# Microsoft Excel 2003

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# Microsoft Excel Tutorials

## Excel Spreadsheets

In this section of the course, you're going to learn what spreadsheets are, and what they can do. You'll get a first glimpse of the Microsoft Excel software, and how it works. You'll also learn about cell coordinates, rows and columns, and how to enter data into a cell. So, let's make a start.

## What is a Spreadsheet?

A spreadsheet is a piece of software for handling and manipulating numbers. You can write numbers down on a piece of paper and add them up. Like this:

**23**
**12**
**10**
**45** =

But that's not a spreadsheet. However, if you bought Microsoft Excel and entered the same numbers into the software, you'd have a spreadsheet. The best part about a spreadsheet is - you don't have to do any adding up yourself! The programme will add the numbers up for you.

A spreadsheet doesn't only add up, of course. It can do a whole lot more besides simple arithmetic. It can handle financial calculations, statistical information, and do complex trigonometry. And it can make a pretty graph for you.

At it's heart, though, a spreadsheet is just a glorified calculator. The main point of using a spreadsheet is do some number crunching. The software will puzzle out the answers to sums for you, and save you a lot of time and effort carrying sevens and trying to remember what eight multiplied by six is.

## Why do I need a Spreadsheet?

There are many reasons why you might need a spreadsheet. Here are few different scenarios:

### Scenario 1 - Personal Investments

You have bought shares in a few different companies and want to keep track of how well, or badly, they are doing. You could enter these values in a spreadsheet:

**MyShare:** Share1
**Price Paid:** 0.25
**Number Held:** 1000
**Total Cost**: £250
**Value Now**: 0.35
**Worth Now**: £350
**Profit/Loss**: +£100

The spreadsheet would do all the sums for you. All you have to do is enter the correct formulas. In the spreadsheet above, if we changed the number in the "Value Now" box, the "Worth Now" box and the "Profit/Loss" box will automatically be updated. That way you could see at a glance how well your shares

are doing.

## Scenario 2 - Personal Finances

We only have a limited amount of money coming into the house each month. The problem is, that money seems to be disappearing pretty fast. If would be nice if we could keep track of where it's all going. A spreadsheet could help us. We could enter the data like this:

**Monthly Income:** £1500

**Gas:** 25
**Electricity:** 20
**Phone:** 35
**HP:** 250
**Food**: 350
**Mortgage:** 425
**Car:** 130

**Total:** £1235
**Leftover:** £265

Of course, we could do all that on a piece of paper. But entering the data into a spreadsheet gives us better control. We could change one value, that massive food bill, and see how much we had left over if we didn't spend so much money on food. Once the formulas are entered, the other figures would be updated automatically.

So there we have two simple scenarios where a spreadsheet might come in handy. Of course, they can be used, and often are, in a business situation. If you want to keep track of things like stock and profit margins, then spreadsheets are very useful indeed. In fact, spreadsheets are useful in a wide range of situations, both business and non-business.

We'll now move on, and get our first glimpse of Microsoft Excel.

Launch and Explore Excel -->

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# Launching and Exploring Excel

To launch Microsoft Excel, do the following:

1. Click on the Start button in the bottom left hand corner of your computer screen
2. A menu pops up
3. Move your mouse up to Programs
4. A sub menu appears
5. Move your mouse to Microsoft Excel
6. When Excel is highlighted, click once with your left mouse button

When you have clicked on Microsoft Excel, the software will load. When it is finished you will be looking at the main Excel screen. It will look like the picture on the next page. If you've never seen spreadsheet software, it can seem quite daunting at first. But don't worry: we'll break it down.

The main Excel screen then looks like this one:

**Excel Main Screen (Opens in new window 67KB)**

It is a fairly daunting piece of software, at first glance. To break it down, let's start with all those numbers and letters.

## Grid Coordinates

Right across the top of the spreadsheet you'll notice that there are some letters, A to L in the picture above. The letters are the columns. If you click on any of the letters with your left mouse button, you'll highlight an entire column. In the picture below, the letter B has been clicked on, thereby highlighting this entire column.
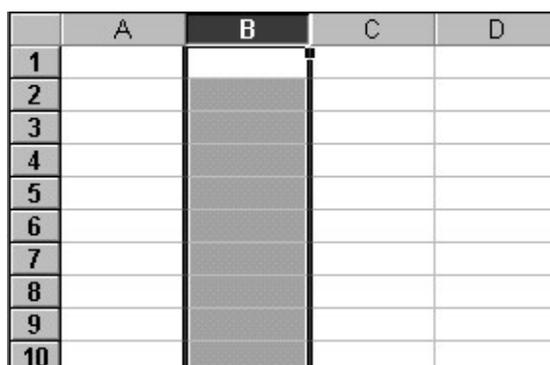


You can't change the letters. If you wanted to call column B "Column Two", for example, this would not be possible. You're stuck with the letters.

Running right down the left hand side of the spreadsheet are numbers. The numbers are the Rows. Click on any of the numbers to highlight an entire row. In the image below, the number 5 has been clicked on, thereby highlighting the entire Row.

In a spreadsheet, you combine a Column letter with a Row number. This gives you an individual Cell in the spreadsheet. For example, the B column plus Row 5 will give you an individual Cell of B5. Likewise, the D Column plus Row 6 will give you an individual Cell of D6.

To see this in action, click on any of the cells in the spreadsheet. In the two pictures below, the picture on the left shows a darker border around cell A1; in the picture on the right, the darker border is now around cell C3.
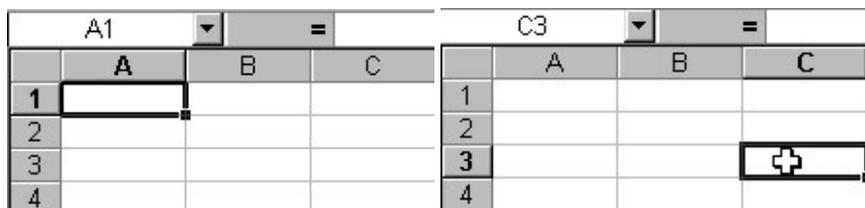


Notice two things: first that your mouse pointers turns into a white cross when it moves around the spreadsheet; second that the coordinates of the cell are displayed at the top left.

When we clicked inside cell C3 with the left mouse button we highlighted that cell. When we highlight a cell, it has the thicker black border around it. This means that it is the Active cell. The coordinates of the Active cell are displayed in the top left - in the Name Box.

When you enter text or numbers into a cell, you first have to make it the Active cell. In other words, you have to click on it to highlight the cell. (Another way to move around the cells in a spreadsheet is by pressing the arrow keys on your keyboard.)

Get some practice by clicking on individual cells in the spreadsheet. Notice the Name box, and how the Cell coordinates change whenever you click on a new cell.

Before moving on, make sure you understand how the Grid coordinates work in a spreadsheet. If you are asked to locate cell G4, for example, you should be able to do so quite easily.

In the next part, we'll see how to enter some text and some numbers into a cell.

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# Entering Data into a Spreadsheet

To begin this part of the course, we'll do something really simply: we'll enter some text and numbers into some cells. When we're finished, our spreadsheet will look like this:
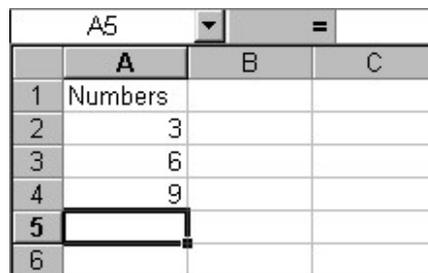


So, to enter something into a cell, do the following:

- Click on cell A1 with your left hand mouse button
- Type the text "Numbers" (without the quotation marks)
- Press the Return key on your keyboard
- The darker border will jump down one cell to A2
- Type a 3 and then press the Return Key on your keyboard
- The darker border will jump down one cell to A3
- Enter a 6 and a 9 in exactly the same way

When you're finished, your spreadsheet will look like the one in the image above.

The word "Numbers" was our heading. We're not going to do anything to the heading. It is there purely for our benefit, in order to serve as an explanation for what the numbers are.

Except "Numbers" is not very descriptive. Let's change it to something else. We'll change it to "Add these numbers".

## Editing data in a cell

When we wanted to enter some data in a cell, we simply clicked on an individual cell and started typing. But you can't edit the data in a cell using that method. If there is already something in a cell, and you tried to type something else, the old contents would be entirely erased. Try it for yourself.

- Click on the cell A1
- Type the letter "A" of "Add"
- The word "Numbers" is erased
- Click on Edit from the menu bar
- From the menu that drops down, click on "Undo Typing"
- The word "Numbers" will be restored

So how do you Edit the data in a cell? You have to do it from the Formula bar. The formula bar is the thin

white text area running right across the top of the spreadsheet. You can see it in the picture below:
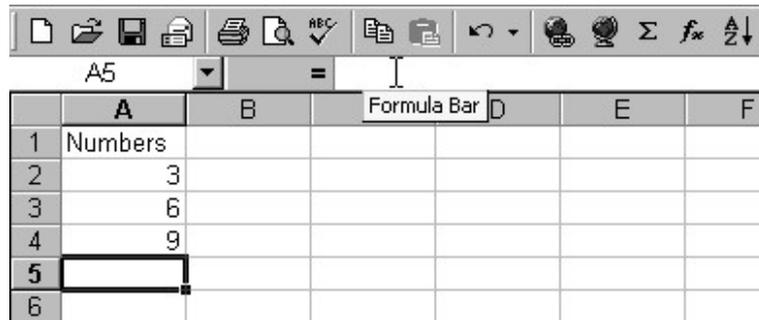
Notice where it says "Formula Bar". The thin white text area just above the label is the "Formula Bar". Notice, too, that there is some thin lines in the shape of an I. This is actually the mouse pointer. It has changed shape, and is now an I-bar.

Click on the cell A1. Then click inside the formula bar. You will see your cursor flashing away. The spreadsheet should now look like the one in the next picture.
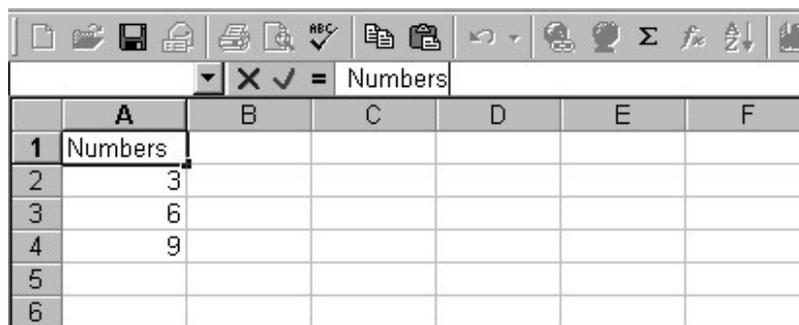
The formula bar is displaying the contents of cell A1. To edit the contents, you can use the backspace key on your keyboard to erase anything you don't want. And you can just type something new in the formula bar. When you've finished editing, press the Return key on your keyboard.

In the next image, the text "Numbers" has been changed to "Add these numbers". Make the changes on your own spreadsheet so that it look like the one below. Notice how the formula bar now reads "3" when the Return key is pressed. The cell A2 is showing in the Name Bar.
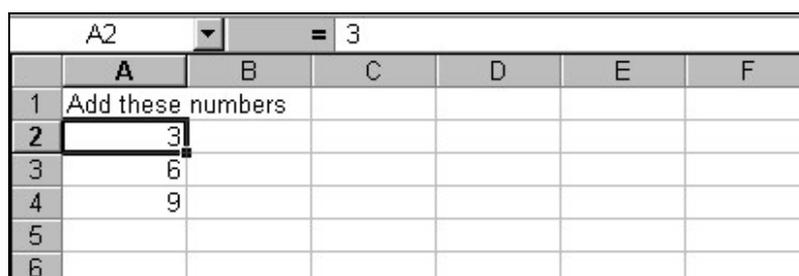
Except we now have a problem: The text is too big for the Cell. It is spilling over into the B column. We can solve that by widening the A column. This will be the subject of the next part.

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# Widen an Excel Column

To widen a column, do the following:

- Move your mouse pointer up to the letter A
- The pointer will be in the shape of a white cross, as in the next image
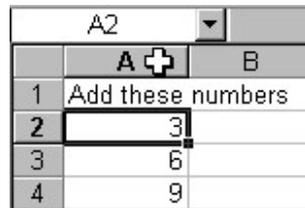


- Now move your mouse pointer, the white cross, to the line in between the A and the B
- The mouse pointer will change shape again
- The mouse pointer will be in the shape of a black cross with arrowheads, like the one in the image below:



- When you mouse pointer changes shape, hold down your left mouse button
- Keep it held down and drag your mouse to the right
- Let go of the mouse button when your are satisfied with the width of your colum

# Centring Data in an Excel Cell

If you are following along from the previous sections, you should now have a spreadsheets with cells highlighted. To centre the data in your four highlighted cells, do the following:

- Click on the word "Format" on the menu bar
- A menu drops down
- Click on the word "cells" with your left mouse button
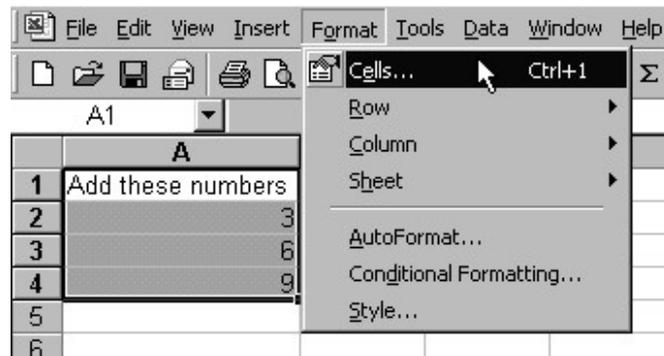


When you click on the word "Cells" from the menu bar, you get a dialogue box popping up. The one below:
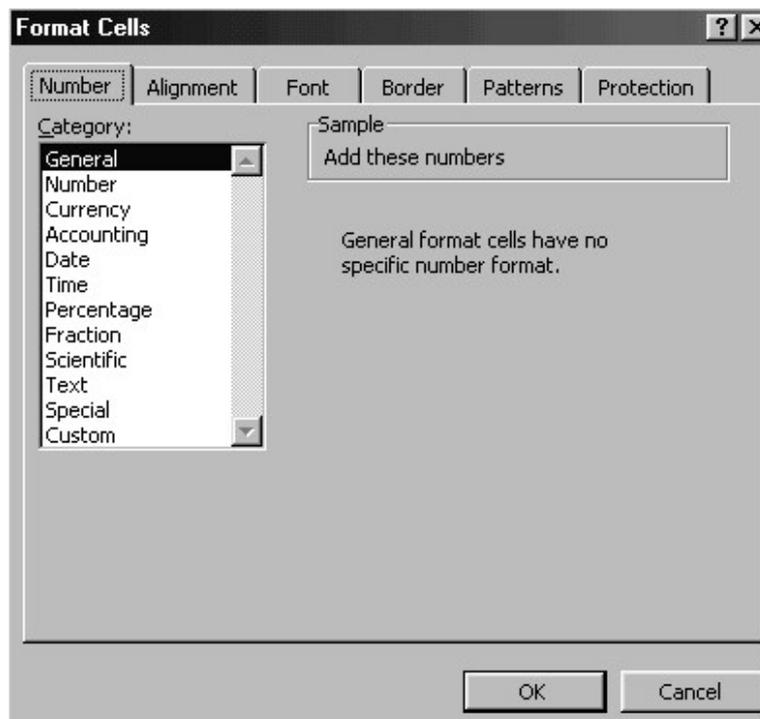


The words across the top (Number, Alignment, Font, etc) are the headings for Tab Strips. The Tab Strip that is showing is the Number tab strip. We'll meet this one a little later. We need the Alignment Tab Strip, however. So click on the word "Alignment". The dialogue box will change to the one below:
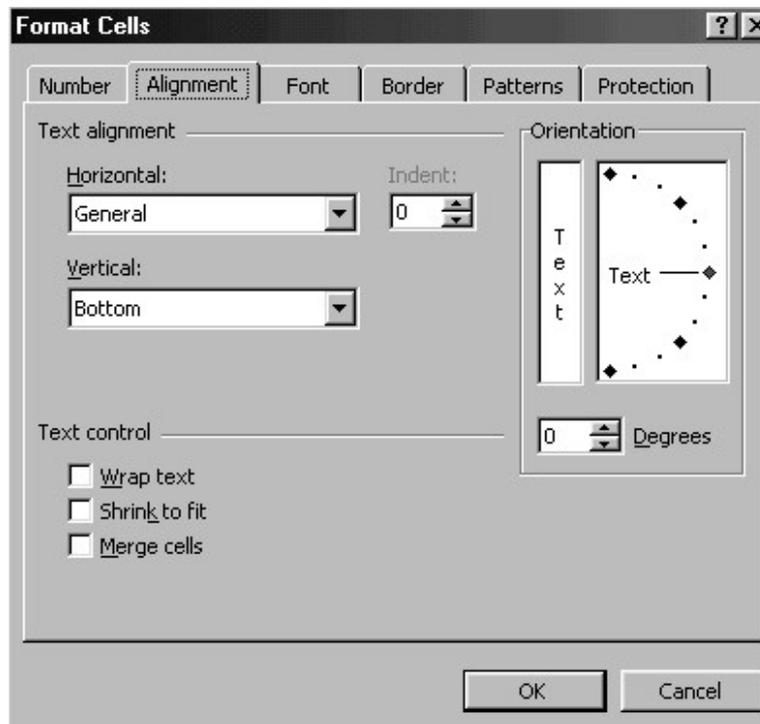
The part of the dialogue box we're interested in is the "Text alignment" section. There are two drop down boxes in this section: Horizontal and Vertical. The Horizontal drop down box has the word "General"; the Vertical drop down box has the word "Bottom" in it. We'll change these.

- Click the little black down-pointing arrow on the right hand side of the Horizontal box
- A drop down list appears
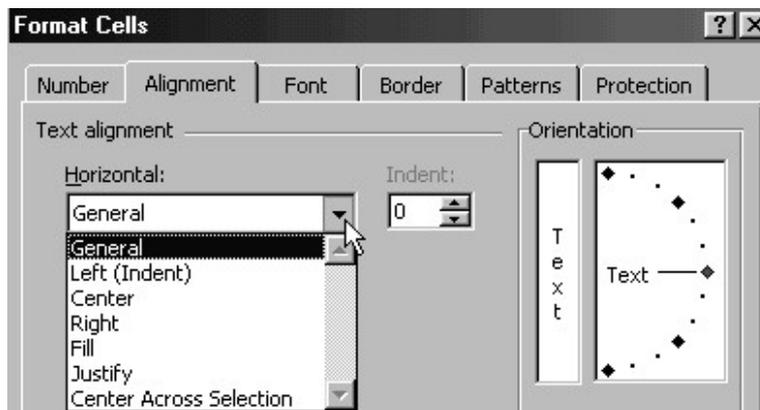


There are a number of options you can select for the Horizontal text alignment. Click on the word "Center" with your left mouse button. Change the Vertical alignment in exactly the same way. When you're done, click the OK button at the bottom of the dialogue box. Your spreadsheet will look like the one below:



All the data in the cells we highlighted is now centred. Before we do some other formatting, here's something you can try:

- Highlight the cells A1 to A6
- Click on Format from the menu bar, then click Cells

- Centre the Horizontal and Vertical text alignment, just like you have just done
- Your spreadsheet should look like the one below
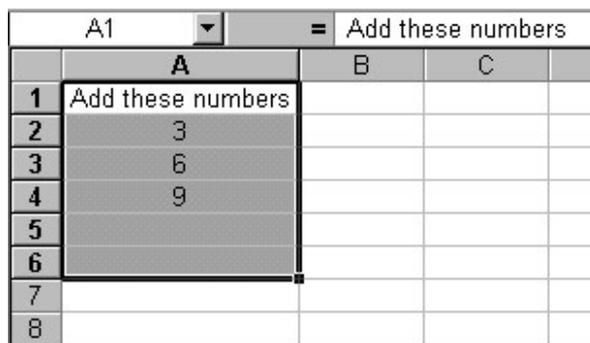
| A1 ▼ | | = | Add these numbers | |
|---|---|---|---|---|
| | **A** | | B | C |
| **1** | Add these numbers | | | |
| **2** | 3 | | | |
| **3** | 6 | | | |
| **4** | 9 | | | |
| **5** | | | | |
| **6** | | | | |
| **7** | | | | |
| **8** | | | | |

- Now, click on the Cell A5
- Type in the number 12
- Press the Return key on your keyboard

What happened? The number you entered should have been centred. The lesson to learn here is that you can format a cell even if there is nothing in it!

OK, let's make our heading bold, and change the font, which we'll do in the next part.

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# Font formatting in Excel

You can change the font of your text and numbers, and make it bold. You can also change the size of the font and the font colour. We'll first format the text in the cell A1, from our spreadsheet in the previous section.

To format the text in the cell A1, then, do this:

- Click on cell A1 with your left mouse button
- Click on Format from the menu bar
- From the menu that drops down, click the word "Cells" with your left mouse button
- The Format dialogue pops up again
- This time, click on the word "Font", instead of "Alignment"
- Your dialogue box will look like the one below (in Excel 2000)
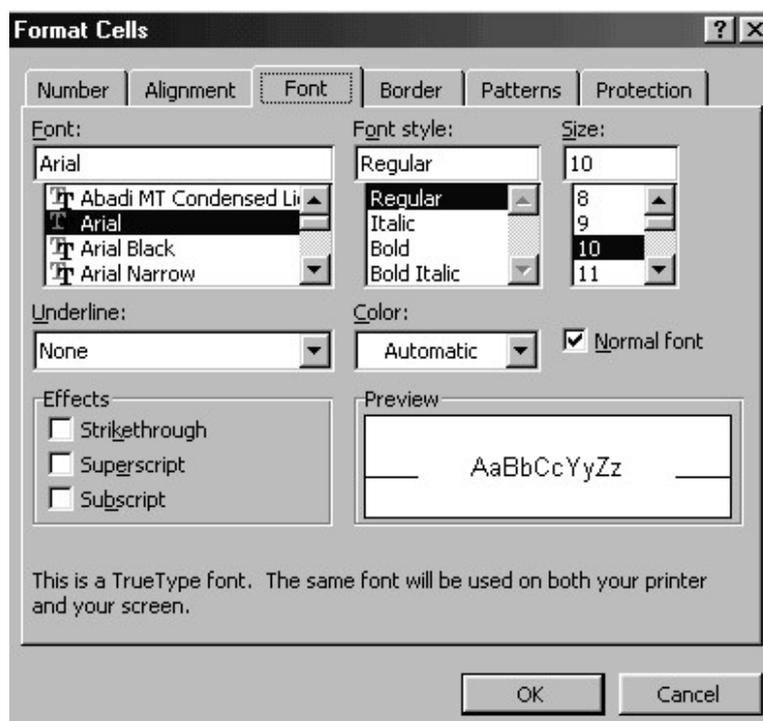


- From the dialogue box, change the Font Style to Bold
- Change the size to 8
- Click the OK button at the bottom
- Your spreadsheet will now look like the one below



The cells don't have to be white. You can change them to whatever colour you want. We'll add a spot of colour the ours cells.

# Changing the cell colour

To add a splash of colour to your cells, first highlight the cells you want to change. In our case, highlight the cells A2 to A5. (We'll do cell A1 after we've done the number cells.)

- With the cells A2 to A5 highlighted, click on Format from the menu bar
- From the drop down menu, click on "Cells"
- The format dialogue box pops up once more
- This time, click on the word "Patterns"
- The dialogue box will now look like the one below
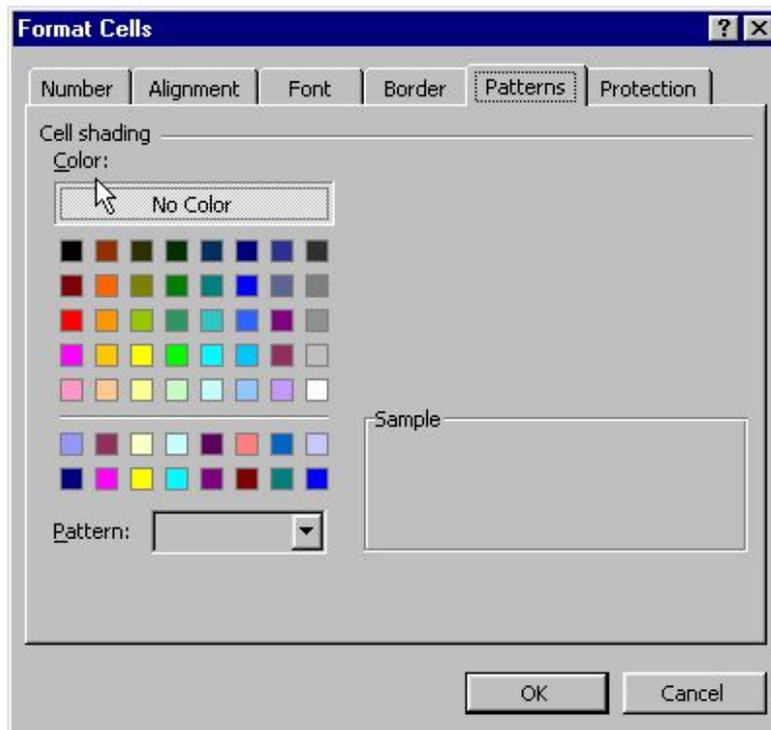


Click on any of the coloured squares that takes your fancy. If you'd prefer a pattern, click the black down-pointing arrow on the drop down box to the right of "Pattern". Select a pattern that takes your fancy. When your done, click the OK button at the bottom. Or you could click on the Font tab strip first, and change the text to bold. Then click OK.

When you click OK, the cell colour will change from white to the colour or pattern you have chosen. If you don't like it, you click on Edit from the menu bar, then click "Undo format cell". Or just try again and choose another colour or pattern.

Once you have the numbers formatted in a different colour, click on the cell A1. Now do exactly the same thing, only this time choose a contrasting colour for the text. Your spreadsheet will now look something like the one below:

Time now to save all your hard work, which we'll do in the next part.

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# Saving your work in Excel

Time now to save what you've done. To save your spreadsheet in Excel, do the following:

- Click on "File" from the menu bar
- From the menu that drops down, click on "Save"
- If you have not yet saved your work, the Save As dialogue box will pop up. Clicking Save otherwise will save the latest version of your work. In other words, your saved work will be updated
- The Save As dialogue box is this one below
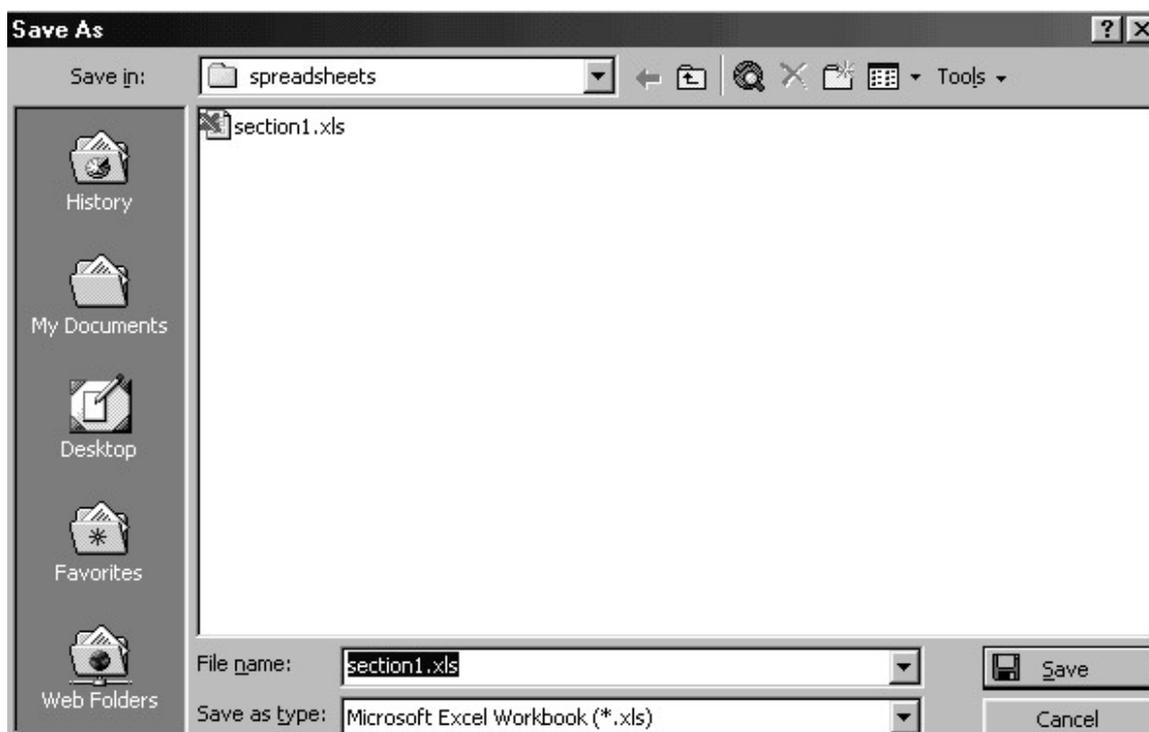


The Save As dialogue box is split into three basic sections: Where do you want to save it; the files already in that location; and what do you want to call your file. Let's examine the first section more closely - Where do you want to save it .

The top of the dialogue box looks like this:



Just to the right of the words "Save in" is a drop down box. At the moment it says "spreadsheets", and there is a little folder icon next to it. This is telling us that there is a folder on our hard drive called "spreadsheets". We're saving our new work in this folder. If we click the black down-pointing arrow, we get this:
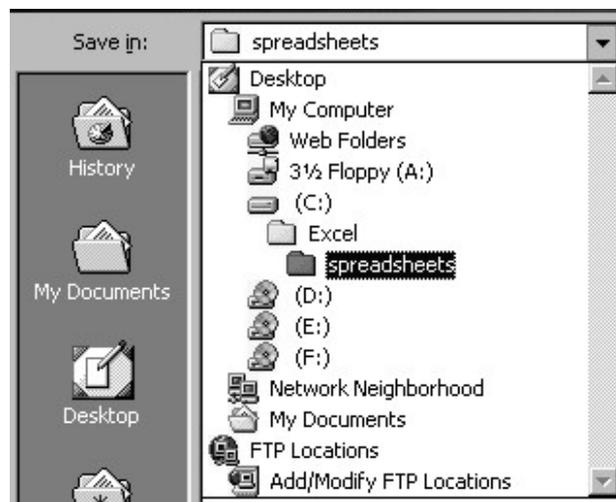
You can change where you want your work to be saved by clicking on any of the locations on the list. This drop down box is telling is that we have a folder called spreadsheets. This spreadsheets folder is inside another folder, called Excel. The Excel folder is on the C drive.

By creating a folder called spreadsheets, which is inside a folder called Excel, we can keep track of where our work is more easily. Just saving it anywhere on the C drive is not a good idea: it's often very difficult to find the work again when it's needed.

So we have a folder called "spreadsheets". The next section of the Save As dialogue box, the big white area, shows the files already in that location. In the image, only one file was showing - section1.xls. We can add as many files as we like to our spreadsheets folder. To do that, we need the third part of the Save As dialogue box. This part:
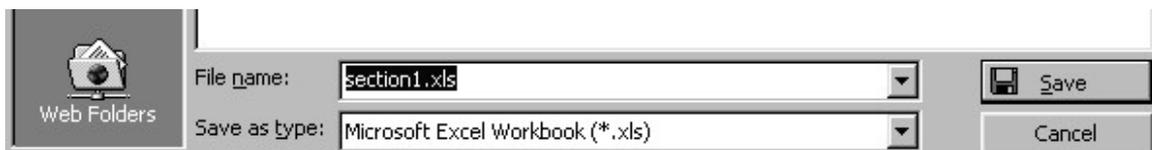


The File name is already highlighted. We can type something else there, a new name for our file. Type in anything you like, and then examine the box below it- Save as type. The box says "Microsoft Excel Workbook". This is exactly what we want, so no changes are needed. But if you click the black down-pointing arrow, you'll see other options: Web page, Template, Text, and so on.

But click the Save button when you've chosen a File name, and set the Save as type to "Microsoft Excel Workbook(*.xls)".

Your new spreadsheet is saved. Keep clicking **File > Save** on a regular basis to keep updating your work. Alternatively, click the Save icon on the toolbar:
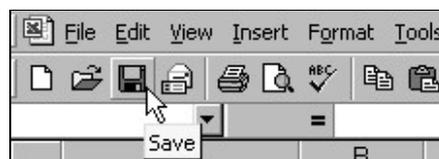


OK, the time for your first Excel Project. It's a nice and easy one, so there's no need to worry.

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# Excel Projects - Project One

The picture below shows a simple spreadsheet. There are no formulas in it, and nothing is being added up or subtracted (we'll do that in the next section).
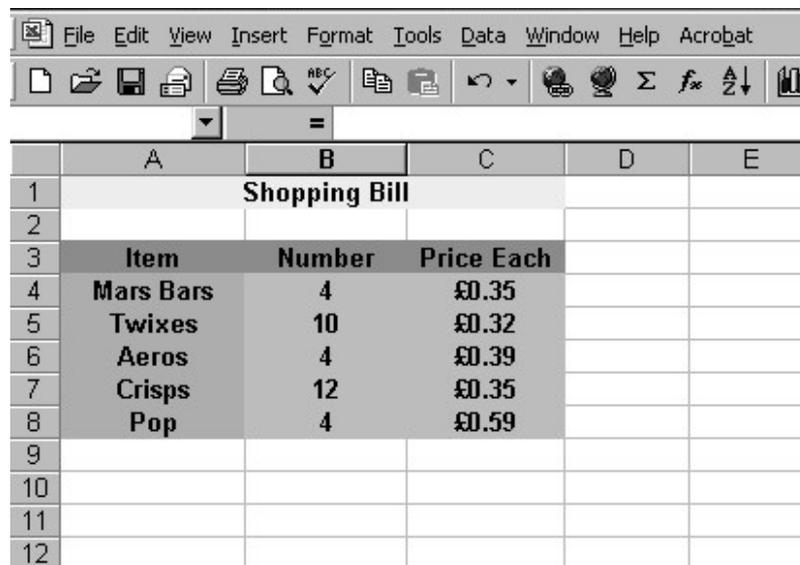
| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | | Shopping Bill | | | |
| 2 | | | | | |
| 3 | Item | Number | Price Each | | |
| 4 | Mars Bars | 4 | £0.35 | | |
| 5 | Twixes | 10 | £0.32 | | |
| 6 | Aeros | 4 | £0.39 | | |
| 7 | Crisps | 12 | £0.35 | | |
| 8 | Pop | 4 | £0.59 | | |
| 9 | | | | | |
| 10 | | | | | |
| 11 | | | | | |
| 12 | | | | | |

For Project Number 1, reproduce the spreadsheet above (the famous junk food diet!). Your spreadsheet must include the following:

1. Centred text and numbers
2. Widened columns
3. Bold font for the text and numbers
4. Background colours or patterns for the cells

In the prices column, you'll notice that the Currency sign has been included. To get theCurrency signs in your spreadsheet, do this:

- First enter a number for the price, but enter a zero then a full stop first, then the numbers. So enter 0.35 for the first price and not just 35
- When you have all five prices, highlight the cells C4 to C8
- With the cells highlighted, click on Format from the menu bar
- From the menu that drops down, click on "Cells"
- You'll get the familiar Format Cells dialogue box popping up
- Click on "Number", and change your setting to match the ones in the dialogue box below
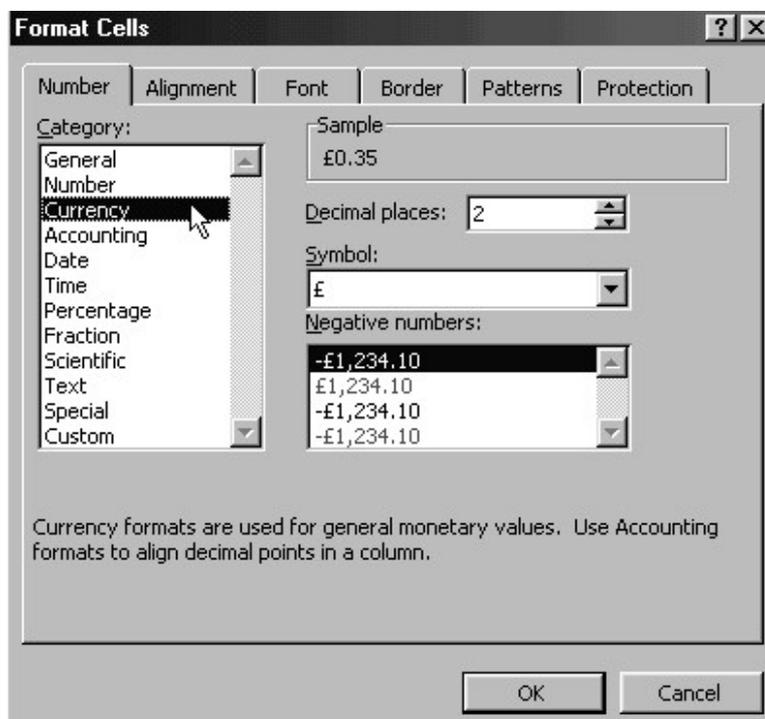
The changes to make are: click on Currency from the Category section; and make sure the Decimal Places text box has a 2 in it. Then click the OK button at the bottom.

Good Luck!

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# Constructing an Excel Spreadsheet

In this section, we'll construct a spreadsheet and learn about: Auto fill, inserting rows and columns, adding up numbers in columns, formulas, and the formula bar. The spreadsheet we will construct will look like this when it is finished:

**Click here to see the Spreadsheets you will construct**

As you can see, not much formatting has been done. We'll concentrate on getting the sums right in this section. But you can format your spreadsheet, if you like.

So, let's get started on the "Chocolate Addiction" spreadsheet.

- Click on cell A1 with your left mouse button
- Enter the text "My Chocolate Addiction" (without the quotes)
- Press the Return key on your keyboard
- Your spreadsheet will look like the one below
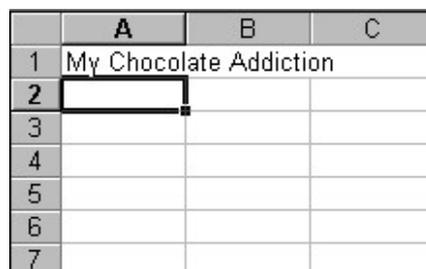


If you now click in cell A1, you'll see the darker border surrounding that cell. Click inside B1 and the darker border surrounds that cell. Likewise, with cell C1. In other words, they are all individual cells behind our heading. We'll turn those three cells into one cell.

- Highlight the cells A1, B1 and C1
- Your spreadsheet will look like the one below
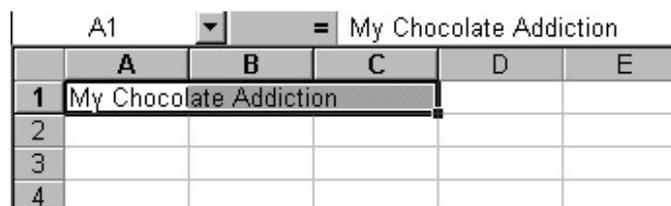


- From the menu bar, Click on Format
- From the drop down menu, click on "Cells"
- The familiar Format Cells dialogue box pops up
- Click on the Alignment tab strip
- Look for the box at the bottom that says "Merge cells"
- Put at tick in this box by clicking it with the left mouse button
- Your dialogue box should look like the one below
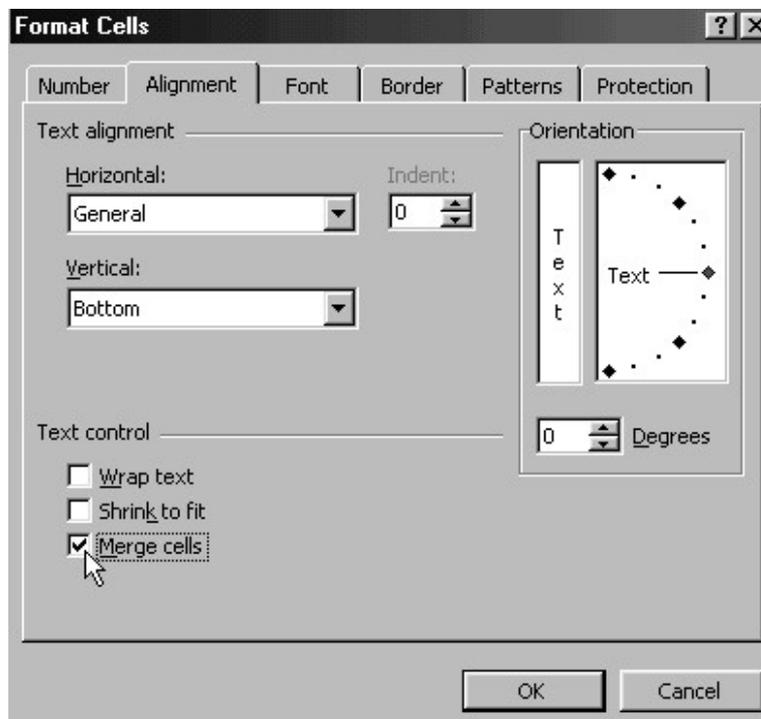
In the dialogue box above, there is a tick inside the box "Merge cells". Click the OK button when you're done. But you can centre your text while the Alignment tab strip is displayed.

Your spreadsheet will now look like the one below:



Now, when you click on cell B1 or cell A1, the Name box will read A1. All three cells have now been merged. The text "My Chocolate Addiction" is entirely in cell A1.

In the next part, you'll learn all about Autofill.

Move on to AutoFill in Excel -->

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# How to Use AutoFill in Excel

AutoFill is a very handy feature of Excel. It allows you to quickly fill a series of data, such as days of the week, months, and consecutive numbers. We'll see how it works.

Click inside the cell B3 on the spreadsheet you started in the previous section, and type the text Monday. Like this one below
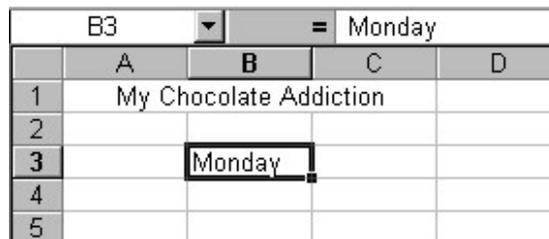


We're going to put the days of the week on the same line, on row 3 of our spreadsheet. But we don't have to type out the rest of the days. We only need to enter Monday, and we can do something called an Auto Fill. With Auto Fill, Excel will "Automatically Fill" in the rest of the days of the week for us. You do it like this:

- Move your cursor to the bottom right of the B3 cell
- Your cursor will change shape from a white cross to a black cross, as in the images below. The one on the left is the normal cursor, and the one on the left is the one we're after

# Entering Data into an Excel Spreadsheet

So we've got a heading at the top of our spreadsheet, and some days of the week headings. We can now enter the chocolate bars. So click on cell A4 and type in the text "Mars Bars" (without the quote marks). Next enter Twix, Bounty and Others. In cell A9, enter the text "Day Totals". Your spreadsheet should now look like the one below:

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | My Chocolate Addiction | | | | | | | |
| 2 | | | | | | | | |
| 3 | | Monday | Tuesday | Wednesd: | Thursday | Friday | Saturday | Sunday |
| 4 | Mars Bars | | | | | | | |
| 5 | Twix | | | | | | | |
| 6 | Bounty | | | | | | | |
| 7 | Others | | | | | | | |
| 8 | | | | | | | | |
| 9 | Day Totals | | | | | | | |
| 10 | | | | | | | | |

Time to enter some numbers now.

- For the Monday column, click on cell B4
- Enter the number 1 then press the Return key on your keyboard
- Enter the number 7 then press the Return key on your keyboard
- Enter the number 8 then press the Return key on your keyboard
- Enter the number 1 then press the Return key on your keyboard
- Your spreadsheet should now look like this one:

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | My Chocolate Addiction | | | | | | | |
| 2 | | | | | | | | |
| 3 | | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
| 4 | Mars Bars | 1 | | | | | | |
| 5 | Twix | 7 | | | | | | |
| 6 | Bounty | 8 | | | | | | |
| 7 | Others | 1 | | | | | | |
| 8 | | | | | | | | |
| 9 | Day Totals | | | | | | | |
| 10 | | | | | | | | |

You now need to enter the rest of the numbers. Enter the following figures for the rest of the week:

# Entering Formula into an Excel Spreadsheet

What we want to do in our spreadsheet from the previous page is to add the daily columns. The four numbers for Monday need to be added up; the four numbers for Tuesday need to be added up; the four for Wednesday, and so on. The totals will go into the cells below, in our Day Totals row.

In a spreadsheet, you have to "tell" Excel which cells you want to add up. So for the Monday column, the 1 is in cell B4, the 7 is in cell B5, the 8 is in cell B6, and another 1 in cell B7. So we want the answer to B4 + B5 + B6 + B7.

To let Excel know that is the sum we want working out, do this:

- Click in the cell where you want the answer to appear (This is cell B9 for us, the first of the Day Totals)
- Now click inside the formula bar
- Type in this: B4 + B5 + B6 + B7
- Your spreadsheet should look like the one below

| | B9 | ▼ | ✗ ✓ = | B4 + B5 + B6 + B7 | | | | |
|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H |
| 1 | My Chocolate Addiction | | | | | | | |
| 2 | | | | | | | | |
| 3 | | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
| 4 | Mars Bars | 1 | 2 | 1 | 3 | 3 | 2 | 5 |
| 5 | Twix | 7 | 5 | 3 | 2 | 4 | 2 | 4 |
| 6 | Bounty | 8 | 3 | 2 | 3 | 4 | 1 | 4 |
| 7 | Others | 1 | 2 | 2 | 2 | 2 | 1 | 1 |
| 8 | | | | | | | | |
| 9 | Day Totals | 36 + B7 | | | | | | |
| 10 | | | | | | | | |

Notice that the Name box top left says B9. This is the cell where we want the answer to appear.

When you have entered the formula in the formula bar, press the return key on your keyboard.

Your spreadsheet will look like the one below:

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | My Chocolate Addiction | | | | | | | |
| 2 | | | | | | | | |
| 3 | | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
| 4 | Mars Bars | 1 | 2 | 1 | 3 | 3 | 2 | 5 |
| 5 | Twix | 7 | 5 | 3 | 2 | 4 | 2 | 4 |
| 6 | Bounty | 8 | 3 | 2 | 3 | 4 | 1 | 4 |
| 7 | Others | 1 | 2 | 2 | 2 | 2 | 1 | 1 |
| 8 | | | | | | | | |
| 9 | Day Totals | B4 + B5 + B6 + B7 | | | | | | |
| 10 | | | | | | | | |

Something has clearly gone wrong! We were expecting Excel to add up the numbers in those cells. Instead it has entered the cell references themselves: B4 + B5 + B6 + B7.

The problem is that Excel thinks you want text in the cell B9. When we entered B4 + B5 + B6 + B7 in the formula bar we didn't "tell" Excel to add up. So when we pressed the Return key, Excel thought it was just text.

To "tell" Excel to add up, you need an equals sign first. We'll also use the Sum function. The Sum function looks this:

<div align="center">

**=Sum( )**

</div>

You put what you want to add up in between the two brackets. So we would need this:

<div align="center">

**=Sum( B4 + B5 + B6 + B7)**

</div>

So go ahead and enter that in the formula bar. Before you press the Return key on your keyboard, your spreadsheet will look like this:

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| | | | | =SUM(B4 + B5 + B6 + B7) | | | | |
| 1 | My Chocolate Addiction | | | | | | | |
| 2 | | | | | | | | |
| 3 | | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
| 4 | Mars Bars | 1 | 2 | 1 | 3 | 3 | 2 | 5 |
| 5 | Twix | 7 | 5 | 3 | 2 | 4 | 2 | 4 |
| 6 | Bounty | 8 | 3 | 2 | 3 | 4 | 1 | 4 |
| 7 | Others | 1 | 2 | 2 | 2 | 2 | 1 | 1 |
| 8 | | | | | | | | |
| 9 | Day Totals | 6 + B7) | | | | | | |
| 10 | | | | | | | | |

When your spreadsheet looks like the one above, press the Return key on your keyboard.

Finally, Excel understands what you want to do. It adds up the numbers in the cells you gave it, and puts the answer in cell B9. Your spreadsheet now looks like this one:

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| B9 | | | = | =SUM( B4 + B5 + B6 + B7) | | | | |
| 1 | My Chocolate Addiction | | | | | | | |
| 2 | | | | | | | | |
| 3 | | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
| 4 | Mars Bars | 1 | 2 | 1 | 3 | 3 | 2 | 5 |
| 5 | Twix | 7 | 5 | 3 | 2 | 4 | 2 | 4 |
| 6 | Bounty | 8 | 3 | 2 | 3 | 4 | 1 | 4 |
| 7 | Others | 1 | 2 | 2 | 2 | 2 | 1 | 1 |
| 8 | | | | | | | | |
| 9 | Day Totals | 17 | | | | | | |
| 10 | | | | | | | | |

Notice what is happening in the Name box and the formula bar. The cell B9 is highlighted and displayed in the Name box top left. The formula bar is telling you what you have in cell B9. In this case it is the Sum( ) function. In between the brackets is what we want to add up: B4 + B5 + B6 + B7.

But suppose you had a very long column to add up. Suppose you wanted to add up the cells B4 to B44. Would you really have to enter B4 + B5 + B6 + B7 + B8 + B9 + B10 + B11, and so on right up to B44?

Fortunately not. There is a shorthand that Excels understands, when you want to add up consecutive cells. You use the colon. You type the first cell you want to add up, then type a colon. After the colon, you type the last cell that you want to add up. It would look like this:

<div align="center">

**=Sum(B4: B44)**

</div>

The colon means: "Add up all the cells between the one on my left and the one on my right."

<-- Back to Entering Data | Continue this lesson on Formulas -->

# Adding up Rows in Excel

In this section, we're going to use the Chocolate addiction spreadsheet from the last section. We'll add to it, and learn how to do some multiplying. We'll also learn how to copy and paste numbers from one column to another. We'll get some more practice with adding columns and rows.

In the last section, you saw how to add up a column of numbers. The long way to do it was this = Sum(A1 + A2 + A3 + A4 + A5). But for a column of consecutive cells, you learnt that there was an easier way. This: = **Sum(A1: A5)**.

We can use that last formula to add up a Row of consecutive cells, too. So, click on cell J3 of your spreadsheet and enter the text "Individual Totals". Widen the column a bit. Your spreadsheet should now look like the one below:

| | A | B | C | D | E | F | G | H | I | J |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | =  | | | | | | |
| 1 | My Chocolate Addiction | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday | | Individual Totals |
| 4 | Mars Bars | 1 | 2 | 1 | 3 | 3 | 2 | 5 | | |
| 5 | Twix | 7 | 5 | 3 | 2 | 4 | 2 | 4 | | |
| 6 | Bounty | 8 | 3 | 2 | 3 | 4 | 1 | 4 | | |
| 7 | Others | 1 | 2 | 2 | 2 | 2 | 1 | 1 | | |
| 8 | | | | | | | | | | |
| 9 | Day Totals | 17 | 12 | 8 | 10 | 13 | 6 | 14 | | |
| 10 | | | | | | | | | | |

What we're going to do now is add up the Rows. We want to know how many Mars Bars are eaten in any one week, how many Twix, how many Bounty bars, and how many Other bars. So the sum is the Monday total, plus the Tuesday total, plus the Wednesday total, plus the Thursday total, plus the Friday total, plus the Saturday total, plus the Sunday total.

If we start on the Mars Bars, we need to know which cells we want to add up. Then we tell Excel to do the sum. The first Mars Bar total is in cell B4, the second is in C4, the third in D4, the fourth in E4, the fifth F4, the sixth in G4, and the seventh total is in H4. So those are the cells we want to add up. As they are consecutive cells we can use the colon - B4:H4.

Next we decide where we want Excel to put the answer. We've just added a new headings called Individual Totals. This was in the J column. The Mars Bar heading was on Row 4. So the first total needs to go into cell J4.

- So click on cell J4 with your left mouse button
- Click inside the formula bar at the top
- Type in the following formula:

**=Sum(B4:H4)**

- Hit the Return key on your keyboard
- The answer to all that addition should appear in cell J4

Once we have the answer in cell J4, we can use Auto Fill to get the answers to the other 3 Rows.

- Click on cell J4
- Move your mouse to the bottom right of the cell
- The cursor turns into a black cross, as in the image below

| H | I | J |
|---|---|---|
| Sunday | | Individual Totals |
| 5 | | 17 |
| 4 | | |
| 4 | | |
| 1 | | |
| 14 | | |

- When the cursor turns into a black cross, hold down your left mouse button
- Keep the left mouse button held down and drag your mouse downwards to cell J7

| H | I | J |
|---|---|---|
| Sunday | | Individual Totals |
| 5 | | 17 |
| 4 | | |
| 4 | | |
| 1 | | |
| 14 | | |

When your cursor gets to cell J7, let go of the left mouse button. Excel will Auto Fill the other three cells, inserting a formula based on the first one. The J column of your spreadsheet now looks like the one below:

| H | I | J |
|---|---|---|
| Sunday | | Individual Totals |
| 5 | | 17 |
| 4 | | 27 |
| 4 | | 25 |
| 1 | | 11 |
| 14 | | |

Click on any of those four cells in the J Column. Then take a look at the formula bar to see the formulas. Make sure you understand what is being added up in each Row, and how the answer is derived.

All right, we have the individual total for the chocolate bars. But we can also work out how many chocolate bars are eaten in any one week. The grand total, in other words.

- Click on cell A11
- Enter the text "Number of Chocolate bars consumed in a week"
- Press the return key on your keyboard
- Click back in cell A11
- Highlight all of your new text and merge the cells (Do you remember how to do this? Click on Format from the menu bar. From the drop down menu, click Cells. Click the alignment tab strip in the dialogue box that pops up. Put a tick in the bottom box "Merge cells".)
- Centre your new text and make it bold. The font should be Arial, 10 points

From our spreadsheet, there are two ways we can find out what the weekly total is. One way would be to add up all the Individual Totals in the J column. The other way is to … Well, what is the other way? What else could we add up to get the weekly total? We're sure you'll have no problem coming up with the answer.

## Exercise

- Click inside cell F11
- Enter a formula to calculate the weekly total

- Press the Return key on your keyboard when you have the correct formula
- The answer should be 80

In the next part, we'll take a look at how to copy and paste in Excel.

- Press the Return key on your keyboard when you have the correct formula
- The answer should be 80

In the next part, we'll take a look at how to copy and paste in Excel.

# Copying and Pasting in Excel

OK, 80 chocolate bars in one week is a lot of chocolate bars. But how much is this addiction costing every week? How much is it costing per year?

We can work this sums out quite easily. First, we'll need some text headings.

- Click inside cell A13 and enter the text "Cost of Addiction"
- Merge the text into one cell, just like you did in the last part
- Format the text: bold, centre, a coloured font or background, if your prefer
- When you have finished, press the Return key on your keyboard

We'll now copy and paste some text.

- Click inside cell A4, then highlighted the cells down to A7 (the cells A4, A5, A6 and A7 should be highlighted)
- From the menu bar, click on Edit
- From the menu that drops down, click copy
- There should be some sort of animated line around your highlighted cells - the marching ants!

| A4 | | = |
|---|---|---|
| | **A** | **B** |
| 1 | My Chocolate Add | |
| 2 | | |
| 3 | | Monday |
| 4 | Mars Bars | 1 |
| 5 | Twix | 7 |
| 6 | Bounty | 8 |
| 7 | Others | 1 |
| 8 | | |
| 9 | Day Totals | 17 |

- When you see the marching ants, click inside cell A15 of your spreadsheet
- Press the Return key on your keyboard
- The text should have been copied to the new location, and your spreadsheet will look like the one below

| | A | Monday | Tuesday | Wednesday | Thursday |
|---|---|---|---|---|---|
| 1 | My Chocolate Addiction | | | | |
| 2 | | | | | |
| 3 | | Monday | Tuesday | Wednesday | Thursday |
| 4 | Mars Bars | 1 | 2 | 1 | 3 |
| 5 | Twix | 7 | 5 | 3 | 2 |
| 6 | Bounty | 8 | 3 | 2 | 3 |
| 7 | Others | 1 | 2 | 2 | 2 |
| 8 | | | | | |
| 9 | Day Totals | 17 | 12 | 8 | 10 |
| 10 | | | | | |
| 11 | Number of Chocolate bars consumed in a week: | | | | |
| 12 | | | | | |
| 13 | Cost of Addiction | | | | |
| 14 | | | | | |
| 15 | Mars Bars | | | | |
| 16 | Twix | | | | |
| 17 | Bounty | | | | |
| 18 | Others | | | | |
| 19 | | | | | |

We'll enter some more headings, so that we can work out how much this addiction is costing.

- Click inside cell B14 and enter Price
- Click inside cell C14 and enter Number
- Click inside cell D14 and enter Cost

The spreadsheet now looks like this:

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | My Chocolate Addiction | | | | |
| 2 | | | | | |
| 3 | | Monday | Tuesday | Wednesday | Thursday |
| 4 | Mars Bars | 1 | 2 | 1 | 3 |
| 5 | Twix | 7 | 5 | 3 | 2 |
| 6 | Bounty | 8 | 3 | 2 | 3 |
| 7 | Others | 1 | 2 | 2 | 2 |
| 8 | | | | | |
| 9 | Day Totals | 17 | 12 | 8 | 10 |
| 10 | | | | | |
| 11 | Number of Chocolate bars consumed in a week: | | | | |
| 12 | | | | | |
| 13 | Cost of Addiction | | | | |
| 14 | | Price | Number | Cost | |
| 15 | Mars Bars | | | | |
| 16 | Twix | | | | |
| 17 | Bounty | | | | |
| 18 | Others | | | | |
| 19 | | | | | |

Under "Price" is where we'll put the price of each chocolate bar. Under "Number" we'll put the number of each bar eaten in a week. Under "Cost" is where we'll find out how much is being spent each week on the individual chocolate bars. In other words, how much is being spent on Mars Bars, how much on Twix, how much on Bounty Bars, and how much on Others.

So enter some prices. Our researchers have been out and about eating chocolate bars. They found that prices for each chocolate bar are these:

# How to Multiply figures in Excel

This time, we need to multiply the cost of each bar by how many were eaten. So we want to multiply the Price by the Number. The Price is in the B column and the Number is in the C column.

We want the answer to appear in the Cost column. So click inside the cell D15. If you wanted to multiply two numbers together the standard mathematical notation is this:

**35 x 17 = 595**

However, Excel doesn't use the X symbol to multiply. Simply because it would be confused with the letter X. Instead the asterisk symbol is used. The asterisk symbol is the one above the number 8 on your (English) keyboard. So the sum above would be this in Excel:

**35 * 17 = 595**

It's very easy to multiply two numbers together using Excel. When we were adding up we used the =Sum( ) function. In between the brackets we told Excel which cells we wanted to add up. You don't need a function when you are multiplying; all you need to do is "tell" Excel which cells you want to multiply. So do this:

- Click inside the cell D15
- Click inside the Formula Bar at the top
- Type this:

**= B15 * C15**

- Then press the Return key on your keyboard
- Excel should give you the answer £5.95
- Your spreadsheet will look like the one below

| D15 | | = | =B15 * C15 | | | | |
|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H |
| 1 | My Chocolate Addiction | | | | | | | |
| 2 | | | | | | | | |
| 3 | | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
| 4 | Mars Bars | 1 | 2 | 1 | 3 | 3 | 2 | 5 |
| 5 | Twix | 7 | 5 | 3 | 2 | 4 | 2 | 4 |
| 6 | Bounty | 8 | 3 | 2 | 3 | 4 | 1 | 4 |
| 7 | Others | 1 | 2 | 2 | 2 | 2 | 1 | 1 |
| 8 | | | | | | | | |
| 9 | Day Totals | 17 | 12 | 8 | 10 | 13 | 6 | 14 |
| 10 | | | | | | | | |
| 11 | Number of Chocolate bars consumed in a week: | | | | 80 | | | |
| 12 | | | | | | | | |
| 13 | Cost of Addiction | | | | | | | |
| 14 | | Price | Number | Cost | | | | |
| 15 | Mars Bars | £0.35 | 17 | £5.95 | | | | |
| 16 | Twix | £0.29 | 27 | | | | | |
| 17 | Bounty | £0.32 | 25 | | | | | |
| 18 | Others | £0.40 | 11 | | | | | |
| 19 | | | | | | | | |

So when you want to multiply use this formula:

**= Cell reference * Cell Reference**

In the formula bar in the image above, you can see the actual formula used:

## = B15 * C15

Once we have that formula in place, we can Auto Fill the others. You should know how to do this by now. So Auto Fill the other three costs and your spreadsheet should look like this one:

| | | | | |
|---|---|---|---|---|
| 11 | Number of Chocolate bars consumed in a week: | | | 80 |
| 12 | | | | |
| 13 | Cost of Addiction | | | |
| 14 | | Price | Number | Cost | |
| 15 | Mars Bars | £0.35 | 17 | £5.95 |
| 16 | Twix | £0.29 | 27 | £7.83 |
| 17 | Bounty | £0.32 | 25 | £8.00 |
| 18 | Others | £0.40 | 11 | £4.40 |
| 19 | | | | |

Make sure your totals in the Cost column are the same as the ones in the image above. You can then move on to the next part.

<-- Back One Page Move on to the Next Part -->

# Working out Weekly and Annual Sums

OK, so what else can we do to our spreadsheet? Well, we can work out how much this addiction is costing each week.

You have the individual costs of each chocolate bar. So all you need to do is add the Cost column up. So enter a suitable heading, something like "Weekly Cost of Chocolate Addiction". Next, enter a formula to add up the Cost column, so that you have a figure for how much is being spent on chocolate bars each week. When you are done, your spreadsheet should look like the one below.

| F20 | | = | =SUM(D15:D18) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H |
| 2 | | | | | | | | |
| 3 | | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
| 4 | Mars Bars | 1 | 2 | 1 | 3 | 3 | 2 | 5 |
| 5 | Twix | 7 | 5 | 3 | 2 | 4 | 2 | 4 |
| 6 | Bounty | 8 | 3 | 2 | 3 | 4 | 1 | 4 |
| 7 | Others | 1 | 2 | 2 | 2 | 2 | 1 | 1 |
| 8 | | | | | | | | |
| 9 | Day Totals | 17 | 12 | 8 | 10 | 13 | 6 | 14 |
| 10 | | | | | | | | |
| 11 | Number of Chocolate bars consumed in a week: | | | | | 80 | | |
| 12 | | | | | | | | |
| 13 | Cost of Addiction | | | | | | | |
| 14 | | Price | Number | Cost | | | | |
| 15 | Mars Bars | £0.35 | 17 | £5.95 | | | | |
| 16 | Twix | £0.29 | 27 | £7.83 | | | | |
| 17 | Bounty | £0.32 | 25 | £8.00 | | | | |
| 18 | Others | £0.40 | 11 | £4.40 | | | | |
| 19 | | | | | | | | |
| 20 | Weekly Cost of Chocolate Addiction: | | | | | £26.18 | | |
| 21 | | | | | | | | |

The formula to add up the Cost column has gone in cell F20. As you can see, the total is £26.18 per week. A lot of money to spend on chocolate bars!

We can also work out how much the addiction costs each year.

Enter some text for the yearly total. In the spreadsheet above, we would just click on cell A21 and enter the text "Annual Cost of Chocolate addiction". We would then want the answer to appear in cell F21, right under the Weekly total of £26.18.

But what's our formula?

We know that there are 52 weeks in a year. We spend £26.18 on chocolate bars every week. So the sum is quite simple:

**= F20 * 52**

- So click inside cell F21
- Click inside the formula bar
- Enter the formula above
- Press the Return key on your keyboard
- The correct figure should appear in cell F21
- Your spreadsheet should now look like the one below:

| 13 | Cost of Addiction | | | | | | |
|----|----|----|----|----|----|----|----|
| 14 | | Price | Number | Cost | | | |
| 15 | Mars Bars | £0.35 | 17 | £5.95 | | | |
| 16 | Twix | £0.29 | 27 | £7.83 | | | |
| 17 | Bounty | £0.32 | 25 | £8.00 | | | |
| 18 | Others | £0.40 | 11 | £4.40 | | | |
| 19 | | | | | | | |
| 20 | Weekly Cost of Chocolate Addiction: | | | | | £26.18 | |
| 21 | Annual Cost of Chocolate Addiction | | | | | £1,361.36 | |
| 22 | | | | | | | |

The formula you just entered demonstrates that you can mix cell references with real numbers: you don't need to enter cell reference in formulas, and only cell references. In fact, you don't even need to enter a cell reference at all. You could have entered this in the formula bar instead:

**= 26.18 * 52**

Excel wouldn't mind either way. It would mind, however, if you tried to enter the pound sign in the formula bar. To get the pound sign you would need to format the cell to Currency.

And that completes our Chocolate Addiction spreadsheet. At an annual cost of one thousand, three hundred and sixty one pounds and thirty six pounds it is definitely time to quit!

The next part is the final paret of section section three, and it's all about how to add comments to your excel spreadsheets.

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# How to Add a Comment to a Cell in Excel

You can add comments to a cell, if you want. To see how they work, take a look at the spreadsheet below:



The function in cell B1 generates a random number from 1 to 49. You can get it to generate a new random number by clicking inside the formula bar and pressing the return key on the keyboard.

We'll add a comment to the cell to let anyone using the spreadsheet know what to do.

First, construct the spreadsheet above. For the RANDBETWEEN( ) function to work, you have to enable it. To enable the function, click on **Tools** from the menu bar. From the drop down menu, click on **Add-ins**. A dialogue box pops up. Click on **Analysis Toolpack** and then click OK.

If **Tools > Add-ins** doesn't work, you can enter this formula in cell B1

$$=RAND( ) * 49 + 1$$

The formula will generate a Random number between 1 and 49. You then need to format the cell to Number and set the decimal places to zero.

Once you have the above spreadsheet up and running, you can add your comment. To add a comment to cell B1, do the following:

- Click on cell B1
- From the menu bar, click on Insert
- From the drop down menu, click on Comment
- A yellow text box will appear to the right of cell B1, as in the image below:



Excel will add to the comment the name of the person who's computer it is. In this case it was done on Kays computer. You can delete this name by pressing the backspace key on your keyboard.

To add your comment, just start typing. You can enlarge the text box by holding down your left mouse button on one of the white squares and dragging.

Click on any other cell in your spreadsheet and the comment will disappear. The cell will have a red triangle in the top right corner, indicating that it contains a comment. Like the one below. Though this is a black and white image, so the effect is not too apparent:

| | A | B | C |
|---|---|---|---|
| 1 | First Lottery Ball | 22 | |
| 2 | | | |
| 3 | | | |

If you move your mouse over cell B1 the comment will pop up. Try it and see.

If you want to get rid of a comment, do the following:

- Click inside the cell that contains the comment
- Click once with your right mouse button
- A menu appears
- Click "Delete Comment" with your left mouse button
- The comment is deleted

And that completes section three of the excel spreadsheet course. You can have a go at the project below, or move on to section four.

# Project Two

You have just created a spreadsheet on Chocolate addiction. Time now to reveal your addiction!

Create a spreadsheet like the one in the last section, but substitute Chocolate Addiction for something else. Examples might be: smoking, drinking, eating out, clothes, make-up - in fact, anything that someone might be spending too much money on. (It doesn't have to be you doing the spending; it can be entirely made up.)

Your spreadsheet must include the following:

- Daily totals
- Individual totals
- Weekly total
- Columns for Prices
- Columns for Number and Cost
- Weekly cost
- Annual cost

You can format the spreadsheet any way you like. The colour scheme is entirely up to you. Just make sure that your spreadsheet is easy to follow.

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# Sorting Data in an Excel Chart

In this section you'll learn how to create a chart from data in a spreadsheet. You'll also learn how to sort data. Sorting data and charts are not part of the same subject: you can sort data without having a chart, and have a chart without sorting data. But sorting data sometimes comes in useful, so we'll tackle it now, and used our sorted data to create our chart.

Before we start this section, though, you need to create the spreadsheet below. Type in the data exactly as it is in this one:

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Viewing Figures March 3 2002 (no soaps) | | | | |
| 2 | | | | | |
| 3 | BBC 1 | | | ITV | |
| 4 | | Millions | | | Millions |
| 5 | Holby City | 6.99 | | Who... Millionaire | 10.99 |
| 6 | Vicar of Dibley | 6.34 | | Heartbeat | 10.22 |
| 7 | Changing Rooms | 7.38 | | Bad Girls | 7.42 |
| 8 | DIY SOS | 7.20 | | The Bill | 6.54 |
| 9 | Lenny Henry | 7.03 | | The Vice | 6.37 |
| 10 | Antiques Roadshow | 7.68 | | Blind Date | 6.31 |
| 11 | Ground Force | 6.71 | | Stars in their Eyes | 6.26 |
| 12 | Casualty | 8.82 | | Footballer's Wives | 6.17 |
| 13 | Ready Steady Cook | 6.33 | | Champions League | 6.09 |
| 14 | National Lottery | 6.27 | | Inspector Morse | 5.81 |
| 15 | | | | | |
| 16 | | | | | |

The spreadsheet above shows the viewing figures for BBC 1 and ITV. The soap operas Eastenders and Coronation Street are not included. The ITV programmes have already been sorted, but the BBC programmes have not. We'll sort the BBC programmes now.

## Sorting the Data

After we sort the BBC1 programmes, the highest viewing figures will be at the top and the lowest at the bottom. This is a Descending sort. If we were sorting the other way around, with the lowest first and the highest last then it would be a Ascending sort.

Before you can sort data, you need to "tell" Excel what you want to sort. You "tell" Excel by highlighting the data. So highlight the BBC 1 programmes and the figures. Your highlighting should look like the one in the image below.

| 3 | BBC 1 | |
|---|---|---|
| 4 | | Millions |
| 5 | Holby City | 6.99 |
| 6 | Vicar of Dibley | 6.34 |
| 7 | Changing Rooms | 7.38 |
| 8 | DIY SOS | 7.20 |
| 9 | Lenny Henry | 7.03 |
| 10 | Antiques Roadshow | 7.68 |
| 11 | Ground Force | 6.71 |
| 12 | Casualty | 8.82 |
| 13 | Ready Steady Cook | 6.33 |
| 14 | National Lottery | 6.27 |
| 15 | | |

To sort the BBC 1 figures, do the following:

- From Excel's menu bar, click Data
- From the drop down menu, click Sort
- A dialogue box appears



In the Sort By box it says "Column A". To the right of this there a Ascending radio button and a Descending radio button. The Sort By box is actually a drop down list.

- Click the word Descending to select this option
- Click the black down-pointing arrow on the Sort By box
- From the drop down list, click on Millions

You could click the OK button right now and the data would be sorted. But what about those "Then By" boxes? What do they do? Well, suppose two of the programmes had exactly the same viewing figures. We have chosen to Sort By the Millions column, the numbers. If two programmes had the same numbers we could specify what to sort on next. If you click the black down-pointing arrow of the first "Then By" box you'll see a drop down list. It's the same list as the Sort By box. Select "Column A" and Descending. If two programmes had the same viewing figures, Excel will then look at Column A. It will see text in this column. It will then sort the two programmes that have "drawn" into alphabetical order.

So the "Then By" boxes are for what happens in the event of a draw. You choose which column to sort on next. But click the OK button when your dialogue box looks like the one below:



Your BBC 1 Viewing figures should now look like this:

| 3 | BBC 1 | |
|---|---|---|
| 4 | | Millions |
| 5 | Casualty | 8.82 |
| 6 | Antiques Roadshow | 7.68 |
| 7 | Changing Rooms | 7.38 |
| 8 | DIY SOS | 7.20 |
| 9 | Lenny Henry | 7.03 |
| 10 | Holby City | 6.99 |
| 11 | Ground Force | 6.71 |
| 12 | Vicar of Dibley | 6.34 |
| 13 | Ready Steady Cook | 6.33 |
| 14 | National Lottery | 6.27 |
| 15 | | |
| 16 | | |

And that's all you need to do for the sort. We can move on to creating a Chart from our data.

# How to Create a Bar Chart in Excel

OK, we're going to make a chart out of the BBC1 Viewing figures we created in the last part. The chart we're going to create will look like the one below, when it's finished.
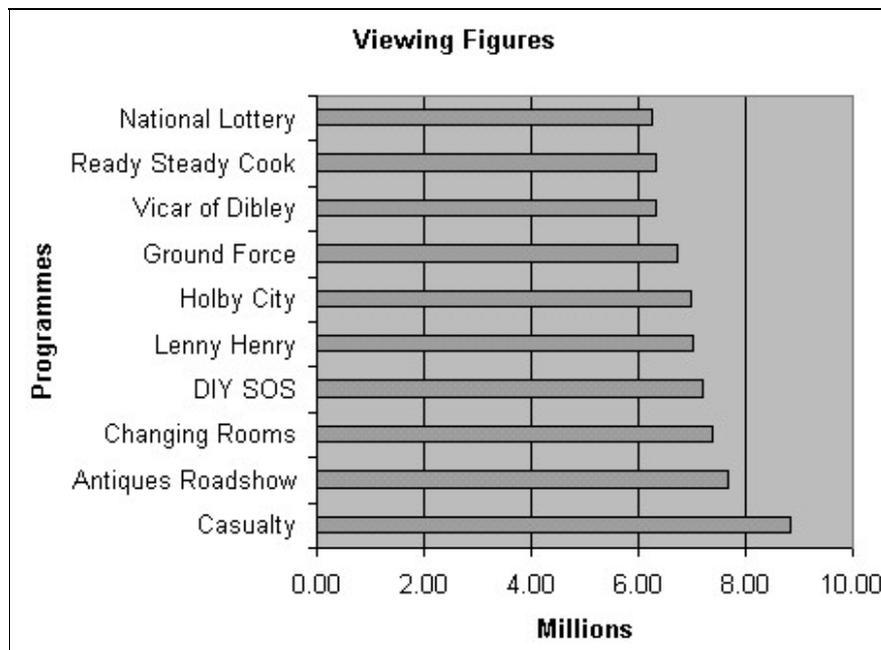


To start making your chart, you need to highlight the data that will make up the chart.

- So highlight the BBC1 programmes and the viewing figures
- From the menu bar, click on Insert
- From the drop down list, click Chart
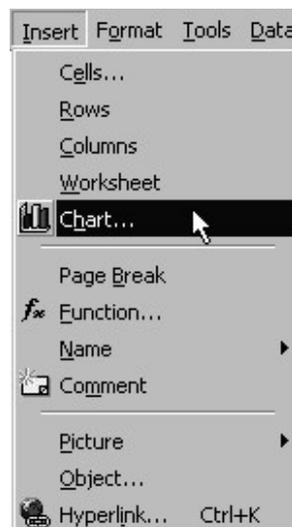


When you click on **Insert > Chart**, the Chart wizard appears. It looks like the one below:
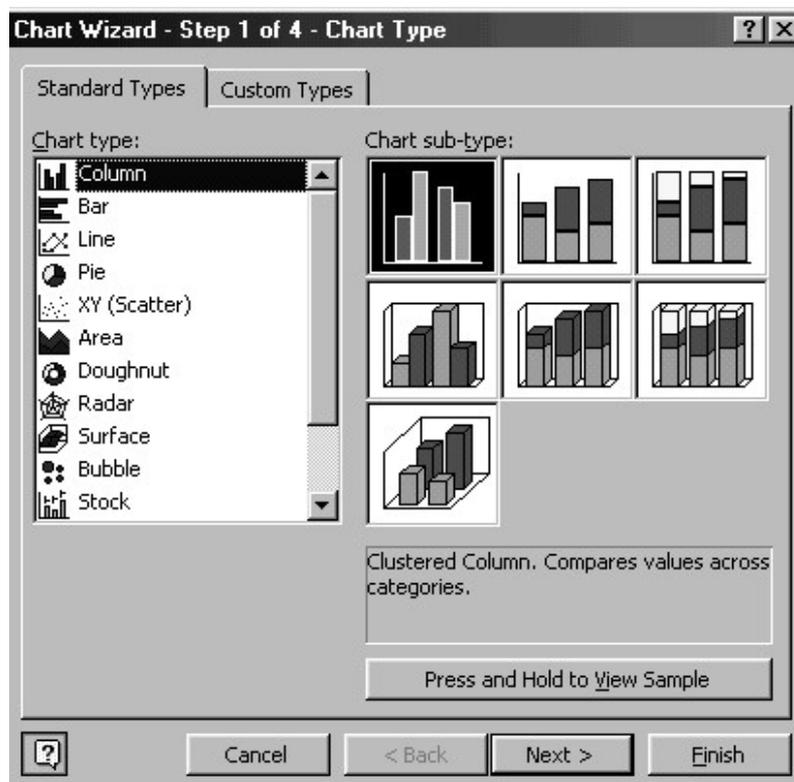
There is a four step process to go through with the wizard. The first step is to select a chart type. The Chart Type showing in the image is a column chart. To see what this will look like, click the button "Press and Hold to View Sample". Click with the left mouse button, and keep the button held down. You see a preview of what the chart will look like.
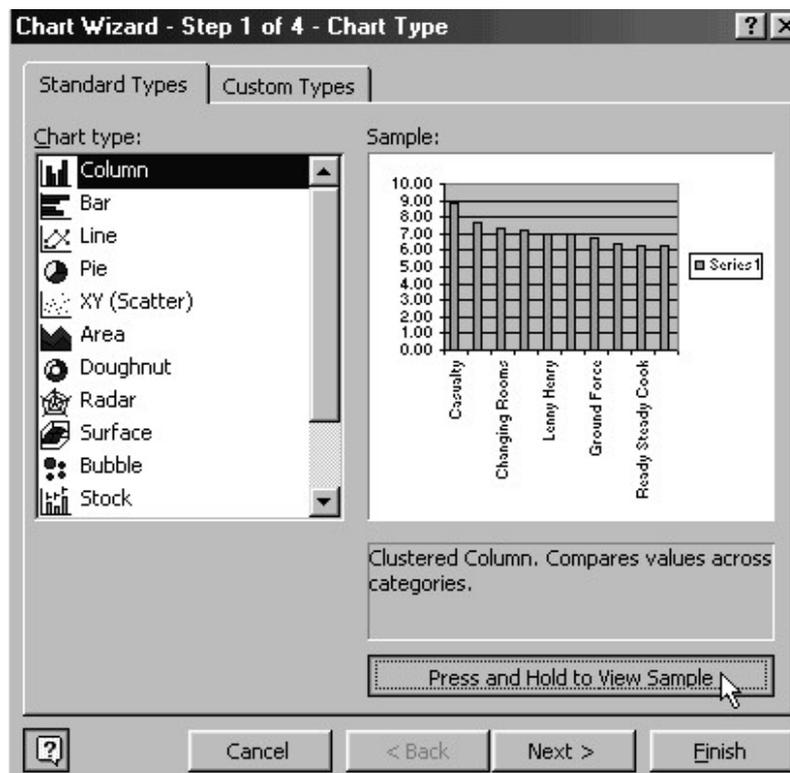


Let go of the left mouse button and you are returned to the chart types. The chart we want is Bar. So click on Bar in the Chart Types list. You'll see some different Bar types under Chart Sub Types. Make sure the first one is selected.
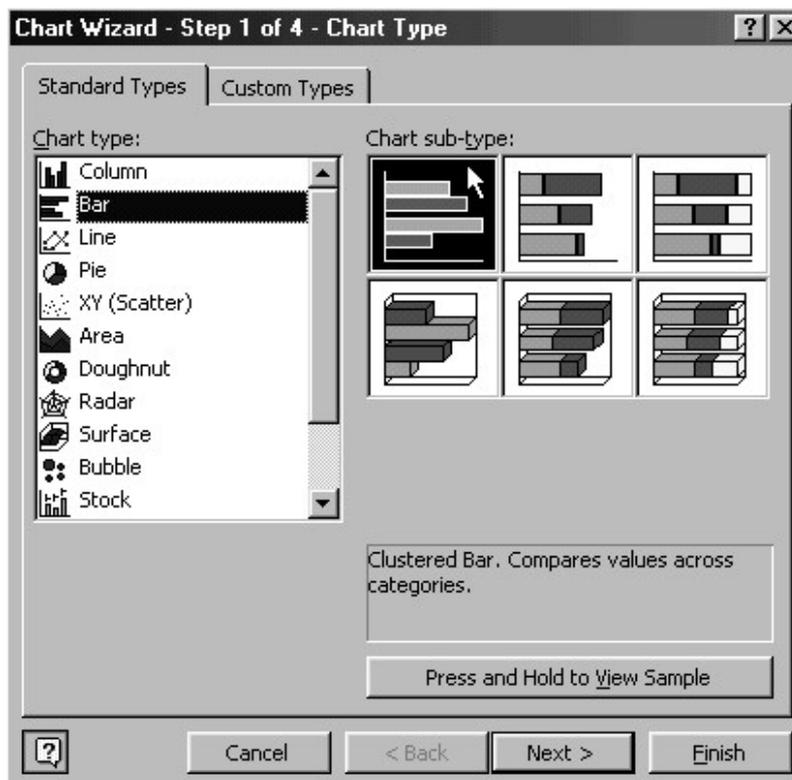
Click the Next Part link below to continue this lesson.

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# How to Format an Excel Chart

To formart the chart you created in the <u>last part</u>, do this:

- Click on your chart with your right mouse button
- A pop up menu appears
- Move your mouse up to "Format Chart Area"
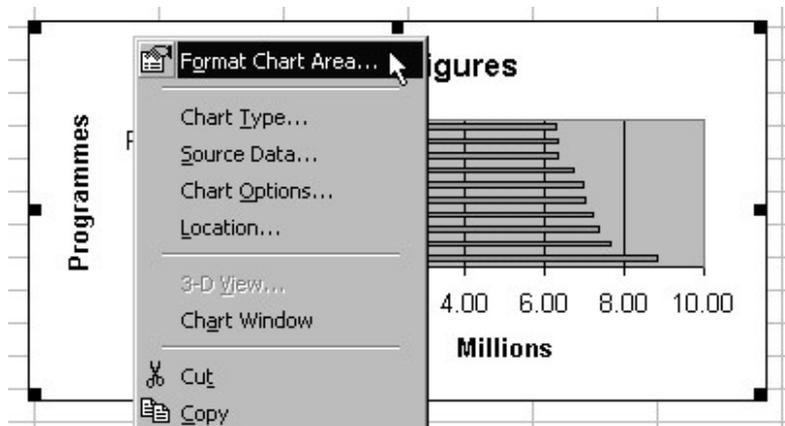


- Click on Format Chart Area with your left mouse button
- A dialogue box appears, and looks like the one below:
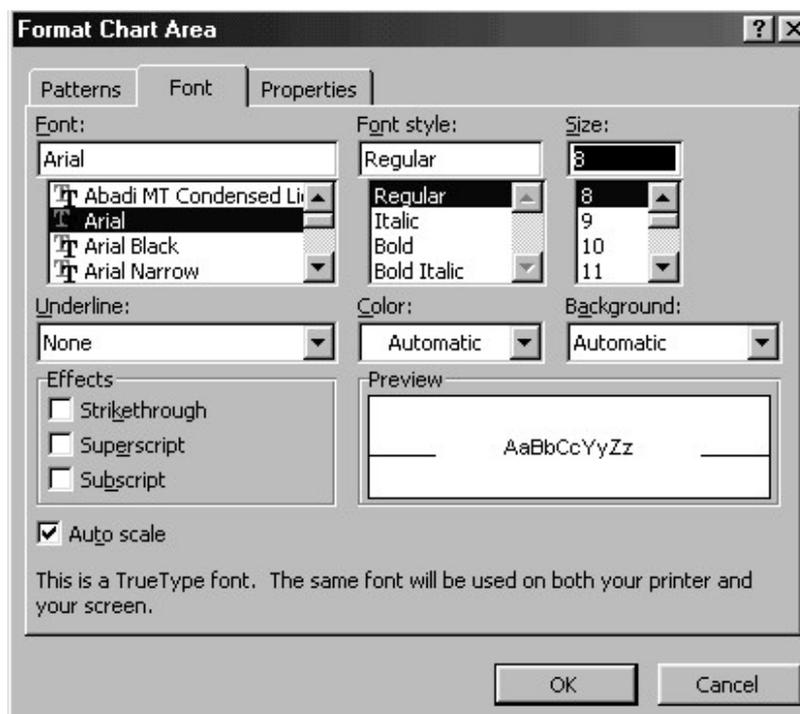


Select the Font tab strip, and change your settings to match those above: Arial, Regular, Size 8. Click OK when you're done. Your Chart will look something like the one below:
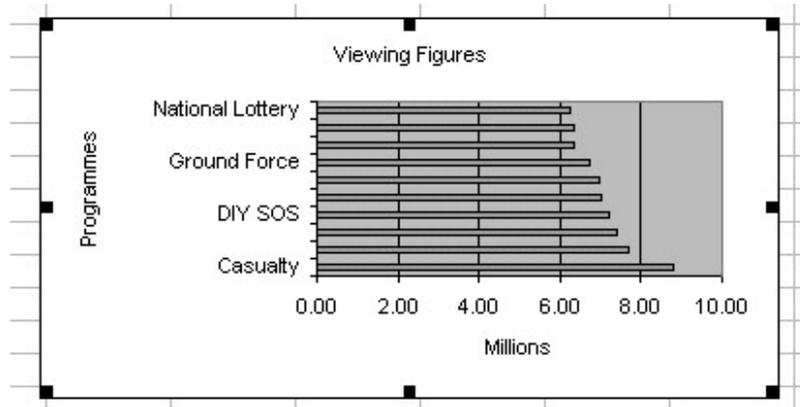
We now have four programmes showing, and different ones! Not quite there yet, then. We need to move the chart up a bit, and then resize it.

To move your chart up, do the following:

- Move your mouse into the Chart Area, but on a white bit
- Hold down your left mouse button
- Keep the left mouse button held down, and drag your mouse upwards
- Your chart should move up
- Let go of the left mouse button when your chart is near the top
- In the image below, the top left of the chart has been moved to the cell B2
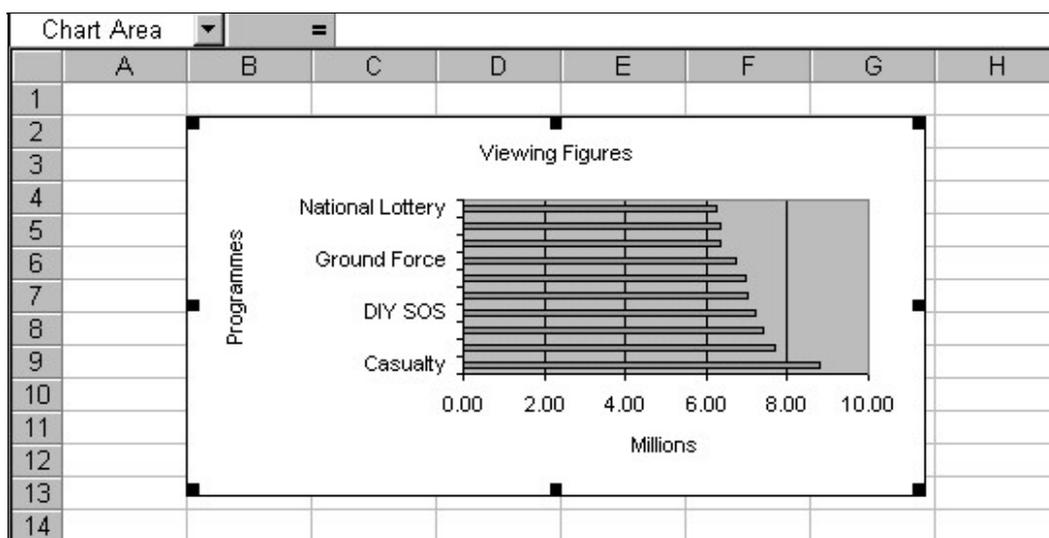


Now that we've moved our Chart up to the top of the spreadsheet, we can resize it.

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# Resizing an Excel Chart

To resize your chart, do the following:

- Move your mouse pointer to the middle black square on the bottom row (if you can't see any black squares around your chart, click on the chart with the left mouse button to select it)
- Your mouse pointer will change to the shape of a arrow-headed line, like the one in the image below:

Millions

- When you mouse pointer changes to the shape above, hold down your left mouse button
- Keep your left mouse button held down and drag downwards
- Let go of the mouse button when the bottom of your chart reaches about Row 22
- Your chart should look like the one in the next picture:
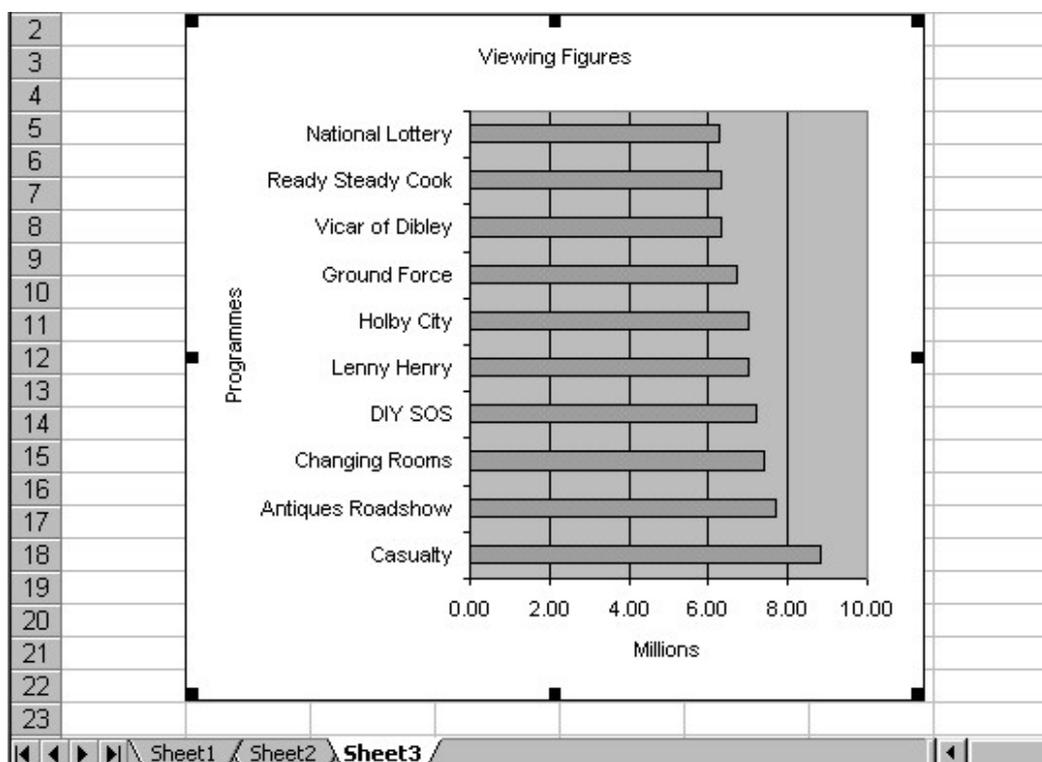


As you can see, all the programmes are now showing. You can make your chart wider by moving your mouse over the right middle black square, and then dragging outwards. But careful not to drag too far out because some of your programmes will disappear. If this happens, click Edit from the menu bar, then click "Undo" from the menu.

We can make some of the Titles bold. To make your titles bold, do the following:

- Click on Viewing Figures, but click with your right mouse button
- A small menu pops up
- Click on Format Chart Title



- Another dialogue box pops up

- Select the Font tab strip
- Choose a Bold font style and click the OK button
- Your title is made Bold
- Do the same with the Programmes title and the Millions title

Your Chart should now look something like the one below:
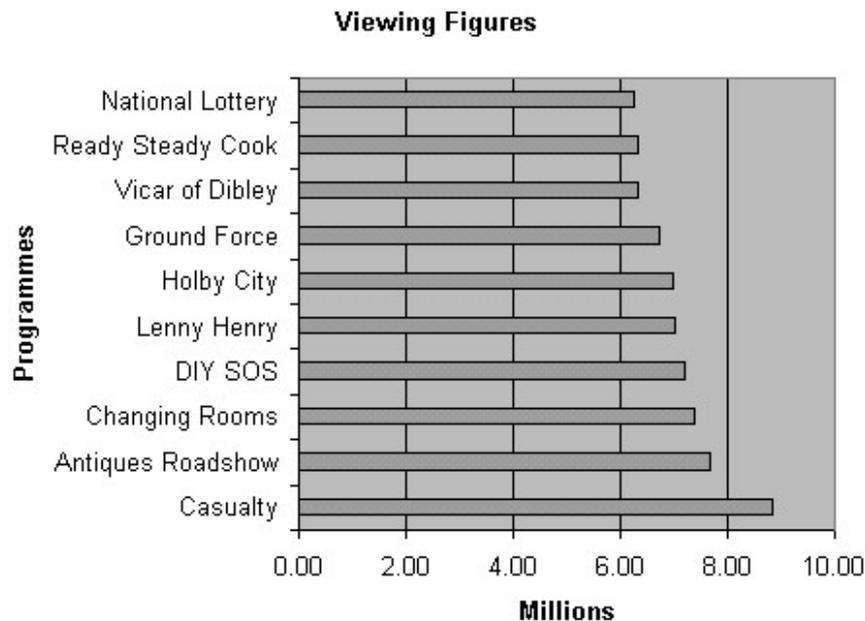
**Viewing Figures**



Except you might have noticed something: The programme with the highest viewing figures, Casualty, is at the bottom! The programme with the lowest viewing figures is at the top. We can do something about this quite easily. To get them other way around, do this:

- Click on Sheet 1 to return to your spreadsheet Data
- Make sure the data is still highlighted
- Click on **Data** from the menu bar
- From the drop down menu, click on **Sort**
- On the Sort dialogue box, change the two Descending radio buttons to **Ascending**
- Click the OK button
- Click back on Sheet 2 to see your Chart
- The Highest programme should now be at the top, and the lowest at the bottom

The above method is not an ideal solution, but that is due to the nature of the Chart type we have chosen.

We'll now do something different with the ITV programmes. We'll create a different chart - a Pie Chart.

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# Excel Pie Charts

The next chart we'll create is a pie chart. The process is almost the same, but instead of creating the chart in a separate sheet, we'll create it in the spreadsheet itself. This time, we'll use the ITV figures.

To make a start on the pie chart, highlight the ITV data in the spreadsheet you created earlier, as in the image below:

| ITV | |
|---|---|
| | Millions |
| Who... Millionaire | 10.99 |
| Heartbeat | 10.22 |
| Bad Girls | 7.42 |
| The Bill | 6.54 |
| The Vice | 6.37 |
| Blind Date | 6.31 |
| Stars in their Eyes | 6.26 |
| Footballer's Wives | 6.17 |
| Champions League | 6.09 |
| Inspector Morse | 5.81 |

Once the data is highlighted, click on **Insert** from the menu bar. From the menu, click **Chart**. Alternatively, click the Chart icon in the toolbar. The chart icon looks like the one below:

If you can't see that icon in the tool bar, click on **View > Toolbars**. From the menu that appears, make sure there is a tick next to **Standard**.

Whichever method you use, the Chart Wizard will start up again.

In step 1 of the Wizard, locate the word Pie in the Chart Type list. The pie chart sub-types appear just to the right. There are six sub-types to choose from. Select the first one.
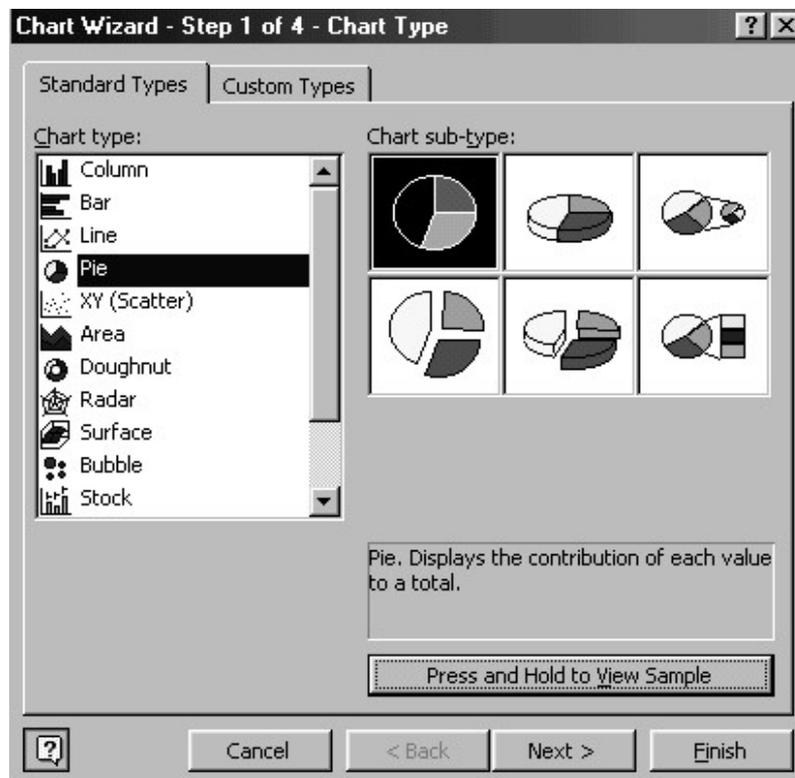
You can click the "Press and Hold to View Sample" button to see what it looks like. But click Next when you're done.

Step 2 of the Wizard is for the data range to include in the Pie chart. We've already selected our data, so just click the Next button on Step 2.

Step 3 of the Wizard looks like this:
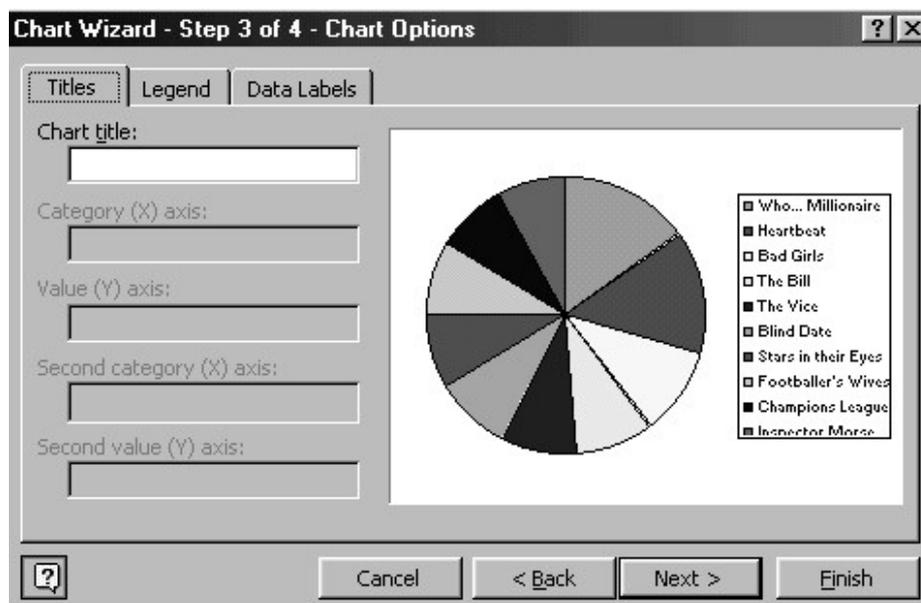


Click inside the Chart Title text box, and enter the title "Viewing Figures in Millions". Then click the Data Labels tab strip.

Under "Data labels", the default value **None** will be selected. Click "**Show value**" instead. (But click the others and see what happens). Then click the Next button at the bottom.

Step 4 of the wizard is where you specify the location for your new chart. This is the dialogue box:
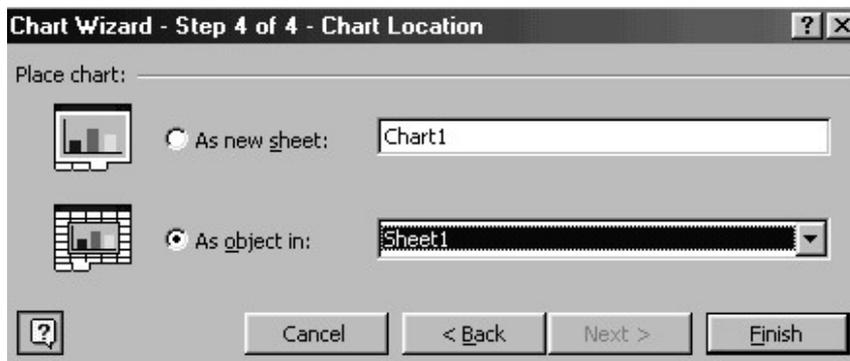
Make sure your dialogue box has "As object in" selected, and it says Sheet 1 (This is where your spreadsheet should be. If it's in a different sheet, click the black down arrow and select the sheet you need.)

Next, click the Finish button at the bottom. We'll see what happens inthe next part of this lesson.

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# Project Three

Create a Column chart from the new data you created in the previous lesson.

The chart should include chart titles.

The chart should also appear in its own Chart sheet. (Step 4 of the Wizard is where to set this up. Just make sure "As new Sheet" is selected.)

Your completed project might look something like the one in the link below:

The completed project

The idea behind the chart is to compare one set of values with another.

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# Excel Formulas - The Basic Operators

In this section, we'll discuss formulas some more. Because formulas are at the heart of spreadsheets. The reason you're using a spreadsheet is to work out some sort of mathematical calculation, whether that be a family budget calculation or a company profit calculation. And you can't do those calculations without using formulas.

## Adding Up

You've seen how to add up in Excel. You either used individual cells to add up, like this:

**= A1 + A2 + A3 + A4**

Or you have used a range of cells with the Sum function. Like this:

**= Sum(A1:A4)**

Either way you get the same answer. But you can combine the two to add up. For example, if you wanted to add up cells A1 to A4 and cell A10, you'd do it like this:

**= Sum(A1:A4) + A10**

You can also use the Sum function alone. Like this:

**= Sum(A1:A4, A10)**

Here we have entered a range of cells in the brackets - A1:A4. But after that, we added a comma then the final cell we wanted to add up. If we also wanted to add cells A12 and A14 to our sum, we just add a comma then the cell reference. Like this:

**= Sum(A1:A4, A10, A12, A14)**

Try using this Sum function yourself by doing these exercises:

### Exercise 1

On a new spreadsheet, enter the number 3 in the following cells: A1, B1, C1, D1. Enter the number 3 in the cell A2. Use only the Sum function to add up the values in the cells. Display the answer in cell A4. In other words, the spreadsheet should look like the one below:

| | A | B | C | D |
|---|---|---|---|---|
| 1 | 3 | 3 | 3 | 3 |
| 2 | 3 | | | |
| 3 | | | | |
| 4 | 15 | | | |
| 5 | | | | |

In the picture above, cell A4 displays the answer. Only a Sum function was used.

### Exercise 2

Enter the number 3 in the following cells: A1, B1, C1, D1, E1. Enter the number 3 in the following cells: A3, C3, E3. Add them all up using a Sum function. Display the answer in cell A5. The spreadsheet will look like this:

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | 3 | 3 | 3 | 3 | 3 |
| 2 | | | | | |
| 3 | 3 | | 3 | | 3 |
| 4 | | | | | |
| 5 | 24 | | | | |
| 6 | | | | | |

The correct answer, 24, is displayed in cell A5. Only one Sum function was used.

# Multiplying

You saw how to multiply two numbers together. Just use the asterisk symbol with the cell references. Like this:

**= A1 * A2**

But what if you wanted to multiply a long range of values together? You might want to multiply all the numbers in the cells A1 to A10. Surely you don't have do this = A1 * A2 * A3 * A4 * A5, etc?

You'd be right - you don't have to enter all the cell references. You can do the same as in the Sum Function, just use A1:A5. But instead of using the word Sum you use the word Product. Like this:

**=Product(A1:A5)**

If you look back at Exercise 2, the number 3 was in the cells A1 to E1. We then added them up. If you wanted to multiply them all instead, use Product. To further illustrate what Product does, this is what we wanted to multiply:

**= 3 * 3 * 3 * 3 * 3**

So 3 times 3 = 9. Multiply the 9 by the third 3 to give 27. Multiply the 27 by the fourth 3 to give 81. Multiply the 81 by the fifth 3 to give 243. And that's what Product does: Multiplies a range of cells together. Just like the Sum function, you can add other cells after a comma. Like this:

**= Product(A1:E1, A3)**

In the above function, our answer of 243 will be multiplied by whatever is in cell A3.

Try using Product yourself with these exercises:

## Exercise 3

In the cells A1 to E1 enter the following values: 1, 2, 3, 4, 5. Use Product to multiply them all together. Display your answer in cell A3. So your spreadsheet will look like this:

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | 1 | 2 | 3 | 4 | 5 |
| 2 | | | | | |
| 3 | 120 | | | | |
| 4 | | | | | |
| 5 | | | | | |

## Exercise 4

In the cells A1 to E1 enter the following values: 1, 2, 3, 4, 5. In the cells A3, C3 and E3 enter the following values: 6, 7, 8. Use Product to multiply all the values together. Display the answer in cell A5. Your spreadsheet will look like this one:

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | 1 | 2 | 3 | 4 | 5 |
| 2 | | | | | |
| 3 | 6 | | 7 | | 8 |
| 4 | | | | | |
| 5 | 40320 | | | | |
| 6 | | | | | |

# Subtraction

To subtract one value from another, you just use the minus sign in between your cell references. Like this:

**= A1 - A2**

Below is an image from a spreadsheet showing a subtraction formula:

A3 ▼ = =A1 - B1

| | A | B | C | D |
|---|---|---|---|---|
| 1 | 25 | 14 | | |
| 2 | | | | |
| 3 | 11 | | | |
| 4 | | | | |

Cell A3 is where the answer is displayed, and where we entered the formula.

If you want to subtract more than two cells you can do it like this:

**= A1 - B1 - C1**

Subtraction is fairly straightforward in spreadsheets, and shouldn't cause you too many problems.

# Division

If you want to divide one number by another the symbol to use is this one:

**/**

That's the forward slash, and can be found just to the right of the full stop on your keyboard. You use it like this:

**= A1 / C1**

There are a number of times when you would want to divide, but wouldn't need the divider symbol at all. For example, you use division to calculate Averages, but you wouldn't need the divider symbol here because Excel has a separate Average function. Likewise, if you wanted to calculate monthly payments, you wouldn't need to use the divider symbol because Excel had quite a number of financial functions you can use. (We'll meet some of these later in the course.)

In the next part, we'll take a look at how to combine these basic Math operators in Excel.

# Excel Formulas - Combining the Mathematical Operators

There are times when you will want to combine the arithmetic operators in your calculations. Here are a few examples of combining the operators:

## Example 1

- Start a new spreadsheet
- Enter the number 25 in cell A1
- Enter the number 50 in cell A2
- Enter the number 2 in cell A3
- In cell A5 enter the following formula

**=(A1 + A2) * A3**

- Press the Return key on your keyboard to get the answer

The answer you should have got was 150. Notice the brackets in the formula. The brackets group part of your sum together. Without them, Excel will normally calculate from left to right. But it does some calculation before others. Excel sees multiplication as more important than adding up. To see what happens without the brackets, do this:

- Click on cell A5
- Click inside the formula bar at the top
- Delete both the brackets from the formula
- Press the return key on your keyboard to see the answer

Now the answer is different! This time you should have gotten 125. Here are the picture versions of both formulas:

You might think the second one is wrong. But it's not. It's just the way Excel works things out. Because it sees multiplication as more important than adding up, it will multiply cell A2 by cell A3 first. That gets the answer of 100. Excel will then add this answer to cell A1, which gives the answer 125.

With the brackets in, you force Excel to work things out your way. You're saying "Do the sum in brackets first, then multiply". When you do the brackets first, you get a different answer. A1 + A2 = 75. Multiply 75 by cell A3 and you get the answer 150.

The moral is: take care when you are grouping operators together. And force Excel to work things out your way by using brackets to group your sums.

## Example 2

Substitute the asterisk symbol from example 1 with the forward slash. So the formula will be changed from this:

**= (A1 + A2) * A3**

to this:

**= (A1 + A2) / A3**

Press the Return key on your keyboard to reveal the answer. It should be 37.5. Now take the brackets out and try again. Again, you get a different answer. The total will now be 50!

Again the same process is at work. Excel sees division as more important than adding up, so it does that first. So it will divide 50 by 2 to get 25. Then it will add the contents of cell A1 to get 50. With the brackets, we force Excel to do the adding up first, then divide by the cell A3.

### Example 3

This time, enter the following formula for cell A5:

$$= (A1 * A2) / A3$$

Press the Return key on your keyboard to reveal the answer. It should be 625.

Remove the brackets and try again. The answer should be 625 again. This is because Excel sees Multiplication and division as being of equal importance. When all things are equal, Excel calculates from left to right.

Likewise, Excel sees addition and subtraction as being of equal importance. So it will calculate from left to right if you use addition and subtraction in the same formula. As an example, study this formula below:

| A5 | ▼ | = | =A1 + A2 - A3 | |
|---|---|---|---|---|
| | **A** | B | C | D |
| 1 | 25 | | | |
| 2 | 50 | | | |
| 3 | 2 | | | |
| 4 | | | | |
| 5 | 73 | | | |
| 6 | | | | |

As you can see, the formula in cell A5 is = A1 + A2 - A3. Now does that mean this:

$$= (A1 + A2) - A3$$

Or this:

$$= A1 + (A2 - A3)$$

Work it out on paper to see if there is any difference.

Despite the answer above, operator precedence is important: All sums are not equal!

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# Project Four - A Budget spreadsheet

OK, let's put all our arithmetical operator knowledge together and construct a spreadsheet.

The spreadsheet you're going to construct is a Budget spreadsheet. Here's the scenario.

There is a small town called Evercrease. Last year the council had a budget of half a million pounds to spend. They overspent by 69 thousand pounds, which the citizens of Evercrease objected to most strongly. So strongly in fact that they got rid of the entire council. Now they need to appoint somebody else to manage the budget. They have asked you to do the job. Have a look at last year's budget:

Budget Spreadsheet Image (opens in a new window - 165K).

The final budget figure is in cell B33 and reads minus £69 000. Your job is to make a new budget spreadsheet, ensuring that you do not have a minus figure in cell B33.

Your first job is to recreate the budget spreadsheet exactly as it is in the picture. Once you have a spreadsheet exactly like the one in the image, along with the formulas to get the same figures, you can start to enter your own numbers. For example, the budget shows that there are 5 teachers. The teachers are paid 16 thousand pounds a year. These 5 cost 80 thousand pounds a year to keep. Perhaps you don't need 5? Change the number to 4. When you change it to 4, the 80 thousand total should adjust. That's because you will have entered a formula in the total column.

So once all your formulas are place, you can adjust the figures in the Number column, column D in the spreadsheet. What you change the numbers to is entirely your decision. After all, you are in charge of the budget. It's your job on the line!

But there are some things you can try. These are:

- **Division formula**
- **Subtraction formula**
- **Multiplication formula**
- **Addition formula**
- **Combination formulas**

You can put the combination formulas in cells B37 and B38 (New Final Budget and New Monthly Spending). Your combination formulas will be the ones with brackets. Something like =A1 - (A2 + A3) or =(A1 + A2) / 12.

Concentrate first on reproducing the same spreadsheet as in the image, and getting the same totals as that one. When your spreadsheet is the same as that one, then you can play around with the numbers.

There is a lot of work to do in the spreadsheet, but it will give you good practice entering text and formulas on a large spreadsheet.

Remember, though: the people of Evercrease are looking for a budget that is less than half a million! If your budget is over that figure, they'll fire you!

Good luck.

NOTE: If you would like a version of the budget with all the formulas already entered, click here: The

Budget as an Excel Spreadsheet.

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# The Average Function in Excel

In section 6, we're going to look at some slightly more complex formulas than the simple operators. In fact the formulas in this section are not really formulas at all. They are Functions. Don't be put off by the name. A Function is just something to help you calculate. You've already met the SUM() function. The ones in this section are just some more of the functions built in to Excel. We will explore averages, date and time formulas, and one or two financial formulas. It might get a bit tricky, so hold on to your hats!

## Averages

We'll make a start with averages. First, what is in an average? In maths, an average is a number derived by dividing how many there are in a list by the list total. For example, suppose a list of student scores in an exam was this: 9, 7, 6, 7, 8, 4, 3, 9. We only have eight scores. To get the average score we first need to get the total. So add up the numbers in the list: 9 + 7 + 6 + 7 + 8 + 4 + 3 + 9 = 53. Next divide by how many there are in the list: 8. So to get the average score the sum is 53 divided by 8. The answer is 6.625. Which means that the average score in the exam was 6.625.

Once we have an average figure we can see at a glance which students are performing above average, and which below. Clearly, the poor student who scored only 3 needs some extra homework!

So now that you know what an average is, how do you calculate averages with Excel? Well, start a new spreadsheet and enter those exams scores in cells A1 to A8. Your spreadsheet will look like the one below:

| | A | B | C |
|---|---|---|---|
| 1 | 9 | | |
| 2 | 7 | | |
| 3 | 6 | | |
| 4 | 7 | | |
| 5 | 8 | | |
| 6 | 4 | | |
| 7 | 3 | | |
| 8 | 9 | | |
| 9 | | | |

- Next, click in cell A9
- We now need to insert the average Function

There are a couple of ways to insert a function.

### Method 1

Click on the equals sign next to the formula bar. This is the Edit formula button, and can be seen in the picture below:
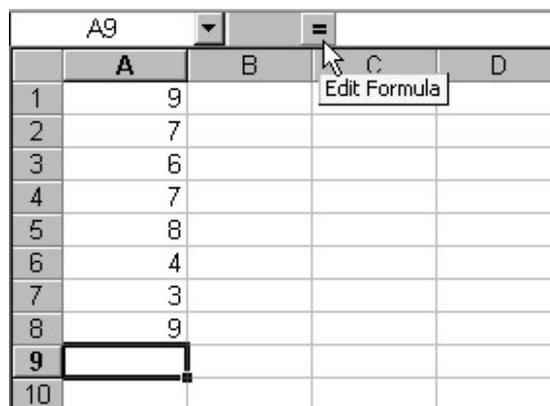
When you click the equals button, you'll see a palette appear just under the Name box and Formula bar. It will look like the one below:
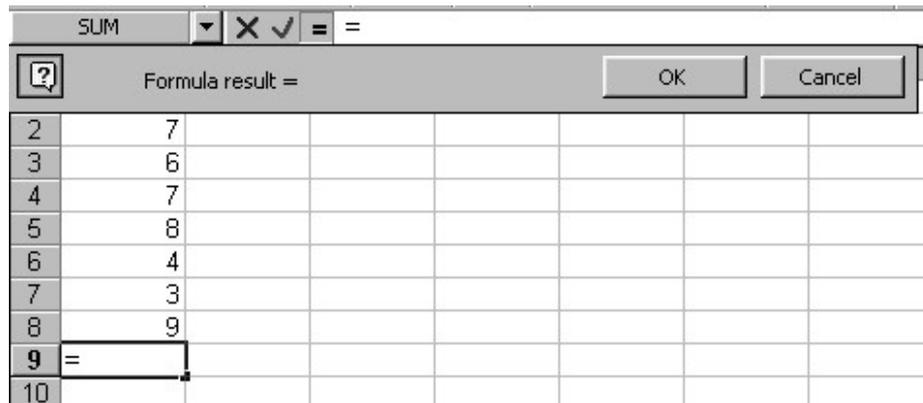
There are one or two things to notice about the Formula palette. First look in cell A9. There is an equals sign in it. Excel has entered this because all formulas and functions must start with this symbol, and it knows that it's easy to forget to put an equals sign in. So it does it for you.

The next thing to notice is that the Name box says "Sum". There is a black down-pointing arrow to the right of "Sum". Clicking on the arrow will reveal a list of Functions.
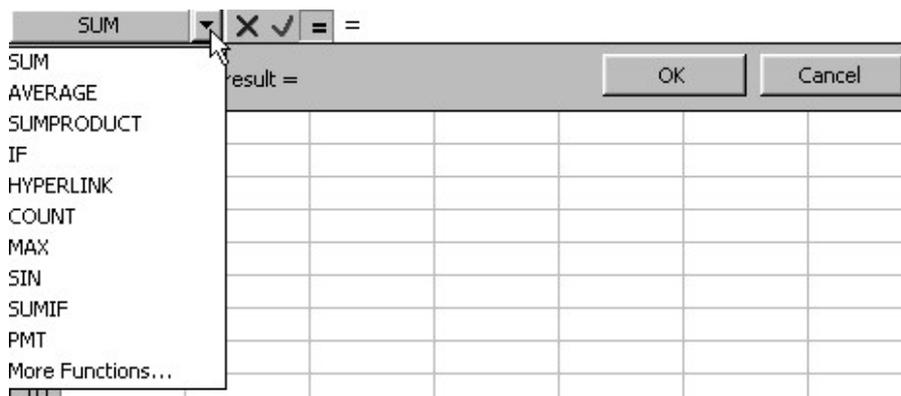
The one we want is there. So click on **Average** with your left mouse button. The palette changes to this rather complicated one:
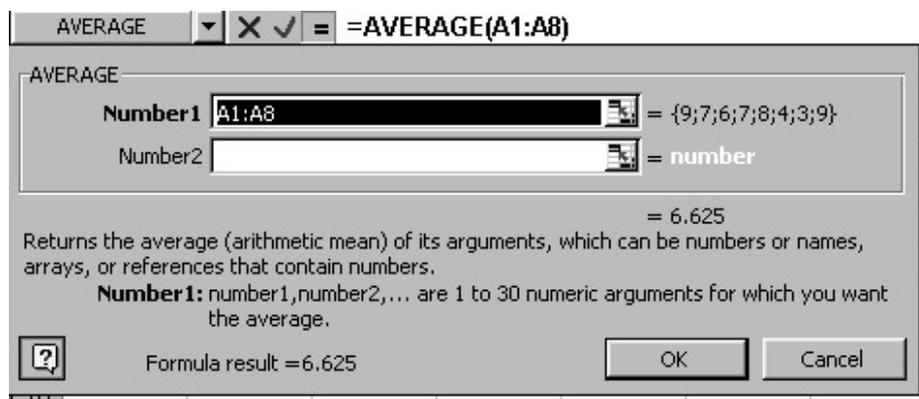
Excel does a few things here: shows you what Function it is putting in the Formula bar at the top (=Average(A1:A8); gives you a list of the values in your cells (in brackets after the Number1 text area); gives you the result (at the bottom "Formula result = ").

But don't worry if you're scratching your head over that dialogue box. Just click the OK button at the bottom. The palette closes, and Excel inserts the result of the average in cell A9.

## Method 2

The second way to enter a Function is this:

- Click inside cell A9
- From the menu bar at the top, click on **Insert**
- From the drop down menu, click on **Function**
- The following dialogue box appears:
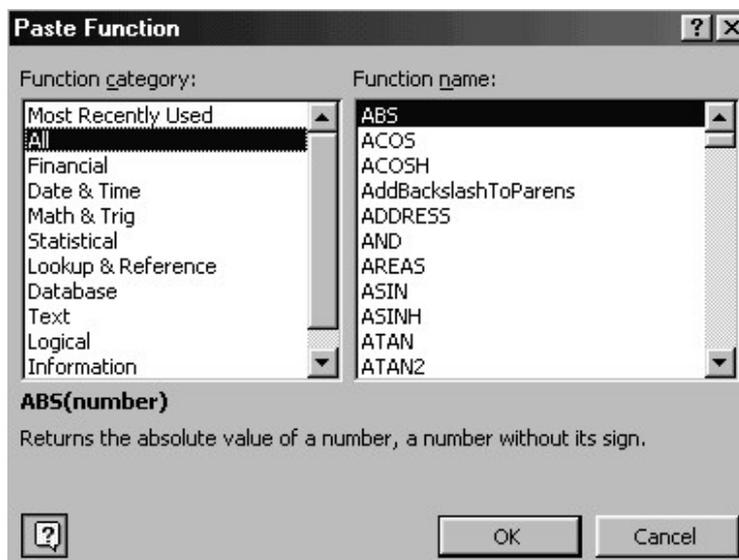


This dialogue box is a listing of all the Functions built in to Excel. The Average function is under Statistical.

- In the **Function category** section, click on **Statistical** with your left mouse button
- A list of all the Statistical functions appears on the right hand side
- Locate **Average** and click it with your left mouse button
- Click the OK button at the bottom
- The function palette appears, the same one from Method 1
- Click the OK button and Excel will insert the answer to your Average Function in cell A9

But what if Excel has the wrong cell references for your Average? Is there any way you can edit the Functions? Yes, there is. Try this:

Click in cell B9 of your spreadsheet. Use one of the methods outlined to bring up the formula palette. Your spreadsheet will now look like this:
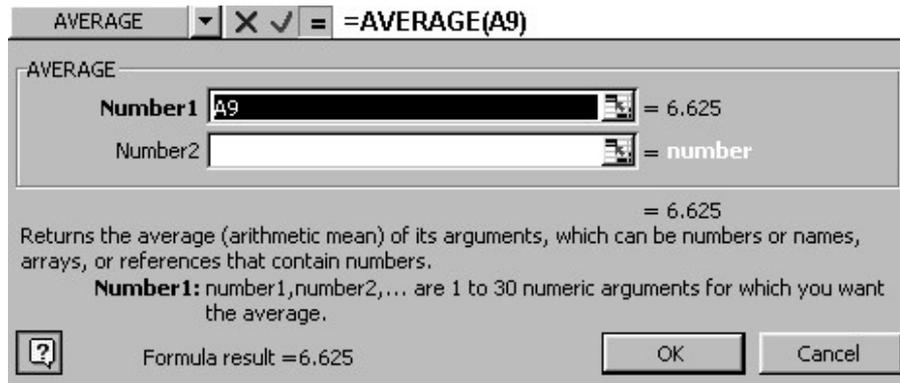


This time the formula bar just reads **=Average(A9)**. You can edit the function by clicking inside the formula bar at the top. Change A9 to A1:A8 and the click the OK button.

Of course, you don't need to use the formula palette at all. You could just enter the Function directly, just like you did with the Sum() function, or any other formula: click on the cell where you want the answer to appear. Then click inside the formula bar. Enter **=Average(A1:A9)** and press the return key on your keyboard.

The advantage of using the formula palette is that Excel enters the correct function for you. It's very easy to make a typing error if you do it yourself, and then get an enigmatic error message for your troubles.

OK, time for an exercise.

# Exercise

A dart's player is trying to work out his three dart average, and his one dart average. Help him out. His scores for a single game were these:

<div align="center">

60
55
24
95
100
60
86
21

</div>

So his score of 60 was achieved by throwing three darts. Likewise, a total of 55 was achieved with three darts. In fact, every score on the list is a the result of three darts. Your task is to work out his three dart average.

Once you have worked out his three dart average, let him know what his average score was for one dart. (You don't need the Average Function here. What you are working out is how many darts he threw in total. Then divide the grand total for all his darts by this number. An easier way to get the answer is to divide the Average by . . . ?)

In the next part, we'll take a look at Date and Time functions in Excel.

# How to use the Date Functions in Excel

There are a numbers of different reasons why you would want a Date or Time function in a spreadsheet: If you're running your own company, you might want to record when an order was received and when it was processed. You could then calculate the difference between the two, so that you check how fast the orders were being processed. We'll do that now.

## Date Functions

Set up this simple spreadsheet in Excel



Click inside cell A3. To enter a date Function, do the following:

- Click on **Insert** from the menu bar
- From the drop down menu, click on **Function**
- The Paste Function dialogue box appears
- In the **Function category** section, click on **Date & Time**
- In the **Function name** section, click on **Date**
- Click the OK button at the bottom
- The formula palette appears on your spreadsheet



What Excel wants you to do here is to enter some figures for the date. So:

- Click inside the **Year** box and enter 2002
- Click inside the **Month** box and enter the number 4 (The fourth month - April. Or you can enter any number you like here, the number for the current month, if you want)
- Click inside the **Day** box and enter the number 15 (The 15th day - or enter another number, if you want.)
- Click the OK button at the bottom
- Excel enters the Date in cell A3

Notice how the date Function is set out in the Formula box. It is set out as **=Date(2002, 4, 15)**. However, in cell A3 the date is 4/15. It has missed out the year completely! Is there anything we can do to resolve the matter?

The reason Excel has missed the year out is because of the way cell A3 was formatted. To change the formatting of cell A3 (or any cell), click on **Format** form the menu bar. From the drop down menu, click on **Cells**. The format dialogue box appears. Click the **Number** tab strip at the top. Under Category, click on **Date**. A list of different date types appears in the Type list. The following picture shows this:
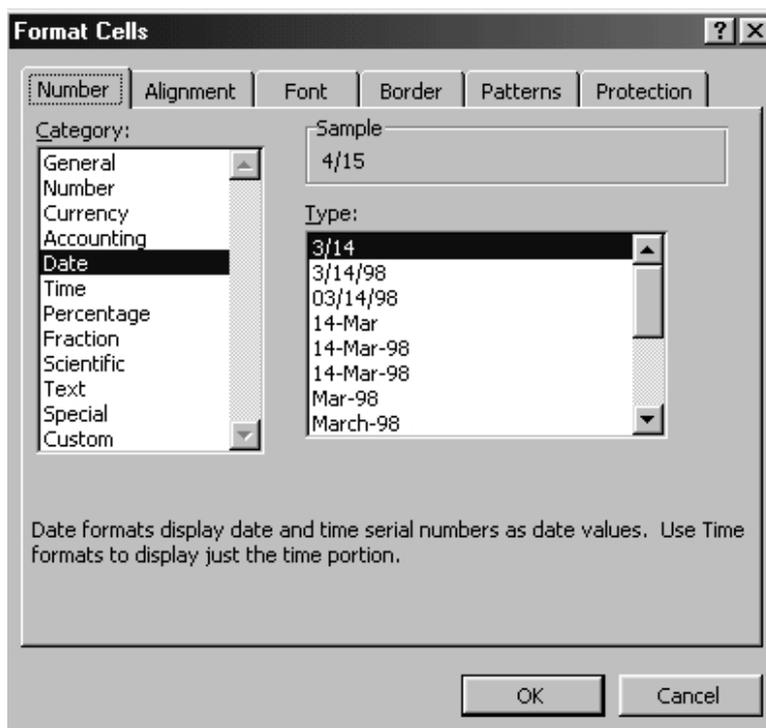


The **Type** section of the dialogue box is where you set how you want your date to look. At the moment, the first option is selected 3/14. Scroll down and click on March 14, 1998. Then click the OK button at the bottom. Your spreadsheet will now look like this one:



In cell B3, for the Date Order Sent, enter another Date Function. This time, have the date read May 3, 2002. Your spreadsheet will then look like this:

In cell C3, under Time Taken, we'll work out how long the order took to be sent out.

## The Days360 Function in Excel

The Function to use when you want to work out how many days difference there are between two dates is the Date360( ) function. So click on cell C3 and do the following:

- From the menu bar, click on **Insert**
- From the drop down list, click on **Function**
- The Paste Function dialogue box appears
- Under **Function category**, click on **Date & Time**
- Under **Function name**, click on **Days360( )**
- Click the OK button at the bottom
- The formula palette appears on your spreadsheet:
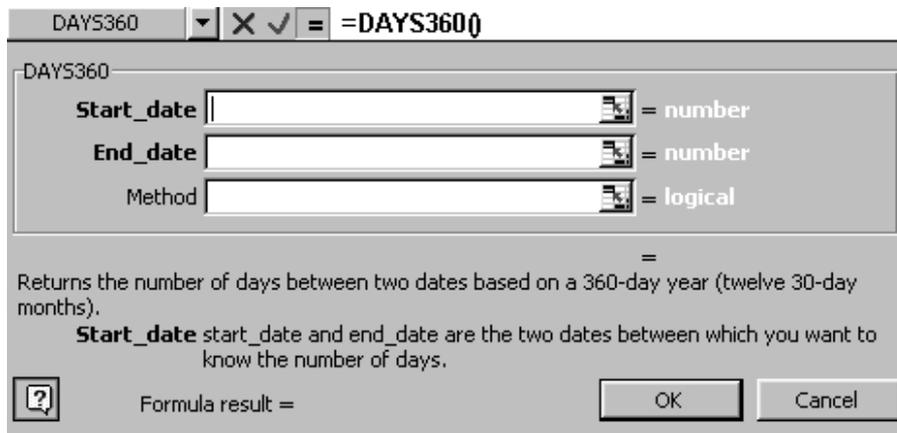


What Excel is looking for here is two dates: a start date and an end date. Our start date was in cell A3, and we can just enter the cell reference here. So click inside the **Start_date** box and enter A3. Next, click inside the **End_date** box and enter B3. Click inside the Method box and enter **True** (This will ensure that Excel calculates from the European date system.) Click the OK button when you're done. Your spreadsheet might look like the one below:



If your spreadsheet has all of those hash symbols in cell C3 it means that your column is not wide enough. So widen the C column until it takes all the date. Your spreadsheet might then look like this one:



As you can see, something has clearly gone wrong. Cell C3 reads January 18, 1900. The reason it is showing such a bizarre answer is because of the way the cell is formatted. We have C3 formatted as a date. But the answer to our Days360( ) function is not a date. The answer is a number. So we need to reformat that cell.

Format the cell C3 so that it is a number, and set the Decimal places to zero. Your spreadsheet will then show the correct answer, like the one below:

| | A | B | C | D |
|---|---|---|---|---|
| | C3 ▼ | = | =DAYS360(A3,B3,TRUE) | |
| 1 | Date Order Taken | Date Order Sent | Time Taken | |
| 2 | | | | |
| 3 | April 15, 2002 | May 3, 2002 | 18 | |
| 4 | | | | |
| 5 | | | | |

Entering dates can be fairly straightforward, like cells A3 and B3. But performing calculations with dates can be slightly more complex. To get you some more practice, try this exercise.

# Exercise

The Mayor or Evercrease celebrates his official birthday on the 28th of June (Nobody knows his unofficial one). Work out how many days there are left to the Mayors official birthday party. After all, you are invited, so you need to start saving for his present.

To get the current date, you can use this function: **=Now()**. You can then format the cell to get the date format you prefer.

In the next part, we'll take a look at the Time Function.

Explore the Time Function in Excel -->

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# How to use the Time Function in Excel

Getting the time into a spreadsheet cell is fairly straightforward. First, use the Now() Function. Then format the cell to the Time format you want. We'll go through it now. To enter the Time function, do the following:

- Click on any empty cell
- Click inside the formula bar
- Type in this formula:

**=Now( )**

- Press the Return key on your keyboard

When you press the Return key, Excel will give the current date and time. To get only the time, do this:

- Click inside the cell where your Now( ) function is.
- From the Excel menu bar, click on **Format**
- From the drop down menu, click on **Cells**
- The **Format Cells** dialogue box appears. Click the **Number** tab strip
- Under **Category**, click on **Time**
- Under **Type**, select the Time type you want.
- Click OK when you have finished

The thing to bear in mind about the Time function is that Excel doesn't update it every second. So you can't use it like a normal clock. But Excel will update the Time when you enter a calculation. As an example, try this:

- Note the cell where your Time function is, and what time it reads
- Click inside an empty cell
- Enter any calculation (= 2 + 2 will do)
- Press the Return key on your keyboard
- Look at your Time function cell again. Excel will have updated the Time

You don't have to use the Now( ) function to get the Time. We'll see how to get the Time another way, and we'll construct a timetable.

## A Timetable

Start on a new spreadsheet, and create the same labels as the ones in the image below:

| | A | B | C |
|---|---|---|---|
| 1 | Job | Start Time | Time it Takes |
| 2 | | | |
| 3 | Wash Pots | | |
| 4 | Hoover | | |
| 5 | Rest | | |
| 6 | Dust | | |
| 7 | Windows | | |
| 8 | Rest | | |
| 9 | | | |

What we're going to do is enter a start time of 9 in the morning. That's when we start washing the pots. We'll estimate how long it takes to wash the pots in the C column, under "Time it Takes". We'll add the

"Time it Takes" to the "Start Time" to get a new start time for the Hoovering . But you'll see how it works as we go along.

The first task is to format the Start Time column. So:

- Highlight the Start Time column, from B3 to B8.
- From the Excel menu bar, click on **Format**
- From the drop down list, click on **Cells**
- The **Format Cells** dialogue box appears
- Click the **Number** tab strip, and select **Time**
- Under **Type**, select **13.30.** Then ckick OK

The next thing to do is enter a time for cell B3, the Start time. Now that you have formatted the B column as a Time, you can go ahead and just enter a time. Do this:

- Click on cell B3
- Click inside the formula bar
- Type in **09:00** (the colon in between the numbers is important)
- Press the return key on your keyboard
- Excel will now treat cell B3 as a time - 9 AM

We'll assume that we're very fast at washing pots (it's all that practice!). So we'll spend just 15 minutes on this job.

- Click inside cell C3
- Click inside the formula bar
- Type in **0:15**
- Press the return key on your keyboard

Excel will probably enter 00:15 for you. (The first two zeros are for the hour.) Your spreadsheet will now look like this:

| | A | B | C | D |
|---|---|---|---|---|
| 1 | Job | Start Time | Time it Takes | |
| 2 | | | | |
| 3 | Wash Pots | 09:00 | 00:15 | |
| 4 | Hoover | | | |
| 5 | Rest | | | |
| 6 | Dust | | | |
| 7 | Windows | | | |
| 8 | Rest | | | |
| 9 | | | | |

We now need to add 15 minutes to the starting time of 9 AM. So do the following::

- Click inside cell B4
- Then click inside the formula bar
- Enter this formula:

$$= B3 + C3$$

- Press the return key on your keyboard
- Excel will enter 09:15 in cell B4

OK, we have a start time for the hovering - 9:15 in the morning. We can get Excel to Auto Fill the rest of the formulas, because they'll be same. So:

- Click inside cell B4
- Move your cursor to the bottom right of the cell

When your cursor changes to the shape of a black cross, hold down your left mouse button.
- Keep it held down and drag the mouse pointer to cell B9
- Excel will enter 09:15 for all the cells

The only thing left for us to do now is enter some times for the "Time Taken" column.

- Click on cell C4
- Click inside the formula bar and type in 01:00 (meaning one hour for the hovering)
- Press the return key on your keyboard
- Excel will change all the cells from Rest downwards to 10:15
- Your spreadsheet will now look like this one:

| | A | B | C | D |
|---|---|---|---|---|
| | Job | Start Time | Time it Takes | |
| 1 | Job | Start Time | Time it Takes | |
| 2 | | | | |
| 3 | Wash Pots | 09:00 | 00:15 | |
| 4 | Hoover | 09:15 | 01:00 | |
| 5 | Rest | 10:15 | | |
| 6 | Dust | 10:15 | | |
| 7 | Windows | 10:15 | | |
| 8 | Rest | 10:15 | | |
| 9 | | 10:15 | | |
| 10 | | | | |

C4 = 01:00:00

OK, you can enter all the other figures yourself. Enter these figures in the remaining "Time it Takes" column:

**Rest:** 30 minutes
**Dust:** 30 minutes
**Windows:** One hour
**Rest** 30 minutes

When you are finished, you should have a timetable like the one below:

| | A | B | C | D |
|---|---|---|---|---|
| 1 | Job | Start Time | Time it Takes | |
| 2 | | | | |
| 3 | Wash Pots | 09:00 | 00:15 | |
| 4 | Hoover | 09:15 | 01:00 | |
| 5 | Rest | 10:15 | 00:30 | |
| 6 | Dust | 10:45 | 00:30 | |
| 7 | Windows | 11:15 | 01:00 | |
| 8 | Rest | 12:15 | 00:30 | |
| 9 | | 12:45 | | |
| 10 | | | | |

And that's how to construct a simple timetable. Working with times can be quite tricky, and a good knowledge of Excel functions will stand you in good stead. But we'll leave the Time function, and move on to something else

We'll now move on to some financial formulas.

Explore Financial Functions in Excel -->

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# How to Work out Interest Rates in Excel

The financial function we're going to explore will calculate the monthly payment amounts on a loan. The function we're going to use is PMT( ).

## The PMT ( ) Function

If you want to know how much a loan will cost you, then the PMT ( ) function is ideal. How much will I have to pay back if I borrow a thousand pounds over 2 years? Over 5 years? Over 10 years? You can calculate this with the PMT ( ) function.

The PMT( ) function expects certain values in between those two brackets. The values are known as arguments. The arguments that the PMT( ) function expects are these:

**PMT(rate, nper, pv,** fv, type**)**

The last two, fv and type, are optional. If all this sounds very confusing, then don't worry: we'll clear it up with an example.

The example is this: You want to borrow ten thousand pounds from your friendly banker. You also want to pay it back over 5 years. What you need to know is - how much will this loan cost me every month?

We'll work it out with the PMT( ) function. First, create a new spreadsheet like the one below:

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Loan amount: | 10000 | | | |
| 2 | | | | | |
| 3 | Interest Rate | Number of Payments | Present Value | Monthly Amount | Total Paid Back |
| 4 | | | | | |
| 5 | | | | | |

The figure in cell B1 is the amount we want to borrow - ten thousand pounds. Our financial function PMT( ) will go under Monthly Amount, in cell D4.

Before we can enter our function, we need to work out the Interest Rate, the Number of Payments, and the Present value. These are the arguments for our function. Let's start with the Interest Rate, the first of our arguments (**rate**).

The bank tells us that the interest rate is 12 percent. This is for the entire year. As we want to know how much to pay back each month, we need to divide this figure by 12 (12 months in a year; divide this into 12 percent). Of course, this is a simple division: 12 divided by 12 is 1. But we'll let Excel work it out. So do the following:

- Click inside cell A4
- Click inside the formula bar
- Enter the following formula:

**= 12% / 12**

- The press the return key on your keyboard
- Excel will enter 0.01 in cell A4

The next thing we need to work out is how many payments there are in total. We are paying back the loan every month for 5 years. As there are 12 months in a year, the formula is just 12 multiplied by 5. So do this:

- Click inside cell B4

Click inside the formula bar
- Enter the following formula:

$$= 12 * 5$$

- Press the Return key on your keyboard
- Excel will enter 60 in cell B4

OK, we have now worked out the second argument for our PMT( ) function - the **nper** bit. We can now move on to the **pv** part of the argument, or Present Value. The Present Value is sometimes known as the Principal. It is what the loan is worth now, and not say 5 years into the future. In other words, it's ten thousand pounds for us. So for the Present Value column in your spreadsheet, do this:

- Click inside cell C4
- Click inside the formula bar
- Enter this:

$$= B1$$

- Press the return key on your keyboard
- Excel will enter 10000 in cell C4, because this is the figure you entered into cell B1

Your spreadsheet should now look like the one below:

|   | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Loan amount: | 10000 | | | |
| 2 | | | | | |
| 3 | Interest Rate | Number of Payments | Present Value | Monthly Amount | Total Paid Back |
| 4 | 0.01 | 60 | 10000 | | |
| 5 | | | | | |
| 6 | | | | | |

Time now to enter our PMT( ) function in cell D4. So, do the following:

- Click inside cell D4
- Click inside the formula bar
- Enter the following function:

$$=PMT(A4, B4, C4)$$

- Press the return key on your keyboard

Excel should now have entered the monthly payments in cell D4. It is usually in red, and with a minus sign at the start (minus because it's what you owe to the bank). The answer you should have in D4 is -£222.44.

So we have to pay back to the bank every month two hundred and twenty two pounds forty four pence.

The final column is "Total Paid Back". To work out that answer you need to multiply the monthly payments by the number of payments. Which should cause you no problems at all. When you're done, the final spreadsheet looks like this:

|   | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Loan amount: | 10000 | | | |
| 2 | | | | | |
| 3 | Interest Rate | Number of Payments | Present Value | Monthly Amount | Total Paid Back |
| 4 | 0.01 | 60 | 10000 | -£222.44 | -£13,346.67 |
| 5 | | | | | |
| 6 | | | | | |

## Varying the Interest Rate

We'll now change that spreadsheet slightly. What we'll do is vary the number of payments. At the moment, we're saying 12 * 5 for the number of payments. But what if we decide we want to pay it back over ten years? How much are the monthly payments then? And how much do we pay back in total?

We also want to vary that interest rate. There is plenty of competition for loans. What if we can get a better deal for our interest payments? How does it effect the monthly payments if the interest rate is 11 percent?

We can make only a few slight changes to the spreadsheet to answer these questions.

Insert two more rows into your spreadsheet, and add two labels. Your spreadsheet sheet match the one below:

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Loan amount: | 10000 | | | |
| 2 | Num of Years | | | | |
| 3 | Interest | | | | |
| 4 | | | | | |
| 5 | Interest Rate | Number of Payments | Present Value | Monthly Amount | Total Paid Back |

To get the interest rate, we entered a formula. We entered this:

**= 12 % / 12**

If we put the percentage figure in a cell of its own, we could then reference that cell in our formula. We could just put this:

**= B3 / 12**

Then we could vary the interest rate by changing the number in cell B3. To clear any confusion, do the following:

- Click inside cell B3
- Click inside the formula bar
- Type in = **12 %**
- Press the Return key on your keyboard
- Click back inside cell **B3** because we need to format the cell as a percentage
- To format the cell as a percentage, click **Format** from the menu bar
- From the drop down menu, click on **Cells**. The Format Cells dialogue box appears
- Select the **Number** tab strip
- Under **Category**, click on **Percentage**.
- Click the OK button when you are done
- Cell B3 should now read 12.00 %

You can now change the formula for your interest rate. So click inside the cell where you interest rate is, probably cell A6. Click inside the formula bar. Change the formula from this:

**= 12 % / 12**

to this:

**= B3 / 12**

When you press the Return key on your keyboard, all of your monthly payment terms should stay the same. The difference is that you can now alter the interest rate from cell B3. Test it out. Change the interest to 10 percent and see what happens to your Monthly Amount figure.

## Exercise

The Number of Payments formula currently reads = 12 * 5. Change this formula so that number of years is coming from cell B2.

When you're finished, you final spreadsheet will look like this one:

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Loan amount: | 10000 | | | |
| 2 | Num of Years | 5 | | | |
| 3 | Interest | 10.00% | | | |
| 4 | | | | | |
| 5 | Interest Rate | Number of Payments | Present Value | Monthly Amount | Total Paid Back |
| 6 | 0.008333333 | 60 | 10000 | -£212.47 | -£12,748.23 |
| 7 | | | | | |

Play about with the figures in cells B1 to B3 and watch the D6 and E6 figures change. What about a ten year loan with interest of 15 percent?

# PMT extra

You can use the PMT( ) function to work out your savings. You might want to know how much you'll have to put away in the bank if you want to save 2 thousand pounds in one year. Remember the full PMT( ) function? It was this:

**PMT(rate, nper, pv, fv, type)**

To work out how much you'll have to save each month, you need that **fv** part. The **fv** stands for Future Value. You would then use the function like this (assume that the interest rate is a massive 10 percent):

**= PMT(10% / 12, 12 * 1, 0, 2000)**

The zero is for the **pv** part. The **pv** was Present Value. Because you haven't saved anything yet, the present value of your savings is zero. The 2000 is how much you want to save over 1 year

In the next part, we'll take a look at how to use IF Statements in your spreadsheets. This is known as Conditional Logic.

# Using If Statements in Excel

Conditional logic(IF) is used quite frequently in modern spreadsheets. But let's start by asking What is Conditional Logic?

## Conditional Logic

For our purposes, conditional logic is two words - "IF" and "Then". You use conditional logic all the time in your daily life, without realising it. You might say to yourself, "IF I eat this delicious cream cake THEN my diet will be ruined." You're using conditional logic to make a decision: **IF** I do this **THEN** that will happen. Some more examples:

**IF** I buy this lovely coat **THEN** I will look beautiful

**IF** I watch one programme **THEN** I can tape the other

**IF** I win the lottery **THEN** I will be happy

Those are all example of conditional logic. Excel also uses the **IF** word for conditional logic. You can test what is in a cell, and say what should happen if it is one value rather than another. For example, suppose cell A1 has the number 6 in it. In cell A2, you can enter an **IF** function to test whether cell A1 is above 5 or below 5. **IF** it is above 5 **THEN** one thing happens; **IF** it is below 5 **THEN** another thing happens.

The correct format to use for the IF function is this:

**IF(** logical_test, value_if_true, value_if_false **)**

So the IF function takes three arguments: **logical test**, **value if true**, **value if false**. Let's break those three arguments down a little more:

**Logical Test:**
This is what you want to test for. In our example, we wanted to test whether cell A1 is greater than or less than 5. Excel uses this symbol > for greater than and this symbol < for less than. So for the first argument, we would put A1 > 5

**Value If True:**
This is the THEN part of the IF statement. Excel needs to know what you want to happen IF your condition is met. You can put in text surrounded by quotes, or another formula.

**Value If False:**
You also need to say what should happen IF your condition is not met.

Let's clarify all this with a spreadsheet example. So, start a new spreadsheet and do the following:

- Click inside cell **A1** and enter the number **6**
- Press the return key on your keyboard
- Widen the B column of your spreadsheet. Make it nice and big.
- Click inside cell **B1**
- Click inside the formula bar
- Enter the following formula:

**=IF(**A1 > 5, "Greater than Five", "Less than Five"**)**

- Press the return key on your keyboard
- Your spreadsheet should look like this one below:

| B1 | | = | =IF(A1 > 5, "Greater than 5", "Less than Five") | | |
|---|---|---|---|---|---|
| | A | B | C | D | E | F |
| 1 | 6 | Greater than 5 | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |

It's important you get all the syntax right in your IF function. In other words, don't forget the commas, and the double quote marks around text.

But click inside cell A1 and change the number 6 to the number 4. Then press the return key on your keyboard. Excel should put Less than Five in cell B1. Now put the number 5 in cell A1 and see what happens.

Nothing happened, right? That's because the IF function is very precise. You didn't tell Excel what to do if the number equalled 5.

To get round this, we can use the **Greater Than** ( > ) symbol and the **Equal** symbol together. Like this:

$$A1 >= 5$$

That says "A1 greater than or equal to 5". When we amend our function, it looks like this:

**=IF(**A1 >= 5, "Greater than or Equal to Five", "Less than Five"**)**

You can also test to see if something is **Less Than** ( < ) **or Equal** to. You could use this for the formula:

**=IF(**A1 <= 5, "Less than or Equal to Five", "Greater than Five"**)**

You can even test for **Not Equal To**. Just join the Less Than (<) symbol to the Greater Than (<) symbol. Like this:

**=IF(** A1 <> 5, "Not 5", "Is 5"**)**

So to sum up: after typing **IF** you tell Excel what you want to test for. Then you say what should happen if the condition is true. Then you say what should happen if the condition is false.

In the next part, we'll take a look at Conditional Formatting.

# Conditional Formatting in Excel

If statements in spreadsheets can be very long and complicated. Consider this problem. You have a spreadsheet of student exam marks. Suppose you want to add the grades as well. If the student scored above 80 it's an A; if the student scored between 60 and 79, it's a B; if the student scored between 45 and 59, it's a C; if the student scored between 30 and 44, it's a D; and if the student scored less than 30, it's Fail. The question is, what does your IF statement look like?

Well, it might look like this:

=IF(B2>=80, "A", IF(B2>=60, "B", IF(B2>=45, "C", IF(B2 >=30, "D", "Fail"))))

What the IF statement is doing is nesting another IF statement on the False condition. So it says, "If B2 is greater than or equal to 80 THEN put an A in cell B15; if it's not, execute another IF statement."

But don't worry if that long IF statement is making your brain hurt - it is quite complicated!

However, we'll use that long IF statement to explore Conditional Formatting. You'll be glad to know that there is a spreadsheet already prepared for you, for this lesson. So right click the link below and save the spreadsheet to your own computer.

**Download the Spreadsheet for this lesson**

Open up the spreadsheet you've just downloaded, and take a look at it. It should be this one:

| | B15 ▼ | = | =IF(B2>=80,"A",IF(B2>=60,"B",IF(B2>=45,"C", IF(B2 >=30, "D", "Fail")))) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | I |
| 1 | | Steven | Mary | Anne | Raymond | Mark | Paul | Eliza | Kelly |
| 2 | Maths | 76 | 89 | 43 | 48 | 51 | 76 | 87 | 56 |
| 3 | English | 55 | 85 | 78 | 61 | 47 | 87 | 91 | 73 |
| 4 | Science | 65 | 82 | 39 | 58 | 52 | 65 | 57 | 45 |
| 5 | History | 45 | 91 | 56 | 72 | 49 | 56 | 78 | 56 |
| 6 | Geography | 51 | 84 | 54 | 64 | 47 | 64 | 67 | 67 |
| 7 | Art | 43 | 63 | 49 | 62 | 39 | 89 | 64 | 63 |
| 8 | Computer Studies | 63 | 95 | 45 | 59 | 41 | 92 | 89 | 52 |
| 9 | French | 35 | 91 | 65 | 26 | 28 | 51 | 92 | 56 |
| 10 | | | | | | | | | |
| 11 | | | | | | | | | |
| 12 | Overall Average | 54.1 | 85.0 | 53.6 | 56.3 | 44.3 | 72.5 | 78.1 | 58.5 |
| 13 | | | | | | | | | |
| 14 | | Steven | Mary | Anne | Raymond | Mark | Paul | Eliza | Kelly |
| 15 | Maths | B | A | D | C | C | B | A | C |
| 16 | English | C | A | B | B | C | A | A | B |
| 17 | Science | B | A | D | C | C | B | C | C |
| 18 | History | C | A | C | B | C | C | B | C |
| 19 | Geography | C | A | C | B | C | B | B | B |
| 20 | Art | D | B | C | B | D | A | B | B |
| 21 | Computer Studies | B | A | C | C | D | A | A | C |
| 22 | French | D | A | B | Fail | Fail | C | A | C |

It looks a bit hard to follow at the moment. It's difficult to know what the data is supposed to represent. Conditional formatting will help to clarify things.

## Conditional Formatting

We can use Conditional logic, however, to format the spreadsheet. What we'll do is to colour those Overall Averages depending on the grade. One colour will represent a high grade, a second colour will mean an average

grade, and a third colour will mean a low grade. So let's get started.

- With your Spreadsheet open, Highlight the cells with Overall Averages in them (From B12 to I12)
- With the cells highlighted, click on **Format** form the menu bar
- From the drop down menu, click on **Conditional Formatting**
- A dialogue box appears, the one below:
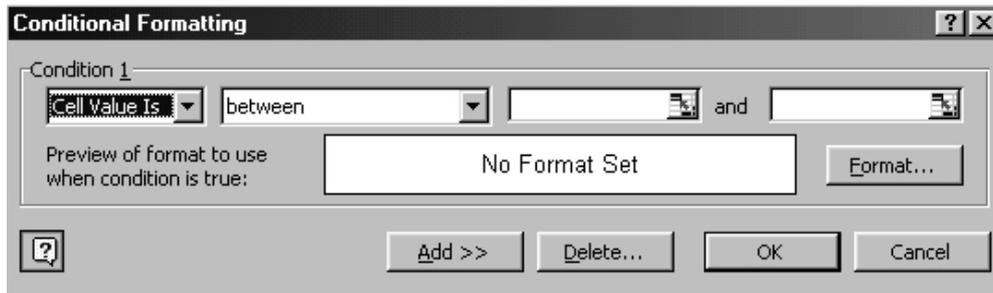


At the top, it says **Condition 1**, and there are 4 text boxes to fill in. The first two "**Cell Value Is**" and "**Between**" will suit our purposes, so:

- Click inside the third text box and enter 80
- Click inside the fourth text box and enter 100
- You should have "Cell Value Is between 80 and 100"

You can now set the colour to use for this condition. So click the **Format** button. Another dialogue box appears. From the Patterns Tab Strip, select a colour or pattern to use. Then click the **OK** button at the bottom. Your dialogue box will look something like the one below:
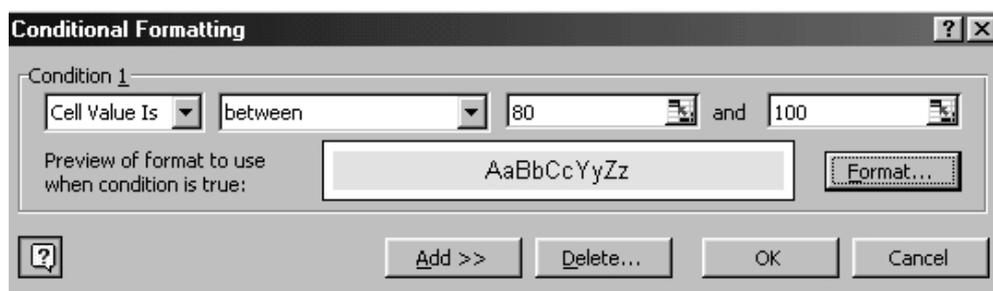


You can now add a second condition. To do that, click the **Add** button at the bottom of the dialogue box. Condition 2 will appear. Repeat the above process: enter some numbers for the middle set of grade (65 to 79, perhaps), and select a different colour by clicking the **Format** button. Add a third condition for the lowest grades. When you're done, click the OK button. Your Overall Averages should change colour depending on what grade the student got. (Unfortunately, Excel only allows you a maximum of 3 conditions.)

Your spreadsheet might look something like the one in the next image:

| | Steven | Mary | Ann | Raymond | Mark | Paul | Eliza | Kelly |
|---|---|---|---|---|---|---|---|---|
| Maths | 76 | 89 | 43 | 48 | 51 | 76 | 87 | 56 |
| English | 55 | 85 | 78 | 61 | 47 | 87 | 91 | 73 |
| Science | 65 | 82 | 39 | 58 | 52 | 65 | 57 | 45 |
| History | 45 | 91 | 56 | 72 | 49 | 56 | 78 | 56 |
| Geography | 51 | 84 | 54 | 64 | 47 | 64 | 67 | 67 |
| Art | 43 | 63 | 49 | 62 | 39 | 89 | 64 | 63 |
| Computer Studies | 63 | 95 | 45 | 59 | 41 | 92 | 89 | 52 |
| French | 35 | 91 | 65 | 26 | 28 | 51 | 92 | 56 |
| | | | | | | | | |
| Overall Average | 54.1 | 85.0 | 53.6 | 56.3 | 44.3 | 72.5 | 78.1 | 58.5 |

The conditional formatting allows you to see at a glance which students are doing well, and which are doing badly. Poor Mark!

## Exercise

Format the Student Grades so that your spreadsheet looks like the one below (you can use different colours, if you like).

| | Steven | Mary | Ann | Raymond | Mark | Paul | Eliza | Kelly |
|---|---|---|---|---|---|---|---|---|
| Maths | B | A | D | C | C | B | A | C |
| English | C | A | B | B | C | A | A | B |
| Science | B | A | D | C | C | B | C | C |
| History | C | A | C | B | C | C | B | C |
| Geography | C | A | C | B | C | B | B | B |
| Art | D | B | C | B | D | A | B | B |
| Computer Studies | B | A | C | C | D | A | A | C |
| French | D | A | B | Fail | Fail | C | A | C |

In the spreadsheet above, you can now see more easily who's doing well and who isn't. In the next section, we'll take a look at CountIF. Again, we'll use the student spreadsheet.

# Using the CountIF Function in Microsoft Excel

The next Conditional function we're going to use is CountIF. This one is fairly straightforward. It looks at a range of cells and tells you how many of them meet the criteria that you set. Once again, we'll use the student exam marks spreadsheet.

## Copying and Pasting Data to a new Sheet

Open up the Spreadsheet you used for the last section. (If you haven't yet downloaded the spreadsheet, click here: Download the spreadsheet.)

Because the exam spreadsheet might be a little full, we'll start on a new sheet. We'll copy and paste the student data onto sheet 2. To do that, follow these steps:

- Highlight the data you want to copy
- For us, that's the student data, as in the image below:

|  | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 |  | Steven | Mary | Anne | Raymond | Mark | Paul | Eliza | Kelly |  | Averages |
| 2 | Maths | 76 | 89 | 43 | 48 | 51 | 76 | 87 | 56 |  | 65.8 |
| 3 | English | 55 | 85 | 78 | 61 | 47 | 87 | 91 | 73 |  | 72.1 |
| 4 | Science | 65 | 82 | 39 | 58 | 52 | 65 | 57 | 45 |  | 57.9 |
| 5 | History | 45 | 91 | 56 | 72 | 49 | 56 | 78 | 56 |  | 62.9 |
| 6 | Geography | 51 | 84 | 54 | 64 | 47 | 64 | 67 | 67 |  | 62.3 |
| 7 | Art | 43 | 63 | 49 | 62 | 39 | 89 | 64 | 63 |  | 59.0 |
| 8 | Computer Studies | 63 | 95 | 45 | 59 | 41 | 92 | 89 | 52 |  | 67.0 |
| 9 | French | 35 | 91 | 65 | 26 | 28 | 51 | 92 | 56 |  | 55.5 |
| 10 |  |  |  |  |  |  |  |  |  |  |  |
| 11 |  |  |  |  |  |  |  |  |  |  |  |
| 12 | Overall Average | 54.1 | 85.0 | 53.6 | 56.3 | 44.3 | 72.5 | 78.1 | 58.5 |  |  |
| 13 |  |  |  |  |  |  |  |  |  |  |  |

- With the data highlighted, click on **Edit** from the menu bar
- From the drop down list, click on **Copy**. The marching ants surround your highlighted data
- Look at the bottom of the spreadsheet and locate **Sheet2**, as in the next image:

| 21 | Computer Studies | B | A | C |
|---|---|---|---|---|
| 22 | French | D | A | B |
| 23 |  |  |  |  |

I◄ ◄ ► ►I \Sheet1 / Sheet2 / Sheet3 /

- Click on **Sheet2** with your left mouse button
- The blank Sheet2 spreadsheet should appear
- Click inside cell **A1**
- Press the Return key on your keyboard to paste the data (Or click **Edit > Paste** from the Excel menu bar)

Add the following labels to **Sheet2** of your spreadsheet:

| 11 | Overall Average | 54.1 | 85.0 |
|---|---|---|---|
| 12 |  |  |  |
| 13 | Num Students Above a Score of 70 |  |  |
| 14 |  |  |  |
| 15 | Maths |  |  |
| 16 | English |  |  |
| 17 | Science |  |  |
| 18 | History |  |  |
| 19 | Geography |  |  |
| 20 | Art |  |  |
| 21 | Computer Studies |  |  |
| 22 | French |  |  |

We'll now use the CountIF function to see how many of the students were above a score of 70 in each subject.

## CountIF

The CountIf function only calculates things when a certain condition is met. For example, only count the students whose grades are above B.

The CountIF function uses this syntax:

**COUNTIF(**range, criteria**)**

In other words, it takes two arguments. The first argument is range, and this means the range of cells you want to count. The criteria is what you want excel to look for when it is counting. Let's see it in action.

- Click inside cell B15
- Click inside the formula bar
- Enter the following function:

**=CountIf(**B2:I2, ">= 70"**)**

- Press the return key on your keyboard
- The answer you should have got was 4

The formula says, look in cells B2 to I2. Then check for a score of greater than or equal to 70. **If** you find this score, keep a **Count**.

So 4 students achieved a mark of 70 or above for Maths. To do the rest of the scores, you can use AutoFill. When you have finished, it should look like this one below:

| 13 | Num Students Above a Score of 70 | |
|---|---|---|
| 14 | | |
| 15 | Maths | 4 |
| 16 | English | 5 |
| 17 | Science | 1 |
| 18 | History | 3 |
| 19 | Geography | 1 |
| 20 | Art | 1 |
| 21 | Computer Studies | 3 |
| 22 | French | 2 |

CountIF is a very useful function for simple data analysis.

In the next part, we'll take a look at two more useful functions: AND and SUMIF.

# How to use the AND and SUMIF Functions in Excel

Two more useful Conditional Functions are AND( ) and SUMIF( ). We'll stay with the students exam results to examine these two functions. If you haven't yet downloaded the spreadsheet we're using for these lessons, click below. (If you've been following along, you can use this new spreadsheet: it has the CountIF already done!)

Download the spreadsheet for this section

## The AND Function

Here's the scenario. The government have decided to take a closer look at school averages. If 4 or more students in a subject get a score of 70 or above, then the school gets a cash bonus for that subject. There are 8 subjects, so 8 cash bonuses are up for grabs.

First, we'll use the AND function to work out if 4 or more students have scores of 70 or above.

The AND( ) function checks a list of arguments and determines whether they are true or false. If all the arguments are true then the function gives you an answer of TRUE. If one or more of the arguments are false, then the function gives you an answer of FALSE.

To give you an easy example. You can check whether two plus two does indeed equal 4. Click inside an empty cell of your spreadsheet, then click inside the formula bar. Enter this:

**=AND(2 + 2 = 4)**

When you press the Return key, Excel gives you the answer TRUE. Now change it to 2 + 3 = 4 and see what happens.

So Excel checked the argument to see whether it was true or false. That's all it will check for, an either or answer. You can have up to 30 arguments between the AND brackets. You could have this, for example:

**= AND(2 + 2 = 4, 1 + 2 = 4)**

There's two arguments to check there. Excel will check the first one and return an answer of TRUE. When it checks the second one it will return an answer of False. The answer to the whole function will then be FALSE. (It's false because all conditions have to be true before the overall answer is TRUE.)

Our AND function is going to be quite simple. We're going to check the B column, the Number of students who have Below Average scores.

- So click inside C15
- Click inside the formula bar
- Enter the following formula :

**= AND(B15 >= 4)**

- Press the return key on your keyboard
- Excel will enter True in this cell (B15 is the cell where we had a score of 4)
- Use Auto Fill to calculate the rest of the AND functions
- Your spreadsheet should look something like the one below:

| 13 | Num Students Above 70 | | |
|----|----------------------|---|-------|
| 14 | | | |
| 15 | Maths | 4 | TRUE |
| 16 | English | 5 | TRUE |
| 17 | Science | 1 | FALSE |
| 18 | History | 3 | FALSE |
| 19 | Geography | 1 | FALSE |
| 20 | Art | 1 | FALSE |
| 21 | Computer Studies | 3 | FALSE |
| 22 | French | 2 | FALSE |

All we're saying in our function is "IF the cell B15 is greater than or equal to 4 THEN put True in cell C15, else put False". Remember: the government pays out if 4 or more students get above a score of 70 for a lesson

Now that we have some True/False values for our C column, we can check all these True/False values. We want to add up all the cash values associated with our TRUE cells. However, we haven't got any cash values yet, so let's do that now. Enter the same cash values as in the image below:

| 13 | Num Students Above 70 | | | |
|----|----------------------|---|-------|----------|
| 14 | | | | |
| 15 | Maths | 4 | TRUE | £ 10,000 |
| 16 | English | 5 | TRUE | £ 5,000 |
| 17 | Science | 1 | FALSE | £ 8,000 |
| 18 | History | 3 | FALSE | £ 4,000 |
| 19 | Geography | 1 | FALSE | £ 4,000 |
| 20 | Art | 1 | FALSE | £ 2,000 |
| 21 | Computer Studies | 3 | FALSE | £ 8,000 |
| 22 | French | 2 | FALSE | £ 1,000 |

The values are just potential values. A school only gets them if 4 or more students gain a score of 70 or above in that subject. So there's a potential ten thousand for Maths, five thousand for English, 8 thousand for Science, etc.

OK, we have 2 cells with TRUE in them. There is a different cash value associated with each subject. We have a TRUE for English, so the school will receive 5 thousand pounds for this. The school can expect 10,000 for Maths. But we need a way to add all the cash values associated with the TRUE values. We can use SUMIF for this.

## SumIF

SUMIF is a little bit more complicated than AND, but not much more. This function adds up things depending on the criteria you give it. (Add up the cost of all apples, for example.) The function expects certain arguments. These are:

**SUMIF(**range, criteria, sum_range**)**

The first argument, range, is the cell or cells you want to check. For us, this would be the TRUE and FALSE values in the D column. The second argument, criteria, is what you want to check for. In our case this is the value TRUE. The third argument, sum_range, are the cells to add up. The figures we want to add up are all in the E column.

- So click in an empty cell (E24 is ideal for us)
- Click inside the formula bar
- Enter the following SUMIF function:

**=SUMIF(C15:C22, TRUE, E15:E22)**

- Press the return key on your keyboard
- Excel adds up only the value associated with TRUE

If everything went well, then you should have a figure of 11 thousand for your SUMIF function. Your spreadsheet might look like the one below:

| 13 | Num Students Above 70 | | | | | |
|----|----|----|----|----|----|----|
| 14 | | | | | | |
| 15 | Maths | 4 | TRUE | | £ | 10,000 |
| 16 | English | 5 | TRUE | | £ | 5,000 |
| 17 | Science | 1 | FALSE | | £ | 8,000 |
| 18 | History | 3 | FALSE | | £ | 4,000 |
| 19 | Geography | 1 | FALSE | | £ | 4,000 |
| 20 | Art | 1 | FALSE | | £ | 2,000 |
| 21 | Computer Studies | 3 | FALSE | | £ | 8,000 |
| 22 | French | 2 | FALSE | | £ | 1,000 |
| 23 | | | | | | |
| 24 | Money Earned | | | | £ | 15,000 |
| 25 | | | | | | |

So our SUMIF function said "Check the cells C15 to C22. If a cell has TRUE in it, make a note of the ammount in the E cell next to it. When you've finished, add them all up."

The SUMIF might be a bit tricky to master, but it can come in quite handy, and it's worth making the effort to understand exactly how it works.

In any case, that concludes are little journey into conditional logic. Hope you're not too disappointed to be leaving the subject behind!

In the next section of the Excel course, we'll take a look at Tables, Scenarios and Goal Seek.

Move on to the next section of the Excel course -->

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# How to Use Microsoft Excel Tables

In Excel, a data Table is a way to see how altering the values in a formula effects the result. Excel will work out the new results for you, based on the new values you give it. Take the following as an example:

You decided to take out a loan of ten thousand pounds. You want to pay back the loan over 5 years. The first bank you try sets a interest rate of 9 percent per year. You use the PMT formula to work out how much you have to pay back every month:

$$=PMT(9\% / 12, 12 * 5, -10000)$$

The formula gives you a figure of £207.58 per month.

However, another three banks are after your business. They are offering interest rates of 8 percent, 7 percent, and 6 percent. You can use the PMT function again to work out the monthly payments for these interest rates, or you could just use a cell reference for that 9% figure in the formula.

Another way to work out the monthly payments for the new interest rates is to use a Table. Excel will then use the PMT function, and the new interest rates, and work out the answers for you. We'll see how to do that now.

## Excel Tables

- Start a new spreadsheet
- Enter the same labels as in the image below
- Enter the same values for the Rate, Months, and Loan

| | A | B | C | D |
|---|---|---|---|---|
| 1 | Payment Terms | | | |
| 2 | | | | |
| 3 | Rate | 9.00% | | |
| 4 | Months | 60 | | |
| 5 | Loan | £10,000 | | |
| 6 | | | | |
| 7 | | | | |

So the Rate (interest rate) is 9 percent, the Months value is 60, and the Loan is 10, 000 pounds.

- Click inside cell D2
- Click inside the formula bar
- Enter the following formula:

$$=PMT(B3 / 12, B4, -B5)$$

- Press the return key on your keyboard
- Excel should give you the answer £207.58

Just in case you're unsure about that PMT Function, here's what it's doing. The first argument for PMT is the rate, meaning the interest rate. The cell B3 is where we had our interest rate of 9 percent. We need to divide that by 12 (the number of months in a year), otherwise the bank will be charging us 9 percent a month! The second argument, where we have B4, is nper. This is just the total number of months in our loan. The third argument is how much we want to borrow. We have this amount in cell B5. It is a minus figure because it's a debt.

Now that we have a function in place, we can construct our Excel Table. First, we need to tell Excel about those other interest rates. It will use these to work out the new monthly payments. Remember, Excel is

recalculating the PMT function. So it needs some new values to calculate with.

- So in cells C3, C4, and C5 enter 8%, 7%, 6%
- Your spreadsheet should look like the one below

| | A | B | C | D |
|---|---|---|---|---|
| 1 | Payment Terms | | | |
| 2 | | | | £207.58 |
| 3 | Rate | 9.00% | 8.00% | |
| 4 | Months | 60 | 7.00% | |
| 5 | Loan | £10,000 | 6.00% | |
| 6 | | | | |
| 7 | | | | |

We have deliberately put the PMT function in cell D2. This is one Row up, and one Column to the right of our first new interest rate of 8%. The new monthly payments are going to go in cells D3 to D5. Excel needs you to set the table out this way.

So that Excel can work out the new totals, you have to highlight both the new values and the Function.

- So click inside cell C2
- Highlight the cells down to D5
- Your spreadsheet should look like this one:

| | A | B | C | D |
|---|---|---|---|---|
| 1 | Payment Terms | | | |
| 2 | | | | £207.58 |
| 3 | Rate | 9.00% | 8.00% | |
| 4 | Months | 60 | 7.00% | |
| 5 | Loan | £10,000 | 6.00% | |
| 6 | | | | |

As you can see, the cells C2 to D5 are highlighted. This includes our new interest rate values, and our function in cell D2. We can now create a Table. So do this:

- From the Excel menu bar, click on **Data**
- From the drop down menu, click on **Table**
- A small dialogue box appears like the one below:
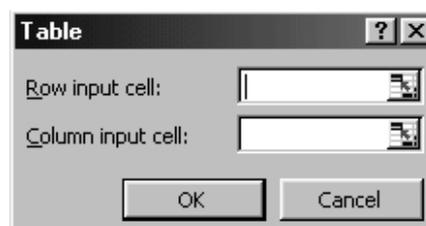


There's not much to fill in on that dialogue box. But the term "Input Cell" does need explaining.

The Input Cell is the cell that you want Excel to substitute. The thing we want Excel to substitute is the interest rate. We had our interest rate in cell B3. So we use this as the Input Cell.

We wanted Excel to fill downwards, down a column. So we need the second text box on the dialogue box "Column input cell". If we were filling across in rows, we would use the "Row input cell" text box.

- So click in side the "**Column input cell**" text box
- Enter B3 as the Input Cell
- Click the OK button
- Excel will work out the new monthly totals for you
- You should have the same values as in the image below:

| | A | B | C | D |
|---|---|---|---|---|
| 1 | Payment Terms | | | |
| 2 | | | | £207.58 |
| 3 | Rate | 9.00% | 8.00% | £202.76 |
| 4 | Months | 60 | 7.00% | £198.01 |
| 5 | Loan | £10,000 | 6.00% | £193.33 |
| 6 | | | | |
| 7 | | | | |

So at an interest rate of 9 percent, we would be paying back just over two hundred and seven pounds. Excel has worked out that an interest rate of 8 percent will lower the monthly payments to just over two hundred and two pounds. At a 6 percent interest rate, the payments will be just over one hundred and ninety three pounds.

If you click inside cells D3, D4 and D5, then look at the formula bar, you will see this:

**{=TABLE(,B3)}**

That's Excel's way of telling you that a Table has been created.

We'll do one more Table. This time we'll use a more simple formula than PMT, and we'll use Rows instead of Columns. We'll do that in the next part.

Move on to another Excel Table example -->

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If you missed the first part of this tutorial, it can be found here: Excel Tables, Part One.

# Part Two of Excel and Tables

In the previous part, we saw how to use an Excel Table to work out interest rates. The Table was used to fill out several values at once. We'll now see how to use a Table to examine profir margins. Here's the scenario:

You take 250 items to a Car Boot sale. Your Unique Selling point is this: All items only a pound each! Except you feel that one pound might be a bit expensive, especially for the goods you're selling! What you want to know is how much profit will you make if you reduce your prices to ninety pence each, how much if you reduce to 80 pence each, and how much if you reduce to 70 pence each. Assume that everything gets sold.

To start creating your Table, construct a spreadsheet like the one below. Make sure that you start on a new sheet.

|   | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Number | 250 | | | |
| 2 | Price | £1.00 | | | |
| 3 | Reductions | 0 | £0.90 | £0.80 | £0.70 |
| 4 | Sales | | | | |
| 5 | | | | | |

Number is the number of items we're taking to the Car Boot sale. Price will be used in our formula. Reductions is the amount we want to reduce by. Sales is the amount of profit we expect to make. Our formula will go in cell B4. So click inside cell B4 and enter the formula:

$$= B1 * B2$$

The answer is, of course, 250. But the answer is in cell B4 for a reason. This is because when you want Excel to recalculate a Table in Rows, the formula must be inserted one Column to the Left of your first new value, and then one Row down. Our first new value is going in cell C3. So one column to the left takes us to the B column. One row down is Row 4. So the formula goes in cell B4.

Next, click inside cell B3 and highlight to cell E4. Your spreadsheet should now look like the one below:

|   | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Number | 250 | | | |
| 2 | Price | £1.00 | | | |
| 3 | Reductions | 0 | £0.90 | £0.80 | £0.70 |
| 4 | Sales | £250.00 | | | |
| 5 | | | | | |

Excel is going to use your formula in cell B4. It will then look at the new values on Row 3 (not counting the zero), and then insert the new totals starting in cell C4.

So with the data highlighted, click on Data from the menu bar
From the drop down list, click on Tables
The Table dialogue box appears
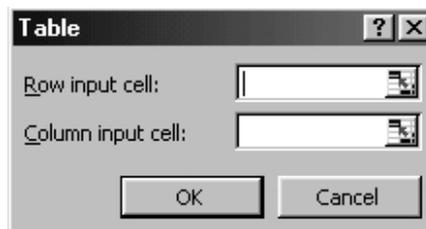
We want Excel to fill our new values in Row 4, so we need the Row input cell. But what is the Input Cell this time?

Ask yourself what you are trying to work out, and what you want Excel to recalculate. You want to work out the new prices. So you need the old price. The old price of each item was one pound, and you used this in the formula.

- So on the Table dialogue box, click inside the "Row input cell" text box
- Enter your cell reference
- Click OK when you are done
- If you got it right, your spreadsheet will look like the one below:

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Number | 250 | | | |
| 2 | Price | £1.00 | | | |
| 3 | Reductions | 0 | £0.90 | £0.80 | £0.70 |
| 4 | Sales | £250.00 | £225 | £200 | £175 |
| 5 | | | | | |

So, if you don't reduce your prices, you will make two hundred and fifty pounds. If you reduce the price of each item to seventy pence, you will make one hundred and seventy five pounds.

Tables are a useful tool when you want to analyze values that can change. Before moving on, try this exercise.

## Exercise

Amend the table above. This time, instead of reducing your prices, you are going to increase the price to £1.25 per item, and increase the number of items you sell. You currently sell 250 items. Work out the new profits if you sell 300 items, 350 items, and 400 items.

In the next part, we'll move on to Scenarios.

# How to use Scenarios in Excel

Scenarios are similar to Tables, in that you are asking "What if"? "What if I change this value, or that amount? What will the spreadsheet look like then?" The difference is that you can create a number of different scenarios and save them.

An example of a scenario you might want to create is this:

You've worked out the family budget, and find you have barely enough left for a night out. The question is, what can you cut back on to give yourself more spending money?

We'll create a spreadsheet to tackle that problem, and you'll see how scenarios work. To get started, there's a new spreadsheet for you to download:

<p style="text-align:center">Download the Spreadsheet for this section</p>

When you open up the spreadsheet, you'll see there is only 46 pounds left at the end of every month. And the cost of the car hasn't even been included yet! Clearly, some cutbacks have to be made.

With a scenario, we can switch between our different budgets and see which one we like best. The best way to see how a scenario works is to construct one yourself.

## Scenarios

To create your scenario, do the following:

- From the Excel menu bar, click on **Tools**
- From the drop down menu, click on **Scenarios**
- The **Scenario Manager** dialogue box pops up
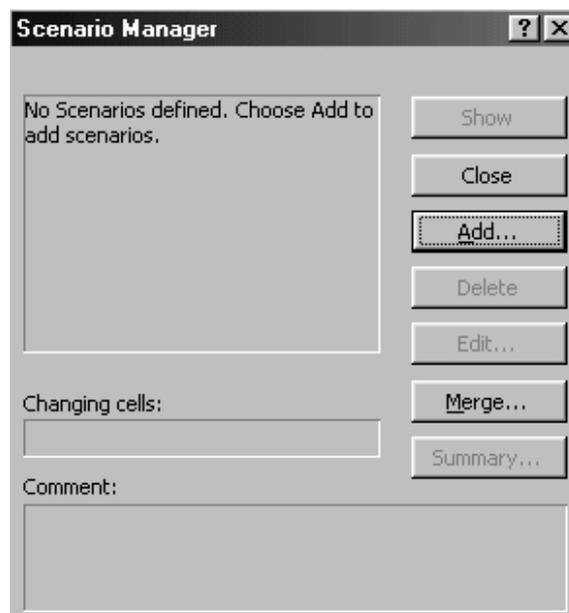


- We want to create a new Scenario, so click the **Add** button
- The **Add Scenario** dialogue box pops up
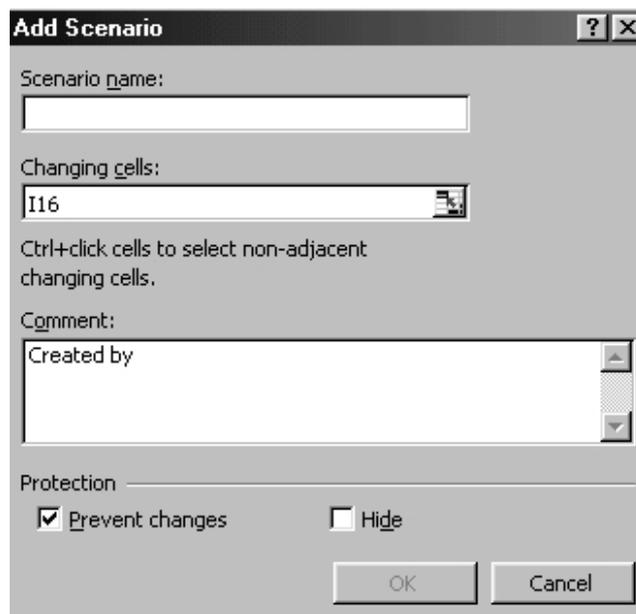
- Click inside the **Scenario Name** text box and type **Original Budget**

You now need to tell Excel which cells will be changing. Although nothing will be changing in this scenario (because it's our original), we still need to specify which cells will be changing. We want to reduce the Food bill, the Clothes Bill, and the Phone bill.

- So click inside the **Changing Cells** text box
- Click back on your spreadsheet and highlight cells B7 to B9
- The "marching ants" will appear around your selected area, and your dialogue box will look like this one:
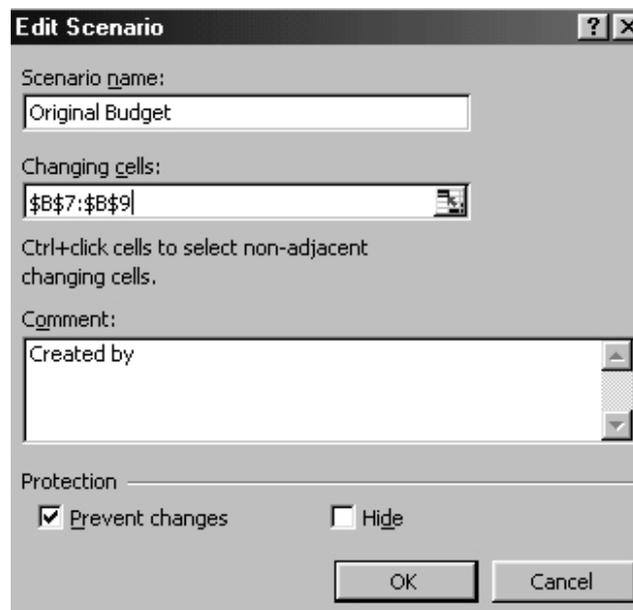


- Click the OK button at the bottom
- Excel will prompt you for the Scenario Values
- We don't want the values on the original to change, so just click OK
- You are taken back to the Scenario Manager dialogue box, and you'll see the scenario you have just created displayed.

We now need to create another Scenario, so that we can switch between the original budget and the new one. So click the Add button to add a new scenario.

- When you get the Add Scenario dialogue box back up again, click inside the **Scenario Name** text box and type **Budget Two**.

- The Changing cells text box should read B7:B9. These are the cells we want to change, so leave them alone
- Click the OK button at the bottom of the Add Scenario dialogue box
- You will be taken to the Scenario Values dialogue box. It looks like the one below:
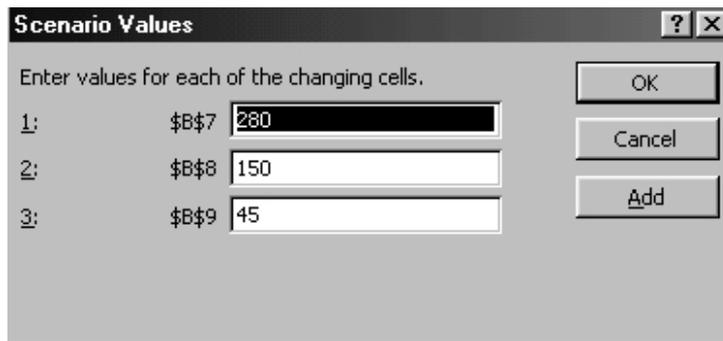


The values in the Text Boxes are the ones from cells B7, B8, and B9. Click inside each text box and type in a different value. The 280 spent on food can be changed to something like 180. Take 50 off the clothes bill. And take 20 off the phone bill. Your dialogue box will then look like this one:
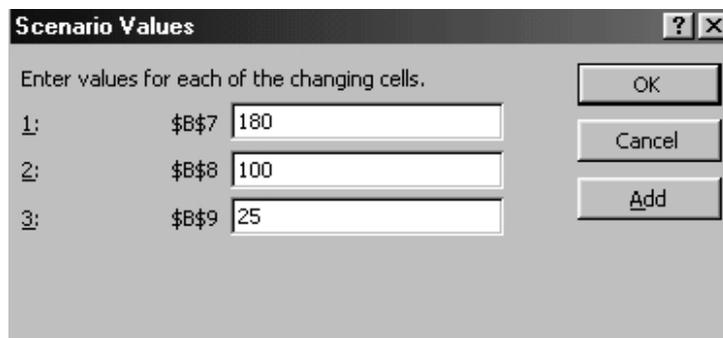


Click the OK button when you're done. You'll be taken back to the Scenario Manager. And this is where the fun starts.

To view a scenario, click on one from the list. Then click the **Show** button. In the image below, Budget Two has been selected:
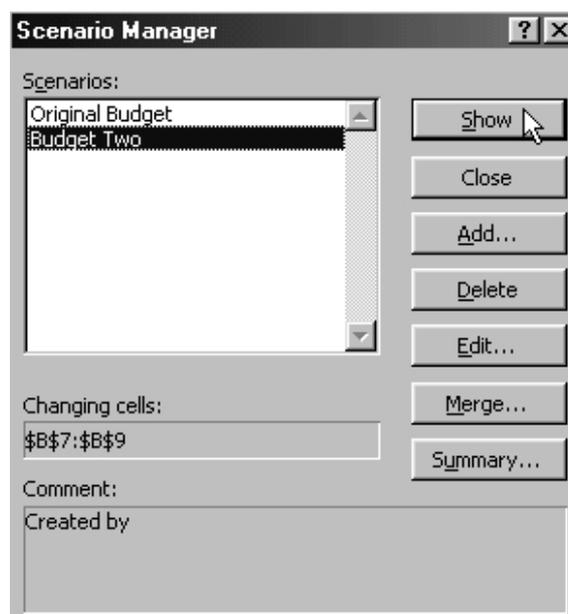


After you click the Show button, have a look at your spreadsheet. The figures should have changed. Select Original Budget from the list, then click the Show button. Your spreadsheet should show the original figures.

Click the **Close** button on the dialogue box when you're done. To view your two scenarios again, just click on **Tools > Scenarios**. This will bring up the Scenario Manager again.

So a Scenario offers you different ways to view a set of figures, and allows you to switch between them quite easily.

## Scenario Reports

Another thing you can do with a scenario is produce a report. This is quite easy. To produce a report of your scenarios, do the following:

- Click on **Tools** from the menu bar
- From the drop-down menu, click on **Scenarios**
- The Scenario Manager dialogue box appears
- Click on the **Summary** button
- The following dialogue box appears
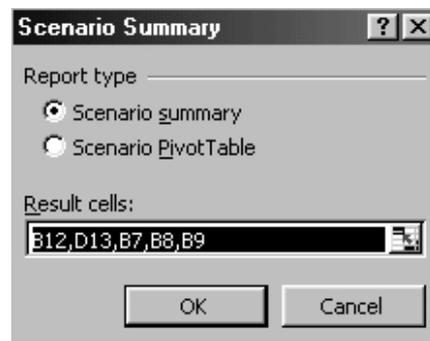


- To change the result cells, click on your spreadsheet
- Click individual cells by holding down the **Ctrl** key on your keyboard, and then clicking inside a cell with your left mouse button
- So hold down the **Ctrl** key and click on cell **D3** (income)
- Hold down the **Ctrl** key and click on cell **B12**
- Hold down the **Ctrl** key and click on cell **D13**
- If you make a mistake and want to get rid of a highlighted cell, just click inside it again with the Ctrl key held down
- Click OK when you're done
- Excel will produce the Summary for you. It will look something like the one below:

| Scenario Summary | | | |
|---|---|---|---|
| | Current Values: | Original Budget | Budget Two |
| **Changing Cells:** | | | |
| $B$7 | 280 | 280 | 180 |
| $B$8 | 150 | 150 | 100 |
| $B$9 | 45 | 45 | 25 |
| **Result Cells:** | | | |
| $D$3 | 1200 | 1200 | 1200 |
| $B$12 | 1154 | 1154 | 984 |
| $D$13 | 46 | 46 | 216 |

All right, it's not terribly easy to read, but it looks pretty! Perhaps it will be enough to convince our family to change their ways. Unlikely, but a nice diagram never hurts!

In the next part, we'll take a look at Goal Seek, what it is and how to use it.

# How to use Goal Seek in Excel

We're not going go too deeply into Goal Seek, because it can get quite complicated. We'll stick with a basic outline, and an example, of just what it is.

## Goal Seek

Goal Seek is used when you know what answer you want, but don't know the exact figure to input for that answer. For example, you're quite certain that 8 multiplied by something equals 56. You just not sure what that missing number is. Is it 8 multiplied by 6? Or Is it 8 multiplied by 7? Goal Seek will tell you the answer.

We'll test that example out right now. So start a new spreadsheet, and create one the same as in the image below:



Before you can use Goal Seek, Excel needs certain things from you. First it needs some sort of formula to work with. In the image above we have the simple formula =B1 * B2. We've put this in cell B3. But the answer is wrong for us. We had a Goal of 56 (8 times something). We want to know which number you have to multiply 8 by in order to get the answer 56. We tried 8 times 6, and that gave the answer of 48. So we have to try again.

Instead of us puzzling the answer out, we can let Goal Seek handle it. So do the following:

- From the Excel menu bar, click on **Tools**
- From the drop down menu, click on **Goal Seek**
- A dialogue box pops up like the one below:
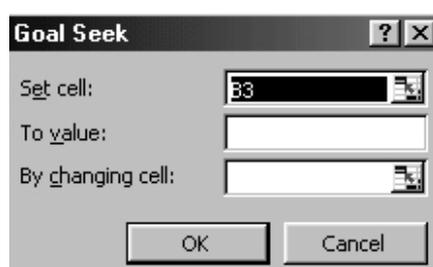


The dialogue box needs a little explaining. "Set cell" is the answer you're looking for, this is the Goal. Set cell needs a formula or function to work with. Our formula is in cell B3, so if your "Set cell" text box does not say B3, click inside it and type B3.

"To Value" is the actual answer you're looking for. With "Set cell", you're just telling Excel where the formula is. With "To Value" you have to tell Excel what answer you're looking for. We wanted an answer of 56 for our formula. So click inside the "To Value" text box and type 56.

"By Changing Cell" is the missing bit. This is the part of the formula that needs to change in order to get the answer you want. In our formula we have an 8 and a 6. Clearly, the 6 is the number that has to go. So the cell that needs to change is B2. So go ahead and enter B2 in the "By Changing Cell" text box. Your dialogue box should now look like this:
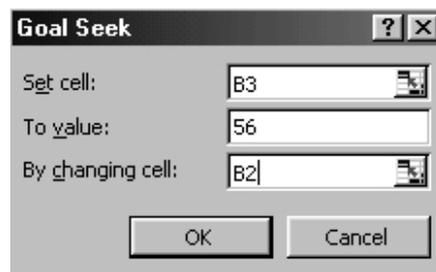
Click OK when your dialogue box looks like the one above. Excel will then Set the cell B3 to the Value of 56, and change the figure in cell B2. You'll also get a dialogue box like the one below:
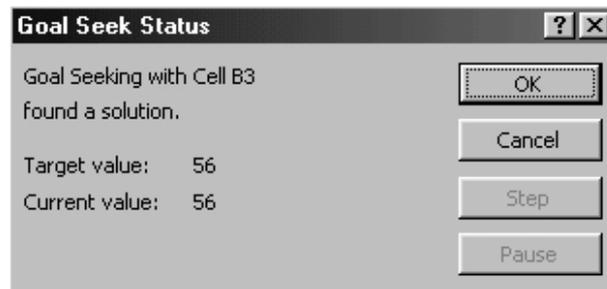


Click OK on the dialogue box. Your new spreadsheet will look like this one:



So Goal Seek has given us the answer we wanted: it is 7 that when times by 8 equals 56.

# Increase your profits with Goal Seek

To give you a more practical example of what Goal Seek does, consider this problem. You have a business that generates 25 thousand pounds worth of profit. You currently sell 1000 items at 25 pounds each. You want to increase your profit to 35 thousand pounds. Assume that you're still going to sell 1000 items. By how much does the price of each item have to increase by in order to generate the new profit total?

We'll work it out together using Goal Seek. And then you can have a try yourself with an exercise. First, here's a new spreadsheet for you to download:

Download the Goal Seek Spreadsheet

When you open the spreadsheet, you'll notice that the Current Sales Figures and the Future Sales Figures are exactly the same. The formula in Cells B4 and E4 are = **B2 * B3** and = **E2 * E3**

We can use Goal Seek to solve our problem. What we want to know is, What should be the new Price Per Item in order to generate Profits of 35 thousand?

- So, from the Excel menu bar, click on **Tools**
- From the drop-down menu, click **Goal Seek**
- The Goal Seek dialogue box appears
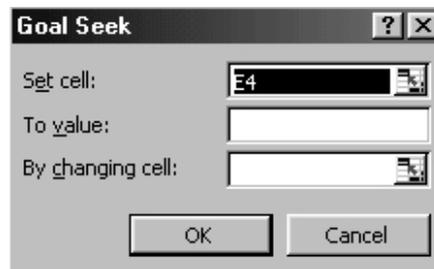
This time, our formula is in cell E4. So we want to Set the cell to the cell that has our formula. So type E4 into the "Set cell" text box.

The "To Value" text box will hold our new Profits. The Goal we are aiming for is 35 thousand. So type in 35000 in the "To value" text box.

The cell we want to change is the Price Per item figure. So in the "By changing cell" text box, type in E3.

Click OK when you're done. Excel will give you this dialogue box:
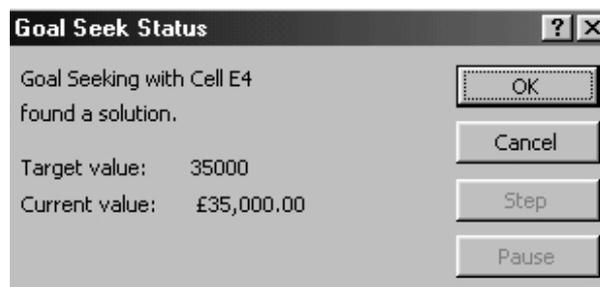


The dialogue box is telling you that Goal Seek has found a solution. Click OK. Your spreadsheet will already have changed. The new Future Sales Figures will be displayed. Your spreadsheet should look something like the one below:

|   | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | **Current Sales Figures** | | | **Future Sales Figures** | |
| 2 | Items Sold | 1000 | | Items Sold | 1000 |
| 3 | Price Per Item | £  25.00 | | Price Per Item | £  35.00 |
| 4 | Profits | £  25,000.00 | | Profits | £  35,000.00 |
| 5 | | | | | |
| 6 | | | | | |

Goal Seek has given us the answer of 35 pounds. So the cost of each item has to increase by 10 pounds if we want a profit of 35 thousand.

And now it's your turn. Try this exercise.

## Exercise

You've had a board meeting. It has been decided that the Price Per Item will remain the same - 25 pounds. But you still want to generate Profits of 35 thousand. Use Goal seek to work out how many Items will now have to be sold in order to reach your target.

And that's it for this section. In the next section, we'll take a look at Absolutes versus Relative cell referencing, Named Ranges and Pivot Tables. There's a lot to get through!

# Absolute and Relative Cell Referencing in Excel

There are two important spreadsheet concepts we haven't yet explored: absolute cell references, and relative cell references. We'll explore these two ideas now. First, absolute cell references.

## Relative cell references in Microsoft Excel

Take a look at the spreadsheet below (create it for yourself):



As you can see, it's quite simple. All we are doing is adding together the numbers in cells A1 and A2. We then put the answer in cell B2.

But suppose we wanted to copy the formula in cell B2 to cell B3. Let's try it and see what happens.

- Click inside cell B2
- Then click once with your right mouse button
- A menu pops up
- With your left mouse button, click Copy
- Now click inside cell B3
- Click once with your right mouse button
- When the menu pops up, click on Paste
- Your spreadsheet will look like the one below:



Excel has done something rather odd. It has given us the answer 25! The sum 20 + 25 clearly does not equal 25, so what's going on?

Well, look inside the formula bar. The formula is now reading = A2 + A3. Yet that was not the formula we pasted from cell B2. We copied and pasted the formula = A1 + A2. So why did Excel copy and paste the wrong formula?

The answer is that we used a Relative cell reference for B2. We have been using Relative cell references throughout this book. This is Excel's default, and it works like this when you copy a formula:

The formula is = A1 + A2. The answer is in cell B2. When copying the formula to cell B3 Excel will note that the cells for the formula start UP one Row, and LEFT one column. When you paste the formula somewhere else, Excel will not paste the formula, but paste this UP one then Left one. So starting at Cell B3, which is where we're pasting to, go UP one Row. This takes you to row 2. Then go one column Left.

This takes you to Column A. So the start for the new formula is cell A2. Your formula will now read = A2 + A3. As there is nothing in cell A3, the formula is really = 25 + 0. Which gives the answer 25.

And that's Relative cell referencing.

## Absolute cell references in Microsoft Excel

If you want to keep a reference to the original cells, A1 and A2, you need to use Absolute cell references. Absolute cell referencing is done with dollar signs.

Change your formula in cell B2 to this:

**= $A$1 + $A$2**

Then copy and paste the new formula to cell B3. You should now get the answer you were looking for: 45. Your spreadsheet will look like the one below:

| | A | B | C | D |
|---|---|---|---|---|
| 1 | 20 | | | |
| 2 | 25 | 45 | | |
| 3 | | 45 | | |
| 4 | | | | |

B3 = =$A$1 + $A$2

To recap, then:

- When you want to copy and paste formulas, use Absolute cell references
- To use Absolute referencing, place a dollar sign before the Column letter and a dollar sign before the Row number (You can mix absolute and relative cell references, but we won't go into that.)

In the next part of this section, we'll take a look at Named Ranges.

# How to Set Up Named Ranges in Excel

Instead of using something like = SUM(A2:A5) to add up a column of numbers, you can replace the A2:A5 part of the function with a more descriptive name. This is known as a Named Range. Examine the spreadsheet below:

| | A | B | C |
|---|---|---|---|
| 1 | | Monthly Totals | Monthly Tax |
| 2 | | 124 | 12 |
| 3 | | 234 | 23 |
| 4 | | 344 | 34 |
| 5 | Results | 702 | 69 |
| 6 | | | |

In the Results Row, cell B5 is a result of adding up cells B2 to B4. The formula used is just this:

**=Sum(B2:B4)**

Now examine the same spreadsheet, but with a Named Range used:

| Result_Totals ▼ | | = | =SUM(Monthly_Totals) | |
|---|---|---|---|---|
| | A | B | C | |
| 1 | | Monthly Totals | Monthly Tax | |
| 2 | | 124 | 12 | |
| 3 | | 234 | 23 | |
| 4 | | 344 | 34 | |
| 5 | Results | 702 | 69 | |
| 6 | | | | |

This time, cell B5 doesn't have in it the formula = Sum(B2:B4). As you can see, it has =SUM(Monthly_Totals). This is the label from B1. We have created a **Named Range**. The formula in cell B5 is now more descriptive. We can tell at a glance what it is we're adding up. Excel has replaced the B2:B4 part with the name we gave it. Behind the scenes, though, we're still adding up the numbers in cells B2 to B4. Excel has just hidden the cell references behind our descriptive name.

You'll now see how to create your own Named Ranges.

## Creating a Named Range

Start a new spreadsheet, and enter the same data as in the image below:

| B5 | ▼ | = | =SUM(B2:B4) | |
|---|---|---|---|---|
| | A | B | C | D |
| 1 | | Monthly Totals | Monthly Tax | |
| 2 | | 124 | 12 | |
| 3 | | 234 | 23 | |
| 4 | | 344 | 34 | |
| 5 | Results | 702 | | |
| 6 | | | | |

Make sure you have the same formula in cell B5 =Sum(B2:B4). We're going to create a Named Range, and then pop it in cell B5. To create a Named Range then, do the following:

- Highlight the B column, from B2 to B4 (Don't include the formula when you're highlighting. Just highlight the same cells as the ones in the function)

- From the menu bar, click on **Insert**
- From the drop-down menu select **Name**
- A sub menu appears like the one below:
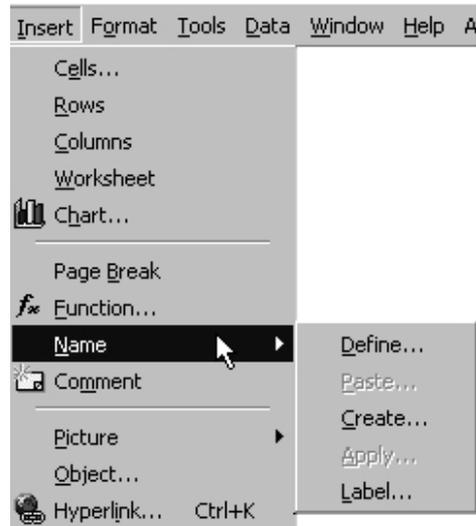
There's a two-step process involved with setting up a Named Range. The fist thing to do is Define the name. You then Apply the name to your formula.

- So select **Define** from the sub menu
- The **Define Name** dialogue box pops up. This one:

With the B column highlighted, Excel will use your label at the top as the name (Monthly_Totals for us). But you can change it if you want. Notice the narrow text box at the bottom, "Refers to". This is showing the highlighted cells.

Click OK on the dialogue box.

You are returned to your spreadsheet. Nothing will happen. This is because we have haven't done step two of the two-step process - Applying the name.

To apply your new name to a formula, do this:

- Click inside the cell where your formula is, B5 in our case
- Click on **Insert** from the menu bar
- From the drop down menu, select **Name**
- From the sub menu that appears, click on **Apply**
- A dialogue box will appear showing a list of all the Names you have set up

You'll have only one Name set up , so there's not much to do except click the OK button.

When you click OK, Excel should adapt your formula in cell B5. If you've done it right, your spreadsheet should look like the one below:

| | B5 | ▼ | = | =SUM(Monthly_Totals) | |
|---|---|---|---|---|---|
| | A | B | | C | |
| 1 | | Monthly Totals | | Monthly Tax | |
| 2 | | 124 | | 12 | |
| 3 | | 234 | | 23 | |
| 4 | | 344 | | 34 | |
| 5 | Results | 702 | | | |
| 6 | | | | | |

As you can see, the cell B5 now reads =SUM(Monthly_Totals). Excel has hidden the cell references behind the Name we defined.

If you didn't get the Name, but instead got the error message below, then there are a couple of things you can do:

**Microsoft Excel** ⚠ Microsoft Excel cannot find any references to replace.  [ OK ]
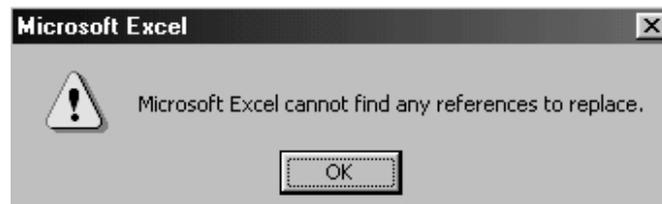
Before you click **Insert > Name > Define**, make sure you highlight only the same cells as the ones in your formula. Make sure that there is a formula in the cell B5, and that it says = SUM(B2:B4)

We can enter another Named Range for our Monthly Tax column, column C. Here's a break down of the Two-Step process involved with setting up a Named Range.

**Step One** - Define the range of cells

- Enter your Formula (In cell C5, enter = **SUM(C2:C4)**)
- Highlight the same cells that are going in your formula
- From the menu bar, click **Insert > Name > Define**
- From the **Define Name** dialogue box, either accept the name Excel gives you, or type your own name for the range of cells you're going to define
- Click OK

**Step Two** - Apply the Name

- Click inside the cell where the formula is (cell C5 for us)
- From the menu bar, click **Insert > Name > Apply**
- From the **Apply Name** dialogue box, click on the Name you want to use
- Click OK
- Excel will insert the name, if it can, and hide your cell references behind the name

So go ahead and insert a Named Range for cell C5. When you're finished, the spreadsheet should look like the one below:

| | C5 | ▼ | = | =SUM(Monthly_Tax) | |
|---|---|---|---|---|---|
| | A | B | | C | |
| 1 | | Monthly Totals | | Monthly Tax | |
| 2 | | 124 | | 12 | |
| 3 | | 234 | | 23 | |
| 4 | | 344 | | 34 | |
| 5 | Results | 702 | | 69 | |
| 6 | | | | | |

As you can see, cell C5 no longer reads = Sum(C2:C4). Instead, we have a Named Range in cell C5.

In the next part, we'll see how to use the Named Ranges you have just set up.

As you can see, cell C5 no longer reads = Sum(C2:C4). Instead, we have a Named Range in cell C5.

In the next part, we'll see how to use the Named Ranges you have just set up.

# How to Use a Named Range in Excel

In the previous part, you saw how to define and apply Named Ranges. In this part, you'll learn how to use the Named Ranges you have just set up.

## Using Named Ranges

The spreadsheet you have created so far looks like this:



We have a Named Range in Cell B5 Called Monthly_Totals, and a Named Range in Cell C5 Called Monthly_Tax. We can use the Named Ranges to deduct the Tax from the Monthly Totals. But we need to set up two new Named Ranges. One for cell B5 and one for cell C5.

You might question the need to set up two more Ranges, on the grounds that we have just set up two Named Ranges in cell B5 and C5.

Strictly speaking, we don't need the new names. To deduct the Tax from the Monthly Total using Named Ranges we could just do this:

**=Sum(**Monthly_Totals**) - SUM(**Monthly_Tax**)**

And it would work. Excel would take one from the other. (The following, however, would not: = Monthly_Totals - Monthly_Tax.)

But if we set up two more Named Ranges, we can just use the single totals, instead of telling Excel to use a Function to add them up first.

So, to define two new Names, do the following:

- Click inside cell B5
- From the menu bar, click on **Insert > Name > Define**
- When the dialogue box appears, click inside the top text box and type in **Monthly_Result**. (Don't forget the Underscore!)
- Click OK
- Click inside cell C5 and do the same. This time, though, type in **Tax_Result** as the Name.
- Your **Define Name** dialogue box will then look like this one:
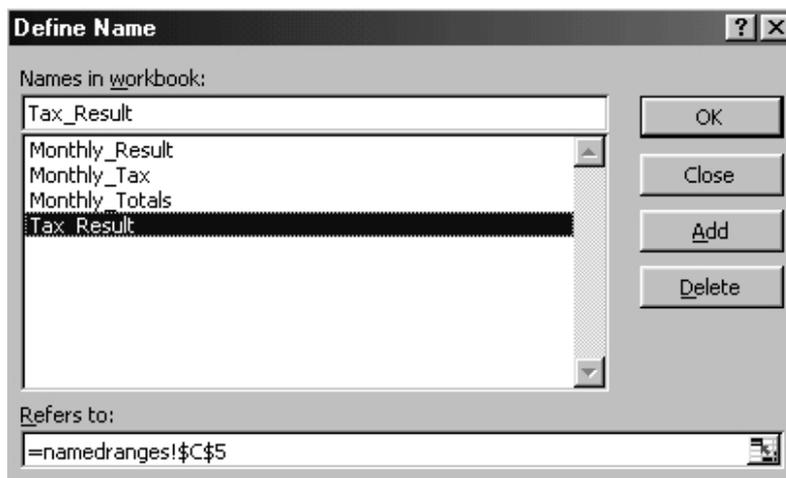
Click the OK button when you're done.

Now that we have the Names defined, we can enter a formula and Apply the names into the formula. First, amend your spreadsheet so that it looks like this one:



As you can see, a new label has been added, along with the formula in cell B7: **= B5 - C5**.

Now that we have a formula we can replace the cell references B5 and C5 with the names we set up. So click on B7 and do this:

- Click on **Insert > Name > Apply**
- The Apply Names dialogue box appears
- Click **Monthly_Result** select it
- Click on **Tax_Result** to select it
- Click the OK button
- Excel replaces your cell references with the Names
- Your spreadsheet will then look like this one:



The cell references in cell B7 have been replaced with our Named Ranges, making the information easier to read.

And that's enough of Named Ranges. We'll move on to Pivot Tables.

# Microsoft Excel and Pivot tables

As you'll shortly see, Pivot Tables can become quite complex. So we'll take it easy and just design a simple one. But first, what is a Pivot table?

## What is a Pivot table?

A Pivot table is to a way to extract data from a long list of information, and present it in a readable form. Remember the data we had from the student scores spreadsheet? You could turn that into a pivot table, and then view only the Maths scores for each pupil. Or view just Paul's scores, and nobody else's.

To get a clearer idea of just what a Pivot Table is, examine the one below. You'll be designing this very Pivot Table yourself shortly.

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | Student | Elisa ▾ | | | | | | |
| 2 | | | | | | | | |
| 3 | Average of Score | Subject ▾ | | | | | | |
| 4 | Month ▾ | Art | English | French | History | Maths | Science | Grand Total |
| 5 | January | 89 | 87 | 62 | 81 | 65 | 58 | 73.67 |
| 6 | February | 83 | 51 | 57 | 84 | 72 | 89 | 72.67 |
| 7 | March | 92 | 41 | 56 | 91 | 71 | 41 | 65.33 |
| 8 | Grand Total | 88.0 | 59.7 | 58.3 | 85.3 | 69.3 | 62.7 | 70.6 |
| 9 | | | | | | | | |

In this school, there is a test every month (it's a tough school!). The Pivot Table above shows the marks that Elisa got in January, February, and March. There were tests for only 6 subjects. Notice the black down-pointing arrows in the Pivot Table. On Row 1 we have Student Elisa. If the black arrow were clicked, a drop-down box would appear showing a list of the other students. We could click on a student and view the marks he or she achieved. Or we could select which subjects to view, or choose only one month.

But Excel does most of the work for you, and puts in those drop-down boxes as part of the wizard. But you'll see how it works.

Before you can construct a Pivot Table, you need some data in list form. We're going to construct our Pivot Table using only two students, Elisa and Mary. We'll use just three months worth of data, and six subjects. You'll be glad to know that this has already been done for you. So download the spreadsheet below:

Download the Pivot Table data

In the next part, you'll start work on constructing the Pivot Table itself.

Move on to the next part -->

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# How to Create a Pivot Table in Microsoft Excel

In the previous part, you learned what a Pivot Table is. In this part, you create a Pivot Table for yourself, using the data you downloaded. (If you haven't yet downloaded the spreadsheet, click here: **Download the Pivot Table data** )

## Creating a Pivot Table in Excel

The Pivot Table is constructed using a Wizard. To create yours, do the following:

- Click inside cell A2 on the spreadsheet you downloaded above
- From Excel's menu bar, click on **Data**
- From the menu that drops down, click on **PivotTable and PivotChart Report**
- The Pivot Table wizard starts up
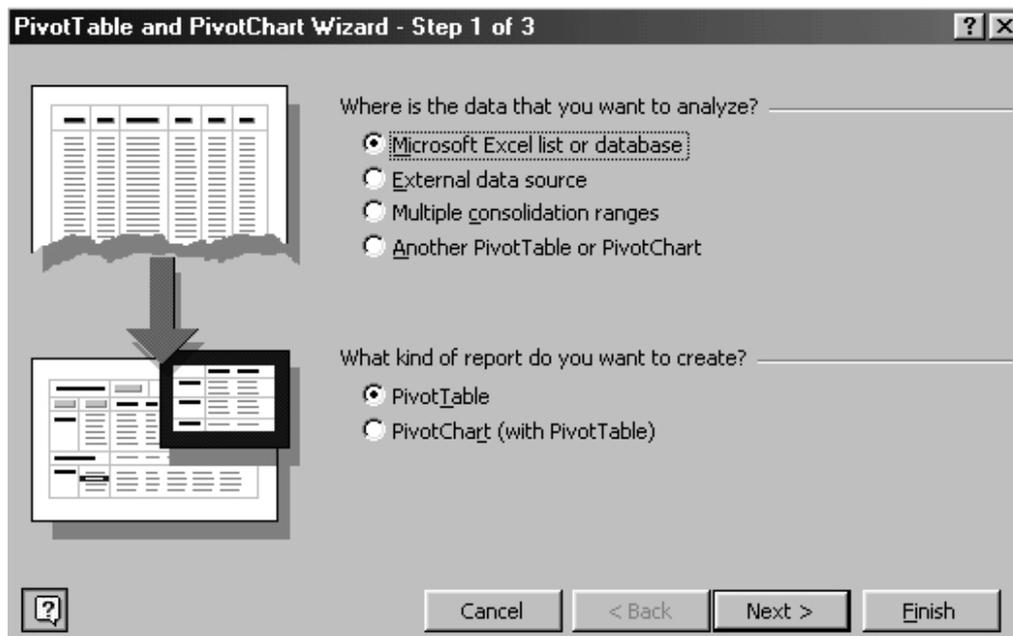


As the Wizard says, this is step one of three. There's nothing much for us to do in step one because the options we want are selected: "Microsoft Excel list or database" and "Pivot Table". With these options chosen, click the Next button at the bottom.

The Wizard moves on to Step Two. It looks like this:



The Range of cells that Excel will include in our Pivot Table is A1 to D37. (You can change this if you wanted.) Because we clicked in cell A2 to begin with, Excel has taken that as the first Row of Data. Excel uses the labels from Row 1 as Headings. Excel will use these for our drop down boxes and data.

Click the **Next** button on Step Two. Step Three of the Wizard appears. It's a little more complicated, this time.
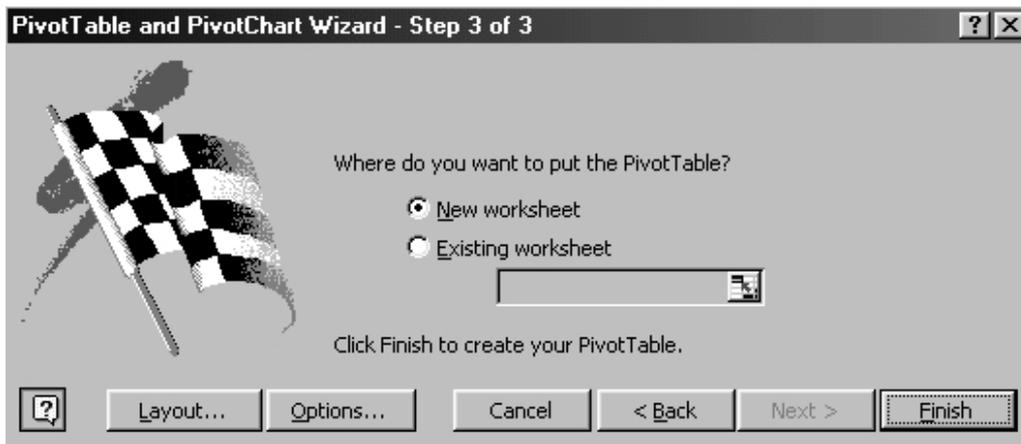


We'll accept the default position for the location of the Pivot Table - New worksheet. The button we're after is **Layout**. So click the **Layout** button to see a quite complicated dialogue box. This one:
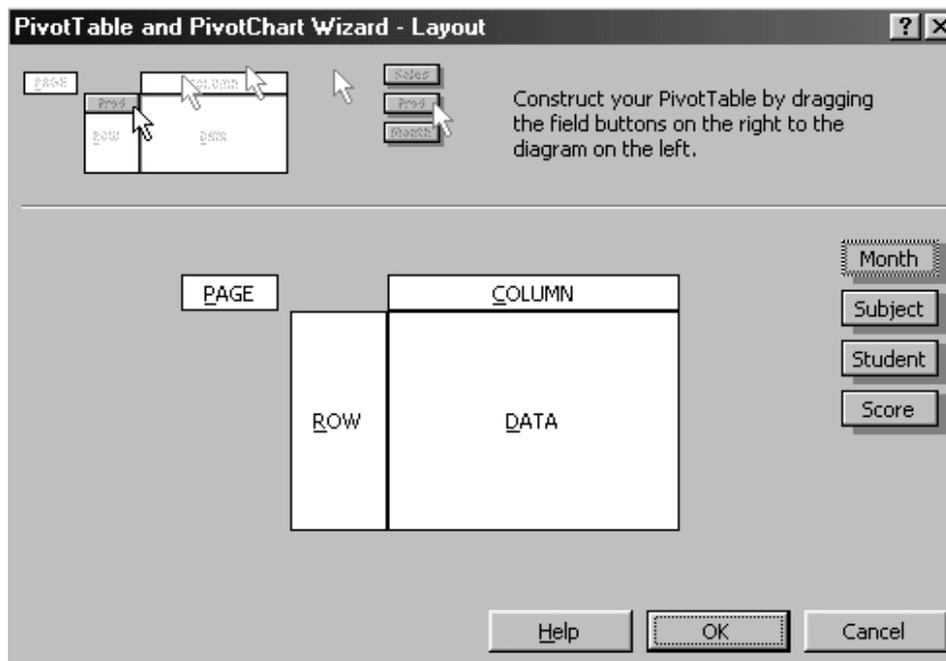


The Field Buttons the Wizard is talking about are those four on the right: **Month**, **Subject**, **Student** and **Score**. The idea is that you click on a button. Hold down your left mouse button and drag to an area on the left. We're going to drag one button to the Column area, one to the Row area, and one to the Data area.

In the Row area, we'll put **Month**; in the Column area, we'll put **Subject**, and in the Data area we'll put **Score**. We'll do something with the Student button after the Pivot Table has been constructed.

So do the following:

- Click on **Month**
- Hold down your left mouse button
- With the mouse button held down, drag the mouse pointer over to the **Row** area
- Let go of the button when it's there
- A button will appear in the **Row** area
- The images below show the process in action

**Hold Down the left Mouse button and drag**
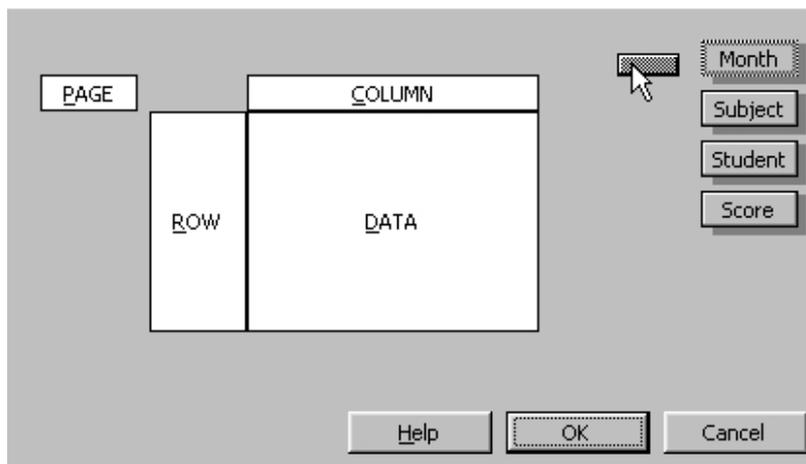
## Drag the mouse pointer over to the Row area
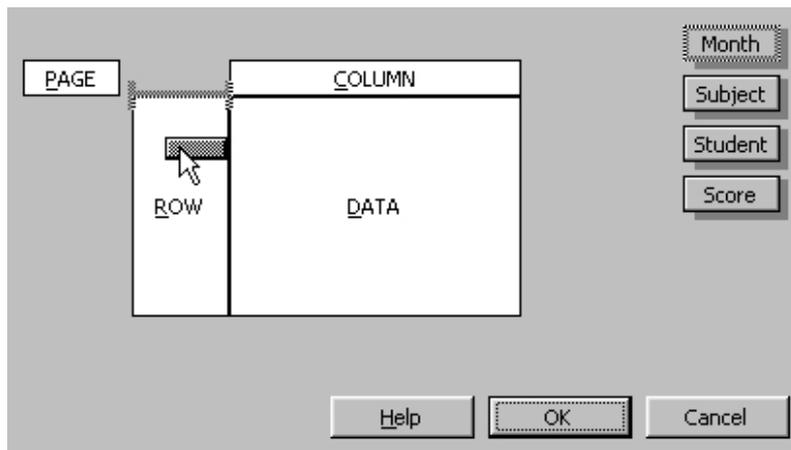


## Let go of the left mouse button when the pointer is over Row
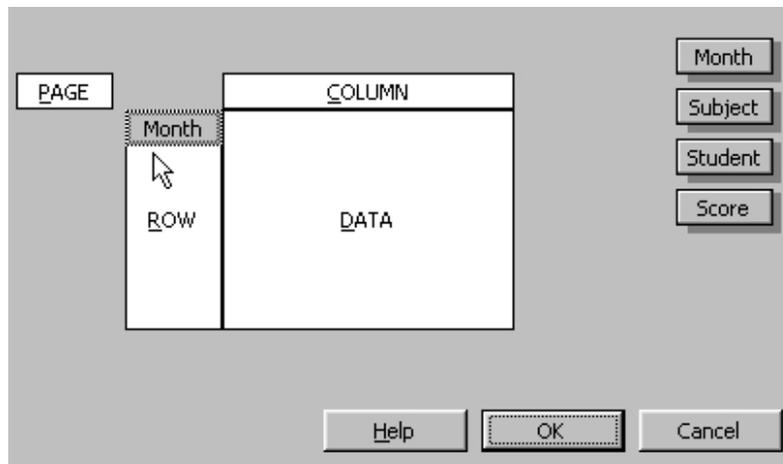


When you have the **Month** button in place, drag the **Subject** button to the **Column** area, and the **Score** button to the **Data** area. Your dialogue box will then look like this:
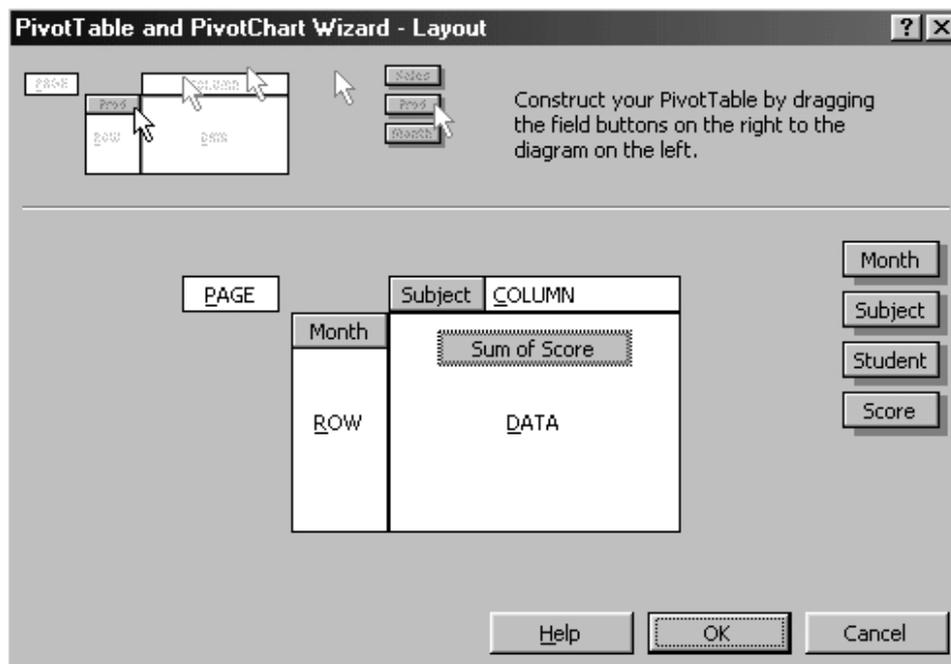
Click OK when your dialogue box looks like the one above. You will be taken back to Step Three of the Wizard. Click the **Finish** button and you're done. You'll then have a spreadsheet that looks like this one:



If you don't see the Pivot Table toolbar, click on **View > Toolbars > Pivot Table**.

I'm sure you'll agree - our Pivot Table is coming along nicely. In the next part, you'll learn how to manually add a button to a Pivot Table.

# Extending the Pivot Table

This lesson follows on from the previous one.

We're now going to put the **Students** button on the Pivot Table. So do the following:

- Locate the **Student** button on the Pivot Table toolbar, as in the image below:
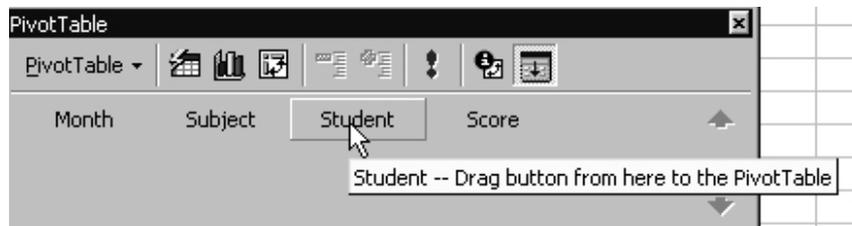


- Hold down your left mouse button on the **Student** button
- Keep the left mouse button held down
- Drag the **Student** button to the top of the Pivot table, where it says "Drag Page Fields Here."
- Let go of the left mouse button
- Excel adds the Student field to the pivot table
- The two images below show the process in action

**Drag the Student button to the top of the Pivot table**



**Release the left mouse button and Excel adds the Student Field**



We're almost there, now. Only a couple more things left to do. First, take a look at the scores. What the Pivot table is doing is adding all the scores up. That's because of cell A3. Notice that it says "Sum of Score". We don't want it to do that. An Average is much better for our purposes.

To change the Scores to Averages, do this:

- On the Pivot Table toolbar, click on the **Pivot Table** button
- A menu pops up like the one below:
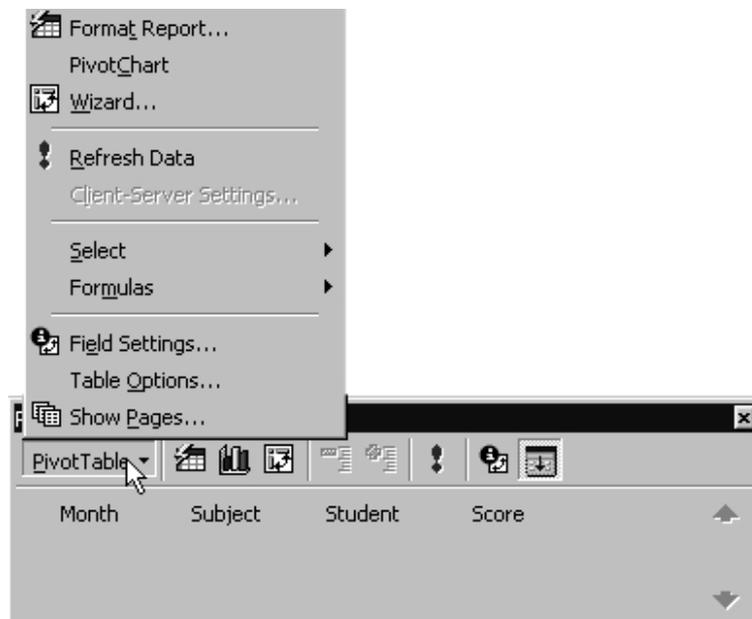
- To change the Scores to Averages, click on **Field Settings**
- The following dialogue box appears:
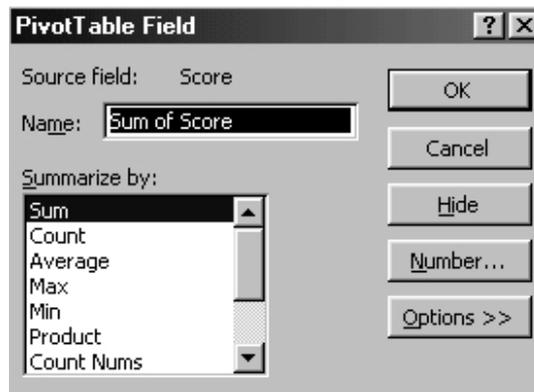


There are not too many functions to choose from in the Summarize by list, but Average is on there. So click on Average, and then click OK. The scores will change on the spreadsheet.

Some of the scores in the Grand Total Row and Grand Total column will be a bit long. But you can format the numbers to in the usual way.

- So highlight the Grand Total row
- From the Excel Menu Bar, click on **Format**
- From the drop down menu, click on **Cells**
- When the dialogue box appears, select the **Number** tab strip
- Format to 1 decimal place
- Do the same for the Grand Total row
- Your Pivot Table should now be looking like the one below:

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | Student | (All) | | | | | | |
| 2 | | | | | | | | |
| 3 | Average of Score | Subject | | | | | | |
| 4 | Month | Art | English | French | History | Maths | Science | Grand Total |
| 5 | January | 75 | 87 | 77 | 69.5 | 59 | 46.5 | 69.0 |
| 6 | February | 71 | 59.5 | 75 | 72.5 | 63 | 72.5 | 68.9 |
| 7 | March | 70 | 41 | 73 | 79 | 53 | 41 | 59.5 |
| 8 | Grand Total | 72.0 | 62.5 | 75.0 | 73.7 | 58.3 | 53.3 | 65.8 |
| 9 | | | | | | | | |

We can now take a look at those drop down boxes. We'll start with the Student box.

At the moment, the Student box says All. Click the black down arrow to see the list of students.



Our two Students are listed there. Click on Elisa, then click the OK button. Notice how your spreadsheet has changed. It should now only be showing you Elisa's results. Click the black down arrow in cell B1 again, and click on Mary. Then click the OK button. Your spreadsheet will change to show only Mary's results.

Try clicking the black down arrow of Subject, in cell B3. You should see this:



All the Subjects have ticks in them. Click on a tick and it will disappear. Try un-ticking a few of the subjects. Then click the OK button to see what happens.

The Month list in cell A4 shows a similar list with ticks in them. Un-tick a month and see the results when you click OK.

You can add comments to pivot tables. The one below shows a Comment about Elisa's English scores:



Another thing you can do is change the type of Pivot Table Report. From the Pivot Table toolbar, click the Pivot Table button. From the menu that pops up, select Format Report. Click on any of the formats you like then click OK to see what happens. If you don't like what you see, click Edit > Undo AutoFormat to get back to your Pivot Table.

And that wraps up this short introduction on Pivot Tables. But they are a good way to summarise long lists of data. In the next section, we take a look at Excel Forms, and see how to download data from a web page straight into Excel.

Move on to the next section -->

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# Data Input Forms

## How to Create a Data Input Form in Microsoft Excel

Forms help you input data into a spreadsheet more easily. We'll look at a data input form. We're going to see how helpful a data input form is, and how easy it is to create one. In fact, you won't be creating one at all - Excel does all the work for you. First, the problem.

## Data Input Forms

Start a new spreadsheet. Enter January in cell A1. AutoFill the months up to October in column J. Then do the following:

- Highlight the entire A column by clicking on the letter A at the top of the spreadsheet
- Hold down your left mouse button on the letter A of the column
- Keep it held down and drag to the right
- Keep dragging until you have highlighted all the columns from A to J
- Your highlighted spreadsheet will look like this:



- Once you have the columns A to J highlighted, click on **Format** from the menu bar
- From the drop down menu, select **Column**. A sub menu appears
- From the sub menu, click on **Width**
- The following little dialogue box pops up:
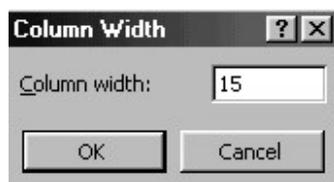


- Change your Column width to 15 and then click OK

What should happen is that columns H to J disappear from the screen, and you can no longer see August to October. Now enter a number for each month. Any number will do.

What happened? You should find yourself having to scroll across the spreadsheet in order to enter number for the months not on the screen. When you got to October, only the months May to October are visible. If you want to enter some more numbers, starting with January again, you have to scroll back to the start.

Clearly this is a problem, if you have lots of data to enter. You don't really want to be scrolling backwards and forwards. Especially if you had over a hundred rows to fill. It would drive you nuts!

There is an easier way - use a Form for the data inputting.

To see how much more simple your life would be, do the following:

- Click inside cell A3 of your spreadsheet
- From the Excel menu bar, click on **Data**
- From the drop down list, click **Form**
- A form like the one below should pop up on top of your spreadsheet:

As you can see, the labels for the months are on the left. To the right of each month there is a text box. The numbers currently in them are the numbers inputted on the spreadsheet.

- Click the **New** button at the top
- The text boxes go blank
- Click inside the **January** text box and enter a new number
- Enter new number for the rest of the months
- When you have finished, click the **New** button again

When you click the New button, Excel will enter the numbers into your spreadsheet. The text boxes will be blanked out, ready for some new data.

And that's it. No more scrolling! Easy, hey? The form even gives you button to set up some search criteria (Find and Criteria buttons). When you want to get back to your spreadsheet, just click the Close button.

In the next part, we'll take a look at Data Validation Forms.

# How to Create a Data Validation Form

When inputting data into a spreadsheet, often you will find yourself having to type the same data into cells. That's where Data Validation comes in handy. Instead of typing the same thing over and over again, you can turn the cells into drop-down lists. That way, you could just quickly select an item from the list and move on to the next entry.

For example, suppose you had a column heading called "Student Grade". Even though there are only two grades available, Pass and More Work Needed, it can become quite laborious having to type either one or the other. Spelling mistakes will become increasingly more likely the more times you have to enter the grades. Much better to have a drop down list where you could select the grade. And no more spelling mistakes!

## Data Validation

We'll now construct a spreadsheet with drop-down lists. The one we're going to construct takes us back to the classroom and our students from previous section.

So start a new spreadsheet, and format it to match the one below:

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | **Student** | **Subject** | **Grade** | | **Comments** | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |

Before we can turn the cells in an entire column into drop down lists, we need some data to go in the lists. So starting at cell F2, add the following to your spreadsheet:

| E | F | G | H |
|---|---|---|---|
| **Comments** | | | |
| | Steven | Maths | A |
| | Mary | English | B |
| | Anne | Science | C |
| | Ray | History | D |
| | Mark | Geography | E |
| | Paul | Art | Fail |
| | Elisa | Computers | |
| | Kelly | French | |
| | | | |

The data in columns F, G and H will be going into our lists. We can then hide this data so that it's not messing up our spreadsheet. You'll see how to do this later. But we can now turn Columns A, B and C into lists.

To turn the cells in an entire Column into a list, do the following:

- Highlight the whole of Column A by clicking on the letter A at the top of the column
- With the whole of Column A highlighted, click on **Data** from the Excel menu bar
- From the drop down menu, click **Validation**
- The following dialogue box appears:
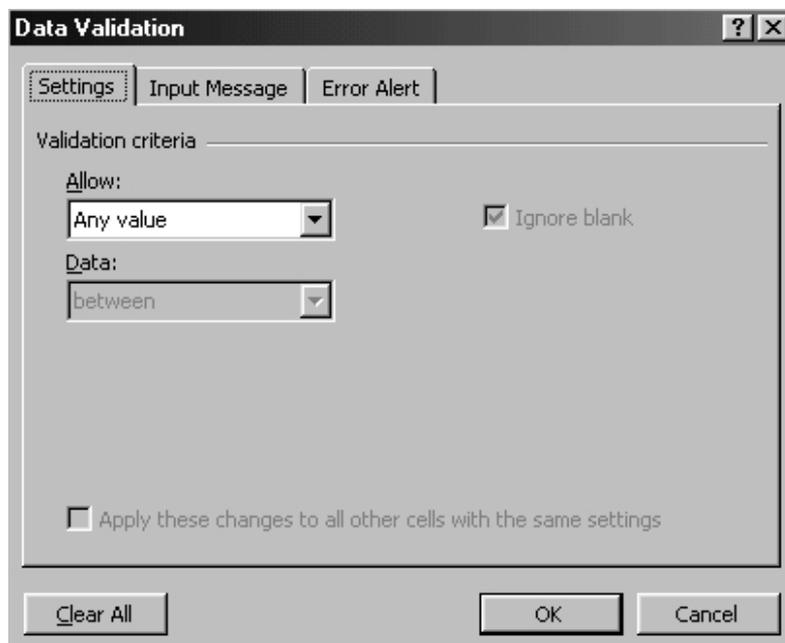
- Make sure the **Settings** tab strip is selected
- Click the black down arrow just to the right of "**Allow**: Any Value"
- A drop down list appears
- Choose **List**
- A Source box appears on the dialogue box

The Source is the data that is going into your list. So you need to select the cells with the students in them. To select the cells with the students in them, do this:

- Click on the icon to the right of the **Source** text box:
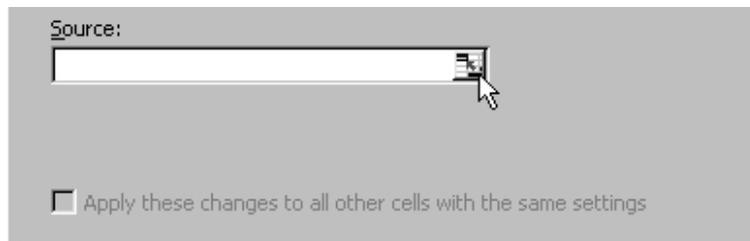


- When you click the icon, the dialogue box contracts
- Click inside cell F2 on your spreadsheet
- Hold down your left mouse button, and drag to cell F9
- Then click on the icon again to expand the dialogue box
- The images below show the highlighting and expanded process in action

## Click the icon and highlight F2 to F9
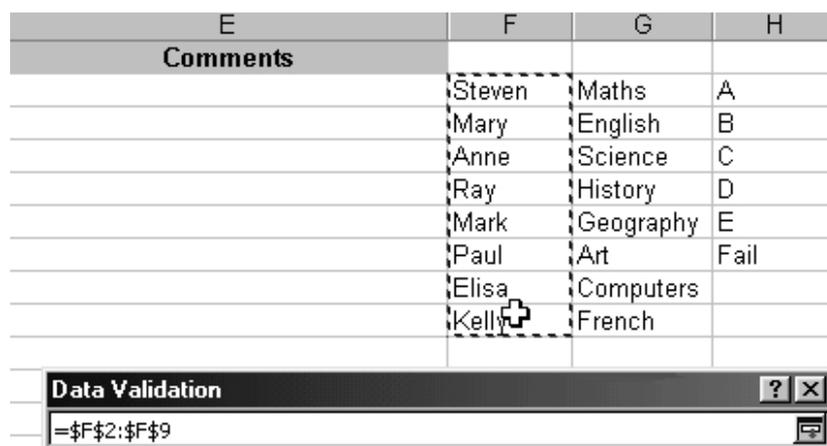
## Click the icon again to expand the dialogue box
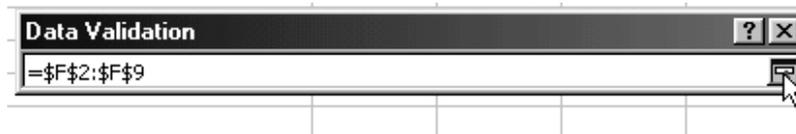


- If you have done it all correctly, your dialogue box will now look like this one:
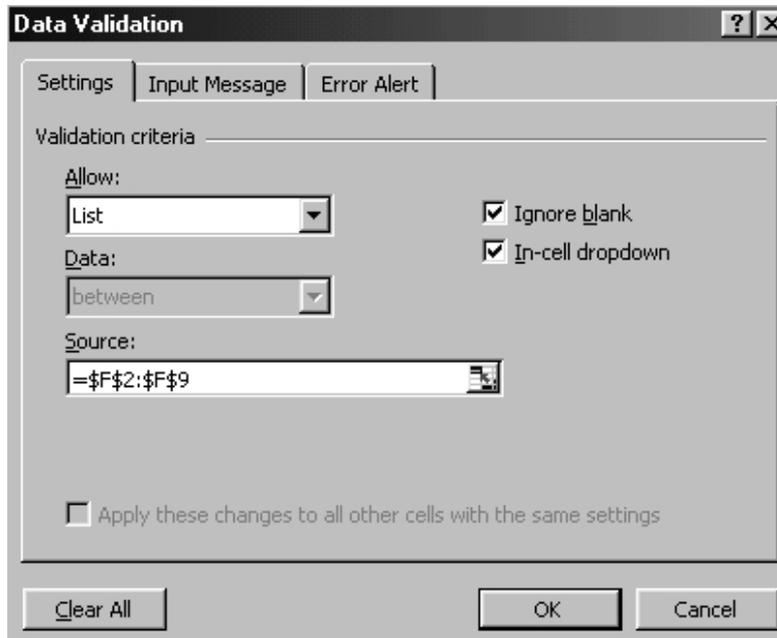


So the Validation criteria should be: "Allow List", and the Source should be = $F$2:$F$9.

Click OK when your dialogue box reads the same as the one above. The cells in you entire A column will now be drop down lists. Test it out. Click on cell A3, for example. It should look like this:



If you click the black down arrow, you should see your list of students. Like the one below:



Click on any student in the list. The student appears in cell A3. Click on another cell in column A and try it again.

I'm sure you'll agree that it's much better than having to type out a student's name over and over again.

Except we have a slight problem. If you click inside cell A1 you'll see that this too has a drop down list.

Clearly we don't want this to happen for our heading. To turn off the list in cell A1, do the following:

- Click inside cell A1
- From the Excel menu bar, click on Data
- From the drop down menu, click Validation
- From the Settings tab strip of the dialogue box, change "Allow List" to "Allow Any Value"
- Click OK

Time for you to try it alone. Change the **Subject** and **Grade** columns into drop down list, and then turn off the list for the headings cells B1 and C1.

The drop down lists for the **Subject** and **Grade** columns should look like these when you're done:





In the next part, you'll learn how to display error messages. That way, you can control what data your users are allowed to enter.

Move on to displaying Error Messages -->

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# Displaying Error Messages in Excel

This tutorials follows on from the <u>previous page</u>

In the previous part, you created drop down lists so that you can simply select the data you want, rather than typing it in all the time. In this part, we'll display error messages if a user types in too much data.

## Displaying Error Messages

We can add Validation to the Comments field in our spreadsheet. We'll restrict the amount of text that can go in the Comments field to a maximum of 25 characters. The comments field you should have is this one:

| E | F | G | H |
|---|---|---|---|
| **Comments** | | | |
| | Steven | Maths | A |
| | Mary | English | B |
| | Anne | Science | C |
| | Ray | History | D |
| | Mark | Geography | E |
| | Paul | Art | Fail |
| | Elisa | Computers | |
| | Kelly | French | |
| | | | |

So highlight the Comments column and bring up the Data Validation dialogue box again (Click **Data > Validation** from the menu). This time, in the Allow drop down box select "Text Length". A few more fields will appear on the dialogue box:



The **Between** in the Data text box is exactly what we're looking for. But we need to enter values for the Minimum and Maximum fields. These are the Minimum and Maximum text lengths that can put in any cell in the comments column. We'll restrict the length to 25 characters, just so you can see how it works.

- So click inside the **Minimum** text box
- Enter the number 1
- Click inside the **Maximum** text box

- Enter the number 25
- Don't click OK just yet

We can add an error message, too, so that we can tell users what they did wrong. To add an error message, do the following:

- Click on the **Error Alert** tab strip of the Data Validation dialogue box
- The dialogue box will change to this:
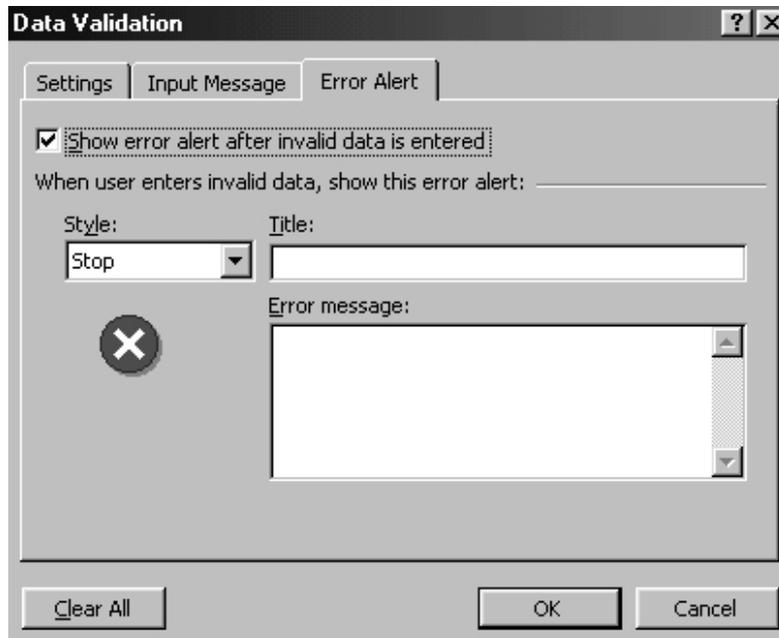


If your dialogue box doesn't look like the one above, make sure there is a tick in the box at the top "Show error alert after invalid data is entered."

There are three different Styles you can choose from for your error message. Click the black down arrow just below **Style** to see them. Click on each one in turn and see what happens. Then set it back to **Stop**.

- Click inside the **Title** text box and type "Too many characters"
- Click inside the **Error message** text area and type "The maximum number of characters for this field is 25 - please try again"
- Your dialogue box will then look like this:
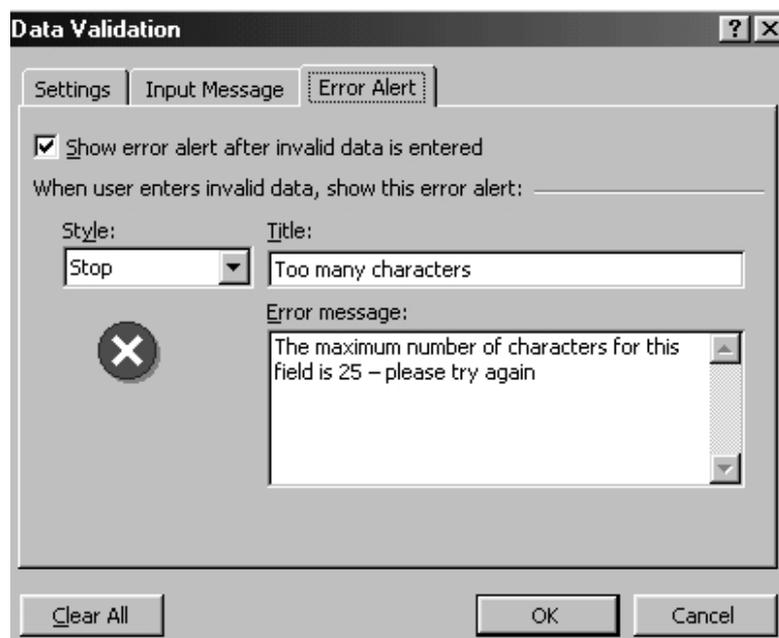


Click OK when you've finished. To test it out, click inside cell E2 and type the following: **Steven can do**

**a lot better than this**. Then press the return key on your keyboard. Your error message should pop up and look like this one:
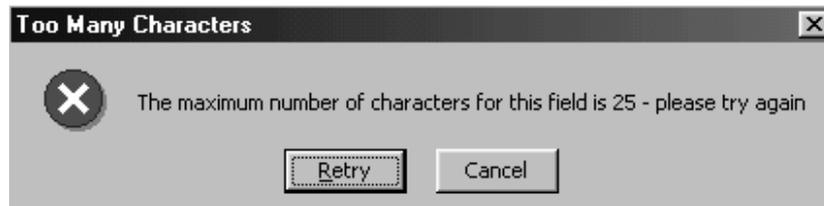


The error alert gives the user the changes to either Cancel the data already input, or to Retry.

The only thing spoiling the look of our spreadsheet are the cells starting at F2, the ones from our list. We can hide all that data from prying eyes.

## Hiding Data in a Spreadsheet

To hide data on a spreadsheet, do the following:

- Highlight the data you want to hide (in our case, highlight F2 to H9)
- From the Excel menu bar, click on **Format**
- From the drop down menu, select **Column**
- From the sub menu that appears, click **Hide**
- The three columns with the list data in them will disappear

Now try this. Click anywhere on the D column. Click **Format > Column > Unhide**. What happens?

Nothing happened, right? So why didn't Excel Unhide your columns?

It's because you did not tell Excel which columns you wanted to Unhide. To do that, highlight columns E and I. Then click **Format > Column > Unhide**. Your data should return.

If you don't want anyone else to Unhide your data, you can Protect the worksheet from unwanted changes. Just click on **Tools > Protection > Protect Worksheet**. A dialogue box appears. Select your options, and then click OK.

And that's it for our brief look at Forms. You can do a whole lot more with Forms, but that enough for us. We can move on to Web Integration.

# Web Integration and Excel

What you're going to do in this section is to download data from the internet, and put it straight into an Excel worksheet. We have a page on our website that is set up for you to download straight into a spreadsheet, and we'll give you the address shortly.

An example of why you would want to download data from a website is this.

You are salesperson out in the field, visiting clients in their homes or offices. You have a laptop that can connect to the internet. There is a spreadsheet on your laptop. The spreadsheet includes lots of data about the products you sell. One piece of data is the prices of each item. Your company is rather ferocious on prices, and it changes them all the time. The question is, how can you, as a salesperson in the field, keep up to date with the changing prices?

One answer is to use an Excel Web Query. The company will update the prices on the website. You can then run a Web Query to download the latest changes into your Excel spreadsheet. That way the clients get the new prices "Hot of the Presses".

We'll see how to run a Web Query soon. But you need a connection to the internet before you can run a Web Query. In other words, you need to be online. (However, if you know some HTML coding, you can construct a table in a web page that is on your own computer. Then you point the Web Query to the web page on your computer, rather than a web page on the internet. Don't worry if you don't know any HTML coding - it's not necessary for this section.)

But don't go online just yet. Read a few more pages first.

Learn how to Create a Web Query -->

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# How to Create a Web Query in Microsoft Excel

You create a web query in Excel when you want to pull data from an internet page and pop it into a spreadsheet. You can retrieve text from a web page, data in tables, and data that is preformatted on the web page.

To see how all this works, do the following:

- Open a new Excel spreadsheet
- Connect to the internet, if you're not already
- When you are connected, click inside cell **A1** of your spreadsheet
- From the Excel menu bar, click on **Data**
- From the drop down menu, select **Get External Data**
- A sub menu appears
- From the sub menu, click on **New Web Query**
- A dialogue box pops up like the one below:
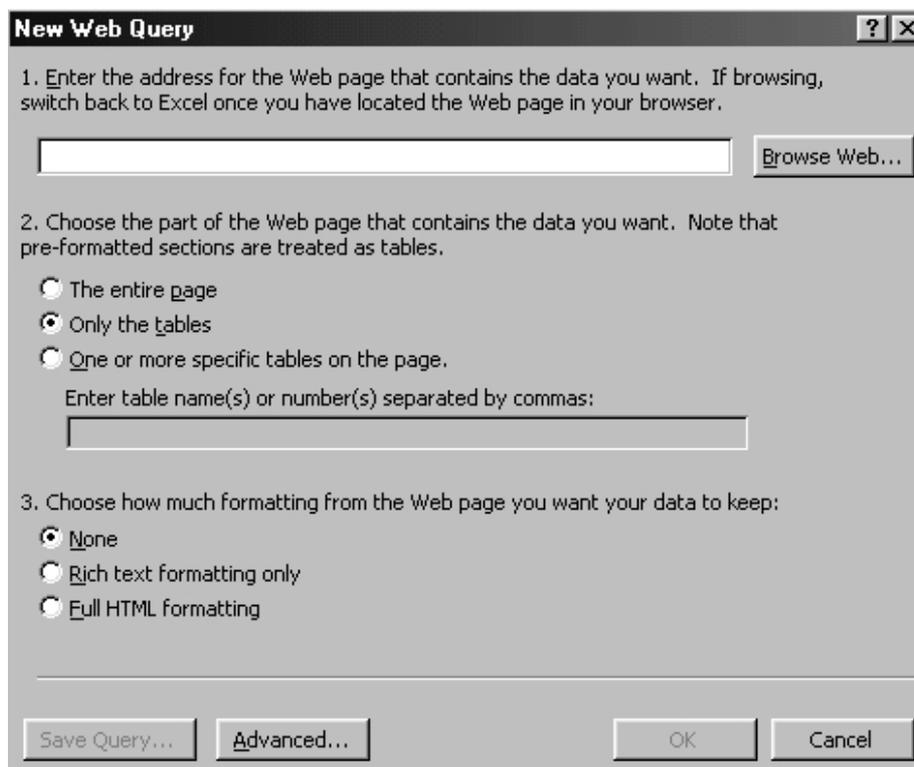


There are three sections to the dialogue box. The first section is where you type in the address of the internet page that you are trying to pop into Excel; the second section is where you specify which part of the web page you want to insert into your spreadsheet; and the third section sounds a bit technical, but basically you are choosing the type of formatting to use: do you want to keep the colour scheme, or strip it bare?

In the first section, you need to type in the name of our internet page. The internet page contains a table with some product information and some prices. By all means, load it into your browser and have a look at it. But first, you need the address. So:

- In the text box right at the top of the dialogue box, type in this internet address. Make sure you spell it exactly as it is below:

- When you have typed the address in the text box, Select "The entire page" from section 2 of the dialogue box.
- From section 3 of the dialogue box, select "None"
- Click OK when you're done

When you click the OK button, another dialogue pops up. This time your are asked where in your spreadsheet you want to put the data. You only need to specify the starting cell. The dialogue box looks like this:

**Returning External Data to Microsoft Excel**

Where do you want to put the data?

⦿ Existing worksheet:

=$A$1

○ New worksheet

○ PivotTable report

[OK] [Cancel] [Properties...] [Parameters...]
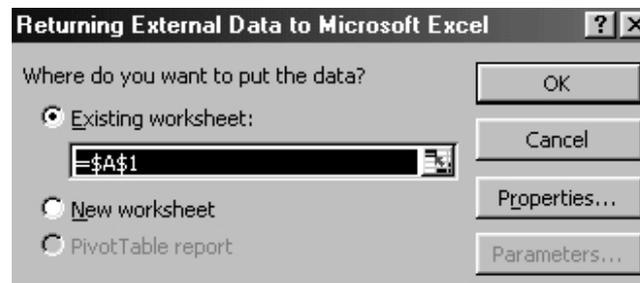
The dialogue box is already set up to put your data into the spreadsheet starting at cell A1. But you could change that, if you wanted. Cell A1 is fine for us, so just click the OK button.

Excel will now look for the internet address you typed. When it finds the web page, it will then take the text and the contents from the table and put them into your spreadsheet.

If the Web Query seems to be taking too long, you can Refresh it. To do that, click on **View > Toolbars > External Data**. A toolbar pops up on your page. Click the Refresh icon, as shown below:

▼ External Data

Refresh Data
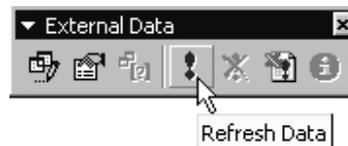
If everything goes well, you should have a spreadsheet that looks like the following one:

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | Code | Product | In Stock | Delivery | Max Discount | Prices |
| 2 | X1 | Widget One | Yes | 2 Days | 20% | £10.99 |
| 3 | X2 | Widget Two | Yes | 2 Days | 10% | £25.99 |
| 4 | X3 | Widget Three | Yes | 3 Days | 5% | £49.98 |
| 5 | X4 | Widget Four | No | NA | 20% | £14.99 |
| 6 | X5 | Widget Five | Yes | 1 Day | 40% | £589.99 |

As you can see, Excel has imported the data from a web page on the internet into a spreadsheet. You now have a way to get the latest prices from Head Office!

In the next part, we'll import a web page with better formatting.

# Web Query, Part Two

This lessons follows on from the previous one

The problem with the spreadsheet in the previous section is that it looks a little dull. This second web page you're going to download into Excel is little more colourful. So do the following:

- Click on Sheet 2 of your spreadsheet, and click inside cell A1
- Run a Web Query just like you did in the previous section: **Data > Get External Data > New Web Query**
- This time, when the dialogue box pops up, type in this new address:

**http://www.homeandlearn.co.uk/ME/webquery2.htm**

- In section 2 of the dialogue box, select "The entire page"
- In section 3 of the dialogue box, select "Full HTML formatting"
- Click the OK button
- Click OK in the next dialogue box that asks you where you want to put the data (=$A$1)
- Excel will place the data from the new web page into sheet 2 of your spreadsheet

Although the table itself might look nice and bright, that text heading looks chopped of. Your heading might look like the following one:

| | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| 1 | atest Prices | | | | | | |
| 2 | | | | | | | |
| 3 | | | | | | | |
| 4 | | | | | | | |
| 5 | | Code | Product | In Stock | Delivery | Max Discount | Prices |
| 6 | | X1 | Widget One | Yes | 2 Days | 20% | £10.99 |

The reason it's chopped of is because the cells on row 1 are not formatted properly. If you highlight row 1, from A1 to G1, and then click **Format > Cells** from the menu bar, you can merge all those cells, and centre the text (Alignment tab strip, centre, tick box at bottom "Merge Cells".)

The image below shows a tidied up version of the downloaded spreadsheet (you can do all the cell formatting before you download):

# Latest Prices

| Code | Product | In Stock | Delivery | Max Discount | Prices |
|------|---------|----------|----------|--------------|--------|
| X1 | Widget One | Yes | 2 Days | 20% | £10.99 |
| X2 | Widget Two | Yes | 2 Days | 10% | £25.99 |
| X3 | Widget Three | Yes | 3 Days | 5% | £49.98 |
| X4 | Widget Four | No | NA | 20% | £14.99 |
| X5 | Widget Five | Yes | 1 Day | 40% | £589.99 |

And that's all there is to the basics of downloading data from the internet and importing it into an Excel worksheet.

In the next part, we take a look at adding hyperlinks to your spreadsheets.

Learn how to add a Hyperlink to a spreadsheet -->

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# How to add an Hyperlink to an Excel Spreadsheet

If you have a lot of different worksheets and want a quick way to jump between them, you can use Hyperlinks. Hyperlinks are those underlined bits of text on the internet that lead to web pages

To get a feel for how they work in Excel, start a new spreadsheet and do the following:

- Click inside cell A1 of the spreadsheet
- On the Excel menu bar, click on **Insert**
- From the drop down menu, click on **Hyperlink**
- The dialogue box below will appear:
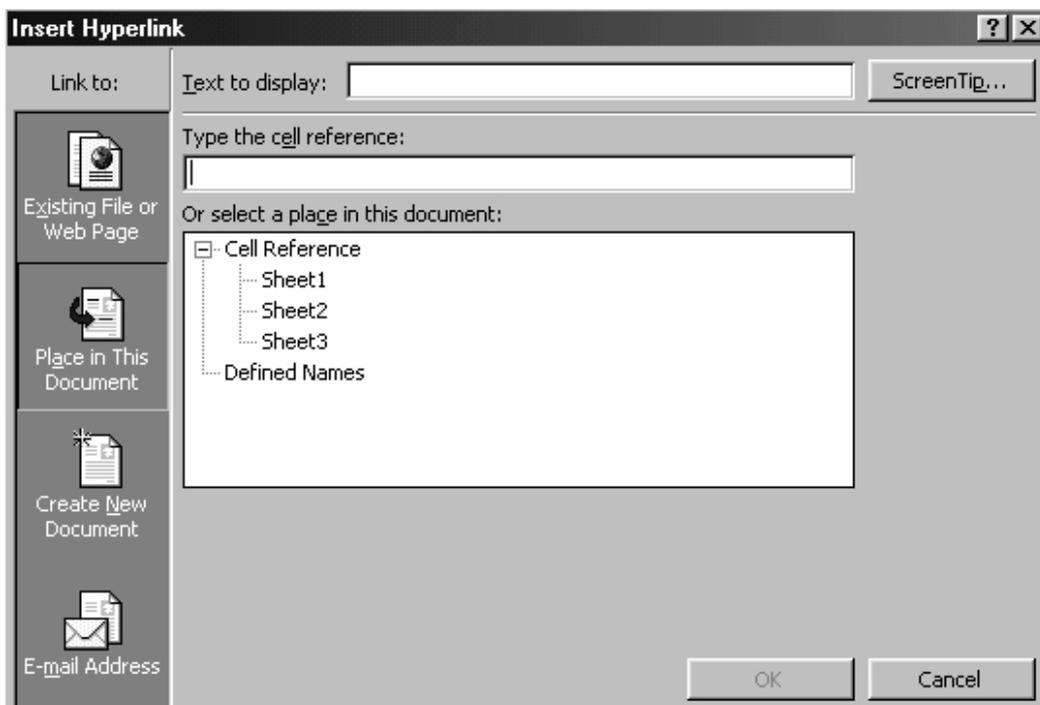


The icons on the left of the dialogue box are all the places you can link to: Existing file or web page, This document, New document, or an Email address.

We're going to place links in specific cells of three different worksheets. So:

- Locate the text area under "**Or select a place in this document**"
- If there is a Plus sign ( + ) next to "Cell Reference", click on the plus sign to expand it. You should see the same choices as in the image above
- Click on "Sheet 3

Now that we have a selected a page to link to, we can specify that Excel goes to a cell of our choice:

- In the text box below "**Type the cell reference**", type in C10

Our A1 cell has nothing in it. So to insert some text for our link, do this:

- Click inside the "**Text to display**" text box
- Type in "**Sheet 3**"
- Your dialogue box should now look like the one below:
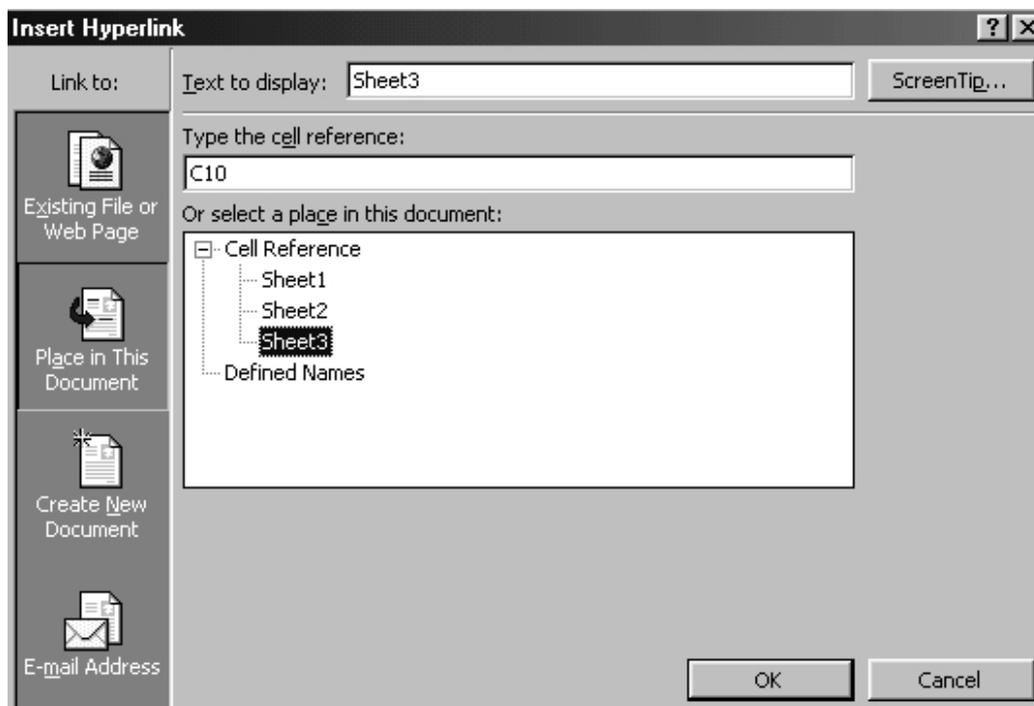
We can add a screen tip as well.

Click the button in the top right of the dialogue box "**Screen Tip**". Another dialogue box pops up, like the one below:
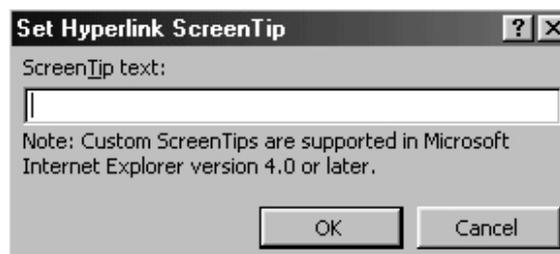


- Click inside the text box and type "**Jump to Sheet3 Cell C10**" (without the quote marks.)
- Click Ok to return to the main dialogue box
- On the main dialogue box, click OK again
- A hyperlink will be inserted into cell A1 of Sheet 1
- Move your mouse pointer over cell A1
- Your spreadsheet will look like the one below:



Click on the link and see what happens. Now it's your turn to try it.

## Exercise

In cell C10 of the spreadsheet, insert a Hyperlink to take you to cell B10 of Sheet 2. Add a suitable Screen Tip.

In cell B10 of sheet 2, insert a Hyperlink to take you to cell A1 of Sheet 1. Add a suitable Screen Tip.

And that ends this somewhat brief introduction to Web integration. There a whole lot more you can do with Excel and an internet connection: Upload data from a spreadsheet to a web page; Save a spreadsheet as a web page; Publish a spreadsheet to web page that others can interact with; Hold an Online discussion. In fact, an entire book could be written on Excel and the Internet!

To wrap up this Excel course, the final section details a few Extra things you can do with Excel. It starts with something called Object Linking and Embedding.

# How to Insert an Excel Spreadsheet into a Microsoft Word Document

Spreadsheets are inserted into Word documents using something called Object Linking and Embedding. Object Linking and Embedding (or OLE), can be a complicated subject, but basically it's used when you want to insert something from one programme into another programme. The example you're going to see will embed a spreadsheet chart into Microsoft Word.

You have two choices when you want to embed something from Excel into another programme - to use **linking**, or **embedding**. If you use linking, you can update the data in Excel and see the changes in the other programme; if you use embedding, any changes you make to Excel will not show up in the other programme.

First, here's how to create a Linked Object. The two programmes used will be Excel and Word. So if you have Microsoft Word and Excel, open up both programmes.

In Excel, create the following spreadsheet:

| | E3 | ▼ | = | = E1 * 12 | | |
|---|---|---|---|---|---|---|
| | A | B | C | D | E | F |
| 1 | Click inside cell E1 and enter a number | | | | | |
| 2 | | | | | | |
| 3 | Your number multiplied by 12 equals: | | | | 0 | |
| 4 | | | | | | |
| 5 | | | | | | |

All the spreadsheet does is multiply whatever is in cell E1 by 12. The answer goes in cell E3. (This example is not terribly functional: you wouldn't really want to use OLE with this particular spreadsheet. But it's easy to create, and will serve as an example of how to use Linking.)

- Once you have created your spreadsheet, highlight from A1 to E3
- With your data highlighted, click on **Edit** form the menu bar
- From the drop down menu, click on **Copy**
- Switch to Microsoft Word
- In Microsoft Word, click on **Edit** from the menu bar
- From the drop down menu, click on **Paste Special**
- A dialogue box pops up in Word like the one below:
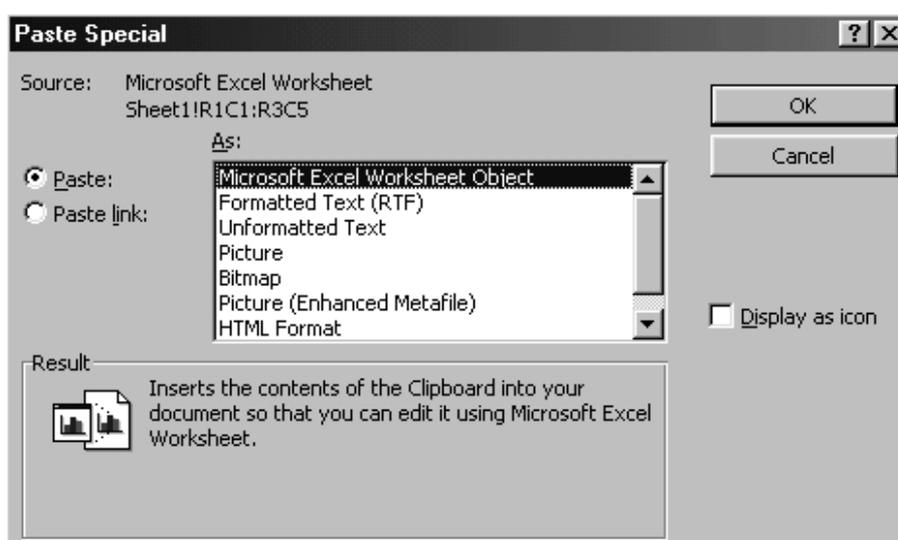
- In the main list box, click on **Microsoft Excel Worksheet Object**
- Of the two Option buttons on the left, Paste and Paste Link, choose **Paste Link** by clicking on it.
- Click the OK button at the top

Word now goes to work and embeds your spreadsheet into the Word processed document. Because we chose **Paste Link**, we will be able to view any updates made from Excel. The Word document should look like the one below:

| Click inside cell E1 and enter a number | | | | |
| --- | --- | --- | --- | --- |
| Your number multiplied by 12 equals: | | | | 0 |
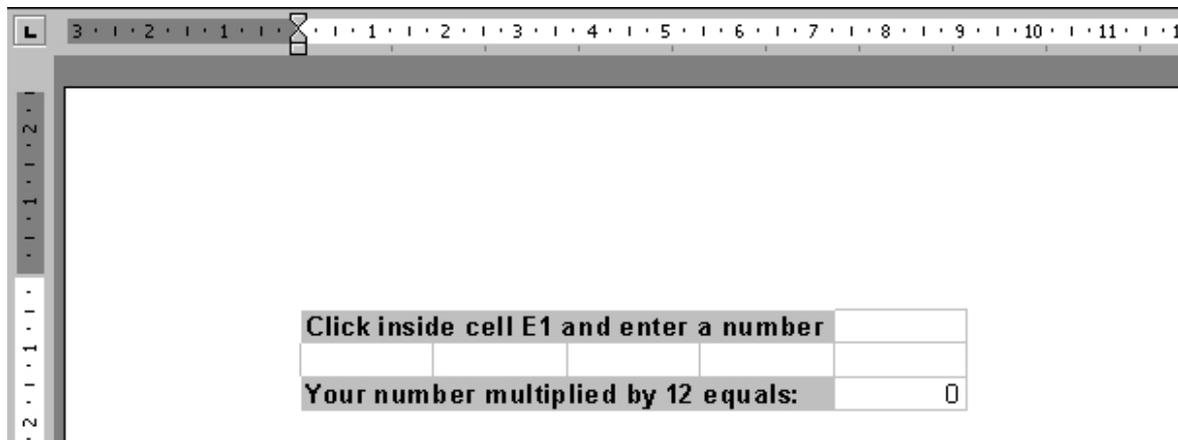
To see that it really does update in Word, do this:

- Go back to your Excel spreadsheet
- Click inside cell **E1**
- Type in the number **7**
- Press the Return key on your keyboard
- The number **84** should appear in cell **E3**
- Switch back to Microsoft Word and view the results
- The Word document will now look like this

| Click inside cell E1 and enter a number | | | | 7 |
| --- | --- | --- | --- | --- |
| Your number multiplied by 12 equals: | | | | 84 |
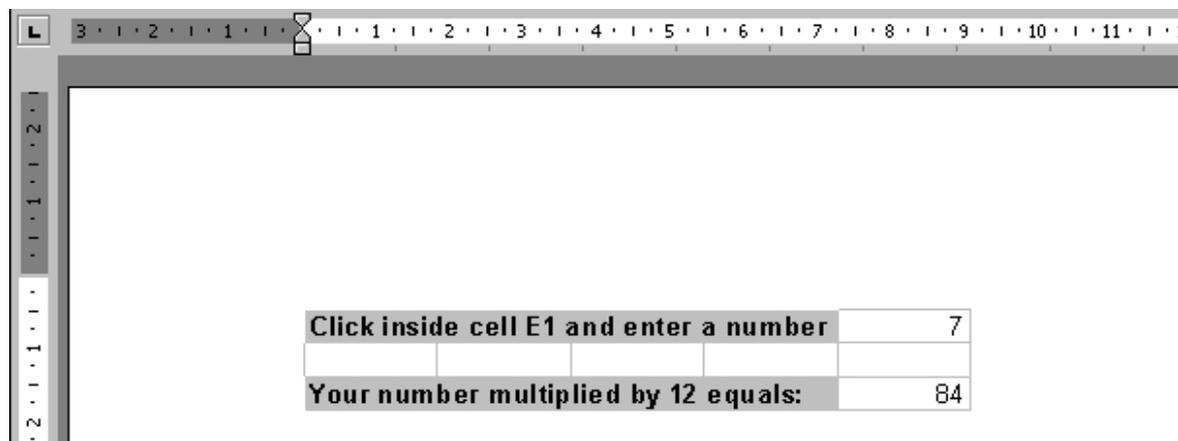
As you can see, the numbers from the Excel spreadsheet are now in the Word document. The link worked!

If you don't want Word updating the embedded object, you would select **Paste** instead of **Paste Link** from the Paste Special dialogue box. Everything else is the same.

Things like Charts and Pivot Tables are the ones usually embedded into a Word document, all ready for the company presentation.

In the next part, we'll see how to reference formulas and data on other worksheets

Learn how to reference formulas and data on other worksheets -->

# Linking to other Excel Worksheets

You can put the answer to a formula on a different worksheet. It doesn't have to go into the same sheet you're working on. For example, think back to the exam marks spreadsheet we did earlier. We had a spreadsheet that had the average scores for the students. Below that we had each exam mark as a letter of the alphabet: A, B, C, etc. The spreadsheet we created was this one below:

| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| B15 | | =IF(B2>=80,"A",IF(B2>=60,"B",IF(B2>=45,"C", IF(B2 >=30, "D", "Fail")))) | | | | | | | |
| 1 | | Steven | Mary | Anne | Raymond | Mark | Paul | Eliza | Kelly |
| 2 | Maths | 76 | 89 | 43 | 48 | 51 | 76 | 87 | 56 |
| 3 | English | 55 | 85 | 78 | 61 | 47 | 87 | 91 | 73 |
| 4 | Science | 65 | 82 | 39 | 58 | 52 | 65 | 57 | 45 |
| 5 | History | 45 | 91 | 56 | 72 | 49 | 56 | 78 | 56 |
| 6 | Geography | 51 | 84 | 54 | 64 | 47 | 64 | 67 | 67 |
| 7 | Art | 43 | 63 | 49 | 62 | 39 | 89 | 64 | 63 |
| 8 | Computer Studies | 63 | 95 | 45 | 59 | 41 | 92 | 89 | 52 |
| 9 | French | 35 | 91 | 65 | 26 | 28 | 51 | 92 | 56 |
| 10 | | | | | | | | | |
| 11 | | | | | | | | | |
| 12 | Overall Average | 54.1 | 85.0 | 53.6 | 56.3 | 44.3 | 72.5 | 78.1 | 58.5 |
| 13 | | | | | | | | | |
| 14 | | Steven | Mary | Anne | Raymond | Mark | Paul | Eliza | Kelly |
| 15 | Maths | B | A | D | C | C | B | A | C |
| 16 | English | C | A | B | B | C | A | A | B |
| 17 | Science | B | A | D | C | C | B | C | C |
| 18 | History | C | A | C | B | C | C | B | C |
| 19 | Geography | C | A | C | B | C | B | B | B |
| 20 | Art | D | B | C | B | D | A | B | B |
| 21 | Computer Studies | B | A | C | C | D | A | A | C |
| 22 | French | D | A | B | Fail | Fail | C | A | C |

Instead of putting all those Grades on the same Sheet, we could have put them on Sheet2 of the Workbook.

If you want to put a formula on a different work sheet, you have to set a reference to the Sheet that contains the numbers going into the formula. An example might clear things up.

- Start a new spreadsheet
- In cell A1 of **Sheet1** enter the number 4
- In cell A2 of **Sheet1** enter the number 5
- Click on **Sheet2** at the bottom of the spreadsheet
- Click inside cell A1 of **Sheet2**
- Click inside the formula bar and enter this formula:

**=Sheet1!A1 + A2**

- Press the Return key on your keyboard
- Excel should give you the answer 4

Four plus five is clearly not four, so what went wrong? Well examine the way we set a reference to the sheet that held our numbers. It was this:

**=Sheet1!A1**

When you are setting a reference to a different worksheet, you need the name of the Sheet. Then you type an exclamation mark (or a bang as it's sometimes known). You then type the cell that you are referring to. So in our formula, we were saying to Excel "Find the worksheet that has the name Sheet1. Now find Cell A1 on the workbook called Sheet1."

However, the whole formula was this:

**=Sheet1!A1 + A2**

For the second part of the formula, we have **+ A2**. But we haven't told Excel the name of the Sheet we're referring to. We've just put **A2**. If the cell reference in the formula doesn't have the name of a worksheet in front of it, Excel will assume you mean the current worksheet. Our current worksheet is Sheet2. Cell A2 of Sheet2 is empty. So the formula adds up the number 4 from cell A1 on Sheet1 and the blank cell A2 on Sheet2. Which gets an answer of 4.

To solve the problem, tell Excel that you want to take the number from cell A2 on Sheet1. So change your formula to this:

**=Sheet1!A1 + Sheet1!A2**

This time, Excel will give you the correct answer of 9.

The main point to bear in mind when referencing data that is on another worksheet is this: Give Excel the name of the worksheet followed by a Bang!

In the next part, you'll learn how to Insert Drawing objects into your Spreadsheets.

# How to Draw a Shape on a Microsoft Excel Spreadsheet

You can draw on your spreadsheet. You can even put a picture on a spreadsheet. Sometimes a drawing can help to illustrate the data or function on the spreadsheet. The drawing in the spreadsheet below is illustrating what the function does:

|   | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Calculates the Cosine of Angle B | | | | |
| 2 | | | | | |
| 3 | | | | | |
| 4 | Enter a Value for the Hypotenuse | | | | 4 |
| 5 | Enter a Value for the Adjacent | | | | 3 |
| 6 | The Cosine of Angle B = | | | | 42 |
| 7 | | | | | |
| 8 | | | | | |
| 9 | | | | | |
| 10 | | | | | |
| 11 | | | 4 | | |
| 12 | | | | 3 | |
| 13 | | | | | |
| 14 | | | | | |
| 15 | | | B | | |
| 16 | | | | | |

We'll see how to draw and format the triangle shape now. (Don't worry about all that Cosine stuff. But we'll give you the formula, just in case you want to duplicate the spreadsheet exactly.)

Before you can draw shapes on your spreadsheet, you need to display the Drawing Toolbar. To display the Drawing Toolbar, do this:

- From the Excel menu bar, click on **View**
- From the drop down menu, select **Toolbars**
- From the sub menu that appears, click on **Drawing**

The Drawing Toolbar should appear, but it might be at the bottom. It looks like this:
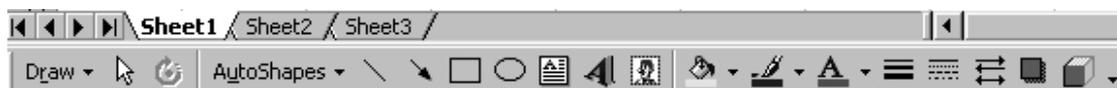
Click on **AutoShapes** to see the kind of shapes you can add to Excel. To get the triangle, do this:

- Click on **AutoShapes** from the Drawing Toolbar
- A menu pops up
- Move your mouse up to **Basic Shapes**
- A box of shapes appears:
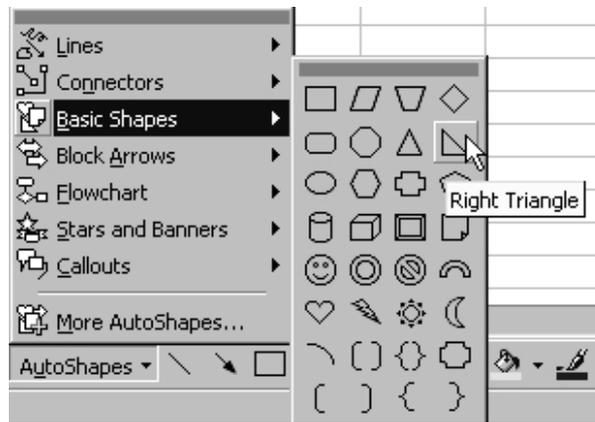
- Click on Right Triangle, as in the image above
- Move your mouse on to the spreadsheet. The mouse pointer will now be in the shape of a thin cross
- Hold down your left mouse button
- Keep the left mouse button held down and drag
- Let go of the mouse button when you're happy with the size of your triangle
- You spreadsheet will look something like this one:
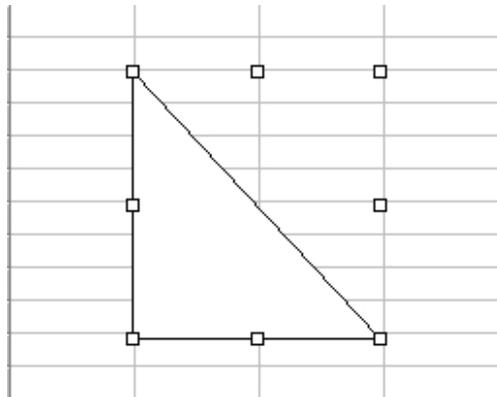


The white squares around the shape are the sizing handles. To resize your triangle, move your mouse over a white square. The pointer will change to the shape of a double-headed arrow. Hold down the left mouse button and drag. To move the triangle somewhere else, move your mouse pointer somewhere in the middle of the shape. When your mouse pointer turns into a arrow-headed cross, hold down the left mouse button and drag the shape somewhere else.

Our triangle is facing the wrong way. To turn it round, do this:

- Click on the triangle with the right mouse button
- A menu appears
- Click on "**Format AutoShap**e", but click with the left mouse button
- A dialogue box appears
- Select the **Size** tab strip
- Click inside the **Rotation** textbox and change it to 270 degrees
- Click OK

To add some colour to your shape, again Right click on the shape and select Format AutoShape. This time, select the Colours and Lines tab strip. Click the down arrow of the "Fill Color" box. Choose a colour for your shape.

To add the letter B to your triangle, you need to add a text box on top of it. So, locate the Text Box tool on the Drawing Toolbar. Click on it with your left mouse button. Position your mouse at the bottom of your triangle. Hold down the left mouse button and drag out a text box. Your spreadsheet will look something like this one:
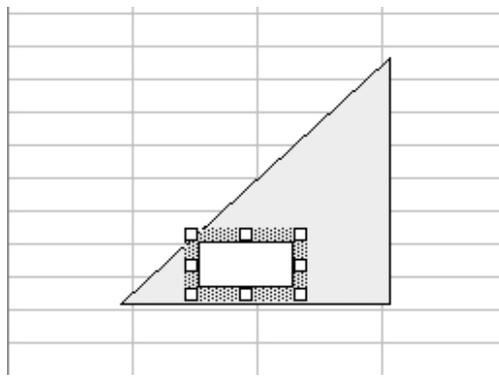
Click inside the text box and type the letter B. Now click on one of the edges of the text box, somewhere near a white square. But click with your Right mouse button. A menu will pop up. When the "Format Text Box" dialogue box appears, select the Colours and Lines tab strip. Under "Line Color" set it to No Line, as in the image below:
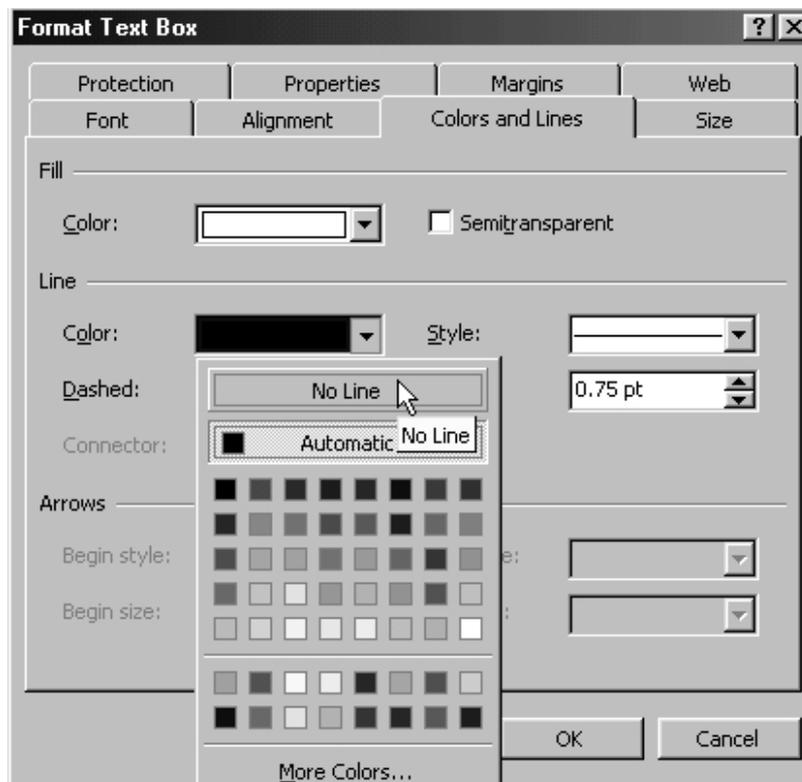


In the "Fill Color" box, set it to No Fill. Then click the OK button. Your final shape will then look like this:
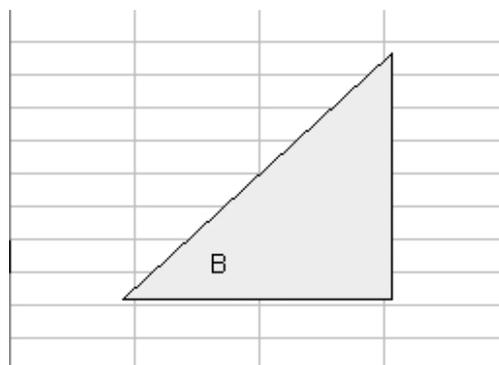


If you want to add the Cosine formula to the spreadsheet, it was this:

**=DEGREES(COS(E4 / E5))**

Cell E4 will then be the input cell for the Hypotenuse, and cell E5 will be the input cell for the Adjacent.

In the final part, you'll see how to insert an image into a spreadsheet.

# How to Place an Image onto an Excel Spreadsheet

Inserting an image into Excel is fairly straightforward. Below is a spreadsheet with a picture in it. The picture serves to illustrate a lesson on the circumference of a circle.

| | Diameter | Radius | Circumference |
|---|---|---|---|
| **Calculate the Circumference of the Planet** | | | |
| Planet One | 1567 | | 4922.88 |
| Planet Two | 568 | | 1784.42 |
| Planet Three | 3478 | | 10926.46 |
| Planet Four | | 1367 | 8589.11 |

The image above was inserted like this:

- From the Excel menu bar, click on **Insert**
- From the drop down menu, select **Picture**
- From the sub menu that appears, click on **From File** (Click the Clip Art option if you want to insert a clip art image.)
- The following dialogue box appears:

**Insert Picture**

Look in: cartoons

- homerexpressions.gif
- millhouse.gif
- mrburns.gif
- ned.gif
- pathetic.jpg
- planet.bmp
- red_lips_1.gif
- sad.jpg
- seymour.gif
- shocked.jpg
- simpons.jpg
- space.jpg
- tools1.bmp
- tools2.bmp
- wiggum.gif
- xmov.gif

History  My Documents  Desktop  Favorites  Web Folders

File name:

Files of type: All Pictures (*.emf;*.wmf;*.jpg;*.jpeg;*.jfif;*.jpe;*.png;

Insert    Cancel
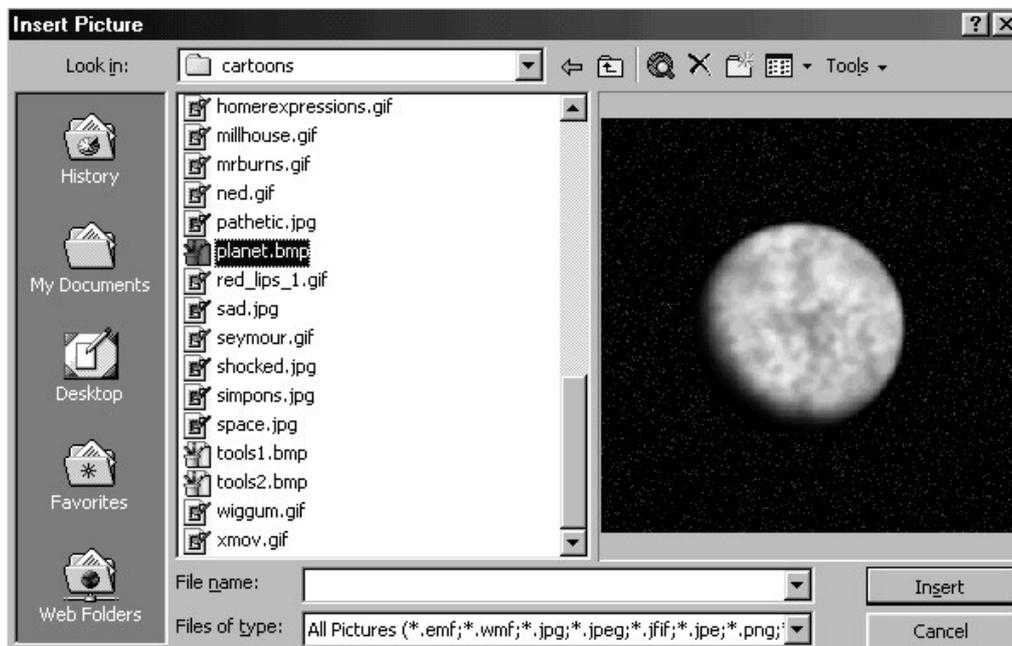
- Navigate to where on your computer your picture is
- Then click **Insert**

Once the picture is inserted into Excel, you can resize it and move it to a new location. You can even crop it down a bit by using the Crop tool on the Picture toolbar (**View > Toolbars > Picture**).

And that's it for the Excel course! Hope you enjoyed it, and that you're inspired to create even more complex spreadhseets than the ones you've created with us. Or why not try one of our other courses at the top of the page?

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