Workbooks and Worksheets

Microsoft Excel is used to perform calculations, analyze information and manage lists using *spreadsheets*[i]. An Excel file is called a *workbook*[ii]. Workbooks are often referred to as *books*. This is the name given to an Excel workbook until you have changed it (e.g. **Book1**, **Book2** etc.).

When you open the program Excel provides you with a new empty workbook containing three *worksheets*[iii] on which to create your spreadsheets (*Fig.1*). You can add many more worksheets, the number being limited only by available memory in your computer. Worksheets are often referred to as *sheets*. Each has a name (e.g. **Sheet1**, **Sheet2** etc.) which you can change to suit your requirements. The worksheet names are shown on tabs at the bottom of the workbook window.

Think of a worksheet as a large sheet of paper ruled with many vertical and horizontal lines to create *columns*[iv] and *rows*[v] of boxes known as *cells*[vi]. As new versions of Excel have been released the potential size of a worksheet has increased. In Excel 2007/2010 each worksheet has 16,384 columns and 1,048,576 rows. Earlier versions of Excel had smaller worksheets, Excel 2003 having 255 columns and 65,536 rows (see the note about version compatibility at the end of this document.)

Each column is identified by a letter (e.g. **A**, **B**, **C** etc.) and each row by a number (e.g. **1**, **2**, **3** etc.). There is a button at the top of each column and to the left of each row bearing its letter or number. This allows each individual cell to be identified by its *address*[vii]. The first cell on a worksheet, in the upper left corner, has the address **A1**. A cell in the 27th row of the 6th column (column **F**) has the address **F27**.
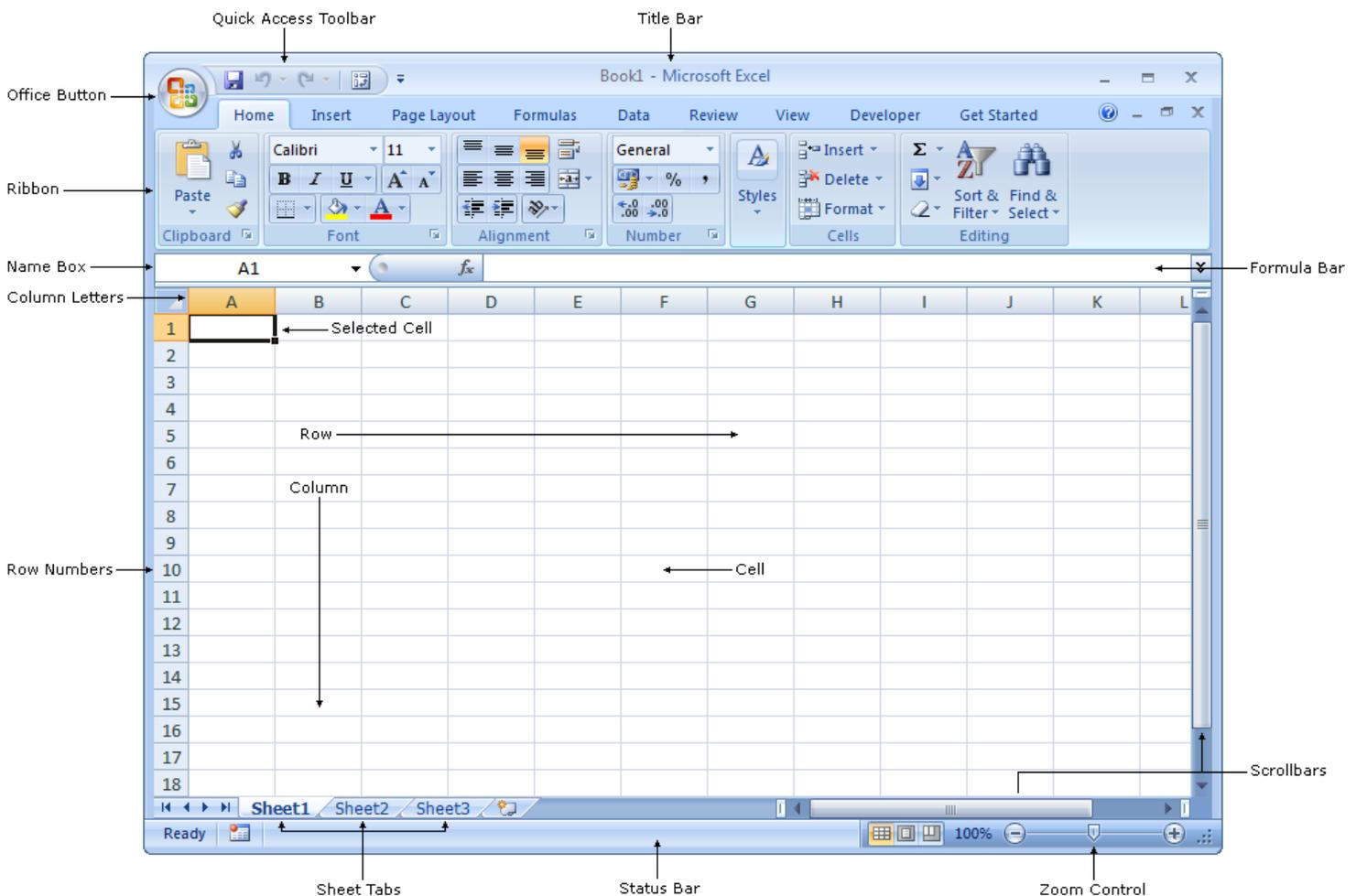


Fig.1 The Excel program window.

When referring to a cell or block of cells on a worksheet it usual to refer to them as *range*. Like a single cell a range containing many cells has an address which describes its position on the worksheet using the address of the cell in the upper-left corner, followed by a colon (**:**) and the

address of the cell in the lower-right corner. The illustration (*Fig.2*) shows that the range **B2:D6** is selected.

Selecting Cells on a Worksheet

At least one cell is always selected on a worksheet. This is known as the *active cell*[viii]. The selection is always marked with a heavy black border. In the illustration (*Fig.1*) the active cell is cell **A1**. You can select a cell by clicking on it or by moving to it using one of the methods described below. The address of the active cell is normally shown in the *name box*[ix] just above cell **A1**.

You can select a rectangular block of cells by dragging with the mouse. The resulting block of cells is called a *multiple selection*[x] (*Fig.2*). When more than one cell is selected one of the cells remains the active cell, usually the first cell to be selected when you began the selection.
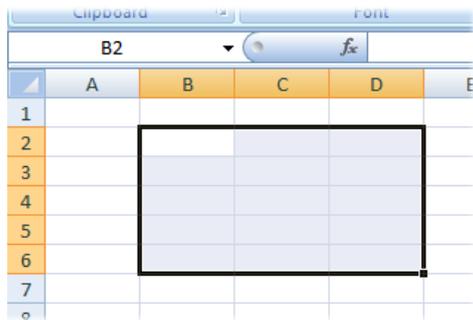
*Fig.2 A multiple selection of cells. Cell **B1** is the active cell.*
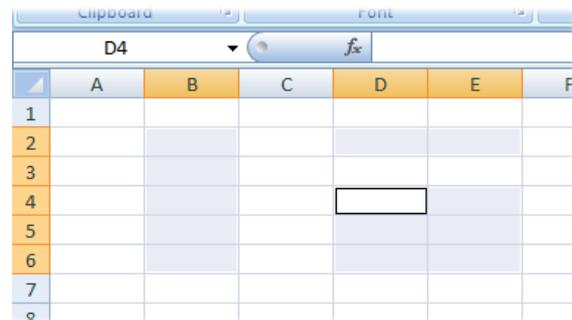
*Fig.3 A Non-contiguous selection of cells. Cell **D4** is the active cell.*

It is possible to select several different blocks of cells at the same time. This is called a *non-contiguous selection*[xi] (*Fig.3*). Select the first cell or block in the normal way then hold down the **[Control]** key while you select each additional cell or block.

Whilst selecting cells is usually done using the mouse, you might find it more convenient to select using the keyboard. Move to the cell where you want to start the selection then hold down the **[Shift]** key whilst you use the **[Up]**, **[Down]**, **[Left]** or **[Right]** keys to extend the selection. With practice this method can become a much faster and more accurate way to select cells than dragging with the mouse.

To select an entire column click the button at the top of the column that bears its letter. This selects all the cells in the column, right down to the bottom of the worksheet. You can select several columns at a time by dragging along the letter buttons or, if you want to select non-adjacent columns, **[Click]** to select the first column then **[Control]+[Click]** to select others. Select entire rows in the same way, using the row number buttons to the left of the rows.

Select the entire worksheet by pressing **[Control]+[A]** or by clicking the sheet selector button, the small blue button in the upper-left corner of the worksheet just above the row **1** button and to the left of the column **A** button.

Selected cells are shaded a different colour from unselected cells but the active cell remains unshaded. As with a single selected cell, a rectangular block of selected cells has a heavy black border.

Moving Around a Workbook

If you have a lot of data it can occupy a very large area on the worksheet, and you might have several worksheets, so it helps to know the different ways of finding your way around a workbook. The method you use to move around determines whether you just go to look at a different part of the worksheet, or whether you move the selection as the view changes, so that when you reach your destination a different cell is selected from the one that was selected when you started.

The workbook window has horizontal and vertical scrollbars that allow you to change the area on view without changing the selection. If you have a scroll-wheel on your mouse you can use it to move up and down the rows, again without changing the selection. Hold down the **[Control]** key whilst rolling the wheel to zoom-in to magnify an area, or zoom-out to view a larger area. There is also a zoom control in the lower right corner of the Status Bar at the bottom of the Excel window.

A quick way to move to a specific cell is to click in the Name Box, type the address of the cell you want to select, then press **[Enter]**. There are also several useful keyboard shortcuts to help you

move around a workbook and its worksheets whilst also changing the selection. Note that any of these keyboard shortcuts will also select cells if you also hold down the **[Shift]** key…

Shortcut	Action
[Up], **[Down]**, **[Left]**, **[Right] Arrow keys**	Move the selection one cell at a time in the appropriate direction.
[Control]+Arrow key	Within a block of data move in the appropriate direction to the end of the block, or until an empty cell is found. Repeat to move to the next cell containing data, or to the end of the row or column.
[Home]	Move the selection to the start (leftmost cell) of the current row.
[Control]+[Home]	Always moves the selection to cell **A1**.
[Control]+[End]	If there is data on the worksheet this moves the selection to the lower-right corner of the used range of the worksheet. If there is no data it moves the selection to cell **A1**.
[Page Up], **[Page Down]**	Move the selection up or down the worksheet a screen at a time.
[Control]+[Page Up], **[Control]+[Page Down]**	Move up or down through the stack of worksheets.
[Control]+[Tab]	Cycle through the currently open workbooks.

Each worksheet is represented by a tab bearing its name attached to its lower edge. The worksheets and their tabs are arranged in a "stack" like a pile of sheets of paper on your desk. The leftmost tab belongs to the sheet that is on the top of the stack. As you move to the right along the row of tabs their worksheets are further down the stack. The rightmost tab belongs to the worksheet at the bottom of the stack.

To bring a worksheet to the top of the stack simply click its tab. This is called selecting a worksheet. When you select a different worksheet it comes to the top and the previously selected one returns to its original position in the stack. The name of the currently selected sheet is shown in **bold** type.

If there are a lot of worksheets you will not be able to see their all their names in the workbook window. To help you locate a worksheet whose tab is not visible use the worksheet navigation buttons located to the left of the first tab. Alternatively, right-click on one of the navigation buttons to open a list of worksheets (*Fig.4*) and click on the name of one to quickly scroll to it.
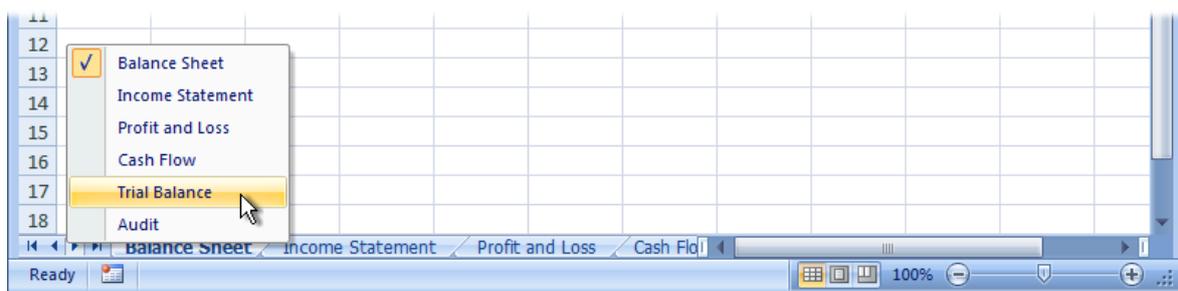

Fig.4 Using the worksheet list to quickly scroll to the chosen worksheet.

Excel's Mouse Pointers

Excel will cause your mouse pointer to change in appearance depending on its function (*Fig.5* to *Fig.8*). Make sure to check the pointer before performing an action on the worksheet.
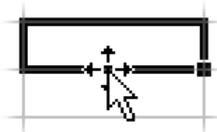

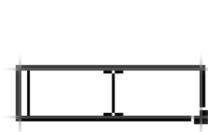*Fig.5 Selecting Pointer*   *Fig.6 Dragging Pointer*   *Fig.7 Filling Pointer*   *Fig.8 Editing Pointer*

Entering Information on a Worksheet

Data entered on a worksheet is typed into the cells. Simply click and start to type. To complete your entry press either the **[Enter]** or **[Tab]** key. Pressing **[Enter]** moves the selection to the next cell down the column. Pressing **[Tab]** moves the selection to the next cell to the right in the same row. You can change the behaviour of the **[Enter]** key by clicking the **Office Button** and choosing **Excel Options > Advanced**.

Excel can usually recognise what you have typed and treats it accordingly. Text becomes left-aligned in a cell whilst dates and numbers are right-aligned, although you can change the in-cell alignment with formatting commands.

When a range of cells is selected, anything you type will appear only in the currently active cell. To fill all the selected cells at the same time press **[Control]+[Enter]** when you finish typing.

When you type text into a cell the width of the column does not automatically change to fit what is typed into it. As you type, if there is too much to be displayed in the cell, the contents flow to the right across any adjacent empty cells. If the next cell is not empty, or if you subsequently type something into it, the cell will show only as much of your entry as space allows.

When you enter a date or a number into a cell, if the column is not wide enough, Excel automatically expands it so the entire entry can be seen (*Fig.9*) (this was not the case in versions prior to Excel 2003). But, if you had already set the width of the column or subsequently make the column narrower so that the full date or number cannot be displayed, Excel will display a row of hashes (**#**) in place of the date, or use *scientific notation*[xii] in place of the number (*Fig.10*). This is to prevent the confusion that would arise if you could only see part of a number or a date, particularly when printing a worksheet.

Fig.9 Columns stretch to display numbers and dates, but not text.

Fig.10 Numbers and dates are not truncated, but represented differently.

You can easily change the width of a column by pointing to the line that separates the column headers, to the right of the column in question, so that the mouse pointer changes to a cross with a double-headed horizontal arrow (*Fig.11*). Now either drag the line to the desired width or double-click the mouse to snap the column to fit the width of its widest content. Any numbers or dates will also now be displayed in full.

Fig.11 Using the mouse to change column width.

You can change the height of a row in the same way using the join between the row numbers.

Using the Fill Handle to Autofill a List

If you need to create a list on a worksheet you can often save time by using the *fill handle*. This tool will automatically create entries in a row or column of cells based upon what is in the cell you start from. To activate the fill handle, select a cell that contains some data. Note that the heavy black line that surrounds the selection has a black dot in its lower right corner. Point at the dot so that the mouse pointer changes to a black cross (*Fig.7*). Now drag across or down the worksheet to autofill the selected cells with data (*Fig.12*).

Fig.12 Using the Fill Handle to create a list.

What you get depends upon what is in the originally selected cell. Numbers alone do not change. A combination of text and numbers, ending in a number, will increment by one (e.g. *Year 1*, *Year 2*, *Year 3* etc.). Dates increment by one day. Day and month names (e.g. *Monday*, *January* etc.) automatically appear in the correct order.

As you drag the mouse a *tooltip*[xiii] will indicate how the list item will appear and, in later versions of Excel, when you release the mouse a *smart-tag*[xiv] will appear. Click the smart-tag to see a list of different options for the list. Many different options are available for filling the list, such as overriding the default behaviour and specifying a step value for the increment. Drag the fill handle using the right mouse button to see a menu of more options when you release the mouse.

If the cell at the start of your list is adjacent to a column of cells that already contain data, you can double-click the fill handle to automatically fill the list down the column to the same extent as the existing data.

Editing and Deleting Information on a Worksheet

There are different ways to edit the information in a cell. You can work directly in the cell or use the *formula bar*[xv]. Whilst you are editing in Excel the program is said to be in *Edit Mode* and the message "Edit" appears in the status bar, replacing the usual "Ready" message.

To work directly in a cell click on the cell you want to change and type to replace any existing contents with your typing. If you want to edit the cell contents rather than completely replace them, double-click the cell so that your cursor appears inside the cell. When you finish working in the cell press **[Enter]** or **[Tab]** to accept your changes, or press **[Esc]** to undo your changes and revert to the original entry.

The formula bar is the horizontal text box located above the column headings on the worksheet (*Fig.1*). Its purpose is to display the contents of the active cell (e.g. the formula behind a displayed value, or text, a date or large number incompletely displayed on the worksheet). You can also type directly into the formula bar to create a new entry or edit an existing one. A cell can contain a very large number of characters (up to 32,767) but on the worksheet the cell is capable of displaying a maximum of only 1,024 characters. The formula bar can display the entire contents of the cell. Click the double-arrow button in the upper-right corner of the formula button to enlarge the box (*Fig.13*) and use the scrollbar as necessary to view the cell contents.
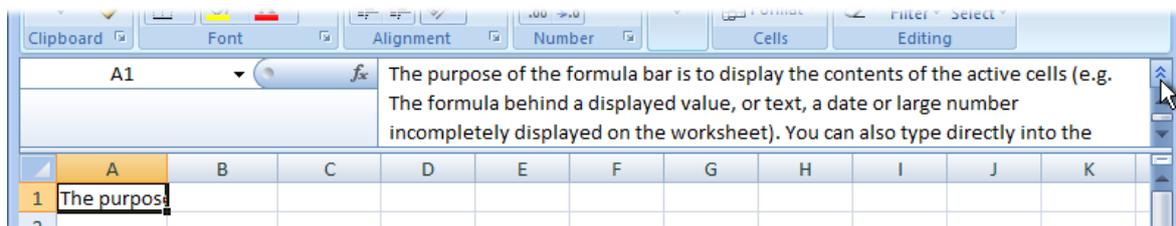

Fig.13 The formula bar can display the entire contents of a cell.

To delete the contents of a cell or a selected row, column or range of cells, make the selection then press **[Delete]** or right-click and choose **Clear Contents**. This clears the contents from the cell(s) but leaves any formatting in place. For a choice of what gets deleted when you do this go do not use this method but go to **Home > Clear** to see a list of options.

To remove the cells themselves, after making the selection go to **Home > Delete**. If and entire row or column was selected it will be removed from the worksheet, the remaining rows moving up or columns moving left to close the gap. When you delete rows or columns new, empty ones are added to the bottom or right of the worksheet so that the maximum number are always available.

Alternatively you can right-click on the selection and choose **Delete.** If you do this Excel will ask you how you want the surrounding cells to fill the resulting space, by moving up from below or left from the right. It is important to make the right decision so that the remaining data on your worksheet does not become misaligned.

Copying, Cutting and Pasting

Copying and pasting cells in Excels is slightly different than copying objects or text in other programs. Start by selecting the cell or block of cells that you want to copy then give the **Copy** command in the usual way (choose **Home > Copy**, right-click the selection and choose **Copy** from the menu, or use the keyboard shortcut **[Control]+[C]**). You will see a moving dotted line surrounding your selection (*Fig.14*).

If pasting the cells elsewhere in Excel click select the cell that corresponds to the upper left corner of the selection and give the **Paste** command (choose **Home > Paste**, right-click the selection and choose **Paste** from the menu, or use the keyboard shortcut **[Control]+[V]**). You can copy a single cell and paste into a block of cells the cell's contents will be repeated in each destination cell.
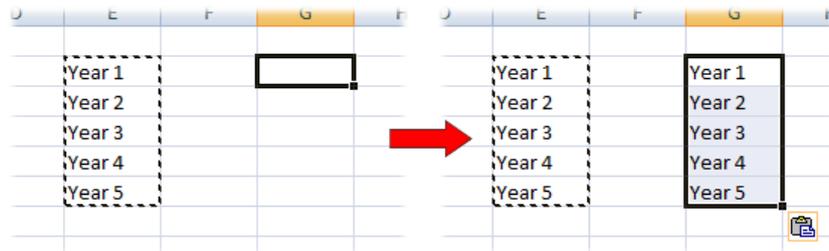

Fig.14 Copying and pasting cells.

You can paste from Excel to somewhere else on the same worksheet or on to a different worksheet in the same or a different workbook. On pasting a smart-tag appears. Click it to see a range of paste options. Alternatively give the **Paste Special** command instead of paste to see a wider range of pasting options. You can paste into many other programs (e.g. Microsoft Word) and text copied from elsewhere can be pasted directly into an Excel cell or into the formula bar. Cutting and pasting works exactly the same way, but the cell contents are moved rather than copied.

The dotted line that appears after you give the Copy command indicates that Excel is in *Edit Mode* and a message to "Select destination and press ENTER or choose Paste" appears in the status bar. Unlike copying in most other programs, the copied information stays on the Windows clipboard only until you start to perform other tasks, so as soon as you start working elsewhere the dotted line disappears, Excel comes out of edit mode, and you are no longer able to paste.

An alternative way of moving or copying a selection is to drag it with the mouse. Make a selection then point at its black border so that the dragging pointer appears. Drag the selection to its destination to move it or, to copy it, drag whilst holding down the **[Control]** key. Alternatively, drag with the right mouse button to see a menu of pasting options when you release the mouse.

Dragging is a useful way to rearrange blocks of data in a spreadsheet. Unlike regular pasting you can easily drop the dragged selection between rows or columns by holding down the **[Shift]** key before you release the mouse button (*Fig.15*).
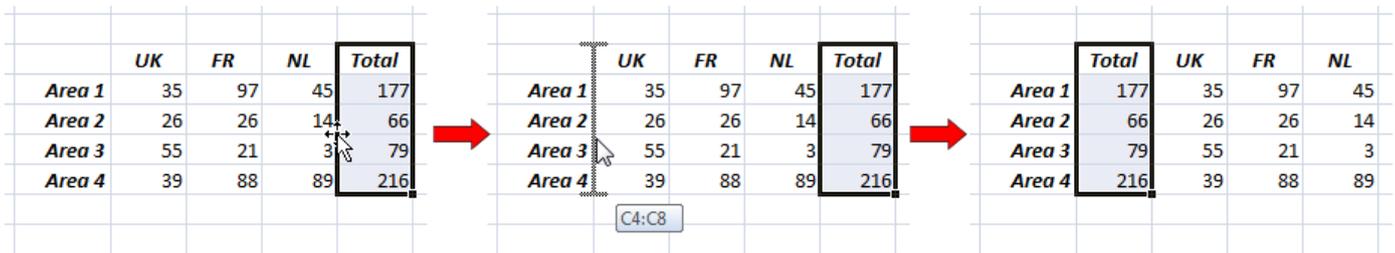

Fig.15 Using drag-and-drop to cut and paste.

Compatibility with Earlier Versions of Excel

If you create a workbook in Excel 2007/2010 that will be used in an earlier version of Excel, it is advisable to save the workbook in an appropriate format. This is because Excel 2007/2010 has introduced a number of significant advances in capacity (increased limits such as more columns and rows on a worksheet) and presentation (e.g. display formats for charts, table formats and conditional formatting) which might limit the compatibility of a workbook that you have created in Excel 2007/2010 when it is to be viewed using an earlier version of Excel.

The default format of an Excel workbook created in Excel 2007/2010 is ***.xlsx**. If you are saving a workbook for the first time you can choose to save it in a compatible format or, if you have a workbook that is already in Excel 2007/2010 (*.xlsx) format you can save a copy of it in a compatible format. There are many different formats to choose from but the most commonly used one is ***.xls**. If saving a new workbook click the **Office Button**, choose **Save** and in the **Save as type** box choose **Excel 97-2003 Workbook (*.xls)** (*Fig.16*).
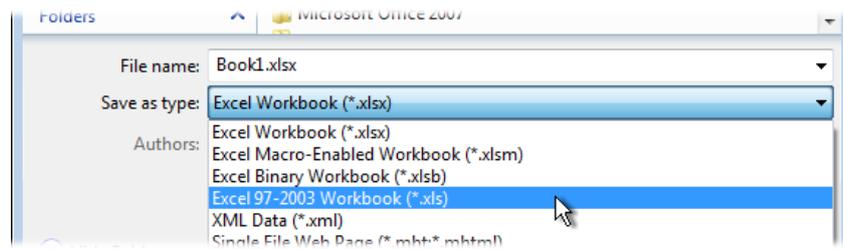
Fig.16 Saving a new workbook in an earlier Excel format.

If saving a copy of an existing Excel 2007/2010 workbook click the **Office Button** and choose **Save As** then choose **Excel 97-2003 Workbook** from the list (*Fig.17*).
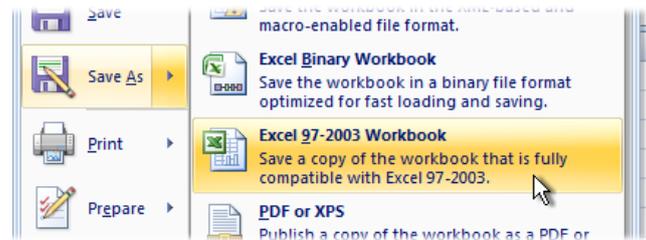

Fig.17 Saving an existing Excel 2007/2010 workbook in an earlier Excel format.

Excel will warn you if there are any features of your existing workbook that are incompatible with the earlier version that will be lost when you save the file.

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[i] *Spreadsheet* – a collection of data, usually including calculations, arranged on a worksheet.

[ii] *Workbook* – the name given to an Excel file. Workbooks have the file extension ".xls".

[iii] *Worksheet* – a workspace in Excel consisting of rows and columns of cells for holding information and performing calculations.

[iv] *Column* – A collection of cells arranged vertically down a worksheet. Columns are identified by letter (e.g. A, B, C etc.)

[v] *Row* – A collection of cells arranged horizontally across a worksheet. Rows are identified by number (e.g. 1, 2, 3 etc.)

[vi] *Cell* – An individual unit on a worksheet where a column and a row intersect. Cells hold data and calculations and are identified by their address (e.g. A1, BF240 etc.)

[vii] *Address* – The coordinates (location) of a cell as expressed by the column letter and row number in which it resides.

[viii] *Active Cell* – The currently selected cell on a worksheet. If more than one cell is selected the active cell is usually the first cell to have been selected when the selection was made.

[ix] *Name Box* – Located at the left end of the Formula Bar this box displays the address of the active cell, the name of a selected named range, or the dimensions of a selection.

[x] *Multiple Selection* – A selection on a worksheet containing more than one cell.

[xi] *Non-contiguous Selection* – A multiple selection of cells in which the selected cells and not in a single rectangular block.

[xii] *Scientific Notation* – A method of representing large numbers without displaying a long string of digits (e.g. $1.23E+08$).

[xiii] *Tooltip* – A box containing helpful information that appears by the mouse pointer when you carry out certain actions.

[xiv] *Smart-tag* – A small blue-edged button that appears after you have carried out certain actions. Click it to see a menu of options relating to the action you just performed (later versions of Microsoft Office only).

[xv] *Formula Bar* – The horizontal text box between the toolbars and the worksheet column headings where the contents of a cell can be viewed or edited. When a cell contains a formula the Formula Bar displays the formula behind the displayed value.