

Building on our first experiences with Excel, here are some slightly more advanced topics that will help you work smarter, not harder!

Named Ranges

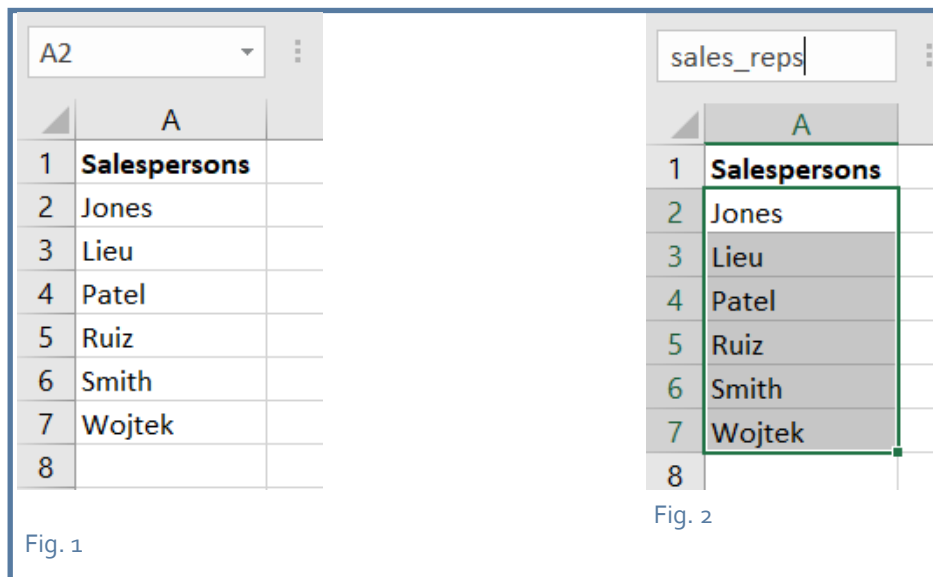
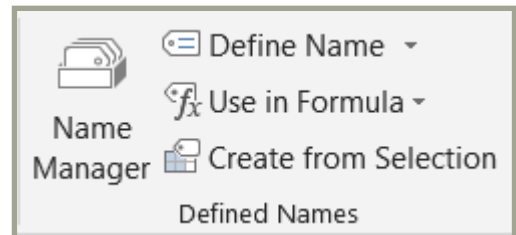
If you're going to be using cells or ranges of cells frequently, in formulas or references, it's best to **name them**.

Here's a quick way to do that:

See the list of sales reps below in Fig. 1. They are in the range A2:A7. Notice that A2 is currently the selected cell in the **Name Box**.

If Fig. 2, the names are all selected and, in the Name Box, we've typed "sales_reps". This is now a named range and can be used in formulas instead of "A2:A7". Note that spaces are not allowed in range names, so we've used an underscore here.

As you create new named ranges, you can work with them in the **Name Manager**, found in the **Defined Names** group on the **Formulas** tab.



Logical Functions

These are used to make decisions or to extract info from the data. Here are some examples:

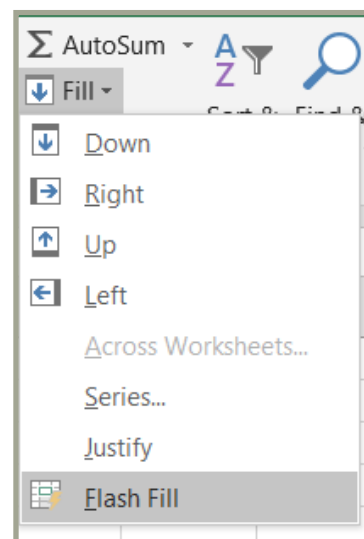
Name	Sample Formula	What It Does	Example
If	=IF(G6>15,"Advertise"," ")	Use an if function if you need to return different results based on the outcome of your data.	I need to have a visual notice whenever I have any inventory in my store for more than 60 days.
Count	=COUNT(B:B)	Count checks every cell to see if there is a number in it, then returns the number of cells that do.	Determine the number of events I organized for my company where at least one person showed up.
Sumif	=SUMIF(A1:A35, ">65", B1:B35)	Add numbers from a list as long as they meet a criteria you set in the formula.	I want to know the total number of students in my class over the age of 65.
Countif	=COUNTIF(A:A, 16)	Counts every cell that meets a criteria you set in the formula.	I want to know the number of times I have all the seats filled in my classroom.

Flash Fill

The fill handle at the bottom right corner of a selected cell can be used to copy or increment data, but fill can also be used to quickly replicate a pattern. Here we have a selection of first names and last names, and we want to create a column of full names. We typed the first one, "Jay Shasthri," and began to type the name in the next row. Excel detects a pattern and suggests the remainder of the names (in gray). If the pattern is what you want, press enter and all the names will fill down.

Note: If Excel can't figure the pattern, you may need to type one or two more examples on the next row. Also, if flash fill isn't automatic, you can select it from the **Editing** group on the **Home** tab or **Data Tools** on the **Data** tab.

	A	B	C
1	First Name	Last Name	Full Name
2	Jay	Shasthri	Jay Shasthri
3	Pratap	Pillai	Pratap Pillai
4	Madhu	Srivastava	Madhu Srivastava
5	Victoria	Marsh	Victoria Marsh
6	David	Pizarro	David Pizarro

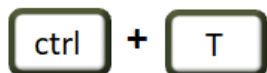


Creating an Excel Table

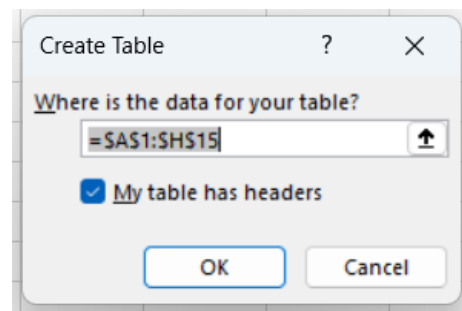
For data that will be updated, consider creating an Excel table object. This transforms simple data in rows and columns to a structured object, and treats each row of the table as a discrete record. This makes it much easier to sort and filter tables. The table automatically expands to accommodate new rows (and columns) of data.

	A	B	C	D	E	F	G	H
	ID	Date	Region	City	Category	Product	Qty	UnitPrice
1	ID07351	1/1/2022	East	Boston	Bars	Carrot	33	1.77
2	ID07352	1/4/2022	East	Boston	Crackers	Whole Wheat	87	3.49
3	ID07353	1/7/2022	West	Los Angeles	Cookies	Chocolate Chip	58	1.87
4	ID07354	1/10/2022	East	New York	Cookies	Chocolate Chip	82	1.87
5	ID07355	1/13/2022	East	Boston	Cookies	Arrowroot	38	2.18
6	ID07356	1/16/2022	East	Boston	Bars	Carrot	54	1.77
7	ID07357	1/19/2022	East	Boston	Crackers	Whole Wheat	149	3.49
8	ID07358	1/22/2022	West	Los Angeles	Bars	Carrot	51	1.77
9	ID07359	1/25/2022	East	New York	Bars	Carrot	100	1.77
10	ID07360	1/28/2022	East	New York	Snacks	Potato Chips	28	1.35
11	ID07361	1/31/2022	East	Boston	Cookies	Arrowroot	36	2.18
12	ID07362	2/3/2022	East	Boston	Cookies	Chocolate Chip	31	1.87
13	ID07363	2/6/2022	East	Boston	Crackers	Whole Wheat	28	3.49
14	ID07364	2/9/2022	West	Los Angeles	Bars	Carrot	44	1.77

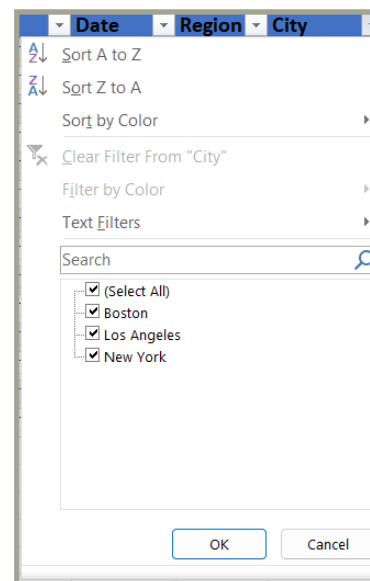
Here's a simple range of data. Either choose **Format as Table** from the **Home** tab or use the keyboard shortcut



The **Create Table** dialog box appears. Select "My table has headers," and press OK. You now have a Table. Each of the **Column Headers** has a dropdown menu which allows you to sort and filter data.



	A	B	C	D	E	F	G	H
	ID	Date	Region	City	Category	Product	Qty	UnitPrice
1	ID07351	1/1/2022	East	Boston	Bars	Carrot	33	1.77
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8	ID07358	1/22/2022	West	Los Angeles	Bars	Carrot	51	1.77
9	ID07359	1/25/2022	East	New York	Bars	Carrot	100	1.77
10	ID07360	1/28/2022	East	New York	Snacks	Potato Chips	28	1.35
11	ID07361	1/31/2022	East	Boston	Cookies	Arrowroot	36	2.18
12	ID07362	2/3/2022	East	Boston	Cookies	Chocolate Chip	31	1.87
13	ID07363	2/6/2022	East	Boston	Crackers	Whole Wheat	28	3.49
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Lookup Functions

One of the most common tasks in Excel is the process of looking up specific values within a data set. This is commonly done using a **Function**. One of the most frequently used is **VLOOKUP**, which searches for a value in the leftmost column of your data range, finds a match, and returns a value in the same row of another column in the same data range.

VLOOKUP(lookup_value, table_array, col_index_num, [range_lookup])

Description

What value are you searching for?

This is the lookup value. Excel will look for a match to this value in the leftmost column of your lookup table.

Where do you want to search?

This is the lookup table. If you plan to copy your VLOOKUP formula, you may want to use absolute references to "lock" the range.

Which column contains the search result?

This value will appear in the cell with the VLOOKUP formula. Count over from the first column to figure out what this number should be, starting with 1.

Should the lookup value be an exact match (FALSE or 0) or is an approximate match (TRUE or 1) okay if an exact match doesn't exist?

For TRUE, sort the leftmost column in ascending order for correct results.

Here we have a simple data range. It's a matrix consisting of rows that represent regions of the country and columns that show Income, Expenses, and Cash Flow for those regions.

	A	B	C	D	E
1					
2		Region	Income	Expenses	Cash Flow
3		Northeast	\$ 2,000,000.00	\$ 1,500,000.00	\$ 500,000.00
4		Mid-Atlantic	\$ 1,740,000.00	\$ 1,320,000.00	\$ 420,000.00
5		Southeast	\$ 3,400,000.00	\$ 1,800,000.00	\$ 1,600,000.00
6		Midwest	\$ 900,000.00	\$ 1,050,000.00	\$ (150,000.00)
7		Southwest	\$ 1,150,000.00	\$ 1,100,000.00	\$ 50,000.00
8		Pacific	\$ 4,800,000.00	\$ 2,000,000.00	\$ 2,800,000.00

Using VLOOKUP, we can search for a region and return the matching Income, Expenses, or Cash Flow.

=VLOOKUP("Southeast", \$B\$3:\$E\$8, 3, False)

We search for the region in the leftmost column of our table and return the matching value from column 3. We are specifying FALSE so we get an exact match on the region. This returns the value \$1,800,000.00, the Expenses for the Southeast region.

Other Useful Lookup and Reference Functions

Name	Sample Formula	What It Does
OFFSET	=OFFSET(B2,1,0)	Returns a range that is a specified number of rows and columns from a reference cell or range.
HLOOKUP	=HLOOKUP ("blue",A1:C5,2,0)	Looks for a value in the top row of a range and returns a value from the same column in a row you specify (Think VLOOKUP turned 90 degrees).
ROWS	=ROWS(A10:D18)	Returns the number of rows in a range of cells.
COLUMNS	=COLUMNS (A10:D18)	Returns the number of columns in a range of cells.
TRANSPOSE	=TRANSPOSE (A1:A25)	Converts a vertical range into a horizontal range and vice versa.
INDEX/ MATCH	=INDEX (D3:D8,MATCH (B10,B3:B8,0))	A formula using two different functions, INDEX and MATCH, to locate data's position in a range using MATCH and return the value using INDEX.

New Lookup Functions in Excel 365

Note that the functions in **RED** are called **Dynamic Array Formulas**, which can return multiple rows/columns of data, with the function being written in only one cell. The results **Spill** into neighboring cells.

Name	Sample Formula	What It Does
XLOOKUP	=XLOOKUP (C18,C3:E3,C4:E9)	Find data in a table or range by row. Look in one column for a search term and return a result from the same row in another column, regardless of which side the return column is on.
FILTER	=FILTER(A5:D20, C5:C20=H2,"")	Extract data from a range, based on criteria you define.
TAKE	=TAKE(A2:C4,2)	Returns a specified number of contiguous rows or columns from the start or end of an array.
UNIQUE	=UNIQUE (SalesTable [Region])	Returns a list of unique values in a list or range.

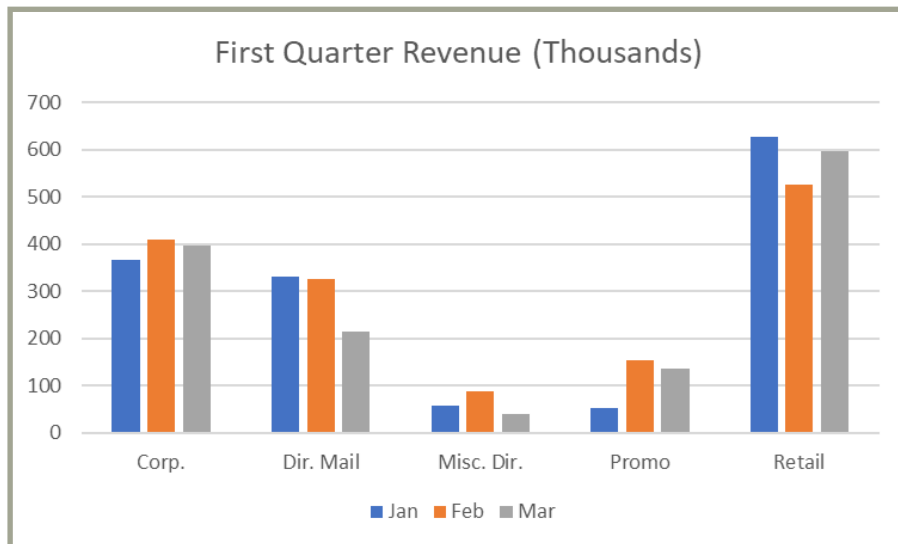
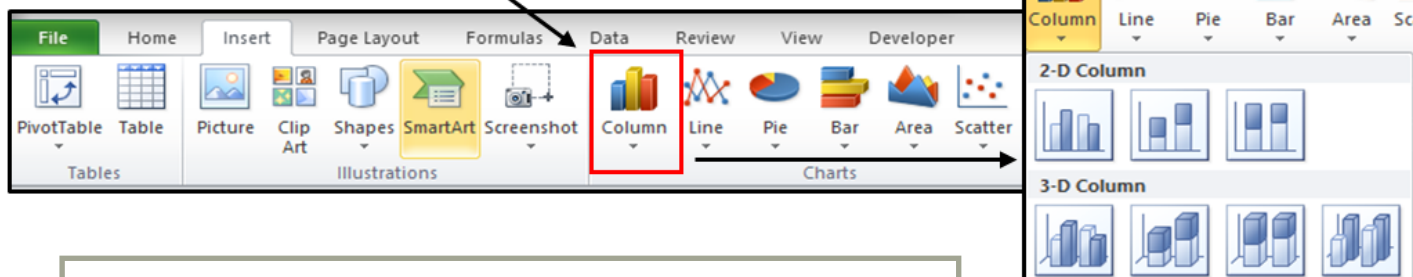


Creating Charts

Making charts from your data is simple

1. Select the cells containing the data and text you want to appear in the chart
2. On the **Insert** tab, select the chart type and subtype in the **Charts** group.

Category	Jan	Feb	Mar	Total	Last Yr.	Difference	% Diff
Corp.	366	410	396	1,172	1,259	(87)	-6.9%
Dir. mail	330	325	215	870	777	93	12.0%
Misc. Dir.	58	88	41	187	210	(23)	-11.0%
Promo	54	154	135	343	320	23	7.2%
Retail	626	527	596	1,749	1,630	119	7.3%
Total	1434	1504	1383	4321	4196	125	3.0%



Modifying Charts

To change elements in a chart, click the area you wish to change and the **Chart Tools** tab will appear at the **top of the ribbon**. **Color**, **Style**, and **Text** options will be under **Format**. To change **Axes**, **Gridlines**, **Chart Titles**, and the **Legend**, click on **Chart Tools** then **Layout**.

