

100 TOP TIPS

Boost your productivity with Excel:

Discover useful timesaving features

Master data entry shortcuts

Use powerful functions for processing data

Create pivot tables for insightful data analysis

Get clever with What-if and Goal-seek

Use graphs & charts to see the whole picture

Learn to debug formulas to find errors

Work with large spreadsheets

Whether you've been using Excel for years and never gone beyond the basics, or are just entering the world of spreadsheets, this book will quickly supercharge your Excel skills. Save hours by using the quick tips for data entry, and get more out of Excel by exploring the powerful tools on offer for data analysis – all **in easy steps!**

£5.99 UK / \$8.99 US



Categories:
Computers//Microsoft Office
Computers/Spreadsheets



Get smart

100 Top Tips – Microsoft Excel Supercharge your Excel skills

100 TOP TIPS

Microsoft Excel

- Supercharge your Excel skills
- Learn more from your data
- Boost your productivity



sean
mcmamus



Get smart



Sean McManus

100 TOP TIPS

Microsoft Excel

- Supercharge your Excel skills
- Learn more from your data
- Boost your productivity





In easy steps is an imprint of In Easy Steps Limited
16 Hamilton Terrace · Holly Walk · Leamington Spa
Warwickshire · United Kingdom · CV32 4LY
www.ineasysteps.com

Content Copyright © 2020 by Sean McManus. In Easy Steps Learning Approach, Series and Format © 2020 by In Easy Steps Limited. All rights reserved. No part of this book may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage or retrieval system, without prior written permission from the publisher.

Notice of Liability

Every effort has been made to ensure that this book contains accurate and current information. However, In Easy Steps Limited and the author shall not be liable for any loss or damage suffered by readers as a result of any information contained herein.

Trademarks

All trademarks are acknowledged as belonging to their respective companies.

In Easy Steps Limited supports The Forest Stewardship Council (FSC), the leading international forest certification organization. All our titles that are printed on Greenpeace approved FSC certified paper carry the FSC logo.



Printed and bound in the United Kingdom

ISBN 978-1-84078-879-2

Contents



1	Entering data with Auto Fill.....	5
2	Filling to match the neighboring column.....	6
3	Using Flash Fill	7
4	Adjusting column widths and row heights	8
5	Inserting multiple rows or columns.....	9
6	Managing large spreadsheets	10
7	Forcing valid data entry	11
8	Adding a drop-down menu.....	12
9	Creating custom validation	13
10	Removing duplicates.....	14
11	Highlighting duplicates.....	15
12	Using advanced paste options	16
13	Expanding the clipboard.....	17
14	Moving data.....	18
15	Entering formulas	19
16	Understanding formula symbols	20
17	Finding the highest/lowest value in a range.....	21
18	Ranking data items.....	22
19	Finding an item by its ranking using LARGE.....	23
20	Finding averages.....	24
21	Sorting data	25
22	Using filters	26
23	Using IF for cell contents	27
24	Combining IF functions.....	28
25	Totaling up values with SUM	29
26	Choosing values to sum with SUMIF.....	30
27	Using several sum criteria with SUMIFS	31
28	Using cumulative sums.....	32
29	Using SUMPRODUCT	33
30	Counting cells.....	34
31	Using more count criteria	35
32	Using wildcards	36
33	Grouping data	37
34	Calculating subtotals.....	38
35	Using subtotals.....	39
36	Copying visible data only	40
37	Naming ranges.....	41
38	Using the Name Manager.....	42
39	Using VLOOKUP.....	43
40	Using HLOOKUP.....	44
41	Finding data with MATCH.....	45
42	Using the INDEX function.....	46
43	Using the CHOOSE function	47
44	Rounding data values	48
45	Using advanced rounding functions.....	49
46	Calculating with dates	50
47	Making dates and breaking them down	51
48	Creating custom date formats	52
49	Using multiple lines of text in cells.....	53
50	Cleaning your text	54

51	Joining text from different cells.....	55
52	Getting the length of a piece of text	56
53	Searching in text.....	57
54	Extracting pieces of text.....	58
55	Splitting first and last names	59
56	Splitting text across columns	60
57	Replacing text in a cell.....	61
58	Counting the number of words in a cell	62
59	Counting occurrences of a word or phrase	63
60	Debugging: Tracing precedents.....	64
61	Debugging: Tracing dependents	65
62	Debugging: Evaluating formulas	66
63	Using the Watch Window	67
64	Adding simple conditional formatting.....	68
65	Adding advanced conditional formatting	69
66	Creating new rules for conditional formatting	70
67	Managing conditional formatting	71
68	Visualizing your data	72
69	Using Quick Analysis.....	73
70	Using What-If? scenarios	74
71	Using data tables.....	76
72	Modeling two formulas in a data table	78
73	Using two-dimensional data tables.....	79
74	Using Goal Seek	80
75	Preparing data for a pivot table	81
76	Creating a pivot table.....	82
77	Deeper analysis with pivot tables	84
78	Using averages and counts in pivot tables.....	85
79	Calculating percentages in pivot tables.....	86
80	Using slicers.....	87
81	Creating a pivot chart.....	88
82	Tracing totals back to data	89
83	Refreshing a pivot table.....	90
84	Inserting a table	91
85	Adding totals to a table.....	92
86	Formatting your table.....	93
87	Setting (and clearing) a Print Area	94
88	Printing to fit the page or across multiple pages	95
89	Adding a page header.....	96
90	Adding a watermark.....	97
91	Choosing cells to leave unlocked	98
92	Hiding formulas in cells	99
93	Password protecting ranges.....	100
94	Protecting the worksheet.....	101
95	Protecting the workbook	102
96	Protecting Excel files	103
97	Data entry shortcuts	104
98	Formatting shortcuts.....	106
99	Navigation shortcuts.....	107
100	Selection shortcuts.....	108

Entering data with Auto Fill

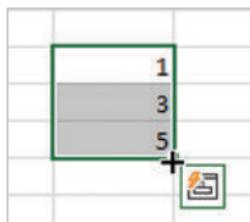


If you're typing in data that has a pattern to it, Excel can complete the pattern for you. You can use this for number sequences, times, and dates.

1 Enter the start of the sequence into two cells. If it's a number sequence, you'll need to enter at least two numbers. For times and dates, Excel can use just one. For alternate months (January, March, etc.), you'd enter the first two to show the pattern.

2 Highlight the cells containing your data.

3 Click the Fill handle. It's a tiny dot in the bottom right of the selected area. Your cursor becomes a small black cross when you hover over it.



4 Drag the mouse to cover the area you want to fill. In the example shown here, you'd drag down. As you drag, you'll see the value that's being added shown next to your cursor.

5 Click the Auto Fill Options menu that appears beside your cursor to find options for the fill, including Copy, which fills each cell with the data you've selected. You can also fill weekdays, days, months, or years from dates. Try putting 31-Jan in the first box, then autofilling months to get the last day of each month.

6 Even quicker: If you just want a sequence of numbers going up by 1, enter the first number, select the cell and hold down Ctrl while you drag the Fill handle.

2

Filling to match the neighboring column

There's an even quicker way to autofill a range so it matches the size of the neighboring columns.

- 1 Enter the first two data items in the sequence you want to use. For example, if you want to add years starting at 2025 and want to increase by 1 each time, enter 2025 and 2026 into two cells.
- 2 Highlight both cells containing the data items you just entered.

Period	US sales	UK sales
2025	65	11
2026	72	22
	46	232
	98	12
	23	54
		45
		54

- 3 Double-click the Fill handle in the bottom right of the selected area.

- 4 Your data column is automatically filled to match the size of the neighboring columns. In my example, the autofill extends to where the data ends in the third column, even though the nearest column is shorter.

Period	US sales	UK sales
2025	65	11
2026	72	22
2027	46	232
2028	98	12
2029	23	54
2030		45
2031		54

Using Flash Fill

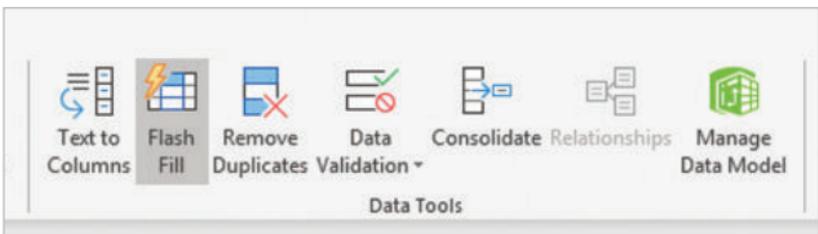


Introduced in Excel 2013, Flash Fill recognizes patterns in data based on neighboring cells. It's much more sophisticated than Auto Fill. You can use it, for example, to reformat text and split or combine data. Here's an example.

- 1 You might have a list of names, with the first name and last name combined. For the first row, type the first and second names into the next cells. This is how you teach Excel the pattern to copy.

Name	First Name	Surname
Murphy Slaw	Murphy	Slaw
Bob Sled		
Phil Space		
Dave Triffids		
Gladys Working		

- 2 Position your cursor in the empty first name cell for the second name.
- 3 Press Ctrl + E or click the Flash Fill button on the ribbon. Find it by clicking the Data tab, then looking in the Data Tools.



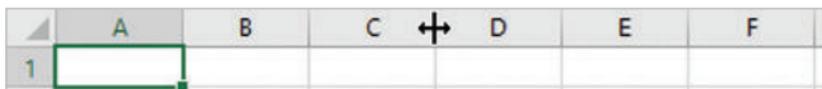
- 4 The first name column is then automatically filled out for you. Check the results look okay, and then do the same for the last name column.

4

Adjusting column widths and row heights

Here are some tips for adjusting the width of columns. Similar ideas apply to rows.

- 1 To adjust the width of a column, click and drag the line to the right of its letter above the column. Here, I'm adjusting the width of column C.



- 2 To make the column width snap to the width of the content in the column, double-click this same dividing line above the column, on its right.

- 3 You can select several columns and adjust them at the same time, making them equal width, or making them all snap to their content width. To select a column, click its letter. Click and drag on the letters to select multiple columns, or use Ctrl + click to select columns that aren't adjacent.

- 4 You might want to set the column width to a particular cell in the column, rather than the widest cell. Perhaps one cell contains a title that you're happy to run into other cells. Select the cell you want to adjust the width to, go to Format in the Cells group of the Home tab, and select AutoFit Column Width.

This is a long title, which we don't want to fit the column to					
Books					
Stationery					
Frozen produce					
Recorded media					

Inserting multiple rows or columns

I'll show you how to quickly insert multiple rows. You can use a similar technique to insert columns.

- 1 Click the number of the row where you want to insert above, and drag down for as many rows as you want to insert. For the example here, I want to insert three rows above row 4.

	A	B	C	D	E	F	G	H
1								
2			Jan	Feb	Mar	Apr	May	Jun
3		Tractors	247	750	500	145	165	400
4		Diggers	325	155	600	655	750	530
5		Dump trucks	125	300	932	800	600	400
6								
7								

- 2 Click Insert in the Cells group of the Home tab. You could alternatively use Ctrl with the plus symbol (+). You can use the + key on your number keypad or add Shift to the key combination to use the key on the main keyboard.

	A	B	C	D	E	F	G	H
1								
2			Jan	Feb	Mar	Apr	May	Jun
3		Tractors	247	750	500	145	165	400
4								
5								
6								
7		Diggers	325	155	600	655	750	530
8		Dump trucks	125	300	932	800	600	400

- 3 If you're inserting a row to copy another row into it, you can save time by copying the row first. When you insert, your copied row will be pasted into the new row(s).

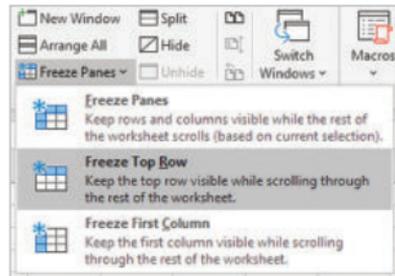
6

Managing large spreadsheets

There are several techniques that can help you to manage large spreadsheets.

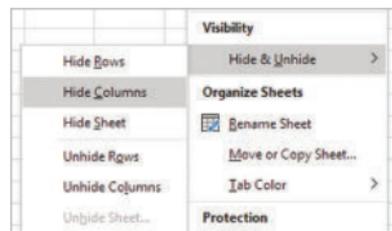
1 On the View tab, click New Window to see your worksheet in another window at the same time. You can scroll around in the windows independently, but it's just two views of the same document. Any changes you make will be visible in both windows. Use Arrange All on the View tab to organize your windows side by side.

2 Keep column and/or row headings in view when you scroll. Also on the View tab, Freeze Panes can keep the top row or first column in view. You can



freeze both by selecting the cell that is underneath the column heading and to the right of the row heading that you want to keep, and then choosing Freeze Panes. Using this approach, you can freeze several rows or columns.

3 Focus on what's important by hiding rows and columns you don't need right now. Select the rows or columns (click and



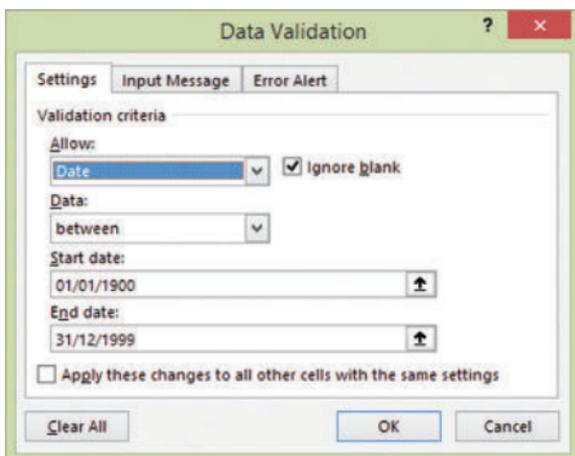
drag on their letters or numbers in the margin), and choose Hide Rows or Hide Columns. These options are on the Home tab, in the Editing group, under the Format menu.

Forcing valid data entry



To improve data quality, you can validate data as it is entered into the spreadsheet.

- 1 Select the cells you want to apply validation to.
- 2 Click Data Validation on the Data tab of the ribbon. The Data Validation options open.
- 3 In the Allow menu, you can choose to allow any value (the default), whole numbers, decimals, dates, times, or text of a certain length. You can also define custom validation (see Tip 9) or use a list of valid data items (see Tip 8).
- 4 In the Data menu, you can choose a sequence of valid values (between), minimum and/or maximum values, or a sequence of invalid values (not between). Use the boxes below to enter the start and end dates, or minimum and maximum numbers. Use the Input Message tab to give users instructions on entering valid data. Instructions are shown when users select the cell.



8

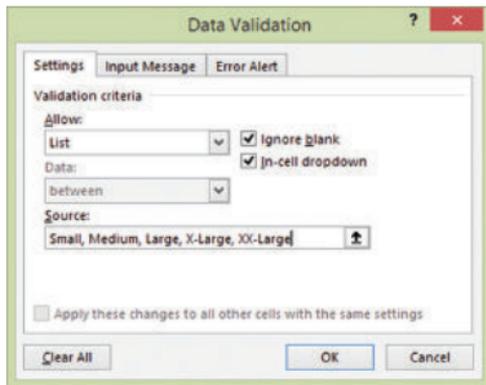
Adding a drop-down menu

You can ensure data is valid and speed up its entry by putting a drop-down menu in a cell. This is one of the data validation options.

1 Select the cell(s) where you want to use the menu.

2 Click Data Validation on the Data tab of the ribbon to open the Data Validation options. There's a shortcut: press ALT, D, and L one at a time.

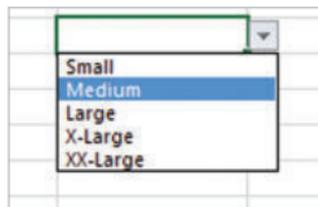
3 In the Allow drop-down menu, choose List.



4 In the Source box, type the menu items, separated by a comma. Click OK.

5 If you prefer, you can use data that's in a spreadsheet row, column, or named range (see p.41). In that case, enter an = sign followed by the name in the Source box, or enter = there and then select the menu items on the spreadsheet using the mouse. It's easy to edit your menu later by simply editing those cells.

6 When you select one of the cells, a menu will appear so you can select the data you'd like to enter in that cell.



Creating custom validation



You can write your own validation rules. Select the cell(s) you want to validate and go to the Data Validation options (see Tip 7). Select Custom in the Allow menu. In the Formula box, enter a formula that gives a result of TRUE or FALSE. Here are some examples to validate cell J8:

- **Must start with text "CPC".** =COUNTIF(J8, "CPC*")=1
- **Length must be 3.** =LEN(J8)=3
- **Must be a number.** =ISNUMBER(J8)
- **First character must be a number.** The LEFT function is used to extract the character, and ISNUMBER is used to test whether it is a number. The VALUE function is required because in a data item like "UK-52", the 52 would otherwise be treated as text. =ISNUMBER(VALUE(LEFT(J8,1)))
- **Last character must not be a number.** To see whether a character is not a number, we can check whether it is a number, and then wrap it in the NOT function to reverse the result. =NOT(ISNUMBER(VALUE(RIGHT(J8,1))))
- **Must be unique in column J.** This shows an error if the same data has already been entered in the same column. =COUNTIF(J:J, J8)<=1
- **Must be odd.** =ISODD(J8). ISEVEN can be used, too.

To allow multiple options, join them with OR, like this example, which allows data of 3 or 5 characters to be valid:

=OR(LEN(J8)=3, LEN(J8)=5)

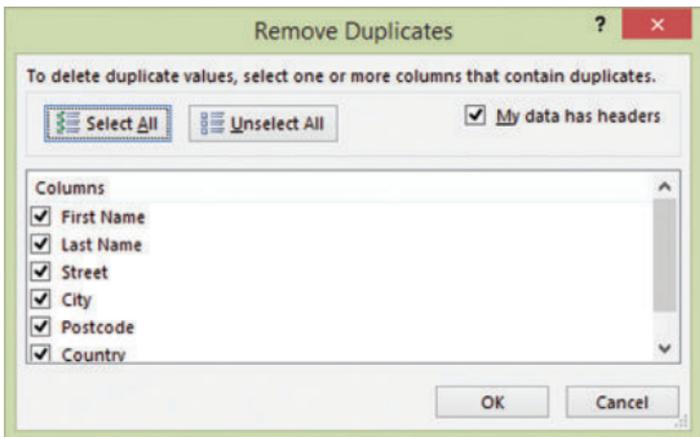
To enforce multiple validation rules, use AND, like this example, which requires a 3-character code starting with A:

=AND(LEN(J8)=3, COUNTIF(J8, "A*")=1)

Removing duplicates

You can remove duplicated data in a spreadsheet, which can easily happen if data such as mailing list information is combined from multiple sources.

- 1 Click in your data so Excel can find it.
- 2 Click Remove Duplicates on the Data tab of the ribbon. You'll find it in the Data Tools group.
- 3 Select the columns that you want to check for duplicate entries. It's safest to keep them all selected. If you just selected the First Name and Last Name (for example), two different people who share a name would be identified as duplicates, even though they have different addresses. One of them would be automatically deleted. This doesn't happen if you select the address fields as well.



- 4 Click OK. Beware, though, as that might delete rows from your spreadsheet. Use Undo immediately to bring them back if you made a mistake.

Highlighting duplicates



You might be storing the same person twice, at their new and their old address. You can highlight duplicated data so you can fix it manually.

- 1 Select the cells you want to check for duplicates. In a mailing list spreadsheet, this might be the First Name and Last Name columns.
- 2 On the Home tab, click Conditional Formatting. Select Highlight Cells Rules and choose Duplicate Values.
- 3 You can choose to highlight duplicate or unique values, and can pick your preferred color and formatting option.



- 4 This isn't smart enough to recognize first and second name combinations, so all the occurrences of Ben would be highlighted, even if they have different surnames. Even if the first name and surname are both highlighted, it might not be a repeated person, because the names might be shared with different people. It's a good first pass for a manual review, though.

First Name	Last Name	Street	City	Postcode	Country
Roger	Anout	99 Penny Lane	Liverpool	L2 0LL	UK
Robin	Banks	99 Mansion Row	Birmingham	B4 9ET	UK
Justin	Case	87 Grantchester Meadows	London	MSO 0AW	UK
Ed	Case	87 Grantchester Meadows	London	MSO 0AW	UK
Ben	Debusse	45 Rhyming Drive	London	MSO 0AW	UK
Al	Dente	555 Americas Avenue	London	W4 4JJ	UK
Ben	Debusse	52 Politti Street	London	MSO 0AW	UK
Ben	Elux	12 Disney Matter Road	Glasgow	G1 1QQ	UK
Howard	Eineau	88 Lucky Street	Bracknell	RG12 4LU	UK
Madge	Ination	12 Disney Matter Road	Glasgow	G1 1QQ	UK

Using advanced paste options

There are lots of advanced paste options. Cells can contain formulas, values (which are formula results, or numbers or text entered directly) and formatting. You can paste each of these independently.

Click the arrow on the Paste button on the Home tab to find advanced paste options. For example, you can paste:



- Formulas and number formatting (such as currencies) without overwriting other formatting.
- Values only. This is useful if you want to copy the result of a formula, but not the formula itself.
- Formatting only (see also Tip 67 – the Format Painter).
- Everything except borders.
- Everything, keeping the original column widths.
- Everything, but transposing (or swapping over) the rows and columns. Here's an example: Compare the left table with the right one.

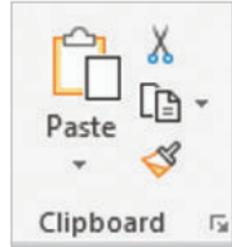
	Tractors	Diggers	Dump trucks		Jan	Feb	Mar
Jan	247	325	125	Tractors	247	750	500
Feb	750	155	300	Diggers	325	155	600
Mar	500	600	932	Dump trucks	125	300	932

Paste Special includes the option to skip blanks or to carry out a mathematical operation. For example, copy 2 and paste with Divide to halve the numbers you paste over. To make negative numbers positive, copy -1 and paste it on top of the negative numbers with the Multiply option.

Expanding the clipboard



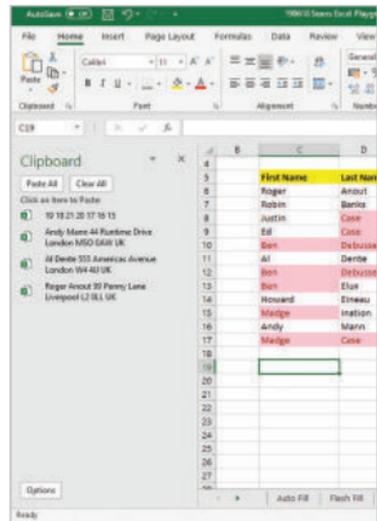
If you're moving lots of information around, you can use the clipboard to store multiple items you've copied.



1 Click the tiny arrow to the right of the Clipboard label on the Home tab.

2 The clipboard expands into a column on the left. You can click any of the items in the clipboard to paste them at your cursor's current position.

3 Click the menu button that appears when you hover over an item in the clipboard, and you can choose to delete that item. This is useful if the clipboard contains data you no longer need and it's getting in the way.

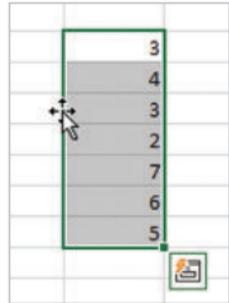


4 You can empty the whole clipboard by clicking Clear All at the top.

5 You can use Paste All at the top of the clipboard to paste all the data in one go. You might get unexpected results if the data is not similar in its structure, because you've been copying from different parts of the spreadsheet.

There is an easier way to move data around your spreadsheet than copying and pasting it.

- 1 Select the data you want to move by clicking the start cell and dragging with the mouse.
- 2 Move your mouse cursor over one of the edges of the selected area. The cursor becomes a four-headed arrow.
- 3 Click and drag with your mouse. An outline will follow your mouse cursor showing how much space the selected area will occupy.
- 4 Release the mouse button to drop the data in its new position on the spreadsheet.



You can use that technique to move an entire row or column after selecting it, but it will overwrite what's already in the cells you move to. Alternatively, you can cut a column and then insert a new column and paste your data into it at the same time. This also works for rows.

- 1 Select the column you want to move. You can select several consecutive columns to move using Shift + click to select the first and last one.
- 2 Use Ctrl + X to cut the data.
- 3 Select the column to the right of where you want to insert a new column. Click Insert on the Home tab of the ribbon to move the columns you cut.

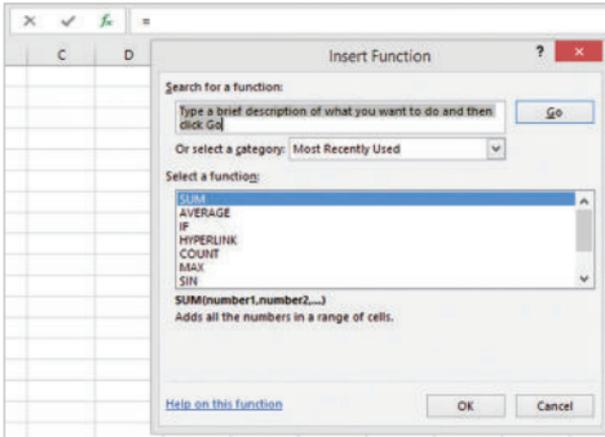
Entering formulas



Here are some tips for entering formulas in cells.

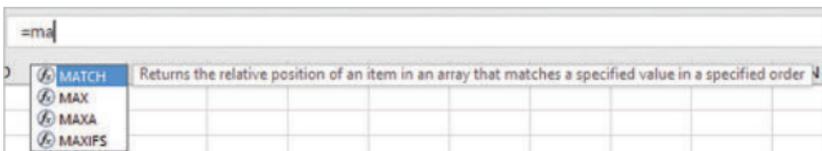
1

If you don't know the name of the function you need, you can click the fx button beside the formula bar to search for it by description.



2

When you're entering a function name, Excel can help you complete it. A menu opens with function names that match what you've typed so far. You see a description of the function too. Use the Up and Down arrows to choose an option. Use Tab to select the option. You can then use Shift + Ctrl + A to have placeholder values inserted in your formula. For example:
=MAX(number1,number2,...)



3

If you've named cells or ranges (see Tip 37), tap F3 to paste a name from a menu into your formula.

Understanding formula symbols

Here's a handy reference to the symbols used in formulas:

- All formulas start with =

- Use \$ to fix cell references. When I copied the formula from cell C2 into C3 and C4, it updated the row references in the formula. As a result, cell C4 adds up the cows (A4) and sheep (B4) in that row, which is the expected result. If you don't want the row to change when you paste a formula, put a \$ in front of it (for example, A\$2). If you don't want the column to change, put a \$ in front of that (for example, \$A2). You can fix both too (for example, \$A\$2). You do this in your formula before you copy it.

	A	B	C
1	Cows	Sheep	Total
2	5	6	=A2+B2
3	4	2	=A3+B3
4	1	3	=A4+B4

- You can cycle through the options for fixing rows, columns, and both in a cell reference by tapping F4.
- Use a colon between cells to make a range. A2:A4 is the range of cells containing all the cows. A:A means all of column A, and 2:2 would be all of row 2.
- Put ! at the end of a sheet name. For example, to use cell C3 in Sheet6 from a different worksheet, your cell reference would be Sheet6!C3.
- Put parentheses () around the data used by functions. Each opening parenthesis needs a closing one.
- Use + for addition.
- Use - for subtraction.
- Use * for multiplication.
- Use / for division.

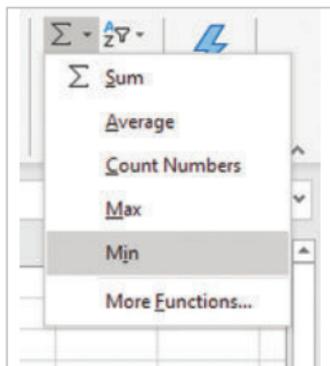
Finding the highest/ lowest value in a range

You can use the MAX function to find the highest value (or latest date) in a range or set of numbers. There is an equivalent function called MIN that you can use to find the lowest number (or the earliest date) from a range.

- 1 Click on the cell where you want the result to be.
- 2 Type in =MAX(
- 3 Select the cells with the mouse, or type in the range coordinates.
- 4 If you want to add another range, type a comma and then select the new range.
- 5 Press Enter to add the closing parenthesis) and see the result in the spreadsheet.

You can access both MIN and MAX using the Autosum button on the Home tab:

- 1 Select the range you want to analyze, typically a column or row of numbers.
- 2 Click the small arrow beside the Autosum button on the Home tab.
- 3 When the menu opens, click Min or Max. The result is added at the end of your range.





Ranking data items

You can use the RANK function to show you how a data item ranks compared to others. For example, you can use it to quickly spot the biggest sale, without sorting the data.

The RANK function works like this:

=RANK(cell you want to rank, cell range you want to compare it against, ranking order)

The ranking order parameter at the end is optional. The default value of 0 is the order we usually use for bestselling book and music charts, where 1 represents the biggest seller, and the rank numbers increase for lower sales volumes.

Add a ranking order of 1 to reverse the order, so the lowest value is ranked 1. For example, you might use this when comparing speed, based on the time taken (the fastest car took the least time).

If you want to copy your RANK function down your column, remember to add a \$ before the row numbers for the comparison range so they aren't changed as the function is copied. For example, looking at the worksheet below, my function to rank the first sales figure in column B is:

=RANK(B2,B\$2:B\$7)

I've copied this formula down column D.

	A	B	C	D
1	Date	Sales	RANK	REVERSE
2	May-25	10764	3	4
3	Jun-25	7338	6	1
4	Jul-25	7436	5	2
5	Aug-25	14162	1	6
6	Sep-25	9360	4	3
7	Oct-25	11529	2	5

Finding an item by its ranking using LARGE

The MAX and MIN functions give you the highest and lowest numbers in a range. To find an item at other positions in the ranking, use the LARGE function.

- 1 Click on the cell where you want the result to be.
- 2 Type in =LARGE(
- 3 Select the cells with the mouse, or type in the range coordinates. In my screenshot, the range is sorted so you can easily check the data. This function is probably most helpful when the data isn't already sorted.
- 4 Type a comma, followed by the position number of the item you want to find. For example, to find the second biggest number in the range, use 2.
- 5 When you've finished, press Enter to complete the formula and see the result in the spreadsheet.

	A	B	
1	Agent	Sales	
2	Alex	15	
3	Chris	27	
4	Charlie	34	
5	Frankie	48	
6	Ashley	56	
7	Jordan	68	
8	Casey	72	
9			
10	MAX(B2:B8)	72	
11	LARGE(B2:B8, 2)	68	
12	MIN(B2:B8)	15	
13			

Finding averages

Excel provides three functions to find the average value from a range of cells.

If you wanted to find the average of the values in the cells A1 to A10, you could use:

- **=AVERAGE(A1:A10)**. This is the average most people think of first: it's calculated by adding up all the values and then dividing by the number of data items. It's the arithmetic mean.
- **=MEDIAN(A1:A10)**. This is the value in the middle of the range when it is sorted in number order. That's how it works if your list has an odd number of items. If your list has an even number of items, there is no item in the middle, so this gives the mid-point between the two middle items. In that case, it returns a number that is not in your range.
- **=MODE(A1:A10)**. This returns the most frequently occurring value, irrespective of whether it is high or low, or somewhere in between.

You can use the Autosum menu on the Home tab of the ribbon to calculate the average (arithmetic mean).

If you just want to do a quick check of the average, highlight the cells and look at the status bar in the bottom right. If your monitor is wide enough, it shows the average, count, and sum for the selected range.

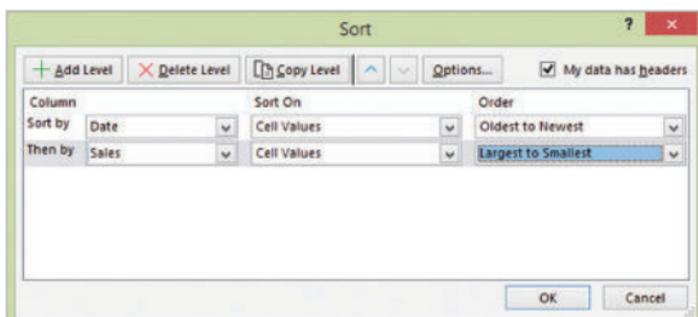
	5
	5
	30
	40
	50
	60
	5
	80
	30
	100
Average	40.5
Median	35
Mode	5

Sorting data



You might find data is not in the right order. Let's sort it!

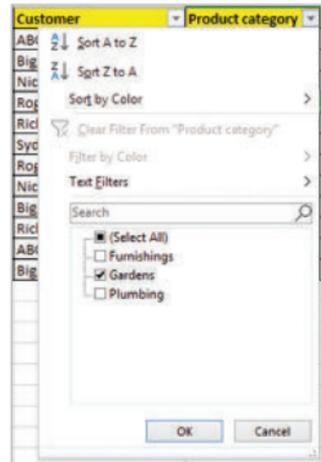
- 1 Click a cell in the column you wish to sort if you're sorting all your data, or select the data to sort.
- 2 On the Home tab, in the Editing group, click Sort & Filter. If available, select the option you require, such as sort Oldest to Newest, Newest to Oldest, Smallest to Largest, or Largest to Smallest.
- 3 It is possible to sort by multiple criteria – for example, sort first by date and then sort by the size of the sales within each month. If you need to sort by two or more criteria, click Custom Sort in the Sort & Filter menu.
- 4 Use the Add Level, Delete Level and Copy Level buttons to add or remove sorting criteria.
- 5 In the Sort On menu, you can sort by cell color, font color, and conditional formatting icon, as well as the cell value.
- 6 If you need to sort left to right instead of top to bottom, click Options and change the orientation.



Filters show you only the rows that contain certain values.

- 1 Click in the data where you want to add a filter.
- 2 On the Home ribbon, in the Editing group, open the Sort & Filter menu. Click Filter.
- 3 Filter buttons are added to your column headers. Click one to open the options. Select which values from that column you want view.

- 4 Click OK, and you see only the rows that contain your chosen values. Where a filter is active, there is an icon in the Filter button at the top of the column. The row numbers may also tell us that some rows are not shown. In my example below, I've filtered the product category to show only "Gardens" sales. You can filter several columns at the same time, so I could use the filter in the Customer column to see sales of Garden equipment to ABC, for example. Use Clear Filter in the Filter options (shown in the picture above) to turn off the filter.



	A	B	C	D
1	Order Number	Customer	Product category	Sales Value
3	1266	Bigg Records	Gardens	1200
5	1268	Roger's Plumbing	Gardens	7650
7	1270	Syd's Home Construction	Gardens	1220
9	1272	Nick's Masonry Services	Gardens	340
11	1274	Rick's Stationery	Gardens	870
12	1275	ABC	Gardens	140

Using IF for cell contents



Excel can decide what should be in a cell using the IF function. It uses this format:

`=IF(decision criterion, cell value if true, cell value if false)`

For example, here's a spreadsheet showing monthly sales and sales targets.

	A	B	C	D
1	Month	Sales by month	Target	On target?
2	Apr-19	11555	10000	
3	May-19	10764	11000	Missed target
4	Jun-19	12194	9500	
5	Jul-19	7338	9500	Missed target

I used this formula in cell D2 then copied it down column D:

`=IF(B2 >= C2, "", "Missed target")`

The "" is an empty value, so column D is empty when the target has been achieved, and the warnings stand out.

You can use all the operators for your comparison:

- = to test whether two values are the same.
- <> to test whether two values are not the same.
- > to check if the first value is more than the second.
- < to check if the first value is less than the second.
- >= to ask whether the first value is more than or equal to the second.
- <= to ask whether the first value is less than or equal to the second.

Combining IF functions

You can combine IF functions together, by putting one inside another. This is called nesting them. For example, let's say you wanted to label a number as high, medium, or low, depending on its value. A value of 100 or lower is low, 101 to 200 is medium, and over 200 is high.

You can check whether a value in cell F4 is low, like this:

```
=IF(F4 <= 100, "low", "not low")
```

You can check whether a value is high, like this:

```
=IF(F4 > 200, "high", "not high")
```

We want to combine these functions, so that Excel works through this thought process:

- Is the number less than or equal to 100? If so, it's low.
- If it isn't a low number, let's see whether the number is higher than 200. If so, it's a high number.
- If it's not a high number, and we know it's not a low number, then it must be medium.

Instead of just displaying "not low" when the value isn't low, we can go straight into another IF function that checks whether it's high. This is what it looks like, all together:

```
=IF(F4 <= 100, "low", IF(F4 > 200, "high", "medium"))
```

Excel 2016 introduced the IFS function, which is easier to use. You give it a list of decision criteria and the cell value if true. To create a default value for when none of the criteria is true, provide a final decision criterion of TRUE with a default value. Here's our high/medium/low cell labeler again:

```
=IFS(F4 <= 100, "low", F4 > 200, "high",  
TRUE, "medium")
```

Totaling up values with SUM

25

To create a total, you can use the SUM function. You provide it with a range of cells you want to sum. Here's an example spreadsheet showing money received.

	A	B	C
1	Category	Sale Value	Received
2	Cutlery	346	Jun-22
3	Crockery	480	Jun-22
4	Cookware	251	May-22
5	Crockery	432	Aug-22
6	Cookware	284	Jul-22
7	Cutlery	423	Jun-22
8	Cookware	439	Sep-22
9	Cleaning	410	May-22
10	Cutlery	510	Apr-22
11	Cleaning	402	Aug-22
12	Total	3977	

- To create the total in cell B12, you can enter `=SUM(B2:B11)` into cell B12. You can type in the cell range, or you can select the range using the mouse after you type the opening parenthesis in the formula.
- You can also use the Autosum button on the Home tab of the ribbon. Put your cursor in cell B12 then click the Autosum button. It will enter the SUM formula and automatically select the range.
- Even quicker: use the keyboard shortcut. Click on cell B12 and then press `Alt + =` to enter the SUM formula and automatically select the range.
- You can also use this shortcut and the Autosum button to total cells to the left in the current row.



Choosing values to sum with SUMIF

Sometimes, you might want to total up some of your data but not all of it. For example, you might want to get the sales receipts from June 2022 only.

You can use the SUMIF function to do this. The format is:

=SUMIF(range to compare, value to compare that range against, data range to add up)

Here's a breakdown of those three parts to the formula:

- The cells you want to compare against.
- The value you want to compare them to – for example, "Jun-22". The value you want to compare will usually be in quotation marks – for example, "Jun-22" for a date, ">21" for values of more than 21, or "blue" to match that word. You can match the contents of another cell by using its cell reference, but shouldn't use quotation marks with it (for example, D2). You don't need quotation marks around a number, either.
- The cells you want to total.

To add up all the sales in June 2022 in rows 2 to 10 of the spreadsheet shown below you would enter this into a cell: **=SUMIF(C2:C10, "Jun-22", B2:B10)**

Beware: If the range you're adding up is smaller than the range you're comparing in any direction, the range you're adding may be extended, leading to unexpected results.

	A	B	C
1	Category	Sale Value	Received
2	Cutlery	346	Jun-22
3	Crockery	480	Jun-22
4	Cookware	251	May-22
5	Crockery	432	Aug-22
6	Cookware	284	Jul-22

Using several sum criteria with SUMIFS

Sometimes, you might want to select data for totaling using more than one criterion. For example, using our sales spreadsheet again (see Tip 26), you might want to total the sales receipts in June 2022 for cutlery. That involves checking the values of two different cells (category and date), before totaling up the number in a third cell (sale value).

To do that, you use the SUMIFS function.

The catch is that the data to sum and the criteria are entered in a different order when you use SUMIFS, compared to SUMIF. You enter data in this order:

- The data you want to total.
- The first range of cells you want to evaluate.
- The value you want to compare them to.
- The second range of cells you want to evaluate.
- The value you want to compare them to.

The format is:

=SUMIFS(data to add up, range to compare, value to compare that range against, second range to compare, value to compare that range against)

You can use more criteria if you wish: you don't have to stop at two.

To add up the cutlery sales from June 2022 in our example spreadsheet (see Tip 26), we'd use:

=SUMIFS(B2:B10, C2:C10, "Jun-22", A0:A10, "Cutlery")

The size and shape of the ranges you are adding up and the ranges containing your criteria must be the same.

Using cumulative sums

A cumulative sum is the “total so far”. For example, if you’re working on a calendar year, March’s total would include the data for March, February, and January, to show the sales in the year up to that point. Cumulative sums can be useful for benchmarking performance against previous years.

There isn’t a built-in function to calculate cumulative sums, but you can use the SUM function to do this. The solution is to fix the starting cell for the range you want to sum, but to leave the end cell as a relative reference.

	A	B	C
1	Month	Sales	Cumulative total
2	Jan	500	500
3	Feb	400	900
4	Mar	600	1500
5	Apr	400	1900
6	May	200	2100
7	Jun	100	2200

Here’s a worked example:

- 1 We want to calculate the cumulative total of the sales that are shown in column B. In cell C2, enter `=SUM(B$2:B2)`. (The start and end of the range are the same here, because there’s only one month to total.)
- 2 Copy the formula down the column.
- 3 As the formula is copied, the end of the range will be updated. For example, in June, the formula becomes `=SUM(B$2:B7)`. Fixing the first cell reference in the formula means it always starts totaling with January’s sales figures.
- 4 You can ignore the warnings that adjacent cells are not included in the formula.

Using SUMPRODUCT



Working out a grand total sometimes involves multiplying different values together. For example, your spreadsheet might show the price and quantity sold for each item.

You could calculate the sales value for each item by multiplying the quantity sold by the price, and then adding all these values up. But the SUMPRODUCT function does this in a single step for you.

The function works like this:

=SUMPRODUCT(first range, second range)

It is possible to add additional ranges to multiply together. You could, for example, add a third column with the percentage margin for each item to work out the profit on the goods sold.

	A	B	C
1	Item	Price	Quantity sold
2	Standard ice cream	2.5	300
3	Double scoop	3.5	200
4	Deluxe	5	100

Here's a worked example.

- 1 Put the unit price in column B.
- 2 Put the quantity sold in column C.
- 3 The grand total will be the sum of the unit price multiplied by the quantity for each row. To work this out, use **=SUMPRODUCT(B2:B4, C2:C4)**

Using more count criteria



You can count cells that meet several criteria using the COUNTIFS function. It takes this form:

=COUNTIFS(range to compare, value to compare against, second range to compare, second value to compare against...)

In the spreadsheet below, we want to count the number of orders delivered to London worth more than \$400.

- 1 Click on the cell where you want the result to be.
- 2 Enter =COUNTIFS(
- 3 Click at the top of column K to select the column.
- 4 Type a comma, and then "London".
- 5 Type a comma, and then select column N.
- 6 Type a comma, and then ">400". Press Enter.
- 7 Your final formula looks like this: =COUNTIFS(K:K, "London", N:N, ">400")

H	I	J	K	L	M	N
First Name	Last Name	Street	City	Postcode	Country	Order value
Roger	Anout	99 Penny Lane	Liverpool	L2 0LL	UK	500
Robin	Banks	99 Mansion Row	Birmingham	B4 9ET	UK	600
Justin	Case	87 Grantchester Meadows	London	MSO 0AW	UK	300
Ed	Case	87 Grantchester Meadows	London	MSO 0AW	UK	200
Ben	Debusse	45 Rhyiming Drive	London	MSO 0AW	UK	800
Al	Dente	555 Americas Avenue	London	W4 4JJ	UK	900
Ida	Down	99 Redford Avenue	Bedford	BD15 8TT	UK	44
Ben	Elux	12 Disney Matter Road	Glasgow	G1 1QQ	UK	555
Howard	Eineau	88 Lucky Street	Bracknell	RG12 4LU	UK	850
Madge	Ination	12 Disney Matter Road	Glasgow	G1 1QQ	UK	921
Andy	Mann	44 Runtime Drive	London	MSO 0AW	UK	1000
Madge	Case	121 Tooth Street	London	RG12 4LU	UK	250

You can use wildcards to do an inexact match with a piece of text. A wildcard is a character that stands in for one or more other characters. Wildcards can be used with COUNTIF/COUNTIFS and SUMIF/SUMIFS as well as some other functions, but cannot be used with IF.

There are three wildcards:

- **? (question mark)**. Stands in for any single character. For example, "a?e" would match both "ape" and "ace" but not "apple".
- *** (asterisk)**. Matches any number of characters. For example, "cut*" would match both "cutlery" and "cutlass".
- **~ (tilde)**. Is used before a * or ? if you actually want to look for one in the text.

Here are some examples, based on counting the cells in the range A1 to A10:

- **=COUNTIF(A1:A10, "<>??-????")**. Checks for cells that do not contain data in the form of two characters, a dash, and then four characters. Checks like this can be used for validating order numbers and similar codes. Note that blank cells are counted in this case, so don't set the range as the whole column.
- **=COUNTIF(A1:A10, "BB*")**. Counts orders beginning with the letters BB.
- **=COUNTIF(A1:A10, "*~?")**. Counts cells that end with a question mark. The * stands in for any number of characters at the start of the text. The tilde is required so Excel knows you want to match a question mark, not use it as a wildcard.

Grouping data



To make it easier to understand your spreadsheet, you can group rows or columns. You can easily hide and show groups using buttons in the margin.

- 1 If your data includes summary rows (see screenshot), Excel can automatically create groups. Click in your data. In the Outline group of the Data tab, open the Group menu and select Auto Outline.

	A	B	C	D
1	Date	Region A	Region B	Region C
2	Jun-22	500	165	700
3	Jun-22	600	223	700
4	Jun-22	740	437	600
5	JUN total	1840	825	2000
6	Jul-22	400	100	600
7	Jul-22	500	200	500
8	Jul-22	600	100	400
9	JUL total	1500	400	1500
10	Aug-22	440	500	200
11	Aug-22	440	560	230
12	Aug-22	440	570	240
13	AUG total	1320	1630	670
14				

- 2 Alternatively, select the rows or columns you want to combine into a group. They must be consecutive: you can't have an unselected row or column in the middle.
- 3 In the Outline group of the Data tab, click Group. This combines your selected data into a group.
- 4 Use the + and - signs in the left and top margins to show and hide your groups.
- 5 You can create a group inside another group.
- 6 To clear a group, select the rows/columns in the group and then click Ungroup. You can remove all groups using the Clear Outline option under Ungroup. It doesn't delete any data.

Calculating subtotals

Excel's subtotal feature does the work of the SUM function, combined with automatic grouping.

- Sort your data so it's organized how you want to subtotal it. For example, if you want to subtotal your expenses monthly, sort your data by month.
- Click in your data.
- On the Data tab of the ribbon, in the Outline group, click Subtotal.
- In the first menu option, tell Excel how you want to group your data. For example, you might want to generate a subtotal for each month change.
- Choose the function you want to use. Typically, this will be Sum. But you can also count items, calculate an average, and show the maximum or minimum values, among other things.
- Select which columns you want to be subtotaled and click OK.

	A	B	C	D	E	F	G	H	I	J	K	L
1	CATEGORY	MONTH	DATE	PLACE	AMOUNT							
2	HOBBIES	Apr-22	01/04/2010	MUSIC DOWNLOADS COMPANY	£14.99							
3	HOBBIES	Apr-22	01/04/2010	MAGAZINE SUBSCRIPTION	£7.47							
4	HOUSE	Apr-22	01/04/2010	TV LICENCE	£32.12							
5	HOUSE	Apr-22	01/04/2010	WATER COMP								
6	HOUSE	Apr-22	01/04/2010	ENERGY COMI								
7	HOUSE	Apr-22	01/04/2010	ENERGY COMI								
8	HOUSE	Apr-22	01/04/2010	PHONE COMP								
9	HOUSE	Apr-22	01/04/2010	COUNCIL TAX								
10	HOUSE	Apr-22	01/04/2010	RENT								
11	HOUSE	Apr-22	06/04/2010	INSURANCE P								
12	HOUSE	Apr-22	06/04/2010	PLUMBING IN								
13	HOUSE	Apr-22	06/04/2010	HOUSESURE H								
14	GOING OUT	Apr-22	22/04/2010	CONCERT TIC								
15	HOBBIES	Apr-22	30/04/2010	MUSIC DOWN								
16	GARDENING	May-22	01/05/2010	PLANTS FOR C								
17	HOUSE	May-22	04/05/2010	TV LICENCE								
18	HOUSE	May-22	04/05/2010	WATER COMP								
19	HOUSE	May-22	04/05/2010	HOUSESURE H								
20	HOLIDAYS	May-22	04/05/2010	FLIGHTS								
21	HOUSE	May-22	04/05/2010	ENERGY COMI								
22	HOUSE	May-22	04/05/2010	ENERGY COMPANY	£242.00							
23	HOUSE	May-22	04/05/2010	COUNCIL TAX	£174.00							
24	HOUSE	May-22	04/05/2010	RENT	£300.00							

Using subtotals



	A	B	C	D	E	F	G	H	I	J	K	L
1	CATEGORY	MONTH	DATE	PLACE	AMOUNT							
2	HOBBIES	Apr-22	01/04/2010	MUSIC DOWNLOADS COMPANY	£14.99							
3	HOBBIES	Apr-22	01/04/2010	MAGAZINE SUBSCRIPTION	£7.47							
4	HOUSE	Apr-22	01/04/2010	TV LICENCE	£12.12							
5	HOUSE	Apr-22	01/04/2010	WATER COMPANY PLC	£16.00							
6	HOUSE	Apr-22	01/04/2010	ENERGY COMPANY PLC	£30.27							
7	HOUSE	Apr-22	01/04/2010	ENERGY COMPANY PLC (PLAN 2)	£42.00							
8	HOUSE	Apr-22	01/04/2010	PHONE COMPANY	£80.00							
9	HOUSE	Apr-22	01/04/2010	COUNCIL TAX	£172.92							
10	HOUSE	Apr-22	01/04/2010	RENT	£350.00							
11	HOUSE	Apr-22	06/04/2010	INSURANCE POLICY (2)	£7.02							
12	HOUSE	Apr-22	06/04/2010	PLUMBING INSURANCE	£18.00							
13	HOUSE	Apr-22	06/04/2010	HOUSEHIRE HOUSE INSURANCE	£30.00							
14	GOING OUT	Apr-22	22/04/2010	CONCERT TICKETS	£40.00							
15	HOBBIES	Apr-22	30/04/2010	MUSIC DOWNLOADS COMPANY	£3.99							
16		Apr-22	Total		£824.78							
17	GARDENING	May-22	01/05/2010	PLANTS FOR GARDEN	£42.18							
18	HOUSE	May-22	04/05/2010	TV LICENCE	£12.12							
19	HOUSE	May-22	04/05/2010	WATER COMPANY PLC	£16.00							
20	HOUSE	May-22	04/05/2010	HOUSEHIRE HOUSE INSURANCE	£30.00							
21	HOLIDAYS	May-22	04/05/2010	FLIGHTS	£200.00							
22	HOUSE	May-22	04/05/2010	ENERGY COMPANY PLC	£30.27							
23	HOUSE	May-22	04/05/2010	ENERGY COMPANY PLC (PLAN 2)	£42.00							
24	HOUSE	May-22	04/05/2010	COUNCIL TAX	£174.00							

This is how you can use automatically generated subtotals.

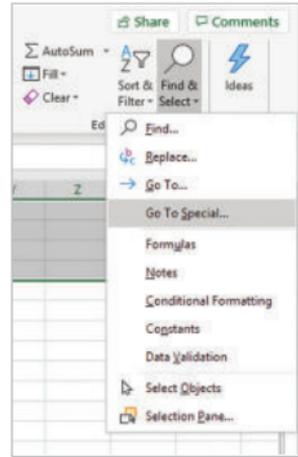
- 1 Click the minus sign beside a subtotal to close the group, leaving only the subtotal visible.
- 2 Click the 1 button above the left margin to see the grand total of all the subtotaled items.
- 3 Click the 2 button above the left margin to see the subtotals. You can expand any of them by clicking the plus button beside it.
- 4 Click the 3 button above the left margin to see all your data again.
- 5 To remove your subtotal, click Subtotal on the ribbon. It's in the Outline group of the Data tab. In the options that appear, click Remove All.

Copying visible data only

When you copy data, any cells that are hidden will be copied with it. For example, any groups you've closed or rows you've hidden will be copied.

1 Select the data you want to copy, which may include hidden groups.

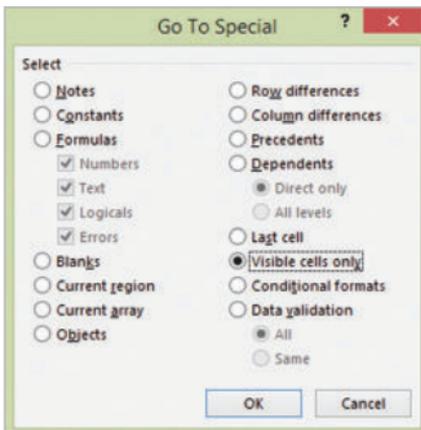
2 On the Home tab, in the Editing group, open the Find & Select menu. Click Go To Special... (see image on the right). The shortcut is Ctrl + G.



3 In the Go To Special menu, shown below, select "Visible cells only".

4 Click OK.

5 Now you can copy and paste in the usual way, using Ctrl + C to copy, and Ctrl + V to paste.

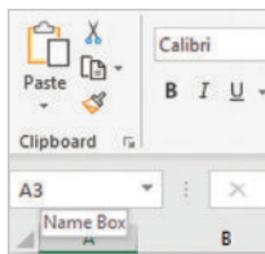


Naming ranges

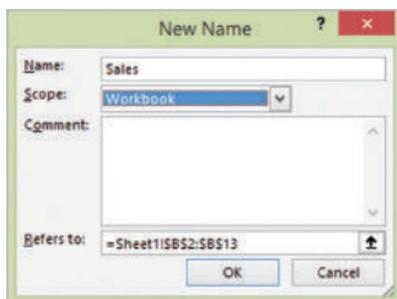
You can simplify your formulas by naming ranges. For example, if you name a range “sales”, you could use the formulas =SUM(sales) or =AVERAGE(sales). Names cannot include spaces, but you can use an underscore character.

1 Select the range you want to name.

2 The Name box is beside the formula bar. It usually contains the selected cell reference, or the size of the selected range while you are selecting it. Type in the name you want to use and press the Enter key.



3 Alternatively, you can click Define Name on the Formulas tab of the ribbon. Here, you can add a comment, and change the scope if you want the

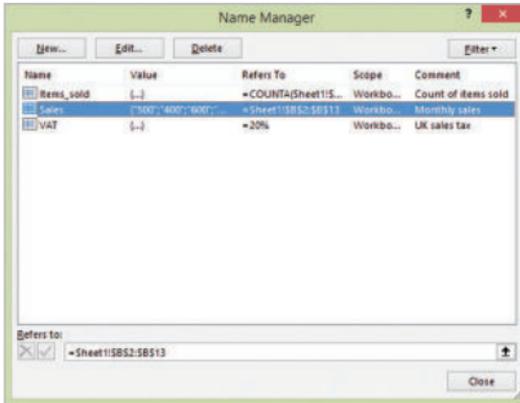


name to only apply to this worksheet and not the whole workbook. You can edit the range the name refers to in the “Refers to” box.

4 You can also put a number or a formula in the “Refers to” box. For example, you could define a name as =20% for discount calculations. If you change this value later, formulas based on the name recalculate. You could give a name to a formula =SUM(C:C) to avoid re-entering it each time you want to use the sales total.

Using the Name Manager

You can see the name of a range in the Name box if you select the whole range. The most useful way to see and manage your named ranges and values, though, is to use the Name Manager.



1

On the Formulas tab of the ribbon, click Name Manager to open it.

2

Click a name to see the range, constant number, or formula it refers to at the bottom of the Name Manager pane.

3

Double-click a name or select it and click Edit if you want to change what it refers to. You can't change a name's scope once it's been defined.

4

Select a name and click Delete to delete it.

5

Use the filter in the top right to show names with errors. Excel will adjust the named range if you add or remove data within the range, but if you delete all of the data in the named range, it causes an error. Any cells using the name will show #REF.

Using VLOOKUP



You can use the VLOOKUP function to find a value in a set of data, and use it in a formula. The function works by searching a column for your data. (If you haven't used VLOOKUP before, try Index-Match instead – see Tips 41 & 42).

VLOOKUP works like this:

=VLOOKUP(data to match, range to find it in, column number in that range where your desired data is, type of match)

It's easiest to understand with a worked example.

	A	B	C	
1	Item	Price	Quantity sold	
2	Standard ice cream	2.5	300	
3	Double scoop	3.5	200	
4	Deluxe ice cream	5	100	
5	Lollies	1.25	200	
6	Crisps	1	120	
7	Canned drink	1	400	
8				

In this spreadsheet, let's say we want to look up the quantity of crisps sold. (We'll use the text "Crisps" but you could use a cell reference to search for a cell's contents instead.) The data is in the range A1:C7. The word we're looking for must always be in the first column of the range, and we call that column number 1. The quantity sold is in column 3, then. There are two types of match you can use. For an exact match, use FALSE.

This is what the final formula would look like:

=VLOOKUP("Crisps", A1:C7, 3, FALSE)

The other match type is an inexact match (chosen using TRUE), where the function returns the nearest value lower than the chosen value. You might want to use this when you're looking up numbers instead of text.

The HLOOKUP function is similar to VLOOKUP (see Tip 39). You use it to find a value in a set of data, but you search across a row to find the data. If this is the first time you've come across HLOOKUP, try Index-Match instead (see Tips 41 & 42).

HLOOKUP works like this:

=HLOOKUP(data to match, range to find it in, row number in that range where your desired data is, type of match)

	A	B	C	D
1	Date	Spanners	Hammers	Drills
2	June	100	200	300
3	July	400	500	600
4	August	700	800	900
5				
6	Spanners	100		

In the spreadsheet shown here, let's say we want to be able to look up the June sales for different product categories. We want to be able to type the product we're interested in into cell A6, and then see the sales volume for that item in cell B6. Obviously, we can see that at a glance in this simple example, but the same idea applies to much bigger worksheets, and to looking up across different worksheets.

The text we're searching for is in cell A6 and the data is in the range B1:D4. The first row must contain the data we're searching for. The first row is number 1, so our data (for June) is in row 2. We use the match type of FALSE to ensure there is an exact match. A match type of TRUE would return the nearest lower value if there isn't an exact match.

Here's what our formula would look like:

=HLOOKUP(A6, B1:D4, 2, FALSE)

Finding data with MATCH



The VLOOKUP and HLOOKUP functions are fairly limited: you can only look up values to the right (VLOOKUP) or below (HLOOKUP) the data you search for, and you need to know the number of rows/columns away your desired data is. If you insert rows/columns, you can break the formula. That's why it's better to use a combination of the INDEX and MATCH functions.

The MATCH function is used to find the position of an item within a range of cells. It works like this:

=MATCH(data to match, range to find it in – must be a single row or column, type of match)

The type of match is optional. Use 0 to force an exact match. The default option (1) returns the largest value up to and including your data to match. Use -1 to find the smallest value equal to, or above, your data.

For example, let's search for a food item in the spreadsheet below. We'll put the item we want to find in cell A9. Our food items are in the range A2:A7. Here's the formula:

=MATCH(A9, A2:A7, 0)

The returned value is 4, because "Lollies" is the fourth item in the range.

	A	B	C	
1	Item	Price	Quantity sold	
2	Standard ice cream	2.5	300	
3	Double scoop	3.5	200	
4	Deluxe ice cream	5	100	
5	Lollies	1.25	200	
6	Crisps	1	120	
7	Canned drink	1	400	
8				
9	Lollies	4		
10				



Using the INDEX function

The INDEX function returns a particular data item, given its position in a range. The range must be in a single column or row. The function is structured like this:

=INDEX(range, item number)

For example, using our ice cream shop example (see Tip 41), we can look up the second item in the sales list (range A2:A7) using:

=INDEX(A2:A7,2)

This returns the value “Double scoop” as you would expect.

The INDEX function is most powerful when combined with the MATCH function. You can replace the item number in the range with a MATCH function, which can generate an item number by searching in another range. Then, INDEX can be a flexible replacement for VLOOKUP and HLOOKUP.

For example, to find the quantity of lollies sold, we’d use:

=INDEX(C2:C7, MATCH(“Lollies”, A2:A7, 0))

Here’s a ready reference for that combination:

=INDEX(range containing data to return, MATCH(data to search for, range to find it in, type of match))

You can use INDEX together with both a row number and a column number. The range doesn’t need to be a single row/column when you do that:

=INDEX(A2:C7, row number, column number)

MATCH can replace both the row and column numbers. Here’s an example, which searches the rows for “Lollies” and the columns for “Price” and returns the number in that cell:

=INDEX(A3:C8, MATCH(“Lollies”,A2:A7,0), MATCH(“Price”,A1:C1,0))

Using the CHOOSE function



The CHOOSE function is used to select an item from a list of items provided in the function. You provide the position number of the item you want, followed by a list of the items. The items can be numbers, pieces of text, or ranges.

This is how you use the CHOOSE function:

=CHOOSE(item number you want, list of items separated by commas)

For example:

=CHOOSE(4, "Monday", "Tuesday", "Wednesday", "Thursday", "Friday", "Saturday", "Sunday")

This would give you "Thursday".

You can use a cell reference in place of the item number:

=CHOOSE(A6, "Monday", "Tuesday", "Wednesday", "Thursday", "Friday", "Saturday", "Sunday")

If you type 3 into cell A6, you'll see "Wednesday" in the cell containing this CHOOSE function. If you don't provide a valid item number, you'll see an error message in the cell.

You can use CHOOSE to return a range, which can then be used in other functions. For example:

=SUM(CHOOSE(2, B2:B7, C2:C7, D2:D7))

Here, the CHOOSE function gives the range C2:C7 to the SUM function to add up.

If you want to select a random item, use the RANDBETWEEN function. It takes the lowest and highest numbers for your random number. Random numbers change whenever the spreadsheet is recalculated. Try this:

=CHOOSE(RANDBETWEEN(1,7), "Monday", "Tuesday", "Wednesday", "Thursday", "Friday", "Saturday", "Sunday")

Rounding data values

You can use the buttons in the Number group of the Home tab to increase or decrease the number of decimal places a cell shows. This doesn't change the number, though, which can lead to odd results when you do sums with them. If you enter 0.25 in two cells and format to one decimal place, they'll be shown as 0.3. But they'll still add up to 0.5.



To fix this anomaly, round the numbers themselves using the ROUND function. It works like this:

=ROUND(cell reference, number of decimal digits)

- 1 Insert a new column (if necessary) beside your data.
- 2 In a cell beside one of the figures you need to round, type in =ROUND(
- 3 Select the cell containing the data to round.
- 4 Enter a comma, followed by the number of decimal spaces you want to round to. For currencies, for example, enter 2.
- 5 Press Enter to add a closing parenthesis.
- 6 Your formula cell now contains the rounded value. Decimal digits of 5 or above are rounded up, and others are rounded down. You can copy the formula down to round other values in the column. Then, you can copy the cells with rounded numbers and paste their values over the unrounded data (see Tip 12).

Using advanced rounding functions

The ROUND function is great for most purposes, but there are additional functions that give you more control over how data is rounded:

- **ROUNDUP**(cell reference, number of decimal digits). This function always rounds numbers up. For example, ROUNDUP(2.111, 2) gives 2.12 and not 2.11. If you're rounding negative numbers, it rounds them away from zero.
- **ROUNDDOWN**(cell reference, number of decimal digits). This function always rounds numbers down. For example, ROUNDDOWN(2.199, 2) gives 2.19 and not 2.2. If you're rounding negative numbers, it rounds them towards zero.

Raw data	ROUND	ROUNDUP	ROUNDDOWN
2.22	2.2	2.3	2.2
2.25	2.3	2.3	2.2
2.27	2.3	2.3	2.2
-2.22	-2.2	-2.3	-2.2
-2.25	-2.3	-2.3	-2.2
-2.27	-2.3	-2.3	-2.2

- **TRUNC**(cell reference, number of decimal digits to keep). This function truncates (or shortens) the number by chopping off the decimal part. If you don't tell it how many digits to leave, it removes all of the decimal portion. TRUNC(2.777, 1) gives you 2.7. TRUNC(2.777) gives you the whole number 2.
- **MROUND**(cell reference, multiple). This function is used to round to the nearest multiple of a number. For example, you could see which multiple of 10 is closest to a particular number. 22 would round to 20. 25 would round to 30.

Calculating with dates

You might have noticed that dates turn into (usually quite big) numbers if you format a date as a number.

That's because Excel doesn't store the date, month, and year of a date. Instead it records a date as the day number, counting from 1st January 1900. When Excel displays the date to you, it decodes it into the form you want to use.

Because dates are stored as numbers, you can perform simple calculations on them:

- You can work out how many days there are between two dates by just subtracting the earlier date from the later date, as this example shows:

C33			
=B33-A33			
	A	B	C
32	Start	End	Days
33	01 January 2030	31 December 2030	364

There is also a function for this. **DAYS(end date, start date)** will count the days between two dates.

- You can add a number of days to a date. For example, if your invoice is due in 30 days, you can work out the due date by adding the number 30 to the date the invoice was issued.

C36			
=B36+A36			
	A	B	C
35	Invoice date	Payment terms	Payment due
36	01 February 2025	30	03 March 2025

Making dates and breaking them down

Excel provides several functions for date handling. They make it easy to split the date up into its constituent parts, and help you compile your own dates in the correct format:

- **DAY(cell containing date).** Extracts the day number from the date in the cell you give it.
- **MONTH(cell containing date).** Pulls out the month number from the date.
- **YEAR(cell containing date).** Extracts the year from the date in the cell.

	A	B	C
39	Date	Formula	Result
40	14 February 2025	=DAY(A40)	14
41	14 February 2025	=MONTH(A41)	2
42	14 February 2025	=YEAR(A42)	2025
43			

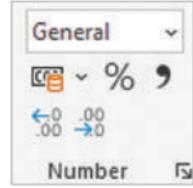
- **DATE(year, month, date).** Creates a date in the correct Excel format, using the numbers you give it. Note that Excel cannot handle years before 1900. If you enter a lower number than 1900, it'll be added to 1900 to make a year later than 1900.

	A	B	C	D
46	Year	Month	Day	Date
47	2025	10	17	17 October 2025



Creating custom date formats

You can create your own date formats. Click the cell(s) containing the dates you want to format, then click to expand the Number group of the Home ribbon. Use the small arrow beside where it says Number. To create your own date format, click Custom in the category list. In the Type box, enter the code for your custom format. The code is made up of these symbols:



- **d**. Days as numbers 1 to 31.
- **dd**. Days as numbers 01 to 31.
- **ddd**. Short day names: Sun, Mon, Tue, etc.
- **dddd**. Full day names: Sunday, Monday, Tuesday, etc.
- **m**. Months as numbers 1 to 12.
- **mm**. Months as numbers 01 to 12.
- **mmm**. Short month names: Jan, Feb, Mar, etc.
- **mmm**. Full month names: January, February, etc.
- **mmmm**. The first letter of the month: J, F, M, etc.
- **yy**. Year as two digits – e.g. 25 for 2025.
- **yyyy**. Full four-digit year.

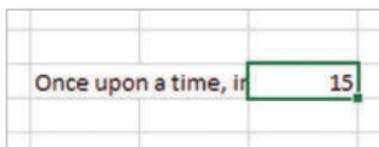
For example, to get a date in the form of **Friday, 31 Oct 25**, you would use: **dddd, dd mmm yy**.

Sample
Friday, 31 Oct 25
Type:
dddd, dd mmm yy

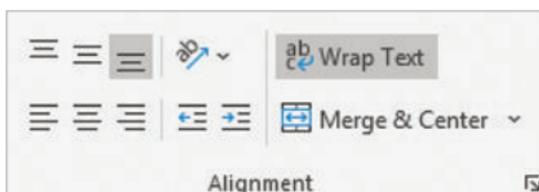
Using multiple lines of text in cells

Here are some tips for working with lengthy text that spans multiple lines within the cell.

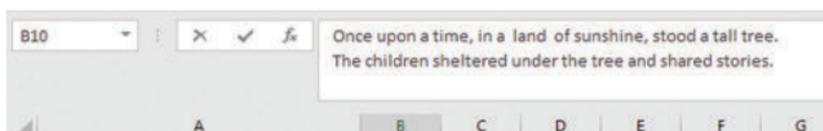
- 1 By default, text will spill out of the right of the cell and into other cells to the right of it. If data is entered into one of those other cells, it will cover your text, as shown here.



To fix this, click the cell with the text in and then click the Wrap Text button on the ribbon. It's in the Alignment group of the Home tab. (You can adjust the column width too – see Tip 4.)



- 2 To enter a line break when you're typing text into a cell, use Alt + Enter.
- 3 To edit your text more easily, expand the formula bar. Click it and drag the bottom of it down.



Cleaning your text

There are several functions you can use to clean your data to avoid unexpected outcomes later on, and to ensure your spreadsheet output looks right:

- **TRIM(cell containing text)**. This function strips out all spaces at the start and end of text, and any extra spaces in the middle. Here's an example of the output below, with the length shown so you can see where there are spaces at the end.

	A	B	C	D
15	Text	Length (untrimmed)	Trimmed text	Length (trimmed)
16	ABC	5	ABC	3
17	AB C	10	ABC	4
18	ABC	8	ABC	3

- **CLEAN(cell containing text)**. This function strips out the first 32 non-printing characters in the character set, including line breaks. You're only likely to need this if you've imported text from another computer system. If you see strange symbols in your data, this might help.
- **PROPER(cell containing text)**. This function is used to capitalize the first letter of each word. It can clean up the formatting of names. It doesn't accurately capitalize names with a capital mid-way through, though (such as McCartney).
- **UPPER(cell containing text)**. This converts the text to capital letters. You could use it to standardize order codes, for example.
- **LOWER(cell containing text)**. This function converts text to lower case.

Joining text from different cells

There are three ways you can join pieces of text:

- The & operator.** Here's an example, where I've made an email address by joining the first name, a dot, last name, and the "@example.com" part of the address. Some of the text is in the spreadsheet cells, and some of it is in the formula. When you put text in a formula, you put quotation marks around it, "like this".

	A	B	C
1	First name	Last name	Email address
2	Willy	Orwonti	Willy.Orwonti@example.com
3			

- CONCAT(text to join, text to join...).** This is short for concatenate, which basically means to join things up. Before Excel 2016, this was called CONCATENATE.

	A	B	C	D
1	First name	Last name	Email address	
2	Al	Dente	Al.Dente@example.com	
3				

- TEXTJOIN(text to add between joined text, ignore empty?, text to join, text to join...).** This function was new in Excel 2016. It's great for joining names because you can tell it to add a space between joined words, and to ignore empty cells. It works with a range too.

	A	B	C	D	E
1	Title	First name	Middle name	Last name	Email address
2	Mr	Billy		Fish	Mr Billy Fish
3		Sally	Jane	Smith	Sally Jane Smith
4	Dr	Alex	Chris	Jones	Dr Alex Chris Jones
5					

Getting the length of a piece of text

In Excel (and many other computing arenas), a piece of text is called a string. It can be helpful to know the length of a string. For example, you might use a spreadsheet to organize social media content, and need to keep a close eye on character counts.

Tweets	Length
Download a free chapter from #Scratch Programming in Easy Steps here. [Link]	76

You can use the LEN function to count how many characters (including spaces) are in a piece of text.

- 1 Enter the text you want to know the length of.
- 2 In another cell where you would like to see the text length displayed, enter =LEN(
- 3 Click the cell containing the content you want the length of.
- 4 Type a closing parenthesis). Now, if you wanted to see the length of the text in cell A1, your cell would contain =LEN(A1)
- 5 Press Enter to see the length shown in your spreadsheet. The count includes any spaces in the string, even if they're at the end of the text in the cell you're counting. When the text in the cell changes, your text length will update automatically.

Searching in text



There are two Excel functions you can use to search inside the text in a cell:

- The **FIND** function is case-sensitive, which means it treats capital and lower case letters as if they were different letters. If you look for a “k” in “Karen”, you won’t find it using FIND because the K in that string is capitalized. If you want an exact match, FIND is ideal.
- The **SEARCH** function is not case-sensitive, and it also enables you to use wildcards to search (see Tip 32). This is a more flexible option, and is the one you’ll want to use most of the time. The exception might be if you want to search your text for an asterisk or a question mark. SEARCH will treat them as wildcards instead of looking for them in the text, unless you use a tilde before the asterisk or question mark. It might be simpler to use FIND instead in that case.

The result is the first position number where your text was found in the cell you’re searching. The count starts at 1 for the first character in that cell. If the text you’re looking for is not found in the text you’re searching, you’ll get the error message #VALUE.

Both functions use a similar format:

=FIND(text to find, cell to search, starting position)

=SEARCH(text to find, cell to search, starting position)

Use the optional starting position if you don’t want to start looking from the beginning of the text you’re searching. For example:

=SEARCH(“hello”, A1, 5)

searches cell A1 from the fifth character in that cell, for the text “hello” in any combination of upper or lower case.

Extracting pieces of text

There are three functions you can use to extract pieces of text or parts of a number from a cell:

- **LEFT(cell containing text, number of letters).** Extracts the first letters from a cell. If you don't include the number of letters, the function gives you the first letter.
- **RIGHT(cell containing text, number of letters).** Extracts the final letters from a cell. If you don't specify how many letters, the function gives you the last one.
- **MID(cell containing text, start position, number of letters).** Extracts some text from the middle of the cell.

For example, if cell A3 contains an order code and the first four letters indicate the product type, you could extract the product type using:

```
=LEFT(A3, 4)
```

Imagine you had a six-digit part number (e.g. 198542) in cell A23, where the middle two digits indicated the bin where they're stored in the warehouse (see screenshot below). You could extract the bin number using:

```
=MID(A23,3,2)
```

This gives us two digits, starting with the third digit (85). Note that you can use MID with numbers, as well as text.

	A	B	C
21	Part number	Warehouse bin	
22	375431	54	
23	198542	85	
24	154231	42	
25			

Splitting first and last names

You might have a spreadsheet where each person's first and last name is combined in a single cell. You can use a combination of the LEFT, RIGHT, and FIND functions to split the names into separate cells. (See also Tip 3 & Tip 56.)

You use the FIND function to find the position of the space in the cell. You can then use that with the LEFT and RIGHT functions to pull out the first and last names.

To find the position of the space in cell A2, you would use:

```
=FIND(" ", A2)
```

If the name is, for example, "George Harrison", the space is in position 7. We only need the first six characters for the name, so when we put the FIND function in place of the number of letters we want to extract, we subtract 1:

```
=LEFT(A2, FIND(" ", A2) - 1)
```

	A	B	C
1	Full name	First name	Last Name
2	George Harrison	George	Harrison
3	John Lennon	John	Lennon
4	Paul McCartney	Paul	McCartney
5	Richard Starkey	Richard	Starkey

To work out how many letters to take from the right, we work out how long the whole name is and then subtract the position number of the space:

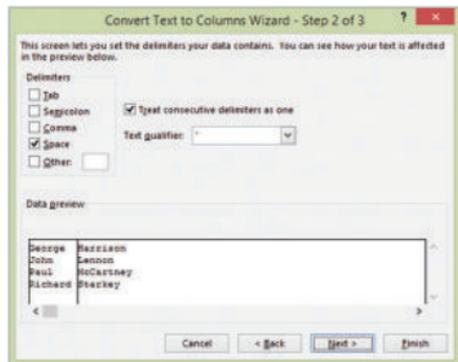
```
=RIGHT(A2, LEN(A2) - FIND(" ", A2))
```

	A	B	C
1	Full name	First name	Last Name
2	George Harrison	George	Harrison
3	John Lennon	John	Lennon

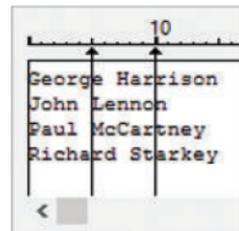
Splitting text across columns

You can also split text (including first and last names) using the Text to Columns feature. This won't update the names when the joined name changes, unlike a formula (see Tip 55).

- 1 Select the cells containing the text to split.
- 2 Click the Data tab, and choose Text to Columns.
- 3 Choose "Delimited" if you want to separate text using spaces, commas, or other symbols. Choose "Fixed width" if you want to always have the same number of characters in each column. Click Next.
- 4 When you choose "Delimited", you can choose which symbols (or "delimiters") are used to split the column. If you're splitting names, choose Space as your delimiter. Click Next.



- 5 Using "Fixed width", you click and drag lines to show where to split the text. Click Next.

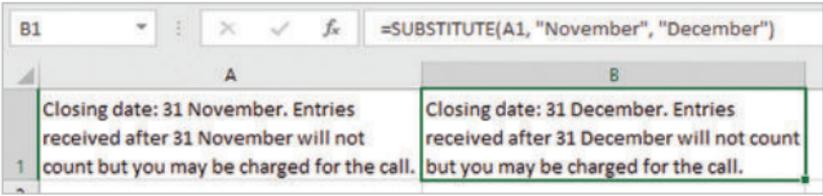


- 6 You can (optionally) choose the data format to use for each column by clicking the column in the data preview, then choosing the data format above. Click Finish.

Replacing text in a cell

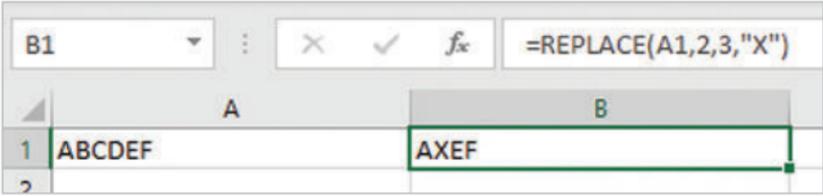
There are two functions you can use to replace text:

- **SUBSTITUTE**(cell containing text, characters you want to replace, new characters you want to use, which occurrence you want to replace). This will replace the characters you specify with new characters. If you miss out the last option, all of the occurrences will be replaced. This function is useful if you want to change words or phrases and you don't know (or don't mind) where they are in the cell. Here's an example, where the function is used to replace the word "November" with "December" each time it occurs in the text:



	A	B
1	Closing date: 31 November. Entries received after 31 November will not count but you may be charged for the call.	Closing date: 31 December. Entries received after 31 December will not count but you may be charged for the call.

- **REPLACE**(cell containing text, position number of first character you want to replace, number of characters you want to replace, new text). Use REPLACE to change specific characters in the cell. It might be useful if you have data such as order codes, which follow a particular pattern. The number of characters you replace and the number of new characters you introduce can be different. You can replace three characters with one character, for example. Here, I replace three characters (BCD) starting at position 2 (B), with the single character "X":

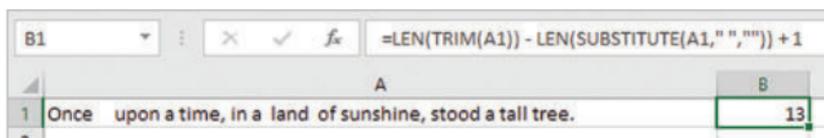


	A	B
1	ABCDEF	AXEF
2		

Counting the number of words in a cell

There isn't a built-in function to count the number of words in a cell, so it requires a formula. The formula works by removing the spaces, and then seeing how much shorter the resulting text is. You'll need the SUBSTITUTE (see Tip 57), LEN (see Tip 52) and TRIM (see Tip 50) functions.

- 1 Start by getting the length of the text where you want to count words. I'm using cell A1. To avoid errors, we'll use TRIM to remove any extra spaces. Enter the following in the formula bar:
`=LEN(TRIM(A1))`
- 2 We're going to remove the spaces in the cell. We use SUBSTITUTE to tell Excel to replace spaces with nothing, by using quotation marks with nothing between them for the replacement text. (The first quotation marks contain a space.) We then need to wrap all of that in a LEN function to work out how long the string is now, and we're going to subtract that from the length of the original string. Add the new parts of your formula shown here:
`=LEN(TRIM(A1)) - LEN(SUBSTITUTE(A1," ",""))`
- 3 Finally, we need to add 1 to make it accurate, because the last word doesn't have a space after it. Your final formula is:
`=LEN(TRIM(A1)) - LEN(SUBSTITUTE(A1," ","")) + 1`



Counting occurrences of a word or phrase

To count the number of times a particular word, phrase or character sequence appears in a piece of text you use a similar approach to that for getting a word count (see Tip 58). You replace the text you are searching with nothing and work out how much shorter the text is now. That will tell you how many characters were removed, so you divide the result by the length of the text you're looking for to work out how many occurrences there are of your text.

Take care with the parentheses in this formula!

- 1 We'll start our formula with an opening parenthesis, and then work out the length of the text we're searching. My text is in cell A1. My formula begins like this:

$$=(LEN(A1)$$
- 2 Now, we'll search for and remove the text we want to count, using SUBSTITUTE. I'm going to search for the letters "ab". We'll count how long the text is after we've done this, so we'll wrap this in a LEN function. We're going to subtract this from the original length of the text. We're going to close the parenthesis we opened at the start of this formula here too. Add the new parts to your formula as shown here:

$$=(LEN(A1) - LEN(SUBSTITUTE(A1,"ab","")))$$
- 3 Finally, we need to divide the result by the length of the text we're counting. Here's the complete formula:

$$=(LEN(A1) - LEN(SUBSTITUTE(A1,"ab",""))) / LEN("ab")$$



Debugging: Tracing precedents

Excel has some features to help you remove errors from (or “debug”) formulas. By tracing precedents, you can quickly see where the data used in your formula comes from.

1 Select the cell containing the formula that you wish to investigate.

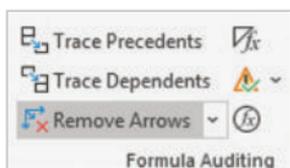
2 On the Formulas tab, click Trace Precedents in the Formula Auditing group. An arrow appears with dots on it, showing where the values come from that feed into your formula. In my example, it shows the two values used to calculate the profit.

	A	B
1		
2		
3	Sales	100
4	Sale price	\$5.00
5	Revenue	\$500.00
6		
7	Unit cost	\$3.77
8	Total cost	\$377.00
9		
10	Profit	\$123.00

3 Click Trace Precedents again, and you can dig deeper. In my example, it shows the values used to calculate the revenue and total cost, which are ultimately used to work out the profit. You can keep going deeper and deeper until you hear the error gong.

	A	B
1		
2		
3	Sales	100
4	Sale price	\$5.00
5	Revenue	\$500.00
6		
7	Unit cost	\$3.77
8	Total cost	\$377.00
9		
10	Profit	\$123.00

4 Click Remove Arrows on the ribbon when you’ve finished.

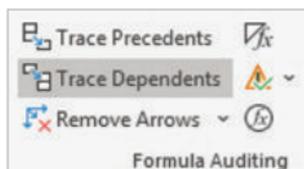


Debugging: Tracing dependents

Excel also enables you to trace a cell to the formulas that rely on it, so you can track down any errors more easily.

1 Select the cell containing the value that you wish to investigate. This cell can contain a formula or a number value. I'm tracing the sales volume (B3).

2 On the Formulas tab of the ribbon, click Trace Dependents. You'll find it in the Formula Auditing group.



3 Arrows extend from your chosen cell to those that use it in their formulas. In my example, you can see the sales number is used to work out the revenue and the total cost.

	A	B
1		
2		
3	Sales	100
4	Sale price	\$5.00
5	Revenue	\$500.00
6		
7	Unit cost	\$3.77
8	Total cost	\$377.00
9		
10	Profit	\$123.00

4 You can click Trace Dependents again to see which cells use those results. In my example, it extends an arrow to the Profit box, so you can trace how the sales volume ultimately influences that figure (see bottom right).

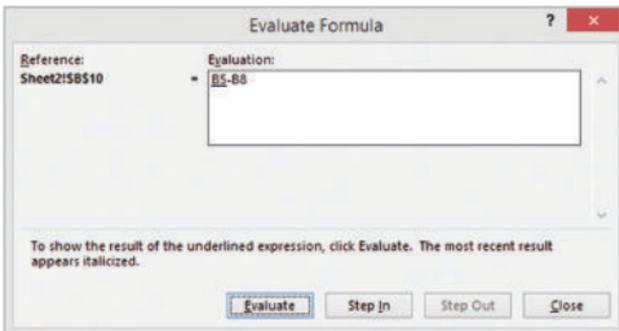
	A	B
1		
2		
3	Sales	100
4	Sale price	\$5.00
5	Revenue	\$500.00
6		
7	Unit cost	\$3.77
8	Total cost	\$377.00
9		
10	Profit	\$123.00

5 Click Remove Arrows on the ribbon when you've finished debugging.

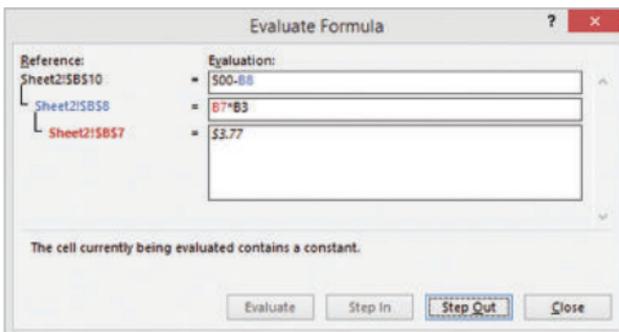
Debugging: Evaluating formulas

Excel can break a complex formula down and step you through it so you can understand the results you're getting.

- 1 Select the cell containing the formula.
- 2 On the Formulas tab (Formula Auditing group), click Evaluate Formula. It's just an icon on small screens.
- 3 You see the formula for the cell you're studying. You click Evaluate to expand the underlined part of the formula and show the number there.



- 4 If a value comes from another formula, click Step In to see that formula and break it down. Use Step Out to go back up a level.



Using the Watch Window



You can use the Watch Window to keep an eye on important values, wherever you scroll the spreadsheet.

- 1 On the Formulas tab of the ribbon, click Watch Window. It's in the Formula Auditing group.
- 2 A new window opens that floats on top of your spreadsheet. If it's in the way, you can click and drag it at the top to reposition it on your screen.
- 3 Click the Add Watch button in this window.
- 4 Select the cell you want to watch. You can use the Watch Window to watch cells on different worksheets and even in different open workbooks (Excel files).
- 5 Now you can see that cell's contents, even if they're not currently visible in the spreadsheet. The Watch Window updates whenever the contents of those cells change in the spreadsheet.



Book	Sheet	Name	Cell	Value	Formula
sales plan.xlsx	Sheet1		B10	\$123.00	=B5-B8
sales plan.xlsx	Sheet1		B5	\$500.00	=B3*B4
sales plan.xlsx	Sheet1		B8	\$377.00	=B7*B3

- 6 When you no longer need to watch a cell, select it in the Watch Window and click Delete Watch.

Adding simple conditional formatting

Conditional formatting changes the appearance of cells depending on their values. It helps you understand your data at a glance, by showing you whether values are high or low, compared to others in the same range.

- 1 Select all the cells in the range you want to compare.
- 2 On the Home tab, click Conditional Formatting in the Styles group.
- 3 For simple conditional formats, choose Data Bars, Color Scales, or Icon Sets. They're shown on this page, from top to bottom. You can choose different styles for each format. Data bars put a bar chart in each cell to show you how it compares to others. Color scales use color gradients, in my example going from red (low), through yellow to green (high). Icon sets divide the data up. In this three-icon set, for example, the top third of values have a green icon, the middle third yellow, and the bottom third red.

	Jan	Feb	Mar	Apr	May	Jun
A Team	91	46	15	55	75	26
B Team	55	28	22	89	52	23
C Team	42	99	22	10	78	87

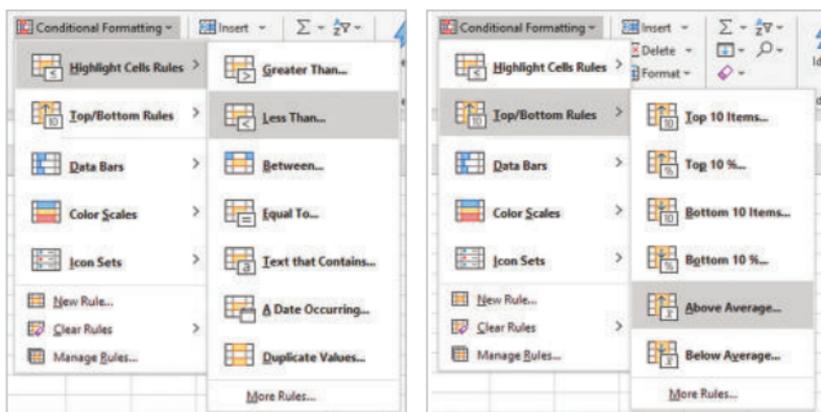
	Jan	Feb	Mar	Apr	May	Jun
A Team	91	46	15	55	75	26
B Team	55	28	22	89	52	23
C Team	42	99	22	10	78	87

	Jan	Feb	Mar	Apr	May	Jun
A Team	91	46	15	55	75	26
B Team	55	28	22	89	52	23
C Team	42	99	22	10	78	87

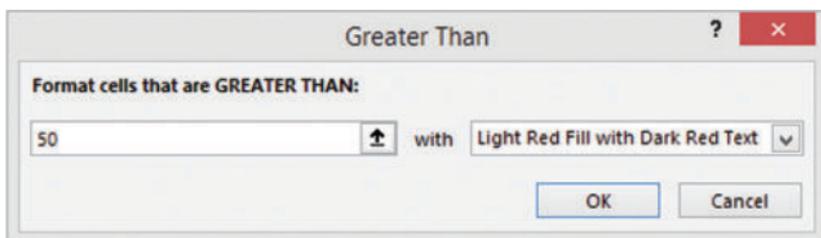
Adding advanced conditional formatting

You can also write your own rules for conditional formatting.

- 1 Select all the cells you want to compare.
- 2 On the Home tab, click Conditional Formatting. Choose Highlight Cells Rules (shown left, below) to compare with particular values, or Top/Bottom Rules to compare the data with itself (shown right, below). For example, under Top/Bottom Rules, you can highlight values that are above or below average, or the top or bottom 10 values.



- 3 You can then enter a value (if appropriate), and choose which color to use.



- 4 Click OK to apply your formatting.

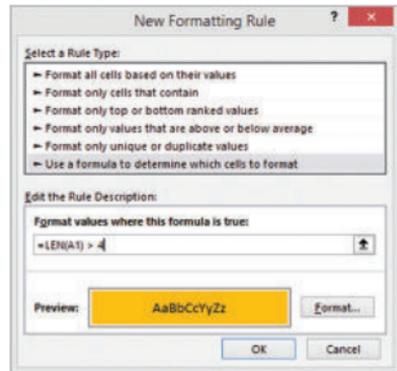
Creating new rules for conditional formatting

You can create your own rules for conditional formatting, using any formula. As an example, I'll show you how to highlight text with more than four characters.

- 1 Select the first cell that you want to apply this formatting to. I've selected cell A1.
- 2 From the Conditional Formatting menu, choose New Rule.

- 3 Click "Use a formula...".

- 4 In the box provided, enter your formula. When the result of this formula is true, your cell will be formatted. Avoid using the cursor keys to edit your formula: they change the cell references instead.



Use the reference of your cell where appropriate. For example, my formula is:
`=LEN(A1) > 4`

- 5 Click the Format button to choose the formatting to use when your formula is true.

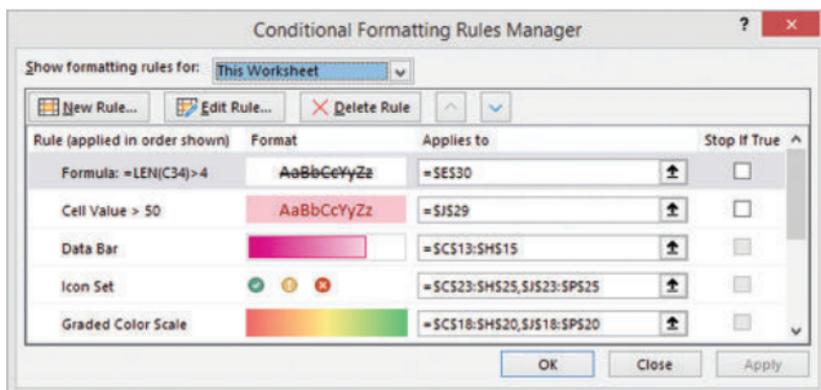
- 6 Click OK to apply your formatting.

- 7 Use the Format Painter (see Tip 67) to copy the conditional formatting to other cells.

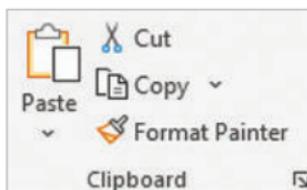
Managing conditional formatting

See how to delete, copy, and manage conditional formats:

- 1 In the Conditional Formatting menu, use Clear Rules to remove the conditional formatting, while leaving other formatting on the cell intact.
- 2 Use Manage Rules to see the rules in use. You can select a range first, or use the menu at the top to see all the rules that apply to the worksheet. Note that multiple rules can apply to the same cell. You could, for example, create two rules that highlight long text one color, and short text another color. When you select a rule, you can edit it or delete it using the buttons in this window.



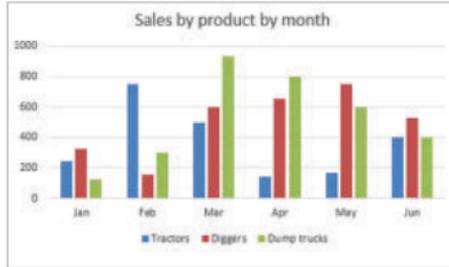
- 3 To copy conditional formatting (or any formatting, in fact), use the Format Painter. Click the cell containing the formatting and select the Format Painter in the Clipboard group of the Home tab. Then, select the cells you want to copy the formatting to.



Visualizing your data

There are several useful ways to visualize data. They're on the Insert tab.

- 1 Select your data, including its column and row titles, and insert a bar chart or pie chart.



- 2 If your data has a geographic element, you can insert a color-coded map (new in Excel 2019).



- 3 Sparklines are graphs inside a cell. You can choose line or bar graphs. They show you trends, and you can highlight the high and low points in a different color using the Sparkline tab.

	Jan	Feb	Mar	Apr	May	Jun	
Tractors	247	750	500	145	165	400	
Diggers	325	155	600	655	750	530	
Dump trucks	125	300	932	800	600	400	

Using Quick Analysis

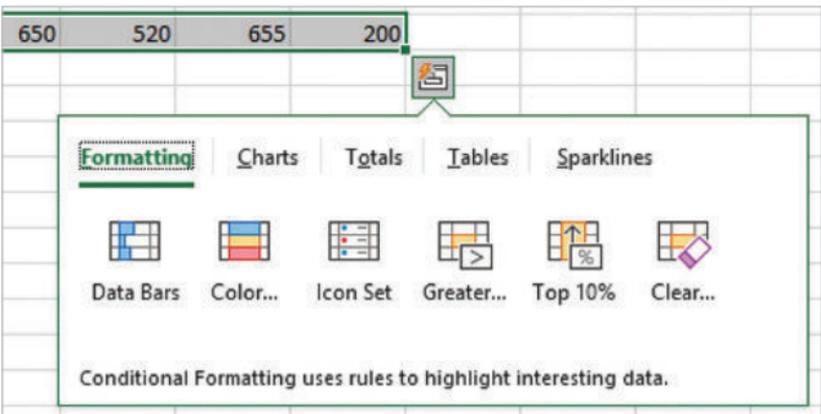
Excel 2013 introduced Quick Analysis, which gives you rapid access to popular analysis features.

- 1 Select your data.
- 2 At the bottom right of your selection is the Quick Analysis menu. Click it to open it, or use Ctrl + Q. If you use the keyboard shortcut, you can simply click in your data first, without selecting it all.

	Aug	Sep	Oct	Nov	Dec
)	650	455	540	877	100
)	700	800	200	100	50
)	530	650	520	655	200



- 3 Choose one of the available formats to apply it in a single click. For example, you can choose from five conditional formatting options and several charts, and you can add totals, or insert sparklines.



650	520	655	200
-----	-----	-----	-----

Formatting | Charts | Totals | Tables | Sparklines

Data Bars | Color... | Icon Set | Greater... | Top 10% | Clear...

Conditional Formatting uses rules to highlight interesting data.

Using What-If? scenarios

You can model different possibilities using What-If? scenarios. They enable you to store several values for a cell and switch between them, so you can see the effect on your calculations. It's simpler than retyping values into cells.

1 Create your spreadsheet as usual. It's a good idea to complete all the cells you'll be using to test your formulas work.

	A	B
1		
2		
3	Sales	100
4	Sale price	\$5.00
5	Revenue	\$500.00
6		
7	Unit cost	\$3.77
8	Total cost	\$377.00
9		
10	Profit	\$123.00
11		

2 Select the cell(s) you want to model different scenarios for. I'll select the unit cost and sale price cells, so I can see how the profit is affected by them changing.

3 Click the Data tab on the ribbon. Click What-If Analysis, and open the Scenario Manager.

4 Click the Add button. Give your scenario a descriptive name, and click OK.

Add Scenario ? X

Scenario name:
Costs rise 10%, sales price flat

Changing cells:
B4,B7

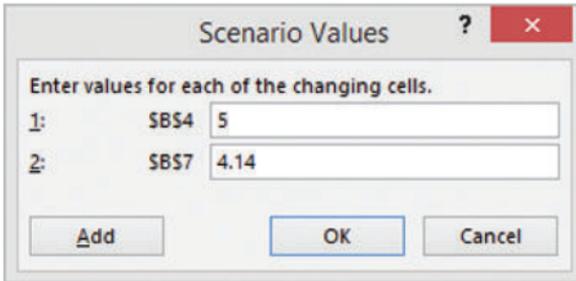
Ctrl+click: cells to select non-adjacent changing cells.

Comment:
Created by Sean on 20/12/2019

Protection
 Prevent changes
 Hide

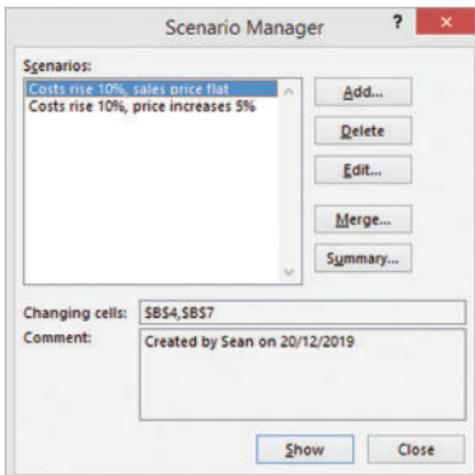
OK Cancel

- 5 Enter the values for the cells that you want to change for the scenario. In my case, I'm going to increase the cost for this scenario, but leave the price the same.



- 6 Click Add to add another scenario or OK if you've finished. You can add many scenarios.

- 7 To view a scenario, open the Scenario Manager. Select the scenario and then click Show. The cells are updated with the values for that scenario, and the formulas are recalculated. Use Edit in the Scenario Manager to add new cells to the scenario.



Using data tables

Data tables show you the formula results from a range of inputs, so you can see them side by side. You might find it easiest to learn this by trying my example. I want to see how the profit varies with different sales volumes.

- 1 Create your worksheet, including the formula for calculating your result. Then, add a column of input values you want to test. To the right and one cell above, add a cell reference to the result of your formula. See my example below, where I'm showing the formulas in the cells. (You can get this view using `Ctrl + ``, which is a grave accent, or by clicking Show Formulas in the Formula Auditing group of the Formulas tab.)

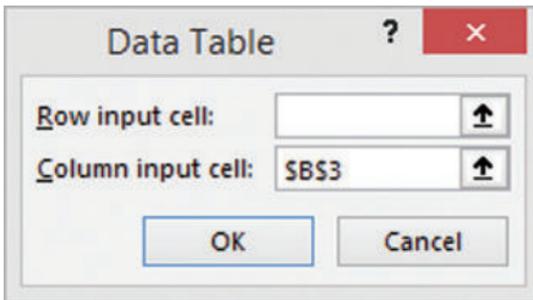
	A	B	C	D	E
1				Sales	Profit
2					=B10
3	Sales	100		100	
4	Sale price	6.1		200	
5	Revenue	=B3*B4		300	
6				400	
7	Unit cost	4.14		500	
8	Total cost	=B7*B3		600	
9					
10	Profit	=B5-B8			

- 2 Select the column of input values, and the formula reference, as shown on the right.

Sales	Profit
	\$196.00
100	
200	
300	
400	
500	
600	

- 3 Go to the Data tab, choose What-If Analysis, and select Data Table.

- 4 Click in the Column input cell box (because the inputs we want to test are organized in a column). Then, click the cell that shows where this input value belongs on the main part of your worksheet. For example, I'm modeling how the profit changes with different sales volumes. So I now select the cell that contains the sales volume. Click OK.



- 5 Your data table is completed with the formula results for each of your inputs. Mine shows, for example, that a sales volume of 600 generates a profit of \$1176. I can test this is correct by entering 600 in box B3 and seeing how that changes the profit shown on the left. You'll need to format the new cell contents correctly.

	A	B	C	D	E
1				Sales	Profit
2					\$196.00
3	Sales	100		100	196
4	Sale price	\$6.10		200	392
5	Revenue	\$610.00		300	588
6				400	784
7	Unit cost	\$4.14		500	980
8	Total cost	\$414.00		600	1176
9					
10	Profit	\$196.00			

Modeling two formulas in a data table

You can also create a data table that shows the outcome for two formulas as one of the inputs changes.

- 1 Create your worksheet, including the formulas for calculating your results. Then, add a column of input values you want to test. To the right and one cell above, add a cell reference to the result of your first formula. In the cell beside it, add a cell reference to your other formula.

	A	B	C	D	E	F
1				Sales	Profit	Total cost
2					=B10	=B8
3	Sales	100		100		
4	Sale price	6.1		200		
5	Revenue	=B3*B4		300		
6				400		
7	Unit cost	4.14		500		
8	Total cost	=B7*B3		600		
9						
10	Profit	=B5-B8				

- 2 Select the column of input values, and the formula references, as shown on the right.

Sales	Profit	Total cost
	=B10	=B8
100		
200		
300		
400		
500		
600		

- 3 Go to the Data tab, choose What-If Analysis, and select Data Table.

- 4 Click in the Column input cell box. Then, click the cell that shows where your varying input value appears in the main part of your worksheet. For example, I chose the cell (B3) with my sales volume in. Click OK to see your results.

Using two-dimensional data tables

You can also use data tables to test the effect of changing two of the inputs. I'll use the sales and profit example again.

- 1 Enter your data for your calculation, as before. On the right, add a grid of values you want to test. I'm testing the sales price and the sales volume.

	A	B	C	D	E	F	G	H
1						Sales Price		
2						\$5.00	\$6.00	\$7.00
3	Sales	100		Sales volume	100			
4	Sale price	\$6.10			200			
5	Revenue	\$610.00			300			
6					400			
7	Unit cost	\$4.14			500			
8	Total cost	\$414.00			600			
9								
10	Profit	\$196.00						

- 2 Enter the reference to your formula result in the top-left corner of your cell. I put =B10 in cell E2.

- 3 Select the data cells in your table.

		Sales Price		
	\$196.00	\$5.00	\$6.00	\$7.00
Sales volume	100			
	200			
	300			
	400			
	500			
	600			

- 4 Go to the Data tab, choose What-If Analysis, and select Data Table.

- 5 In the row input cell, enter the cell for your data along the top of your table (it's in a row). Put the cell for your other data item in the other box. Click OK. My table shows the profit (from the formula in B10) for each price and volume combination.

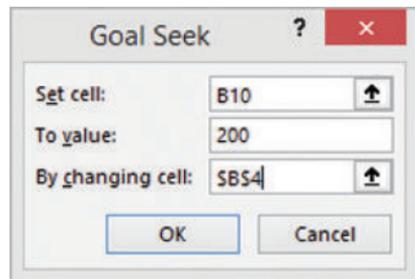
Data Table		?	×
Row input cell:	<input type="text" value="\$B\$4"/>		
Column input cell:	<input type="text" value="\$B\$3"/>		
		OK	Cancel

Using Goal Seek

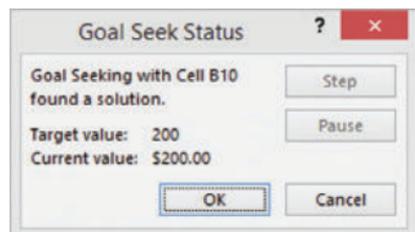
If you know the result you want from a formula, but don't know the numbers that will give you that result, Goal Seek can help. This feature can be used, for example, to work out the sales price required to achieve a specific profit.

- 1 Create your spreadsheet as usual, including any formulas you will need. It's a good idea to add data in the cells the formulas use to test your formulas work.
- 2 Select the cell containing the formula that you want to find the input numbers for. I'm selecting the cell with my profit formula (see Tip 73).
- 3 Click the Data tab on the ribbon. Click What-If Analysis, and choose Goal Seek.

- 4 The Goal Seek dialog opens. The first box should contain the reference to your formula cell – in my case, the profit calculation. The second box is for the target number for that formula. In the third box, tell Excel which cell to change to achieve that value. That's my sales price in cell B4.



- 5 Click OK. The spreadsheet is updated with the answer.



Preparing data for a pivot table

Pivot tables enable you to summarize and analyze your data, and can give you incredible insight. Using a pivot table, you can easily create totals, averages, and counts across a huge number of individual data items. You can improve the performance of your pivot table by cleaning your data first.

- 1 Use standard descriptions for your data. If you spell a company name or product name in two different ways, they'll be shown as separate items in the pivot table, instead of having their values combined. See Tips 7-9 for tips on data validation.
- 2 Delete any blank columns or rows in your data set to ensure the data in your pivot table is complete, and does not include entries for (blank).
- 3 Ensure your data has a single row containing meaningful titles for each column.
- 4 For best results, organize your data so that each row represents a unique time period or data item. For example, each row might represent a single transaction, or a single month's sales. If a row contains several data items (such as sales for different months in different columns), the pivot table will be less useful. Here's an example of a good data set. Each row contains the details for a single transaction. You could have many more columns and rows.

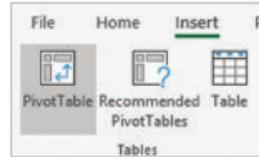
	A	B	C	D	E
1	Date	Customer	Country	Product	Sale value
2	07 January 2024	Sixways Independent Trading	UK	Adhesives	750
3	08 January 2024	Megadino Publications	US	Paper	400
4	12 February 2024	Overture Science	US	Storage	70
5	12 February 2024	Megadino Publications	US	Ink	870
6	14 February 2024	Emcazet Corporation	US	Adhesives	800
7	09 March 2024	Sixways Independent Trading	UK	Coffee	70

Creating a pivot table

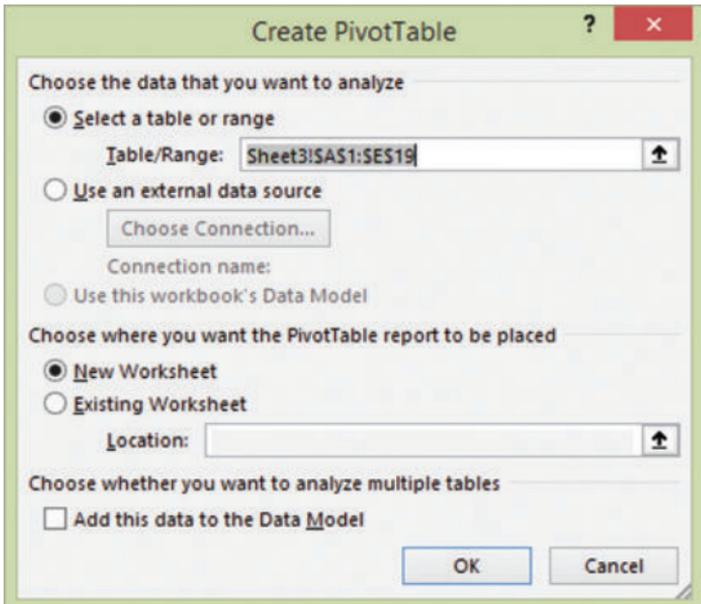
Follow these steps to build a pivot table.

1 Click to position your cursor inside the data you want to analyze. It doesn't matter where in the data you position the cursor.

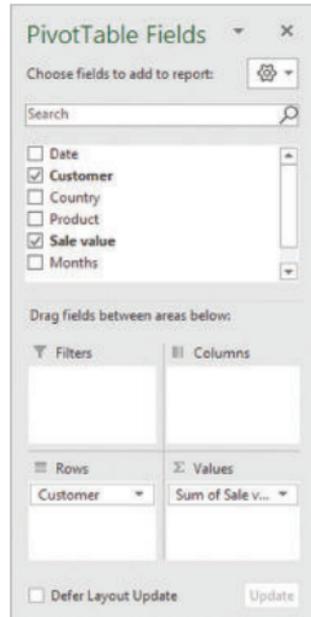
2 Click the Insert tab, and click the PivotTable button. If you can't see it because your screen isn't wide enough, you'll find it by clicking Tables on the Insert tab.



3 In the options, you can change the table or range used. You can also choose to insert the pivot table into your existing worksheet, instead of putting it into a new worksheet. Usually, you'll want to simply click OK without making any changes here. This will create a pivot table based on your island of data, in a new worksheet.



4 The pivot table fields are used to design the layout of your pivot table. The field names are the same as the column names above your data, but we use the word “fields” and not “columns” now because you can arrange this data however you like. Within the PivotTable Fields panel, you drag the fields from the list into one of the boxes below. The data item you want to total goes into the Values box. In my case, it’s the “Sale value” field. Drag another field, such as Customer name or Country, into the Rows box. The pivot table will give you a total for each of the fields (for example, for each country).



5 To make a two-dimensional pivot table, drag another field into the Columns box. I dragged the Date field in and Excel automatically grouped transactions by month for me. It now shows me sales value by customer and month.

Sum of Sale value	Column Labels						
Row Labels	Jan	Feb	Mar	Apr	May	Jun	Grand Total
Emcazet Corporation		800		330			1130
Megadino Publications	400	870				700	1970
Overture Science		70	70			210	350
Political Cybernetics			700	500			1200
Sixways Independent Trading	750		540		600		1890
Twinkle Bee Media			900		140		1040
Grand Total	1150	1740	2210	830	740	910	7580

Deeper analysis with pivot tables

Why not add another dimension to your analysis?

- 1 You can add another field to your column or row box. For example, I added the Country above the Date in the Columns box. That gave me the total sales for each country, and a + button on the pivot table to drill down into detail by month. If I had put the Date first, I'd see the sales by month, with a button to break them down by country.

Column Labels
 UK Total | US | Grand Total |

 <tr>
 Row Labels | Jan | Mar | Apr | May | | | |

 </thead>
 <tbody>
 <tr>
 Emcazet Corporation | | | | | 1130 | 1130 | |

 <tr>
 Megadino Publications | | | | | 1970 | 1970 | |

 <tr>
 Overture Science | | | | | 350 | 350 | |

 <tr>
 Political Cybernetics | | 700 | 500 | | 1200 | 1200 | |

 <tr>
 Sixways Independent Trading | 750 | 540 | | 600 | 1890 | 1890 | |

 <tr>
 Twinkle Bee Media | | 900 | 140 | | 1040 | 1040 | |

 <tr>
 Grand Total | **750** | **2140** | **500** | **740** | **4190** | **9450** | **7580** |

 </tbody>
 </table>
 The task pane shows:

 Choose fields to add to report: Customer, Country, Product, Sale value, Months
 Columns: Country, Months, Date
 Rows: Customer
 Values: Sum of Sale value

 The task pane also has a 'Defer Layout Update' checkbox and an 'Update' button."/>

- 2 You can also add fields to the Filters box. When I put the Country into the Filters box (and remove it from the Columns box), the pivot table has a Country filter. When I view the UK, for example, I don't see the non-UK companies any more, and I get a monthly total and grand total for the UK.

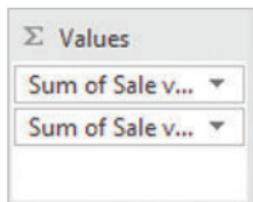
Country	UK				
Sum of Sale value	Column Labels				Grand Total
Row Labels	Jan	Mar	Apr	May	
Political Cybernetics		700	500		1200
Sixways Independent Trading	750	540		600	1890
Twinkle Bee Media		900	140		1040
Grand Total	750	2140	500	740	4130

Using averages and counts in pivot tables

By default, your pivot table will give you totals, based on the fields you put into the Values box on the PivotTable Fields panel. You can change this to get different values.

1

Add the fields you want to perform mathematical analysis on into the Values box. You can have more than one field here, or you could add the same field twice if you want to see both the total and the count of the sale, for example.

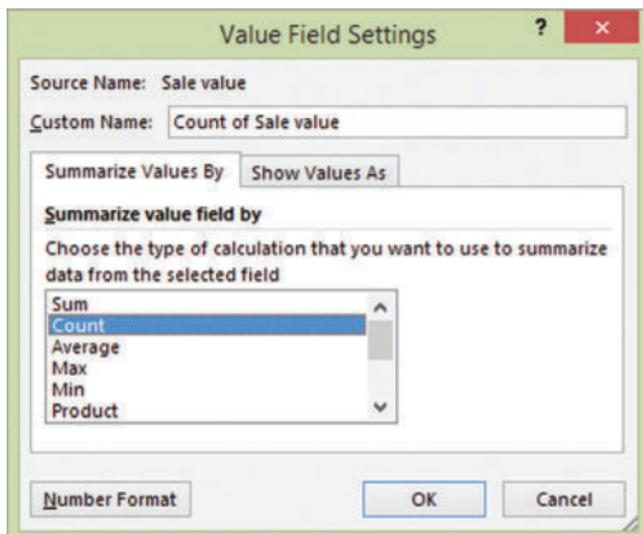


2

Click the field name inside the Values box to open a menu. Click Value Field Settings.

3

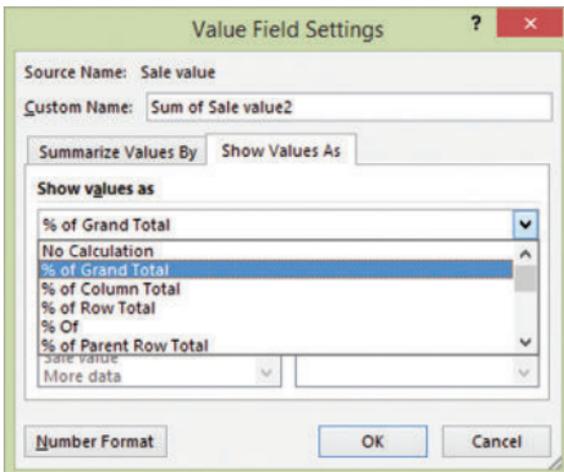
Choose how you want to summarize values. For example, you could use the Count option to give you an insight into the number of orders per month, or use the Average, Min, or Max functions to help you forecast future sales. Click OK.



Calculating percentages in pivot tables

You can not only change how the data in your pivot table is calculated (for example, as a sum, count, or average), but how it is displayed (for example, as a rank or percentage).

- 1 Add the fields you want to perform mathematical analysis on into the Values box.
- 2 Click the field name inside the Values box to open a menu. Click Value Field Settings.
- 3 Choose how you wish to summarize values. Given that you will be comparing these numbers to others, the Sum and Count are probably the most meaningful options to use.
- 4 Click the Show Values As tab. Click No Calculation to open the menu. Now you can choose from percentage calculations, based on the grand total, a column/row total, or relative to a base item such as another customer. You could also choose the difference from a base item, a running total, a rank, or an index (which shows how significant a value is in its row or column).

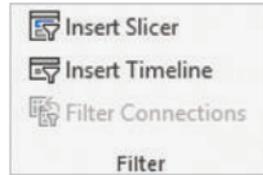


Using slicers

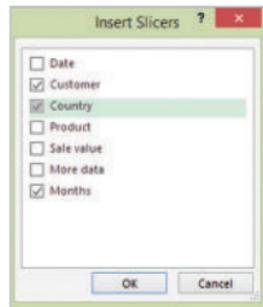


Slicers provide an easier way to filter your pivot table (or a regular table) than using filters. They give you single-click access to different views of your data, and make it easier to see what has been filtered out of your view.

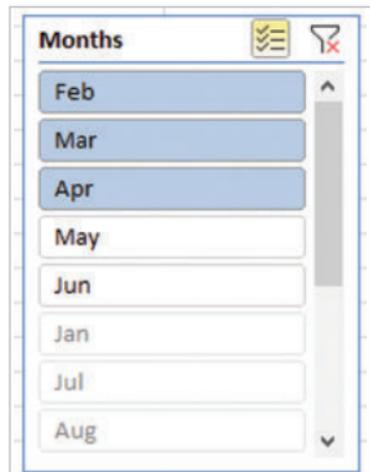
- 1 If you are using a pivot table, click in the pivot table and then click the PivotTable Analyze tab. In the Filter group, click Insert Slicer. If you are using a regular table, go to the Insert tab, then click Insert Slicer in the Filters group.



- 2 Use the checkboxes to indicate which fields you'd like to create a slicer for (see screenshot, right).



- 3 Click OK. You will now see a panel for each of the fields you selected (see bottom right). Each item in it is a button you can click to turn a filter on or off. Use the button in the top right of the slicer to clear its filters. Use the button beside that to toggle between enabling multiple selections, and only allowing one. Drag your slicers to wherever you want them on the worksheet.



Creating a pivot chart

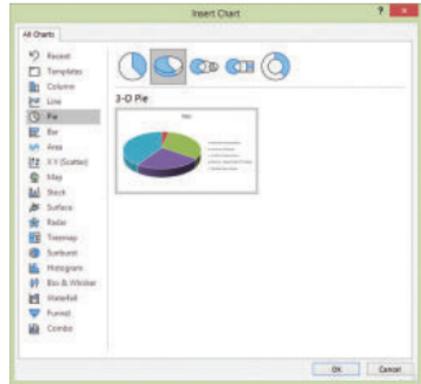
Pivot tables are great for summarizing and analyzing numerical data, but it can be hard to see the overall picture. A pivot chart adds a visual representation.

1 Click anywhere in your pivot table.

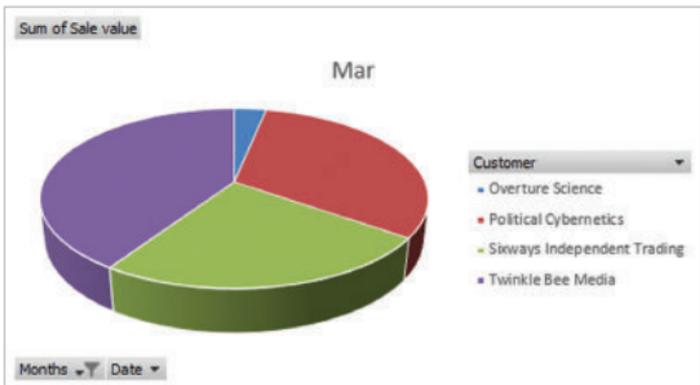
2 Click the PivotTable Analyze tab, and click PivotChart. You'll find it in the Tools group.



3 Use the menu to choose the chart you want to use. You can select a type of chart on the left, and a design for it at the top. When you've finished, click OK.



4 Your chart is inserted in your worksheet. You can use slicers to change its display, or the filters positioned around it.



Tracing totals back to data

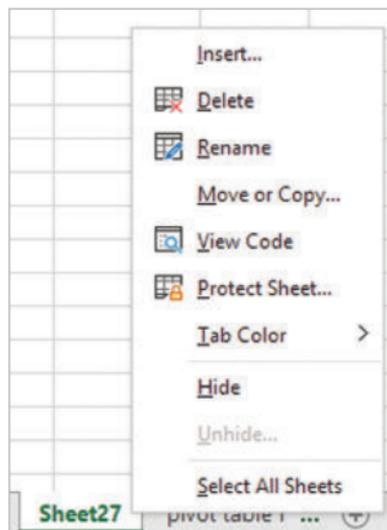


To understand the values that make up a summary value in your pivot table, you can drill down to the data.

- 1 You can use the expand and collapse buttons (+/-) on your pivot table to see more detail in your data. If you cannot see these buttons, you may be able to enable them by clicking your pivot table, then clicking Show +/- Buttons on the PivotTable Analyze tab.
- 2 You can also double-click any value to see the data that makes it up. For example, you could click a sum in your pivot table to see the individual items that make up that sum. The data items are presented as a new table in a new worksheet.

Date	Customer	Country	Product	Sale value	More data
09/03/2024	Sixways Inde	UK	Coffee	70	70
15/03/2024	Sixways Inde	UK	Adhesives	400	400
18/03/2024	Sixways Inde	UK	Storage	70	70

- 3 When you have finished analyzing that data, I recommend you delete the worksheet that was created to avoid too many building up. To delete a worksheet, right-click its tab at the bottom of the worksheet and choose Delete from the menu.

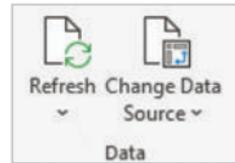


Refreshing a pivot table

If you make changes to your data, you will need to refresh your pivot table to reflect those changes.

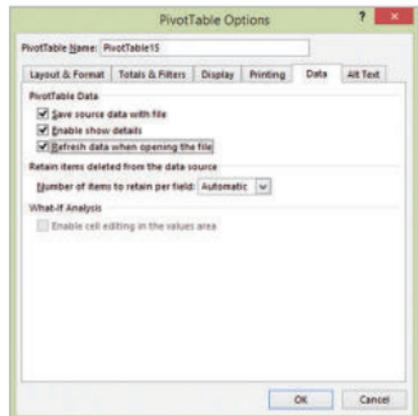
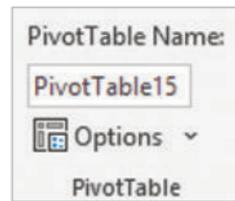
1 Click your pivot table to show the PivotTable Analyze tab.

2 On the PivotTable Analyze tab, find the Data group and click Refresh or use Alt + F5 as a shortcut. If you want to update all your pivot tables, you can open the Refresh menu and use the Refresh All option.



3 If refreshing all tables takes too long, you can use the Cancel Refresh option in that menu to stop it.

4 As a safety measure, you can set the pivot table to automatically update when the workbook is opened. To do this, click in your pivot table to show the PivotTable Analyze tab. On the left, find the PivotTable Options. (If your monitor isn't wide enough to show them, click the PivotTable menu on the left to see them.) On the Data tab, select the box to refresh data when the file is opened.



Inserting a table

Excel tables (not the same as data tables – see Tip 71) help you manage your data consistently. To create a table, you click in your data, and then click Insert Table in the Tables group of the Insert tab (or use Ctrl + T). Here's an example:

	A	B	C	D
1	Products ▾	Price ▾	Units ordered ▾	Order value ▾
2	Tractors	\$50,000.00	12	\$600,000.00
3	Diggers	\$75,000.00	16	\$1,200,000.00
4	Dump Trucks	\$65,000.00	20	\$1,300,000.00
5	Drills	\$2,000.00	15	\$30,000.00
6	Skips	\$500.00	10	\$5,000.00

The advantages of tables include:

- **Consistency.** If you enter a formula in one cell, it will be copied into the others in that column. If you edit the formula, all the other cells will also update.
- **Filtering.** Filters (see Tip 22) are automatically added.
- **Easier data entry.** When you reach the end of a row, use Tab to start a new row. Cell formats and formulas are copied down. If you add data in a cell next to the table, the table extends to it automatically.
- **Easier printing.** You can print just the table.
- **More readable formulas.** For example, if I select a range for my SUM formula, Excel describes it using the table and column name rather than cell references:
=SUM(Table1[Order value])
- **Easier scrolling.** When you scroll, the column headings remain in view.
- **Easier analysis.** You can use a slicer (see Tip 80).

Adding totals to a table

Using a table makes it easy to add totals and other calculations. Follow these steps.

- 1 Click the Table Design tab on the ribbon. If you can't see it, click in your table to show it.
- 2 In the Table Style Options group, check (or tick) the box beside Total Row to add a total row to the bottom of your table. The last column is added up automatically for you.

	A	B	C	D
1	Products ▾	Price ▾	Units ordered ▾	Order value ▾
2	Tractors	\$50,000.00	12	\$600,000.00
3	Diggers	\$75,000.00	16	\$1,200,000.00
4	Dump Trucks	\$65,000.00	20	\$1,300,000.00
5	Drills	\$2,000.00	15	\$30,000.00
6	Skips	\$500.00	10	\$5,000.00
7	Total			\$3,135,000.00 ▾
8				None
9				Average
10				Count
11				Count Numbers
12				Max
13				Min
14				Sum
				StdDev
				Var
				More Functions...

- 3 Click your total, and you can choose a different calculation. You can click one of the empty cells in the total row to add a sum, average, or other calculation for its column too. If you look at the cell formula that's added for you, you'll notice it is actually using the SUBTOTAL function, which can carry out all of these calculations. To change the calculation type, it's easiest to use the menu again.

Formatting your table

Make your tables look great with Excel's formatting options.

- 1 Click the Table Design tab on the ribbon. If you can't see it, you need to click your table first.
- 2 In the Table Style Options, the Banded Rows option gives you horizontal stripes, the Banded Columns option gives you vertical stripes, and the First Column and Last Column options apply bold formatting to those columns when selected.
- 3 To remove the filters at the top of your columns, uncheck the Filter Button box.
- 4 To change the colors, choose a style from the Table Styles group of the Table Design tab. On smaller screens, you'll need to open the Quick Styles menu. Themes are grouped as Light, Medium, or Dark. You can choose New Table Style to design your own.

The screenshot shows the Microsoft Excel interface with the Table Design tab selected. A table is displayed with the following data:

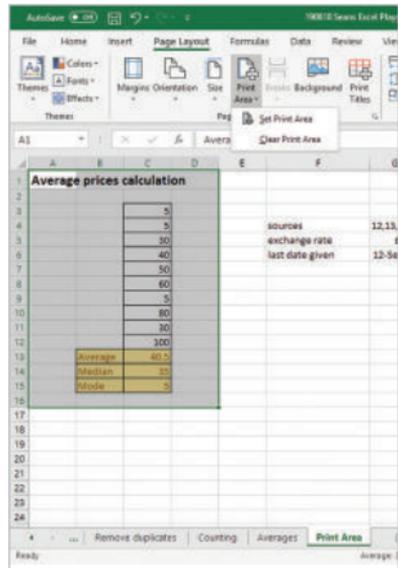
	Price	Units ordered	Order value
1 Tractors	\$50,000.00	12	\$600,000.00
2 Tractors	\$75,000.00	10	\$1,200,000.00
3 Tractors	\$65,000.00	20	\$1,300,000.00
4 Dump Trucks	\$2,000.00	15	\$30,000.00
5 Skids	\$500.00	10	\$5,000.00
7 Total			\$3,135,000.00

The Table Design tab ribbon is visible, showing options for Table Name (Table5), Properties, and various formatting options like Banded Rows, Banded Columns, First Column, Last Column, and Filter Button. The Table Styles group is open, showing a grid of styles categorized into Light, Medium, and Dark themes. The 'Light' theme is currently selected.

Setting (and clearing) a Print Area

Sometimes you won't want to print your whole spreadsheet. Defining a print area tells Excel which part of the sheet to print by default, without having to select it each time you print your work.

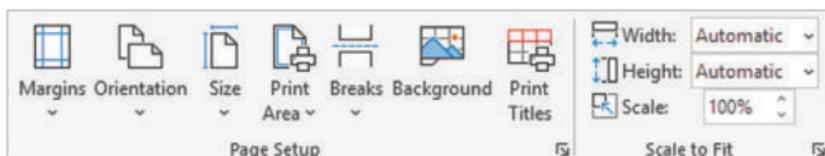
- 1 Select the cells you want to include in the Print Area.
- 2 On the Page Layout tab, click the Print Area drop-down and choose Set Print Area.
- 3 You'll see "Print Area" appear in the Name box, above cell A1. Selecting "Print Area" in this drop-down at any time will show you the print area that's currently defined.
- 4 Add to an existing print area by highlighting the new cells to add, and selecting "Add to Print Area" from the Print Area drop-down. The new range of cells doesn't have to be adjacent to the existing.
- 5 Delete your print area by selecting "Clear Print Area" from the drop-down.



Want to start again with a new Print Area? No problem. Simply highlight a new set of cells and start again.

Printing to fit the page or across multiple pages

Worksheets can quickly expand in all directions, which is fine when you're scrolling, but difficult if you want to print. Using Excel's scaling options, you can quickly make your worksheet fit on exactly the right number of pages. You'll find the options on the Page Layout tab.



- Use the Scale to Fit options to choose how many pages wide and/or tall you want your printed worksheet.
- Alternatively, use the Scale option to set the percentage size you want to print your worksheet at.
- Use the Orientation option to choose a landscape or portrait layout, depending on the shape of your data.
- For the complete Page Setup options, click the arrow in the bottom-right corner of the Page Setup group.

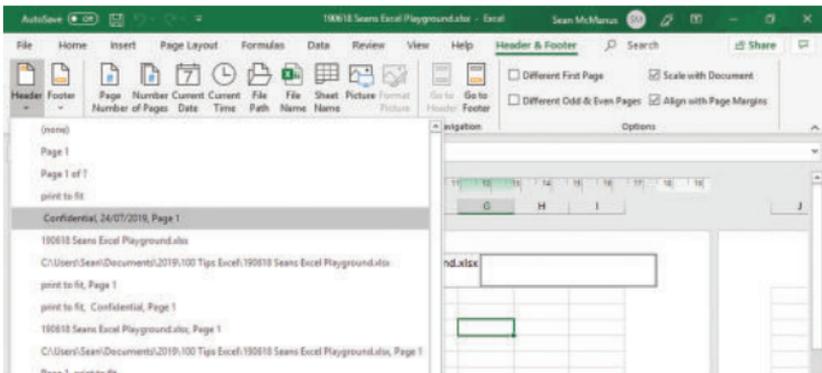
You might need to experiment, but here are some tips:

- To fit your whole print area onto a single page, scale both the width and height to 1 page.
- For a data set with a few columns and lots of rows, try printing it one page wide, but as many pages down as required. Select 1 page for the width, and leave the height set to Automatic. For a data set with many columns and few rows, try selecting 1 page for the height, and leave the width box set to Automatic.
- To repeat the column or row headings on each sheet, click Print Titles on the ribbon. Enter how many rows or columns to repeat.

Adding a page header

Adding titles, page numbers, and other information to your printout can make it look great – and help you to keep track of which file it has come from.

- 1 On the Insert tab, click on Header & Footer (in the Text group) to open the Header & Footer tab.
- 2 The sheet will change to Page Layout view, and the header boxes will appear at the top of your page, representing the left, center, and right positions.



- 3 Click Header on the ribbon to choose from the default headers. These can get you started quickly.
- 4 To customize your header, click in the appropriate section, and use the Header & Footer elements on the ribbon to add new information fields.
- 5 To change the style or formatting of your header, select the text and change it using the Font buttons on the Home tab.

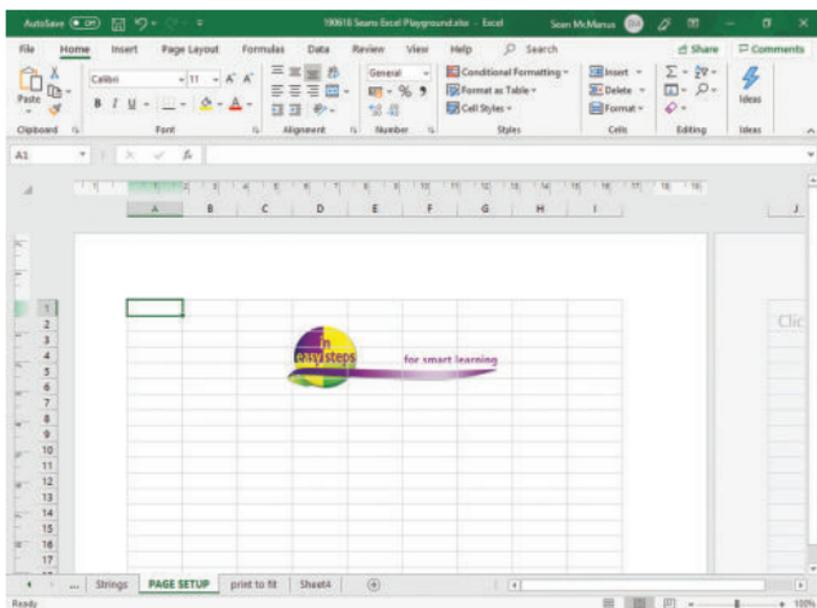
Note: The Header & Footer tab isn't available if you're using Freeze Panes. You'll be sent instead to the Page Setup dialog box, which has all the same options, in a similar layout.

Adding a watermark



Unlike other Office programs, Excel doesn't come with a watermark function, but you can add text or a background image, like a logo, which will appear onscreen and in print.

- 1 Add an image to your document header and it will appear on every page. On the Insert tab, click on Header & Footer in the text group. Click the Picture button, browse to your image, and insert it.
- 2 &[Picture] appears in the header, and your logo appears on the sheet.



- 3 Use the Format Picture button on the Header & Footer tab to crop or change the size of the image, convert it to grayscale or a washout, and more.
- 4 When you've finished editing the header, click your data (outside the header), then click the View tab and choose Normal.

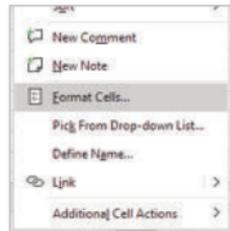
Choosing cells to leave unlocked

You can protect your spreadsheet to prevent others editing it, or to avoid the risk of accidental overwriting.

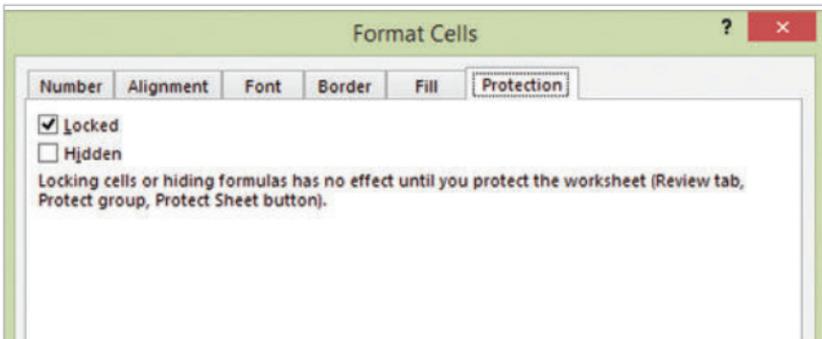
If you want to allow some cells to be edited, you need to unlock those cells first. This could be useful if you wanted a user to be able to enter data, but not disturb formulas, for example. If you're happy for the whole spreadsheet to be locked or unlocked, you don't need to follow this process.

1 Select the cells you wish to leave unlocked.

2 Right-click in your selected cells. From the menu that opens, choose Format Cells.... You'll find it near the bottom.



3 Click the Protection tab.

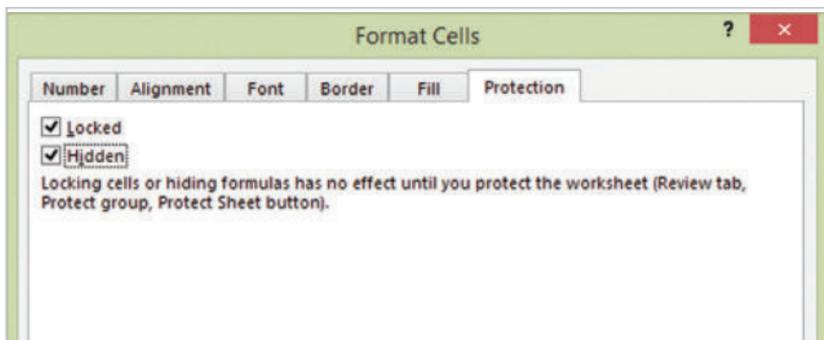
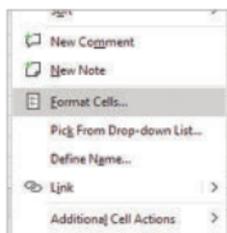


5 Your cells and spreadsheet are not actually protected from changes until you protect the worksheet (see Tip 94).

Hiding formulas in cells

You can protect the formula in a cell, so that it cannot be seen when the worksheet is protected. The result can still be seen on the worksheet, but the formula that generates that number cannot be seen in the formula bar. This process is similar to the one used for marking cells to be locked or unlocked for editing (see Tip 91).

- 1 Select the cells containing the formulas you wish to hide. They don't need to be next to each other.
- 2 Right-click in your selected cells. From the menu that opens, choose Format Cells....
- 3 Click the Protection tab.



- 4 Select the Hidden option. When you start a new worksheet, no cells are set to be hidden so even if the spreadsheet is locked and cannot be edited, the formulas can be seen. You may also wish to lock the cells to stop them being edited.
- 5 As with locking cells (see Tip 91), nothing actually changes until you protect the worksheet (see Tip 94).

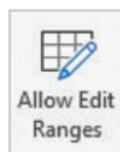
Password protecting ranges

If you're sharing a workbook, you might want to allow different people to edit different parts of it, but be certain that they don't accidentally overwrite other cells. You can do this by setting passwords for particular ranges.

1 Select the cells you want to password protect.

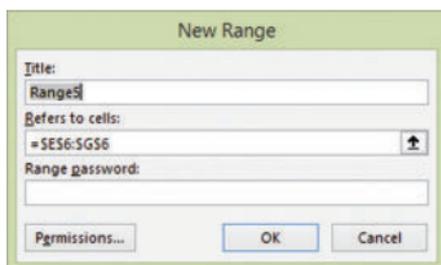
2 Click the Review tab on the ribbon.

3 Click Allow Edit Ranges in the Protect group on the ribbon.



4 An options box opens, with buttons to modify or delete protected ranges. Click the New button to create a new one.

5 Enter a title for the range. I use the name of the person who's allowed to edit it. The range should be selected already, but you can edit it. Enter the password and click OK, and then confirm it.



6 Click OK. Now you have told Excel which ranges to protect with which passwords, you need to protect the worksheet to turn the protection on (see Tip 94).

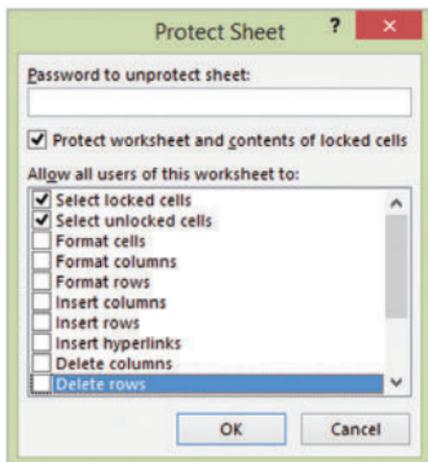
Protecting the worksheet

As you've seen in the last three Tips, you can protect a worksheet to stop people from editing the cell contents, or viewing the formulas behind the results. Let's see how you switch the protection on and off.

- 1 Click the Review tab.
- 2 Click Protect Sheet. It's in the Protect group on the ribbon.



- 3 Enter a password that will be used to unprotect the sheet. If you don't enter a password, then someone can simply click the Unprotect Sheet button to unlock it.



- 4 Select the activities you'd like users to be able to undertake on cells that are not locked. You need to have unlocked these cells first (see Tip 91). You can let users sort or delete columns, for example.
- 5 Click OK. Enter your password and click OK to confirm. Your worksheet is now protected.
- 6 To unprotect your worksheet, click the Unprotect Sheet button in the Protect group of the Review tab of the ribbon.

Protecting the workbook

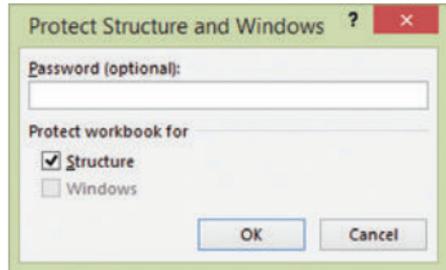
As you've seen, you can prevent users from changing the data within a worksheet (see Tip 94). However, they could still delete the entire worksheet! To prevent users from deleting worksheets, adding new ones, or hiding or unhiding them, you need to protect the workbook.

1 Click the Review tab.

2 Click Protect Workbook. It's in the Protect group on the ribbon.

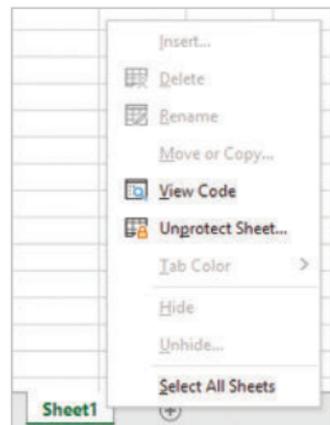


3 Enter a password. The password is optional. If you're just protecting the workbook (or a worksheet) to stop yourself



accidentally overwriting things, you may prefer not to provide a password. Although the protection tools for worksheets and workbooks are not robust security features, Microsoft cannot help you recover a forgotten password.

4 To confirm the workbook is protected, right-click a worksheet's tab at the bottom to see whether the options to hide, delete, or rename the worksheet are available. They should be grayed out.



Protecting Excel files



There are several options you can use to protect your Excel file, containing all of its worksheets, from changes.

- 1 Click the File tab above the ribbon and click Info in the menu on the left.
- 2 Click Protect Workbook to see the options for protecting the file.



- 3 Choose Always Open Read-Only to make Excel ask users whether they need to modify the file when they open it. This can prevent accidental changes being saved.
- 4 Choose Encrypt with Password to password protect the file. Excel won't open the file unless the correct password is entered. Don't lose the password!
- 5 Choose Mark as Final if the document is complete. Users will be warned you've marked it as final, and will have to click Edit Anyway to make changes.



Data entry shortcuts

- Autocomplete function name. Tab
- Copy. Ctrl + C
- Copy formula, number, or text from cell above. Ctrl + ' (apostrophe)
- Copy value from cell above. Shift + Ctrl + "
- Cut. Ctrl + X
- Cycle through absolute/relative cell references for selected cell in formula. F4
- Data Validation. Alt + D L
- Date, enter today's. Ctrl + ;
- Delete cells. Ctrl + minus (-)
- Delete column. Alt + H D C
- Delete row. Alt + H D R
- Edit text or formula in a cell. F2
- Enter data and go to next cell on the right. Tab or Right arrow
- Enter data and keep the same cell active. Ctrl + Enter
- Enter data and move to next selected cell. Enter
- Enter data and move up a cell. Shift + Enter
- Enter the same data in all selected cells. Ctrl + Enter
- Fill down, copying top selected cell into selected cells below. Ctrl + D

- Fill right, copying leftmost selected cell into selected cells. Ctrl + R
- Formulas, get placeholders after Excel recognizes the function you're entering. Shift + Ctrl + A
- Formulas, insert name. F3
- Formulas, show/hide in cell. Ctrl + ` (grave accent)
- Insert cells. Ctrl + plus (+). Add Shift if required.
- Link, insert. Ctrl + K
- Open cell's data validation choices or copy text from any cell above. Alt + Down arrow
- Paste. Ctrl + V
- Paste formats only. Ctrl + Alt + V T Enter
- Paste formula only. Ctrl + Alt + V F Enter
- Paste once only. Enter
- Paste Special. Ctrl + Alt + V
- Paste values only. Ctrl + Alt + V V Enter
- Refresh. Alt + F5
- Start a new line in the same cell. Alt + Enter
- Sum formula for cells above or to the left. Alt + =
- Undo. Ctrl + Z

Formatting shortcuts

- Bold. Ctrl + B
- Borders, adding/removing. Alt + H B
- Borders, add around selected cells. Shift + Ctrl + &
- Borders, take off cells. Shift + Ctrl + Underline (_)
- Center cell contents. Alt + H A C
- Color, choose cell color. Alt + H H
- Currency format. Shift + Ctrl + \$
- Date format. Ctrl + # (+ Shift on some keyboards)
- Format cells options. Ctrl + 1
- General number format. Shift + Ctrl + tilde (~)
- Hide. Ctrl + 0 to hide column. Ctrl + 9 to hide row.
- Insert table. Ctrl + T
- Italics. Ctrl + I
- Number (x,xxx.xx) format. Ctrl + Shift + !
- Percentage (x.xx%) format. Shift + Ctrl + %
- Strikethrough (crossed out). Ctrl + 5
- Time format. Shift + Ctrl + @
- Underline. Ctrl + U
- Unhide column. Alt + H O U L (Shift + Ctrl + 0 might work depending on your operating system)
- Unhide row. Shift + Ctrl + 9

Navigation shortcuts



- Cancel a data entry, edit or menu selection. Esc
- Formula bar, expand or collapse. Ctrl + Shift + U
- Go one screen down or up. Pg Down / Up
- Go one screen left or right. Alt + Pg Up / Down
- Go to bottom right of data. Ctrl + End
- Go to cell reference or name. Ctrl + G
- Go to end of cell content in formula bar. Ctrl + End
- Go to next unlocked cell in protected worksheet. Tab
- Go to next/previous worksheet. Ctrl + Pg Down / Up
- Go to previous cell or previous option. Shift + Tab
- Go to start of row. Home
- Go to top left (A1). Ctrl + Home
- Move to edge of current data block or move to next data block from edge of current one. Ctrl + Arrow key
- Quick Analysis options (see Tip 69). Ctrl + Q
- Repeat the last action. Ctrl + Y
- Right-click menu (context menu). Shift + F10, or Context key.
- Search. Alt + Q. Use this to find an Excel feature by keyword. Use Ctrl + F to find/replace in spreadsheet.



Selection shortcuts

- Select multiple rows/columns/cells. Ctrl + click
- Select to the clicked cell/row/column. Shift + click
- Select all. Ctrl + A
- Select column. Ctrl + Space
- Select row. Shift + Space
- Select current block of data. Ctrl + Shift + Space
- Select range with arrow keys (on/off for extend mode). F8
- Expand selected cells to bottom right of data. Ctrl + Shift + End
- Extend selected range by one cell. Shift + Arrow key
- Extend selected range to disconnected cells using Arrow keys. Shift + F8
- Extend selected range to edge of data, edge of sheet, or next nonblank cell. Ctrl + Shift + Arrow key
- Extend selection to top left (A1). Shift + Ctrl + Home
- Select precedent cells (see Tip 60). Ctrl + [
- Select dependent cells (see Tip 61). Ctrl +]

About the author

Sean McManus is a specialist technology copywriter and book author. His other titles include *Scratch Programming in easy steps* and *Cool Scratch Projects in easy steps*. Visit his website at www.sean.co.uk. Sean sends his thanks to Karen, Leo, Sevanti, and Ruth for all their support on this project!

Learn more in easy steps

Visit www.ineasysteps.com for updates and to see the full range including Excel Functions & Formulas, and Excel VBA.