Making IT happen with

MS EXCEL

(Excel 97, 2000, 2002, 2003)

Basic operations

Entering your data

Laying out and Formatting data

Formulae and Functions

Organising data in Lists

Creating Charts in Excel

Viewing and printing

Transferring data

ECDL cross-reference

This document is written both for newcomers to Excel, and for those who are already familiar with the basics. Some experience of Windows and Microsoft Word is assumed.

The original version of this document was written for staff and students working on the networked PCs at Sheffield Hallam University. *Organisations wishing to modify and distribute this document should first obtain permission from Paul Buckley, Head of Academic IT Services, LITS, (e-mail p.n.buckley@shu.ac.uk)*

Jos Kingston   January 2006

Contents

Introduction

☑ *This document was written to be used as a printed booklet. You are strongly recommended to refer to a paper copy, rather than trying to learn the features described while you are reading it online.*

Excel is the leading spreadsheet software for Windows. An electronic spreadsheet makes any work involving rows or columns of numbers much easier. As soon as you change any numbers on your spreadsheet, calculations which use those numbers will be automatically updated. You can apply your own formulae or select from Excel's wide range of built-in functions. You can generate charts in a variety of formats from data in an Excel spreadsheet, and your chart will automatically update when you change your spreadsheet data. Excel also provides the tools for simple database-style work with lists, but Access offers much more sophisticated tools for handling and querying databases.

This document sets out to provide the information which is most commonly needed by people who are using Excel in an academic or office context. It assumes that you are familiar with the Windows interface, and with basics such as opening and saving files. You'll find it much easier to learn Excel if you are acquainted with using Word before moving on to spreadsheet work. Microsoft have designed all the Office applications so that they are as similar as possible. Common menu items will be found in the same place; text and data are for the most part edited, cut and pasted in the same way.

These instructions are based on the Excel 2002 user interface. Excel 2003 is identical as far as the features described here are concerned. If you have an earlier version, for most purposes there are no compelling reasons to upgrade to Excel 2003 if you already have Excel 97,2000 or 2002 on your home computer. Files can be moved between all versions of Excel from 97-2003 without conversion.

Where things are different in the Excel 97 and 2002/3 versions, this is flagged in the course of the document. Margin notes are used to highlight significant Excel 97 differences. Excel 2000 is like 97 in some respects and like 2002 in others.

☑ **Excel 2002/3 files can be moved to and from Excel 97 or 2000 *without* requiring any conversion**, but if you have used any features which were new to Excel 2002/3 they will not be honoured when you open the file in earlier versions.

Basic operations

● **Load Excel**.
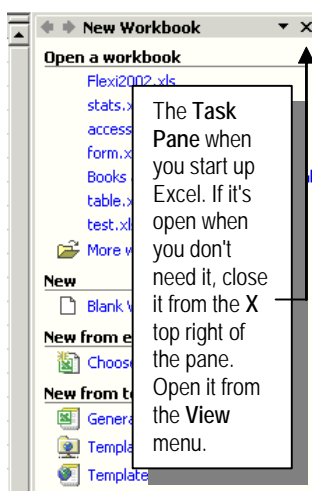
When Excel has loaded, it automatically opens a new **workbook**, with a **worksheet** open ready for you to use. In Excel 2002/3, you'll also see that the **Task Pane** has opened at the right of the screen. This was a much-proclaimed new feature in the 2002 versions of Microsoft Office software. But in Excel, it only has limited functions. Close it, and the worksheet view will expand to the full size of the Excel window.

The **Task Pane** when you start up Excel. If it's open when you don't need it, close it from the **X** top right of the pane. Open it from the **View** menu.

Any Excel file is a workbook. Think of this as an "electronic ring binder" where related worksheets are filed together. The worksheet is like a massive piece of paper where you can set out your work. You can have different spreadsheets and charts on different w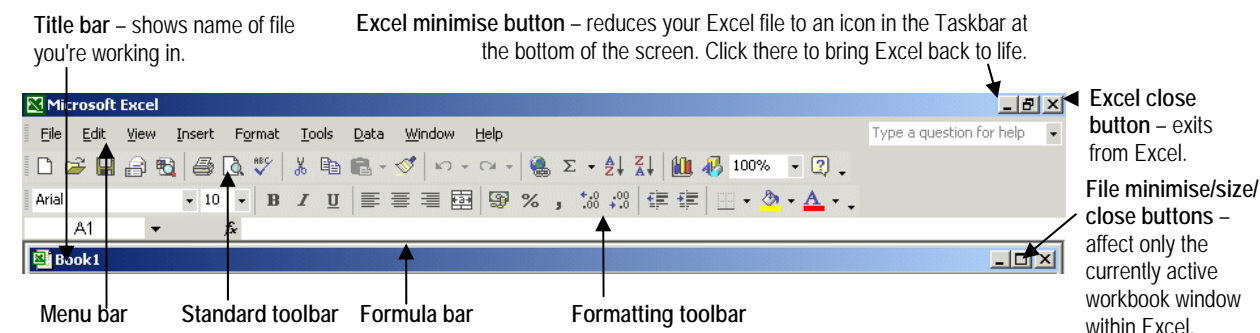orksheets or on different parts of the same worksheet, as you prefer. You only see a small part of the available worksheet area on screen.

● Familiarise yourself with the **menu**, **toolbar**, and **window** controls at the **top** of the screen. *On your own computer*, the toolbars you see may not be exactly as illustrated below – they can be *customised* to suit different users' preferences.

Title bar – shows name of file you're working in.

Excel minimise button – reduces your Excel file to an icon in the Taskbar at the bottom of the screen. Click there to bring Excel back to life.

Excel close button – exits from Excel.

File minimise/size/close buttons – affect only the currently active workbook window within Excel.

Menu bar   Standard toolbar   Formula bar   Formatting toolbar

● Move the cursor *slowly* over the toolbar buttons. A yellow **tool tips** box pops up to describe the function of the tool which the cursor is currently resting on.

● In Excel 2000-2003, there is a separate icon in the **Taskbar** at the bottom of the screen for each workbook you have open.
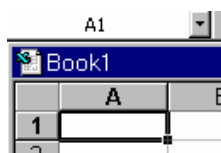
The worksheet is divided into **rows** and **columns**: each box formed by this grid is called a **cell**. To enter data in a cell, you **select** the cell by clicking in it. The **active cell** is the one you have currently selected. It will be surrounded by a thick black border. The **cell reference** consists of its column and row **address**: for instance, **A1**.
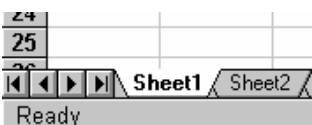
The **sheet tabs** at the bottom of the window let you move quickly from one worksheet to another within your current workbook. For easier reference, you can give each worksheet within your workbook file any name you want. Beneath this, the **status bar** often provides useful information relating to your current action.

Using Excel help
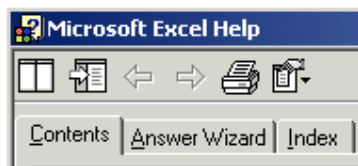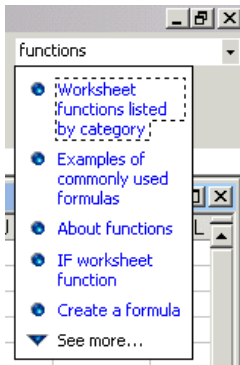
Excel 2002/3 has an **Ask a Question** box at the top right of the screen.

1. Type a question - or just a keyword - into the box, then press **enter**. A list of topics will appear.

2. Select a topic, and the **Excel Help window** will open, with information on the selected topic displayed. Click on any blue text to display further information about that sub-topic.

In earlier versions of Excel, use the Help menu to access this window.

3. Notice the three **tabs** at the top left of the Help window. **Answer Wizard** and **Index** provide two different ways in to the same help which is available from the Ask a Question box. Generally, it's quickest to use the Index if you're familiar with Excel terminology, whilst the Answer Wizard is more likely to locate the help you need when you don't know the jargon.

4. **Contents Help** offers tutorial-type help on specific topics. Click the Contents tab, then click the **+** symbol to expand the list.

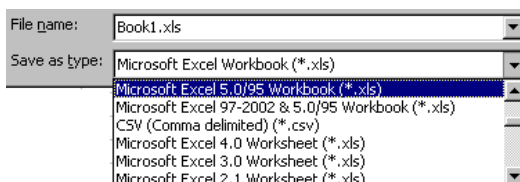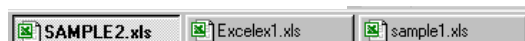## Managing your files

- **Save your file as soon as you start work.** An Excel file will automatically have the **extension** ".XLS" added to the name you give. Keep filenames short and meaningful.

- **Save your work every few minutes**. Otherwise, you run the risk of losing your work if the system crashes.

- **It's essential that you're clear about where you are saving your work to.** If you're working on a networked PC,, it's generally best to work from your network homespace. Most especially with large spreadsheets or spreadsheets containing a lot of charts, working from floppy disk, or a USB storage device with only limited space, should be avoided.

- **When a file has been created in other software**, its name may not be visible in the Open dialog box. To display the file: Under **Files of Type**, select **All Files** (*.*).

- **If you want to take a file to a different computer which runs a version of Excel earlier than Excel 97**, or other spreadsheet software, you must save in the correct format. In the **Save As** dialog box, click on the arrow to the right of **Save File as Type**, and select the format you want.

- **You can have more than one Excel file open at the same time.** In Excel 2000 and later versions, click on the **Taskbar** icons(bottom of the desktop) to move between them.

  It can be confusing to have multiple files open – always close files if you aren't using them.

"Windows in Taskbar" (below) were introduced in Office 2000. Excel 97: move between open files from the Excel **Window** menu.

Entering your Data

A Trial Run

- If cell **A1** isn't surrounded by a thick border, click in it to make it the **Active Cell**. Type in the following heading:
  `THE SIZE OF AN EXCEL WORKSHEET`

Accept or clear active cell entry   Formula Bar
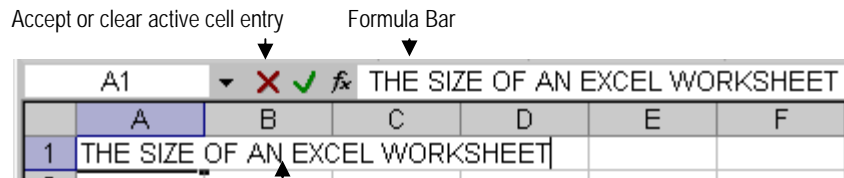
All of this text is contained in the Active Cell, even though on screen it overflows into the neighbouring cells.

- What you're typing will be displayed in the **Formula Bar** as well as in the Active Cell. Use the delete and backspace keys to correct mistakes as in a word processor.
- To accept your cell entry, either press Enter; use the tab key; or click the tick ☑ by the Formula Bar.

The Formula Bar displays the formula you have entered.

Once you've pressed Enter or clicked the Tick, the Active Cell displays the result of your formula.

Now type in the rest of this little table to look like the example on the left, but don't type anything in cell C6 yet.

- Use **tab**; the **arrow keys;** or click with the mouse, to go to the next cell you want to enter data in.

In cell **C6**, you need to enter a **formula** – you want Excel to calculate the number of rows multiplied by the number of columns. This is entered as: =C3*C4

- **Always** begin a formula with the = sign.
- Use * for multiplication, / for division. You can enter these characters, as well as numbers, either from the main keyboard or from the numbers pad on the right.

- In Excel 2002/3, you'll notice that any cells referred to in your formula appear with a coloured border. You can click and drag this border to another cell or cells, and your formula will update automatically to specify the new cell address.
- Press Enter or click on the tick ☑ to confirm your formula. Read the warning note in the margin!

You now know how many millions of cells are available in an Excel worksheet. But worksheets are much easier to handle if you keep to a fairly small area. If you have a lot of different but related items to include, arrange them on different worksheets within your workbook.

Undoing and redoing
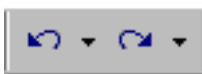
☑ **Don't forget how useful the Toolbar *Undo* and *Redo* buttons are in all Office software.** Excel lets you undo multiple actions, not just your last action.

Entering your data

Data Entry Shortcuts: the Auto-Fill feature

Excel does everything it can to make data entry as quick and easy as possible. Try one of Excel's nicest features to see how intelligent it can be.

Cell Handle

Autofill cursor

- Type into cell A10:   **MONDAY**

- If necessary, click in A10 to make it the active cell.

- Look at the bottom right corner of the active cell border. The little square box is called the **Cell Handle**. When the mouse cursor is moved over the Cell Handle, it changes shape to **+**

- While the mouse cursor is this shape, click with the left mouse button, then keep holding the mouse button down while you *drag* down over cells A11-A18. (Go further or not so far if you want.) Release the mouse button, and what you see should look like this picture. If it doesn't, try again.
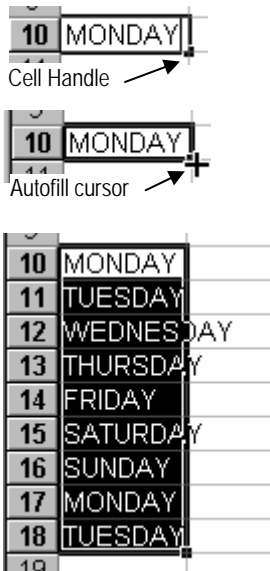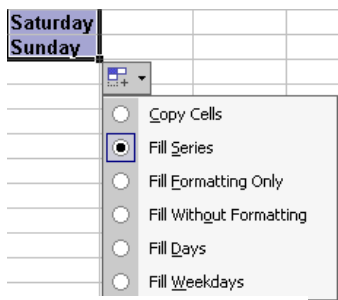
- Move into an empty area of your worksheet. Try using the Auto-Fill feature in the same way to enter months of the year instead of days of the week.

When you want to use Auto-Fill for a sequence of *numbers*, you will need to type in two (or more) "example cells" to show Excel the logical sequence you want.

- Move into an empty area of your worksheet. Type **1851** into a cell, then **1861** into the cell below.

- Click and drag over these cells to **select** both of them together. They will share a common cell border and cell handle, as shown.

- Drag on the cell handle to auto-fill the cells below these two dates. This should give you a column of ten-yearly intervals.

- Auto-Fill can work along rows as well as down columns. This time type the number 0 into a cell, then type 50 into the cell to the *right* of it. Select both cells, then Auto-fill by dragging the cell handle *across* instead of down.

In Excel 2002/3, the **Autofill Options Button** will appear whenever you use the Autofill feature. If what the Autofill has given you isn't what you wanted, click the arrow by the button to select from alternative options. The button disappears when you carry on working.

☑ **If you use Autofill with text that Excel doesn't recognise as the beginning of a series, your cell entry will be *copied* into all the cells you drag across.**

☑ **You can create custom Autofills for any text entries you need to use frequently.** You might do this for entering sets of row or column headings you commonly use. In Excel Online Help, use the *Answer Wizard* to search for *Custom Fill Series.* (*Word 97*: you'll find this from *Index Help*.)

Laying out and Formatting Data

Universal DO's and DON'Ts

☒ **Never split a single item of data between different cells.** It doesn't matter how long a heading is, for example – you can align and position the contents of the cell on the page exactly as you wish while still confining it to a single cell.

☑ **Concentrate first on getting your data entered correctly. Don't** get carried away at this stage with all the intricacies of formatting which are available in Excel.

☑ As you get more familiar with Excel, you will find that there are other ways of doing things as well as the ones described here. Experiment!

Creating an example Spreadsheet

● **Close** any workbooks you have open, and open a new file.

● **Save** it straight away – if you're following the example below, you might give the file a name like "Student_stats". Keep filenames as short as possible. (Generally it's a good habit to avoid spaces in filenames – they can cause problems in some contexts.)

If you want to learn by following an example, type in the student numbers data so that it looks exactly as it does below. Type in the data first, *then* improve the layout and formatting.

☑ **The instructions you need to add formatting to your spreadsheet as shown below are on the next page.**

Type the whole main heading into cell A1. *After* formatting the whole of column A as you require for your row headings, come back to adjust the heading format, then select cells A1:D1 and *centre the heading across* them.

Leaving a blank row between a main heading and the data is fine, but *don't* leave blank rows within the body of your data.

Increase the *height* of row 4 to give some extra space after the column headings.

Left align column A and format *bold italic*. Do this *before* formatting the main spreadsheet heading. Otherwise, you'll lose the heading formatting if you then apply different settings to the whole of column A.

	A	B	C	D
1	STUDENT NUMBERS			
2				
3	*YEAR*	*TOTAL*	*WOMEN*	*MATURE*
4	*1991*	18680	7876	9262
5	*1992*	20275	8722	10253
6	*1993*	19183	8038	9607
7	*1994*	21868	9267	11786
8	*1995*	21532	9186	13360
9	*1996*	22321	9858	14143
10	*1997*	22531	10289	15274
11				

Right align the column headings in B3:D3 to match the right alignment of the figures.

Adjust all columns to appropriate *widths*.

Column
address
bar

Row
address
bar

Select All button
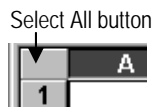
Select, then Do

The general rule when you want to format, change, move or use data is: **Select, then Do**. Selected items appear *highlighted* on screen, except for the active cell, which remains white even when selected.

- *To select just one cell*: simply **click** in it.
- *To select a range of cells*: **click and drag** over them.
- *To select an entire column or row*: click on the row number or column letter in the **address bar**.
- *To select non-adjacent cells*: hold down the **Control** key (bottom left of keyboard) while you click each one.
- *To select everything in the worksheet*: click the **Select All button** in the top left corner of the address bars.

Column and heading alignment

Setting column alignment appropriately greatly improves appearance. Excel decides for you that numbers should be aligned right, and text should be aligned left. You'll often want to change this – in our example (page 8), the column headings look better aligned right.

- **Select** the cells you want to realign.
- Click on the appropriate **Toolbar button**.

To centre a main heading:

- Type the heading into a single cell.
- Click and drag to select the cells which you want your heading centred across. (Cells A1:D1 in our example.)
- Click on the **Merge and Centre** toolbar button.

Left
Align   Centre   Right
Align

Merge and Center

Adjusting column width and row height

Adjusting column width to suit your data will often be necessary. For instance, to change the width of column A:
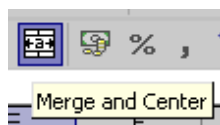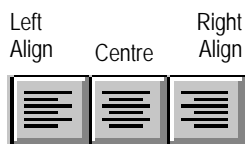
- Position your mouse cursor on the dividing line between A and B on the **column address bar**.

When the cursor changes to a *resize* symbol ("double arrow" shape):

- **Click and drag** until the column is the width you want.

You will often want to adjust a column's width after you have typed in data, to fit the longest entry. Excel can do this automatically:

- To autofit a *single column*: position the mouse cursor as above, then **double-click** when it changes to a resize symbol.
- To autofit *all columns*: **select** the columns, making sure that any main headings which you want running across multiple columns *aren't* included in the selection. From the **Format** menu, select **Column**, then **Autofit Selection**.
- To adjust *row height* – click and drag between address bars as for columns. **Select all** first if you want adjustments to apply to all rows in the spreadsheet.

Book1   Width 12.00
A   ↔   B

A tooltip will appear while you're dragging to show you what width you're setting.

✏ Help: my figures have disappeared!!
If your column isn't wide enough to fit any number contained in it, that number will be displayed as a set of hash symbols:
########
When you adjust column width, the figures will be displayed properly again.

Deleting, copying, inserting and moving cells

To apply the most commonly used "cut and paste" commands, you can use the Edit menu or the Toolbar, as in Word. It's also worth being aware that you can use the **right mouse button** to access the editing and formatting commands you're most likely to need.

Deleting data
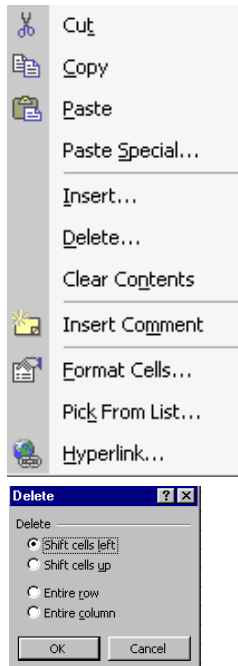
- *To clear the contents* of a cell or cells and leave them empty: **select**, then press the **keyboard Delete key**. If you enter new data into this cell, any formatting which you had previously set on the cell (bold, number format etc.) will be retained.
- *Where you want cells and not just their contents to be deleted:***Select**, then click on the **right** mouse button. A **shortcut menu** should now appear. It may not be quite the same as the example: some menu items are *context-sensitive*.

Note the difference in **Cut**, **Delete** and **Clear Contents**:

- **Cut** in Excel is mainly used to *move* cells. See the next page.
- **Delete** deletes full rows, columns, or selected cells, and moves the adjacent cells on the worksheet up or across into the vacated space. When you choose Delete from the menu, the *Delete dialog box* will pop up. Select the option you want.
- **Clear Contents** blanks the selected cells, but leaves them in position – exactly like the keyboard delete key.

Copying cells

1. **Select** the cells you want to copy, then click the Toolbar **Copy** button. A shimmering box will appear around the selected cells.
2. Click in the cell where you want the top left item in your copied block to be placed.
3. Press Enter; or select **Paste** from the toolbar or right mouse shortcut menu. Press the **Escape** key to cancel your action.
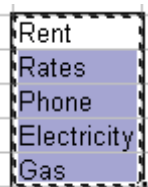
The shimmering box shows that Excel is waiting for you to specify where you want the selected data copied to.

Using the Office Clipboard (Excel 2002/3)

In all Office 2002/3 software, up to 24 items you have cut or copied can be stored at one time. The contents of the Office Clipboard are accessed from the **Clipboard Task Pane**.

The icon appears in the System Tray as soon as you have copied an item in any Office 2002/2003 software.

- To display the Task Pane: double-click the **Office Clipboard icon** in the **System Tray** at the bottom right of the desktop.
- To paste an item from the Clipboard Task Pane to your spreadsheet: single-click on it.
- You can use the Clipboard to copy and paste items between any Office software files you have open.
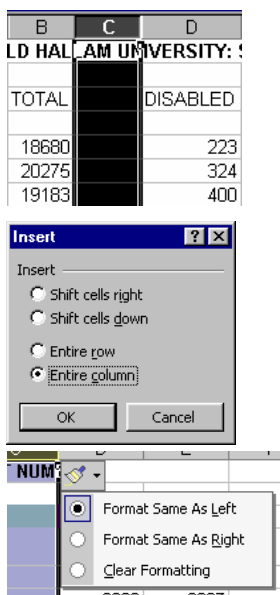
Inserting cells, rows and columns

Sometimes you'll want to insert extra cells *within* an existing row or column – for example, if you've accidentally omitted an item when entering data, and need to add it in. On other occasions, you'll want to insert a full row or column, as in the illustration. When you insert cells, they will be placed *above* or to the *left* of the selected cells.

- Click with the **right** mouse button in the cell below or right of where you want a new cell or cells inserted. Select **Insert** from the shortcut menu which appears.

- Make the appropriate choices in the *Insert dialog box*. and OK. In Excel 2002/3, an **Insert Options Button** will now appear next to the inserted cells. If the cell formatting isn't as you want, click the button arrow to select alternatives. Otherwise, carry on working and the button will go away.

Shortcut to insert a full row or column:

- Click with the **right** mouse button on the **address** of the row below, or column to the right, of where you want the new one. This will select the row or column and bring up the shortcut menu at the same time. When you select **Insert** from the shortcut menu, a new row or column will automatically be inserted without needing to use a dialog box.

Moving cells

☑ **If you want to move cells to a new position within your spreadsheet without replacing existing data, you'll first have to make the space to receive the data by *inserting* cells as described above.**

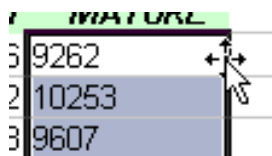To move cells short distances, it's easiest to use **drag and drop.**

- **Select** the cells you want to move, then point the mouse cursor at the *border* of the selection – it will change from a white cross to a **move cursor**, as illustrated. (If you're using this document with Excel 97 or 2000, see the accompanying note.)

- **Click and drag** to move the selected cells to their new position.

- *If you're using more than one worksheet in your workbook* and want to move cells between them: hold down the **Alt** key while you drag. Drag over the worksheet tabs until the one you want is highlighted, then drop at the position you want.

Drag and drop will only work when the cursor changes to the move shape, as illustrated. (Note: the shape of the Excel move cursor was changed in the 2002 version to conform to the standard move tool used widely in Windows software. In earlier versions, you'll just see a white arrow.)

Drag and drop can be difficult if you're moving cells a long way across your worksheet – if so:

- **Select** the cells you want to move. On the toolbar, click the **Cut** button. *Or* right-click with the mouse to select and bring up the shortcut menu all in one go, and choose Cut from there.

- Now follow the same procedures as when copying (page 10) to **paste** the selected cells to a different position.

Using multiple worksheets

It's often useful to organise your data on different **worksheets** within the same workbook file. For example, if you wanted to keep month-by-month accounts for the whole year in a single workbook, you could use one worksheet for each month. By setting up one worksheet to use as a template, you can easily apply consistent layout and formatting between worksheets.

A new Excel file opens with three worksheets available. You can name and rename worksheets as you want; insert more worksheets; and shuffle around their order as you require. All this is done by clicking on the **worksheet tabs** at the bottom of the Excel window.

Naming worksheets

By default, worksheets are named Sheet 1, Sheet 2 etc. To supply names of your own:

1. **Double-click** on the tab for the worksheet you want to rename.

2. The name currently on the worksheet tab will be highlighted, waiting for you to type in your replacement.
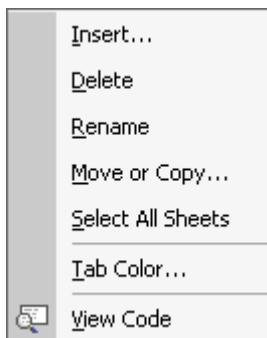
Deleting, inserting and reordering worksheets

- *To delete a worksheet*: with the right mouse button, click the worksheet tab, then select **Delete** from the shortcut menu.

- *To insert a worksheet*: With the **right** mouse button, click on the worksheet tab to the *right* of where you want a new one inserted. Select **Insert** from the shortcut menu.

When you insert a new worksheet, it will be placed *before* the one currently selected. This is annoying if you want a new worksheet after all your existing ones: you will need to reorder worksheets.

- **Click** on the tab for the worksheet you want to reposition.

- **Click and drag** the tab to its new position. The black arrow above the tabs shows where the worksheet will be inserted.

Viewing multiple worksheets

- In the **Window** menu, click on **New Window**.
- Return to the **Window** menu, and select **Arrange**. Select your arrange option. If you have more than one workbook file open but want to view only the worksheets within the active one, make sure **Windows of active workbook** is checked.
- Add extra new windows for as many worksheets as you want to view simultaneously.
- Select a different worksheet to view in each of your windows. Move, copy, paste etc. between them as required.

Laying out and Formatting Data

Changing your data's appearance

There are many things you can do in Excel to make your spreadsheet fit elegantly on the page. Headings can be set to run vertically; text can be "wrapped" to the column width. You can choose from a variety of number formats; and change your typeface or type size.

Simple character formatting

Select All button

All Microsoft Office software is designed to be as similar as possible. Simple character formatting is done from the toolbar just as in Word.

- If you want to change the typeface and/or size of *all* your data: use the **Select All** button and make these changes *before* formatting any headings differently.

- *To change font colour*: select the cells. In the **toolbar**, click the arrow by the **font colour** tool, and choose your colour.

- *To give cells a coloured fill*: select the cells. In the toolbar, click the arrow by the **fill** tool, and choose your colour.

✓ **Arial Narrow** is often a good choice of typeface for a spreadsheet, because of its compactness.

✓ **10** pt is a good size for numbers to be legible but not too large.

✓ **If you're moving files between computers**, it's wise to stick to standard typefaces to avoid formatting changes if the typeface you have specified isn't available. Arial and Times are available on any computer running Windows.

The **Format Cells** dialog box (see below) gives access to more sophisticated control over formatting text as well as numbers.

Formatting numbers

Currency Commas

Percent Decrease/increase decimal places

There are a variety of ways you may want to format numbers: with or without currency signs, decimal places, commas between 1,000s and so on. The commonest number formatting types can be applied to selected cells straight from the **toolbar**. These *aren't* on/off buttons – to reverse their effects, **Undo** straight away or Format Cells as below.
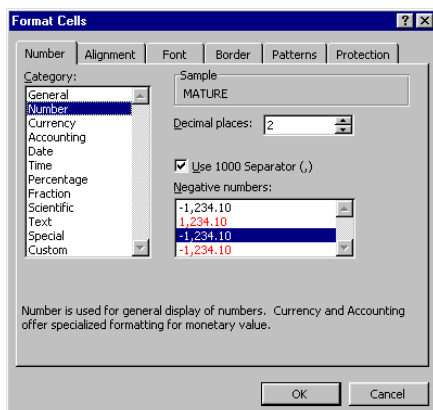
A much wider range of formatting options is available from the **Format Cells** dialog box than from the toolbar:

- **Select** the cells you want to format, then **right-click**.

- In the Shortcut menu, select **Format Cells**.

The Format Cells Dialog box will open. Make sure the **Number** tab is selected, and browse through the available formats and settings to find what you want.

Alignment: text wrap and orientation

☑ **When you set wrap or orientation, settings will be applied to cells containing numbers as well as cells containing text. Make sure you haven't selected entire columns when you only want the heading cells running vertically or at an angle.**

- **Select** the cells you want to format, then **right-click** on the mouse. Click **Format Cells** in the shortcut menu.
- In the Format cells box, click the **Alignment** tab.
- Click the **Wrap Text** checkbox if you want text in the selected cells to wrap to column width.
- Change the **Orientation** setting if you want cell contents to run vertically or at an angle. Click and drag on the red marker or set the angle from the Degrees Box. Set at 90°, text or numbers will run *upwards*; set at -90°, they will run *downwards*.

Adding borders and patterns

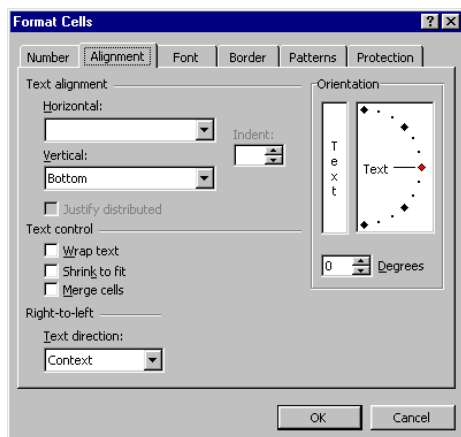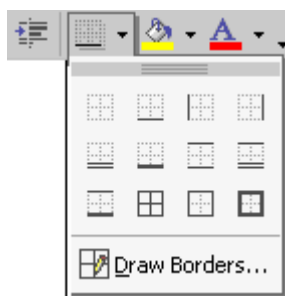By default, the grey gridlines you see on screen *won't* print out. You can change this by specifying *show gridlines* when you print (page 30). For a wider choice of border options:

- Select the cells, then click the arrow by the toolbar **Borders** button. Make your choice from the selection that pops up.

Patterns and shading can be added from the **Patterns** tab in the **Format Cells** dialog box (see above). From the **Borders** tab, you get control over line width that isn't available from the toolbar button.
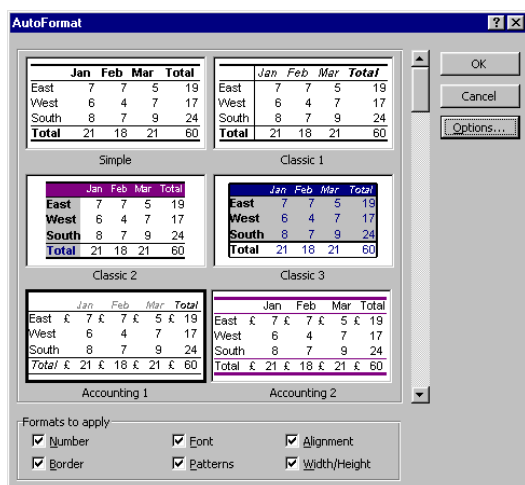
Using AutoFormat

- **Select** the spreadsheet area you want formatted.
- Select **Format** from the Menu Bar, then **AutoFormat**. Use the scroll bar to view the full range of styles available. Use the **Undo** button straight away if you decide you don't like the effects of the AutoFormatting.

You can "pick and choose" which elements of an autoformat you want to use:

- In the **AutoFormat** box, click on **Options**.
- Set the **Formats to Apply** checkboxes as required.

💣 **Warning:** "Not enough memory" problems may arise when using AutoFormat. This is especially likely if there are charts within the worksheet area you have selected for formatting.

Laying out and Formatting Data

Formulae and Functions

This section gives you enough information to carry out basic operations such as calculating sums, percentages and averages. It doesn't cover specialist tasks in any depth.

Functions are built-in formulae designed to make your work simpler and faster. A few of these – SUM and AVERAGE in particular – are useful to almost everybody. Many more functions are available for specialist use.

A simple example: SUM

You can use **Autosum** (page 16) or **Insert Function** (page 17) to do this, but it's useful to know how to set up a function from scratch.

- Type in a column of around half a dozen numbers.
- Click in the cell directly below these numbers to make it the Active Cell. This is where you want the result of your formula to appear.

Now you're ready to try out the SUM function. Note:

- As with all formulae, begin with the = sign.
- A function begins with the function **name** (in this case, SUM), followed by its **arguments**, contained in **parentheses**. You need to be familiar with the jargon, but don't be put off by it. "Parentheses" are brackets, and "arguments" are the data which the function is to work on. Another key word is **syntax** – the structuring rules which must be obeyed so that the function makes sense to Excel. In Excel 2002/3, the correct syntax is displayed under the formula bar as soon as you type a function name, as illustrated below.

In this case, the function has just one argument: the **range** of cells you want to add up. To specify a range:

The sum function can be used with *any* set of numbers or cell addresses, not just cell ranges – for example SUM(A2, B5, C7)

- Type in the left bracket after the function name, then enter the first and last cell address to be included, with a colon : between the two.
  Or: On the worksheet, **select** the required range of cells. A shimmering line will appear around them. In Excel 2002/3, a coloured border will also appear round the cells. This can be moved or resized to modify the range of cells specified in your formula.
- When the range is correct, add the closing bracket.
- Press **Enter** or click on the **tick** in the Formula Bar, and the calculation is made.

☑ **Once you have finished entering your formula, what you will see in the cell is the *result*, not the formula itself.** See page 18 if you want your spreadsheet to display the formulae instead of the resulting data.
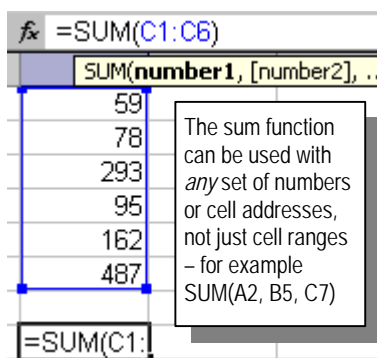
The AutoSum shortcut

People want to total rows or columns of figures so often that Excel provides a toolbar button for you:

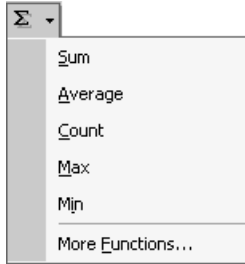- Click to place your Active Cell beneath a column of numbers, or to the right of a row of numbers. In the **Toolbar**, click on the **AutoSum** tool.
- A shimmering line will appear around the cells which Excel assumes you would like added up. Click and drag with the mouse to alter this range if necessary. When the required range is selected, press Enter.

Excel 2002/3 provides quick access to other commonly used functions from the Autosum tool. Click on the tool's pick arrow to select these.

If you want more control over the range of cells to be summed, highlight the required range *before* clicking on AutoSum. You can sum a *group* of rows or columns if you want.

Using AutoFill with formulae and functions

All the columns or rows in your spreadsheet may need the same action applied to them: for instance, totalling or averaging. Use AutoFill (see page 7) to avoid having to enter formulae individually to apply to each row or column. Cell references will be automatically adjusted as Autofill copies the formula into adjacent cells.
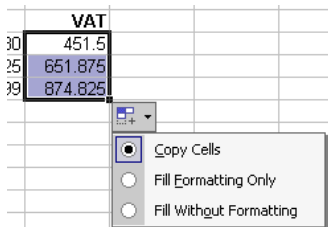
In Excel 2002/3, an **Options Button** appears whenever you use Autofill. See page 5. When you're using Autofill with formulae, you won't normally want to change from the default Copy Cells option. Ignore the button and it will go away when you carry on working. Or, press the Escape key to get rid of it.

Relative and Absolute cell references

When you use Autofill to copy a formula, it uses *relative cell references*. They are automatically adjusted for each row or column – for instance, when a reference to cell A1 is copied to the next cell across using autofill, it will refer to B1. Sometimes, though, you will want a cell reference to remain constant within a formula. For example, you may have a cell on your spreadsheet where the current chargeable rate of VAT is specified, and you always want your formulae to refer to this specific cell. This requires an *absolute* cell reference.

The row and/or column address of a cell reference is made absolute when a dollar sign **$** is placed in front of it, as you see in the Formula Bar here. Cell **B1**, where the current VAT rate is stored, is referred to as **B1**. If you use Autofill to copy a formula from a cell where a reference has been specified as absolute, this will carry through to all cells covered by the Autofill.

To quickly change cell references within a formula from relative to absolute: in the Formula Bar, highlight the cell reference you want to change, then press F4. This will add in the $ sign. If more than one cell reference is highlighted, pressing F4 further times will cycle through all possible combinations of relative and absolute references.

Formulae and Functions

More about Formulae

☑ **As in algebra, you use brackets (parentheses) to make Excel *evaluate* your formula in a particular order**. So if you need to use any but the simplest formulae, you must understand why

$$= (A1+A2)*B1$$

gives you a different result from:

$$= A1 + (A2*B1)$$

☑ **Always make sure that every bracket has its matching pair!**

☑ **If you are getting unexpected results, try working out a simple example by hand.**

☑ **It can be helpful to split complex formulae between two or more cells - this makes tracking errors easier.**

Two other *arithmetic operators* are available as well as the standard add (+), subtract(-), multiply(*) and divide(/):

- **percent** (%)

  Use with multiply or divide. To calculate 30% of the number in cell A1, the formula would be: $= A1*30\%$
  To calculate cell A1 as a percentage of cell A2, the formula would be: $= A1/A2\%$

- **raise to the power of – ** exponentiation (^)

  Use Shift-6 on the keyboard for the exponentiation symbol ^ .

Specialist functions

> In **Excel 97**, the capabilities now described as *Insert Function* were referred to as *Paste Function*. The standard toolbar included a Paste Function tool for quick access.

Excel 2002 introduced slightly different ways from previous versions of accessing specialist functions. To use a specialist function, or if you want to browse through the functions available:

- From the **Insert** menu, select **Function**.
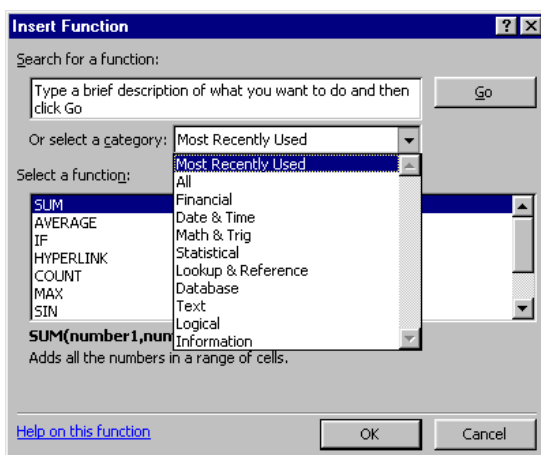
The *Insert Function box* will appear.

- Select the function type you want from the **Function Category** list, then select your function from the list. Information about the function is displayed at the bottom of the box.

If you choose the **Most Recently Used** Function Category, you'll find the most commonly used functions, including average, mimimum, maximum etc. (If you have Excel on your own computer, this list will automatically expand to include the functions which you use most commonly.)

IF Statements

`fx =IF(B12<500,500-B12,0`
`B  IF(logical_test, [value_if_true], [value_if_false])`

12	Total	£ 382.00
13		
14	Efficiency bonus	£ 118.00

You will often want to make a calculation on data held in your spreadsheet only if certain conditions apply to it. In the example, the company director pays an efficiency bonus if staff manage to keep their overheads to less than £500 a year. Total overheads are given in cell B12. The amount to be paid will be £500 less the total overheads incurred. Nothing is paid if overheads total £500 or more. The IF statement formula generates the value for cell B14.

IF statements are always structured as follows:

=IF(condition,value if condition true,value if false)

The *condition* in the example is "B12 is less than 500"; *value if true* is "500 minus B12"; *value if false* is zero.

> The useful syntax tip which is displayed as you type in your IF statement is a new feature in Excel 2002. Once you've entered your final bracket, the tip disappears.

☑ **Always make sure that the brackets and the comma separators are positioned correctly in your IF statement. And don't forget that, like all formulae, an IF statement must begin with an = sign.**

☑ **Excel *Contents help* provides extensive information about creating and correcting formulae of all kinds.** In Excel 2002/3, it's under *Creating and Correcting formulas*.

Displaying Formulae

By default, the *results* of your formulae will be displayed in the spreadsheet cells, rather than the formulae themselves. You'll only be able to see formulae one at a time in the formula bar, when the cell to which it applies is active. It can often be useful to view all the formulae you're using on a spreadsheet at the same time.

To quickly toggle between viewing formulae and data:

- On the keyboard, press **Ctrl + `**
  (` is the grave accent key – top left of keyboard below Escape.)
- Press the same keyboard combination to return to data view.

For some purposes, you may want to change settings so that by default you view the formulae in your worksheet.

Window options
☐ Page breaks
☑ Formulas
☑ Gridlines

- From the **Tools** menu, select **Options**. The *Options dialog box* will appear. Click on the **View** tab. Under **Window options**, click in the checkbox by **Formulas**.
- Return to the Options box and switch the Formulas checkbox off again when you want to return to viewing the data.

☑ **The Options box is where you go to change a number of important Excel settings.** On your own computer, changes made from here will remain in force until you change them again. On centrally-administered networked computers, standard settings may be restored every time Excel is loaded.

Formulae and Functions
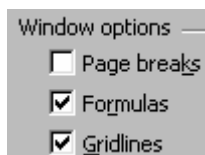
Organising data in lists

A **list** is Excel's word for a humble kind of database. Excel provides database-type features which can be used to order or **sort** data; and to extract or **filter** sets of data which meet particular **criteria**. **Beware** of treating the wrong kind of data as a list – for example, you could create havoc with a set of accounts by applying a sort.

Designing your List

Field names

	A	B	C	D	E	F	G
1	**LASTNAME**	**FIRSTNAME**	**AGE**	**ADDRESS**	**TOWN/CITY**	**COUNTY**	**PHONE**
2	Parker	Anna	45	Lees Hall, Norton Lees	Sheffield	Yorks	2560954
3	Blythe	William	72	Bishops House, Meersbrook	Sheffield	Yorks	2585503
4	Barten	Maria	38	Plague Cottage	Eyam	Derbys	97-9355
5	Stanniforth	Kate	54	The Old Washhouse, Priory Lane	Worksop	Notts	83-1536
6	Tempest	George	20	256 Artisan View, Heeley	Sheffield	Yorks	2580099
7							

Records

Above is a sample list. It is made up of a collection of **Records**, each held in a row of the Excel worksheet. Within the records, the data is systematically organised into **Fields**: thought always needs to be given to how this organisation should be done, for the particular set of data you are working with. Each field has a **Field Name**: keep these as short as possible, but *meaningful*.

☑ **Think in advance about how you might want to *sort* the data in your list.**

Consider this advice in relation to the sample. It's important that you should appreciate why it's a good idea to divide people's names into separate Lastname and Firstname fields. (Rather than having one Name field and entering names as "Anna Parker" and so on.)

Entering data into a list

There are two ways of entering data into your database list:

1. Exactly as you would enter data into a spreadsheet. There is no fundamental difference between a spreadsheet and a list.

2. By using Excel's **Form** facility, from the **Data** menu. This allows you to enter data in what can be an easier way, with one record displayed at a time. See page 20.

For most purposes entering data in the usual spreadsheet way has no disadvantages. But where your list includes a large number of columns and involves a lot of scrolling across to enter data, you may find that using a form is better. Forms also provide an easy way to filter out records that meet specific conditions, or *criteria*; but if you want to view these filtered records all together in a table rather than one-by-one, you need to apply a filter from the menu instead. See the following pages.

Setting up lists: Do's and Don'ts

Problems most commonly arise with lists because people haven't been careful enough at the data entry stage.

☑ **Keep each list you create on its own separate worksheet.** See page 12. Otherwise, Excel may become confused over what data items you want to be treated as part of a specific list, and what you don't.

☒ **Don't leave *any* blank rows in your list – not even below column headings**. When you sort, the blanks will end up all clustered together. If you use forms, they will completely screw up. Adjust row height to give extra space between records – see page 9.

☒ **Any spaces accidentally included at the beginning of a field entry will mess up attempts to order or extract data**. It's essential when entering any data you want to sort, that you should do so carefully and consistently.

☑ All of Excel's formatting capabilities are used in just the same way with lists as with any other spreadsheet data.

Using forms to enter data

Excel refers to a row of headings as a *header row.*

	A	B	C
1	LASTNAME	FIRSTNAME	AGE
2	Parker	Anna	45

Before you can use a form, you need at least one sample row in your list. Excel will interpret what you want most satisfactorily if you have first set up your column headings in the top row of your list, set your column widths appropriately, and entered a sample record.

- **Click** anywhere in your list. Make sure you haven't got multiple cells selected – for instance an entire row or column. Things won't work properly if you have.

- From the **Data** menu, select **Form**.

What you now see should look like the illustration.

- Click on **New** to add another record to your list.

- Use the **Tab** key, or click with the mouse, to move between fields.

- Use the **Scroll Bar**, or **Find Previous** and **Find Next**, to move through your records.

- Click on **Criteria** to filter out records meeting specific conditions. In the illustration, criteria have been set to pick out all entries whose age is less than 50 and who live in Sheffield.

☑ **Excel provides plentiful online help for learning about its list handling features.** In Excel 2002/3, type *Lists* in the Ask a Question box. In Excel 97, from Help *Contents*, select *Managing Lists.*

Sorting data

On many occasions, *sorting* is the quickest and simplest way to cluster together the data you're looking for: it often isn't necessary to worry about setting filters. You can use these tools with any data, not just database-type lists, but sorting isn't appropriate for all types of data. For a simple ascending or descending sort on one field:

- Click anywhere within the column you want to sort on, and click the **Sort Ascending** or **Sort Descending button**.

You may want to include a "sort within a sort". If you had numerous Smiths in a list of names, you would like them sorted by Last name, and within that by First name.

- Click on **Data** in the Menu Bar, then **Sort**.

The *Sort dialog box* will now appear. In our example, you would select Lastname under **Sort By**, and Firstname under **Then By**. To specify the fields you want to sort by:

- Click on the arrow next to the *Sort By* box, then select the name of the field you want. Set Ascending or Descending order as required. Do the same thing in the *Then By* boxes.

- Make sure **My list has** is correctly set for Header row/No header row. If your top row is formatted differently from your data, Excel will automatically assume it's a header row.

Filtering data
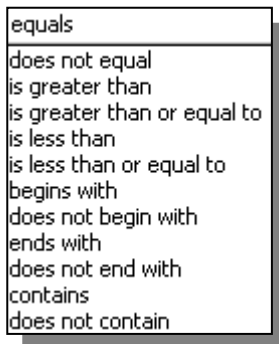
Use the **Autofilter** feature to display only records from a worksheet which meet a specific set of conditions, or **criteria** – for instance, all the sales made by one salesman. *Operators* you can use include those listed on the left. In addition to the standard "equals", "greater than" and so on, "begins with", "ends with" and "contains" operators are available. All operators can be used with either number or text data.
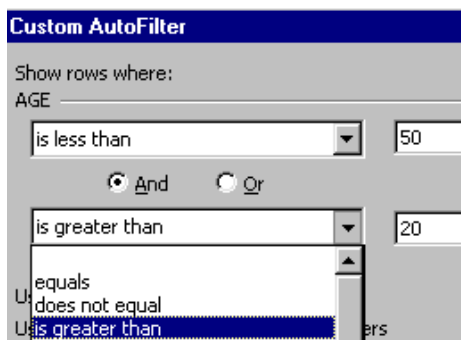
1. Click anywhere within your list.

2. From the **Data** menu, select **Filter**, then **AutoFilter**.

Picklist arrows will appear by the top of each column.

3. Click the arrow by the field you want to filter on.

The picklist will show all the different values which have been entered in that field.

4. Select **Custom** if you want to use "greater than", "less than" etc. The example is set to filter records where Age is less than 50 and greater than 20.

5. *If you want to create a chart from a filtered list*, **copy** the filtered data to another worksheet or another area of the current worksheet, and select it for charting from there.

6. *To show all your records again:* from the **Data** menu select Filter, then **Show All**.

Creating Charts in Excel

This section explains how to create charts using Excel's **Chart Wizard** tool. The example data used here is the *student stats* spreadsheet – if you want to follow these guidelines using this data, see page 9.

☑ Before you click the Chart Wizard tool, you should always **stop and think. The Wizard can't do its job properly without your help.**

☑ **Plan out clearly what you want your chart to look like** – this will help you to make the appropriate selections from Chart Wizard. If your choices are inappropriate, it's quite possible to produce a chart which looks good but means little or nothing.

☑ **Most charting problems arise because Excel can't make sense of the data you have selected from your spreadsheet.** Be careful that you select the correct data from your spreadsheet for Chart Wizard to work with – *all* the required data, and *only* the required data.

Basic concepts

Chart Wizard needs two things to do its job properly:

● **Numbers** for plotting. These will be contained in one or more rows or columns of your spreadsheet. Each row or column of numbers for plotting is known as a **data series**.

● **Text** (or numbers to be treated as text) for labels or "legends" – the text which appears along the axis, and/or in a chart key.

YEAR	TOTAL	WOMEN	MATURE
1991			
1992	In our example, we will want Chart Wizard to		
1993	use the **column** headings for **legend text**,		
1994	and the **row headings** as category (x)axis		
1995	labels.		

Usually, the column headings (the *first row*) of your selected data will contain the names of your data series, and will be used for the chart *legend*. The row headings (*first column*) will contain the labels for the x-axis - these are known as *category labels*. Chart Wizard will let you switch this round, if you want; or treat the first row and/or column as data instead of labels.

☑ Excel will *automatically* generate the values needed for the **y-axis** (*value labels*), from the range of numbers in your data.

☒ If a row or column which you want to use as category labels consists of data which Excel thinks of as numbers rather than text, Chart Wizard may get in a muddle. In the example, this is going to happen because we want to use the *Year* column as category axis labels, not as a data series. See the next page.

1. Plan where to place your chart

Once you've created your chart, you'll be able to scale its size exactly as you want. You can place a chart on the same worksheet as your data – for instance, below or alongside it. Or, you can keep charts on separate worksheets within your worksheet book. Either way, your chart will be automatically updated if the data changes. If you plan to put charts alongside the data, if necessary rearrange any other data before you start so that the space is ready to receive it.

2. Select your data for charting

Chart Wizard works on the rows or columns which **you** select for charting. Bear in mind the following rules:

☒ **If there's a heading at the top of your spreadsheet, *don't* select it as part of the data for plotting**. Chart Wizard will prompt you to type in a title for your chart.

☒ **Don't select blank rows or columns.** Chart Wizard will treat the blanks as data for plotting, and you will not get a satisfactory chart.

☑ **Make sure** the columns you select all extend over the same set of rows; and that the rows you select all extend over the same set of columns, as in the example below.

☑ **If you want a row or column of *numbers* to be used as legends or axis labels and not as data to be plotted**, be prepared for some extra work so the Wizard understands what you want.

In the example data, we'll want to use the Year column as category (x-axis) labels. One possible workaround, as illustrated below, is simply to avoid using pure numbers for row or column headings. In this case, editing the *Year* column so it reads 1991/2, 1993/4 etc. ensures that it won't be treated as a data series. Alternatively, take action at Step 2 of the Chart Wizard process - see the next page.

| YEAR	TOTAL	WOMEN	MATURE
1991/2	18680	7876	9,262.00
1992/3	20275	8722	10,253.00
1993/4	19183	8038	9,607.00
1994/5	21868	9267	11,786.00
1995/6	21532	9186	13,360.00
1996/7	22321	9858	14,143.00
1997/8	22531	10289	15,274.00

● **To select non-adjacent rows or columns**: keep the **Ctrl** key (bottom left or right of keyboard) held down while you click and drag over the areas you want to select.

● Try this out by selecting the data for a chart to show the proportion of mature students at Sheffield Hallam University 1991-1997.

What you have highlighted for charting should look like the illustration. Don't be confused if the first cell of the last group you highlighted doesn't look as if it has been selected.

3. Conjure up your Chart

- Check you have **selected** your data correctly (page 23).
- In the **Toolbar**, click on the **Chart Wizard** tool.

Chart Wizard Step 1
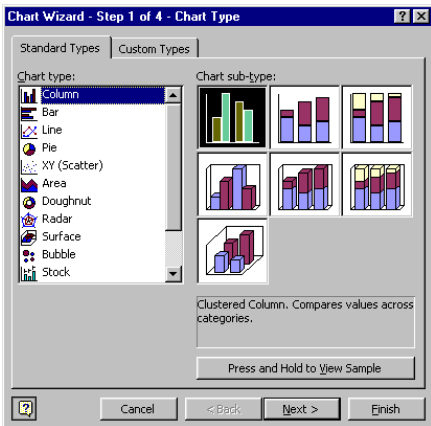
- Select the **Chart type** you want.

From the many chart types to choose from, only one or two are likely to be appropriate for your particular data. For numerical or scientific line graphs, "XY Scatter" may be a better choice than "Line". The Line type won't use variable x axis values.

- Select the **Chart sub-type** you want. Read the description which appears at the bottom for the highlighted item. Be clear about the differences – for instance, between *stacked* and *clustered* columns.

3-D graphs are excellent for giving a quick visual impression, but may be hard to interpret for "heavyweight" scientific data.

- **Click "Press and hold to view sample**".

What you see now in the sub-type window should chart the data as you want. Check that the correct data has been charted, but don't worry at this stage if the axis labels or legends aren't formatted as you want, or if the chart looks completely the wrong shape.

- If you realise you've selected your data incorrectly, you may find it easiest to **Cancel** and start again. Alternatively, carry on and reselect your data at Step 2.
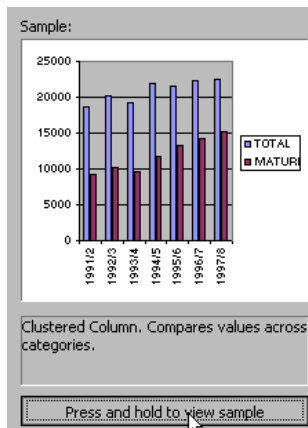
Chart Wizard Step 2
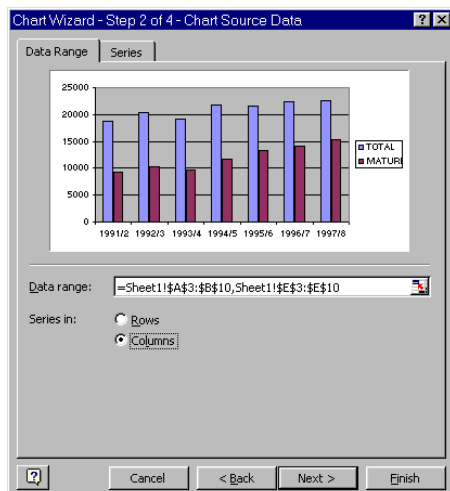
- To make changes to the data range selected: click on the red arrow by the **Data range** box. Reselect your data, then click the red arrow again to return to the Wizard.
- Click on the **Series** tab to see exactly how Excel is using your data. If the Wizard hasn't interpreted correctly which rows or columns are data series, and which are category axis labels, you will need to make changes from here. Click on the red arrow by **Category (X) axis labels**, select the required data, then click the red arrow again to return to the Wizard. *Note*: if the row or column containing this data has a heading cell (*Year* in our example) make sure that this cell *isn't* selected. You will also need to **remove** this data range from the **series** picklist.

Chart Wizard Step 3

This is where you set a variety of chart options.
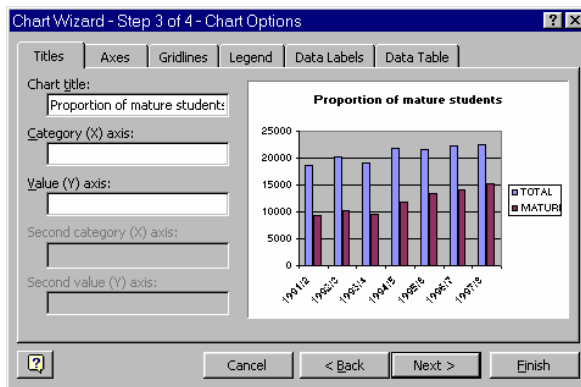
- Add a **title** for your chart. Don't worry if it isn't positioned correctly, or is too large or small – you can alter this later.

- Click on the other chart options tabs to see what you can alter. From **Legend**, you can change the positioning of your legend in relation to the chart. Click **Data Labels** if you want to show values in figures on your chart; **Data Table** if you want to display the chart data in table form underneath it.
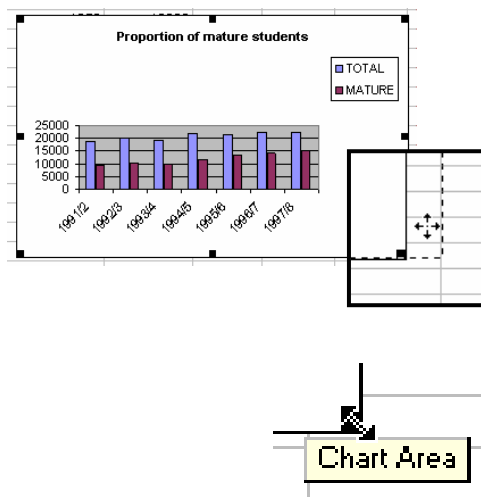
Chart Wizard Step 4
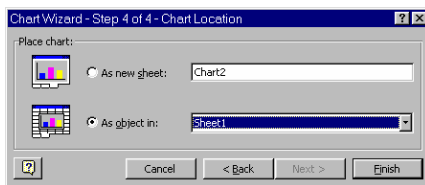
Specify whether to put your chart on its own separate worksheet within the workbook, or as an object in the current worksheet. See page 23.

- Make your choice, then click on **Finish**.

Your chart will now appear. In Excel 2002/3, the **Chart Toolbar** will also pop up - see page 26.

Moving and resizing your chart

- To **move** your chart: move the mouse cursor until it's over a blank area of the chart. Check that the yellow tool tip box which appears says **Chart Area**, otherwise your actions will only apply to a specific object within the chart. **Click and drag** to move – when you start dragging, the cursor will change to a move symbol, as illustrated.

- To **resize** your chart: click in a blank area of the chart to select the whole chart area. Small black **handles** will appear at the corners of the chart area. Move the mouse over a *corner* handle until it's a two-way arrow shape, then click and drag. If you click and drag on *side* handles, the chart will be stretched or shrunk in that direction. When you do this, axis labels etc. will be automatically reformatted to best suit the new size.

- *Within* your chart, you can independently move and resize title, legend and plot area in the same way.

Changing Chart Data


X-axis labels have updated automatically

To edit your chart title: just click within it and type as usual. You *can't* do this with legends or axis labels –these values are supplied by their related data cells on the spreadsheet.
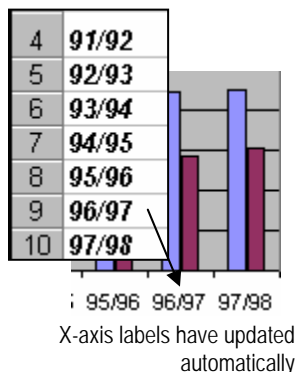
Your chart is actively **linked** to the data it was created from. As soon as you correct or change *any* data contained in the cells selected for charting, the chart will be updated automatically. In our example, you might decide that your x-axis labels would look better if you changed your row headings to "91/92" instead of "1991/92", and so on.

- Click to make cell A4 the active cell. Change so it reads 91/92, and treat cells A5 – A10 similarly.
- Look at the chart again. The x-axis labels have been updated.
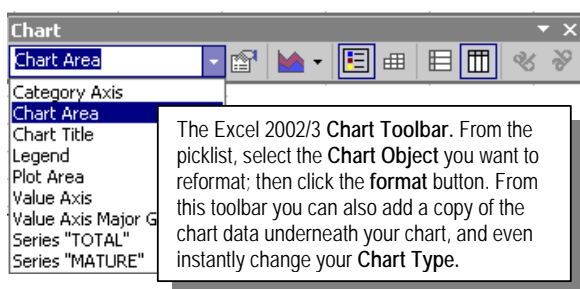
Adding a data series to your chart
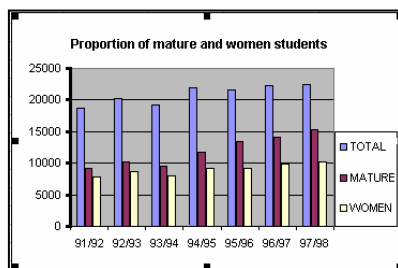
After you have created a chart, you can **instantly add data series**, without having to repeat the whole Chart Wizard process. In the example, you might want to change the chart to show numbers of women as well as mature students.

- **Select** the data you want to add to the chart.
- Move the mouse over the border of the selected cells until its shape changes to a **move cursor** (see page 11), then **drag and drop** into the chart. Magic!

Deleting a data series from your chart

- In your chart, **single-click** anywhere on the data series you want to delete to select it. Press the **Delete** key. The data from which the chart was generated will not be affected.

Formatting chart objects

The Excel 2002/3 Chart Toolbar. From the picklist, select the Chart Object you want to reformat; then click the format button. From this toolbar you can also add a copy of the chart data underneath your chart, and even instantly change your Chart Type.

The different components which make up a chart – Title, Legend, Axis, Data Series and so on – are referred to in Excel as **chart objects**. You may want to make formatting changes to any of these objects. In Excel 2002/3, this can be done from the **Chart Toolbar**. It should pop up whenever a chart is selected. If not: from the **View** menu, select **Toolbars**, then **Chart**.
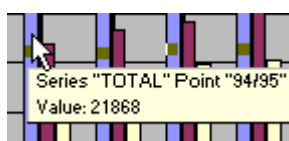
*In Excel 97/2000*, **double-click** on any chart object to open the relevant formatting dialog box; or **right-click** on it, then select the Format option from the shortcut menu. These methods can also still be used in 2002/3: double-clicking is often quicker than using the Chart Toolbar. Keep your eye on the yellow *tool tips* box to ensure that the selected chart object is the one you want to change.

Using the chart formatting dialog boxes
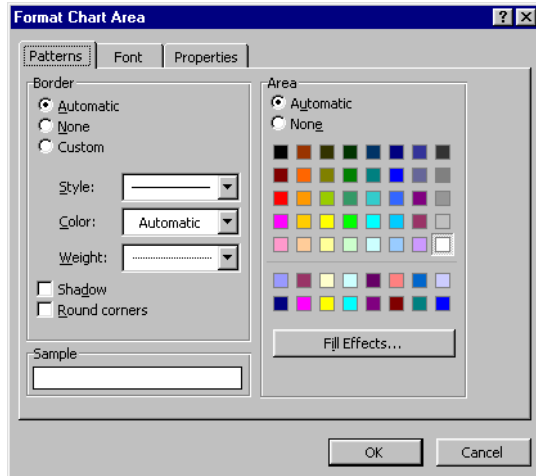
- Select the chart object you want to reformat and open the formatting dialog box as described on the previous page. The options available from the dialog box will vary depending on the type of object you have selected.

- The **Format Chart Area** dialog box is illustrated, with the **Patterns** tab selected. From here, the colour or fill effects you select will be applied to the chart's background area. Changes you make from the **Font** tab will be applied globally to *all* chart objects. To change font style or size for a *specific* chart object (for example title, axis or legend): *select* the object before you double-click so the appropriate dialog box opens.

Formatting data series
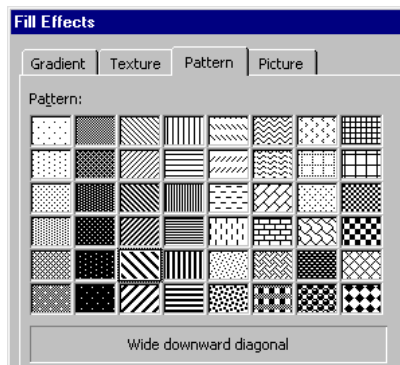
- Double-click on one of your data series to open the **Format Data Series** dialog box. You will need to repeat the process for each of the series in your chart.

- **Patterns** are especially useful for applying to data series when you're printing on a black-and-white printer. From the **Patterns** tab, select **Fill Effects**, then **Pattern**. Notice that if you want, you can even use pictures as a fill – but if you do, you may find things run very slowly!

- Other items available from the Format Data Series dialog box can be very useful. From the **Data Labels** tab, you can select settings to print the actual figures as labels on your data series. **Series order** lets you switch around the order of the data series as they appear on your chart. From **options**, you can specify overlap and gap width between columns, or make similar kinds of adjustment to other types of chart.

Formatting axis lines and text
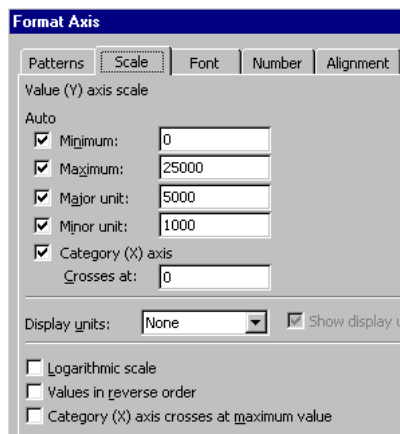
Excel refers to the two axes of a chart as *category* (usually the x-axis, running across) and *value* (usually the y-axis, running up). You must format each axis separately.

- From **Patterns**, set the weight and style of the axis line.

- From **Scale**, set the units used on the axis. If, for instance, Excel has chosen units of 100 on the y-axis and you want units of 50 instead, change it from here.

- From **Number**, set any special formatting you want. For instance, you might want £ signs on your axis numbers.

- From **Alignment**, change the orientation of your axis labels – they can run at any angle you want.

Viewing and Printing your work

Zooming
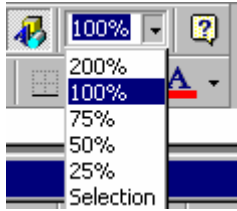
While you're working, you can view your spreadsheet at whatever magnification is convenient to you. Zooming has no effect on how your work looks when it's printed.

- In the **Toolbar**, click the arrow by the **Zoom** box.

It's often useful to select the area you want to view, and then choose the **Selection** zoom – this will fit the whole area selected onto the screen. At a low magnification, note that screen display may not be accurate.

Printing Do's and Don'ts

☑ **You don't have to worry too much about the size of the printed page while you're working on an Excel worksheet**: Excel will let you **scale** your spreadsheet to fit the printed page. However, it's best to use type sizes which mean that drastic scaling isn't required.

☑ **Don't print until you have followed the steps below.**
1. If more than one **printer** is available, select the one you want *before* previewing - change from **File | Print**.
2. **If you want to print only part of a worksheet, Set Print Area** before previewing. See below.
3. **Always check thoroughly in Print Preview** before printing. This is important - unless you have made appropriate Page Break and Page Setup choices, you may find that columns are split across two pages, rather than all fitting within one page.

Selecting part of a worksheet for printing

- If you want a single **chart** to occupy a full page, select just the chart, and this will be what Excel gives you automatically. Go straight to Print Preview – see the next page.

For any other selection:

- **Select** the area of the worksheet which you want to print. This can include any mixture of charts and data, provided that they are adjacent and can be selected "all in one".
- From the **File** menu, select **Print Area**, then choose **Set Print Area**.
- Return to the Print Area menu item to **Clear** the Print Area when you have finished printing the required selection.

Using Print Preview

☑ **Always use Excel's Print Preview facility to check your selection, layout and formatting before sending your work to the printer.**
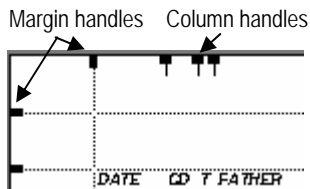
- If you want to print only a *selection* from your worksheet area, follow the instructions in the previous section first.

- From the **File** menu, select **Print Preview** (or click the **Toolbar** button).

What you see on screen will be the first page of your printout.

- Check the page looks as you expect. Look at the bottom left of the preview window to check that the printout will consist only of the number of pages you anticipated. If columns or rows are overflowing onto extra pages, you'll need to use Page Setup to switch page *orientation* and/or *scale to fit*.

- Look at the controls at the top of the preview window:

Next | Previous | Zoom | Print... | Setup... | Margins | Page Break Preview | Close | Help
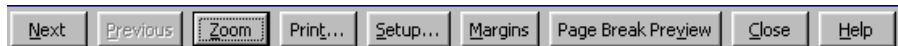
- Use **Next** and **Previous** to move between pages. (You can also do this with the Scroll bar on the right of the window.)

- **Zoom** takes you between a whole-page view, and homing in on a particular area. Click while the mouse cursor is a magnifying glass shape to "home in", and click again to return to the whole page view.

- The **Print** button takes you straight into the Print dialog box – make sure you've got everything as you want first.

- **Setup** opens the Page Setup dialog box. See the next page.

- Click on the **Margins** button if you want to alter these from Print Preview. When the black margin handles are visible, click and drag to reposition them. Note that you can change column widths from here too. Changes you make to margin and column settings from Print Preview will apply to all the pages in a multi-page printout.

- Use **Page Break Preview** to alter where rows and columns break across pages. Excel will automatically apply scaling as necessary once you have done this. **Click and drag** on the blue dashed lines to make your changes. Use the **View** menu if you want to switch back from here to normal spreadsheet view.

- The **Close** button returns you from Print Preview to the normal editing mode. If you have been using Page Break Preview, a **Normal View** button will have appeared when you return to print preview. Use *instead of* Close to return to normal editing mode.

Preview: Page 1 of 2

Always check that total number of pages is as you expect.

Margin handles   Column handles

DATE   CD T FATHER

ROSE SUSAN
FRITH ALICE
MAWER JAMES
MALAM RICHARD
BLYTHE ROBERT
PARKER JOHN
BROWNELL ELIZABETH
PADLEY DOROTHY
BARNES EDWARD
WILLYE ELIZABETH
POYNTON CHRISTOPHE

Page Setup

In Excel, Page Setup dictates how your spreadsheet will look printed out, not how it looks on screen. You can *scale* to fit the printed page; change *orientation* to print *portrait* (the usual tall and thin) or *landscape* (short and wide); print with or without *gridlines* showing round each cell; set margins from here; and include Headers and/or Footers (including file name and page numbers) on every sheet.
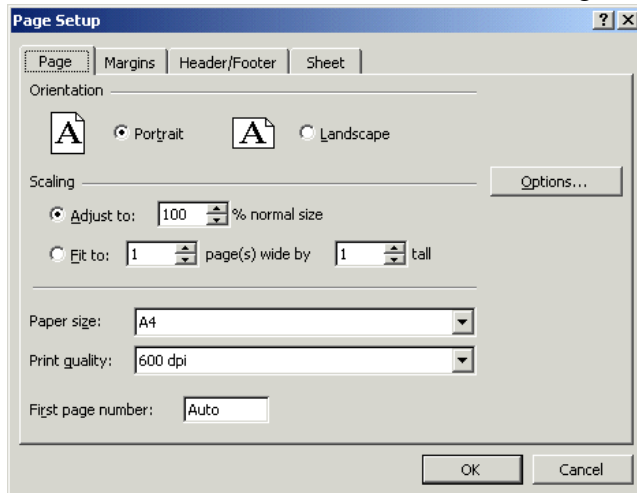
- In the Print Preview toolbar, click the **Setup** button. Alternatively, you can make changes *before* previewing: from the **File** menu, select **Page Setup**.

- Click the **Page** tab to change *Orientation* and *Paper size*. Paper size must correspond to what the printer uses. You can *Scale* so that your work prints at whatever % you want of its actual size. *Fit To* is very often useful to scale down your work so that it will fit exactly to the paper size being printed on. If you want page numbers starting other than at 1, enter the required starting number in the *First Page Number* box.

- From the **Margins** tab, *Centre on Page* is a useful option. If you want to change the positioning of headers and footers in relation to the page, you also do this from here. You may prefer to alter the margins themselves from Print Preview: it's much easier to see what the effect will be.

- Click the **Header/Footer** tab if you want to add page numbers or any other information on every page. Excel offers you a range of preset ways to combine page number and filename information in your headers and footers – click on the arrow by the Header or Footer box to choose from the picklist. You can add your own **Custom** Headers and Footers if you wish.

- From the **Sheet** tab, the setting you'll most often want to change is *Print Gridlines* – the default is usually set so that gridlines don't print, but you'll often want them. If you check *Row and Column Headings*, cell reference numbers will be printed – any headings you've added within the worksheet *will* print *without* this option being checked.
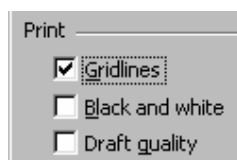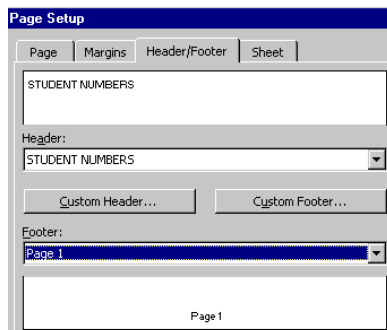
Printing

- In **Print Preview** mode, click on the **Print** button to open the Print box. You can set number of copies, and the range of pages you want printed, from here. With a multi-page job, it's always a good idea to print out just one page first to check. If you use the toolbar Print button when you *aren't* in Preview mode, a single copy of all pages will be sent straight to the printer – you won't be able to specify anything different.

Importing, exporting, copying & pasting

Copying and pasting between Excel and Word

Data can easily be transferred as a table from Excel into Word.

- In Excel, **select** the cells you want to copy, and click the **Copy** button on the toolbar. *Don't* be tempted to press Escape to get rid of the shimmering lines which appear – you won't be able to paste if you do.

- Switch to Word, and paste. Your spreadsheet data will now appear as a Word table. You may need to adjust column widths and text alignment. The **Table** menu **Autofit** capabilities are useful.

Pasting a Word table into Excel is equally simple. **Charts** need handling a little more carefully.

Word 97/2000: To paste a chart as a picture: **don't use the Paste button**. From the **Edit** menu, select **Paste Special**, then choose **Picture** format.

- Before copying, resize your chart to roughly the size you want.

- **In Word 2002/3,** by default your chart will be pasted into Word as a bitmap *picture*. This avoids the risks of unexpected changes in the formatting of the chart which may arise if it is pasted as an editable Excel object.

Transferring data to and from Access

Pasting data from Access into Excel is straightforward. When you paste data from Excel into Access, Access will automatically set up a new table within this database and place the data within it. Rename this new table as you wish, and open it in the usual way.

Incorporating pictures in an Excel worksheet

You can use Microsoft's drawing tools to create drawings or diagrams on an Excel worksheet in just the same way as you can in Word.

- In the **Toolbar**, click the **Drawing** icon. The drawing toolbar will open at the bottom of the window.

- Drawing objects which you have created in Word should copy and paste into Excel without any problems.

You can include a company logo, or any other image saved in a *bitmap* format (for example .jpg, .gif, .bmp, .tif) on your worksheet. **Don't copy and paste bitmap images into Excel** – it may make your file many times larger than it needs to be.

- From the **Insert** menu, select **Picture**, then **From File**.

The companion document, *Making IT happen with MS Word,* includes guidance on using Office drawing tools, and on how to handle bitmap images in Office software.

Exporting spreadsheets in simple text format
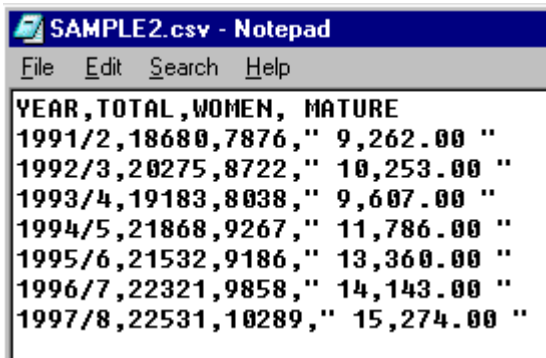
Above: The sample "Student Stats" data saved in CSV format and displayed in Notepad. Inverted commas have been added automatically around the column where numbers had been formatted with commas to separate thousands. This is to distinguish those commas from the ones which separate each cell.

Any simple numerical or text data which has been laid out in tabular format – whether it's a table in Word, a spreadsheet in Excel, or a database table in Access – can be saved in a *delimited* text format. This is an approach which is often used when any kind of table data needs to be saved in a format which can be understood by any text or data processing software running on any operating system. Cells are separated from one another by a specified character – usually a comma or a tab.

- Place the data you want to export on a separate worksheet.

- From **File | Save As**, select **Text (Tab delimited)** or **CSV** (Comma delimited – CSV is short for Comma Separated Values). You will be reminded that only the active sheet will be saved, and that some Excel features will not be compatible with this format. OK to carry on.

Table data saved from any software in any delimited format can be imported into Excel.

- From **File | Open**, set **Files of Type** to **All Files**. You will now see all files listed regardless of their file extension – select your file.

- If Excel isn't completely clear about the file format, a **Text Import Wizard** will appear to guide you through the necessary choices.

Saving data as HTML

You can convert all or part of an Excel worksheet, including charts, into html format so that it can be displayed on Web pages:

- If you want just a part of your data saved in html format, **select** it first. From the **File** menu, select **Save as Web Page**. Make sure that you click the **Selection** button if you don't want the entire file to be converted.

Excel 97: "*Save as HTML*" calls up an *Internet Assistant Wizard*. Office XP (2002) software introduced significant changes in html capabilities. Excel 2000 comes somewhere between the two.

Any charts you have included will be converted into GIF bitmap files, and placed in a folder with the same name as your html file. This can be a useful way of converting charts to image files, even if your reason for wanting to do this isn't for use in Web pages!

Be cautious when you save as html from any Microsoft Office software – your html files will be unnecessarily large, and may not view correctly on all browsers. For serious Website production, save your spreadsheet from Excel as **tab-delimited text**, then import into Dreamweaver using the **import tabular data** option.

Importing, exporting, copying and pasting

References and Further Reading

Companion documents to this one include:

Making IT happen with MS Word

Making IT happen with MS Access

If you've understood how to use the features described here, you should be able to learn for yourself from online help about Excel's other capabilities which haven't been covered. Features which you may want to investigate include:

- *"What if" analysis:* Excel offers a variety of statistical analysis tools, including *data table*, *scenarios*, *goal seek*, and *solver*.
- *Validating cell entries*: especially important if you're designing a spreadsheet for others to enter data in.
- *Data summaries and analysis*: use a *pivot table* and/or Excel's *outline tools* for this.
- *Consolidating data from multiple tables*.
- *Worksheet protection*.
- *Saving display and print settings* as *views* for future use.
- Creating *macros* for automating tasks.

DOCUMENT CROSS-REFERENCE TO EUROPEAN COMPUTER DRIVING LICENCE (ECDL) SYLLABUS

The ECDL is an internationally accepted certificate of computing competence. The purpose of the table below is to set out what ECDL Database module requirements are; and to indicate how the content of this document maps to these requirements. **This document can be used as a supplement to ECDL learning materials, but not as a replacement**. You need experience in traffic before you can pass a driving test; in the same way you'll need practical experience of working with a fairly substantial spreadsheet. Items are marked with an asterisk * where this is particularly important to bear in mind.

ECDL "Getting started" basics which are the same in any Windows software are not repeated in this document. Some topics are covered in greater depth here than is required by the ECDL syllabus. This applies particularly to using formulae and functions, and to Excel's list-handling capabilities.

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