

Excel Instructions

This is a general document designed to assist you with understanding the Excel functions (formulas) and how they work. The contents are:

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Entering Excel Formulas

How Formulas Work

When you enter a formula into Excel, it does not read from left to right as we do, it applies the mathematical method of carrying out calculations. For those who remember it is called BODMAS, for those who grew up using an abacus (me) this is an acronym for:

Brackets (done first)
Over
Division (/)
Multiplication (*)
Addition (+)
Subtraction (-)

So, to look at an example or two, if you have a formula that reads:

=5+3*8 this gives the answer **29**

Your answer is 29 because Excel will multiply before adding. If the formula reads:

=(5+3)*8 this gives the answer **64**

Your answer is 64 because Excel will do the addition before multiplying, as instructed, by placing the brackets around the first part of the formula.

There may be some situations where you see brackets within brackets. If this is the case, Excel will carry out the instructions in the innermost brackets first, then work its way out to the outside brackets. By the way, don't try to do some of these in your head, it hurts!

=(5+3)*8+2/11 gives the answer **64.18182**

=((5+3)*8+2)/11 gives the answer **6**

In the first example above Excel adds, then multiplies, then divides, then adds because of BODMAS.

In the second example Excel, adds, then multiplies, then adds, then divides, again because of BODMAS.

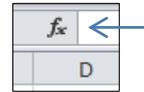
The information on the use of brackets (parentheses) is across the board for all formulas or functions used within Excel. It may help you understand how Excel is providing the answer you see in a cell when you look at the formula generating the result.

Note : If you just wish to calculate some figures, you can enter a formula in a cell, using any of the examples above, exactly as they are shown, and when you press Enter, you will see the result. If you then wish to use the figure you can press F2 (edit a cell), press F9 (recalculate) and the formula is removed and the result shown. Finally press Enter to leave the figure in the cell.

General Information

The method of entering criteria into formulas is quite often driven by the function you have selected.

Using the Insert Function button on the formula bar takes you into a list of all functions displaying three different areas you can work with:



Insert Function

Search for a function:

Type a brief description of what you want to do and then click Go

Or select a category: Most Recently Used

Select a function:

- CORREL
- COUNTIFS
- IF
- SUM
- AVERAGE
- HYPERLINK
- COUNT

CORREL(array1,array2)
Returns the correlation coefficient between two data sets.

Help on this function

OK Cancel

Annotations:

- Type a question to search Help for a type of function and press Enter or click Go
- Click list arrow to select a category, eg Statistical, to see a list of those specific functions.
- List of functions based on the selected category, presented alphabetically.

Functions are divided into four parts. Using =SUM(B6:B18) as an example, the four parts are described:-

- = Instructs Excel that you inserting a function (or formula)
- SUM The function name. There are over four hundred functions in Excel so the word Sum is replaced by the appropriate function name
- () The brackets, or parentheses if you like Excel terms, surround the cell references that you tell Excel to use to carry out the calculation
- B6:B18 Excel calls the cell references the Argument(s). Some functions work with one argument as in the example of Sum, other functions require two or more arguments. Each set of arguments is separated by a comma. A comma can also be used in the Sum function if you wish to sum more than one range into the current cell, for example =SUM(B6:B18,E6:E18).

An example of a function requiring two arguments is:

=COUNTIF(B6:B18,90)

In this example you are asking Excel to scan the range of cells and tell you how many times the number 90 appears in the range.

If an argument requires the entry of text, the text is placed in quotes:

```
=COUNTIF(B6:B19,"cat")
```

In this example you are asking Excel to scan the range of cells and tell you how many times the word Cat appears. When using text, Excel does not take any notice of capitals, lower case, etc, it just searches for the sequence of characters.

In the example above, you are being very specific in that you want Excel to find and count "cat". If there is the possibility that the cells contain "black cat", "cat tabby", "cats", etc and you wish to count all of them, the criteria needs to be entered using wildcard(s). Using the example of these possibilities, the criteria would have to be entered as "*cat*" which searches for all occurrences of the characters **cat** anywhere within each cell in the range – no matter if they appear at the beginning, in the middle or at the end.

Quotes will also be needed for values if you need to use comparison symbols, eg > (greater than), = (equal to), etc to enable you to be more flexible with your criteria:

```
=COUNTIF(B16:B19,">=90")
```

In this example you are asking Excel to scan the range of cells and tell you how many times it sees the value of 90 or more.

If you are entering a function using more than one set of criteria, be sure to enter the criteria in a logical sequence:

```
=IF(C8<20,"Too small","Well done")
```

This tests the contents of cell C8 and if the value entered is less than 20, the response in the cell containing the formula will be "Too small". If the value is 20 or more, then the response will be "Well done". You may need to apply more criteria to the value in the cell, and this requires you to enter the formula differently:

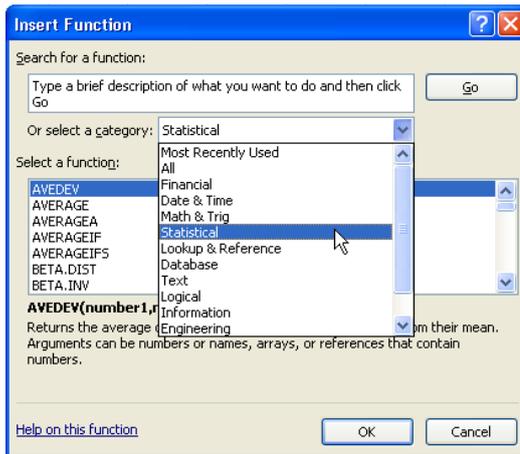
```
=IF(C8<20,"Too small",IF(C8<40,"Good effort","Well done"))
```

In this case the "Too small" response is the same, but if the C8 contains 20 to 39, then the response will be "Good effort", whereas if the value is 40 or more then the response will be "Well done". Notice the use of brackets to drive which part of the formula is to be applied first. The other important point is that the first part starts with 20, then 40, then the rest therefore it is entered in a logical arithmetical sequence that Excel can understand. This is called a Nested Function.

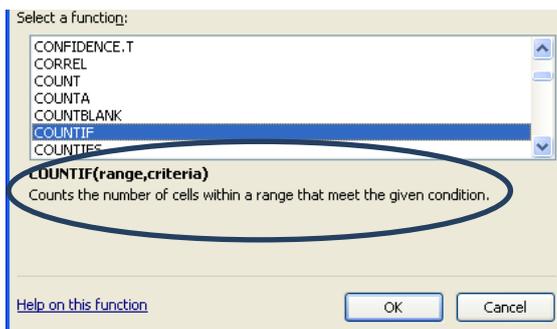
Using Insert Function

To have a look at how the Insert Function button works, this section will take you through the steps to scan a range of cells and look for the word “Cat”.

1. Go to the cell which is to contain the results of the formula.
2. Click on the **Insert Function** button on the formula bar.
3. Select the category to be used, in this case *Statistical*.

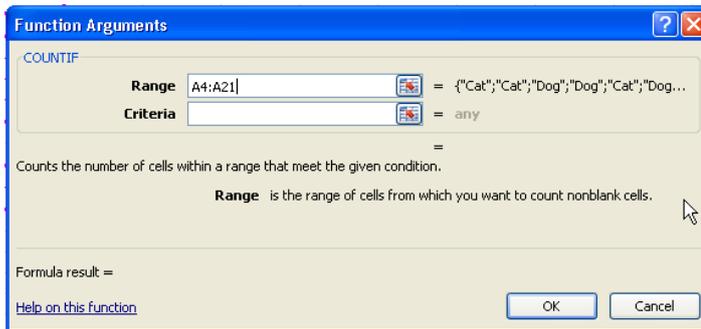


4. Click on the function name to be used. Note, if you click **once** on the first function name and then type (reasonably quickly) the name of the function you wish to use, you will jump to that function in the list.

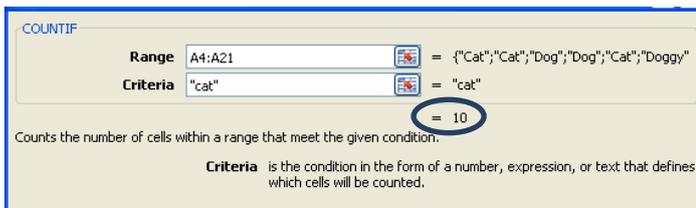


5. Click OK to move to the next step. Note that when you click on the function name the bottom part of the screen shows a description of what the function is designed do.

- The **Function Arguments** dialogue box now appears on the screen. You can move this around the screen if it is sitting over the area you wish to work with, and you can take your mouse pointer outside the box and drag over the range of cells to be used in the Function.



- Now enter the Criteria, remembering to use quotes for text (which is not case sensitive), or values using symbols. Note that you can already see the result if the Criteria is correctly entered.



- Click OK and the results will be inserted into the cell.

Use these steps for all Functions. It helps walk you through the steps you are taking and you can see the results of your work. You cannot use the Insert Function option for Nested Functions, but it will at least get you started.

Viewing Formulas

If you are working on a book that is shared with others, you want to make sure you do not inadvertently overwrite one of their complex formulas. If you hold down the Ctrl key and press ` (above the tab key and below the Esc key), you switch the view of your sheet from results to formulas. Press this again, and you switch back to results view.

	A
1	64
2	29
3	11
4	66
5	6
6	64.18182

	A
1	= $(5+3)*8$
2	= $5+3*8$
3	= $((5+3)*8+2)/6$
4	= $(5+3)*8+2$
5	= $((5+3)*8+2)/11$
6	= $(5+3)*8+2/11$

If you look at a formula you have entered, and think “I could never do that again”, switch to the formula view and print that part of the sheet. If you do this, it is worth making some extra printing choices:

		Mon	Tue	Wed	Total
North	45	51	62	=SUM(B4:D4)	
South	51	53	66	=SUM(B5:D5)	
East	49	56	61	=SUM(B6:D6)	
West	53	44	65	=SUM(B7:D7)	
Total	=SUM(B4:B8)	=SUM(C4:C8)	=SUM(D4:D8)	=SUM(B9:D9)	

This can be read, but it is not easy to work out which part of the sheet is being referred to. By turning on grid lines and row and column headings, it becomes much easier to see:

	A	B	C	D	E
1					
2		Mon	Tue	Wed	Total
3					
4	North	45	51	62	=SUM(B4:D4)
5	South	51	53	66	=SUM(B5:D5)
6	East	49	56	61	=SUM(B6:D6)
7	West	53	44	65	=SUM(B7:D7)
8					
9	Total	=SUM(B4:B8)	=SUM(C4:C8)	=SUM(D4:D8)	=SUM(B9:D9)

As you can see if the second example it is extremely simple to work out what ranges each formula is using to achieve its results. This is activated by using the Page Setup dialogue box, Sheet tab, and selecting both the Gridlines and Row and column heading.

