



Helping you get the most  
out of technology

# Excel Quick Reference Guide

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Student Manual

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# **Introduction**

Welcome to the Excel Review and Quick Reference course. This course is NOT an introductory course. Instead, it is a review course. It is for the many users of Excel who are self-taught, and who wonder if there are basic Excel concepts, that they never learned, that could save them hours of work.

## ***What this guide is not***

Unlike many books on Excel, this guide does NOT provide detailed explanations. Instead, its purpose is to be a mere Quick Reference guide. This allows readers to quickly review HOW to do something without wading through explanations about the WHAT and the WHY. For example, this guide shows you how to create a PivotTable, but only provides one short sentence about what a PivotTable is and what it can do for you. If you are looking for a more details, please check out TechMentors other courses.

# Course Outline

Upon completion of this course, students will be able to:

## ***Navigate and format worksheets***

- Use over 60 keyboard shortcuts to navigate and/or manipulate an Excel workbook
- Change the font, alignment, and number format of data using the standard formatting icons
- Insert rows and columns
- Delete rows and columns
- Freeze data rows at the top of the screen
- Freeze data column at the left edge of the screen

## ***Manipulate Excel data***

- Use the AutoFill feature to quickly fill in lists of values, month names, names of the days of the week, date values, and number patterns
- Filter data to display a data subset
- Sort data by one or more columns

## ***Prepare data for printing***

- Select a specific area for printing
- Fit a printout on one horizontal and/or vertical page
- Add a page header and/or footer
- Print column headers at the top of each page

## ***Design an Excel PivotTable***

- Define what a PivotTable is and describe its use
- List the data rules that must be follow before a PivotTable can be created
- Create a PivotTable

## ***Create advanced formulas***

- List the four range operators and describe how they can be used in an Excel formula
- Use the five mathematical operators in a numeric formula
- List the five logical operators and describe how they can be used in a comparison formula
- Save time and prevent calculation errors by properly using the proper absolute, mixed, and relative reference operators in a formula
- Increase / decrease the size of the Excel formula bar
- Employ techniques for creating complex mega formulas

## ***Use the following functions***

### *Summary*

- Sum
- Average
- Count
- Min
- Max
- Small
- Large
- Median
- Mode
- SumIf
- CountIf
- SumIfs
- CountIfs

### *Lookup*

- VLookup
- HLookup
- Index
- Match

### *Logical*

- If
- And
- Or
- Not
- IfError

# Keyboard Shortcuts

## Selecting

One cell to the right	→
One cell to the left	←
One cell down	↓ or Enter
One cell up	↑ or Shift + Enter
One screen down	Page Down
One screen up	Page Up
Beginning of sheet (A1)	Ctrl + Home
End of sheet (last cell)	Ctrl + End
To the end of contiguous data	Ctrl + Arrow or End + Arrow
A cell or range of cells	Ctrl G or F5 then enter address
Next sheet	Ctrl + Page Down
Previous sheet	Ctrl + Page Up
Whole column	Ctrl + Space Bar
Whole row	Shift + Space Bar
One more cell to the right	Shift + →
One more cell to the left	Shift + ←
One more cell up	Shift + ↑
One more cell down	Shift + ↓
All the contiguous data to the right	Ctrl + Shift + →
All the contiguous data to the left	Ctrl + Shift + ←
All the contiguous data up	Ctrl + Shift + ↑
All the contiguous data down	Ctrl + Shift + ↓
All cells	Ctrl A

## Function Keys

Help	F1
Edit cell formula	F2
Paste Name box	F3
Insert function	Shift + F3
Toggle absolute / relative references	F4
Go to specified cell	F5
Go to next pane	F6
Check spelling	F7
Toggle extended mode	F8
Recalculate	F9
Activate ribbon options with letters	F10
Auto Graph / Chart	F11
Save As	F12

## Editing

Cut	Ctrl + X
Copy	Ctrl + C
Paste	Ctrl + V
Undo	Ctrl + Z
Redo	Ctrl Y
Insert cells, rows, or columns	Ctrl + +
Delete cells, rows, or columns	Ctrl + -
Find	Ctrl + F
Search and Replace	Ctrl + H
Erase cell contents	Delete
Finish cell formula and stay in cell	Ctrl + Enter
Cancel edit	Esc
Insert new line in cell	Alt + Enter
Insert current date	Ctrl + ;
Insert current time	Ctrl + :
Toggle display between formulas vs. values	Ctrl + `

## File Functions

Open file	Ctrl + O
Save file	Ctrl + S
Close window	Ctrl + W
New file	Ctrl + N
Print file	Ctrl + P

## Formatting

Format cells	Ctrl + 1
Bold	Ctrl + B
Italic	Ctrl + I
Underline	Ctrl + U

# Formatting Options

## Format Cells



Figure 1: Home tab, Font group

Calibri	Font		Borders
20	Font Size		Background color
	Increase Font		Font color
	Decrease Font		More font settings
<b>B</b>	Bold		
<i>I</i>	Italic		
<u>U</u>	Underline		

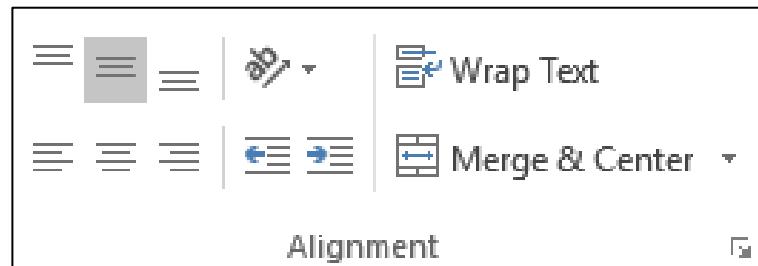


Figure 2: Home tab, Alignment group

	Align Top		Rotate Text
	Align Middle		Decrease Indent
	Align Bottom		Increase Indent
	Align Left		Wrap Text
	Align Center		Merge & Center
	Align Right		More alignment settings

## Format numbers

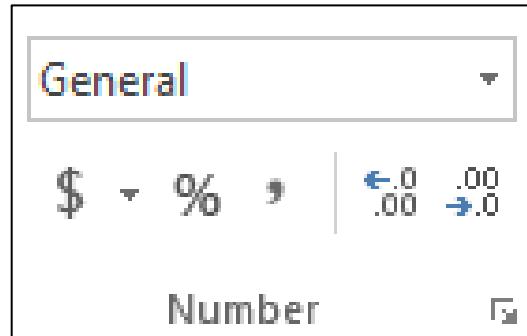


Figure 3: Home tab, Number group

### Drop down options

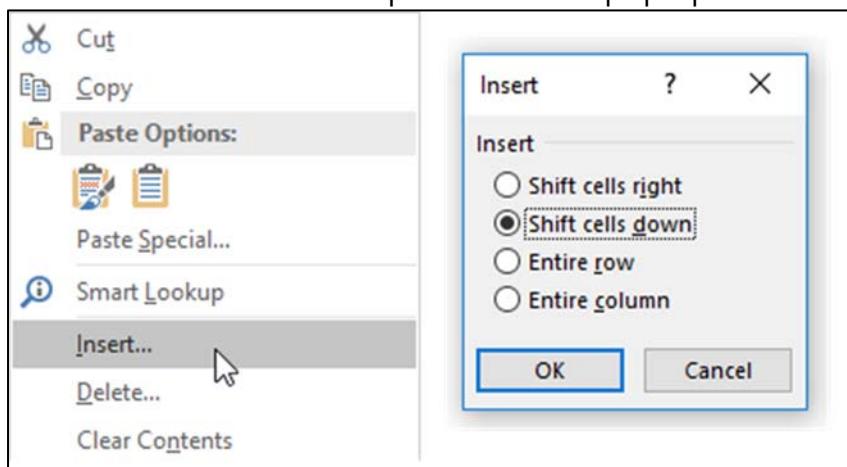
ABC	General	1234.5678
123	No specific format	
12	Number	1234.57
	Currency	\$1,234.57
	Accounting	\$ 1,234.57
	Short Date	5/18/1903
	Long Date	Monday, May 18, 1903
	Time	2:24:00 PM
%	Percentage	12.34%
	Fraction	3/5
10 <sup>2</sup>	Scientific	1.23E+03
ABC	Text	1234.5678

### Buttons

\$	Currency	\$ 1,234.57
%	Percentage	12%
,	Comma	1,234.57
	Increase decimals	
	Decrease decimals	
	More number format options	

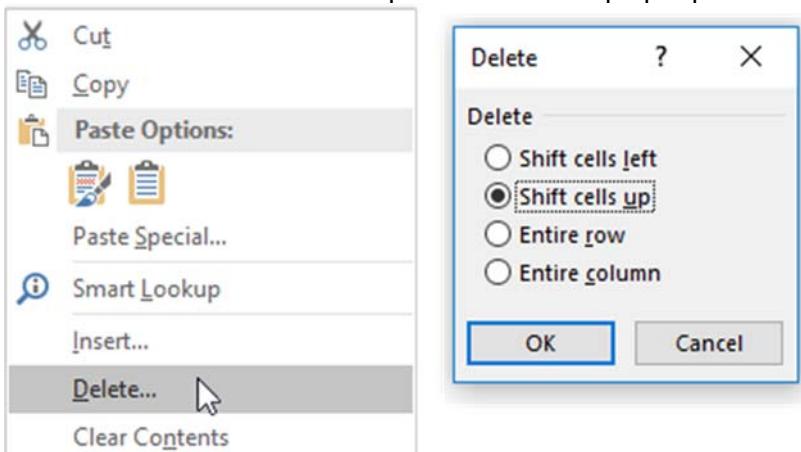
## Insert Rows / Columns

Position the cursor in the desired location and right click and choose **Insert...** or press **Ctrl + +**. Then choose the desired option from the pop-up menu.



## Delete Rows / Columns

Position the cursor in the desired location and right click and choose **Delete...** or press **Ctrl + -**. Then choose the desired option from the pop-up menu.



## Freeze Panes

From the ribbon's View tab you can **Freeze Panes** to "freeze" headings (rows at the top and/or columns at the left) so they don't disappear as you scroll through the spreadsheet.

If you need to freeze both rows and columns, first position the cursor in the cell just below and to the right of the rows and columns you want frozen. For example, if you want to freeze rows 1 through 4 and columns A through C, you would position your cursor in cell D5, and then choose **View, Freeze Panes, Freeze Panes**.

The screenshot shows a Microsoft Excel window titled "Northwind.xlsx - Excel". The ribbon is visible at the top with the "View" tab selected. In the "View" tab, the "Freeze Panes" button is highlighted. A dropdown menu is open from this button, displaying three options: "Freeze Panes", "Freeze Top Row", and "Freeze First Column". The "Freeze Panes" option is currently selected. The main worksheet area shows a table of data. The first four rows (1-4) and the first three columns (A-C) are highlighted in green, indicating they are frozen. The cursor is positioned over the "Freeze Panes" option in the dropdown menu.

Order ID	Customer ID	Order Date	Required Date	Shipped Date	Shipper	Product ID	Product Name
10248	VINET	07/04/96	08/01/96	07/16/96	Federal Shipping	11	Queso Cabrales
10248	VINET	07/04/96	08/01/96	07/16/96	Federal Shipping	42	Singaporean Hokkien Fried Mee
10248	VINET	07/04/96	08/01/96	07/16/96	Federal Shipping	72	Mozzarella di Giovanni
10249	TOMSP	07/05/96	08/16/96	07/10/96	Speedy Express	14	Tofu
10249	TOMSP	07/05/96	08/16/96	07/10/96	Speedy Express	51	Manjimup Dried Apples
10250	HANAR	07/08/96	08/05/96	07/12/96	United Package	41	Jack's New England Clam Chow
						51	

## Auto Fill

Enter a name from a series (like the name of a month), or a formula, or one or more values. Then drag or double click the AutoFill button (the cell's bottom right corner) as needed.

The image contains four separate screenshots demonstrating Excel's Auto Fill functionality:

- Top Left:** Shows a list of months from January to May in column A. A green callout bubble with the text "Drag the AutoFill corner" points to the bottom-right corner of the selected range (cell A1).
- Top Right:** Shows a list of days of the week from Sunday to Saturday in column B. A green callout bubble with the text "Double click the corner to automatically fill down to the end of a group of cells." points to the bottom-right corner of the selected range (cell B1).
- Bottom Left:** Shows a single cell containing the number "1". A green callout bubble with the text "Select one cell and drag the AutoFill corner and the number will be duplicated." points to the bottom-right corner of the cell.
- Bottom Right:** Shows a list of numbers from 1 to 9. A green callout bubble with the text "Select two cells and drag the AutoFill corner and the pattern will be duplicated." points to the bottom-right corner of the selected range (cells A1:A9).

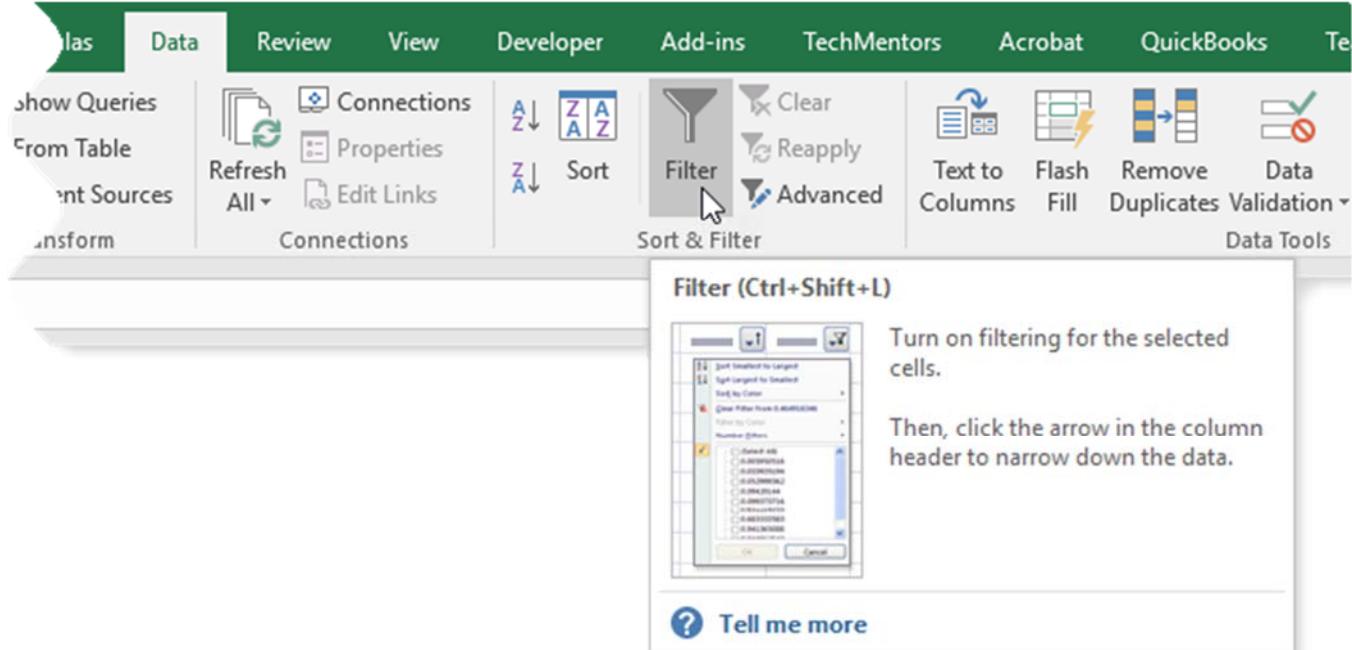
## Instant Charts

You can quickly create a chart by selecting your data and then pressing F11.



## Filter data

From the ribbon choose Data, Filter.

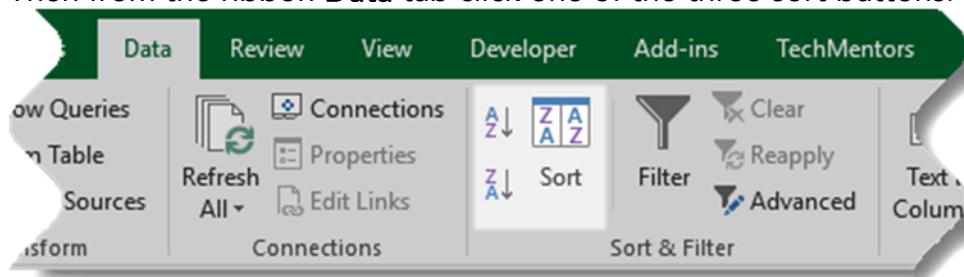


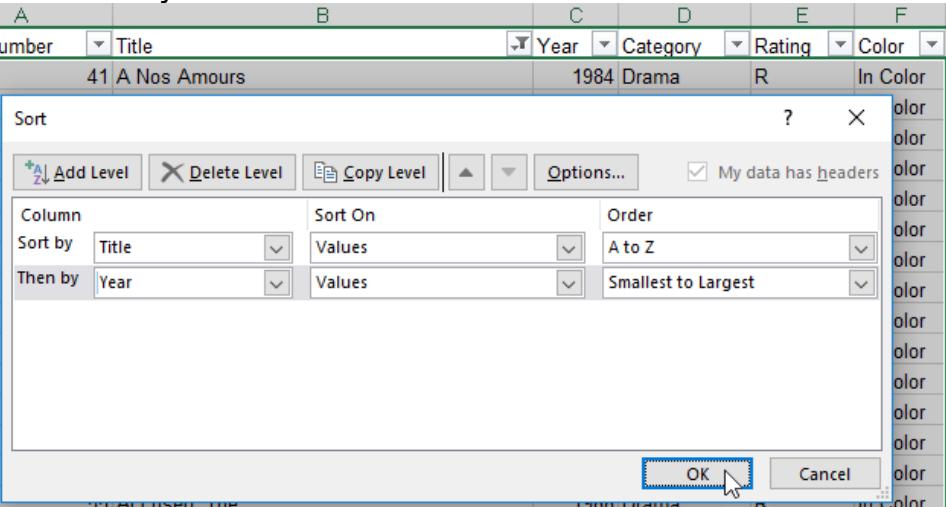
Then click the column heading's drop down to apply the desired filter.

A	B	C	D	E	F
1	MovieNumber	Title	Year	Category	Rating
3	2	\$1,000,000 Duck	A↓	Sort A to Z	In Color
5	4	10 Rillington Place	Z↓	Sort Z to A	In Color
6	5	100 Rifles		Sort by Color	In Color
7	6	11 Harrowhouse			In Color
9	8	16 Days of Glory			In Color
10	9	1776			In Color
11	10	18 Again!			In Color
13	12	1941			In Color
18	17	2001: A Space Odyssey			In Color
19	18	2010			In Color
21	20	3 Men and a Baby			In Color
22	21	3 Men and a Little Lady			In Color
23	22	3 Ninjas			In Color
24	23	3 Ninjas Kick Back			In Color
25	24	3 Women			In Color
27	26	300 Year Weekend, The			In Color
28	27	40 Carats			In Color
34	33	80 Steps to Jonah			In Color
35	34	84 Charing Cross Road			In Color
37	36	9 to 5			In Color
40	39	99 and 44/100% Dead			In Color
62	61	Across the Great Divide			In Color
64	63	Act of the Heart			In Color
65	64	Adam			In Color

## Sort data

To sort your data, click on one cell, that has data, in the column you want sorted. Then from the ribbon Data tab click one of the three sort buttons.

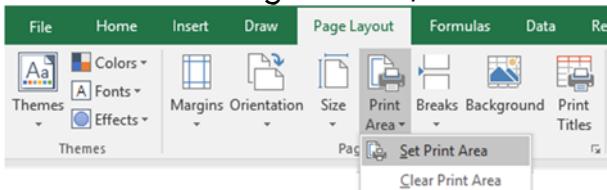


	Sort lowest to highest
	Sort highest to lowest
	Custom sort – lets you do a multi-column sort. 

# Printing

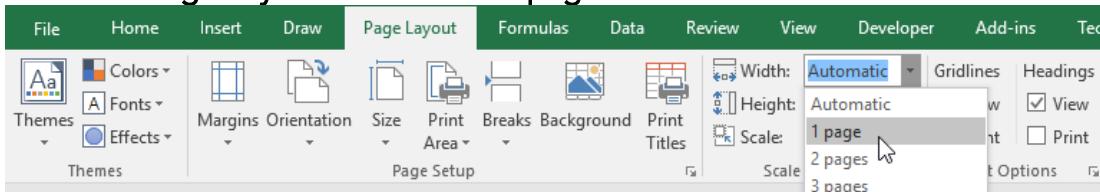
## Select a print area

Select desired range of cells, then from the Page Layout tab choose Set Print Area as shown below.



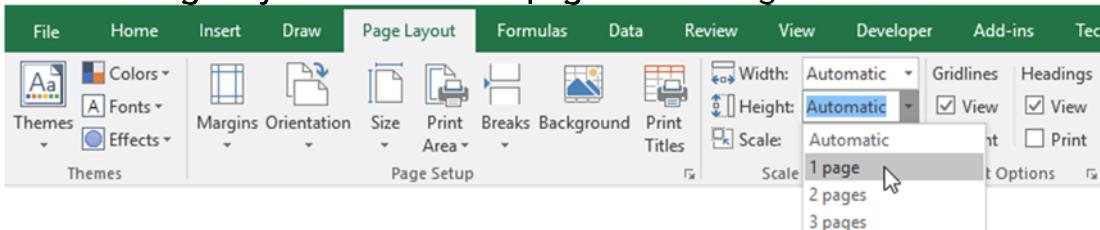
## Fit print to one page wide

From the Page Layout tab choose 1 page for the width as shown below.



## Fit print to one page tall

From the Page Layout tab choose 1 page for the height as shown below.

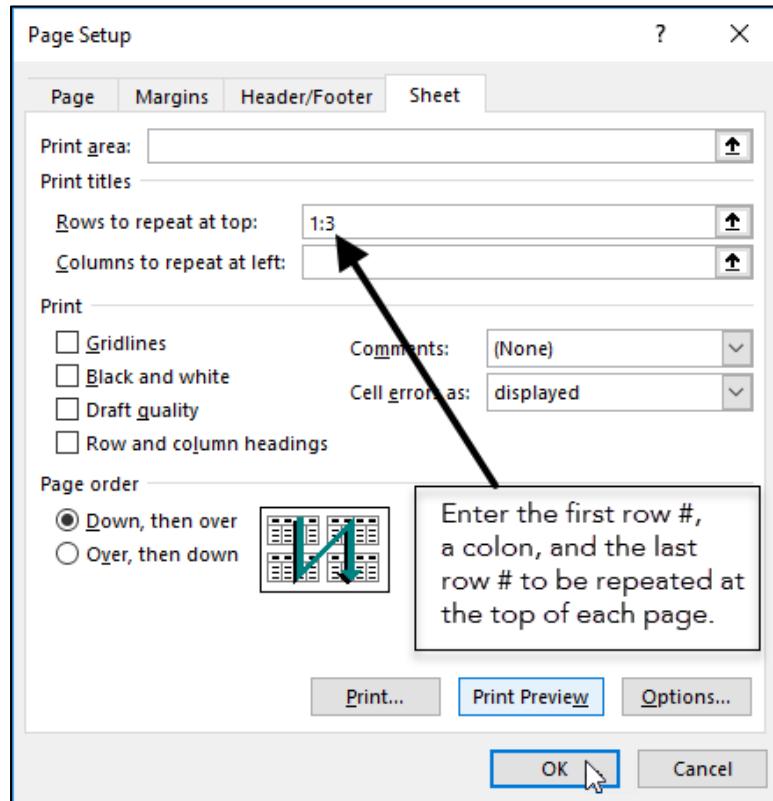
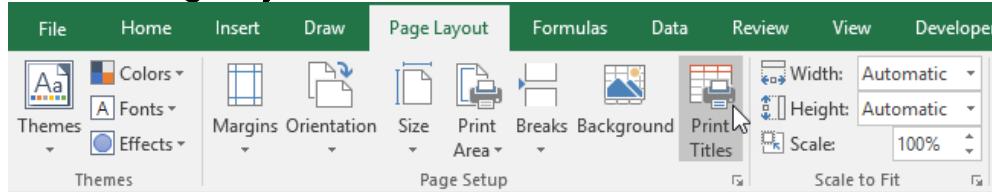


## Add header / footer

From the Insert tab choose Header & Footer then type your text in the desired location.

## **Print rows at top of each page**

From the Page Layout tab click Print Titles, then select the rows to repeat at top and click OK.



## PivotTables

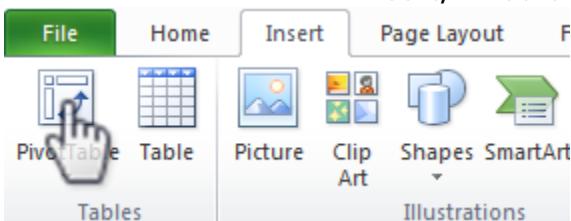
PivotTables allow you to arrange and summarize complex data in an easy to read report that is easy to manipulate. To create a simple PivotTable follow these steps:

1. Start Excel and create or open your file.
2. Make sure your data can support a PivotTable by using the check list below:
  - Each column of data has a column heading
  - Each column heading is unique
  - Each column heading is in the same row
  - The column headings do not span multiple rows
  - No merged cells exist
  - All the data is contiguous
  - The data in each column follows a consistent format

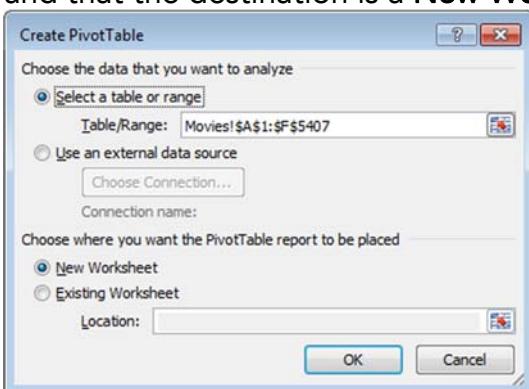
3. Position the cursor in one cell, and only one cell of the data.

	A	B	C	D	E	F
1	MovieNumber	Title	Year	Category	Rating	Color
2	1	\$(\$Dollars)	1972	Crime	R	TRUE
3	2	\$1,000,000 Duck	1971	Comedy	G	TRUE
4	3	10	1979	Comedy	R	TRUE
5	4	10 Rillington Place	1970	Crime	PG	TRUE
6	5	100 Rifles	1969	Western	PG	TRUE
7	6	11 Harrowhouse	1974	Crime	PG	TRUE
8	7	1492: Conquest of Paradise	1992	Drama	PG-13	TRUE
9	8	16 Days of Glory	1986	Documentary	G	TRUE
10	9	1776	1972	Historical	G	TRUE
11	10	18 Again!	1988	Comedy	PG	TRUE
12	11	1900	1977	Drama	NC-17	TRUE

4. From the ribbon choose Insert, PivotTable.



5. In the resulting dialog box make sure the **table/range** is referring to the correct table or range and that the destination is a **New Worksheet**, then click **OK**.



6. Drag the fields from the PivotTable Field List to the desired location as shown below.

The screenshot shows the 'PivotTable Field List' dialog box open on the right side of the Excel interface. On the left, a PivotTable is visible on the 'Sheet1' tab, containing movie data categorized by Title, Year, Category, and Rating. The 'PivotTable Field List' dialog box contains the following settings:

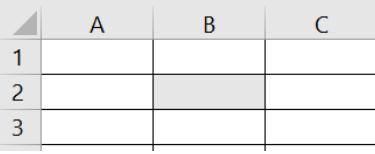
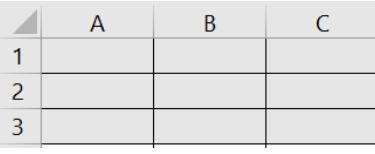
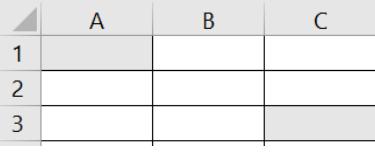
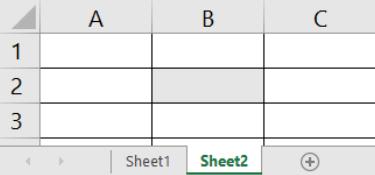
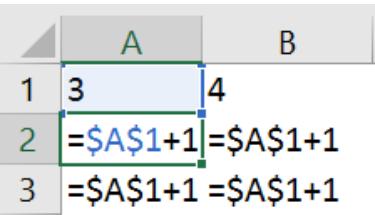
- Choose fields to add to report:** Title, Category, Rating (checkmarks present)
- Drag fields between areas below:**
  - Report Filter:** Empty
  - Column Labels:** Rating
  - Row Labels:** Category
  - Values:** Count of Title
- Defer Layout Update:** Unchecked
- Update:** Button

You now have a PivotTable.

The screenshot shows the completed PivotTable on the 'Sheet1' tab. The table structure is as follows:

Category	Rating	Column Labels						Grand Total
		NC-17	NR	PG	PG-13	R		
Action		2	70	21	218		311	
Adventure		30	100	11	36		177	
Animated		43	1	13	1	6	64	
Biography		6	49	17	49		121	
Children's		37		15			52	
Comedy		65	3	1	487	206	505	1267
Crime		4	1	78	5	252		340
Dance		4		1	4			9
Disaster		3		14		3		20
Docudrama		1		1				2
Documentary		10	2	11		7		30
Drama		40	7	6	410	127	650	1240
Fantasy		16		37	13	11		77
Historical		4		23	3	18		48
Horror	2	1		110	16	317		446
Musical		32		53	8	22		115
Mystery		4		40	4	45		93
Opera		1		1	1			3
Political				5	10			15
Prison				3	27			30
Religious		5		5	2	5		17
Romance		2		50	18	43		113
Science		22		88	22	69		201
Sports		7		51	9	28		95
Spy		4		39	3	15		61
Thriller				50	10	143		203
War		12		38	5	26		81
Western		25		105	3	42		175
<b>Grand Total</b>		<b>381</b>	<b>12</b>	<b>10</b>	<b>1947</b>	<b>508</b>	<b>2548</b>	<b>5406</b>

## Range Operators

Cell address with no operator	Refers to cell address	B2	
:	Refers to all cells between first and last reference	A1:C3	
,	Refers to first and last reference	A1,C3	
!	Refers to address on the specified sheet	Sheet2!B2	
\$	Designates that a column or row reference absolute and therefore should not change when copied.	=\\$A\$1 + 1	

## Formula Operators

+	Add	$20 + 2 = 22$
-	Subtract	$20 - 2 = 18$
*	Multiply	$20 * 2 = 40$
/	Divide	$20 / 2 = 10$
^	Exponent	$20 ^ 2 = 400$
&	Concatenate	$20 \& 2 = 202$

=	Equals	$20 = 10 = \text{False}$
>	Greater than	$20 > 10 = \text{TRUE}$
>=	Greater than or equal to	$20 >= 10 = \text{TRUE}$
<	Less than	$20 < 10 = \text{FALSE}$
<=	Less than or equal to	$20 <= 10 = \text{FALSE}$

# Absolute, Mixed, and Relative References

When a formula is copied from one cell to another, you have four options for how the formula's cell addresses will be adjusted relative to the new vs. original location. You select the options you want by choosing whether or not to place a \$ in front of the row number and/or column letter.

## Absolute Reference – nothing changes

Use a \$ in front of both the column letter and row number

	A	B	C
1	10		
2		=\\$A\\$1	=\\$A\\$1
3		=\\$A\\$1	=\\$A\\$1

No matter where the destination cell is, the row number and the column letter will not change.

In this example, when B2 is copied down to a cell in row 3, the "1" stays a "1" because the \$ in front of the row letter makes it absolute.

When B2 is copied across to a cell in column C, the column letter remains an "A" because the preceding \$ makes it absolute.

## Relative Row, Absolute Column

Use a \$ in front of the column letter but not the row number

	A	B	C
1	10		
2		=\\$A1	=\\$A1
3		=\\$A2	=\\$A2

Based on the destination cell, the row number can change but the column letter will not change.

In this example, when B2 is copied down to a cell in row 3, the "1" becomes a "2".

When B2 is copied across to a cell in column C, the column letter remains an "A" because the preceding \$ makes it absolute.

## Absolute Row, Relative Column

Use a \$ in front of the row number but not the column letter.

	A	B	C
1	10		
2		=A\$1	=B\$1
3		=A\$1	=B\$1

Based on the destination cell, the row number will not change but the column letter can change.

In this example, when B2 is copied down to a cell in row 3, the "1" remains a "1" because the \$ in front of the row letter makes it absolute.

When B2 is copied across to a cell in column C, the column letter changes to a "B".

## Relative Reference

Do not place a \$ in front of the row number and do not place a \$ before the column letter.

	A	B	C
1	10		
2		=A1	=B1
3		=A2	=B2

Based on the destination cell, both the row number and the column letter can change.

In this example, when B2 is copied down to a cell in row 3, the "1" becomes a "2".

When B2 is copied across to a cell in column C, the column letter changes to a "B".

## Expand the formula bar

When you have a long / complex formula you might want an expanded formula bar so you can see the whole thing. Just click the expand button shown below. After that you can drag the border with the mouse to make it even bigger.



## Basic Arithmetic Formulas

Addition	= A1 + B1	= A1 + 3
Subtraction	= A1 - B1	= A1 - 3
Multiply	= A1 * B1	= A1 * 3
Divide	= A1 / B1	= A1 / 3

## Basic Functions

Sum	=Sum(A1:A10)	Totals values in A1 through A10.
Average	=Average(A1:A10)	Calculates the average of the values in A1 through A10.
Count	=Count(A1:A10)	Counts the cells with numeric data in A1 through A10.
CountA	=CountA(A1:A10)	Counts the cells with alpha or numeric data in A1 through A10.

# Summary Functions

## Sum

Description	Adds all the numbers you specify		
Syntax	SUM(Number1, [Number2]...)		
Arguments	Number1	Required	The first number, cell, or range to be added
	Number2	Optional	The next number, cell, or range to be added
	NumberN	Optional	You can have up 255 number arguments
Example	A screenshot of an Excel spreadsheet. Column A contains numbers 1 through 6. Column B contains country names and their corresponding values in dollars. Column C is empty. Row 7 shows the formula =SUM(B2:B5) in cell B7, which calculates the sum of the values in cells B2 through B5.		

## Average

Description	Returns the average value of a group of numbers		
Syntax	Average(Number1, [Number2]...)		
Arguments	Number1	Required	The first number, cell, or range to be averaged
	Number2	Optional	The next number, cell, or range to be averaged
	NumberN	Optional	You can have up 255 number arguments
Example	A screenshot of an Excel spreadsheet. Column A contains numbers 1 through 6. Column B contains country names and their corresponding values in dollars. Column C is empty. Row 7 shows the formula =AVERAGE(B2:B5) in cell B7, which calculates the average of the values in cells B2 through B5.		

## **Count**

Description	Counts the number of cells that have a numeric value		
Syntax	Count(Value1, [Value2]...)		
Arguments	Value1	Required	The first number, cell, or range to be counted
	Value2	Optional	The next number, cell, or range to be counted
	ValueN	Optional	You can have up 255 number arguments
Example	A	B	C
	1	January	
	2 United States	\$ 866,826	
	3 China	\$ 583,501	
	4 Japan	\$ 445,808	
	5 Germany	\$ 338,968	
	6		
	7 COUNT	0	=COUNT(A2:A5)
	8 COUNT	4	=COUNT(B2:B5)

## **CountA**

Description	Counts the number of cells that have a non-blank value		
Syntax	CountA(Value1, [Value2]...)		
Arguments	Value1	Required	The first number, cell, or range to be counted
	Value2	Optional	The next number, cell, or range to be counted
	ValueN	Optional	You can have up 255 number arguments
Example	A	B	C
	1	January	
	2 United States	\$ 866,826	
	3 China	\$ 583,501	
	4 Japan	\$ 445,808	
	5 Germany	\$ 338,968	
	9		
	10 COUNTA	4	=COUNTA(A2:A5)

## Min

Description	Calculates the smallest of a group of values						
Syntax	MIN(Number1, [Number2]...)						
Arguments	Number1	Required	The first number, cell, or range of cells				
	Number2	Optional	The next number, cell, or range of cells				
	NumberN	Optional	You can have up 255 number arguments				
Example	A	B	C	D	E	F	G
	1	1	41.00	=SUM(A1:A7)		10.00	=MAX(A1:A7)
	2	2	7.00	=COUNT(A1:A7)		8.00	=LARGE(A1:A7,2)
	3	5	5.86	=AVERAGE(A1:A7)		1.00	=MIN(A1:A7)
	4	7	7.00	=MEDIAN(A1:A7)		2.00	=SMALL(A1:A7,2)
	5	8	8.00	=MODE(A1:A7)			
	6	8					
	7	10					

## Max

Description	Calculates the largest value of a group of values						
Syntax	MAX(Number1, [Number2]...)						
Arguments	Number1	Required	The first number, cell, or range of cells				
	Number2	Optional	The next number, cell, or range of cells				
	NumberN	Optional	You can have up 255 number arguments				
Example	A	B	C	D	E	F	G
	1	1	41.00	=SUM(A1:A7)		10.00	=MAX(A1:A7)
	2	2	7.00	=COUNT(A1:A7)		8.00	=LARGE(A1:A7,2)
	3	5	5.86	=AVERAGE(A1:A7)		1.00	=MIN(A1:A7)
	4	7	7.00	=MEDIAN(A1:A7)		2.00	=SMALL(A1:A7,2)
	5	8	8.00	=MODE(A1:A7)			
	6	8					
	7	10					

## **Small**

Description	Calculates the Kth smallest value of a group of values						
Syntax	SMALL(Array, K)						
Arguments	Array		Required	The numbers or cells that have the data			
	K		Required	The position within the array. If K is 2 the function returns the 2 <sup>nd</sup> smallest value.			
Example	1	A 1	B 2	C 5	D 41.00 =SUM(A1:A7)	E 10.00 =MAX(A1:A7)	F 8.00 =LARGE(A1:A7,2)
	2			7.00 =COUNT(A1:A7)		1.00 =MIN(A1:A7)	
	3			5.86 =AVERAGE(A1:A7)			
	4			7.00 =MEDIAN(A1:A7)		2.00 =SMALL(A1:A7,2)	
	5			8.00 =MODE(A1:A7)			
	6						
	7						

## **Large**

Description	Calculates the Kth biggest value of a group of values						
Syntax	LARGE(Array, K)						
Arguments	Array		Required	The numbers or cells that have the data			
	K		Required	The position within the array. If K is 2 the function returns the 2 <sup>nd</sup> biggest value.			
Example	1	A 1	B 2	C 5	D 41.00 =SUM(A1:A7)	E 10.00 =MAX(A1:A7)	F 8.00 =LARGE(A1:A7,2)
	2			7.00 =COUNT(A1:A7)		1.00 =MIN(A1:A7)	
	3			5.86 =AVERAGE(A1:A7)			
	4			7.00 =MEDIAN(A1:A7)		2.00 =SMALL(A1:A7,2)	
	5			8.00 =MODE(A1:A7)			
	6						
	7						

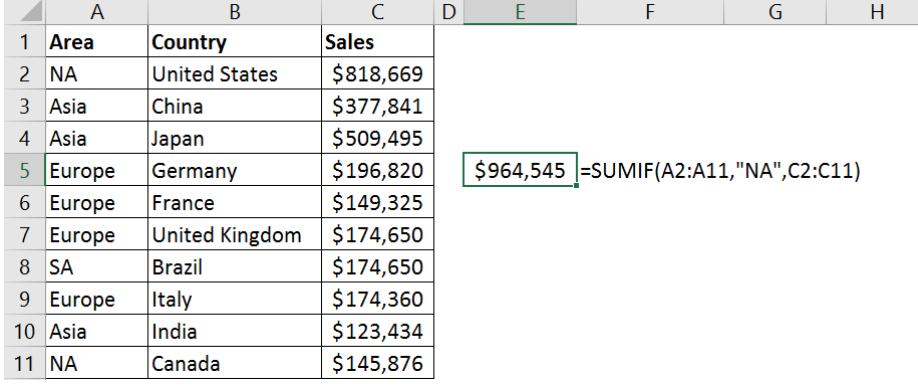
## Median

Description	Calculates the number that is in the middle of a set of numbers						
Syntax	MEDIAN(Number1, [Number2]...)						
Arguments	Number1	Required	The first number, cell, or range of cells				
	Number2	Optional	The next number, cell, or range of cells				
	NumberN	Optional	You can have up 255 number arguments				
Example	A	B	C	D	E	F	G
	1	1	41.00	=SUM(A1:A7)		10.00	=MAX(A1:A7)
	2	2	7.00	=COUNT(A1:A7)		8.00	=LARGE(A1:A7,2)
	3	5	5.86	=AVERAGE(A1:A7)		1.00	=MIN(A1:A7)
	4	7	7.00	=MEDIAN(A1:A7)		2.00	=SMALL(A1:A7,2)
	5	8	8.00	=MODE(A1:A7)			
	6	8					
	7	10					

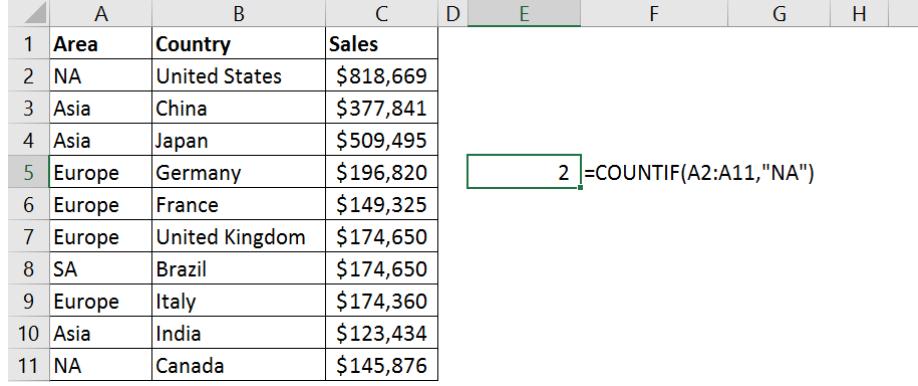
## Mode

Description	Calculates the number that occurs most frequently in a set of numbers						
Syntax	MODE(Number1, [Number2]...)						
Arguments	Number1	Required	The first number, cell, or range of cells				
	Number2	Optional	The next number, cell, or range of cells				
	NumberN	Optional	You can have up 255 number arguments				
Example	A	B	C	D	E	F	G
	1	1	41.00	=SUM(A1:A7)		10.00	=MAX(A1:A7)
	2	2	7.00	=COUNT(A1:A7)		8.00	=LARGE(A1:A7,2)
	3	5	5.86	=AVERAGE(A1:A7)		1.00	=MIN(A1:A7)
	4	7	7.00	=MEDIAN(A1:A7)		2.00	=SMALL(A1:A7,2)
	5	8	8.00	=MODE(A1:A7)			
	6	8					
	7	10					

## **SumIf**

Description	Sums the number of cells in a range that match a given criteria						
Syntax	SUMIF(Range, Criteria, [Sum_range])						
Arguments	Range	Required	The set of cells to test				
	Criteria	Required	The condition the cells must match in order to be added				
	Sum_range	Optional	The cells that are to be added. If left blank the cells in the range parameter are used.				
Example	 <p>\$964,545 =SUMIF(A2:A11,"NA",C2:C11)</p>						

## **CountIf**

Description	Counts the number of cells in a range that match a given criteria						
Syntax	COUNTIF(Range, Criteria)						
Arguments	Range	Required	The set of cells to count				
	Criteria	Required	The condition the cells must match in order to be counted				
	A	B	C	D	E	F	G
Example	 <p>2 =COUNTIF(A2:A11,"NA")</p>						

## SumIfs

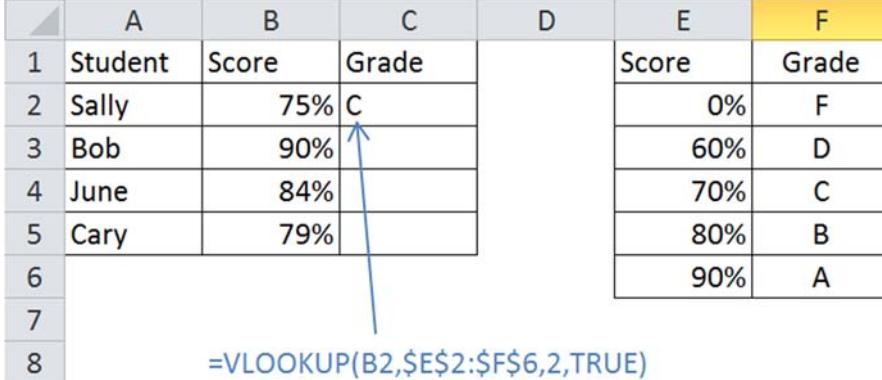
Description	Sums the number of cells in a range that match all the given criteria																																																																																																																		
Syntax	SUMIFS(Criteria_range1, Criteria1, [Criteria_range2],[Criteria2]...)																																																																																																																		
Arguments	Sum_range		Required	The cells that are to be added																																																																																																															
	Criteria_range1		Required	The first set of cells to be evaluated																																																																																																															
	Criteria		Required	The criteria the first set must match																																																																																																															
	Criteria_range2		Optional	The second set of cells to be evaluated																																																																																																															
	Criteria2		Optional	The criteria the first set must match																																																																																																															
Notes	<p>The criteria can be literal text or cell references. Literal criteria should be placed inside quotes. Operators like =, &gt;, &lt; can be used as part of the criteria Use ? and * as wildcards to represent one or multiple characters.</p>																																																																																																																		
Example	<p>The screenshot shows an Excel spreadsheet with data in columns A, B, and C. Row 1 contains headers: Area, Country, and Sales. Rows 2 through 11 contain data points. Cell E5 contains the formula =SUMIFS(C2:C11,A2:A11,"Asia",C2:C11,&gt;200000). The formula is highlighted with a green box, and the result \$887,336 is displayed in the cell.</p> <table border="1"><thead><tr><th></th><th>A</th><th>B</th><th>C</th><th>D</th><th>E</th><th>F</th><th>G</th><th>H</th></tr></thead><tbody><tr><td>1</td><td>Area</td><td>Country</td><td>Sales</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>2</td><td>NA</td><td>United States</td><td>\$818,669</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3</td><td>Asia</td><td>China</td><td>\$377,841</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>4</td><td>Asia</td><td>Japan</td><td>\$509,495</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>5</td><td>Europe</td><td>Germany</td><td>\$196,820</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>6</td><td>Europe</td><td>France</td><td>\$149,325</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>7</td><td>Europe</td><td>United Kingdom</td><td>\$174,650</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>8</td><td>SA</td><td>Brazil</td><td>\$174,650</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>9</td><td>Europe</td><td>Italy</td><td>\$174,360</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>10</td><td>Asia</td><td>India</td><td>\$123,434</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>11</td><td>NA</td><td>Canada</td><td>\$145,876</td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table>								A	B	C	D	E	F	G	H	1	Area	Country	Sales						2	NA	United States	\$818,669						3	Asia	China	\$377,841						4	Asia	Japan	\$509,495						5	Europe	Germany	\$196,820						6	Europe	France	\$149,325						7	Europe	United Kingdom	\$174,650						8	SA	Brazil	\$174,650						9	Europe	Italy	\$174,360						10	Asia	India	\$123,434						11	NA	Canada	\$145,876					
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## CountIfs

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# Lookup functions

## VLookup

Description	Looks for a value in the first column of a table and then returns the value from the specified column of that same row						
Syntax	VLOOKUP(Lookup_value, Table_array, Col_index_num, [Range_lookup])						
Arguments	Lookup_value		Required	The value to find			
	Table_array		Required	The table or range of cells where the value can be found			
	Col_index_num		Required	The column number in the table from which the value is to be returned			
	Range_lookup		Optional	Leave blank or enter TRUE to find the closest match, enter FALSE to find only an exact match			
Notes	If the Range_lookup is blank or TRUE then the data must be sorted in ascending order.						
Example	 <p>=VLOOKUP(B2,\$E\$2:\$F\$6,2,TRUE)</p>						

## HLookup

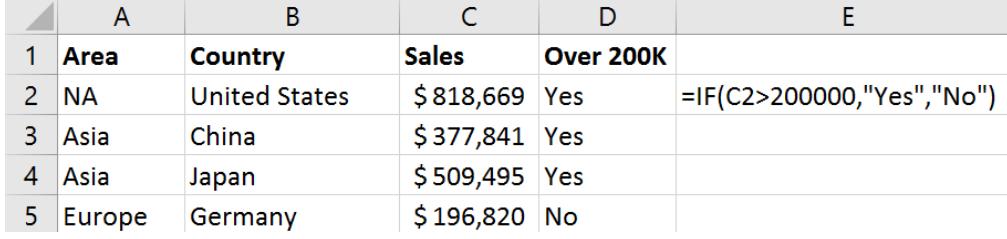
Description	Looks for a value in the first row of a table and then returns the value from the specified row of that same column																																																																																																										
Syntax	HLOOKUP(Lookup_value, Table_array, Row_index_num, [Range_lookup])																																																																																																										
Arguments	Lookup_value		Required		The value to find																																																																																																						
	Table_array		Required		The table or range of cells where the value can be found																																																																																																						
	Row_index_num		Required		The row number in the table from which the value is to be returned																																																																																																						
	Range_lookup		Optional		Leave blank or enter TRUE to find the closest match, enter FALSE to find only an exact match																																																																																																						
Notes	If the Range_lookup is blank or TRUE then the data must be sorted horizontally in ascending order.																																																																																																										
Example	<p>The screenshot shows two tables side-by-side. The left table has columns A, B, and C. The right table has columns E, F, G, H, I, and J. An arrow points from cell B2 of the first table to cell E\$1 of the second table. The formula =HLOOKUP(B2,\$E\$1:\$J\$2,2,TRUE) is shown at the bottom.</p> <table border="1"> <thead> <tr> <th></th> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>E</th> <th>F</th> <th>G</th> <th>H</th> <th>I</th> <th>J</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Student</td> <td>Score</td> <td>Grade</td> <td></td> <td>Score</td> <td>0%</td> <td>60%</td> <td>70%</td> <td>80%</td> <td>90%</td> </tr> <tr> <td>2</td> <td>Sally</td> <td>75%</td> <td>C</td> <td></td> <td>Grade</td> <td>F</td> <td>D</td> <td>C</td> <td>B</td> <td>A</td> </tr> <tr> <td>3</td> <td>Bob</td> <td>90%</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>June</td> <td>84%</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td>Cary</td> <td>79%</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>6</td> <td></td> </tr> <tr> <td>7</td> <td></td> </tr> <tr> <td>8</td> <td></td> <td></td> <td></td> <td></td> <td>=HLOOKUP(B2,\$E\$1:\$J\$2,2,TRUE)</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>									A	B	C	D	E	F	G	H	I	J	1	Student	Score	Grade		Score	0%	60%	70%	80%	90%	2	Sally	75%	C		Grade	F	D	C	B	A	3	Bob	90%									4	June	84%									5	Cary	79%									6											7											8					=HLOOKUP(B2,\$E\$1:\$J\$2,2,TRUE)					
	A	B	C	D	E	F	G	H	I	J																																																																																																	
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## XLookup

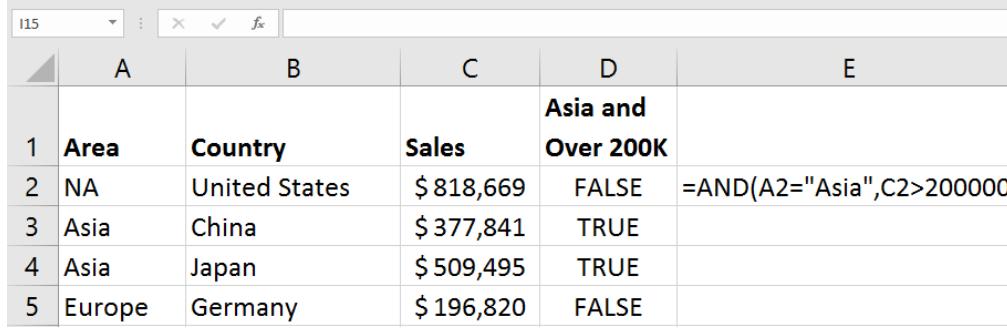
Description	Looks for a value in a column and then returns the value from the same row of a corresponding column																																																																																																				
Syntax	XLOOKUP(Lookup_value, Lookup_array, Return_array, [If_not_found], [Match_mode], [Search_mode])																																																																																																				
Arguments	Lookup_value	Required	The value to find																																																																																																		
	Lookup_array	Required	The column or range of cells where the value can be found																																																																																																		
	Return_array	Required	The column or range of cells where the desired value can be found																																																																																																		
	If_not_found	Optional	Value to display if the Lookup_value is not found																																																																																																		
	Match_mode	Optional	0 or blank for exact match -1 for exact match or next smaller item 1 for exact match or next larger item 2 for wildcard character match																																																																																																		
	Search_mode	Optional	1 or blank for search of first-to-last -1 for search of last-to-first 2 for binary search (sorted in ascending order) -2 for binary search (sorted in descending order)																																																																																																		
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# Logical functions

## If

Description	Evaluates a logical expression. If the expression is true one value is returned, if not another value is returned.			
Syntax	IF(Logical_test, [Value_if_true], [Value_if_false])			
Arguments	Logical_test	Required	The expression that is either TRUE or FALSE	
	Value_if_true	Optional	The value you want returned if the logical expression is TRUE	
	Value_if_false	Optional	The value you want returned if the logical expression is FALSE	
Example				

## And

Description	Determines if all the arguments are TRUE			
Syntax	AND(Logical1, [Logical2])			
Arguments	Logical1	Required	Expression that results in either TRUE or FALSE	
	Logical2	Optional	Expression that results in either TRUE or FALSE	
	LogicalN	Optional	Expression that results in either TRUE or FALSE You can have up to 255 logical expressions.	
Example				

## Or

Description	Determines if any of the arguments are TRUE																																																																																		
Syntax	OR(Logical1, [Logical2])																																																																																		
Arguments	Logical1	Required	Expression that results in either TRUE or FALSE																																																																																
	Logical2	Optional	Expression that results in either TRUE or FALSE																																																																																
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## Not

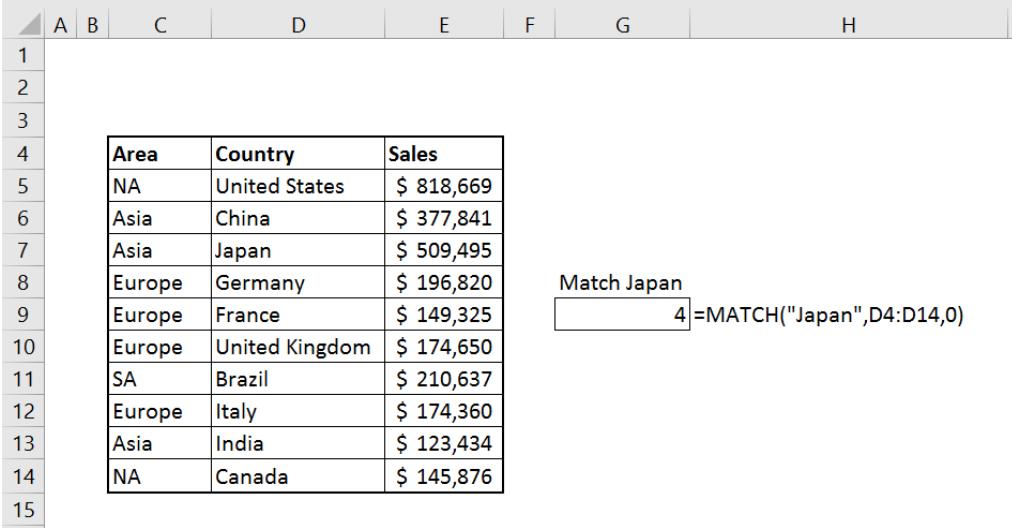
Description	Changes FALSE to TRUE and TRUE to FALSE																																														
Syntax	NOT(Logical)																																														
Arguments	Logical	Required	Expression that results in either TRUE or FALSE																																												
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# Advanced functions

## Index

Description	Determines the value from a table or range of cells that is at the intersection of the specified row number and column number.																																																																																																																																																			
Syntax	INDEX(Array, Row_num, [Column_num])																																																																																																																																																			
Arguments	Array	Required	The table or range of cells																																																																																																																																																	
	Row_num	Required	Specifies the desired row number, relative to the range of cells.																																																																																																																																																	
	Column_num	Optional	Specifies the desired column number, relative to the range of cells.																																																																																																																																																	
Example	<p>The screenshot shows a portion of an Excel worksheet. Column A contains row numbers 1 through 15. Column B contains letters A through H. A table is located in rows 4 through 14, spanning columns C, D, and E. The table has three columns: Area, Country, and Sales. The data includes entries for NA, Asia, Europe, and SA regions, with countries like United States, China, Japan, Germany, France, United Kingdom, Brazil, Italy, India, and Canada, and their corresponding sales values. In cell C4, the formula =INDEX(C4:E14,3,2) is entered, and the result 'China' is displayed. A callout box points to this cell with the text 'Index of 3rd row, 2nd column' and the formula '=INDEX(C4:E14,3,2)'.</p> <table border="1"><thead><tr><th></th><th>A</th><th>B</th><th>C</th><th>D</th><th>E</th><th>F</th><th>G</th><th>H</th></tr></thead><tbody><tr><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>4</td><td></td><td></td><td>Area</td><td>Country</td><td>Sales</td><td></td><td></td><td></td></tr><tr><td>5</td><td></td><td></td><td>NA</td><td>United States</td><td>\$ 818,669</td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td></td><td>Asia</td><td>China</td><td>\$ 377,841</td><td></td><td></td><td></td></tr><tr><td>7</td><td></td><td></td><td>Asia</td><td>Japan</td><td>\$ 509,495</td><td></td><td></td><td></td></tr><tr><td>8</td><td></td><td></td><td>Europe</td><td>Germany</td><td>\$ 196,820</td><td></td><td></td><td></td></tr><tr><td>9</td><td></td><td></td><td>Europe</td><td>France</td><td>\$ 149,325</td><td></td><td></td><td></td></tr><tr><td>10</td><td></td><td></td><td>Europe</td><td>United Kingdom</td><td>\$ 174,650</td><td></td><td></td><td></td></tr><tr><td>11</td><td></td><td></td><td>SA</td><td>Brazil</td><td>\$ 210,637</td><td></td><td></td><td></td></tr><tr><td>12</td><td></td><td></td><td>Europe</td><td>Italy</td><td>\$ 174,360</td><td></td><td></td><td></td></tr><tr><td>13</td><td></td><td></td><td>Asia</td><td>India</td><td>\$ 123,434</td><td></td><td></td><td></td></tr><tr><td>14</td><td></td><td></td><td>NA</td><td>Canada</td><td>\$ 145,876</td><td></td><td></td><td></td></tr><tr><td>15</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table>					A	B	C	D	E	F	G	H	1									2									3									4			Area	Country	Sales				5			NA	United States	\$ 818,669				6			Asia	China	\$ 377,841				7			Asia	Japan	\$ 509,495				8			Europe	Germany	\$ 196,820				9			Europe	France	\$ 149,325				10			Europe	United Kingdom	\$ 174,650				11			SA	Brazil	\$ 210,637				12			Europe	Italy	\$ 174,360				13			Asia	India	\$ 123,434				14			NA	Canada	\$ 145,876				15								
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## Match

Description	Calculates the position of a value in a range of cells		
Syntax	MATCH(Lookup_value, Lookup_array, [match_type])		
Arguments	Lookup_value	Required	The value you want to find
	Lookup_array	Required	The range of cells that will contain the lookup_value
	Match_type	Optional	Leave blank or enter 1 to find the closest value without going over. The data must be sorted in <b>ascending</b> order. Enter 0 to find an exact match. Enter -1 to find the closest value without going under. The data must be in <b>descending</b> order.
Example	 <p>Match Japan 4 =MATCH("Japan",D4:D14,0)</p>		

## Complex formula using Index and Match

Description	You can use Index and Match to find data in one column based on the location of a value in another column.
Syntax	INDEX(Array, MATCH(Lookup_value, Lookup_array, [match_type]), Column_num)
Example	<p>Index and Match together Find Area for Brazil SA =INDEX(C4:E14, MATCH("Brazil", D4:D14, 0), 1) Look in C4:E14 row for Brazil column 1</p>

## IfError

Description	If a value results in an error, displays an alternate value instead.		
Syntax	IFERROR(Value, Value_if_error)		
Arguments	Value	Required	The value you want to display, unless it results in an error.
	Value_if_error	Required	The alternate value to use instead.
Example	<p>=IFERROR(F9/E9-1, "New")</p>		