



# The Must Know Excel Features

Developed by Bryan L. Smith, CPA.CITP, CISA

November 18, 2025 - 3:45-4:50 PM



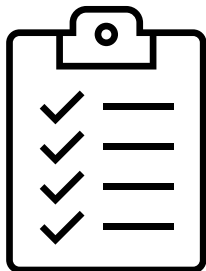
## Bryan L. Smith, CPA.CITP, CISA

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- Owner DataSmithPro, LLC
- Co-founder of CPA Crossings, LLC
- Strategic technology advisor to CPAs w/ 40+ years of experience
- Nationally recognized author and presenter on CPA technology
- Extensive knowledge and experience in proper Excel design techniques as well as helping CPAs build spreadsheets that are accurate
- As a Certified Information Systems Auditor (CISA), spent a considerable amount of time auditing and validating thousands of Excel spreadsheets
- Developed various data analysis and Microsoft Power BI courses and has worked with multiple organizations to train and coach staff on proper data analysis techniques
- Masters of Science in Information Assurance (MSIA)

# Presentation Outline

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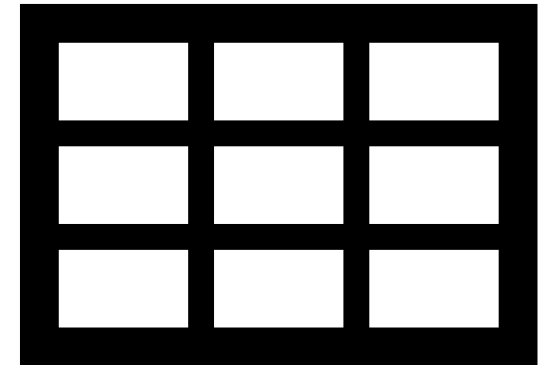
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The slides in this presentation contain many screenshots of the Excel application in order to demonstrate particular features and functionality.

These screenshots were taken during the development of this course. However, Microsoft updates the apps regularly and it becomes difficult to constantly update the screenshots. Therefore, please note that screenshots may vary from your actual version, but the overall functionality remains the same.

Note About Screen Shots

# Excel Tables



# Excel Tables - Defined

A feature added in Excel 2007 - "Format as Table"

Should not be confused with What-If Analysis "Data Tables"

Structured range of data

Typically contains related data in a series of Rows / Columns

A way to organize and analyze data

# Format As Table

The screenshot shows the Microsoft Excel interface with the 'Home' tab selected. The 'Format as Table' button is highlighted in the ribbon. A dropdown menu is open, showing various table styles. A red box highlights the 'Format as Table' button and the dropdown menu. A green callout box points to a selected cell in the spreadsheet.

	A	B	C	D	E	F
1	Sub-Class	Begal	Per.01	Per.02	Per.03	Per.04
2	Sales		(941,979)	(955,055)	(965,452)	(979,053)
3	Sales Returns		7,371	7,543	7,719	7,898
4	Sales Discounts		24,569	25,141	25,727	26,327
5	Costs of Goods		664,392	672,478	678,277	686,658
6	Salary		91,710	93,264	96,034	98,272
7	Depreciation		4,855	4,855	4,855	4,855
8	Office		5,458	5,546	5,671	5,803
9	Rent		9,175	9,389	9,608	9,831
10	Travel		7,775	7,956	8,142	8,332
			7,025	7,174	7,326	7,482
			25,496	26,091	13,349	13,659
			25,179	25,575	29,119	29,441
			1,125	1,125	1,125	1,125
			(228)	(229)	(230)	(231)
17						
18						

Select a single cell in contiguous range, then Format as Table

# Productivity Gain Topics

**Easily change  
Table  
formatting**

**Navigate  
directly to  
Tables**

**Auto filters  
headers that  
stay visible**

**Easily reorder  
rows and  
columns**

**Auto expands  
with new data  
and maintains  
cell formatting**

**Calculated  
columns keeps  
formulas  
consistent**

**Total row with  
drop down list  
for quick  
calculations**

**Structured  
references in  
formulas**

**Use a Table with  
a PivotTable**

**Use Slicers with a  
Table**

# Easily Change Table Formatting

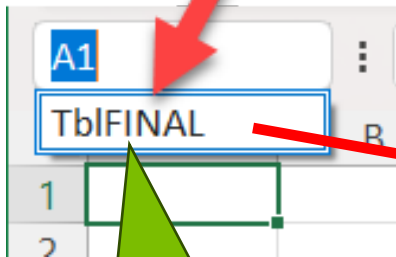
The screenshot shows the Excel interface with the Table Design ribbon active. The ribbon is divided into several sections: Properties (Table Name: TblFINAL, Resize Table), Tools (Summarize with PivotTable, Remove Duplicates, Convert to Range), External Table Data (Insert Slicer, Export, Refresh, Unlink), and Table Style Options (Header Row, Total Row, Banded Rows, First Column, Last Column, Banded Columns, Filter Button). A red box highlights the Table Design ribbon, and a red arrow points from a callout to the 'Filter Button' checkbox. A green callout points to the ribbon with the text 'Select any cell in Table to display Table Design Ribbon'. Another green callout points to the Table Style Options section with the text 'Formatting options'. A third green callout points to the table styles grid with the text 'Table Styles for easy formatting'. The table data is visible in the background, showing columns for Sub-Class, BegBal, and various periods (Per.01 to Per.09).

Sub-Class	BegBal	Per.01	Per.02	Per.03	Per.04	Per.05	Per.06	Per.07	Per.08	Per.09
Sales	0	(941,979)	(955,055)	(965,452)	(979,033)	(996,275)	(1,019,727)	(1,043,227)	(1,066,727)	(1,090,227)
Sales Returns	0	7,371	7,543	7,719	7,898	8,083	8,271	8,463	8,661	8,865
Sales Discounts	0	24,569	25,141	25,727	26,327	26,940	27,567	28,209	28,869	29,539
Costs of Sales	0	664,392	672,478	680,277	686,656	698,000	714,271	730,542	746,813	763,084
Salary	0	91,710	93,264	96,034	98,272	100,561	102,899	105,287	107,725	110,213
		4,855	4,855	4,855	4,855	4,855	4,855	4,855	4,855	4,855
		5,458	5,546	5,671	5,803	5,937	6,074	6,113	6,153	6,197
		9,175	9,389	9,608	9,831	9,085	10,295	10,371	10,449	10,527
		17,775	7,956	8,142	8,332	8,527	8,723	8,790	8,255	8,924
		7,025	7,174	7,326	7,482	7,643	7,809	9,468	9,588	9,709
		25,496	26,091	13,349	13,659	13,978	14,305	16,031	16,233	16,438
		25,179	25,575	29,119	29,441	30,178	30,643	29,831	30,399	30,989
		1,125	1,125	1,125	1,125	1,125	1,125	1,061	1,050	1,040
Interest Income	0	(228)	(229)	(230)	(231)	(233)	(234)	(235)	(436)	(438)
<b>Total</b>	<b>0</b>	<b>(68,077)</b>	<b>(69,147)</b>	<b>(78,730)</b>	<b>(79,603)</b>	<b>(81,596)</b>	<b>(82,848)</b>	<b>(85,060)</b>	<b>(87,277)</b>	<b>(88,359)</b>

# Navigate Directly to Tables



Navigates to the Table, even if it's on a different sheet



This is why it's important to name Tables

	A	B	C	E	F	G	H	I	J	K	L	M	N	O	
1	Sub-Class	BegBal	Per.01	Per.02	Per.03	Per.04	Per.05	Per.06	Per.07	Per.08	Per.09	Per.10	Per.11	Per.12	Per.YTD
2	Sales	0	(941,979)	(955,055)	(965,452)	(979,053)	(996,275)	(1,019,266)	(1,046,016)	(1,063,650)	(1,083,227)	(1,095,751)	(1,095,153)	(1,106,068)	(12,346,945)
3	Sales Returns	0	7,371	7,543	7,719	7,898	8,083	8,271	8,445	8,622	8,803	8,987	9,177	9,370	100,289
4	Sales Discounts	0	24,569	25,141	25,727	26,327	26,940	27,568	28,147	28,738	29,341	29,958	30,587	31,229	334,272
5	Costs of Goods	0	664,392	672,478	678,277	686,656	698,000	714,080	734,346	747,900	763,074	772,374	770,746	778,698	8,681,021
6	Salary	0	91,710	93,264	96,034	98,272	100,561	102,904	103,733	104,567	105,409	106,260	107,118	107,986	1,217,818
7	Depreciation	0	4,855	4,855	4,855	4,855	4,855	4,855	4,855	4,855	4,855	5,155	5,155	5,155	54,160
8	Office	0	5,458	5,546	5,671	5,803	5,937	6,074	6,113	6,153	6,197	6,240	6,288	6,336	71,816
9	Rent	0	9,175	9,389	9,608	9,831	9,085	10,295	10,371	10,449	10,527	10,606	10,684	10,766	120,786
		0	7,775	7,956	8,142	8,332	8,527	8,723	8,790	8,255	8,924	8,993	9,062	9,129	103,209
	Advertising	0	7,025	7,174	7,326	7,482	7,643	7,809	9,468	9,588	9,709	9,832	9,956	10,082	103,094
	Commissions	0	25,496	26,091	13,349	13,659	13,978	14,305	16,031	16,233	16,438	16,646	16,855	17,068	206,149
	State Tax	0	25,179	25,575	29,119	29,441	30,178	30,643	29,831	30,399	30,989	31,187	30,466	31,088	354,095
	Interest Expense	0	1,125	1,125	1,125	1,125	1,125	1,125	1,061	1,050	1,040	1,029	1,019	1,009	12,958
15	Interest Income	0	(228)	(229)	(230)	(231)	(233)	(234)	(235)	(436)	(438)	(440)	(444)	(445)	(3,823)
16	<b>Total</b>	<b>0</b>	<b>(68,077)</b>	<b>(69,147)</b>	<b>(78,730)</b>	<b>(79,603)</b>	<b>(81,596)</b>	<b>(82,848)</b>	<b>(85,060)</b>	<b>(87,277)</b>	<b>(88,359)</b>	<b>(88,924)</b>	<b>(88,484)</b>	<b>(88,597)</b>	<b>(991,101)</b>

# Auto Filters Headers That Stay Visible

	A	B	C	D	E
1	Sub-Class ▼	BegBal ▼	Per.01 ▼	Per.02 ▼	Per.03 ▼
2	Sales	0	(941,979)	(955,055)	(965,452)

Automatically adds filters to Table headers

Scroll down and filters/column names replace column letters

	Sub-Class ▼	BegBal ▼	Per.01 ▼	Per.02 ▼	Per.03 ▼	P
2	Sales	0	(941,979)	(955,055)	(965,452)	
3	Sales Returns	0	7,371	7,543	7,719	

Only works if a cell within the Table is selected

# Auto Expands with New Data

9	Travel	103,209	0	7,775	7,956	8,142	8,332	8,527	8,723	8,790	8,255	8,924	8,993	9,062	9,129
10	Advertising	103,094	0	7,025	7,174	7,326	7,482	7,643	7,809	9,468	9,588	9,709	9,832	9,956	10,082
11	Commissions	206,149	0	25,496	26,091	13,349	13,659	13,978	14,305	16,031	16,233	16,438	16,646	16,855	17,068
12	Depreciation	54,160	0	4,855	4,855	4,855	4,855	4,855	4,855	4,855	4,855	4,855	5,155	5,155	5,155
13	Income Tax	354,095	0	25,179	25,575	29,119	29,441	30,178	30,643	29,831	30,399	30,989	31,187	30,466	31,088
14	Interest Expense	12,958	0	1,125	1,125	1,125	1,125	1,125	1,125	1,061	1,050	1,040	1,029	1,019	1,009
15	Interest Income	(3,823)	0	(228)	(229)	(230)	(231)	(233)	(234)	(235)	(436)	(438)	(440)	(444)	(445)
16	Advertising	103,094	0	7,025	7,174	7,326	7,482	7,643	7,809	9,468	9,588	9,709	9,832	9,956	10,082
17	Commissions	206,149	0	25,496	26,091	13,349	13,659	13,978	14,305	16,031	16,233	16,438	16,646	16,855	17,068
18	Depreciation	54,160	0	4,855	4,855	4,855	4,855	4,855	4,855	4,855	4,855	4,855	5,155	5,155	5,155
19	Income Tax	354,095	0	25,179	25,575	29,119	29,441	30,178	30,643	29,831	30,399	30,989	31,187	30,466	31,088
20	Interest Expense	12,958	0	1,125	1,125	1,125	1,125	1,125	1,125	1,061	1,050	1,040	1,029	1,019	1,009
21	Interest Income	(3,823)	0	(228)	(229)	(230)	(231)	(233)	(234)	(235)	(436)	(438)	(440)	(444)	(445)

Copy & Paste Values auto expands the Table range

Can also paste over Table Total row

20	Interest Expense	12,958	0	1,125	1,125
21	Interest Income	(3,823)	0	(228)	(229)
22	Investment Income				

Also expands if you type new data on the row right under the Table

# Calculated Columns Keeps Formulas Consistent - New Formula

O	P
Per.12	
(1,106,068)	
9,370	
31,229	=[@[Per.YTD]]*1.1
778,698	
107,986	
6,336	
10,766	
9,129	
10,082	
17,068	
5,155	
31,088	

Enter formula in a single cell in a column, it copies to the other cells in the column

O	P	Q
Per.12	Per.	
(1,106,068)	(13,581,640)	
9,370	110,318	
31,229	367,699	
778,698	9,549,123	
107,986	1,339,600	
6,336	78,998	
10,766	132,865	
9,129	112,869	
10,082	113,403	
17,068	226,764	
5,155	65,076	
31,088	389,505	

Note: Conditional Formatting doesn't copy to auto column

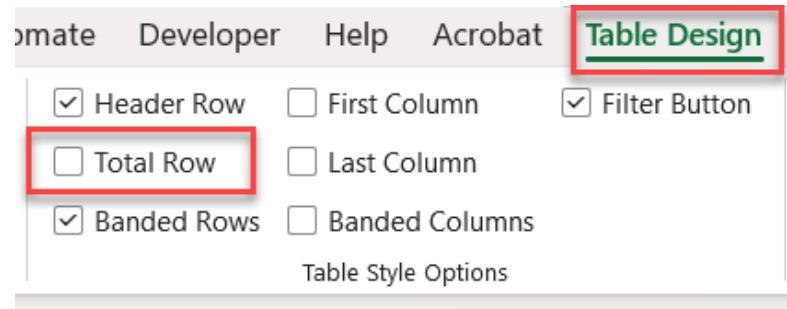
# Calculated Columns Keeps Formulas Consistent - Change Formula

O	P
Per.12 ▾	Per. ▾
(1,106,068)	(13,581,640)
9,370	110,318
31,229	=[@[Per.YTD]]*1.15
778,698	9,549,123
107,986	1,339,600
6,336	78,998
10,766	132,865
9,129	112,869
10,082	113,403
17,068	226,764
5,155	65,076
31,088	389,505

Change formula in a single cell in a column, it changes all formulas in the column

O	P	Q
Per.12 ▾	Per. ▾	
(1,106,068)	(14,198,987)	
9,370	115,332	
31,229	384,413	
778,698	9,983,174	
107,986	1,400,491	
6,336	82,588	
10,766	138,904	
9,129	117,999	
10,082	118,558	
17,068	237,071	
5,155	68,034	
31,088	407,209	

# Total Row for Quick Calculations



22	Income Tax	79,873	90,262	91,219	92,741	354,095
23	Interest Expense	3,375	3,375	3,151	3,057	12,958
24	Interest Income	(687)	(698)	(1,109)	(1,329)	(3,823)
25	<b>Total</b>					<b>0</b>

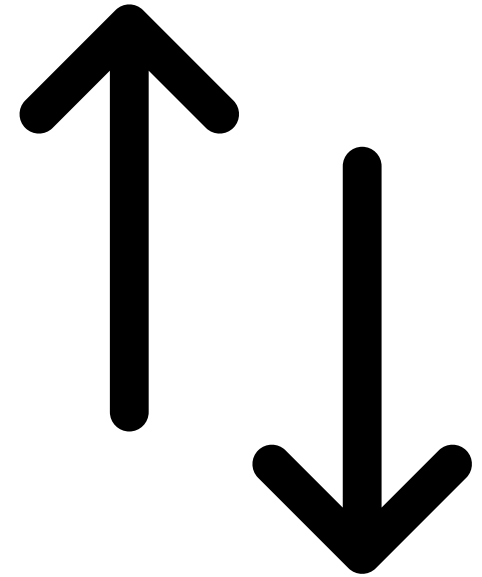
Adds a total to the rightmost cell that contain values

# Total Row with Drop-Down List for Quick Calculations

	Sub-Class	Qtr1	Qtr2	Qtr3
16	Depreciation	14,565	14,565	14,565
17	Office	16,675	17,814	18,000
18	Rent	28,172	29,211	31,000
19	Travel	23,873	25,582	26,000
20	Advertising	21,525	22,934	28,000
21	Commissions	64,936	41,942	48,000
22	Income Tax	79,873	90,262	91,000
23	Interest Expense	3,375	3,375	3,375
24	Interest Income	(687)	(698)	(1,000)
25	<b>Total</b>			
26				
27				
28				
29				
30				
31				
32				
33				

Drop-down list to select a Function. Can use ANY function. Turning Total Row off/on it remembers the formula

# Custom Sorting



# Custom Sorting

## Built-In sorting order in Excel

- Ascending
- Descending
- Dates (date, month, day of week)
- Color in Excel Table

## Custom Lists allows user-defined order

- List must contain text or text with numbers
- Numbers only must come from a list formatted as text

# Example of Custom Lists

High, Medium, Low

Large, Medium, Small

North, South, East, West

Senior Manager, Regional Manager, Department Manager, Sales Representative

# Creating a Custom List

The image shows two screenshots from Microsoft Excel. The left screenshot is the 'Excel Options' dialog box, with the 'Advanced' category selected in the left-hand pane. A green callout bubble points to the 'Advanced' category and contains the text: 'File > Options > Advanced > scroll down > Edit Custom Lists'. A red arrow points from the 'Advanced' category to the 'Edit Custom Lists...' button in the 'Create lists for use in sorts and fill sequences' section. The right screenshot is the 'Custom Lists' dialog box, which is open to the 'Custom Lists' tab. A red arrow points from the 'Edit Custom Lists...' button in the first screenshot to the 'Custom Lists' dialog box. The 'Custom Lists' dialog box shows a list of custom lists with 'NEW LIST' selected. The list entries are: 'Sun, Mon, Tue, Wed, Thu, Fri, Sat', 'Sunday, Monday, Tuesday, Wedne', 'Jan, Feb, Mar, Apr, May, Jun, Jul, Au', and 'Detroit, Grand Rapids, Saginaw, Rc'. There are 'Add', 'Delete', and 'Import' buttons, and 'OK' and 'Cancel' buttons at the bottom.

# Setting Up Custom List

You can manually enter

You can create from range

- Use UNIQUE function to get list
- Copy & Paste Values, then Set order
- Select range
- Open Custom Lists
- Range should be in "Import list from cells"

# Creating Custom List from Range

The screenshot illustrates the process of creating a custom list from a data range in Excel. It shows a data table with columns for MonthYear, Salesperson, Region, and Product. A secondary table shows the unique values extracted from the Salesperson, Region, and Product columns. The Custom Lists dialog box is open, showing the 'Import list from cells' field with the range \$M\$3:\$M\$6 selected.

MonthYear	Salesperson	Region	Product
Jan 2007	Joseph	North	FastCar
Jan 2007	Joseph	North	RapidZoo
Jan 2007	Joseph	West	SuperGlue
Jan 2007	Joseph	West	FastCar
Jan 2007	Joseph	West	RapidZoo
Jan 2007	Joseph	Middle	SuperGlue
Jan 2007	Joseph	Middle	FastCar
Jan 2007	Joseph	Middle	RapidZoo
Jan 2007	Lawrence	North	SuperGlue
Jan 2007	Lawrence	North	FastCar
Jan 2007	Lawrence	North	RapidZoo
Jan 2007	Lawrence	West	SuperGlue
Jan 2007	Lawrence	West	FastCar
Jan 2007	Lawrence	West	RapidZoo
Jan 2007	Lawrence	Middle	SuperGlue
Jan 2007	Lawrence	Middle	FastCar
Jan 2007	Lawrence	Middle	RapidZoo
Jan 2007	Maria	North	SuperGlue
Jan 2007	Maria	North	FastCar

Salespersons	Region	Product
Joseph	North	FastCar
Lawrence	West	RapidZoo
Maria	Middle	SuperGlue
Matt		

Custom Lists dialog box details:

- Custom Lists: NEW LIST
- List entries: (Empty)
- Import list from cells: \$M\$3:\$M\$6

# Sort with Custom List

I add Custom Sort to Quick Access Toolbar

	A	B	C	D	E	F	G
1							
2		MonthYear	Salesperson	Region	Product	Customer	Number
3	Jan 2007	Joseph	North	FastCar	8	\$1,000,000.00	\$100,000
4	Jan 2007	Joseph	North	RapidZoo	8	\$1,088.00	\$396
5	Jan 2007	Joseph	West	SuperGlue	8	\$1,680.00	\$752
6	Jan 2007	Joseph	West	FastCar	9	\$2,133.00	\$922
7	Jan 2007	Joseph	West	RapidZoo	10	\$1,610.00	\$579
8	Jan 2007	Joseph	Middle	SuperGlue	10	\$1,540.00	\$569
9	Jan 2007	Joseph	Middle	FastCar	7	\$1,316.00	\$427

# Results of Custom Sort

Sort

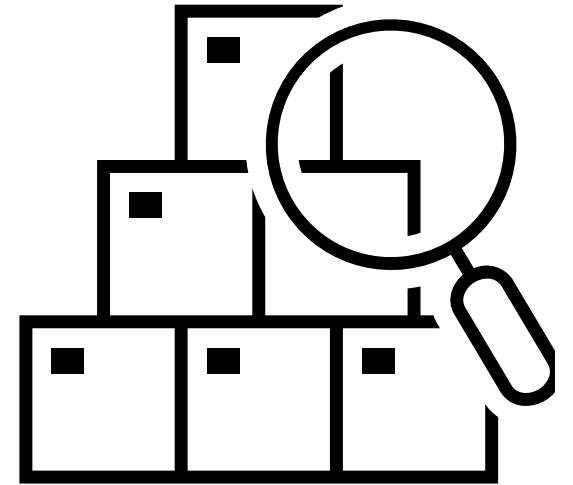
My data has headers

Column	Sort On	Order
Sort by Salespersons	Cell Values	Maria, Lawrence, Matt, Joseph
Then by Region	Cell Values	North, West, Middle
Then by Product	Cell Values	RapidZoo, SuperGlue, FastCar

OK Cancel

MonthYear	Salesperson	Region	Product	Number	Customer	Net S
Jan 2007	Maria	North	RapidZoo	6		
Feb 2007	Maria	North	RapidZoo	6		
Mar 2007	Maria	North	RapidZoo	6		
Apr 2007	Maria	North	RapidZoo	7		
May 2007	Maria	North	RapidZoo	6		
Jun 2007	Maria	North	RapidZoo	8		
Jul 2007	Maria	North	RapidZoo	10		
Aug 2007	Maria	North	RapidZoo	10		
Sep 2007	Maria	North	RapidZoo	10		
Oct 2007	Maria	North	RapidZoo	9		
Nov 2007	Maria	North	RapidZoo	9		

# XLOOKUP



# VLOOKUP / HLOOKUP

The traditional “lookup” functions

Looks for a value in array (list) and return a value from that array

V - looks down a column in a list to find a value

H - looks across a row in a list to find a value

Can be inefficient in older versions of Excel

**XLOOKUP was created to replace these 2 functions**

# Issue #1 with VLOOKUP / HLOOKUP

R33    fx

	A	B	C	D	E	F	G	H	I	J	K	L
1								VLOOKUP(lookup_value, table_array, col_index_num, [range_lookup])				
2												
3	OrderNo	CustNo	Date	Total	SalesPNo	CustName		CustID	Name	Territory	Group	
4	43659	676	7/1/2023	4079.99	279	Better Bike Shop		117	Pedals Warehouse	Southeast	North America	
5	43659	676	7/1/2023	80.75	279	Better Bike Shop		146	Latest Sports Equipment	Northwest	North America	
6	43659	676	7/1/2023	2039.99	279	Better Bike Shop		227	Health Spa, Limited	Canada	North America	
7	43660	150	7/1/2023	419.46	279	#N/A		397	Capable Sales and Service	Northwest	North America	
8	43661	442	7/1/2023	20.75	282	Original Bicycle Supply Co.		442	Original Bicycle Supply Co.	Canada	North America	
9	43661	442	7/1/2023	1637.4	282	Original Bicycle Supply Co.		5			North America	
10	43661	442	7/1/2023	4079.99		Original Bicycle Supply Co.		6			North America	
11	43661	442	7/1/2023	40.37		Original Bicycle Supply Co.		676	Better Bike Shop	Southeast	North America	
12	43662					Limited						
13	43662					Limited						

If Exact match & lookup\_value is missing, you get #N/A error

Must wrap formula in IFERROR function

# Issue #2 with VLOOKUP & HLOOKUP

F4    fx    =VLOOKUP([@CustNo],TblCus,2,[range\_lookup])

OrderNo	CustNo	Date	Total	SalesPNo	CustName	CustID	Column1	Name	Territory	Group
43659	676	7/1/2023	4079.99	279		117		Pedals Warehouse	Southeast	North America
43659	676	7/1/2023	80.75	279		145		Latest Sports Equipment	Northwest	North America
43659	676	7/1/2023	2039.99	279		227		Health Spa, Limited		
43660	150	7/1/2023	419.46	279	#N/A	38		Capable Sales & Service		
43661	442	7/1/2023	20.75	282				Original Bicycle Supply Co.	Canada	North America
43661	442	7/1/2023	1637.4	282				Wheel Gallery	Southwest	North America
43661	442	7/1/2023	4079.99	282				Yellow Bicycle Company	Central	North America
43661	442	7/1/2023	40.37	282				Better Bike Shop	Southeast	North America
43662	227	7/1/2023	1258.38							
43662	227	7/1/2023	367.88							

VLOOKUP(lookup\_value, table\_array, col\_index\_num, [range\_lookup])

Now, col\_index\_num = 3

If you add column to table\_array, you may have to adjust formula

# Issue #3 with VLOOKUP & HLOOKUP

Name	CustID	Territory	Group
Pedals Warehouse	117	Southeast	North America
Latest Sports Equipm	146	Northwest	North America
Health Spa, Li	227	Canada	North America
	397	Northwest	North America
	442	Canada	North America
Wheel Gallery	511	Southwest	North America
Yellow Bicycle Company	646	Central	North America
Better Bike Shop	676	Southeast	North America

Lookup\_value must be in the first column/row of table\_array

Otherwise, must use the more complicated INDEX and MATCH functions

# XLOOKUP to the Rescue

XLOOKUP(lookup_value, lookup_array, return_array, [if_not_found], [match_mode], [search_mode])	
Argument	Description
<b>lookup_value</b>	The lookup value
<b>lookup_array</b>	The array or range to search
<b>return_array</b>	The array or range to return
<b>[if_not_found]</b>	Where a valid match is not found, return the [if_not_found] text you supply If a valid match is not found, and [if_not_found] is missing, #N/A will be returned
<b>[match_mode]</b>	Specify the match type: 0 - Exact match. If none found, return #N/A. (default) -1 - Exact match. If none found, return the next smaller item 1 - Exact match. If none found, return the next larger item 2 - A wildcard match where *, ?, and ~ have special meaning
<b>[search_mode]</b>	Specify the search mode to use: 1 - First to last (default) -1 - Last to first 2 - Binary search, first to last (relies on lookup_array being sorted in ascending order) (faster search mode) -2 - Binary search, last to first (relies on lookup_array being sorted in descending order) (faster search mode)

Look\_array and return\_array, so lookup\_value doesn't have to be 1<sup>st</sup> column/row

Ability to handle no match

Defaults to Exact match

# Main Benefits of XLOOKUP

Has all the speed improvements released to VLOOKUP in 2018

No longer relies on col\_index\_num

- Can select any column (left or right of lookup\_array), eliminate most uses of INDEX/MATCH
- Won't break if someone inserts or deletes columns in lookup\_array

Performance improvements because only need to specify 2 columns instead of the whole table\_array

Defaults to an exact match

Provides array capabilities...it returns a range instead of a value

Search\_mode option

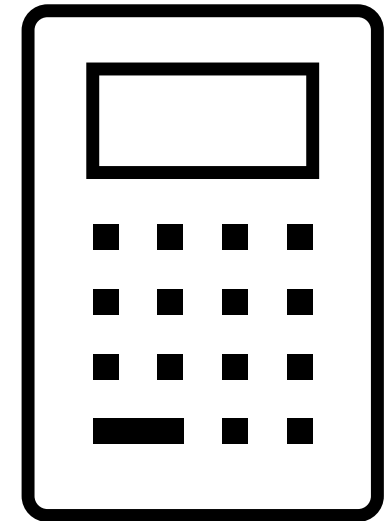
Can allow wildcard matches in search

# XLOOKUP Example

F4       *fx*    =XLOOKUP([@CustNo],TblCustX[CustID],TblCustX[Name],"MISSING")

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	<b>XLOOKUP(lookup_value, lookup_array, return_array, [if_not_found], [match_mode], [search_mode])</b>												
2													
3	<b>OrderNo</b>	<b>CustNo</b>	<b>Date</b>	<b>Total</b>	<b>SalesPNo</b>	<b>CustName</b>	<b>CustName TblCust2X</b>		<b>CustID</b>	<b>Name</b>	<b>Territory</b>	<b>Group</b>	
4	43659	676	7/1/2023	4079.99	279	Better Bike Shop	Better Bike Shop		117	Pedals Warehouse	Southeast	North America	
5	43659	676	7/1/2023	80.75	279	Better Bike Shop	Better Bike Shop		146	Latest Sports Equipment	Northwest	North America	
6	43659	676	7/1/2023	2039.99	279	Better Bike Shop	Better Bike Shop		227	Health Spa, Limited	Canada	North America	
7	43660	150	7/1/2023	419.46	279	MISSING	MISSING		397	Capable Sales and Service	Northwest	North America	
8	43661	442	7/1/2023	20.75	282	Original Bicycle Supply Co.	Original Bicycle Supply Co.		442	Original Bicycle Supply Co.	Canada	North America	
9	43661	442	7/1/2023	1637.4	282	Original Bicycle Supply Co.	Original Bicycle Supply Co.		511	Wheel Gallery	Southwest	North America	
10	43661	442	7/1/2023	4079.99	282	Original Bicycle Supply Co.	Original Bicycle Supply Co.		646	Yellow Bicycle Company	Central	North America	
11	43661	442	7/1/2023	40.37	282	Original Bicycle Supply Co.	Original Bicycle Supply Co.		676	Better Bike Shop	Southeast	North America	
12	43662	227	7/1/2023	1258.38	282	Health Spa, Limited	Health Spa, Limited						
13	43662	227	7/1/2023	367.88	282	Health Spa, Limited	Health Spa, Limited						

SUBTOTAL



# SUBTOTAL & AGGREGATE Functions

- SUBTOTAL(function\_num, ref1, ref2, ...)
  - Subtotals values
  - Does NOT include other SUBTOTAL in range
- AGGREGATE(function\_num, options, ref1, [ref2], ...)
  - Like SUBTOTAL with the option to ignore hidden rows and error values

# SUBTOTAL Functions Syntax

SUBTOTAL = SUBTOTAL(function\_num, ref1, ref2, ...)

Used to calculate a range that is filtered

Designed for  
Columns  
NOT Rows

Function_num (includes hidden values)	Function_num (ignores hidden values)	Function
1	101	AVERAGE
2	102	COUNT
3	103	COUNTA
4	104	MAX
5	105	MIN
6	106	PRODUCT
7	107	STDEV
8	108	STDEVP
9	109	SUM
10	110	VAR
11	111	VARP

# AGGREGATE Function Syntax

AGGREGATE(function\_num, options, ref1, [ref2], ...)

More options than  
the SUBTOTAL  
function

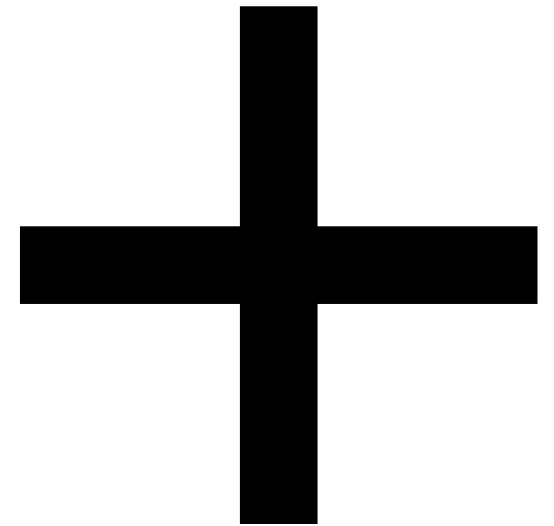
AGGREGATE(function_num, options, ref1, [ref2], ...)			
Function_num	Function	Options	Behavior
1	AVERAGE	0 or omitted	Ignore nested SUBTOTAL and AGGREGATE functions
2	COUNT	1	Ignore hidden rows, nested SUBTOTAL and AGGREGATE functions
3	COUNTA	2	Ignore error values, nested SUBTOTAL and AGGREGATE functions
4	MAX	3	Ignore hidden rows, error values, nested SUBTOTAL and AGGREGATE functions
5	MIN	4	Ignore nothing
6	PRODUCT	5	Ignore hidden rows
7	STDEV.S	6	Ignore error values
8	STDEV.P	7	Ignore hidden rows and error values
9	SUM		
10	VAR.S		
11	VAR.P		
12	MEDIAN		
13	MODE.SNGL		
14	LARGE		
15	SMALL		
16	PERCENTILE.INC		
17	QUARTILE.INC		
18	PERCENTILE.EXC		
19	QUARTILE.EXC		

# SUBTOTAL & AGGREGATE Examples

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	AGGREGATE(function_num, options, ref1, [ref2], ...)				<b>Aggregate OPTIONS:</b>	0	1	2	3	4	5	6	7
2						#DIV/0!	#DIV/0!	24,673	24,673	#DIV/0!	#DIV/0!	24,673	24,673
3													
4					<b>Math Function:</b>	#DIV/0!	(289)	63	429,273				
6					<b>Subtotal Function:</b>	<b>Sum</b>	<b>Avg</b>	<b>Count</b>	<b>Max</b>				
7	SUBTOTAL(function_num, ref1, ref2, ...)					#DIV/0!	(289)	63	429,273				
8													
9	<b>Desc</b>	<b>Location</b>	<b>Department</b>	<b>Class</b>	<b>Sub-Class</b>	<b>Qtr_01</b>	<b>Qtr_02</b>	<b>Qtr_03</b>	<b>Qtr_04</b>				
10	Sales-Retail-Denver	Denver	Retail	Revenue	Sales	(137,258)	(140,456)	(143,729)	(147,078)				
11	Sales-Wholesale-Denver	Denver	Wholesale	Revenue	Sales	#DIV/0!	(44,002)	(45,027)	(46,076)				
12	Sales-Wholesale IC	Denver	Wholesale IC	Revenue	Sales	(509,030)	(512,018)	(512,103)	(515,128)				
13	Sales-Retail-S.F.	San Francisco	Retail	Revenue	Sales	(124,581)	(127,484)	(130,454)	(133,494)				
14	Sales-Wholesale-S.F.	San Francisco	Wholesale	Revenue	Sales	(41,760)	(42,733)	(43,729)	(44,748)				
15	Sales-Service-Lab-S.F.	San Francisco	Lab	Revenue	Sales	(22,600)	(23,127)	(23,655)	(24,217)				
16	Sales-Service-Studio-S.F.	San Francisco	Studio	Revenue	Sales	(14,000)	(14,326)	(14,660)	(15,002)				
17	Sales-Wholesale IC (Elimination)	Denver	Wholesale IC	Revenue	Sales	-	-	-	-				
18	Sales Returns-Retail-Denver	Denver	Retail	Revenue	Sales Returns	3,850	3,940	4,032	4,125				
19	Sales Returns-Retail-S.F.	San Francisco	Retail	Revenue	Sales Returns	3,521	3,603	3,687	3,773				
20	Sales Discounts-Retail-Denver	Denver	Retail	Revenue	Sales Discounts	12,832	13,131	13,437	13,750				
21	Sales Discounts-Retail-S.F.	San Francisco	Retail	Revenue	Sales Discounts	11,737	12,010	12,290	12,577				
22	COGS-Retail-Denver	Denver	Retail	Costs of Goods	Costs of Goods	94,200	96,395	98,641	100,939				
23	COGS-Wholesale-Denver	Denver	Wholesale	Costs of Goods	Costs of Goods	29,500	30,187	30,891	31,610				
24	COGS-Wholesale IC	Denver	Wholesale IC	Costs of Goods	Costs of Goods	424,192	426,682	426,753	429,273				
25	COGS-Retail-S.F.	San Francisco	Retail	Costs of Goods	Costs of Goods	85,300	87,287	89,321	91,402				
26	COGS-Wholesale-S.F.	San Francisco	Wholesale	Costs of Goods	Costs of Goods	31,200	31,927	32,671	33,432				



SUMIF(S)



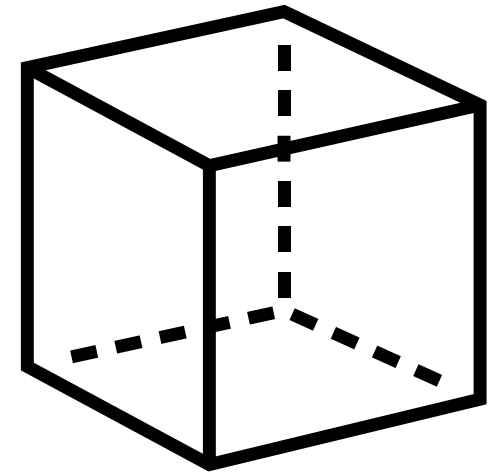
# Math Functions

- `SUMIF(range, criteria, [sum_range])`
  - Adds the cells specified by a given criteria
- `SUMIFS(sum_range, criteria_range1, criteria1, [criteria_range2, criteria2], ...)`
  - Adds the cells in a range that meet multiple criteria

# SUMIF(S) Example

	A	B	C	D	E	F	G	H	I	J	K	L
1	<b>SUMIF Math Functions</b>											
2	<b>Function</b>	<b>Syntax</b>	<b>FORMULATEXT</b>	<b>Result</b>		<b>Last Name</b>	<b>First Name</b>	<b>Department</b>	<b>Status</b>	<b>Current Salary</b>	<b>Date Hired</b>	<b>Year Hired</b>
3	SUMIF	SUMIF(range, criteria, [sum_range])	=SUMIF(H3:H28,"=Marketing",J3:J28)	\$ 165,427	Allen	Yolanda	Sales	Full-Time	\$ 105,321	3/5/2013	2013	
4			=SUMIF(I3:I28,"=Part-Time",J3:J28)	\$ 110,000	Baker	Nancy	Operations	Contract	\$ 75,374	4/16/2018	2018	
5			=SUMIF(L3:L28,2019,J3:J28)	\$ 375,939	Bunnel	Ken	Marketing	Full-Time	\$ 45,427	12/1/2019	2019	
6			=SUMIF(J:J,">100000")	\$ 225,321	Champ	Larry	Administration	Part-Time	\$ 18,000	9/16/2014	2014	
7					Cramden	Moe	Administration	Part-Time	\$ 18,000	3/12/2016	2016	
8	SUMIFS	SUMIFS(sum_range, criteria_range1, criteria1, [criteria_range2, criteria2], ...)	=SUMIFS(J3:J28,I3:I28,"=Full-Time",H3:H28,"=Sales")	\$ 499,833	Davis	Rita	Administration	Full-Time	\$ 28,000	4/15/2020	2020	
9					Dunwell	James	Operations	Full-Time	\$ 45,639	2/9/2015	2015	
10					Ellis	Pamela	Sales	Full-Time	\$ 98,512	3/24/2019	2019	
11					Endow	Ed	Data Processing	Contract	\$ 65,321	11/12/2018	2018	
12		<b>Input</b>			Perry	Adam	Sales	Full-Time	\$ 95,000	3/5/2013	2013	
13	<b>Dept =</b>	<b>Administration</b>	=SUMIF(TblEE[Department],B13,TblEE[Current Salary])	\$ 208,000	Hernandez	Albert	Operations	Contract	\$ 120,000	4/16/2018	2018	
14	<b>Status =</b>	<b>Full-Time</b>	=SUMIFS(TblEE[Current Salary], TblEE[Department],B13,TblEE[Status],B14)	\$ 98,000	Jackson	Austin	Marketing	Full-Time	\$ 75,000	12/1/2019	2019	
15					Gill	Beth	Administration	Part-Time	\$ 15,000	9/16/2014	2014	
16					Brooks	Bill	Administration	Part-Time	\$ 15,000	3/12/2016	2016	
17					Moreno	Billy	Administration	Full-Time	\$ 35,000	3/5/2013	2013	
18					Alonso	Carrie	Operations	Full-Time	\$ 58,000	4/16/2018	2018	
19					Gill	Casey	Sales	Full-Time	\$ 65,000	12/1/2019	2019	
20					Verlander	Justin	Data Processing	Contract	\$ 73,500	9/16/2014	2014	
21					Scherzer	Max	Sales	Full-Time	\$ 66,000	3/12/2016	2016	
22					Cabrera	Miguel	Operations	Contract	\$ 50,000	4/15/2020	2020	
23					Infante	Omar	Marketing	Full-Time	\$ 45,000	2/9/2015	2015	
24					Farbill	Oscar	Administration	Part-Time	\$ 22,000	3/24/2019	2019	
25					Fielder	Prince	Administration	Part-Time	\$ 22,000	11/12/2018	2018	
26					Sanchez	Raymond	Administration	Full-Time	\$ 35,000	3/5/2013	2013	
27					Hunter	Tori	Operations	Full-Time	\$ 47,000	4/16/2018	2018	
28					Martinez	Victor	Sales	Full-Time	\$ 70,000	12/1/2019	2019	
29												

# Array Formulas



# What is an Array Formula?

Think	You can think of an array as a combination of rows and columns of values
Perform	An array formula can perform multiple calculations on one or more items in an array
Return	Array formulas can return either multiple results, or a single result



# Important Note About Array Formulas

- Microsoft 365 Excel versions you can press Enter for array formulas
- ALL other Excel versions require legacy array formulas entry, which requires you to press Ctrl+Shift+Enter
- Due to the difficulty of building training material for ALL versions, I will only be covering Microsoft 365 Excel versions
- If you have other versions, please use the links in the upper right for details on legacy array formulas

# Example of a Single-Cell Array Formula

Cust#	Customer Name	Product Name	Qty	Unit Price	Total
33930	Justin A Robinson	ML Mountain Tire	77	\$29.99	\$2,309.23
50470	Tamara Zhu	Patch Kit/8 Patches	238	\$2.29	\$545.02
43580	Nicole White	Road Tire Tube	15	\$3.99	\$59.85
42860	Nancy L Sanchez	Road-250 Red, 48	5	\$2,443.35	\$12,216.75
45800	Reginald Navarro	Sport-100 Helmet, Blue	50	\$34.99	\$1,749.50
14170	Autumn Zhu	Touring Tire	150	\$28.99	\$4,348.50
43580	Nicole White	LL Road Tire	110	\$21.49	\$2,363.90
21840	Denise Mehta	Mountain-200 Black, 42	18	\$2,049.09	\$36,883.62
50470	Tamara Zhu	Mountain-200 Silver, 42	13	\$2,319.99	\$30,159.87
14170	Autumn Zhu	Touring Tire Tube	23	\$4.99	\$114.77
45800	Reginald Navarro	Touring-1000 Blue, 46	12	\$2,384.07	\$28,608.84
	<b>Grand Total</b>		<b>711</b>		<b>\$119,359.85</b> =SUM(F2:F12)
					Non-Array Formula
					<b>\$119,359.85</b> =SUM(D2:D12*E2:E12)
					Array Formula

Non-Array formula, to calculate Grand Total, need to have a calculation for each row that is Qty \* Unit Price

An Array formula is a calculation in a single cell that performs Qty \* Unit Price row by row without the need for a Total column

# Example of a Multi-Cell Array Formula

Cust#	Customer Name	Product Name	Qty	Unit Price	Total	Array Spill
33930	Justin A Robinson	ML Mountain Tire	77	\$29.99	\$2,309.23 =D2*E2	\$2,309.23 =D2:D12*E2:E12
50470	Tamara Zhu	Patch Kit/8 Patches	238	\$2.29	\$545.02 =D3*E3	\$545.02
43580	Nicole White	Road Tire Tube	15	\$3.99	\$59.85 =D4*E4	\$59.85
42860	Nancy L Sanchez	Road-250 Red, 48	5	\$2,443.35	\$12,216.75 =D5*E5	\$12,216.75
45800	Reginald Navarro	Sport-100 Helmet, Blue	50	\$34.99	\$1,749.50 =D6*E6	\$1,749.50
14170	Autumn Zhu	Touring Tire	150	\$28.99	\$4,348.50 =D7*E7	\$4,348.50
43580	Nicole White	LL Road Tire	110	\$21.49	\$2,363.90 =D8*E8	\$2,363.90
21840	Denise Mehta	Mountain-200 Black, 42	18	\$2,049.09	\$36,883.62 =D9*E9	\$36,883.62
50470	Tamara Zhu	Mountain-200 Silver, 42	13	\$2,319.99	\$30,159.87 =D10*E10	\$30,159.87
14170	Autumn Zhu	Touring Tire Tube	23	\$4.99	\$114.77 =D11*E11	\$114.77
45800	Reginald Navarro	Touring-1000 Blue, 46	12	\$2,384.07	\$28,608.84 =D12*E12	\$28,608.84
	<b>Grand Total</b>		<b>711</b>		<b>\$119,359.85 =SUM(F2:F12)</b>	
					Non-Array Formula	
					<b>\$119,359.85 =SUM(D2:D12*E2:E12)</b>	
					Array Formula	

Enter a formula in a single cell but refer to a Range and it will SPILL to remaining cells

If there is an entry in one of these cells, you will get a #SPILL! error

# Using Array Formula SPILL Range

Cust#	Customer Name	Product Name	Qty	Unit Price	Total	Array Spill	Tax		Total	
33930	Justin A Robinson	ML Mountain Tire	77	\$29.99	\$2,309.23	\$2,309.23	\$138.55	=H2#*0.06	\$2,447.78	=H2#+J2#
50470	Tamara Zhu	Patch Kit/8 Patches	238	\$2.29	\$545.02	\$545.02	\$32.70		\$577.72	
43580	Nicole White	Road Tire Tube	15	\$3.99	\$59.85	\$59.85	\$3.59		\$63.44	
42860	Nancy L Sanchez	Road-250 Red, 48	5	\$2,443.35	\$12,216.75	\$12,216.75	\$733.01		\$12,949.76	
45800	Reginald Navarro	Sport-100 Helmet, Blue	50	\$34.99	\$1,749.50	\$1,749.50	\$104.97		\$1,854.47	
14170	Autumn Zhu	Touring Tire	150	\$28.99	\$4,348.50	\$4,348.50	\$260.91		\$4,609.41	
43580	Nicole White	LL Road Tire	110	\$21.49	\$2,363.90	\$2,363.90	\$141.83		\$2,505.73	
21840	Denise Mehta	Mountain-200 Black, 42	18	\$2,049.09	\$36,883.62	\$36,883.62	\$2,213.02		\$39,096.64	
50470	Tamara Zhu	Mountain-200 Silver, 42	13	\$2,319.99	\$30,159.87	\$30,159.87	\$1,809.59		\$31,969.46	
14170	Autumn Zhu	Touring Tire Tube	23	\$4.99	\$114.77	\$114.77	\$6.89		\$121.66	
45800	Reginald Navarro	Touring-1000 Blue, 46	12	\$2,384.07	\$28,608.84	\$28,608.84	\$1,716.53		\$30,325.37	
<b>Grand Total</b>			<b>711</b>		<b>\$119,359.85</b>					
					Non-Array Formula					
					<b>\$119,359.85</b>	=SUM(D2:D12*E2:E12)				
					Array Formula					

Use # to refer to the Spill Range in another calculation & that formula will also Spill

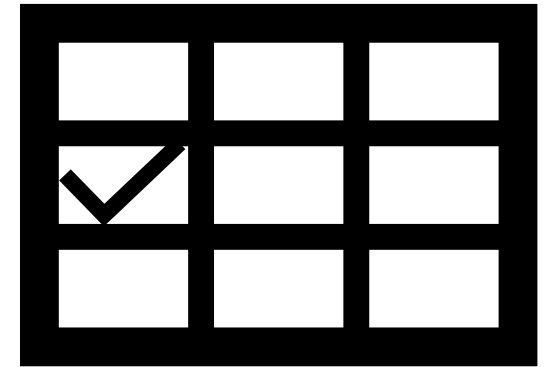
# New Dynamic Array Formulas

N2    ✕ ✓ *fx*    =SORT(A2:F12,1)

	N	O	P	Q	R	S
1	<b>SORT Function</b>					
2	14170	Autumn Z	Touring Tir	150	28.99	4348.5
3	14170	Autumn Z	Touring Tir	23	4.99	114.77
4	21840	Denise M	Mountain-	18	2049.09	36883.62
5	33930	Justin A R	ML Mount	77	29.99	2309.23
6	42860	Nancy L Sa	Road-250 I	5	2443.35	12216.75
7	43580	Nicole Wh	Road Tire	15	3.99	59.85
8	43580	Nicole Wh	LL Road Tir	110	21.49	2363.9
9	45800	Reginald M	Sport-100	50	34.99	1749.5
10	45800	Reginald M	Touring-10	12	2384.07	28608.84
11	50470	Tamara Z	Patch Kit/8	238	2.29	545.02
12	50470	Tamara Z	Mountain-	13	2319.99	30159.87

Dynamic Array  
Formulas automatically  
SPILL the entire range!!

# Data Validations



# Data Validation in Excel

Define restrictions on what data can or should be entered in a cell

Provide messages to define what input you expect

Prevent or warn users of invalid data

Restrict data to:

- Predefined list
- Date/time range,
- Number range
- Text size
- Formula

# Data Validation Example

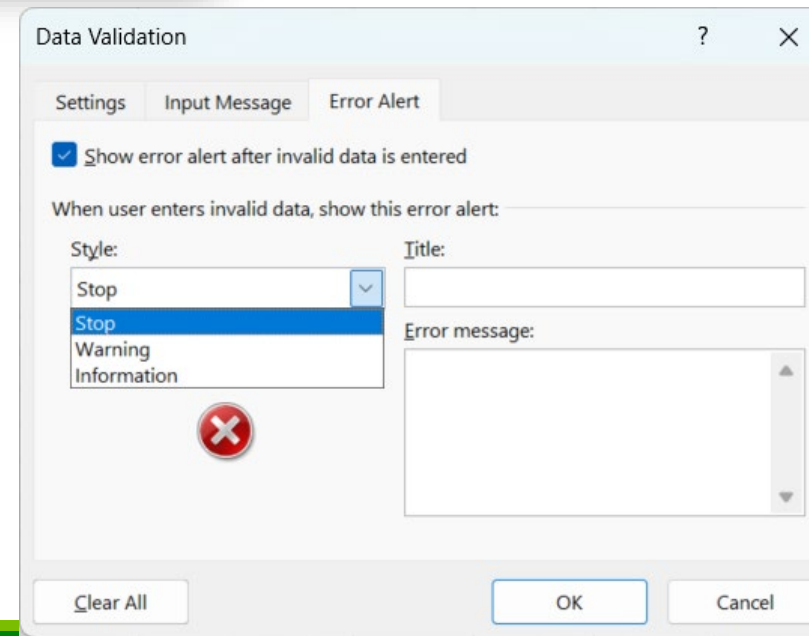
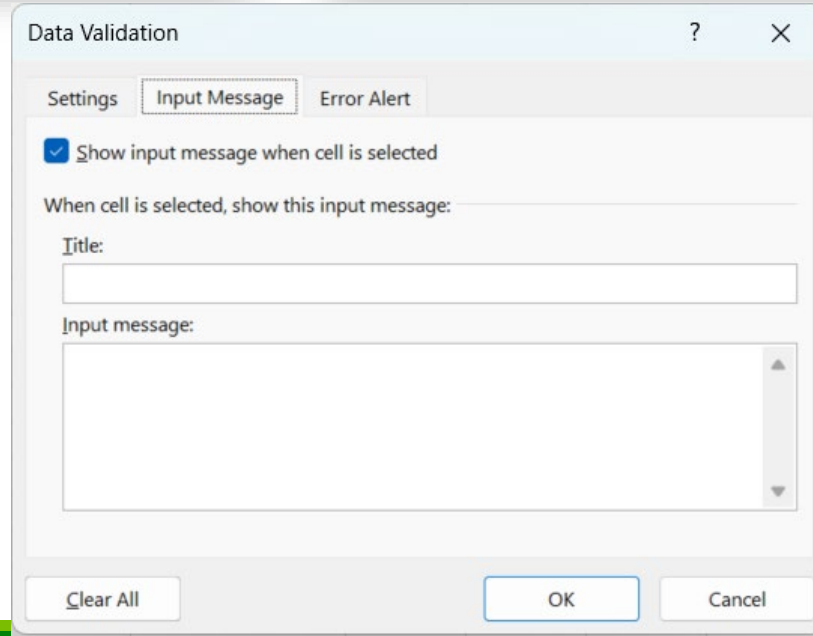
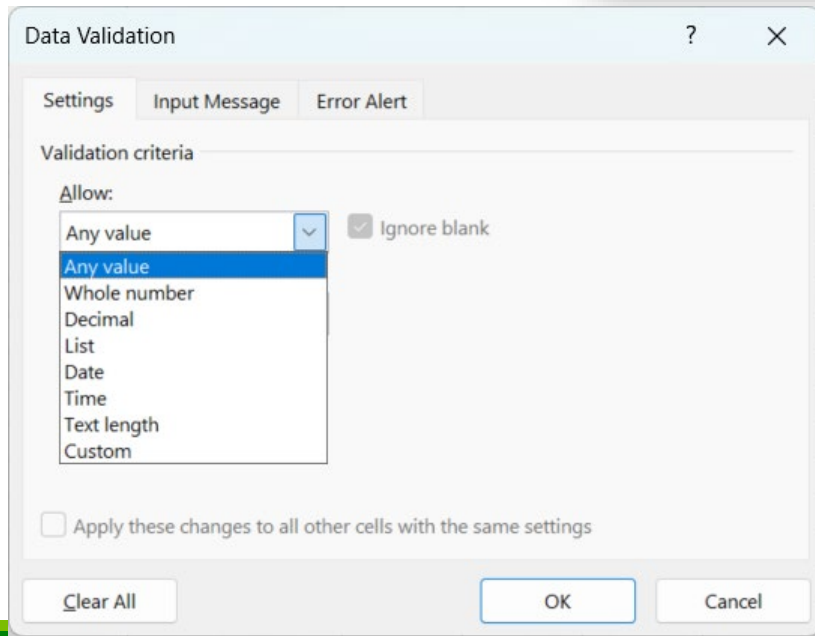
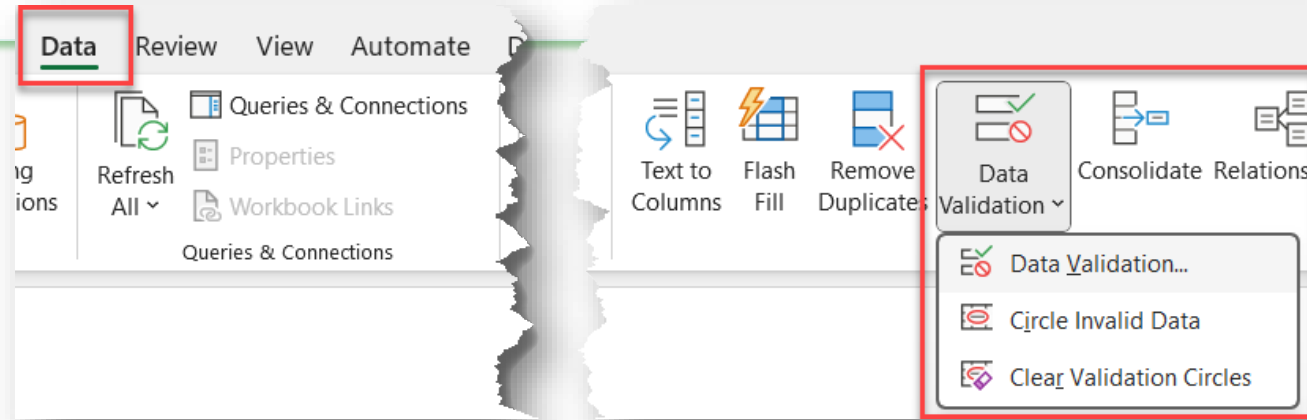
Data Entry Cells

Data Entry Requirements

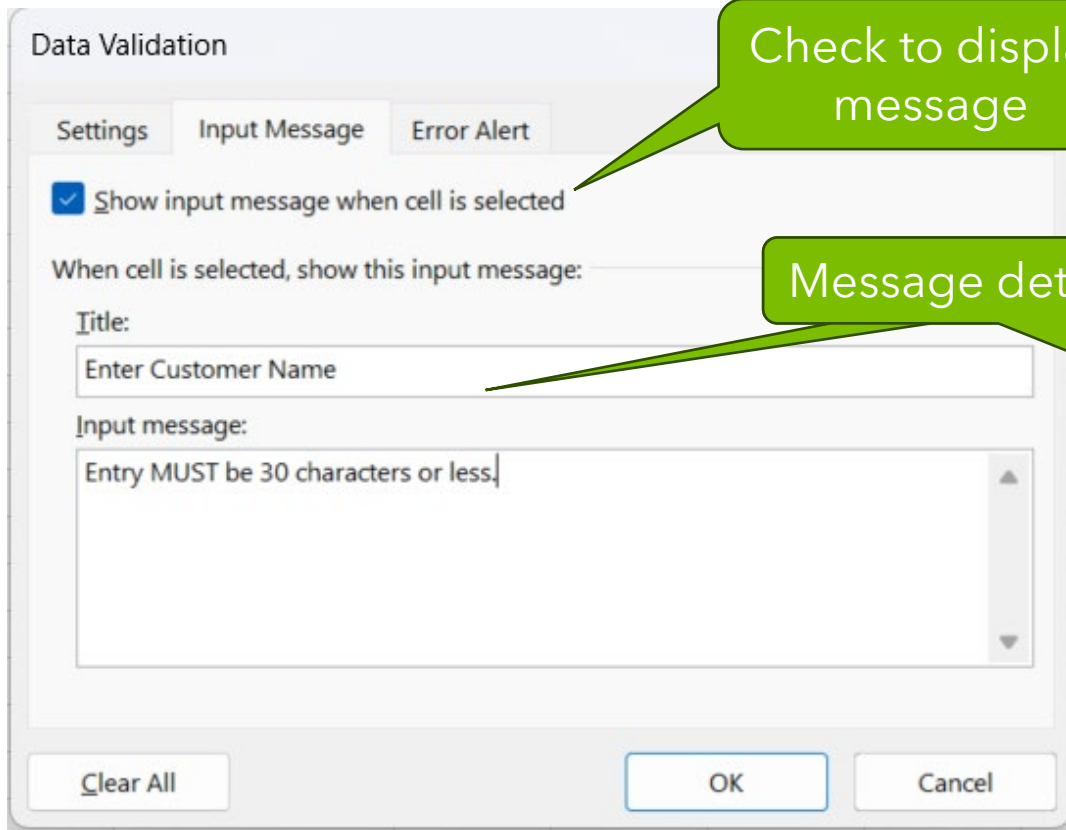
Selection Lists

	A	B	C	D	E	F	G	H	I
1							<b>Territories</b>		
2		<b>Enter Data:</b>	<b>Data Validation Requirements:</b>		<b>Continent</b>		<b>Europe</b>	<b>NorthAmerica</b>	<b>Pacific</b>
3	<b>CustID:</b>		---> Special format		Europe		France	Canada	Australia
4	<b>Name:</b>		---> Limit # of characters		North America		Germany	Central	Japan
5	<b>Continent:</b>		---> Drop-Down list of valid entries		Pacific		Italy	Northeast	Philippines
6	<b>Territory:</b>		---> Lookup based on Territory				Spain	Northwest	Taiwan
7							United Kingdom	Southeast	
8								Southwest	
9									

# Data Validation Dialog Box and Options



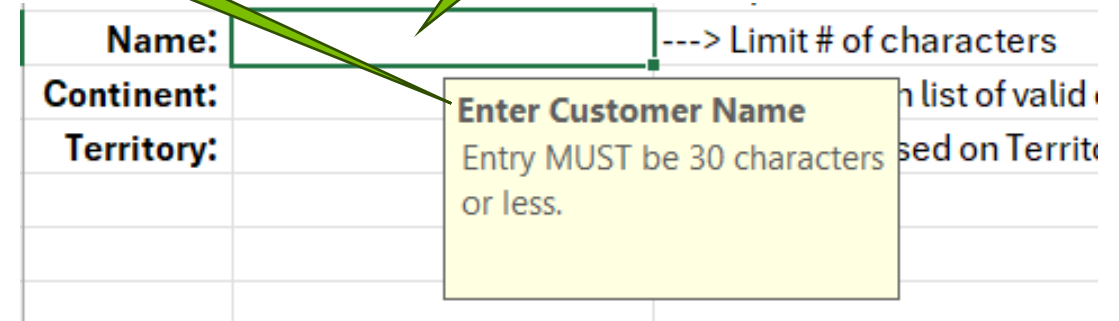
# Input Message



Check to display message

Message details

Select cell to display message



# Error Alert

The screenshot shows the 'Data Validation' dialog box with the 'Error Alert' tab selected. A green callout box labeled 'Select Style' points to the 'Style' dropdown menu, which is currently set to 'Stop'. Another green callout box labeled 'Message details' points to the 'Error message' text area, which contains the text: 'The data entry requires 30 characters of less, entry is GREATER THAN 30 characters. Please correct.' A third green callout box labeled 'Message Examples' points to a small preview of the error message icon (a red circle with a white 'X') located at the bottom left of the dialog. The dialog also has a 'Show error alert after invalid data is entered' checkbox checked, and buttons for 'Clear All', 'OK', and 'Cancel' at the bottom.

This dialog box is titled 'Invalid Entry' and features a red circle with a white 'X' icon. The message text reads: 'The data entry requires 30 characters of less, entry is GREATER THAN 30 characters. Please correct.' At the bottom, there are three buttons: 'Retry', 'Cancel', and 'Help'.

This dialog box is titled 'Invalid Entry' and features a yellow triangle with a black exclamation mark icon. The message text reads: 'The data entry requires 30 characters of less, entry is GREATER THAN 30 characters. Please correct. Continue?'. At the bottom, there are four buttons: 'Yes', 'No', 'Cancel', and 'Help'.

This dialog box is titled 'Invalid Entry' and features a blue circle with a white 'i' icon. The message text reads: 'The data entry requires 30 characters of less, entry is GREATER THAN 30 characters. Please correct.' At the bottom, there are three buttons: 'OK', 'Cancel', and 'Help'.

# Name Field Example - Limit # of Characters to 30

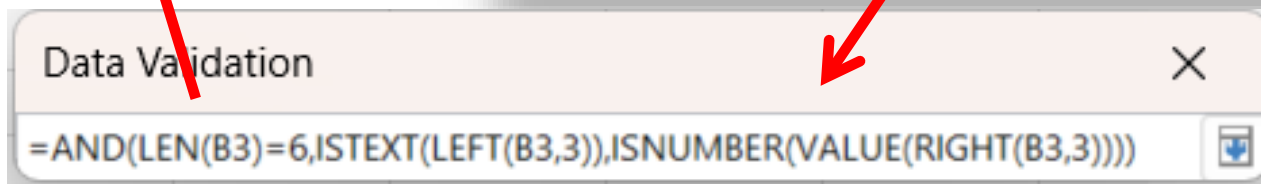
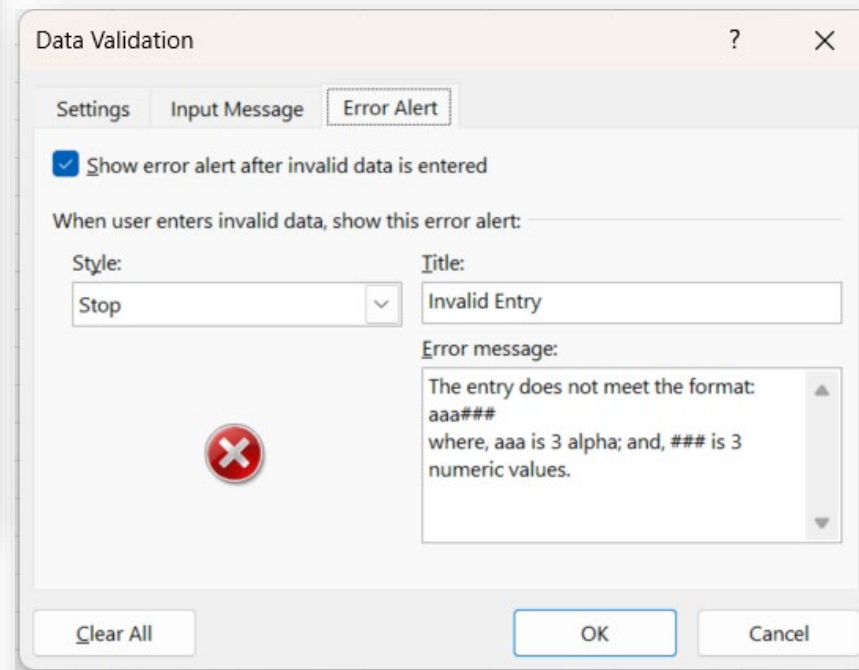
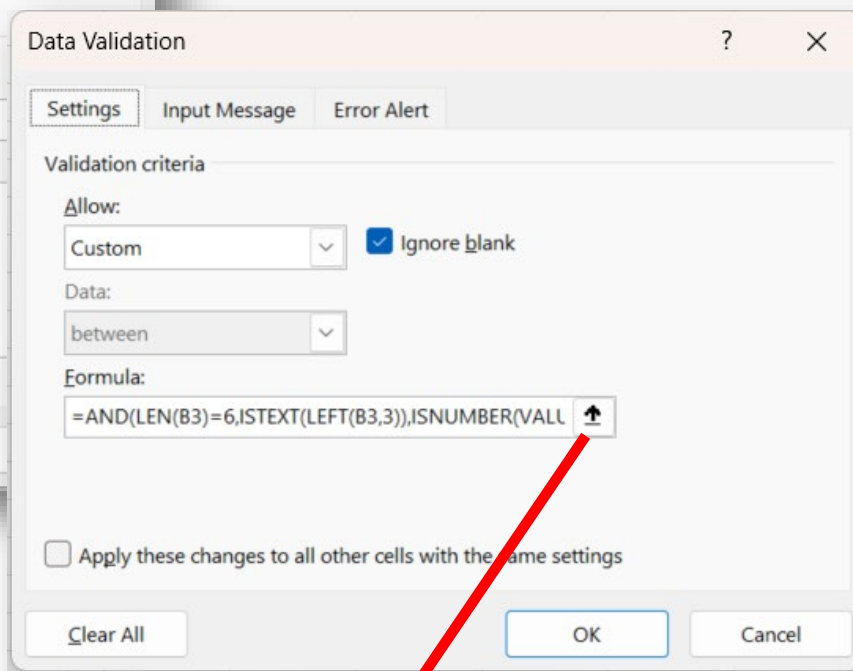
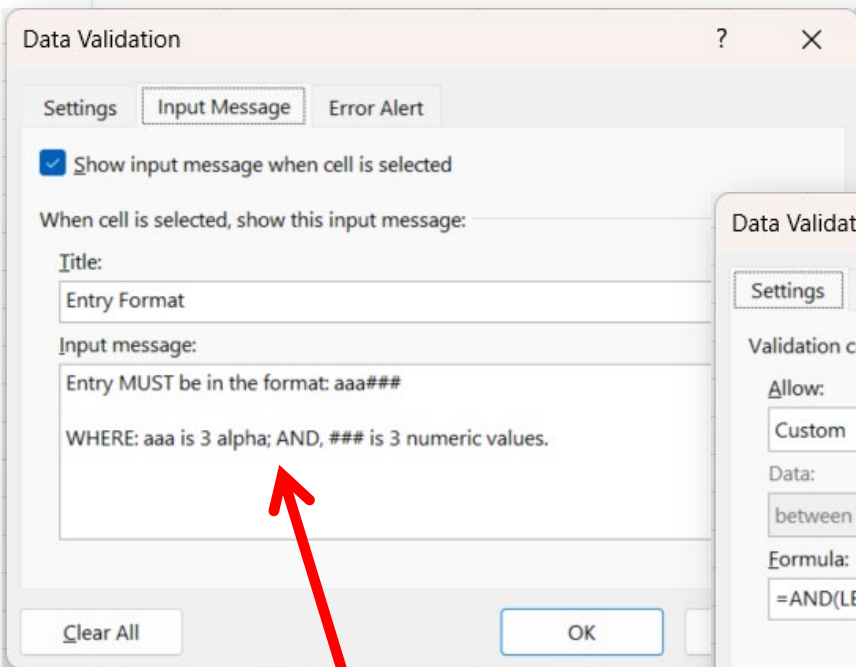
	Enter Data:	Data Validation Requirements:
CustID:		---> Special format
Name:		---> Limit # of characters
Continent:		---> Drop-Down list of valid entries

Select Cell > Data > Data Validation

The image displays three sequential screenshots of the Excel Data Validation dialog box, illustrating the configuration for a name field with a 30-character limit.

- Settings Tab:** Shows the 'Validation criteria' section. Under 'Allow:', 'Text length' is selected. Under 'Data:', 'less than or equal to' is selected. Under 'Maximum:', the value '30' is entered. The 'Ignore blank' checkbox is checked.
- Input Message Tab:** Shows the 'When cell is selected, show this input message:' section. The 'Title' is 'Enter Customer Name' and the 'Input message' is 'Entry MUST be 30 characters or less.'
- Error Alert Tab:** Shows the 'When user enters invalid data, show this error alert:' section. The 'Style' is 'Stop', the 'Title' is 'Invalid Entry', and the 'Error message' is 'The data entry requires 30 characters of less, entry is GREATER THAN 30 characters. Please correct.'

# Customer ID Example - Formula for Special Format



# Continent Example - Select from a Drop-down List

## Best Practice

Create List

Make list an Excel Table

Allows list to auto-expands

Create Data Validation where  
source uses INDIRECT

Data Validation source doesn't allow  
table names

=INDIRECT("Table[Column]")

Here  
=INDIRECT("TblContinent[Continent]")

# Data Validation - List

The screenshot shows an Excel spreadsheet with columns A through G and rows 1 through 23. In row 2, column B is labeled 'Enter Data:' and column C is labeled 'Data Validation Requirements:'. In row 3, column A is 'CustID:' and column C is '---> Special format'. In row 4, column A is 'Name:' and column C is '---> Limit # of characters'. In row 5, column A is 'Continent:' and column C is '---> Drop-Down list of valid entries'. In column E, there is a table with a header 'Continent' and three rows: 'Europe', 'North America', and 'Pacific'. A yellow callout box points to the 'Continent' cell in row 5, column B, with the text 'Continent Select from Drop-Down List'. The 'Data Validation' dialog box is open, showing the 'Settings' tab. The 'Allow:' dropdown is set to 'List', and the 'Source:' field contains the formula '=INDIRECT("TblContinent[Continent]")'. The 'Ignore blank' and 'In-cell dropdown' checkboxes are checked. The 'Apply these changes to all other cells with the same settings' checkbox is unchecked. The 'Clear All', 'OK', and 'Cancel' buttons are visible at the bottom of the dialog box.

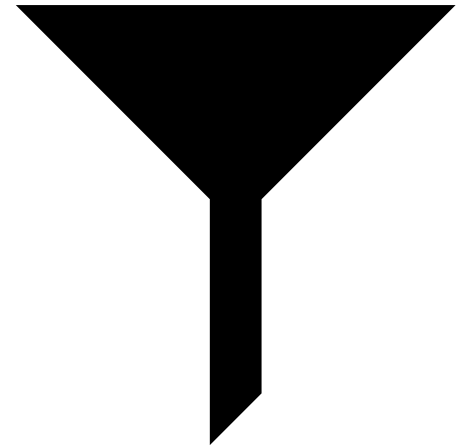
# Data Validation Note

Input messages and error alerts appear only when data is typed directly into the cells

- They do not appear under the following conditions:
  - Pasting values into cell or using the fill command
  - A formula in the cell calculates a result that is not valid
  - A macro enters invalid data in the cell

If you apply Data Validation to cells that already have data, does not notify you of invalid data (use Circle Invalid Data)

# Slicers



# What Are Slicers?

A filtering tool in Excel

Easily filter data in Tables, PivotTables and PivotCharts

User-friendly interface, don't have to use the drop-down button on columns

"Button-like" interface that indicate current filtering state

"Buttons" are automatically created and updated base on data

Options to change the look of individual slicers

# Insert Slicer(s)

The screenshot displays the Excel interface with the 'Table Design' ribbon selected. The 'Table Name' is 'Tb1Slicers'. The 'Table Style Options' group includes 'Filter Button' (checked), 'First Column' (unchecked), 'Last Column' (unchecked), 'Banded Rows' (checked), and 'Banded Columns' (unchecked). The 'Table Style Options' group is highlighted with a red box. The 'Insert Slicer' button is also highlighted with a red box. The 'Insert Slicers' dialog box is open, showing a list of columns from the table: 'MonthYear', 'Salespersons', 'Region', 'Product', 'Number Customers', 'Net Sales', and 'Profit / Loss'. The 'MonthYear' column is selected. A green callout bubble points to the list of columns in the dialog box.

Column list from Table. Select a single or multiple column(s).

# Inserted Slicers

Slicers can be moved, resized and "float" anywhere on the sheet

Number							
MonthYear	Salesperson	Region	Product	Customer	Net Sales	Profit / Loss	
<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p><b>Salespersons</b></p> <p>Maria</p> <p>Lawrence</p> <p>Matt</p> <p>Joseph</p> </div> <div style="width: 30%;"> <p><b>Region</b></p> <p>North</p> <p>West</p> <p>Middle</p> </div> <div style="width: 30%;"> <p><b>Product</b></p> <p>RapidZoo</p> <p>SuperGlue</p> <p>FastCar</p> </div> </div>							
Mar 2008	Maria	North	RapidZoo		10	\$1,140.00	\$457.19
Apr 2008	Maria	North	RapidZoo		8	\$2,240.00	\$864.64
May 2008	Maria	North	RapidZoo		10	\$1,220.00	\$443.84
Jun 2008	Maria	North	RapidZoo		6	\$670.00	\$202.81

# Using Slicers

MonthYear	Salesperson	Region	Product	Customer	Net Sales	Profit / Loss
Jan 2007	Maria	North	RapidZoo	6	\$966.00	\$329.70
Feb 2007	Maria	North	RapidZoo	6	\$828.00	\$360.68
Mar 2007	Maria	North	RapidZoo	6	\$966.00	\$329.70
Apr 2007	Maria	North	RapidZoo	6	\$828.00	\$360.68
May 2007	Maria	North	RapidZoo	6	\$966.00	\$329.70
Jun 2007	Maria	North	RapidZoo	6	\$828.00	\$360.68
Jul 2007	Maria	North	RapidZoo	6	\$966.00	\$329.70
Aug 2007	Maria	North	RapidZoo	6	\$828.00	\$360.68
Sep 2007	Maria	North	RapidZoo	6	\$966.00	\$329.70
Oct 2007	Maria	North	RapidZoo	6	\$828.00	\$360.68
Nov 2007	Maria	North	RapidZoo	6	\$966.00	\$329.70
Dec 2007	Maria	North	RapidZoo	6	\$828.00	\$360.68
Jan 2008	Maria	North	RapidZoo	6	\$966.00	\$329.70
Feb 2008	Maria	North	RapidZoo	6	\$828.00	\$360.68
Mar 2008	Maria	North	RapidZoo	6	\$966.00	\$329.70
Apr 2008	Maria	North	RapidZoo	6	\$828.00	\$360.68
May 2008	Maria	North	RapidZoo	10	\$1,220.00	\$443.84

Click on a choice

Hold **Ctrl** to select **multiple** items

Hold **Shift** to select **range** of items

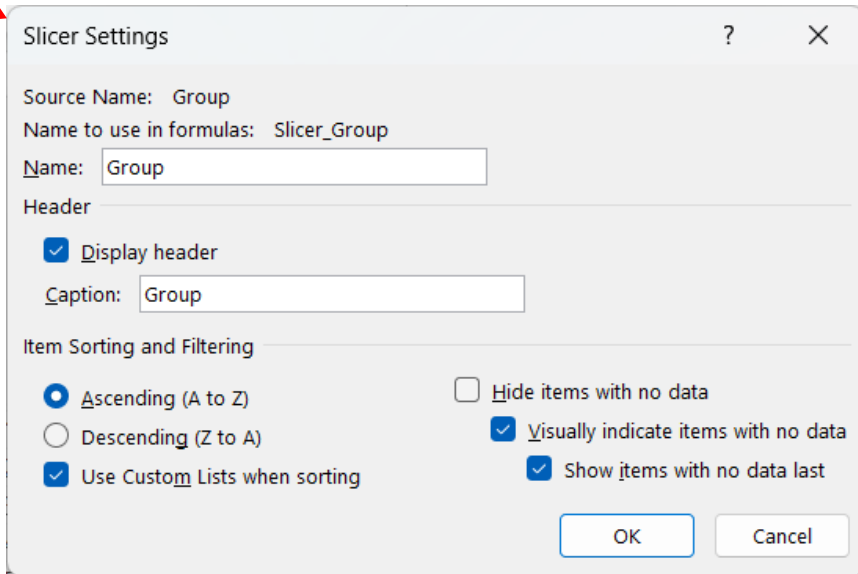
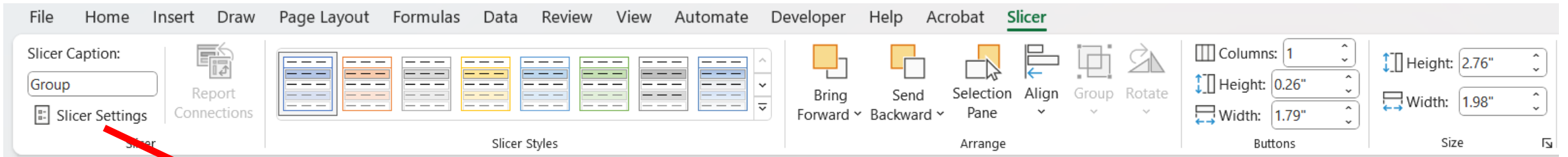
Removing a selected slicer leaves the associated column filtered

Click this icon to clear the selection

Selection may affect other slicers

Click this icon for Multi-Select (don't have to hold Ctrl)

# Customizing Slicers



# Best Practice for Slicers

Add above data & make row size to fit sliders

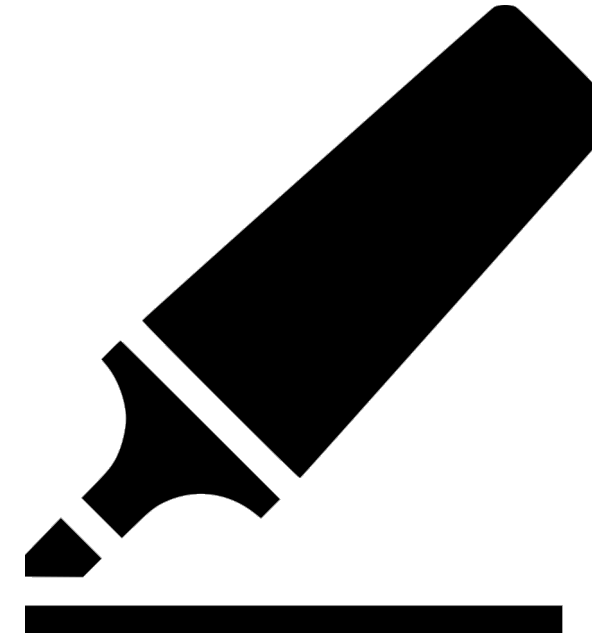
Month	Salesperson	Region	Product	Customer	Net Sales	Profit / Loss
	Joseph	North	FastCar	8	\$1,000.00	\$100,000.00
	Matt	West	RapidZoo	9	\$1,089.68	\$1,089.68
	Lawrence	West	FastCar	9	\$1,023.18	\$1,023.18

Choose enough columns to display as many choices as possible

Choose a different color for each slicer

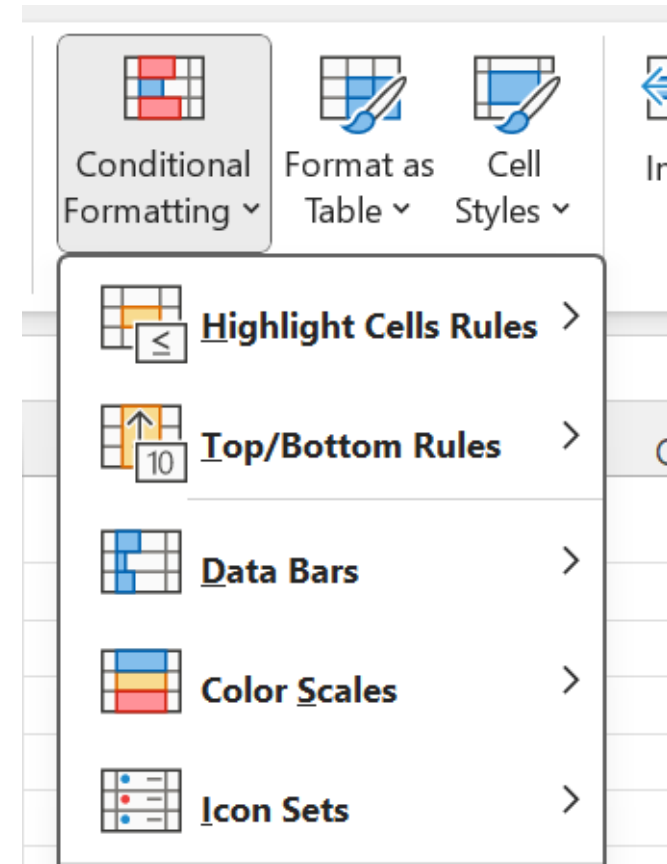
When slicers span several columns, their width will be affected when adding / removing / moving / changing column width

# Conditional Formatting



# Conditional Formatting

- Rules to automatically format cells/range based upon a condition
- Excel has many built-in conditions
- Formula option allows you to build complex conditions





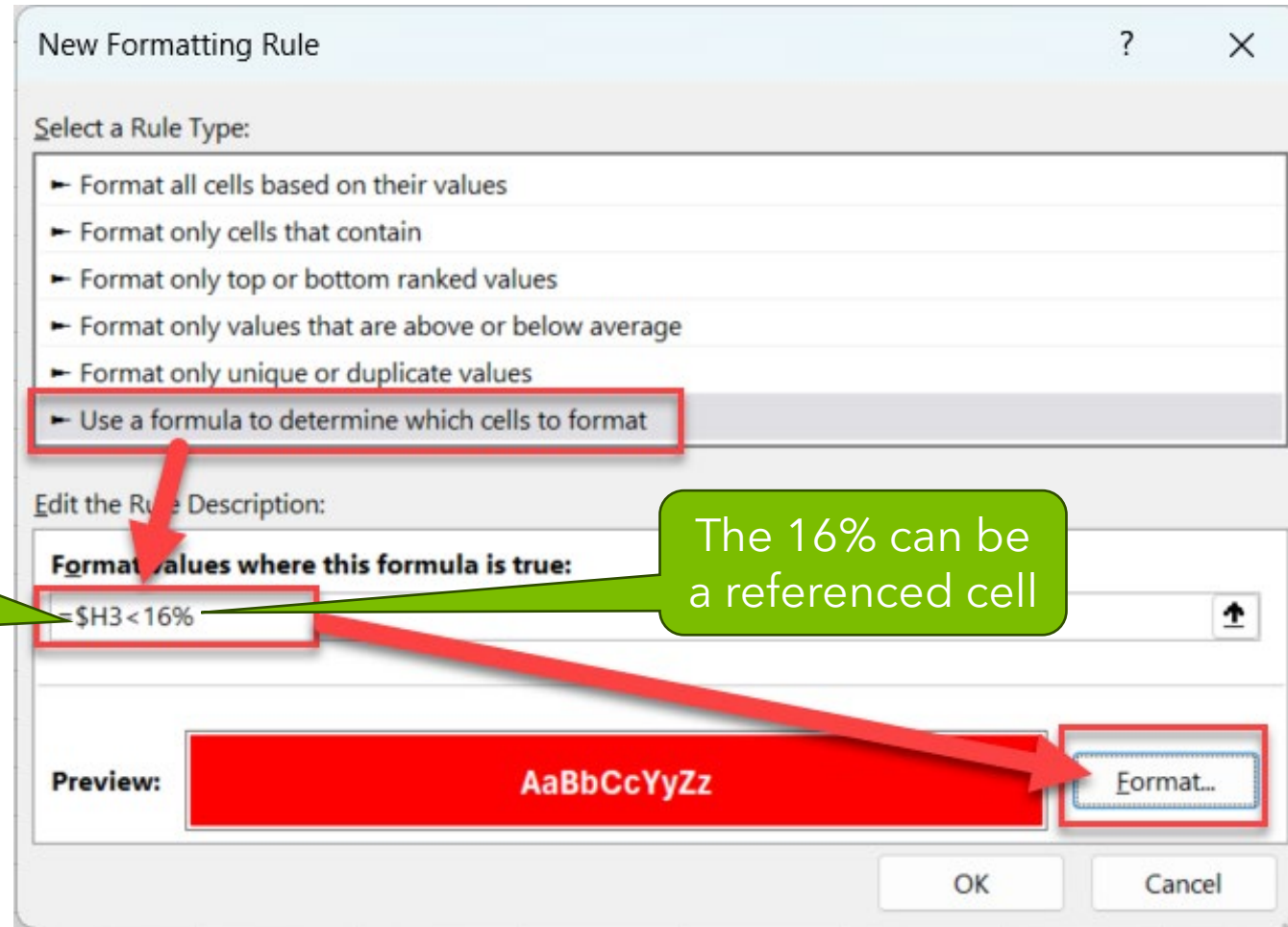
# Conditional Formatting - Formula

## Highlight a Row based on Condition

The screenshot shows the Excel ribbon with the 'Conditional Formatting' button highlighted. A red arrow points from this button to the 'New Rule...' option in the dropdown menu. Below the ribbon, a data table is shown with columns: Salespersons, Region, Product, # of Cust, Net Sales, Profit, and Profit %.

Salespersons	Region	Product	# of Cust	Net Sales	Profit	Profit %
Lawrence	Middle	RapidZoo	6	\$984.00	\$250.00	25.4%
Maria	North	RapidZoo	6	\$966.00	\$125.00	12.9%
Maria	North	SuperGlue	9	\$981.00	\$370.00	37.7%
Matt	Middle	FastCar	6	\$1,020.00	\$300.00	29.4%
Matt	North	RapidZoo	9	\$2,232.00	\$350.00	15.7%
Maria	West	SuperGlue	6	\$1,536.00	\$100.00	6.5%
Lawrence	North	RapidZoo	9	\$2,277.00	\$950.00	41.7%
Joseph	North	RapidZoo	8	\$1,088.00	\$400.00	36.8%
Lawrence	North	FastCar	6	\$726.00	\$250.00	34.4%
Lawrence	Middle	FastCar	7	\$1,939.00	\$800.00	41.3%
Joseph	North	FastCar	8	\$2,040.00	\$900.00	44.1%
Joseph	West	FastCar	9	\$2,133.00	\$100.00	4.7%
Matt	Middle	SuperGlue	8	\$2,312.00	\$1,000.00	43.3%
Lawrence	North	SuperGlue	8	\$1,624.00	\$600.00	36.9%
Matt	Middle	RapidZoo	8	\$872.00	\$330.00	37.8%
Joseph	Middle	RapidZoo	7	\$1,799.00	\$700.00	38.9%
Maria	West	SuperGlue	9	\$2,223.00	\$775.00	34.9%

# New Formatting Rule - Formula



Enter a formula, here we anchor the COLUMN so the entire row is highlighted

The 16% can be a referenced cell

# Wrap-Up



# Presentation Wrap-Up

Excel Tables

Custom  
Sorting

XLOOKUP

SUBTOTAL

SUMIF(S)

Array  
Formulas

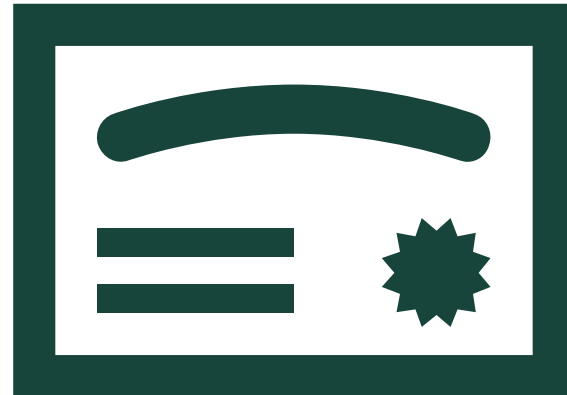
Data  
Validations

Slicers

Conditional  
Formatting

# Questions?





# Thank You!!



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ONE FINAL NOTE