell.

2. Click on EDIT, FILL, SERIES

3. Select either ROWS or COLUMNS (specifies where data will be filled – column is the more common).

4. Excel recognises #1 as being a number and therefore has automatically selected LINEAR.

5. Make sure Step Value = 1, and Stop value = 600

6. Click on OK to finalise.

NOTES:

Linear – will create a linear series based on the value you have entered on the worksheet. If the TREND option is cleared, Linear uses the value in the STEP VALUE text box. This value is the amount you want adding each time to the value you have on the worksheet – 1 would make it 1,2,3,4 etc. 2 would make it 1,3,5,7 etc). STOP VALUE is the value you want to stop at.

If TREND is enabled, the STEP VALUE AND STOP VALUE are greyed out. In this scenario you would enter an example of the trend desired in 2 or more cells on the worksheet, then select all the cells which you want filling before going to the EDIT, FILL, SERIES command. For example, if you put #5 in cell A1, and #10 in cell A2, then select A1:A12, the result would be 5,10,15,20,25,30,35,40…..60.

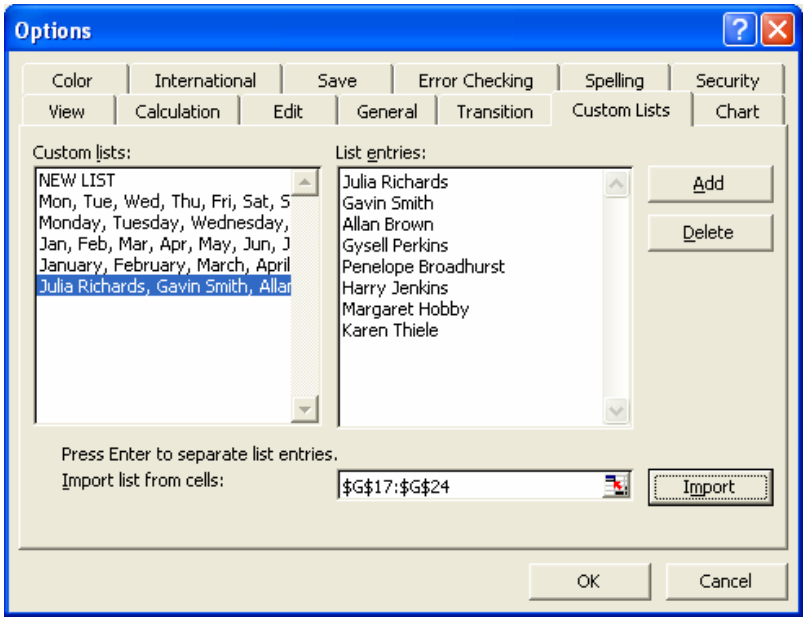
Growth – will create a series whereby the number is multiplied by the number in the STEP VALUE. If you have #1 in cell A1, then go into EDIT, FILL, SERIES and select COLUMN, GROWTH, STEP VALUE = 2 and STOP VALUE = 20 the result would be 1,2,4,8,16.

Customising a Fill Series

Any list of items that you use constantly can be made into a customised list. For example – a roster of staff members.

1. If you have a list typed, select the list.

2. Click on TOOLS, OPTIONS, CUSTOM LISTS



3. Click on the IMPORT button. The list you selected will appear in the LIST ENTRIES window.

4. If you did not select a list before you entered this option, click in the LIST ENTRIES window and type in the list, using a new line for each entry. When you have finished adding items, click on the ADD button.

5. Click on OK to finish.

Deleting a Custom List

1. Click on TOOLS, OPTIONS, CUSTOM LISTS

2. In the CUSTOM LISTS window select the list to be deleted

3. Click on the DELETE button

4. Click on OK to accept the warning that the list will be deleted and then OK again to close the CUSTOM LISTS window.

CONDITIONAL FORMATTING

Conditional formatting is extremely useful for things like changing the colour of cells or text in order to flag an event. Formatting occurs when a cell reaches the condition that is set in the Conditional Formatting option.

Example 1 If you are doing a roster, having cells that reach a certain date turn red.

Example 2 A spreadsheet that has student exam results – having those that Pass turn yellow in order to see who should receive a Distinction. You may also want to highlight the "Fail" marks in red so as to flag them for follow up. The instructions for doing this example are below.

Creating a Conditional Format

Steps 1-8 show how to make cells in Column D in the screenshot below change colour if a student has passed (using 19 marks or over as the benchmark), (the formula will have to refer to the data in Column C to work this out). Steps 9-10 show how to make the score in Column C change colour if a student has 10 marks or less (to show that they have failed).

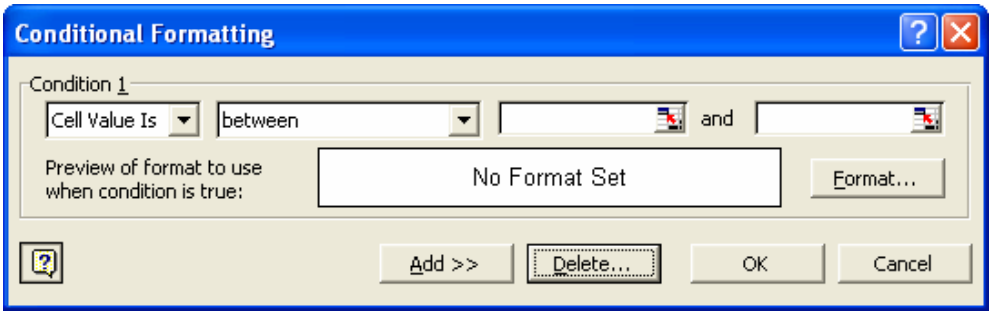
A working example of the following has been set up on the CONDITIONAL FORMATTING worksheet which is in the Advanced Excel Exercises workbook.

D6 =IF(C6<=7,"Fail","Pass")

	A	B	C	D	E	F	G
1	Conditional Formatting						
2	Make those cells containing students with a score of over 19 turn yellow						
3							
4							
5	**Surname**	**Christian**	**Score**	**Pass/Fail**			
6	Richards	Julia	15	Pass			
7	Smith	Gavin	7	Fail			
8	Brown	Allan	4	Fail			
9	Perkins	Gysell	19	Pass			
10	Broadhurst	Penelope	16	Pass			
11	Jenkins	Harry	13	Pass			
12	Hobby	Margaret	20	Pass			
13	Thiele	Karen	11	Pass			
14							

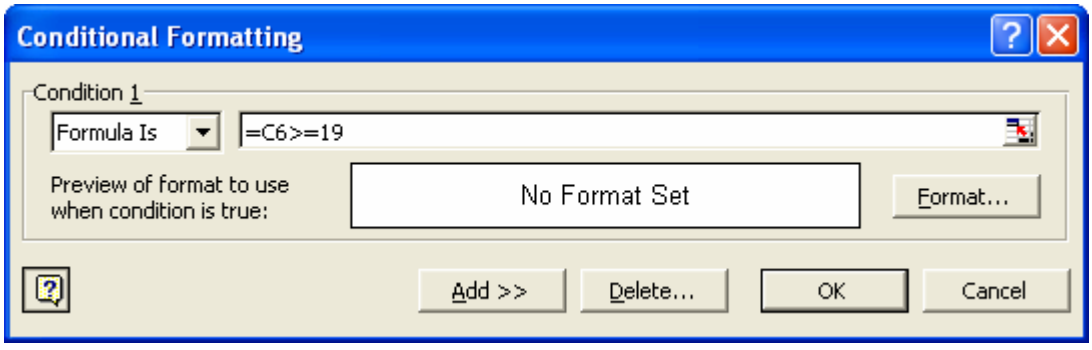
1. Click in the first cell that will have conditional formatting attached (**D6**)

2. Click on FORMAT, CONDITIONAL FORMATTING. The CONDITIONAL FORMATTING dialog box will appear.



3. Change the first dialogue box to FORMULA IS. This allows you to enter the instructions to refer to another location other than the one you are currently in.

4. The formula is the condition i.e. to find out if the figure to the left is greater than or equal to (**>=**) the pass mark of 19 . If you use the pointer to enter the cell address, make sure you change it to relative (as a default Excel will make it Absolute).



5. Click on the FORMAT button

6. In the FORMAT CELLS dialogue box that appears, make all the required changes. In the example being used here you would choose the PATTERNS tab, and then choose a yellow fill colour for the cell.

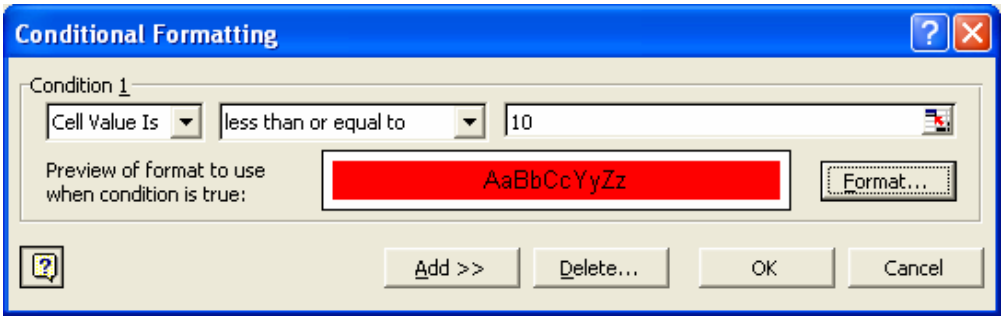
7. Click on OK (twice) to finalise the formatting.

8. To copy the formatting to the rest of the cells in the column either:

   - use the FORMAT PAINTER ;
   - use the fill handle (use this **only** if the cell contains a formula) to copy to the other cells – beware - if you use the fill handle on cells containing values, you will change the values; or
   - use the normal COPY command and then use the EDIT, PASTE SPECIAL, FORMATS option to apply to the other cells

9. To apply conditional formatting to an active cell (in our example, changing the cell to red if the student has 10 or less marks) - place the cursor in Cell C6. Click on FORMAT, CONDITIONAL FORMATTING

10. Select CELL VALUE IS (this will make Excel look at the value of the cell you are currently placed in). Make the changes the same as the screenshot below (the fill colour is red). Click on OK to finish, then copy the formatting to the rest of the column as previously described.



NOTES: Should you require more than one condition, click on the ADD button. If you want to get rid of a condition, select the DELETE button and then specify which condition is to be erased.

Find Cells That Have Conditional Formats

- To find all cells that have conditional formatting, click any cell in the worksheet then follow the steps 1-3 below.

- To find cells that have conditional formatting settings identical to the settings of a specific cell, click the specific cell, then do steps 1-4 below.

1. On the EDIT menu, click GO TO.

2. Click on the SPECIAL button.

3. Select the CONDITIONAL FORMATS option.

4. To find cells with identical conditional formats, click SAME below DATA VALIDATION (the default is ALL).

SORTING AND FILTERING

Excel's sorting and filtering functions range from very simple sorts to being able to filter out unwanted data in large lists of information. Lists typed into an Excel worksheet are often used as a data source for creating merge documents in Word, or for exporting to other databases such as Microsoft Access.

If you are creating a list that is intended for using with a merge document, the information you type is organized into fields (columns) and records (rows). The fields (the headings of each column known as the header row), must be one word i.e. "*Firstname*" or "*First_Name*" is more correct than "*First Name*".

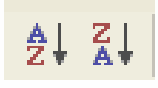
A list, unlike normal worksheet data, must not have entire blank rows or columns. However if information from a record is missing, a cell can be left blank.

Once a list is created, it becomes easy to sort and filter the information. It can also be used to create pivot tables (not covered here).

The Excel worksheet, Sorting and Filtering, has been set up to make practicing the following sorting and filtering methods more convenient.

Simple Sorts

Select any cell in the column that needs sorting, then use the SORT ASCENDING or SORT DESCENDING icons on the formatting toolbar.

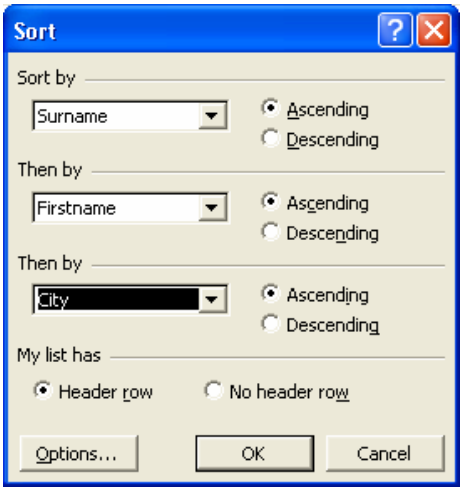


Do not highlight the column to be sorted. If you do, only that column will sort, the rest of the data will remain static.

Sorting on more than one criteria (DATA, SORT)

The DATA, SORT option is used if you wish to sort on more than one criteria. For example, you may wish to have a sort done on surname, then if there is more than one surname the same, sort on the first name, then the city the person comes from. You can have up to three selections using the DATA, SORT option.

1. Select any cell within the list – this will help Excel to select the correct range of cells to be sorted.
2. Click on DATA, SORT. The SORT dialog box will open.
3. If your list has a header row, make sure this option is selected. Doing this makes the field names appear in the field names drop down text boxes.
4. Select which field names are to be sorted, specifying each time whether the sort is to be in ascending or descending order.
5. Click on OK



Filtering Data

Filtered lists allow you to view only the specified data. This data can then be copied, printed etc.

Example 1: From your list you require a list of all males living in NSW

1. Click on DATA, FILTER, AUTOFILTER

2. Drop down arrows appear next to each heading in the list.

   a) Click on the drop down arrow next to “GENDER” and select “Male”

   b) Click on the drop down arrow next to “STATE” and select “NSW”

- Notice that the drop down arrow on both of these fields have turned blue. This is to show that these particular fields have had filters applied.

- To return each of the columns information back to normal, click on the drop down arrow and select “ALL”

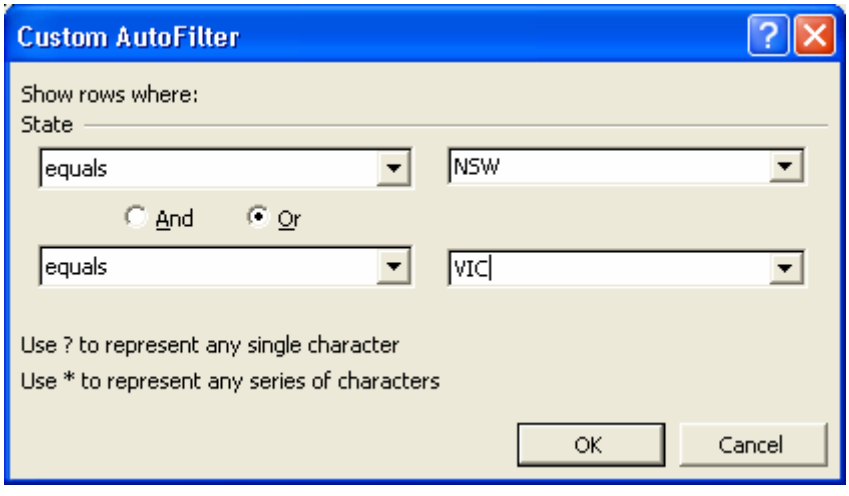
- If you have many columns to restore, it is quicker to click on DATA, FILTER, SHOW ALL

Example 2: You need a report listing everybody who lives in VIC or NSW, and was born before 1 January 1985.

1. Click on DATA, FILTER, AUTOFILTER

2. Select the drop down arrow next to “STATE” and select CUSTOM

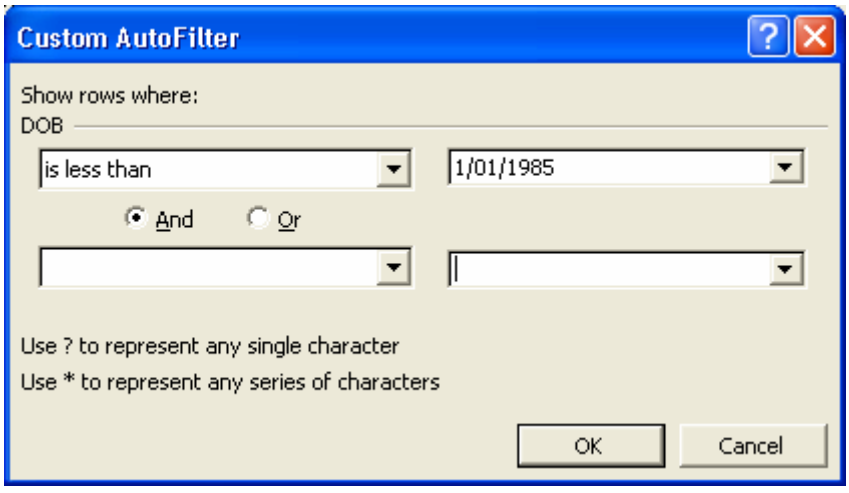
3. Fill in the CUSTOM AUTOFILTER dialog box the same as the following screenshot (make sure you select the OR option, this makes sure you are left with everyone who lives in NSW **or** VIC)



4. Click on OK

5. Select the drop down arrow next to “DOB” and select CUSTOM

6. Fill in the CUSTOM AUTOFILTER dialog box as shown in the following screenshot



Turning AUTOFILTER off

When you have finished filtering your data, click on DATA, FILTER, AUTOFILTER (there should be a tick next to AUTOFILTER, clicking on this 'unticks' the option).

MACROS

Introduction

Macros in Excel are not macros in the normal sense. Excel comes with its own programming language, Visual Basic for Applications. This means that very powerful macros can be created by almost anyone with the time and patience to construct them.

A macro is a recording of actions to automate tasks that are tedious or you do frequently. Some examples:

- A macro to open a document you use every day;
- A macro to add the months of the year across a row, centring and bolding the names of the month;
- A macro to select a group of cells;
- A macro to find out which cells have Conditional Formatting;
- A macro to set up a worksheet in a certain way and then print the worksheet.

Excel provides some useful tools to help beginners to use macros and to start achieving results straight away without having to learn much about Visual Basic for Applications.

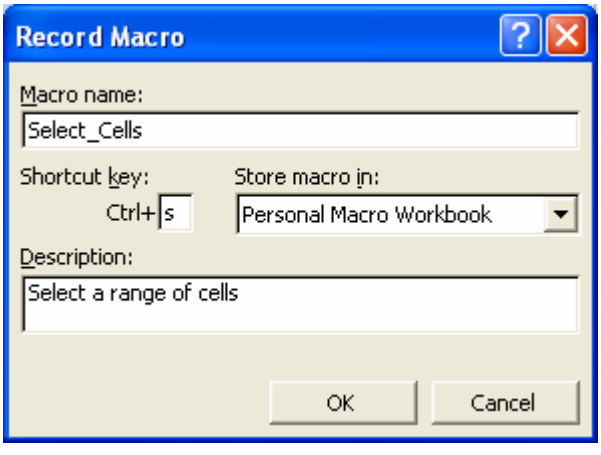
The following notes show how to:

- record a simple macro
- toggle between absolute and relative references when recording
- place a macro (assign a macro) on a toolbar icon
- assign a macro to a button on a worksheet so it is only available to that worksheet
- delete macros

Recording a macro

These are instructions for recording a simple macro – selecting a range of cells you need to enter data into on a regular basis.

1. Select TOOLS, MACRO, RECORD NEW MACRO. The RECORD MACRO dialog box will appear.



2. In the MACRO NAME text box, type a name for your macro. Macro names cannot include spaces – an underscore is a good way to separate words. Do not use a cell address in the name as this will cause an error. Also, you may not use names of commands that already exist, e.g. Close. We have used **Select_Cells** for our example.

3. You may wish to give the macro a keyboard shortcut (which is typed in the SHORTCUT KEY text box). You can have a lower case or upper case letter. If you use a shortcut that is already assigned to another function (i.e. CTRL + B has already been assigned to BOLD), you will overwrite that shortcut whilst the workbook that is storing the macro is open.

4. Decide where to store the macro This information gets entered in the STORE MACRO IN text box:

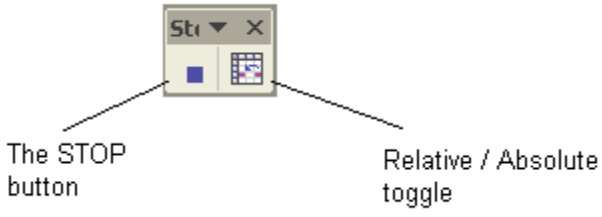
   - Personal Macro Workbook – a workbook that is usually hidden from view, a macro stored here will be available every time you use Excel, no matter which workbook or worksheet.

   - This Workbook – the current workbook. Useful if the macro you are going to record is only to be available when you are using this workbook.

   - New Workbook – Will open a new workbook where you can store the macro. You might do this because you want to have a similar macro workbook like the Personal Macro workbook – although unlike the Personal Macro workbook, this one will not open automatically. If you want to use the macros stored in this new workbook, you would have to physically open it first.

5. If desired, fill in a brief description in the DESCRIPTION text box – this is for your information only.

6. Click on OK to start the recording process. You will be placed back in the main worksheet. A STOP RECORDING toolbar should appear (if not, click on VIEW, TOOLBARS, STOP RECORDING). This toolbar has two icons. An icon to stop the recording and one to toggle between recording relative or absolute addresses (explained later).



The Macro Recorder is active at this stage. The Macro Recorder records all keystrokes and commands that you use, so now is the time to be careful as any mistakes you may make will also be recorded.

7. Enter data as normal. For our example, select a range of cells e.g. **F1:G12**.

8. Click on the STOP button to stop recording or alternatively, click on TOOLS, MACRO, STOP RECORDING.

Running a Macro

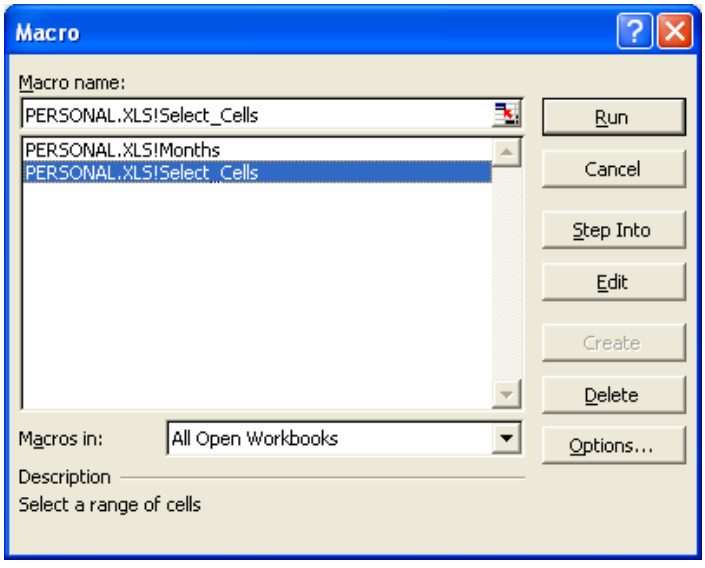
The computer terminology for playing a macro is “Run”. To run a macro you can use any one of the methods following:

1. Click on TOOLS, MACRO, MACROS (or use the keyboard shortcut ALT + F8), select your macro from the list. Click on RUN;

2. Use the shortcut key if you created one (our example is CTRL + s);

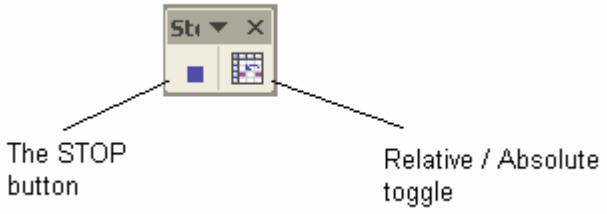
4. Use an icon on the toolbar if one has been created for the macro (covered on Page 28); or

5. Use a button on the worksheet if one has been created (covered on Page 27).



Absolute vs Relative

If you followed the example above, run the macro a couple of times from different locations. For example, place your cursor in **A1** and run the macro – it will select cells **F1:G12.** Place your cursor in **H12** and run the macro. It will still select the cells **F1:G12**. This is because the macro you created recorded ABSOLUTE cell references – the default way of recording. If you want to select a range of cells relative to where your cursor is at the time of recording, ensure you click on the Relative / Absolute icon on the Macro toolbar before commencing to record.

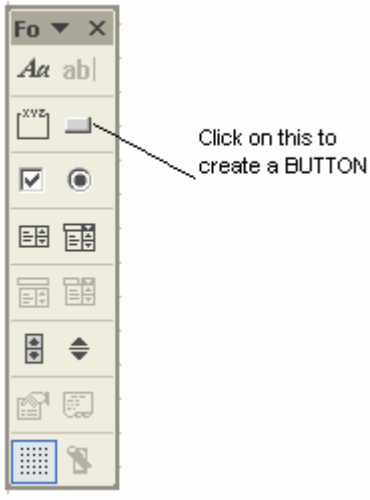


Assigning buttons to macros

Macros can be assigned to buttons or any AutoShape on the worksheet. These buttons will only show on the worksheet that you assign it to and therefore the macro will only be available to the worksheet the button is on. To assign a button:

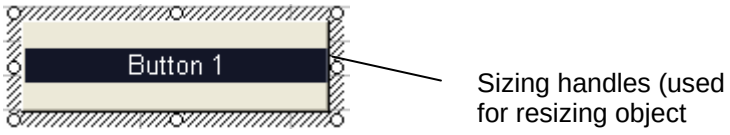
1. Make sure the FORMS toolbar is showing (right mouse click over a toolbar that is already showing and select FORMS from the list, or VIEW, TOOLBARS, FORMS)

2. Select the BUTTON shape from the toolbar. Once you have clicked on the shape, go into the worksheet and click and drag the mouse until the desired size of the button is achieved (this can be edited later if necessary).



3. The ASSIGN MACRO window will immediately appear. Select the macro being assigned to the button from the list. Click on OK.

4. You will be returned to the Excel worksheet where you will see your button with sizing handles around it. You can change the text inside the button by dragging over the text and retyping.



   a) To resize, hold mouse over a sizing handle and drag in or out

   b) To retype label drag over text, then type. If the button is not selected, select it by:

      - Holding down CTRL key and clicking on the button; or
      - Click on the button with Right Mouse button and select EDIT TEXT.

      NOTE: Do not use left mouse button to select the button as this runs the macro.

   c) To move the button, click and drag on the frame surrounding the button, avoid dragging on the sizing handles.

5. Once you click away from the button you have created, it becomes active and will run the macro assigned to it when clicked on.

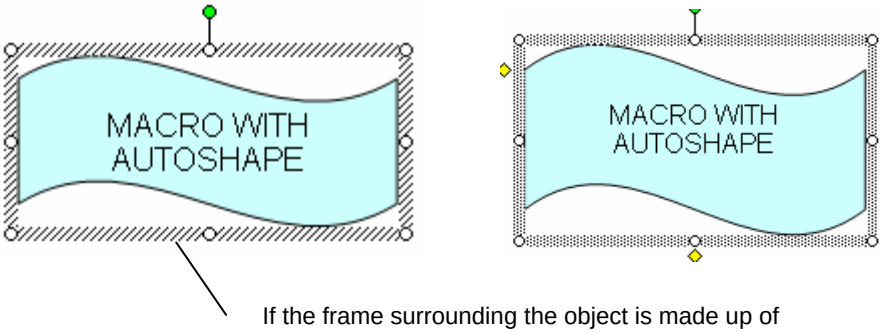
Assigning the macro to an AutoShape

1. Draw an AutoShape on your worksheet.

2. Format the AutoShape in any way you like e.g. borders and patterns.

3. Add descriptive text to the AutoShape (right Mouse click on the AutoShape and select ADD TEXT)

4. Right mouse click on the AutoShape and select ASSIGN MACRO (if Assign Macro is not available try clicking on the frame surrounding the AutoShape again, it should be made up of tiny dots, not diagonal lines.



If the frame surrounding the object is made up of diagonal lines, click on the frame again so that is made up of tiny dots. "Assign Macro" will then be active in the shortcut menu

5. The ASSIGN MACRO window will immediately appear. Select the macro being assigned to the AutoShape from the list. Click on OK.

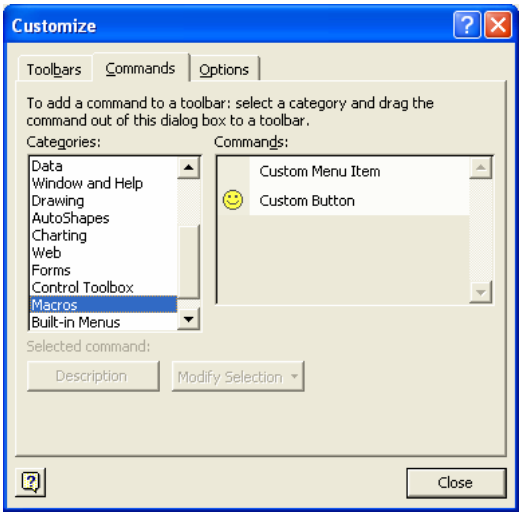
6. When you deselect the AutoShape, it becomes active and will run the macro assigned to is when clicked on.

Assigning a macro to an icon on a Toolbar

Macros can be assigned to icons on an existing toolbar or on a new toolbar. This macro will be available whenever you open a worksheet showing that toolbar.

1. Use either the VIEW, TOOLBARS, CUSTOMIZE command or click on any toolbar with the right mouse button and select the CUSTOMIZE option. The CUSTOMIZE dialog box will appear.

2. Choose the COMMANDS index card and select MACROS from the CATEGORIES listing text box.



3. Click on the CUSTOM BUTTON (the smiley face) in the COMMANDS window and drag and drop this icon on to the desired toolbar, in the desired location.

4. Click with the Right mouse button on the icon you have just put on the toolbar and select the ASSIGN MACRO option from the shortcut menu. Select your macro from the list.

5. Optional - to change the button image, make sure the CUSTOMIZE dialog box is still on the screen, then use the Right Mouse button over the icon you want to change, choose CHANGE BUTTON IMAGE from the menu. Choose a new icon.

6. Close the CUSTOMIZE dialogue box.

Viewing The Macro

1. Once you have recorded your macro you may view it by Selecting TOOLS, MACRO, MACROS. The Macro Dialogue box will appear.

2. Select your macro from the list and then click on the EDIT button

This displays the module containing the text of the macro in Visual Basic. Once you have gained experience, simple editing changes can be made inside the Visual Basic Editor.

Deleting a Macro

1. Open the TOOLS, MACRO, MACROS dialog box.

2. Select the macro to be deleted, then click on the DELETE button.

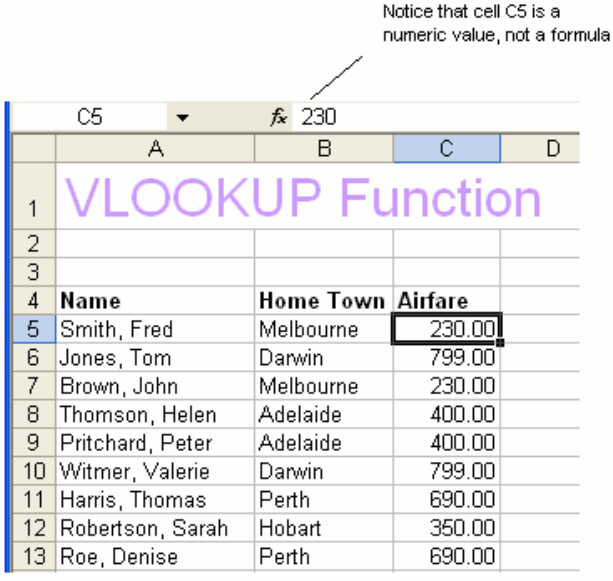
LOOKUP TABLES
(Using VLOOKUP as example)

The functions VLOOKUP and HLOOKUP enter information into a spreadsheet from a table made up of possible values. The result can be a value or text.

The advantages of using VLOOKUP and HLOOKUP are:

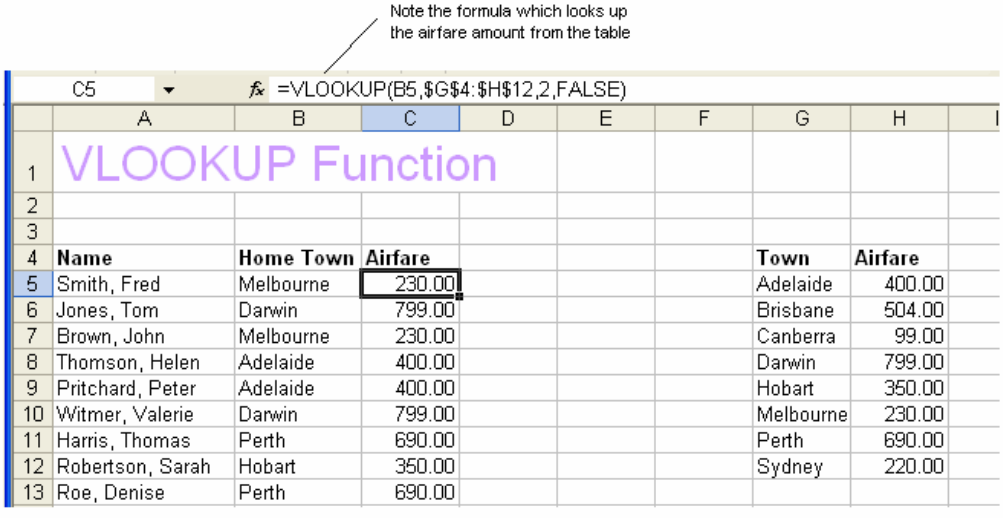
- They avoid the need for repetitious data;
- Cuts down on the possibility of entering data incorrectly; and
- Allows automatic updating of entries by changing the values in the lookup table.

Example: Imagine having to work out staff allowances for 100 staff, each entitled to a return airfare to their home town each year. If you enter a value next to each staff member for the price of the airfare, and the airfares change (as they do), you would have to change each value every time the airfares changes. By using VLOOKUP, only the airfares in the lookup table are updated.



	A	B	C	D
1	VLOOKUP Function			
2				
3				
4	**Name**	**Home Town**	**Airfare**	
5	Smith, Fred	Melbourne	230.00	
6	Jones, Tom	Darwin	799.00	
7	Brown, John	Melbourne	230.00	
8	Thomson, Helen	Adelaide	400.00	
9	Pritchard, Peter	Adelaide	400.00	
10	Witmer, Valerie	Darwin	799.00	
11	Harris, Thomas	Perth	690.00	
12	Robertson, Sarah	Hobart	350.00	
13	Roe, Denise	Perth	690.00	

Figure 1 - Airfares entered manually



	A	B	C	D	E	F	G	H
1	VLOOKUP Function							
2								
3								
4	**Name**	**Home Town**	**Airfare**				**Town**	**Airfare**
5	Smith, Fred	Melbourne	230.00				Adelaide	400.00
6	Jones, Tom	Darwin	799.00				Brisbane	504.00
7	Brown, John	Melbourne	230.00				Canberra	99.00
8	Thomson, Helen	Adelaide	400.00				Darwin	799.00
9	Pritchard, Peter	Adelaide	400.00				Hobart	350.00
10	Witmer, Valerie	Darwin	799.00				Melbourne	230.00
11	Harris, Thomas	Perth	690.00				Perth	690.00
12	Robertson, Sarah	Hobart	350.00				Sydney	220.00
13	Roe, Denise	Perth	690.00					

Figure 2 - Airfares using a VLOOKUP formula – if the airfares change then only the amounts in column H will be changed – the amounts in column C will update automatically.

VLOOKUP function (see Figure 2), looks up a value from the LEFT most column of a table. This function is used when your data is arranged in columns.

HLOOKUP function looks up a value from the top row of a table. HLOOKUP is used when your table is arranged in rows.

Syntax: **VLOOKUP(lookup_value,table_array,col_index_num**,range_lookup)
HLOOKUP(lookup_value,table_array,row_index_num,range_lookup)

The bold part of the formula above is required, the last bit is optional.

lookup_value — refers to a cell in the main part of your worksheet whose information also appears in the first column (or row if using HLOOKUP) of your table. Using Figure 2 as an example, the lookup value for the first staff member is cell **B5** (Melbourne). This information is also found in the first column of the Lookup table (the table you are going to refer to, to get the amount of the airfare).

The lookup value can be text, a value or a cell reference.

table_array — refers to the reference table from which you are going to get information. When referring to this table you should refer to an ABSOLUTE range (in Figure 2 the table's range is **$G$5:$H$12**). You can also refer to a Range Name. If you give the table a range name, by default the cells will be absolute. Having an absolute range ensures that the formula always refers to the same set of cells making up the table when copying.

The first column (or first row) of the table can be text, numbers or logical values. It doesn't matter if it is uppercase or lowercase. The first column (or row) should be in either numerical or alphabetical order, it can be sorted using the DATA, SORT menu

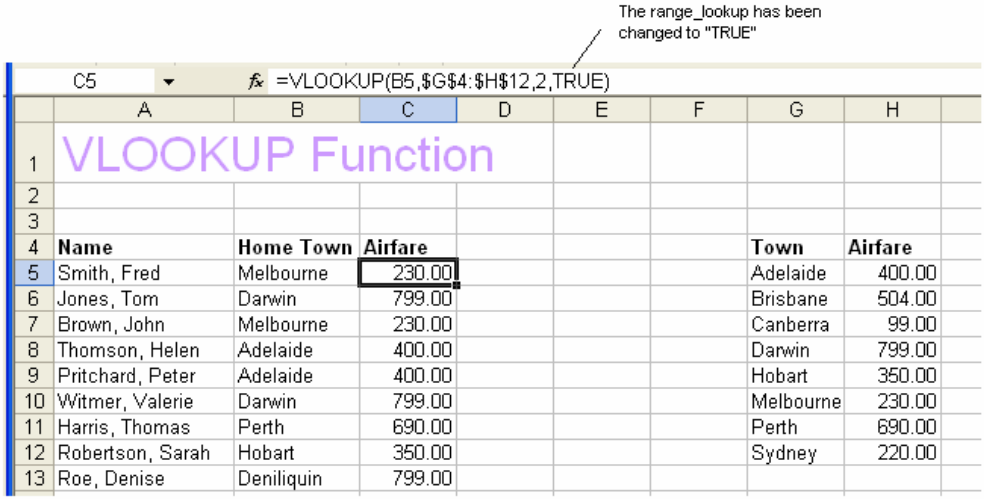
col_index_num — The third part of the function is asking which column of the reference table do you want your answer to come from. In Figure 2 the table is a 2-column table and we want the answer to be the amount of the airfare, therefore in this case the col_index_num would be **2**.

- If the col_index_num is less than 1, you will get a #VALUE error.
- If col_index_num is more than the number of columns in the table, you will get a #REF! error.

range_lookup — The 4th part of the formula is optional depending on the answer you want. If you require an exact match, use FALSE. If you want an approximate match, leave this option out or use TRUE (they are the same).

For example (refer to Figure 3), Denise Roe's home town has been changed from Perth to Deniliquin. The fourth part of the LOOKUP function has been made to say TRUE and will therefore look up an approximate match. Deniliquin is not in the table of airfares therefore the formula returns the nearest match which is less than or equal to what is being looked up (Deniliquin). Darwin is the nearest match,

slightly lower in the alphabetical scale. This formula would be unsuitable in this case because hopefully the airfare to Deniliquin would be nowhere near the amount of $799.00. FALSE should have been used in the fourth part of this function.



	Name	Home Town	Airfare		Town	Airfare
5	Smith, Fred	Melbourne	230.00		Adelaide	400.00
6	Jones, Tom	Darwin	799.00		Brisbane	504.00
7	Brown, John	Melbourne	230.00		Canberra	99.00
8	Thomson, Helen	Adelaide	400.00		Darwin	799.00
9	Pritchard, Peter	Adelaide	400.00		Hobart	350.00
10	Witmer, Valerie	Darwin	799.00		Melbourne	230.00
11	Harris, Thomas	Perth	690.00		Perth	690.00
12	Robertson, Sarah	Hobart	350.00		Sydney	220.00
13	Roe, Denise	Deniliquin	799.00			

Figure 3 - Finding an Approximate Match

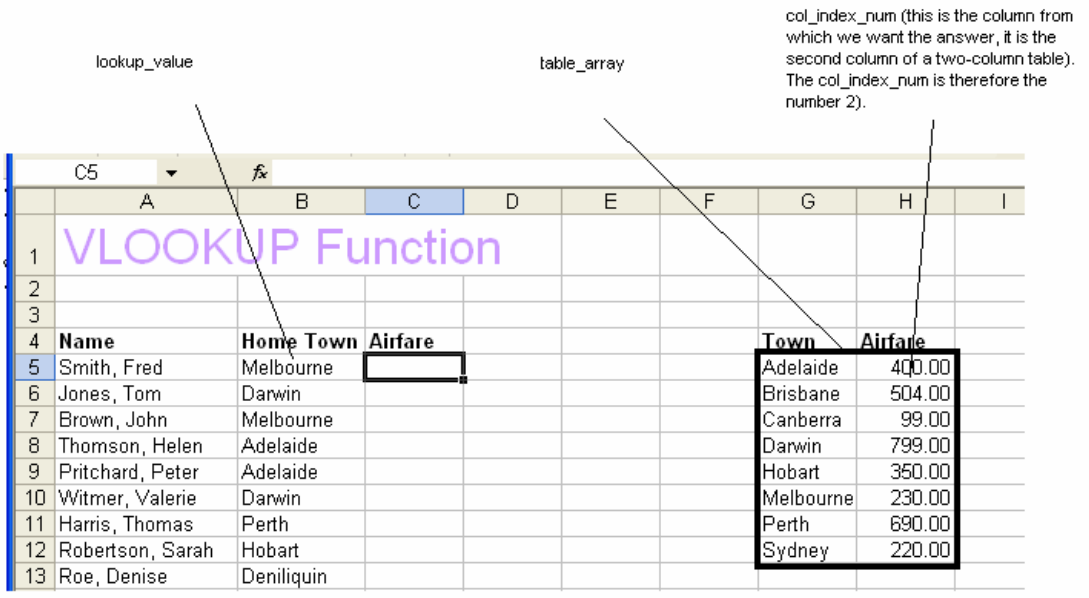
NOTES:

- When TRUE is used, or the range_lookup is omitted, the VLOOKUP and HLOOKUP will return the largest match which is less than or equal to the lookup_value.
- If using FALSE and exact match is not found, a #N/A error is returned.
- If lookup_value is smaller than the smallest value in the first column/row of the table, you will get a #N/A error.

- When referring to the table range, the range should be made to be ABSOLUTE. i.e. highlight the table (do not include headings), press **F4** until the range has "**$**" signs in front of column and row references e.g. **$G$5:$H$12**. (**F4** is the shortcut key to toggle between different sorts of addresses – relative, absolute and a combination of the two. A way to remember this shortcut key is that the normal number 4 has the $ sign above it).
- Consider giving the table a range name. Using the airfare example, a good name would be "Airfares". As a default range names are made absolute. See pages 7 to 9 on how to name ranges.
- The table can be put on the same worksheet as your data however you should take into account security issues. If you don't want just anyone changing the core data of the table you might wish to put the table on a different worksheet or even in a totally different file. See Pages 12 to 13 for instructions on how to reference other worksheets or files.

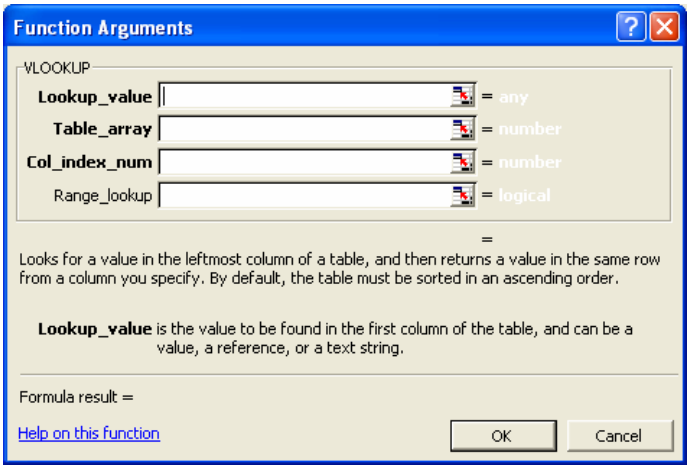
Creating the VLOOKUP Function

To practice the VLOOKUP formula, open the read-only file Advanced Excel Exercises and go to the VLOOKUPS worksheet. Use the FILE, SAVE AS command to save this file in a different name in your P:\DATA folder.



1. Place your cursor in the cell where the first result will be (**C5** using the example above).

2. Use the instructions on Pages 2 to 5 to get the VLOOKUP FUNCTION ARGUMENTS dialog box showing on your Excel worksheet.



3. The Lookup_value is asking you to refer to a cell in the main part of your worksheet, that has the data that also appears in the first column of the reference table. Using our airfare example, B5 has this information. B5 has the text "Melbourne". Melbourne also appears in the first column of our reference table. If you can see B5 on your spreadsheet, click on it. This cell address will then appear in the first reference. (Use the COLLAPSE DIALOG icon if you can't see the spreadsheet behind the FUNCTION ARGUMENTS dialog box, or move the dialog box by dragging on the title bar).

4. Table_array is asking for the details about the table. Highlight the entire table, do not include any headings. When the range address appears in the reference area, use the **F4** key to make the range ABSOLUTE (each column and row reference has a "$" sign in front of it); or

   If you have previously given the table a RANGE NAME, use **F3** to bring up the PASTE dialog box, select the table name from the list. (See pages 7 to 9 for more about Range Names.) If the table is on another sheet or file, see pages 12 to 13 for Referencing other Sheets or Files.

5. Col_index_num is asking for the number of the column in the table the result is to come from. In our example, the table has only 2 columns and the prices of airfares are in the second column, therefore type the number 2 in the third reference area.

6. Range_lookup is optional (notice the text is not bold like the compulsory arguments). If you want an exact match, type FALSE in here. If you want an approximate match, leave it blank or type TRUE. In our example you would need an exact match.

   If you are doing the VLOOKUPS exercise, try leaving this option blank and then look at Row 10 and Row 17 of the example. Denise Roe's airfare would read $799.00 – the amount someone flying to Darwin would receive. Joe Bloggs' airfare would read $400.00. Deniliquin and Alice Springs are not mentioned in the airfares table so it used the nearest matches – Adelaide and Darwin. Fill the option in with "FALSE". You will now have a "**#N/A**" error. This will serve to draw your attention to the fact that Alice Springs and Deniliquin both need to be added into the table information.

7. Click on OK to finish the function. If filling several cells with this formula, use the FILL HANDLE to drag down to the other cells. (see Page 14 to read more about the FILL HANDLE)

   Note: In the example used, NEW STAFF entries should have #N/A errors. As soon as a new staff member and city is added, the prebuilt formula will immediately show the amount of airfare (if the city is mentioned in the table).

If you are putting formulas in a worksheet where no data has yet been entered (such as the NEW STAFF in our example) #N/A errors will occur. This type of error can be 'hidden' by using the ISNA or ISERROR function. See page 48 for step by step instructions on using this function.

If you add new data to the table, your range address used in each formula will have to be changed to include the new cells of the table. If you used a range name this will be taken care of automatically if you ensure that the new data falls within the boundary of the range name – you can check by looking at the reference in the INSERT, NAME, DEFINE dialog box. As a hint, if you add a couple of rows in the middle of the table, add the new data then re-sort the first column of the table into alphabetical/numerical order, the new data will be confined within the boundaries of the range name.

IF FUNCTION

The IF function is located in the LOGICAL category of functions in Excel. Its job is to do a conditional test on criteria then return different answers depending on whether the results of the test are true or false.

The conditional test can be made on values, text or on formulas

Example1: A typical example is that of a lecturer giving a PASS to a student having a score of 10 or more in an exam, and a FAIL if they have a score less than 10. The logical test is to find out what their score is, then return a PASS or FAIL depending on the outcome of the test.

Example 2: Staff in a hardware store receive 5% commission if they achieve budget. The logical test is to find out whether they have achieved budget and then give them 5% commission if they have, no commission if they haven't.

Working examples of the above can be found in the Advanced Excel Exercises workbook, on the IF FUNCTIONS worksheet.

Syntax:

IF(logical_test,value_if_true,value_if_false)

logical_test is the test performed on a value or expression. The result of the test must be able to be evaluated to TRUE or FALSE. The logical test uses comparison calculation operators e.g:

=	equal to
>	greater than
<	less than
>=	greater than or equal to
<=	less than or equal to
<>	not equal to

Using the example screenshot below, Julia Richards has a score of 15 in her exam, the logical test would be to find out if C6 is greater than or equal to 10 (shown as **C6>=10)**. In this case, the answer would be TRUE, cell **C6** is greater than 10. Julia Richards will get a PASS.

	A	B	C	D	E
1	IF Function & Nested IF State				
2	Use the IF function to calculate the answers required.				
3					
4					
5	**Surname**	**Christian**	**Score**	**Pass/Fail**	**Grade**
6	Richards	Julia	15		
7	Smith	Gavin	7		
8	Brown	Allan	4		

In the second screenshot, the logical test would be to find out if the cells in column B are greater than the sales target found in cell **B21**. The logical test is to find out if **B25** is greater than or equal to the amount found in cell B21 (**B25>=$B$21**). It isn't greater so the answer

would be FALSE. (Note how **B21** has been made absolute so that when the formula is copied down, each line will refer to the amount in **B21**. The first staff member has not reached or equaled the sales target and therefore will not get the 5% commission.

19	**ABC Staff Sales Commission**			
20				
21	***Sales Target***	$ 1,500.00		
22				
23				
24	**Staff Member**	**Sales**	**Commission**	**Total**
25	Richards, J	900.00		900.00
26	Smith, G	1600.00		1600.00

value_if_true — is one of the values that can be returned from the logical test.

If you want the answer to be "True", then the text "TRUE" would be used (can be lower or upper case). Any text can be used, just make sure it is enclosed in double quotation marks ("text to be returned").

If you want the answer to be nothing, leave the argument blank or type "". (In Excel text expressions are enclosed within double quotation marks).

You can use another formula if the answer is true i.e. sum figures or multiply by an amount.

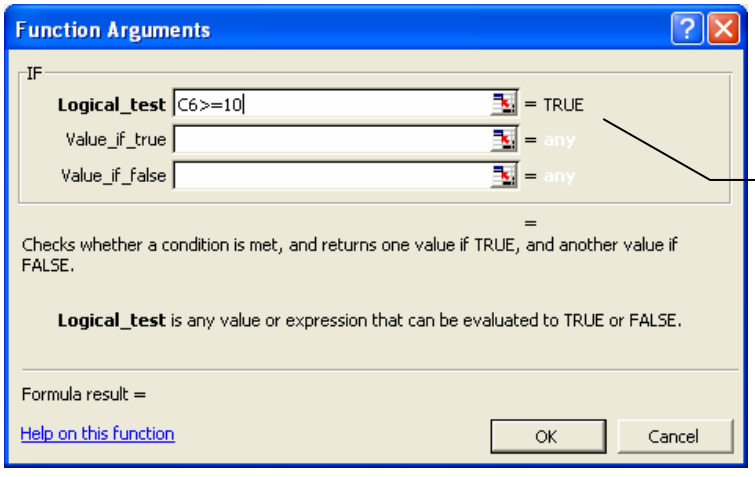
value_if_false — is the other value that can be returned from the logical test. The same arguments as for value_if_true are used except if you want "False" to be returned, type the text "FALSE".

Creating the IF Function – Example 1

Use the IF function to work out whether students have a Pass or Fail (P or F).

1. Place your cursor in the cell where the result will be (**D6** using the worksheet from the Advanced Excel Exercises).

2. Use the instructions on Pages 2 to 5 to get the IF FUNCTION ARGUMENTS dialog box showing on your Excel worksheet.

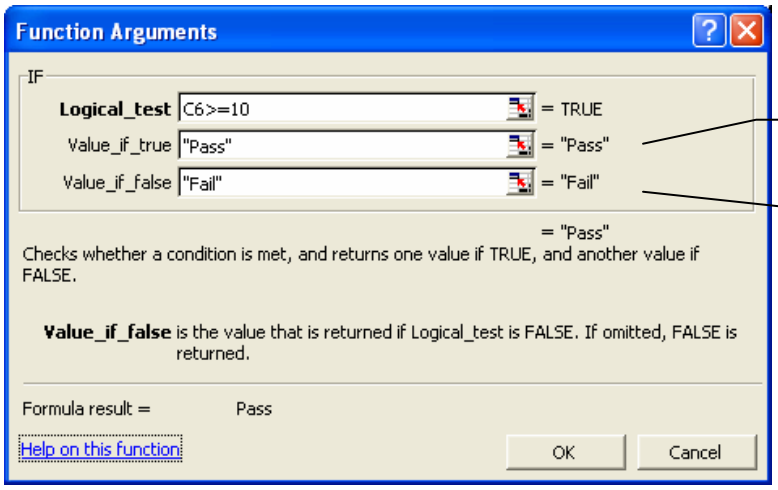


Message showing current result of your logical test

3. The Logical_test is where you put your argument – which must return an answer of true or false. In the above figure we refer to Julia Richards' exam result in **C6** and ask if it is greater than or equal to 10. Note the "TRUE" message.

4. Value_if_true – Type the word "Pass" (If using the Function Wizard the double quotation marks are automatically typed in for you). Note the result at the right-hand side of the dialog window. This is the result you will get if the argument is TRUE.

5. Value_if_false – Type the word "Fail". This is the result you will get if the argument is FALSE.



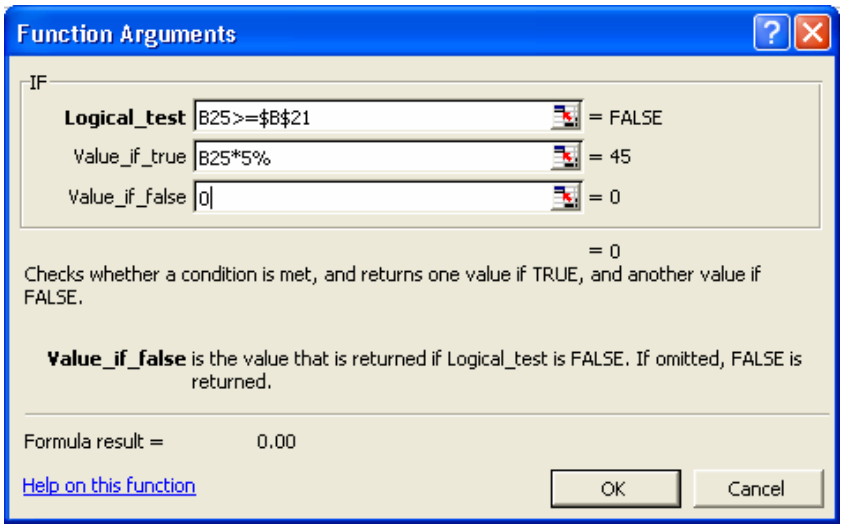
Results that will be used after the logical test has been completed.

6. Click on OK to finish the function. If filling several cells with this formula, use the FILL HANDLE to drag down to the other cells. (see Page 14 to read more about the FILL HANDLE)

NOTE: The arguments are not always text, it can be another formula or a value, or if a null (no result) is required, nothing (or "". i.e. nothing between the double quotation marks).

Creating the IF Function – Example 2

The second example – using sales commission, requires a formula to be used.



In this case the Logical_test is asking if the value in B25 (on the IF FUNCTIONS worksheet) is greater than or equal to B21 (the target the salespeople have to achieve in order to get any commission, note that this reference is Absolute).

The Value_if_true is saying if the target is achieved, multiply the amount by 5%.

The Value_if_false is saying if the target is not achieved, give 0 commission.

Manually Creating an IF Function

Once you are confident with IF functions you may decide to type the formula rather than use the FUNCTION ARGUMENT dialog box. Just remember:

- To use **=IF** as the function

- Inside the parenthesis (brackets) you have 3 arguments which MUST be separated by commas (,)

- If you require a result to be text, the text must be enclosed inside double quotation marks e.g. “Pass” or “Fail” or "" (the latter is to have no text appear)).

=IF(B25>=B21,B25*5%,0)

or

=IF(B25>=B21,B25*5%,"")

NESTED IF FUNCTION

Occasionally a single IF statement may not be enough to give you the results you are looking for. The traditional example of this is taking the student example a little further. In the figure below, (which is in the Advanced Excel Exercises workbook), Column D is the normal IF function done in the last exercise which finds out whether the student has passed or failed. Column E, however, is asking what grade the student is to receive based on the following table:

A	=	17-20
B	=	14-16
C	=	11-13
D	=	8-10
E	=	7 or below

1	IF Function & Nested IF State				
2	Use the IF function to calculate the answers required.				
3					
4					
5	**Surname**	**Christian**	**Score**	**Pass/Fail**	**Grade**
6	Richards	Julia	15	Pass	
7	Smith	Gavin	7	Fail	
8	Brown	Allan	4	Fail	
9	Perkins	Gysell	19	Pass	
10	Broadhurst	Penelope	16	Pass	
11	Jenkins	Harry	13	Pass	
12	Hobby	Margaret	9	Fail	
13	Thiele	Karen	11	Pass	

The normal IF Function will not give you the required result. You need more than one IF function to complete the job – you can do this with a NESTED IF FUNCTION i.e. more than one IF Function, one inside the other (you are allowed up to 7 nested functions).

Put in simple terms, our nested IF statement is going to be:

First IF statement:

Logical test – see if C6 is a value of 7 or below (C6<=7)
If true – Give an “E” grade
If false – see IF C6 is a value of 10 or below to work out whether this student should have a “D” grade – this will lead to the second IF statement

Second IF statement:

Logical test - see if C6 is a value of 10 or below (C6<=10)
If true - Give a “D” grade
If false - see IF C6 is a value of 13 or below to work out whether they should get a “C” grade – this leads to the third IF statement

Third IF statement:

Logical test - see if C6 is a value of 13 or below (C6<=13)
If true - Give a “C” grade
If false - see IF C6 is a value of 16 or below to work out whether they should get a “B” grade – this leads to the fourth (and last) IF statement

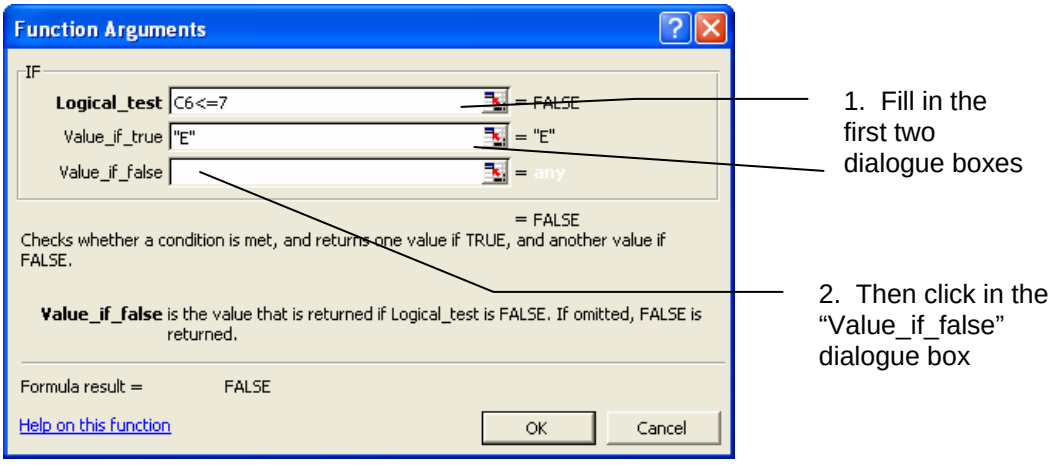
Fourth IF statement:

Logical test - see if C6 is a value of 16 or below (C6<=16)
If true - Give a “B” grade
If false - it must be true that C6 is between 17 and 20 as there are no other possible marks left. Therefore “A” should be entered here to indicate the top grade possible.

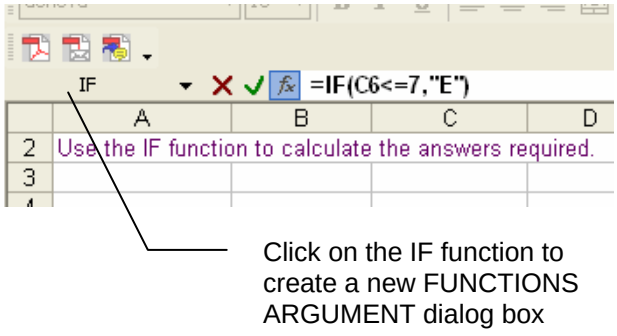
Each statement above has a logical test, then a value_if_true, then a value_if_false. The step by step instructions, using the FUNCTION ARGUMENT dialog box and the scenario about a student's grades as an example are:

1. Ensure your cursor is in Cell **E6**. Call up the IF FUNCTION ARGUMENT dialog box.

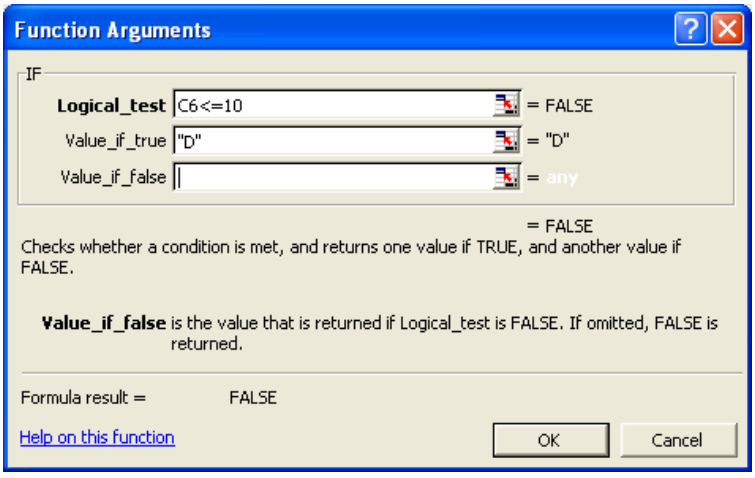
2. Put in the first logical test (point and click on Cell C6 then type **<=7**) and the Value_if_true result (the student would get an **"E"** if true).



3. Make sure your cursor is in the "Value_if_false dialog box. Now click on the IF function in the name box to bring up a brand new FUNCTION ARGUMENTS dialog box.

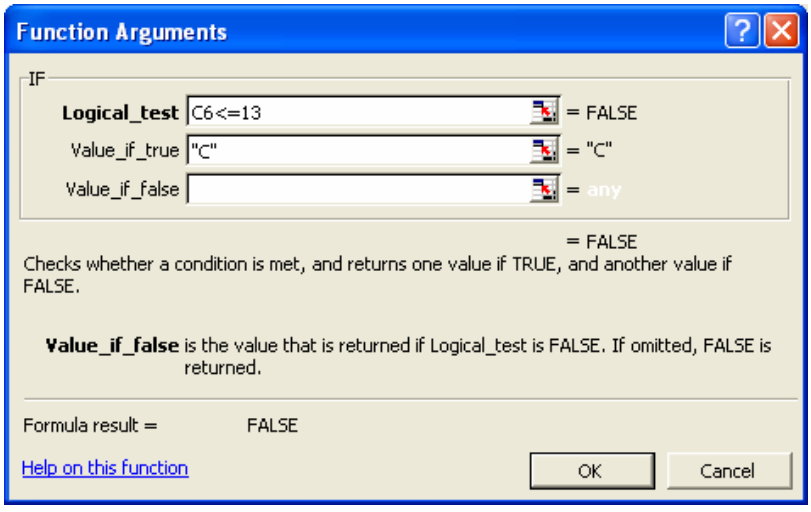


4. In the new FUNCTION ARGUMENTS dialog box, type in the next argument, and the Value_if_true result (see if the student has a mark of 10 or less, and if so give them a "D").

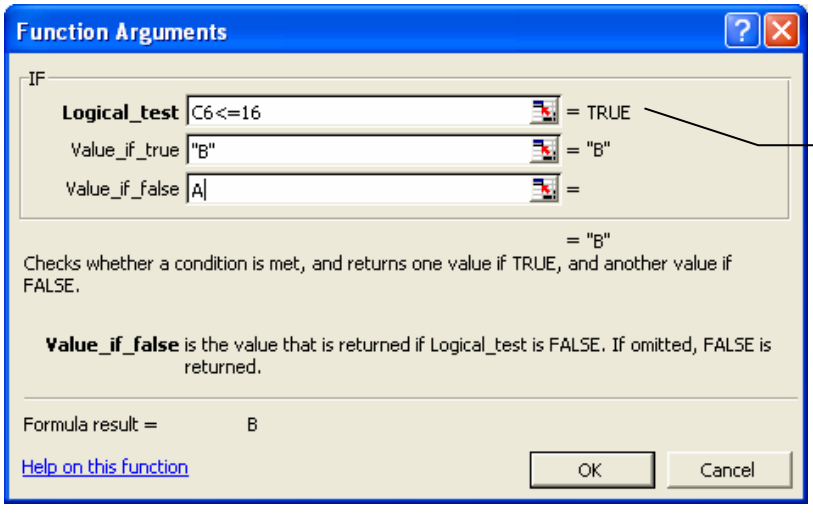


5. Repeat Step 3

6. Repeat Step 4 but this time the logical test is to see if the student has a mark of 13 or less. If it is TRUE, they will get a “C”



7. Repeat Step 3 to bring up a final FUNCTION ARGUMENTS dialog box. This is the only tricky part, knowing when to stop asking for more new arguments. Here the final logical test is entered (C6<=16). Notice that the result of this argument is TRUE. The Value_if_true is a mark of B. The value_if_false must therefore be someone who has more than 16 marks and gets an “A”.



8. Click on OK to finish the function. If filling several cells with this formula, use the FILL HANDLE to drag down to the other cells. (see Page 14 to read more about the FILL HANDLE)

If you were to manually type the above formula it would look like:

=IF(C6<=7,"E",IF(C6<=10,"D",IF(C6<=13,"C",IF(C6<=16,"B","A"))))

As you can see it looks a little complex, just remember that you must have the right amount of parenthesis in the right order, and commas separating the arguments. Usually this sort of formula is easier to create using the FUNCTION ARGUMENTS dialog boxes.

AND, OR AND NOT FUNCTIONS

The AND, OR and NOT functions, like the IF function, are found under the LOGICAL category of functions available in Excel.

Although they can be used in their own right, these functions are most often found being used to increase the logical comparisons you can make within an IF function.

The AND and OR Functions

Both of these functions can have up to 30 arguments. The difference between them is that:

- with an AND function, all arguments MUST be TRUE, to return a TRUE result. Only one comparison needs to be false to make the result FALSE.
- With an OR function, only one of the comparisons needs to be TRUE to return an answer of TRUE.

Example 1 (Using the AND function) - Using a Sales Commission example, an employee gets a 10% bonus commission when his sales meets a target ($1,500) AND he has worked for the company for 2 or more years (2 comparisons). If these comparisons are true he gets the 10% bonus, if he doesn't meet these conditions he gets a 5% bonus as long as he has sales of $500 or more (another IF function). If sales are less than $500, the commission is zero.

If we do an OR function using the same example, we would get a different result, What we would be saying is an employee gets a 10% bonus if he reaches the $1500 target OR he has worked for the company for 2 or more years. Therefore in this case he would get his 10% bonus commission if he only has sales of $1,000.

Syntax: =AND(logical1,logical2,…….logical30)
=OR(logical1,logical2,…….logical30)

logical# the comparisons you make, (each to be separated with a comma) up to 30 are allowed as long as does not exceed 1,024 characters in total.

A working example of the above can be found in the Advanced Excel Exercises workbook, on the AND, OR, NOT worksheet.

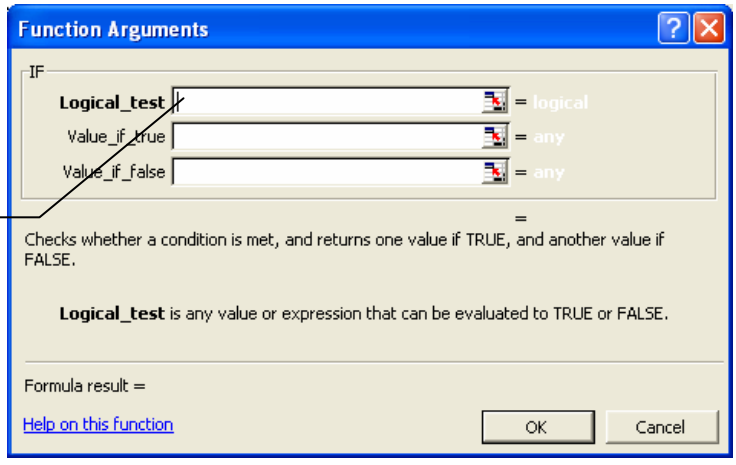
Creating the AND function within an IF statement

1. Ensure your cursor is in Cell D8. Bring up the IF FUNCTION ARGUMENT dialog box.

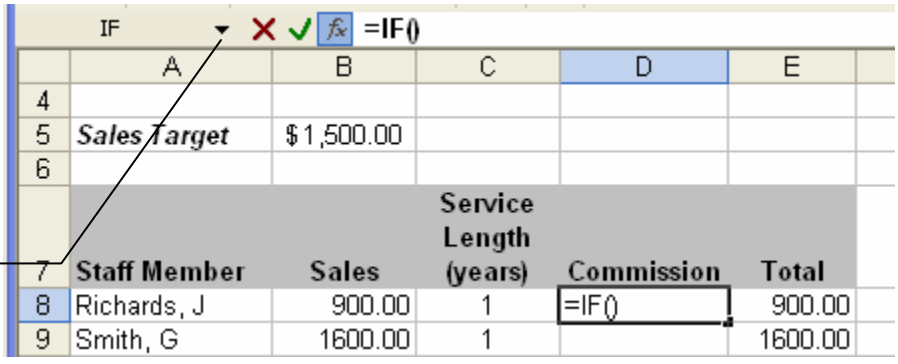
2. In a normal IF Function we would be using only one conditional test here. However we have two tests to make so we use the AND function. You have a choice of either manually typing the AND function in the Logical_test dialog box, or using the AND FUNCTION ARGUMENTS dialog box. If using the latter, make sure the

cursor is in the Logical_test dialog box then click on the drop down arrow on the Name Box (which should have the word “IF” on it), and select the AND function from the list (go into MORE FUNCTIONS if AND is not in the list).

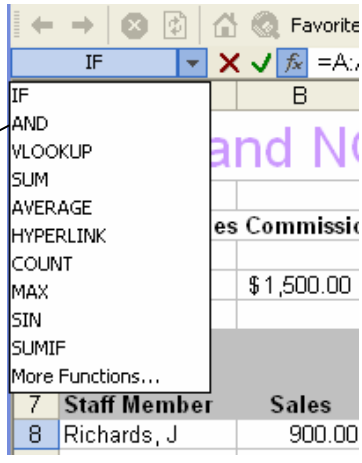
Step 1 - Make sure your cursor is in the Logical_test dialog box



Step 2 – Click on the drop down arrow here

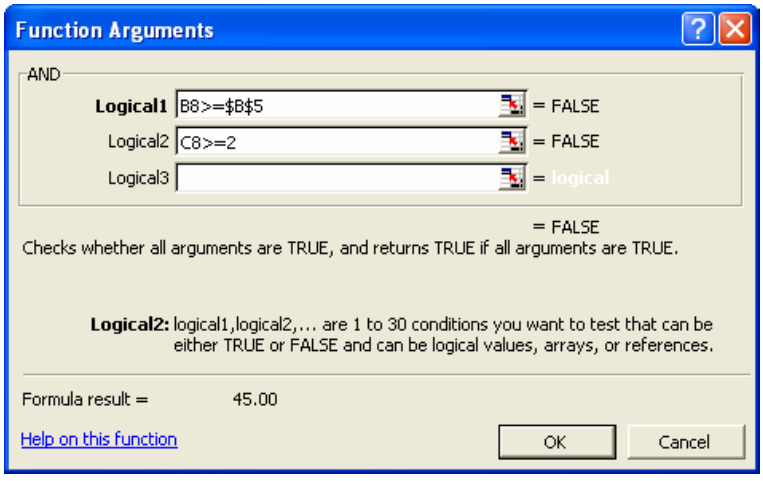


Step 3 – Select the AND function from the list or go into “More Functions” if AND is not in the list.

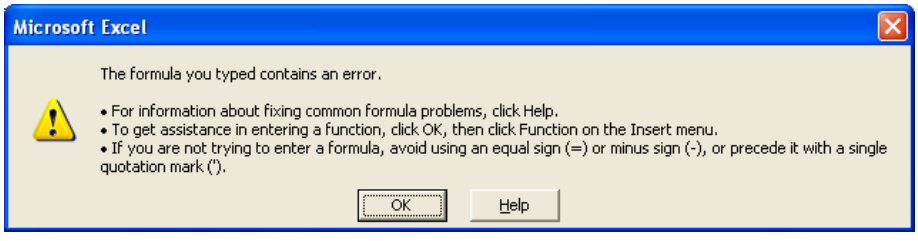


3. The AND FUNCTION ARGUMENTS window appears. Your cursor should be in the Logical1 dialog box. Click in **B8** (the first sales figure), type in “**>=**” and then click in **B5** (the sales target figure). After clicking in **B5**, press the **F4** key to make **B5** absolute. (If you don’t, when you copy the formula down to other rows, **B5** will change to **B6**, then **B7** and so on. This reference must always be talking about the figure in **B5**). Logical1 should now read **B8>=$B$5**

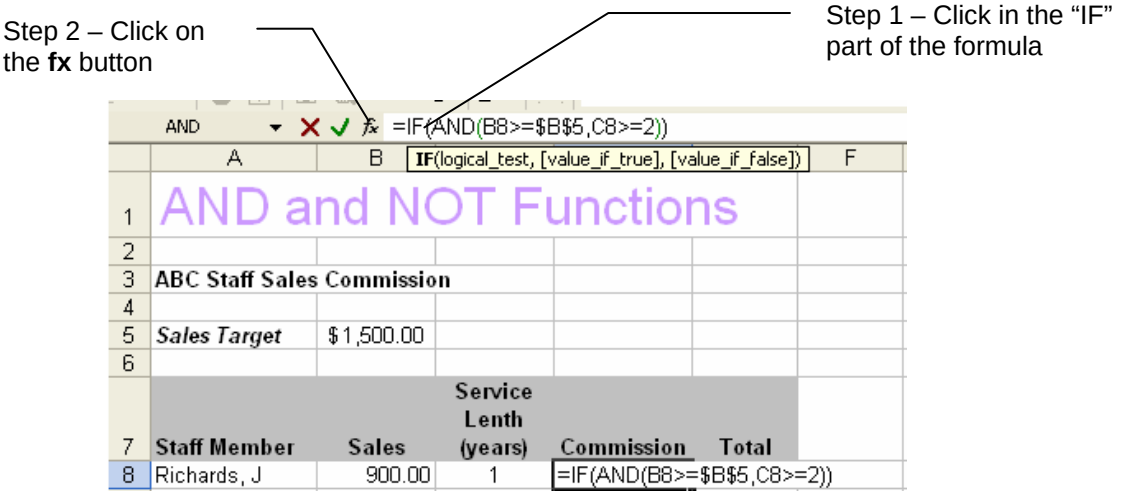
4. Click in the Logical2 dialog box (notice that Logical3 automatically gets added). The second comparison is now entered. Click in C8 (the amount of years the staff member has worked for the company), type "**>=**", finally type the number **2**.



5. Click on OK. Excel now believes you have finished the formula and returns you to the worksheet. However there is an error (because the formula has not been finished), the following message will appear.



6. Click on OK to get rid of the message. To bring the FUNCTION ARGUMENTS dialog window back up, click in the formula bar where the IF function part of the formula is, and then click on the FX button.



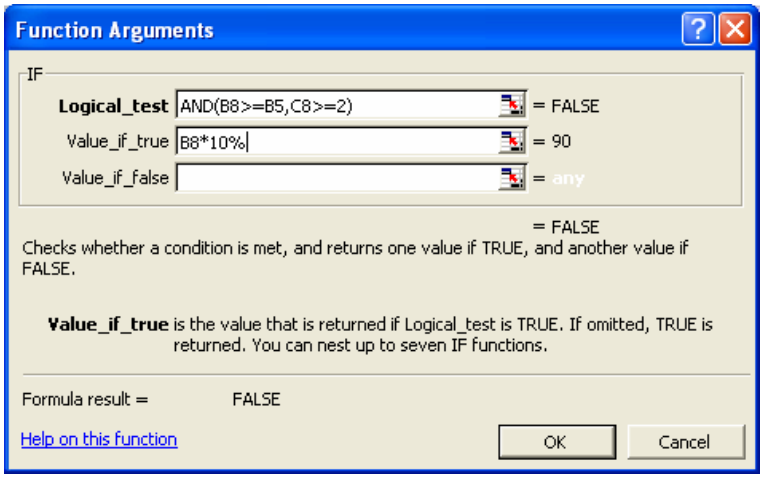
7. The IF FUNCTION ARGUMENTS window will reappear, with the AND function information in the Logical_test dialog box.

NOTE: If you want to manually type in the AND Function, replace Step 2 by typing in the function name, open the brackets and put in the arguments, each

separated by a comma. End by closing the brackets. (Don't forget to make the reference to **B5** absolute. Go to Step 8 when you have done this. Your value_if_true should read:

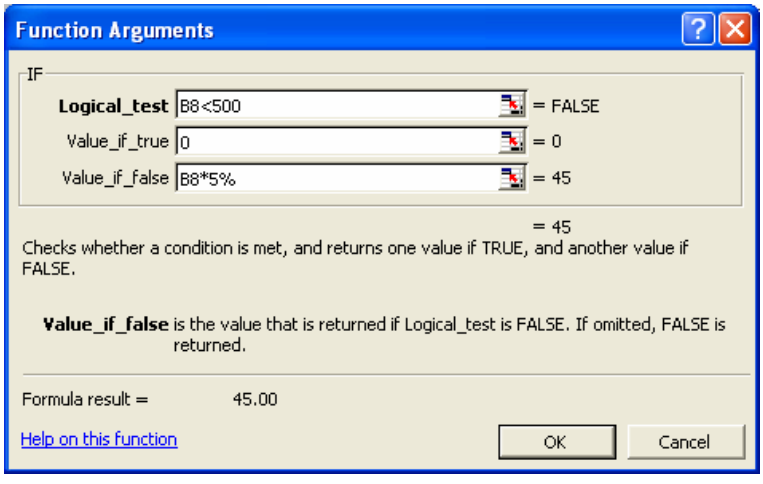
AND(B8>=$B$5,C8>=2)

8. In the Value_if_true dialog box, type in the TRUE result – i.e. click in B8 to select the sales amount then type "***10%**". Value_if_true should then read **B8*10%**



9. The Value_if_false is another IF function – to find out **IF** the salesperson has earned $500 or more. Making sure your cursor is in the Value_if_false box, go and request another IF Function. Use the instructions in Step 2 which show you where to click to request another function.

10. Fill in the details as shown in the following screenshot (note that Value_if_true is 0 – they get no commission if sales are less than $500).



11. Click on OK to finish the function. If filling several cells with this formula, use the FILL HANDLE to drag down to the other cells. (see Page 14 to read more about the FILL HANDLE)

If you were to manually enter the above formula it would look like:

IF(AND(B8>=$B$5,C8>=2),B8*10%,IF(B8<500,0,B8*5%))

Creating the OR function within an IF statement

Repeat all of the above instructions but using the OR function rather than the AND function. Note that the results are different. This is because anyone achieving either of the comparison tests (earning over $1500 OR having worked for 2 or more years), will earn them a 10% bonus.

The NOT function

The NOT function only has one argument. Again it can be used on its own, but is usually used in conjunction with an IF function. Whereas most of our logical functions return TRUE if the argument is true, and FALSE if the argument is false, the NOT function returns FALSE if the argument is true, and returns TRUE if the argument is false.

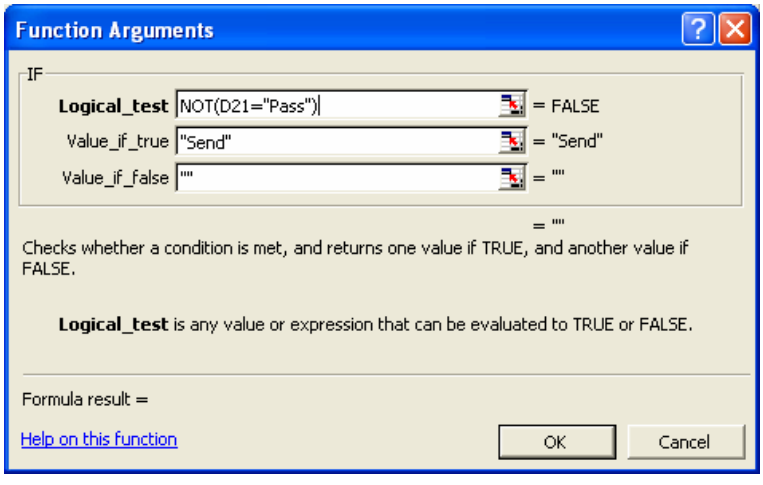
Syntax: =NOT(logical)

Example: Using the Pass/Fail of students example, a letter must be sent to the students who failed. To aid in flagging these, a formula is created to put the word "Send" next to those who have failed.

A working example of the above can be found in the Advanced Excel Exercises workbook, on the AND, OR, NOT worksheet.

Surname	Christian	Score	Pass/Fail	Letter to student	
Richards	Julia	15	Pass		
Smith	Gavin	7	Fail	Send	
Brown	Allan	4	Fail	Send	
Perkins	Gysell	19	Pass		
Broadhurst	Penelope	16	Pass		
Jenkins	Harry	13	Pass		
Hobby	Margaret	9	Fail	Send	
Thiele	Karen	11	Pass		

1. Create an IF Function and fill in the following details by going and calling in a NOT FUNCTION ARGUMENTS window using the method described previously. Remember that any text you request must be enclosed in double quotation marks.



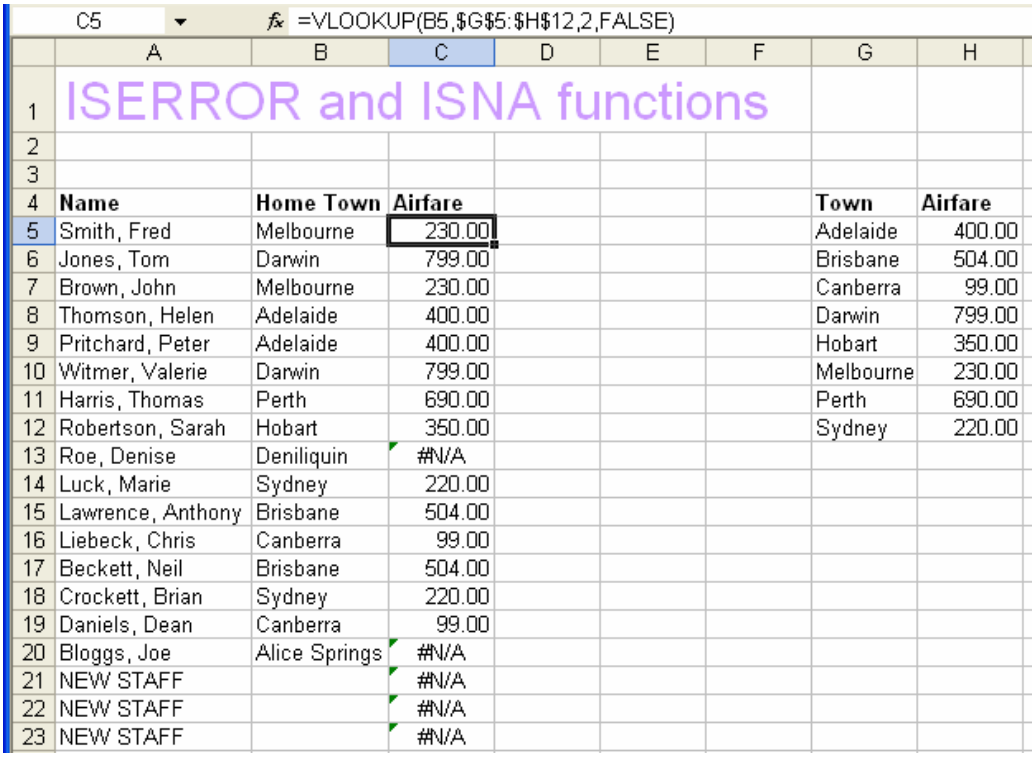
2. Click on OK to finish the function. If filling several cells with this formula, use the FILL HANDLE to drag down to the other cells. (see Page 14 to read more about the FILL HANDLE)

If you were to manually enter the above formula it would look like:

=IF(NOT(D21="Pass"),"Send","")

ISNA AND ISERROR FUNCTIONS

When doing IF and LOOKUP Functions (amongst others) you may be left with #N/A or #REF! error codes that look unsightly or "clutter" up the page. In the VLOOKUP example formulas have been built in for Staff not yet employed. #N/A errors will disappear as soon as a Home Town has been added to column B. #N/A errors occur if there is no information available to make the formula work.



C5 =VLOOKUP(B5,$G$5:$H$12,2,FALSE)

	A	B	C	D	E	F	G	H
1	ISERROR and ISNA functions							
2								
3								
4	**Name**	**Home Town**	**Airfare**				**Town**	**Airfare**
5	Smith, Fred	Melbourne	230.00				Adelaide	400.00
6	Jones, Tom	Darwin	799.00				Brisbane	504.00
7	Brown, John	Melbourne	230.00				Canberra	99.00
8	Thomson, Helen	Adelaide	400.00				Darwin	799.00
9	Pritchard, Peter	Adelaide	400.00				Hobart	350.00
10	Witmer, Valerie	Darwin	799.00				Melbourne	230.00
11	Harris, Thomas	Perth	690.00				Perth	690.00
12	Robertson, Sarah	Hobart	350.00				Sydney	220.00
13	Roe, Denise	Deniliquin	#N/A					
14	Luck, Marie	Sydney	220.00					
15	Lawrence, Anthony	Brisbane	504.00					
16	Liebeck, Chris	Canberra	99.00					
17	Beckett, Neil	Brisbane	504.00					
18	Crockett, Brian	Sydney	220.00					
19	Daniels, Dean	Canberra	99.00					
20	Bloggs, Joe	Alice Springs	#N/A					
21	NEW STAFF		#N/A					
22	NEW STAFF		#N/A					
23	NEW STAFF		#N/A					

The ISNA and the ISERROR functions allow you to use other functions without returning an error. Instead you can have a "0" appear or alternatively an empty cell (or any text you enclose within double quotation marks). This would be useful, for example, when information is yet to be added i.e. you have formulas entered for a budget using January through to December. If the current month is March error codes will probably appear in April through to December cells. It would look better to have them blank (or with a "0").

The ISNA command avoids the #N/A code.

The ISERROR command enables you to avoid the #N/A, #VALUE!, #REF!, #DIV/0!, #NUM!, #NAME? and the #NULL codes.

Syntax:

=IF(ISERROR(VLOOKUP(lookup_value,table_array,col_index_num,range_lookup)),"", VLOOKUP(lookup_value,table_array,col_index_num,range_lookup))

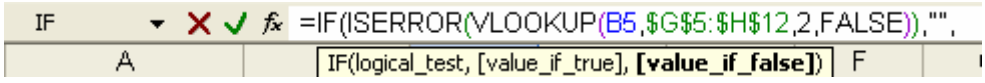
=IF(ISNA(VLOOKUP(lookup_value,table_array,col_index_num,range_lookup)),"", VLOOKUP(lookup_value,table_array,col_index_num,range_lookup))

This would be quite complex to enter manually. A working example to practice and demonstrate using the ISERROR function is located in the Advanced Excel Exercises workbook. Click in C5 in the workbook and follow the steps below:

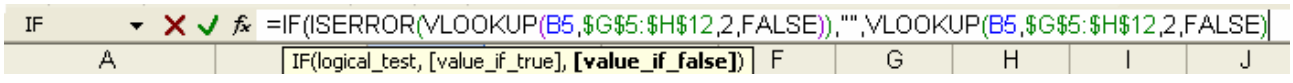
1. Highlight the formula in the formula bar (without the "=" sign). Copy this formula (use the copy icon or CTRL + C)

2. In front of the VLOOKUP formula, BUT after the "=" sign, type **IF(ISERROR(**

3. Now hit END on the keyboard to go to the end of the formula. Type **),"",** (if you want the cell to be blank) or type **),0,** (if you want a "0").



4. Paste in the formula you previously copied (use paste icon or CTRL + V).



5. Finish off by typing a closing **)**

6. Use the ENTER key to finish the function. If filling several cells with this formula, use the FILL HANDLE to drag down to the other cells. (see Page 14 to read more about the FILL HANDLE) Those cells that previously had an error code should now be blank.

WORKING WITH TEXT

There are many functions under the TEXT category and once you have worked with a few the others are quite easy to follow. Some of the more common text functions are:

- LOWER
- MID
- PROPER
- RIGHT
- UPPER
- LEFT

	A	B	C
1	Richards	julia	
2	Thompson	sarah	
3	Smith	fred	

Syntax	**Description**	**Example**
=lower(cell address)	Gives you the text all in lower case	=lower(A1) would return "**richards**"
=upper(cell address)	Returns text string in upper case	=upper(A1) would return "**RICHARDS**"
=left(cell address)	Returns the leftmost character in a text string	=left(A1) would return "**R**"
=right(cell address)	Returns the rightmost character in a text string	=right(A1) would return "**s**"
=mid(cell_address,where_to_start,how_many_characters_ to_return)	Returns characters from a specified point in the text Has 3 arguments. 1. Cell address 2. Which character to start from (first character is no 1) 3. How many characters do you want to appear	Example - to return the 1st three letters of the surname =mid(A1,1,3) would return "**Ric**"
=proper	Makes the first letter of character string uppercase	=proper(B1) would return "**Julia**"

Nested Text Functions

If nesting text functions (having more than one function in the same formula) ensure you enter the formulas in the right order.

For example: If you wanted the first 3 letters of the surname in Lower case:

Right Way: =lower(mid(A1,1,3)) would return "ric"
Wrong Way: =mid(lower(A1,1,3)) would return an error

For more text functions look up TEXT FUNCTIONS in the help menu. Also, a practice exercise has been set up in the Advanced Excel Exercises.xls workbook, on the Text and Concatenation worksheet.

CONCATENATION

concatenation (-n-k-), n. Connexion as of chain-links, string or series of or of ideas, events, &c.

Oxford Dictionary

The CONCATENATE function joins strings of text together. It is often used when working with databases but is also useful for consolidating information. There are two methods of concatenating text, with the CONCATENATE function or by using the **&** operator. Both are explained here.

Example When doing consolidations where you have to combine information, you may end up with a list where items often mean the same thing e.g. imagine working with two different companies each with their own expense sheet. It is your job to bring the expenses together in a consolidated expense sheet.

Dodgy Brothers	**Sweet Tooth Cafe**
Wages	Telephone
Electricity	Communications
Power	COGS
Rent	Lease
COGS	Salaries

In a consolidated expense sheet this may look better presented as:

Wages & Salaries
Electricity & Power
Rent & Lease
Telephone & Communications
COGS & COGS

COGS would look unusual being mentioned twice so we have combined it into one listing, using an IF function. See example 2.

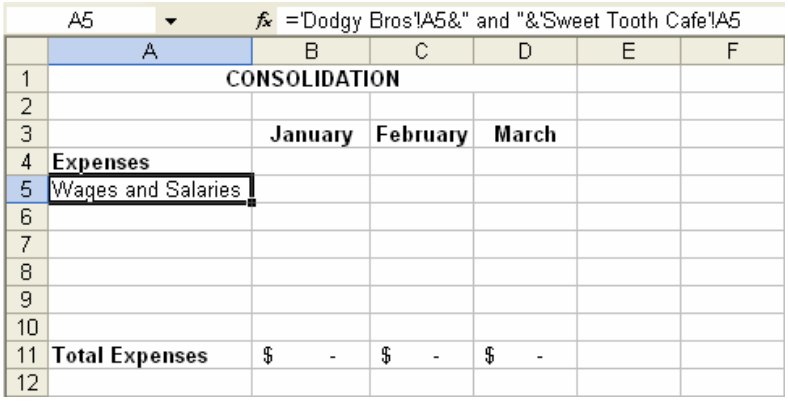
The listing for the consolidated information could be typed as ordinary text, however you would be breaking a basic rule of spreadsheeting - **Do not repeat information, use cell references. I**f you change the ORIGINAL text in any way whatsoever, the change will automatically be reflected in the Consolidation if you use Concatenation to combine the information.

In the following detailed instructions there are two ways of handling concatenation, one where words are combined (Electricity and Power) and one where the listing is only mentioned once (COGS). An exercise has been set up for your convenience and can be found in the working example Consolidation. The first two worksheets belong one each to Dodgy Brothers and Sweet Tooth Café, the third worksheet is the consolidation where you can concatenate the cells.

Example 1 - Combining two entries using the & operator

Join the two cell references with **&" and "&**

In the following screenshot, Wages and Salaries have been combined - notice the formula in the formula bar.



In Excel you normally have operators such as +, -, / or * between cell references, which asks Excel to add, subtract, divide or multiply the contents of those cells. In this scenario however, we are joining two cells that contain text. The **&** symbol is the operator used for joining cells with text. They are usually in pairs so that in between the symbols you can indicate what text you want to join the words (a space or words, punctuation etc). This text must be enclosed in double quotation marks – “”

1. Using the Consolidation workbook as an example, make sure you are in Cell A5 on the CONSOLIDATION worksheet.

2. Type an “**=**” sign (the beginning of every formula).

3. To get the first cell which contains the word “Wages”, click on the DODGY BROS worksheet tab at the bottom of the window, then click in **A5**, the cell address **'Dodgy Bros'!A5** should be in the address bar.

4. Type an ampersand (a **&** symbol, found above the number 7 on the keyboard). This tells Excel you are going to add some text or point to another cell containing text.

5. We want some text between the words “Wages” and “Salaries”. This text is a space, followed by the word “and” followed by another space.

   After the & you just typed, type **“ and “** (a double quotation mark, a space, the word “and” and then another space, close the quotation marks).

   Any text you want between cells MUST BE ENCLOSED IN DOUBLE QUOTATION MARKS.

6. Type another **&**. This tells Excel you are ready to point to another cell.

   The &"....."& is the way to combine cells containing text with whatever text or symbols you place between these characters - in our case with a space, the word *"and"* and another space.

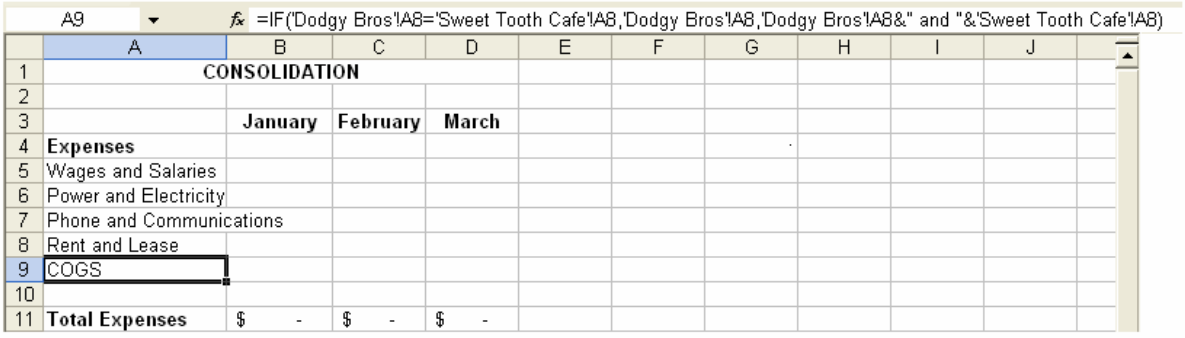
7. Click on the SWEET TOOTH CAFÉ worksheet tab. Then click in cell A5 (the cell containing the word “Salaries”.

8. To finalise the formula, click on the Green ✓ or hit ENTER on the keyboard.

9. Repeat the above instructions to create the Electricity & Power, Rent & Lease and Telephone & Communications cells. (if you were sure they were entered in the same order on both worksheets, you could use the Fill Handle to copy the formula).

Example 2 – By using an IF function, combine two entries, ending up with one entry

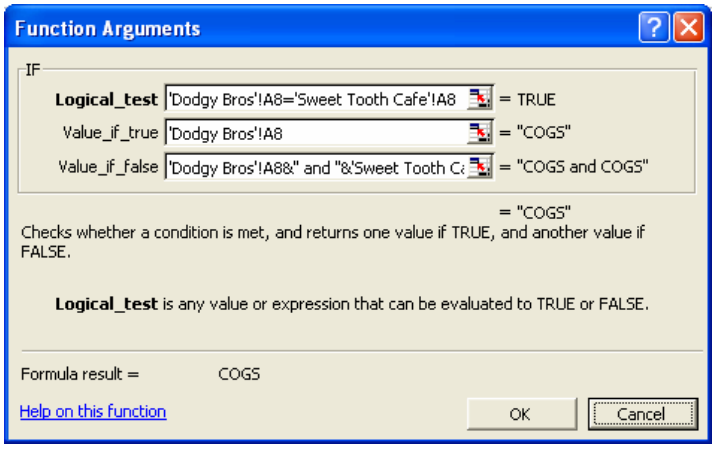
In the case of the COGS entry, combining them as in the first example, we would end up with **COGS and COGS** which is exactly the same thing and would not look very professional. By using an IF function we can say make Excel show COGS only once, but if the original text changes then reflect that change automatically.



	A	B	C	D	E	F	G	H	I	J
1	CONSOLIDATION									
2										
3		January	February	March						
4	**Expenses**									
5	Wages and Salaries									
6	Power and Electricity									
7	Phone and Communications									
8	Rent and Lease									
9	COGS									
10										
11	**Total Expenses**	$ -	$ -	$ -						

1. Ensure you are in Cell **A9** of the CONSOLIDATION worksheet.

2. Call up an IF FUNCTIONS ARGUMENTS window.



3. *Logical_test*
   - click on DODGY BROS worksheet and select **A8**.
   - Type an "**=**" sign
   - Click on SWEET TOOTH CAFÉ worksheet and select **A8**.

   i.e. you are asking "is the cell A8 in Dodgy Bros the same as cell A8 in Sweet Tooth Café". Note in the screenshot above, the result of the logical test is "True". The cells are the same as each other.

4. *Value_if_true*
   - Click on DODGY BROS worksheet and select **A8**.

   i.e. if the cells are the same, you only wish to have the word "COGS" appear once.

5. Value_if_false
   - Click on DODGY BROS worksheet and select **A8**
   - Type the following **&" and "&**
   - Click on SWEET TOOTH CAFÉ worksheet and select **A8**

   i.e. if the cells aren't the same, show the contents of the two cells joined by the text " **and** "

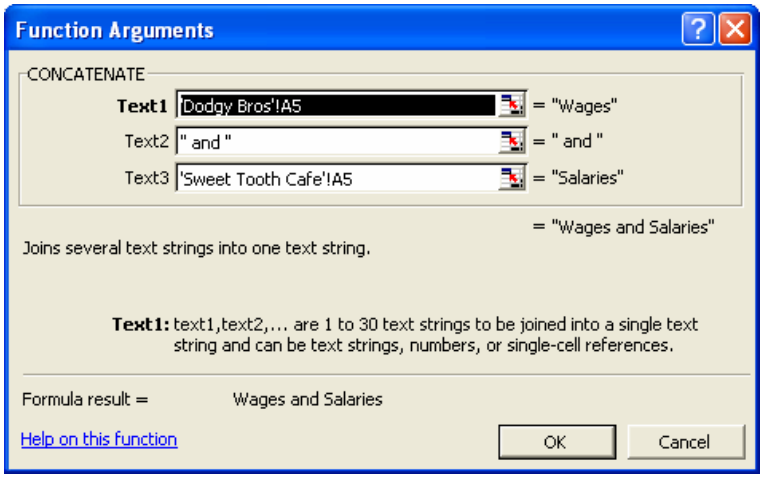
6. Click on OK to finish the formula.

To see if this works correctly, try going to the DODGY BROS worksheet and changing Cell A8 to read "**Cost of Goods Sold**". Go back to the CONSOLIDATION worksheet and see if the cell containing COGS now reads "**Cost of Goods Sold and COGS**"

Example 3 – Using the CONCATENATE Function

The text cells can be joined by using the CONCATENATE function, which is found under the TEXT category of functions.

1. Call up a CONCATENATE FUNCTION ARGUMENTS window



2. In Text1, click on DODGY BROS worksheet and select **A8.** Then click in Text2. Note Text3 automatically appears (you can join up to 30 strings of text)

3. In Text 2 type a space, then the word **and,** then type another space.

4. Click in Text3 – note how the double quotation marks have been added automatically for you in the Text2 dialog box

5. Click on SWEET TOOTH CAFÉ worksheet and select **A8**

6. Click on OK to finalise the formula.

To fix up the problem of COGS appearing twice, you would have to create an IF function and when you get to the "VALUE-IF_FALSE" section, call up a CONCATENATE function and fill in as per instructions above.

The final step to completing the exercise is to bring across the figures for DODGY BROS and SWEET TOOTH CAFÉ. These will be normal formulas – do not retype the figures

because if the original figures change, the retyped ones on the CONSOLIDATION worksheet will not change. By using the following instructions the consolidation figures will automatically update with any changes.

Using **Wages and Salaries** as an example:

1. Using the CONSOLIDATION worksheet, click in B5. Type an "**=**" sign to start off a formula.

2. Click on the DODGY BROS worksheet tab and select **B5** (the first wages amount).

3. Type a "**+**" sign

4. Click on the SWEET TOOTH CAFÉ worksheet tab and select **B5** (the first salaries amount)

5. Either click on the green ✓ or hit ENTER on the keyboard to finalise.

6. Use the fill handle to drag this formula across to February and March (see page 14 for details about the Fill Handle)

7. When you have finished inputting all the consolidated figures, check the final totals agree with the final totals of the first two worksheets.

For more practice try the Concatenation exercise in the Advanced Excel Exercises.xls workbook, on the Text and Concatenation worksheet.

WORKING WITH DATES

Dates are stored as numbers in spreadsheets and because of this you can do calculations using dates. Take the number 36500.35 for example. The integer component (36500) is the date and the decimal fraction (.35) is the time. The integer number is the number of days since 01/01/1900. The number 36500.35 therefore, would be 6 December 1999, 8.24am.

By going to the TOOLS, OPTIONS menu and clicking on the CALCULATION tab you can enable the 1904 DATE SYSTEM option which calculates all dates from January 1, 1904.

When you enter a date into a cell in a worksheet Excel formats that cell as a date format. If you then try and put a normal number into that cell, it will appear as a date. This is because the formatting information and the data are stored separately in spreadsheets. To correct the situation you need to reformat the cell as a number (FORMAT, CELLS, NUMBER) or clear the format (EDIT, CLEAR, FORMATS). You can also use the shortcut key to return a cell to GENERAL format – CTRL + SHIFT + ~ (a tilde).

NOTES: If you are typing a date into a cell, you can use either / or – (slashes or hyphens) as separators. E.g. 31/12/99 or 31-12-99 do the same formatting.

If entering a date with the year between 1920 and 2029, you only need enter the last two digits. Before or after these years, enter the four numbers for the date to appear correctly.

The easiest way to enter a quantity of dates in a row or column is to use the EDIT, FILL, SERIES command. You can then make the dates appear in Day, Weekday, Month or Year series. Alternatively you can use the fill handle (pages 14 to 17) with the Right Mouse Button to select a series of dates.

CTRL + ; is a shortcut for entering the current date.

A cell with a date can be reformatted to appear the way you want by going to FORMAT, CELLS, DATE (for pre-designed formats) or FORMAT, CELLS, CUSTOM to design your own format. The following table shows some of the different ways of formatting a date – using 6 August 2004 as an example:

m/d	8/6
d/m	6/8
d/m/yy	11/8/04
dd/mm/yy	06/08/04
d-mmm	6 Aug
d-mmmm	6 August
dddd d mmmm yyyy	Friday 6 August 2004

Useful Date Functions

There are many DATE functions available but some common ones are:

DATE Returns a serial number that represents a particular date. The result is formatted to appear as a date. This function is most often used when creating a date from values in a spreadsheet. Calculations can be performed on these dates because they are stored as a serial number

Syntax: =DATE(year,month,day)

Example:

F4 =DATE(E4,D4,C4)

	A	B	C	D	E	F
1	**MEMBERSHIP LISTING**					
2						
3	**Surname**	**FirstName**	**Day_Joined**	**Month_Joined**	**Year_Joined**	**Date**
4	Bloggs	Fred	11	8	2001	11/08/2001
5	Brown	John	27	23	2003	27/11/2004
6	Smith	Tom	23	4	1999	23/04/1999
7						

NOTE: If you enter an invalid month e.g. 14, Excel assumes you wish to use February (12 months + extra 2 months into the new year). If you enter an invalid day such as 45, Excel will add that number to the first day of the month.

Example: DATE(2004,14,45) would return 17 March 2005. (1st February 2004 + 45 days).

DAY Returns a number as a value corresponding to the day in a date – numbers range between 1 and 31. Useful if you need to extract the day so as to perform calculations.

Syntax: DAY(serial_number)

Example: Two examples are given, the first where the formula refers to a cell containing a date, the other where the date is used in the formula itself – Note that the date is enclosed in double quotation marks. If the quotation marks were not there Excel would attempt to take 17 and divide by 12, then the result would be divided by 1979.

B3 =DAY(B1)

	A	B	C
1	**Date Joined**	**17/12/1979**	
2			
3	Day of month	17	
4	Month of year	12	
5	Year	1979	

B3 =DAY("17/12/79")

	A	B	C
1	**Date Joined**	**17/12/1979**	
2			
3	Day of month	17	
4	Month of year	12	
5	Year	1979	

MONTH Returns a number as a value corresponding to the month in a date – numbers range between 1 and 12. Useful if you need to extract the month so as to perform calculations.

Syntax: MONTH(serial_number)

Example: Two examples are given, the first where the formula refers to a cell containing a date, the other where the date is used in the formula itself – Note that the date is enclosed in double quotation marks. If the quotation marks were not there Excel would attempt to take 17 and divide by 12, then the result would be divided by 1979.

B4 =MONTH(B1)

	A	B	C
1	**Date Joined**	**17/12/1979**	
2			
3	Day of month	17	
4	Month of year	12	
5	Year	1979	

B4 =MONTH("17/12/79")

	A	B	C
1	**Date Joined**	**17/12/1979**	
2			
3	Day of month	17	
4	Month of year	12	
5	Year	1979	

YEAR Returns a number as a value corresponding to the year in a date – numbers range between 1900 and 9999. Useful if you need to extract the year so as to perform calculations.

Syntax: YEAR(serial_number)

Example: Two examples are given, the first where the formula refers to a cell containing a date, the other where the date is used in the formula itself – Note that the date is enclosed in double quotation marks. If the quotation marks were not there Excel would attempt to take 17 and divide by 12, then the result would be divided by 1979.

B5 =YEAR(B1)

	A	B	C
1	**Date Joined**	**17/12/1979**	
2			
3	Day of month	17	
4	Month of year	12	
5	Year	1979	

B5 =YEAR("17/12/79")

	A	B	C
1	**Date Joined**	**17/12/1979**	
2			
3	Day of month	17	
4	Month of year	12	
5	Year	1979	

TODAY: Returns the current date. Useful for inserting into a spreadsheet where the current date is required. This function does not require any arguments. The date updates everytime a calculation is made in the worksheet.

Syntax: =TODAY()

Example:

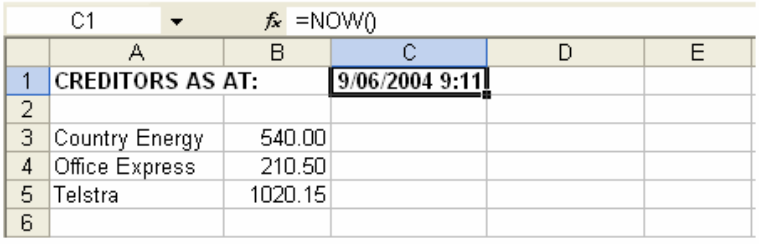
C1 =TODAY()

	A	B	C	D	E
1	**CREDITORS AS AT:**		**9/06/2004**		
2					
3	Country Energy	540.00			
4	Office Express	210.50			
5	Telstra	1020.15			

NOW: Returns the current date and time. This function does not require any arguments. The date and time update everytime a change is made in the worksheet.

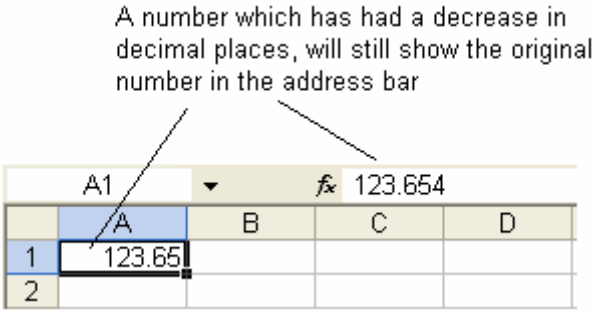
Syntax: =NOW()

Example:



ROUNDING FUNCTIONS

Numbers can be rounded to decimal places by using the INCREASE or DECREASE DECIMAL on the Formatting toolbar or the FORMAT, CELLS, NUMBER option, however you are not changing the value of the number when you use these, only the display. For example, if you have 123.654 decreased to 123.65, you will see 123.65 in the worksheet but 123.654 in the address bar. Excel will use the underlying value (123.654) to do any calculations, not the displayed value.



ROUND Rounds a number to a specific number of decimal places. It is made up of 2 arguments, the reference to a number and the number of decimal places that reference is to be rounded to.

Syntax: =ROUND(number,num_digits)

Notes: The *number* argument can be a number, a cell address referring to a cell that holds a number, or a formula which results in a number.

The *num_digits* argument can be a negative or positive integer (whole number). If you use a negative number it rounds that number of places to the left of the decimal point. If you use 0 (zero), it number rounds to the nearest whole number.

Numbers less than 5 get rounded down. Numbers that are 5 or more get rounded up.

Examples:

	A	B	C	D
1	123			
2	258.3			
3	654			
4	125.3			
5	258.456			
6	1419.056	=SUM(A1:A5)		
7	1419	=ROUND(SUM(A1:A5),0)		
8	1419.06	=ROUND(SUM(A1:A5),2)		

The ROUND function using a FORMULA that returns a number as its NUMBER argument

Assuming that Cell A1 holds the number 2365.854, using the ROUND formula in the following ways will return:

=ROUND(A1,0)	2366
=ROUND(A1,1)	2365.9
=ROUND(A1,2)	2365.85
=ROUND(A1,3)	2365.854
=ROUND(A1,-2)	2400

A number can be used as the Number argument e,g:

=ROUND(2365.854,-3) would return 2000

ROUNDDOWN Works in the same way as ROUND, however as its name suggests, this function rounds down.

Syntax: =ROUNDDOWN(number,num_digits)

Examples: Assuming that Cell A1 holds the number 2365.854, using the ROUNDDOWN formula in the following ways will return:

=ROUNDDOWN(A1,0)	2365
=ROUNDDOWN(A1,1)	2365.8
=ROUNDDOWN(A1,2)	2365.85
=ROUNDDOWN(A1,3)	2365.854
=ROUNDDOWN(A1,-2)	2300

ROUNDUP Works in the same way as ROUND, however as its name suggests, this function rounds up.

Syntax: =ROUNDUP(number,num_digits)

Examples: Assuming that Cell A1 holds the number 2365.854, using the ROUNDUP formula in the following ways will return:

=ROUNDUP(A1,0)	2366
=ROUNDUP(A1,1)	2365.9
=ROUNDUP(A1,2)	2365.86
=ROUNDUP(A1,3)	2365.854
=ROUNDUP(A1,-2)	2400

EVEN Using this function a number can be rounded up to the nearest even integer or down to the nearest even negative integer.

Syntax: =EVEN(number)

Examples:

=EVEN(13.6)	14
=EVEN(16.2)	18
=EVEN(16)	16
=EVEN(-3)	-4

ODD This function rounds a number up to the nearest odd integer or down to the nearest odd negative integer.

Syntax: =ODD(number)

Examples:

=ODD(13.6)	15
=ODD(16.2)	17
=ODD(17)	17
=ODD(-4)	-5

CEILING The CEILING function rounds a number up to the nearest specified multiple. This is a useful function for rounding someone's wages to the nearest 5 cents for example, since 1 and 2 cent pieces have been discontinued.

Syntax: =CEILING(number,multiple)

Examples:

=CEILING(2365.81,.05)	2365.85
=CEILING(2365.81,-.05)	#NUM!
=CEILING(-2365.81,-.05)	-2365.85

Note: The number argument and the multiple argument must have the same sign or the function will return a #NUM! error.

FLOOR The FLOOR function rounds a number down to the nearest specified multiple.

Syntax: =FLOOR (number,multiple)

Examples:

=FLOOR(2365.81,.05)	2365.80
=FLOOR(2365.81,-.05)	#NUM!
=FLOOR(-2365.81,-.05)	-2365.80

Note: The number argument and the multiple argument must have the same sign or the function will return a #NUM! error.

INT The INT function rounds numbers down to the nearest integer.

Syntax: =INT(number)

Example: =INT(2365.80) 2365

TRUNC The TRUNC functions truncates numbers to the right of the decimal point.

Syntax: TRUNC(number,num_digits) *num_digits* is optional

Example:

=TRUNC(2365.8045)	2365
=TRUNC(2365.8045,2)	2365.80
=TRUNC(2365.8045,1)	2365.8

APPENDIX 1 - FUNCTION KEYS

The following lists contain function key, CTRL combination shortcut keys and some other common shortcut keys, along with descriptions of their functionality.

Function Keys

Key	Description
F1	Displays the **Microsoft Office Excel Help** task pane. CTRL+F1 displays or hides the ribbon. ALT+F1 creates a chart of the data in the current range. ALT+SHIFT+F1 inserts a new worksheet.
F2	Edits the active cell and positions the insertion point at the end of the cell contents. It also moves the insertion point into the Formula Bar when editing in a cell is turned off. SHIFT+F2 adds or edits a cell comment. CTRL+F2 displays the Print Preview window.
F3	Displays the **Paste Name** dialog box. SHIFT+F3 displays the **Insert Function** dialog box.
F4	Repeats the last command or action, if possible. CTRL+F4 closes the selected workbook window.
F5	Displays the **Go To** dialog box. CTRL+F5 restores the window size of the selected workbook window.
F6	Switches between the worksheet, ribbon, task pane, and Zoom controls. In a worksheet that has been split (**View** menu, **Manage This Window**, **Freeze Panes**, **Split Window** command), F6 includes the split panes when switching between panes and the ribbon area. SHIFT+F6 switches between the worksheet, Zoom controls, task pane, and ribbon. CTRL+F6 switches to the next workbook window when more than one workbook window is open.

F7	Displays the **Spelling** dialog box to check spelling in the active worksheet or selected range. CTRL+F7 performs the **Move** command on the workbook window when it is not maximized. Use the arrow keys to move the window, and when finished press ENTER, or ESC to cancel.
F8	Turns extend mode on or off. In extend mode, **Extended Selection** appears in the status line, and the arrow keys extend the selection. SHIFT+F8 enables you to add a nonadjacent cell or range to a selection of cells by using the arrow keys. CTRL+F8 performs the **Size** command (on the **Control** menu for the workbook window) when a workbook is not maximized. ALT+F8 displays the **Macro** dialog box to create, run, edit, or delete a macro.
F9	Calculates all worksheets in all open workbooks. SHIFT+F9 calculates the active worksheet. CTRL+ALT+F9 calculates all worksheets in all open workbooks, regardless of whether they have changed since the last calculation. CTRL+ALT+SHIFT+F9 rechecks dependent formulas, and then calculates all cells in all open workbooks, including cells not marked as needing to be calculated. CTRL+F9 minimizes a workbook window to an icon.
F10	Turns key tips on or off. SHIFT+F10 displays the shortcut menu for a selected item. ALT+SHIFT+F10 displays the menu or message for a smart tag. If more than one smart tag is present, it switches to the next smart tag and displays its menu or message. CTRL+F10 maximizes or restores the selected workbook window.
F11	Creates a chart of the data in the current range. SHIFT+F11 inserts a new worksheet. ALT+F11 opens the Microsoft Visual Basic Editor, in which you can create a macro by using Visual Basic for Applications (VBA).
F12	Displays the **Save As** dialog box.

CTRL Combination Shortcut Keys

Key	Description
CTRL+SHIFT+(	Unhides any hidden rows within the selection.
CTRL+SHIFT+)	Unhides any hidden columns within the selection.
CTRL+SHIFT+&	Applies the outline border to the selected cells.
CTRL+SHIFT_	Removes the outline border from the selected cells.
CTRL+SHIFT+~	Applies the General number format.
CTRL+SHIFT+$	Applies the Currency format with two decimal places (negative numbers in parentheses).
CTRL+SHIFT+%	Applies the Percentage format with no decimal places.
CTRL+SHIFT+^	Applies the Exponential number format with two decimal places.
CTRL+SHIFT+#	Applies the Date format with the day, month, and year.
CTRL+SHIFT+@	Applies the Time format with the hour and minute, and AM or PM.
CTRL+SHIFT+!	Applies the Number format with two decimal places, thousands separator, and minus sign (-) for negative values.
CTRL+SHIFT+*	Selects the current region around the active cell (the data area enclosed by blank rows and blank columns). In a PivotTable, it selects the entire PivotTable report.
CTRL+SHIFT+:	Enters the current time.
CTRL+SHIFT+"	Copies the value from the cell above the active cell into the cell or the Formula Bar.
CTRL+SHIFT+Plus (+)	Displays the **Insert** dialog box to insert blank cells.
CTRL+Minus (-)	Displays the **Delete** dialog box to delete the selected cells.
CTRL+;	Enters the current date.
CTRL+`	Alternates between displaying cell values and displaying formulas in the worksheet.
CTRL+'	Copies a formula from the cell above the active cell into the cell or the Formula Bar.

CTRL+1	Displays the **Format Cells** dialog box.
CTRL+2	Applies or removes bold formatting.
CTRL+3	Applies or removes italic formatting.
CTRL+4	Applies or removes underlining.
CTRL+5	Applies or removes strikethrough.
CTRL+6	Alternates between hiding objects, displaying objects, and displaying placeholders for objects.
CTRL+8	Displays or hides the outline symbols.
CTRL+9	Hides the selected rows.
CTRL+0	Hides the selected columns.
CTRL+A	Selects the entire worksheet. If the worksheet contains data, CTRL+A selects the current region. Pressing CTRL+A a second time selects the current region and its summary rows. Pressing CTRL+A a third time selects the entire worksheet. When the insertion point is to the right of a function name in a formula, displays the **Function Arguments** dialog box. CTRL+SHIFT+A inserts the argument names and parentheses when the insertion point is to the right of a function name in a formula.
CTRL+B	Applies or removes bold formatting.
CTRL+C	Copies the selected cells. CTRL+C followed by another CTRL+C displays the Clipboard.
CTRL+D	Uses the **Fill Down** command to copy the contents and format of the topmost cell of a selected range into the cells below.
CTRL+F	Displays the **Find and Replace** dialog box, with the **Find** tab selected. SHIFT+F5 also displays this tab, while SHIFT+F4 repeats the last **Find** action. CTRL+SHIFT+F opens the **Format Cells** dialog box with the **Font** tab selected.
CTRL+G	Displays the **Go To** dialog box. F5 also displays this dialog box.

CTRL+H	Displays the **Find and Replace** dialog box, with the **Replace** tab selected.
CTRL+I	Applies or removes italic formatting.
CTRL+K	Displays the **Insert Hyperlink** dialog box for new hyperlinks or the **Edit Hyperlink** dialog box for selected existing hyperlinks.
CTRL+N	Creates a new, blank workbook.
CTRL+O	Displays the **Open** dialog box to open or find a file. CTRL+SHIFT+O selects all cells that contain comments.
CTRL+P	Displays the **Print** dialog box. CTRL+SHIFT+P opens the **Format Cells** dialog box with the **Font** tab selected.
CTRL+R	Uses the **Fill Right** command to copy the contents and format of the leftmost cell of a selected range into the cells to the right.
CTRL+S	Saves the active file with its current file name, location, and file format.
CTRL+T	Displays the **Create Table** dialog box.
CTRL+U	Applies or removes underlining. CTRL+SHIFT+U switches between expanding and collapsing of the formula bar.
CTRL+V	Inserts the contents of the Clipboard at the insertion point and replaces any selection. Available only after you have cut or copied an object, text, or cell contents.
CTRL+W	Closes the selected workbook window.
CTRL+X	Cuts the selected cells.
CTRL+Y	Repeats the last command or action, if possible.
CTRL+Z	Uses the **Undo** command to reverse the last command or to delete the last entry that you typed. CTRL+SHIFT+Z uses the **Undo** or **Redo** command to reverse or restore the last automatic correction when AutoCorrect Smart Tags are displayed.