Week 3 Basic Excel Workshop

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Contents

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NOW

This formula can be entered into any cell and will be updated every time the sheet is calculated.

The formula is: **=NOW()**

This formula will return the current Date & Time e.g. **01/08/2023 10:15** and will update automatically as the workbook is edited.

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TODAY

This formula can be entered into any cell and will be updated every time the sheet is calculated.

The formula is: **=TODAY()**

This formula will return the current Date e.g. **01/08/2023** and will update automatically as the workbook is edited.

It can also be used in formulas to return a continually updating countdown (or countup) to a future (or past) date, such as:

	A	B	C	D
1	**Today**	25/08/2023		=TODAY()
2				
3	**Christmas 2023**	25/12/2023	**122**	=B3-TODAY()
4				
5	**Payment Due Date**	14/08/2023	**(11)**	=B5-TODAY()

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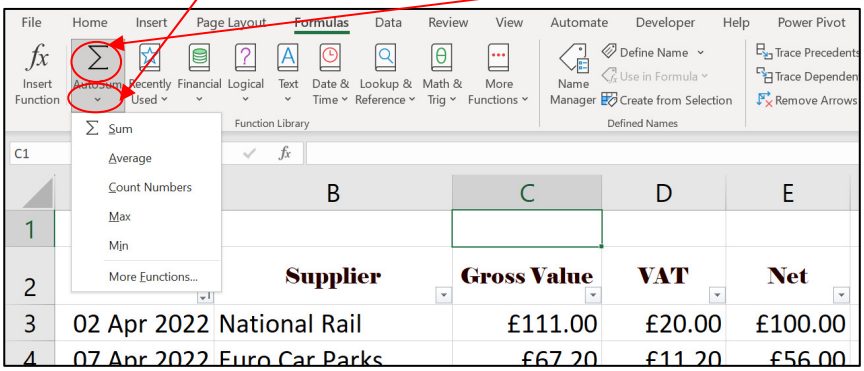
Sum

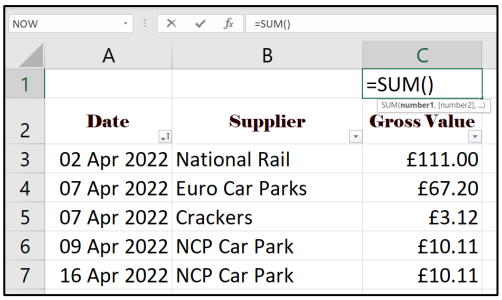
This formula would be used to add up a list of numbers and can be input manually, or using the specific 'Autosum' buttton. It is one of the most commonly use formula in Excel.

This example will input the formula using the 'Autosum' button, but can also be typed manually if preferred:

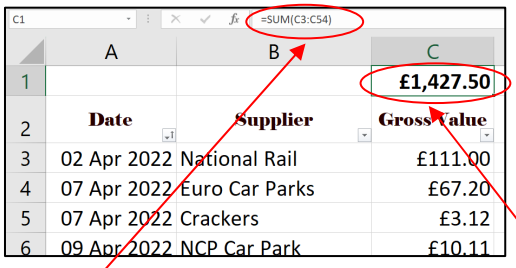
- Position the cursor in the cell where you want the 'sum' to appear.
- From the ribbon, select 'Formulas', 'Autosum' (top half of button):
  Note: *If you click the bottom half of this button you will get more options as below. If you click the top half of the button, you get the Sum formula*



- The formula will begin to be populated within the cell, and as the cursor will be flashing this indicates that more information is required:



- Select the range of cells to be included in the formula
  Note: *The Sum formula will exclude any cells within the range that include text*
- Press 'Enter'



- The sum of the column will appear within this cell, and the formula is visible within the formula bar.

This formula will continually update as the values within the range are edited.

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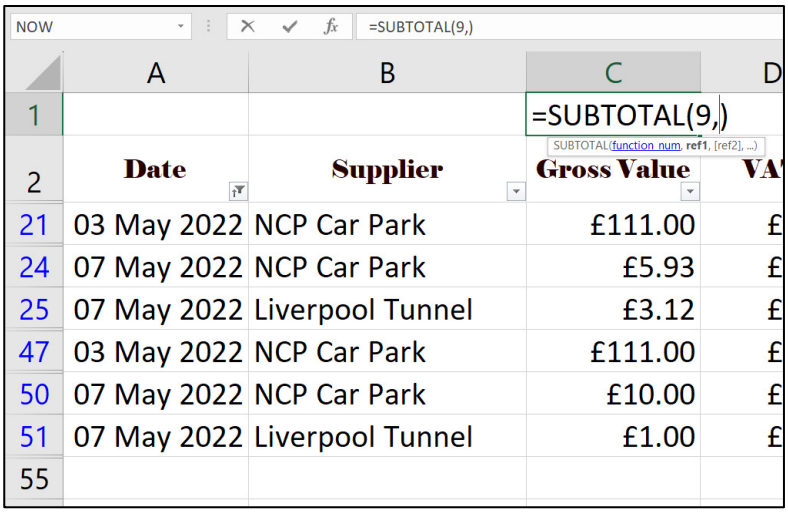
Subtotal

This formula is similar to the 'Sum' formula above, but will recalculate to show the sum of the visible items when a 'Filter' is used.

This formula ca be entered manually, or using the Wizard, but the simplest method is to apply a filter to any column, ensuring the text of the row numbers turns blue. Then when you apply the 'Sum' formula, Excel will automatically apply the 'Subtotal' formula.

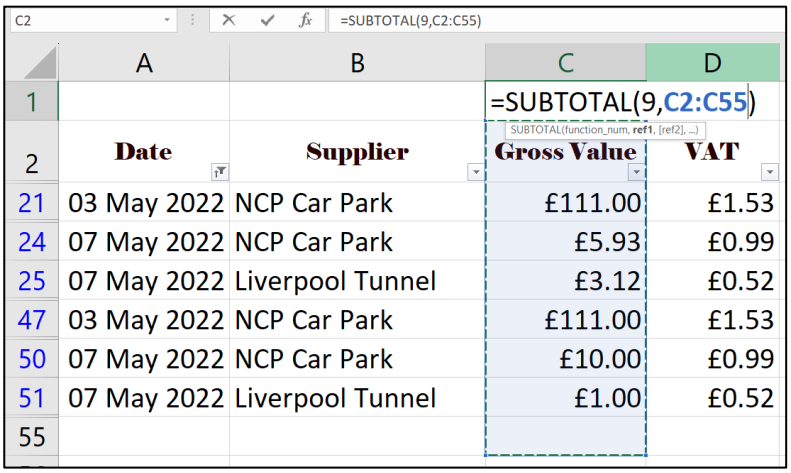
- Apply a filter to any column
- Position the cursor in the cell where you want the 'sum' to appear.
- From the ribbon, select 'Formulas', 'Autosum' (top half of button):



	A	B	C	D
1			=SUBTOTAL(9,)	
2	Date	Supplier	Gross Value	VA
21	03 May 2022	NCP Car Park	£111.00	£
24	07 May 2022	NCP Car Park	£5.93	£
25	07 May 2022	Liverpool Tunnel	£3.12	£
47	03 May 2022	NCP Car Park	£111.00	£
50	07 May 2022	NCP Car Park	£10.00	£
51	07 May 2022	Liverpool Tunnel	£1.00	£
55				

- The formula will begin to be populated within the cell, and as the cursor will be flashing this indicates that more information is required.
- Select the range of cells to be included in the formula…….ensuring that ALL cells within the column are included, even those that have been hidden by the filter.

  Note: *The Subtotal formula will exclude any cells within the range that include text*



	A	B	C	D
1			=SUBTOTAL(9,C2:C55)	
2	Date	Supplier	Gross Value	VAT
21	03 May 2022	NCP Car Park	£111.00	£1.53
24	07 May 2022	NCP Car Park	£5.93	£0.99
25	07 May 2022	Liverpool Tunnel	£3.12	£0.52
47	03 May 2022	NCP Car Park	£111.00	£1.53
50	07 May 2022	NCP Car Park	£10.00	£0.99
51	07 May 2022	Liverpool Tunnel	£1.00	£0.52
55				

- Press 'Enter'

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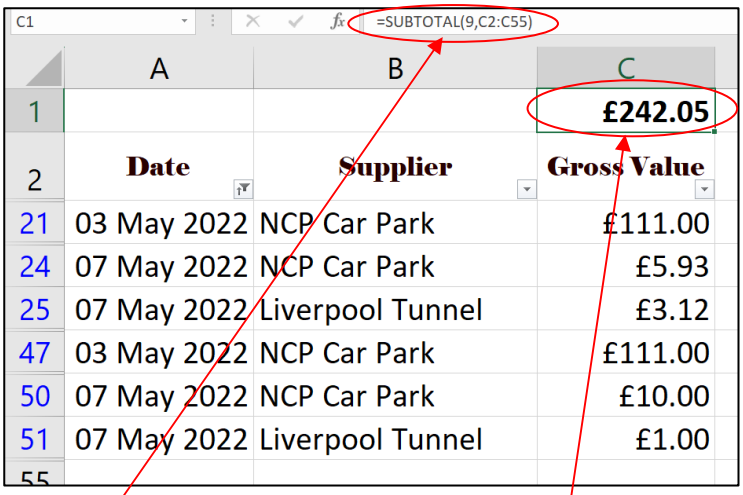


- The sum of the column will appear within this cell, and the formula is visible within the formula bar.

This formula will continually update as the values within the range are edited.

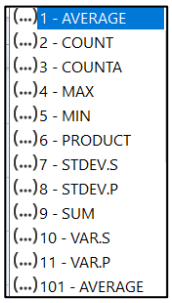
The formula works as follows:

=SUBTOTAL(9,C2:C55)

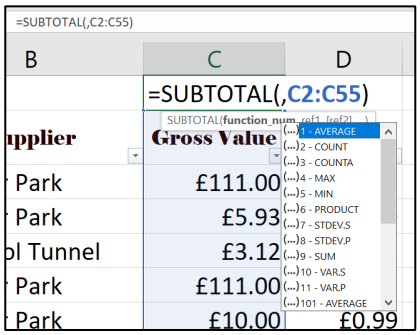
SUBTOTAL- This is the function Name and it will only include 'visible' cells in any calculation

9 - This is the function number and represents 'Sum'.

Other function numbers are:



This list can be found by entering the formula as above, then deleting the function num: '9':



C2:C55 - This is the range of cells to include in the calculation.

This formula works great with any filtered ranges, and also returns the result of Sum, when filters are not applied.

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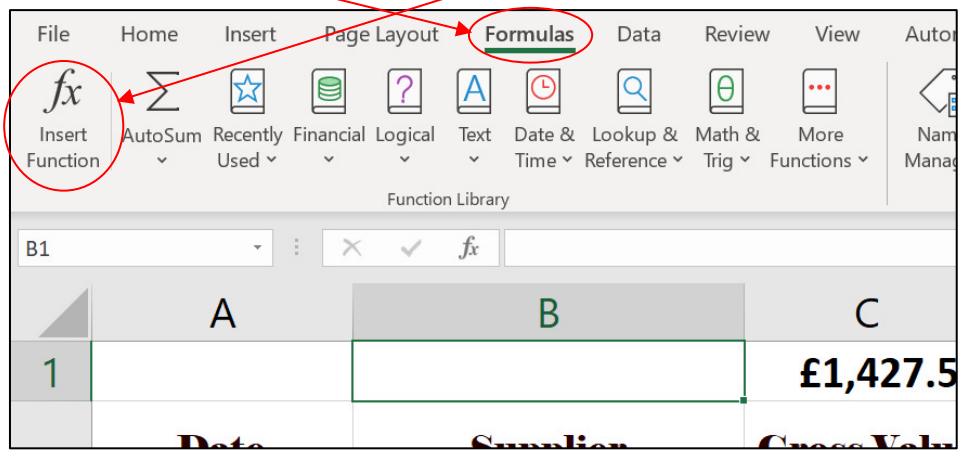
Count

Overview

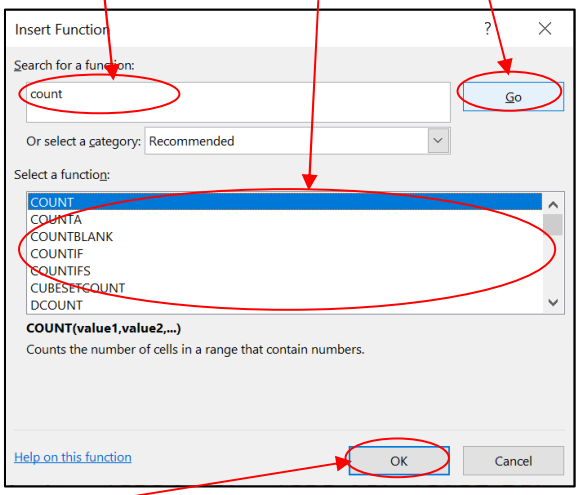
This formula allows you to 'Count' the number of items in a range, but this will only count cells that contain Numbers.

This example will input the formula using the wizard:

- Position the cursor in the cell where you want the 'Count' formula to appear.
- From the 'Formulas' ribbon, select 'Insert Function'



- Enter 'Count' into this box, and press 'Go'.
- 'Count' will appear in this box, along with any other formulas that include the search term



- Select the required formula and click OK, then the Wizard will appear:

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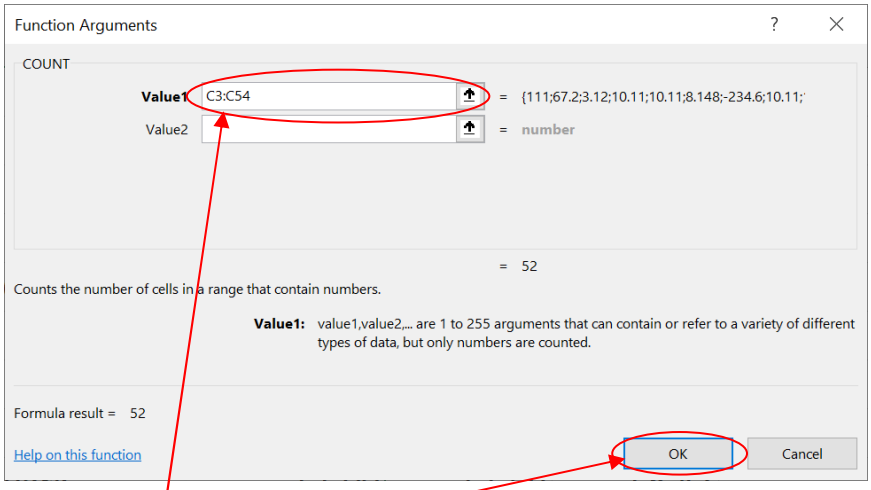
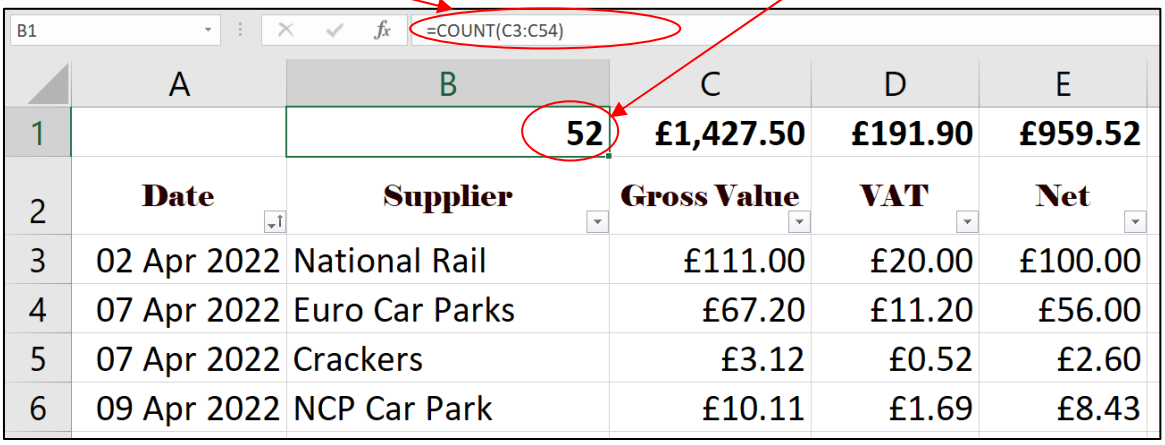


- Enter the 'Range' to be counted, remembering to select a range that contains numbers. ***(you can also include up to 255 other boxes by using the Value 2, Value 3…. boxes too)***
- Click OK

The formula will appear as follows, and correctly calculates that there are 52 rows (in column C) that contain a numeric value:



	A	B	C	D	E
1		52	£1,427.50	£191.90	£959.52
2	Date	Supplier	Gross Value	VAT	Net
3	02 Apr 2022	National Rail	£111.00	£20.00	£100.00
4	07 Apr 2022	Euro Car Parks	£67.20	£11.20	£56.00
5	07 Apr 2022	Crackers	£3.12	£0.52	£2.60
6	09 Apr 2022	NCP Car Park	£10.11	£1.69	£8.43

Note: If this formula was applied to Column B, the result would be Zero, as none of the cells in that column contain Numbers.

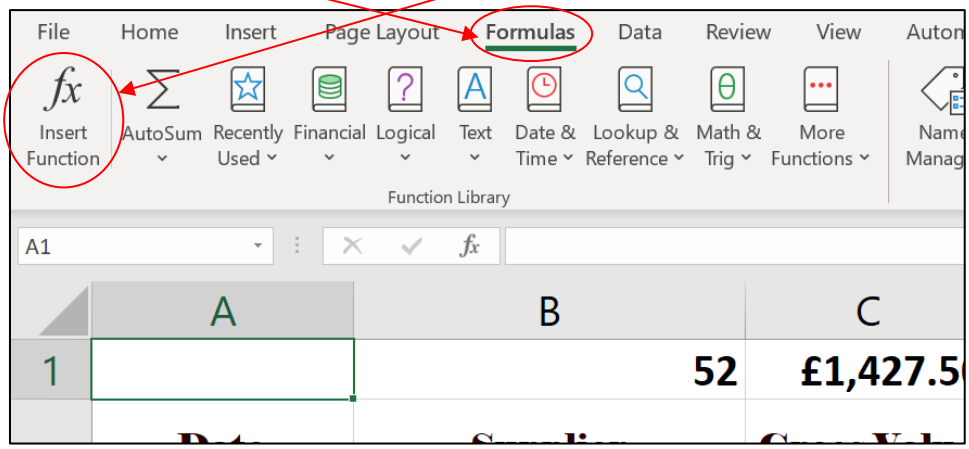
Counta

Overview

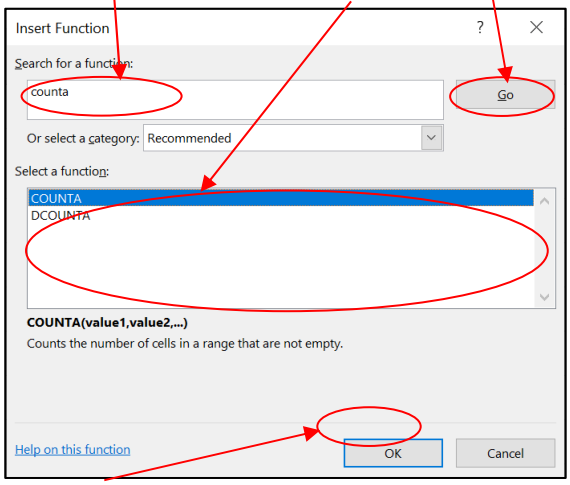
This formula allows you to 'Count' the number of items in a range that are not empty. This will include both numeric and non numeric values.

This example will input the formula using the wizard:

- Position the cursor in the cell where you want the 'Count' formula to appear.
- From the 'Formulas' ribbon, select 'Insert Function'



- Enter 'Counta' into this box, and press 'Go'.
- 'Counta' will appear in this box, along with any other formulas that include the search term



- Select the required formula and click OK, then the Wizard will appear:

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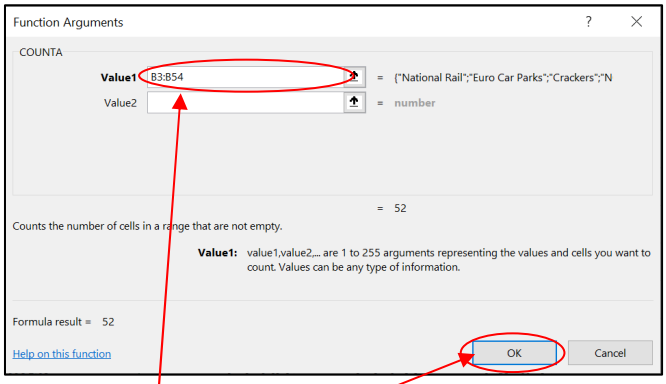
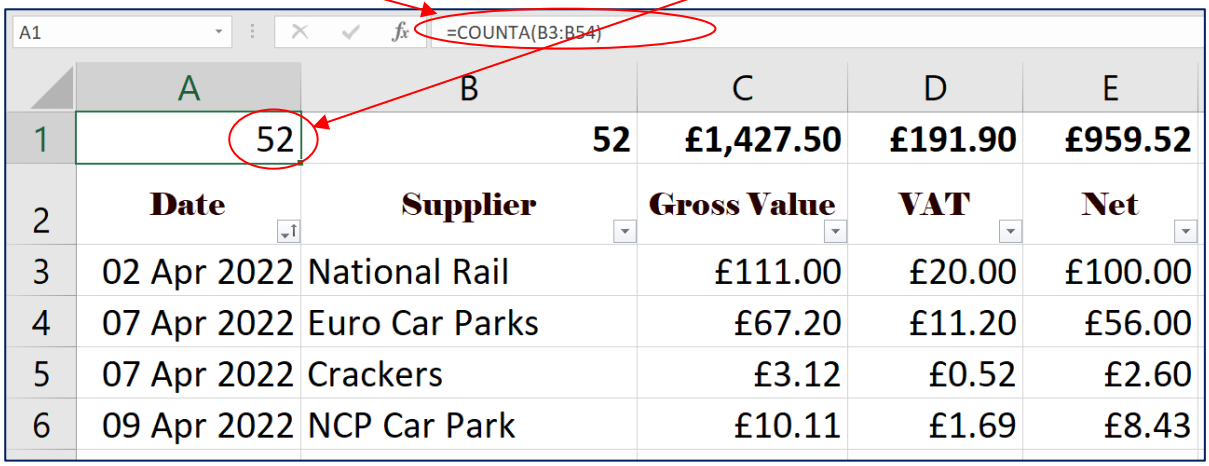


- Enter the 'Range' to be counted. ***(you can also include up to 255 other boxes by using the Value 2, Value 3…. boxes too)***
- Click OK

The formula will appear as follows, and correctly calculates that there are 52 rows (in column B) that are not empty:



	A	B	C	D	E
1	52	**52**	**£1,427.50**	**£191.90**	**£959.52**
2	**Date**	**Supplier**	**Gross Value**	**VAT**	**Net**
3	02 Apr 2022	National Rail	£111.00	£20.00	£100.00
4	07 Apr 2022	Euro Car Parks	£67.20	£11.20	£56.00
5	07 Apr 2022	Crackers	£3.12	£0.52	£2.60
6	09 Apr 2022	NCP Car Park	£10.11	£1.69	£8.43

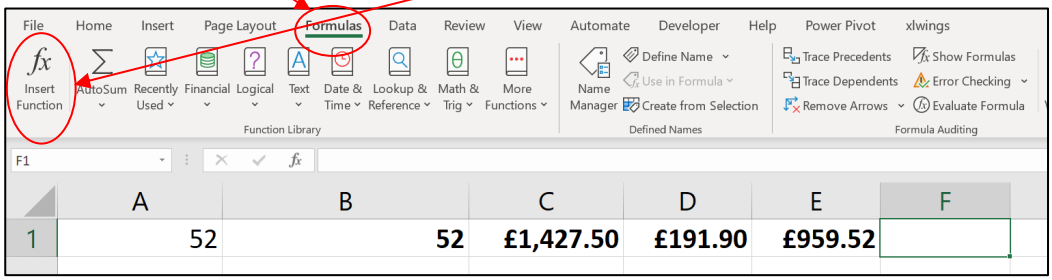
Countif

Overview

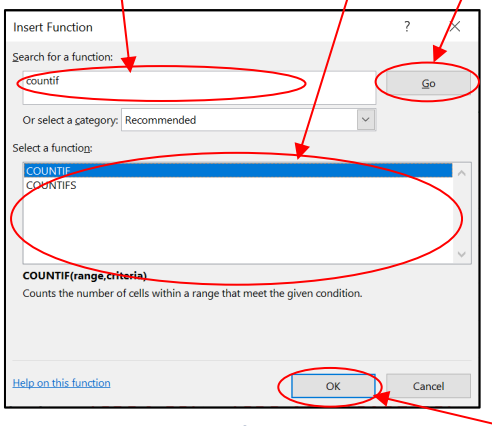
This formula allows you to 'Count' the number of items that meet a specific criteria.

This example will input the formula using the wizard:

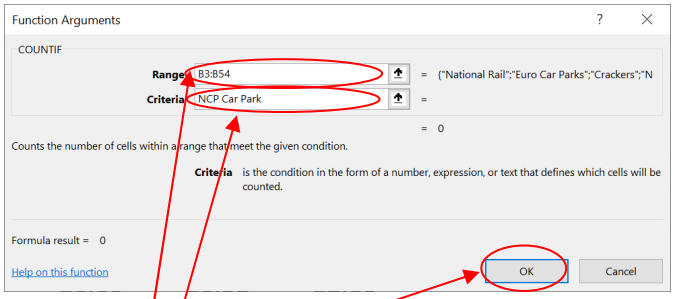
- Position the cursor in the cell where you want the 'Countif' formula to appear.
- From the 'Formulas' ribbon, select 'Insert Function'



- Enter 'Countif' into this box, and press 'Go'.
- 'Countif' will appear in this box, along with any other formulas that include the search term



- Select the required formula and click OK, then the Wizard will appear:



- Enter the 'Range' where data is to be found
- Enter the criteria to be met (in this example the criteria is: if Column B contains 'NCP Car Park')
- Click OK

NOTE: This formula is NOT case sensitive, it literally matches the characters regardless of capitalisation.

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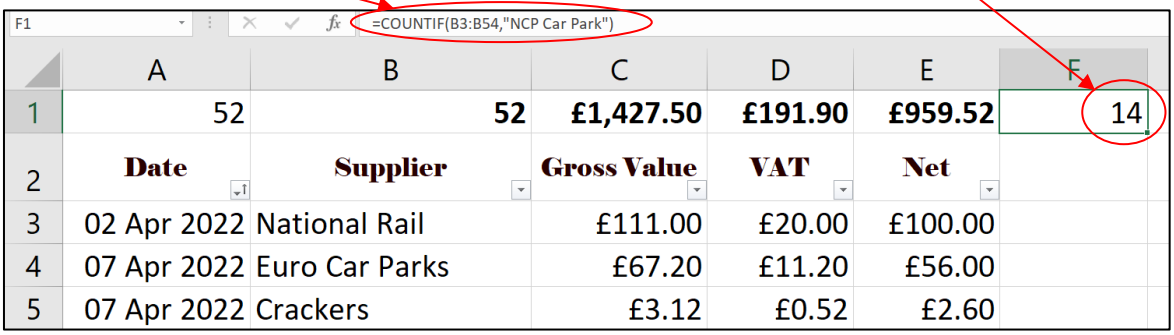
The formula will appear as follows, and correctly calculates that there are 14 rows in column B that equal 'NCP Car Park':



	A	B	C	D	E	F
1	52	**52**	**£1,427.50**	**£191.90**	**£959.52**	14
2	**Date**	**Supplier**	**Gross Value**	**VAT**	**Net**	
3	02 Apr 2022	National Rail	£111.00	£20.00	£100.00	
4	07 Apr 2022	Euro Car Parks	£67.20	£11.20	£56.00	
5	07 Apr 2022	Crackers	£3.12	£0.52	£2.60	

Note: As the criteria is 'text' it has been wrapped in speech marks ("") by the wizard. The wizard has also included a comma (,) to separate each argument in the formula.

Other variations of this formula include:

Matching part of the cell text

If the Supplier Name was variable and included a locations, as follows:

	A	B	
1	52	**52**	**£1**
2	**Date**	**Supplier**	**Gros**
3	02 Apr 2022	National Rail	
4	07 Apr 2022	Euro Car Parks	
5	07 Apr 2022	Crackers	
6	09 Apr 2022	NCP Car Park Liverpool	
7	16 Apr 2022	Manchester NCP Car Park	
8	21 Apr 2022	Staples	

The above formula would not work, as it matches the entire cell contents, and the cells highlighted yellow above, would NOT match the criteria.

We would need to amend the formula to be:

```
=COUNTIF(B3:B54,"*NCP Car Park*")
```

Here, the asterisks represent a wildcard and therefore can be 'any character'. They transform this formula to look for any cell that ***'contain'*** the words 'NCP Car Park'.

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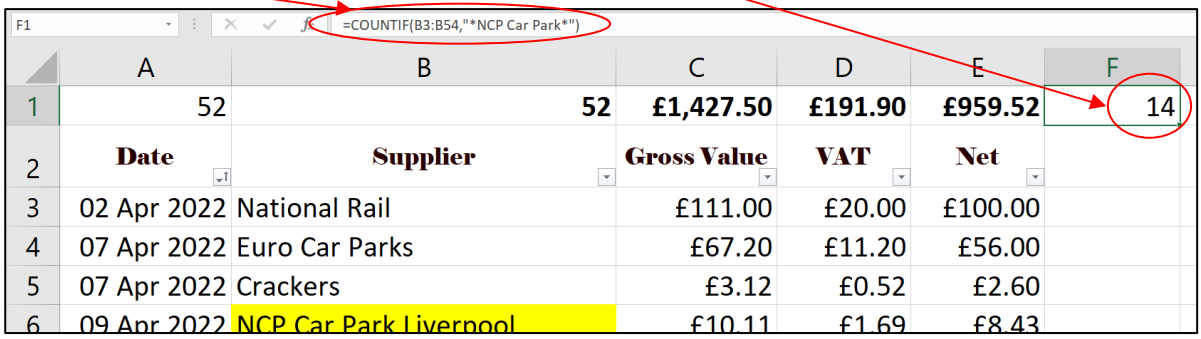
This formula still returns the same answer as above, 14 occurrences:



	A	B	C	D	E	F
1	52	**52**	**£1,427.50**	**£191.90**	**£959.52**	14
2	**Date**	**Supplier**	**Gross Value**	**VAT**	**Net**	
3	02 Apr 2022	National Rail	£111.00	£20.00	£100.00	
4	07 Apr 2022	Euro Car Parks	£67.20	£11.20	£56.00	
5	07 Apr 2022	Crackers	£3.12	£0.52	£2.60	
6	09 Apr 2022	NCP Car Park Liverpool	£10.11	£1.69	£8.43	

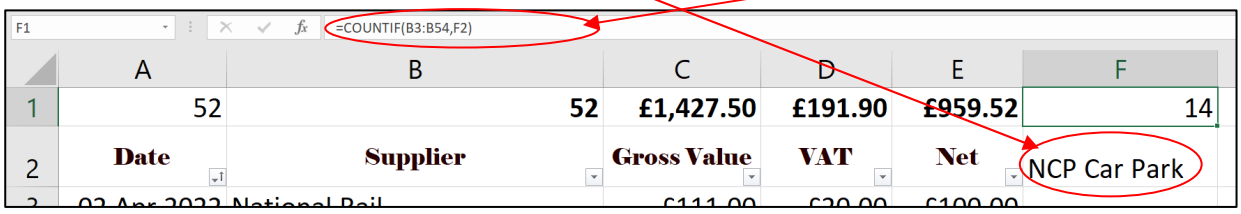
Linking Criteria to a cell value

In the examples above, the formula has physically included the Supplier Name, meaning that to apply this formula to a different Supplier, we would need to edit the formula manually.

Of course this increases the risk of making a mistake, and also requires knowledge of the formula to be abe to do this.

A safer (and quicker) method woud be to manually enter the relevant Supplier Name into a cell, and link the fomula to that cell. This way, if the Supplier Name needs to change, we can simply edit the Supplier Name in the cell and never need to touch the formula.

Here I have entered the Supplier Name into cell F2, and amended the formula as follows:



	A	B	C	D	E	F
1	52	**52**	**£1,427.50**	**£191.90**	**£959.52**	14
2	**Date**	**Supplier**	**Gross Value**	**VAT**	**Net**	

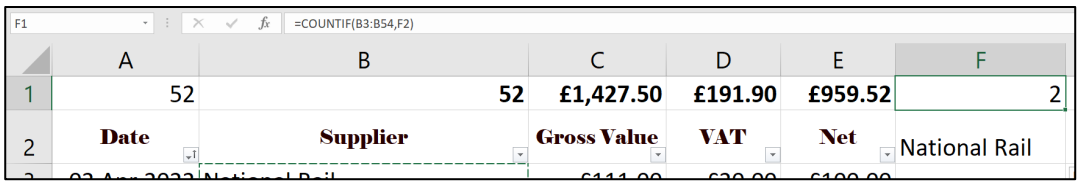
The formula is:

=COUNTIF(B3:B54,F2)

Note: As F2 represents a cell reference, it does not need to be wrapped in speech amrks ("") like text does…….the Wizard takes care of this too…….so one less thing for you to remember.

Where 'F2' represents the cell containing the Supplier Name.

In future I can literally edit the Supplier Name on cell F2 and the formua will return the no. of rows for that Supplier…….without ever needing to amend the formula:



	A	B	C	D	E	F
1	52	**52**	**£1,427.50**	**£191.90**	**£959.52**	2
2	**Date**	**Supplier**	**Gross Value**	**VAT**	**Net**	

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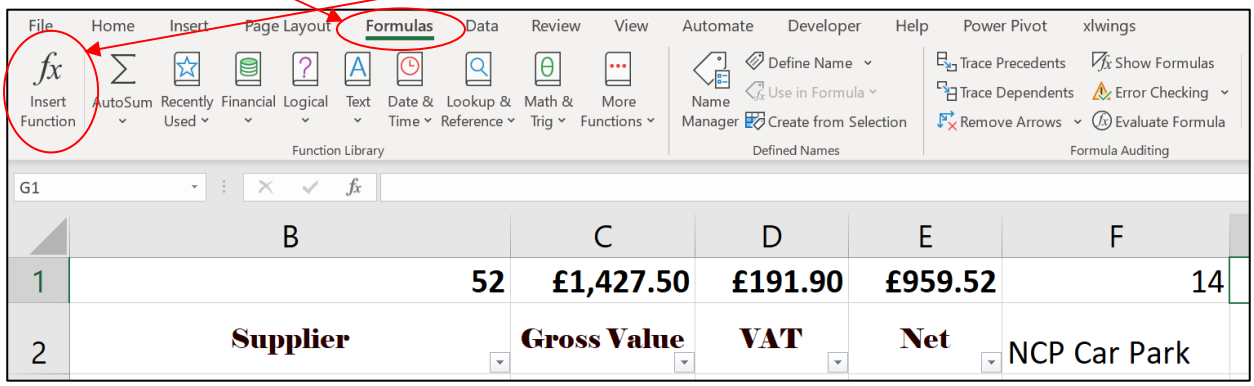
Sumif

Overview

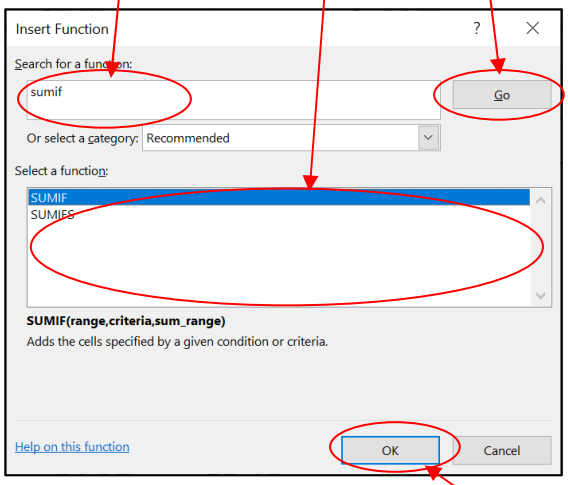
This formula would be used to add up a list of numbers, when the given criteria has been met.

This example will input the formula using the wizard:

- Position the cursor in the cell where you want the 'Sumif' formula to appear.
- From the 'Formulas' ribbon select 'Insert Function'



- Enter 'Sumif' into this box, and press 'Go'.
- 'Sumif' will appear in this box, along with any other formulas that include the search term



- Select the required formula and click OK, then the Wizard will appear:

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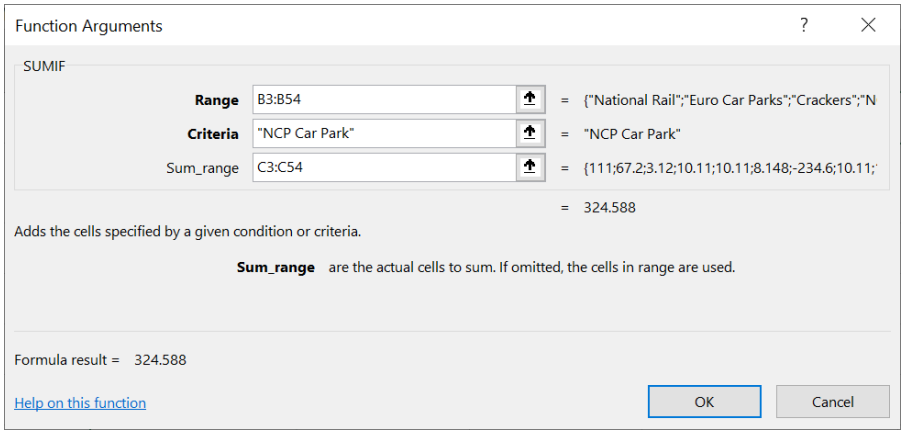


- Complete the boxes as follows:

  Range - This is the Range of cells that contain the Criteria

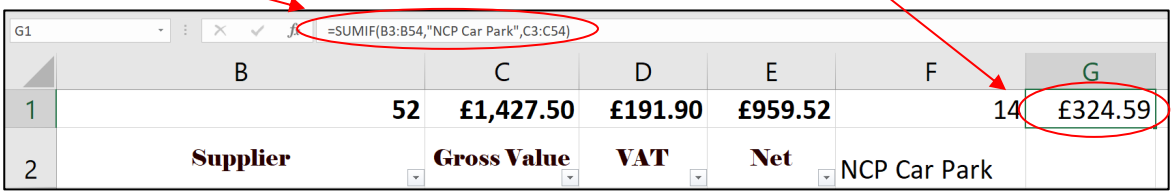
  Criteria - This is the specified Criteria to be found

  Sum Range- This is the Range of cells to 'Sum' the values from, when the criteria matches

As the boxes are completed, the formula will also be populated within the cell. Click 'OK' when complete.

NOTE: Please be aware of Freezing Cell References (with Dollar symbol) if the formula needs to be copied into multiple cells.

The formula will appear as follows, and correctly calculates that the sum of column C, where column B equals 'NCP Car Park' is £324.59 :



This formula can also be amended to match part of the cell (as opposed to the entire cell contents), and also linking to a cell value, in the same way as the Countif.

=SUMIF(B3:B54,"*NCP Car Park*",C3:C54) - match part of the cell

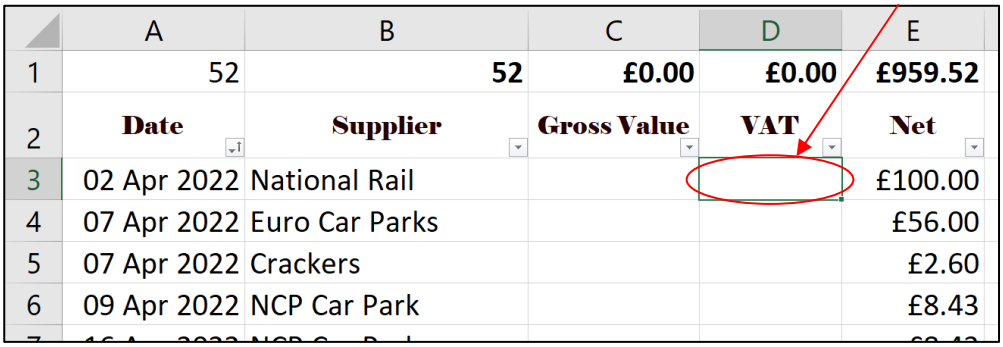
=SUMIF(B3:B54,F2,C3:C54) - Where 'F2' contains 'NCP Car Park'

Multiply (VAT)

Multiplication formulas can be instrumental when analyzing data. For instance, if you're calculating total sales (quantity sold multiplied by price per unit), a multiplication formula would be beneficial.

In this example, I will use multiplication to calculate VAT, so would be taking the Net value and multiplying by 20% (UK VAT Rate).

- Position the cursor in the cell where you want the 'VAT' value to appear (cell D3).



	A	B	C	D	E
1	52	**52**	**£0.00**	**£0.00**	**£959.52**
2	**Date**	**Supplier**	**Gross Value**	**VAT**	**Net**
3	02 Apr 2022	National Rail			£100.00
4	07 Apr 2022	Euro Car Parks			£56.00
5	07 Apr 2022	Crackers			£2.60
6	09 Apr 2022	NCP Car Park			£8.43

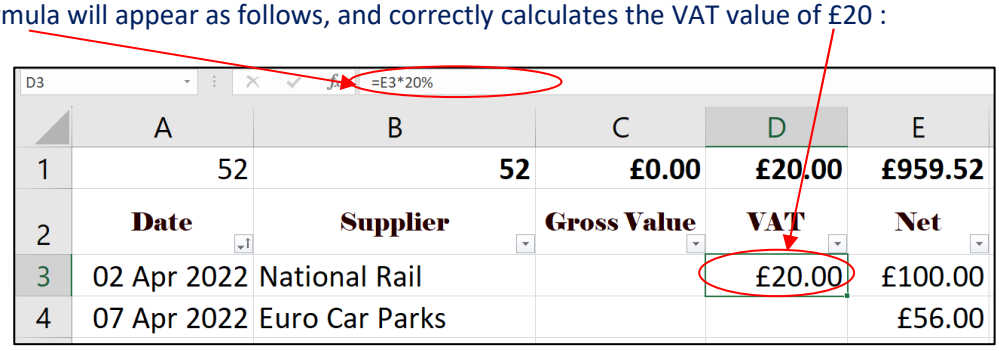
- The formula to use would be: =E3*20% ***(then press enter)***

  E3 - Represents the cell containing the Net value

  20% - Represents the VAT Rate

NOTE: The ability to include the % symbol in a formula is relatively new, so you may find historic spreadsheets may still contain the Vat rate as a decimal (=E3*0.20), or as a calculation of the decimal (=E3*(20/100)), ……all methods are perfectly functional

The formula will appear as follows, and correctly calculates the VAT value of £20 :



D3 =E3*20%

	A	B	C	D	E
1	52	**52**	**£0.00**	**£20.00**	**£959.52**
2	**Date**	**Supplier**	**Gross Value**	**VAT**	**Net**
3	02 Apr 2022	National Rail		£20.00	£100.00
4	07 Apr 2022	Euro Car Parks			£56.00

This formula will automatically update if the Net value in cell E3 is changed.

This formula can be copied down into the rows below, where the row number will automatically update for each relevant row.

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Divide (VAT)

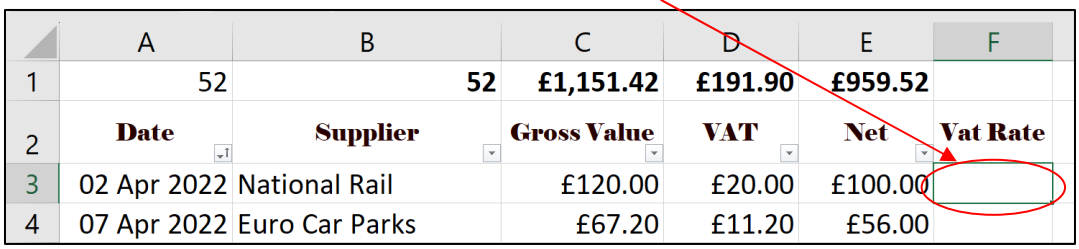
Division is a fundamental operation when determining averages, ratios or percentages.

In this example, I will use Division to calculate the applied VAT rate, so would be taking the VAT Value and dividing it by the Net value.

Displaying the result as a % would also be dependant on the cells being formatted appropriately too.

The method for this formula is the same as the mathematical calculation, i.e. Divide one by the other to get the %.

- Position the cursor in the cell where you want the 'Percentage' to appear (cell F3).



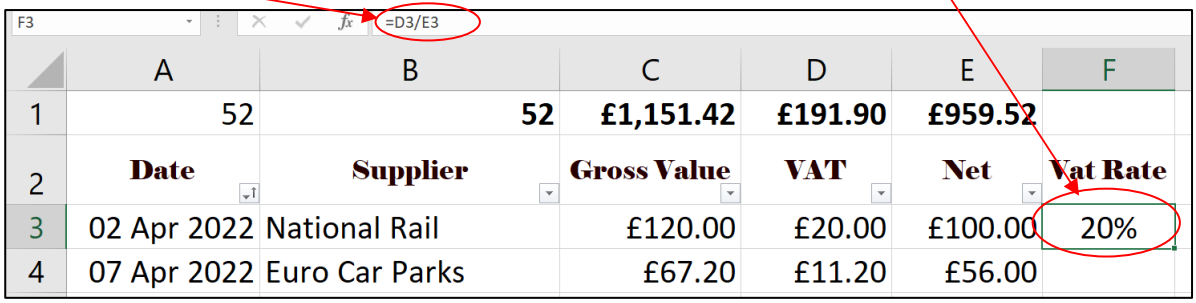
	A	B	C	D	E	F
1	52	**52**	**£1,151.42**	**£191.90**	**£959.52**	
2	**Date**	**Supplier**	**Gross Value**	**VAT**	**Net**	**Vat Rate**
3	02 Apr 2022	National Rail	£120.00	£20.00	£100.00	
4	07 Apr 2022	Euro Car Parks	£67.20	£11.20	£56.00	

- The formula to use would be: =D3/E3 ***(then press enter)***

  D3 - Represents the cell containing the VAT Value

  E3 - Represents cell containing the Net Value

The formula will appear as follows, and correctly calculates the VAT value of 20% :



F3 =D3/E3

	A	B	C	D	E	F
1	52	**52**	**£1,151.42**	**£191.90**	**£959.52**	
2	**Date**	**Supplier**	**Gross Value**	**VAT**	**Net**	**Vat Rate**
3	02 Apr 2022	National Rail	£120.00	£20.00	£100.00	20%
4	07 Apr 2022	Euro Car Parks	£67.20	£11.20	£56.00	

*****Format the cell to appear as 'Percentage' and not a decimal***

This formula will automatically update if the Net or VAT values in cells D3 or E3 change.

This formula can be copied down into the rows below, where the row number will automatically update for each relevant row.

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Dates (General)

Dates are extremely useful in Excel, they can be used within formulas, filters and data can also be grouped by them within Pivot Tables / Power Query & Timelines/

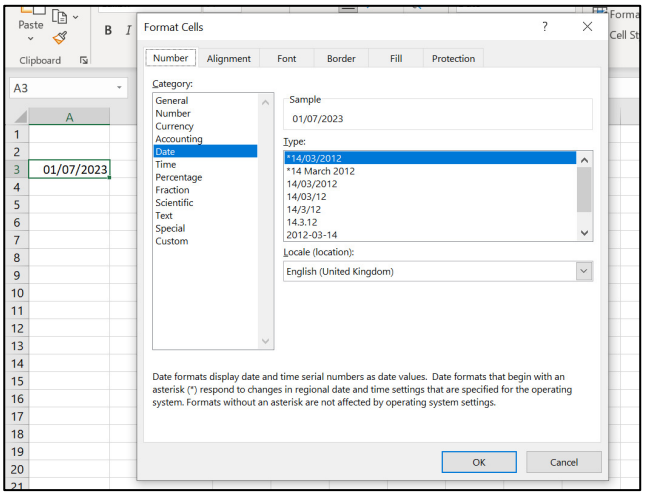
Entering Dates

To get the most from dates in a spreadsheet, they MUST be entered in a format recognised by Excel as a date. This usually means entering the date in the format of MM/DD/YYYY or DD/MM/YYYY (depending on regional settings), using the '/' (or a '-' as the separator).

Excel will automatically format dates aligned to the right of the cell.

Formatting Dates

- Select the date or range of dates you want to format.
- Right-click mouse and select 'Format Cells' (or use the Home ribbon's Number Format drop-down).
- In the Format Cells dialog box, go to the 'Number' tab and select 'Date'.
- Choose from various pre-defined formats or create a custom format:



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Using Dates in Formulas:

Excel represents dates as serial numbers. For example, the date "1/1/1900" is serial number 1. The use if serial numbers enables mathematical calculations to be performed using dates.

Examples:

Date Difference: =DATEDIF(A1, A2, "d") gives the number of days between the dates in A1 and A2.
Adding Days: =A1 + 5 adds 5 days to the date in A1.
Current Date: =TODAY() returns the current date.
Extract Year, Month, Day: You can use the YEAR(), MONTH(), and DAY() functions respectively to extract these components from a date.

	A	B	C	D	E	F	G	H
1	**01/01/2023**		**Date Difference**	**Adding Days**	**Current Date**	**Extract Year**	**Extract Month**	**Extract Day**
2	**01/07/2023**		181	06/01/2023	25/08/2023	2023	7	1
3			**=DATEDIF(A1,A2,"d")**	**=A1+5**	**=TODAY()**	**=YEAR(A2)**	**=MONTH(A2)**	**=DAY(A2)**

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EOMONTH

The ‘EOMONTH’ formula will return the last day of the month, a specified number of months before or after a given date.
‘EOMONTH’ stands for ‘End Of MONTH.’

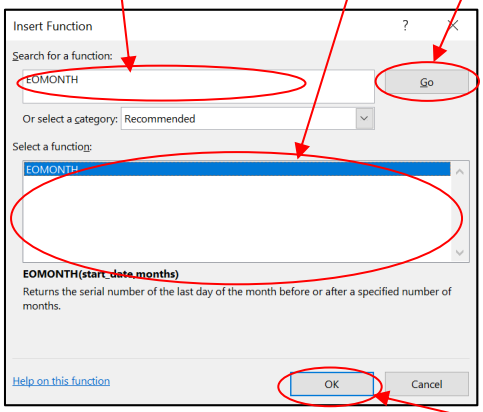
In this example, there is a list of Invoice dates, and we can use this formula to work out the payment dates for each of them, if payment is made at the end of the Month:

	A	B
1		
2	**Invoice Date**	**Payment Date at end of Month**
3	27/01/2023	
4	05/02/2023	
5	10/03/2023	
6	23/04/2023	
7	01/07/2023	
8	31/07/2023	
9	09/08/2023	

This example will input the formula using the wizard:

- Position the cursor in the cell where you want the ‘EOMONTH’ formula to appear.
- From the ‘Formulas’ ribbon, select ‘Insert Function’

- Enter ‘EOMONTH’ into this box, and press ‘Go’.
- ‘EOMONTH’ will appear in this box, along with any other formulas that include the search term



- Select the required formula and click OK, then the Wizard will appear:

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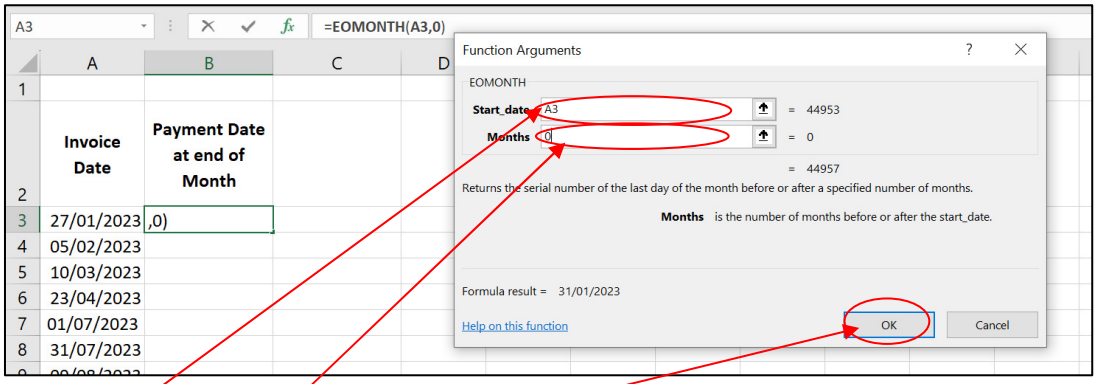
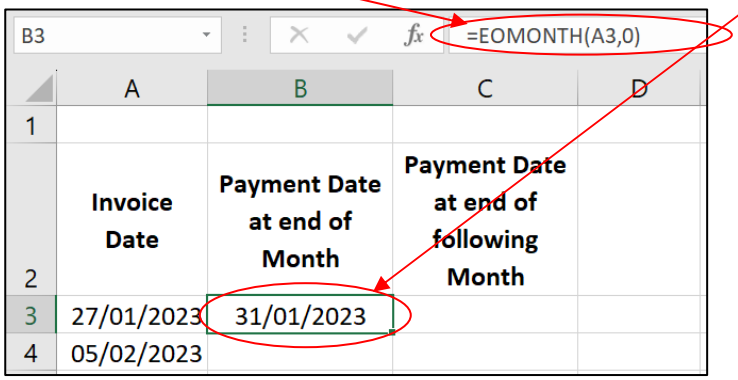


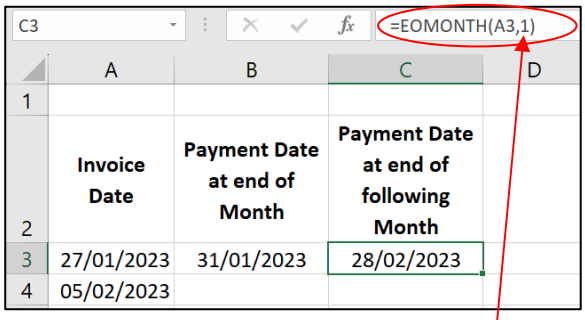
- Enter the 'Start Date' where the Invoice Date can be found (cell A3)
- Enter the number of months before (negative value) or after (positive value) the start date.
  NOTE: In this instance I wanted the date at the end of the current Month, so I entered 0 Months
- Click OK

The formula will appear as follows, and correctly calculates that the date at the end of the Month (from start date) is 31st Jan 2023 :



This formula can be copied down into the rows below, where the row number will automatically update for each relevant row.

Given the scenario that payment would be made at the end of the Month, 1 Month after the Invoice Date, then this formula would be used:



The only difference to the formula is the 1 at the end, representing 1 month after the Start Date.

TOP TIP: There isn't a formula to calculate a date at the beginning of a Month, so instead I would calculate the EOMONTH date and add 1 day to it……..giving the date on the 1st of the following Month: =EOMONTH(A3,1)+1

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EDATE

The ‘EDATE’ formula will return a date a specified number of months before or after a given date.

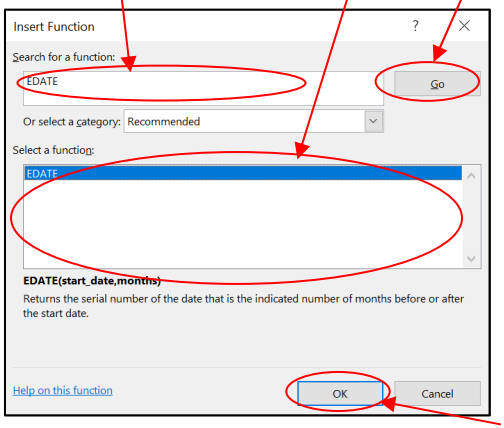
In this example, if we had a dentist appointment and needed to make another appointment 6 or 9 Months later, this formula would help us to work out what dates they should be:

	A	B	C
1		**EDATE**	
2	**Dental Appmt**	**6 Month check up**	**9 Month check up**
3	10/07/2023		

This example will input the formula using the wizard:

- Position the cursor in the cell where you want the ‘EDATE’ formula to appear.
- From the ‘Formulas’ ribbon, select ‘Insert Function’

- Enter ‘EDATE’ into this box, and press ‘Go’.
- ‘EDATE’ will appear in this box, along with any other formulas that include the search term



- Select the required formula and click OK, then the Wizard will appear:

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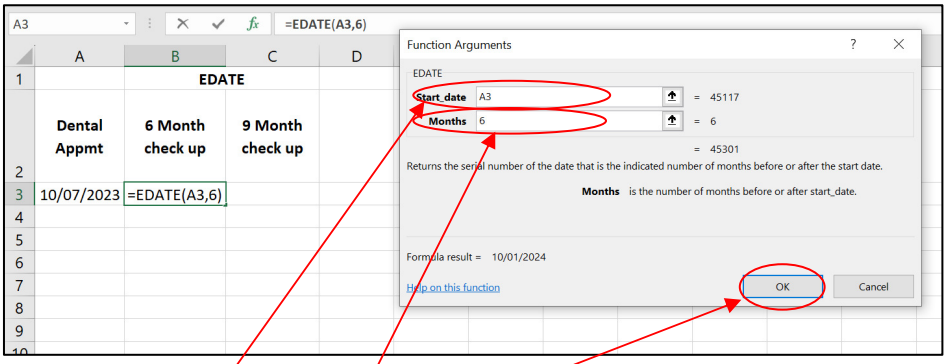
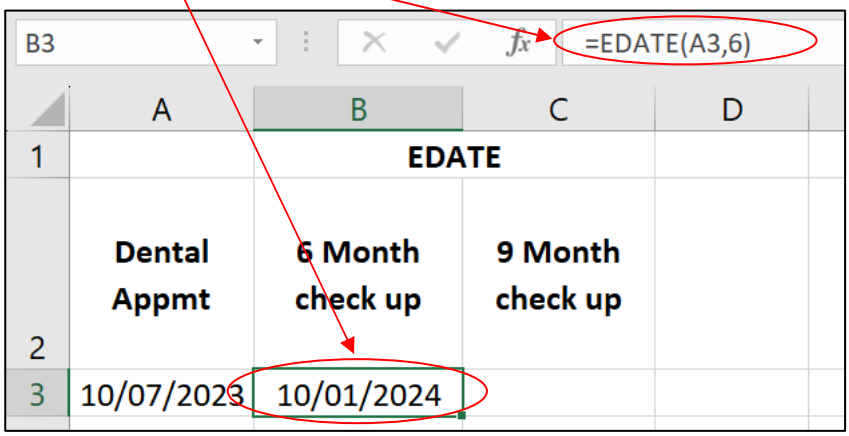
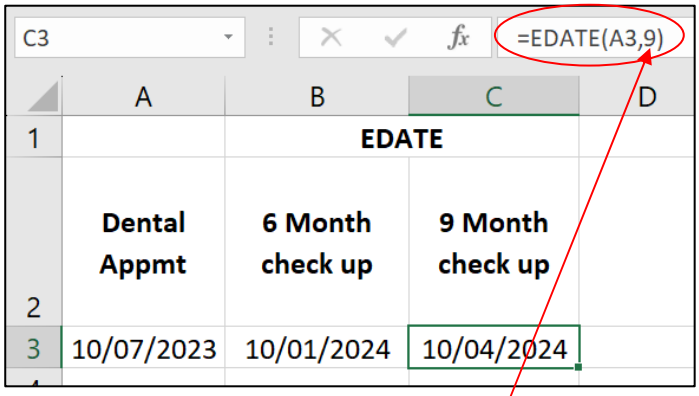


- Enter the 'Start Date' where the original appmt Date can be found (cell A3)
- Enter the number of months you want to subtract (negative value) or add (positive value) to the start date.
- Click OK

The formula will appear as follows, and correctly calculates that the date 6 Months later (from start date) as 10th Jan 2024 :



Given the scenario that a follow up appointment should be 9 Months later, then this formula would be used:



The only difference to the formula is the 9 at the end, representing 9 months after the Start Date.

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Evaluate Formula

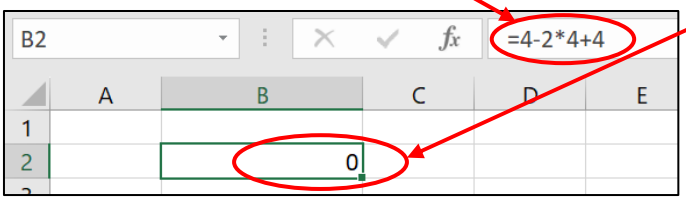
Overview

This is an excellent tool to help to follow how Excel is calculating a Formula. It can be used to step through a large or complex formula, so you can follow how the result is being generated.

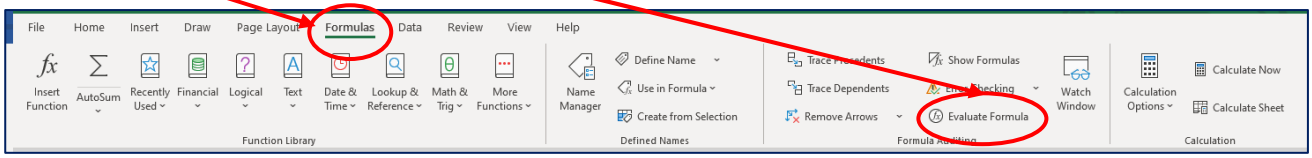
This is super helpful if a formula is not calculating a correct figure, as this can help you to identify any mistakes in the formula, or (potential) missing parenthesis.

Method

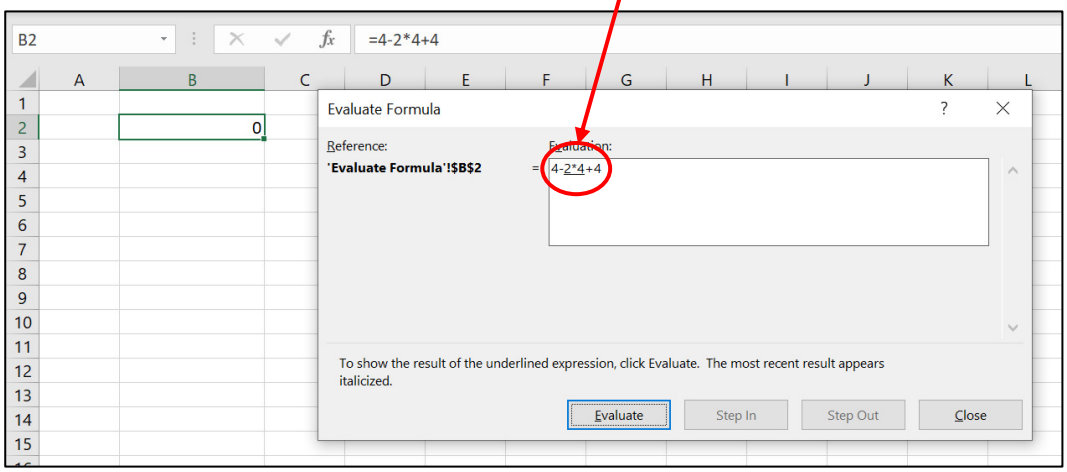
In this example our formula is: =4-2*4+4 and is returning a result of 0 ***(I am expecting an answer of 12)***:



Go to 'Formulas' ribbon and select 'Evaluate Formula'



This screen will appear which will contain the entire formula from the selected cell:



A tiny part of the formula will be underlined, and this represents the position where Excel will begin the calculation.

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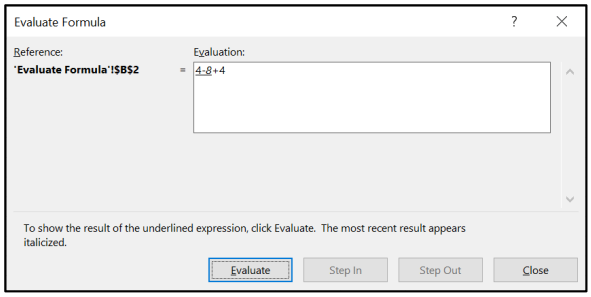
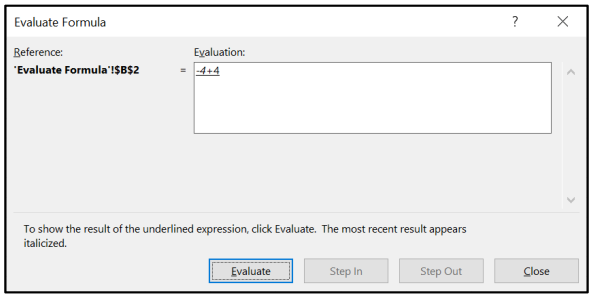
If you click ‘Evaluate’, this part of the formula will be replaced with the value of the underlined element (whether that represents a cell, range or a calculation). I would recommend identifying the value you expect it to return, before pressing ‘Evaluate’ as this is the best way to follow the logic.

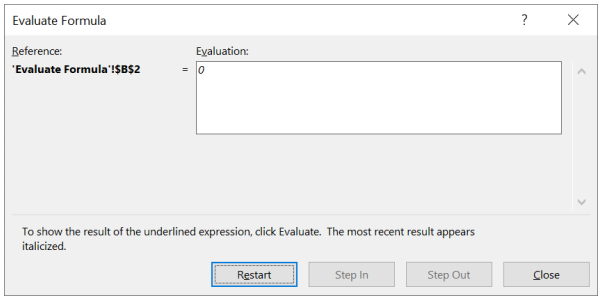
In this instance I can see it is calculating 2 * 4 = 8 as follows:



The evaluation then moves on and has underlined the next part of the formula that will be evaluated: 4 - 8 = (4):



Now it is taking (4) + 4 = 0 :



This helps me to understand how Excel is arriving at the answer, and I can see that I need to change the formula to provide the answer I need.

The formula I needed is: =((4-2)*4)+4

The use of brackets (or parenthesis) results in Excel working through the calculations in the brackets first and using the result of the brackets within the wider formula to get me the required result of 12.

Evaluate Formula will not provide any answers directly, but it helps you to see the logic that is being used within the formula. It is a great tool for understanding any spreadsheets and formulas that you did not build yourself.

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