

Summarize and Analyze Data: MS Excel 2016

American University
Office of Information Technology
Training Unit



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CONDITIONAL FORMATTING

Conditional Formatting is used to emphasize data that meets certain conditions in cells or formulas. For example, you can set up **Conditional Formatting** so that all sales greater than or equal to a value will display in a different color. The formatting options used for a condition can be customized.

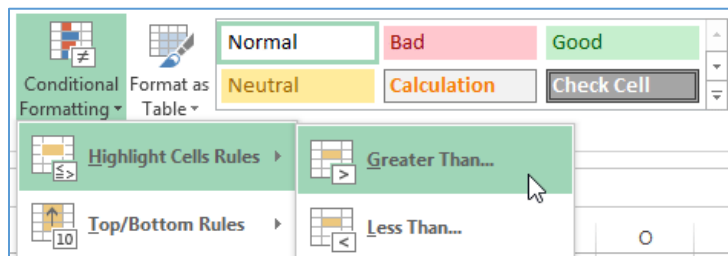
CREATE A CONDITIONAL FORMATTING RULE

In this example, a worksheet contains sales data and we'd like to see which salespeople are meeting their monthly sales goals. The sales goal is \$4,000 per month. Create a conditional formatting rule for any *cells containing a value higher than 4000*.

1. Use the spreadsheet **CONDFORMATTING** in the workbook: **AdvExcelExamples.xlsx**
2. Select the desired cells for the conditional formatting rule. In this example, **May, June, July and August** values were selected (do not select the column headings).

	A	B	C	D	E
1	Salesperson	May	June	July	Aug.
2	Albertson, Kathy	\$3,947.00	\$557.00	\$3,863.00	\$1,117.00
3	Allenson, Carol	\$4,411.00	\$1,042.00	\$9,355.00	\$1,100.00
4	Altman, Zoey	\$2,521.00	\$3,072.00	\$6,702.00	\$2,116.00
5	Bittiman, William	\$4,752.00	\$3,755.00	\$4,415.00	\$1,089.00
6	Brennan, Michael	\$4,964.00	\$3,152.00	\$11,601.00	\$1,122.00
7	Carlson, David	\$2,327.00	\$4,056.00	\$3,726.00	\$1,135.00
8	Collman, Harry	\$3,967.00	\$4,906.00	\$9,007.00	\$2,113.00
9	Counts, Elizabeth	\$4,670.00	\$521.00	\$4,505.00	\$1,024.00

3. From the **HOME** tab, click the **CONDITIONAL FORMATTING** command.
4. Hover the mouse over the desired **conditional formatting type** and then select the rule from the menu that appears. In this example, **'Greater Than'** is selected because you want to **highlight cells** that are **greater than \$4,000**.



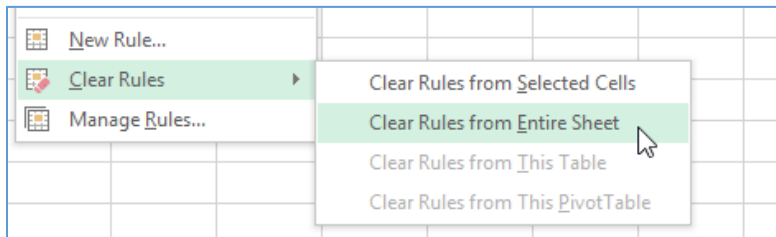
5. In the dialog box that appears, enter **4000** into the blank field. Then, select a formatting style (**Light Red Fill with Dark Red Text**) from the drop-down menu. The conditional formatting will be applied to the selected cells.
6. You can apply multiple conditional formatting rules to a cell range or worksheet, allowing you to visualize different trends and patterns in your data. Select the same values (May,

June, July, August). Now **Highlight** cells that are **less than \$2,000**. Choose 'Less Than', enter **2000** in the dialog box and select the formatting style **Green Fill with Dark Green Text**.

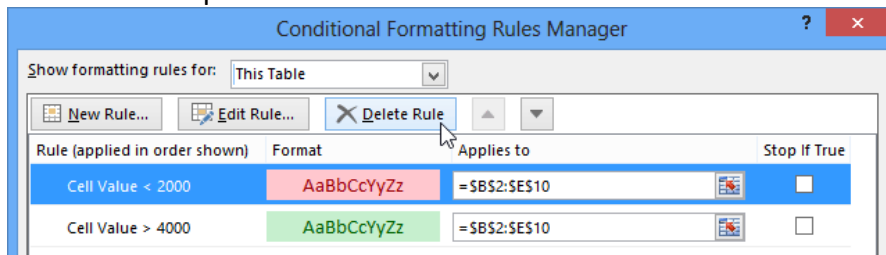
	D	E
	July	August
	\$3,863.00	\$1,117.00
	\$9,355.00	\$1,100.00
	\$6,702.00	\$2,116.00
	\$4,415.00	\$1,089.00
	\$11,601.00	\$1,122.00
	\$3,726.00	\$1,135.00
	\$9,007.00	\$2,113.00

REMOVE CONDITIONAL FORMATTING

1. Click the **CONDITIONAL FORMATTING** command.
2. Hover the mouse over **CLEAR RULES** and choose which rules you wish to clear.



3. Click **MANAGE RULES...** to edit or delete individual rules. This is especially useful if you have applied **multiple rules** to a worksheet. You must change the **Show formatting rules for:** dropdown to **This Worksheet** to see all the rules on the spreadsheet.



CONDITIONAL FORMATTING PRESETS

Excel has a number of pre-defined styles, or **presets**, that you can use to quickly apply conditional formatting to your data. They are grouped into three categories:

- **DATA BARS** are horizontal bars added to each cell, much like a bar graph.

\$3,863.00	\$1,117.00	\$8,237.00	\$8,690.00
\$9,355.00	\$1,100.00	\$10,185.00	\$18,749.00

- **COLOR SCALES** change the color of each cell based on its value. Each color scale uses a two or three color gradient.

\$3,863.00	\$1,117.00	\$8,237.00	\$8,690.00
\$9,355.00	\$1,100.00	\$10,185.00	\$18,749.00
\$6,702.00	\$2,116.00	\$13,452.00	\$8,046.00

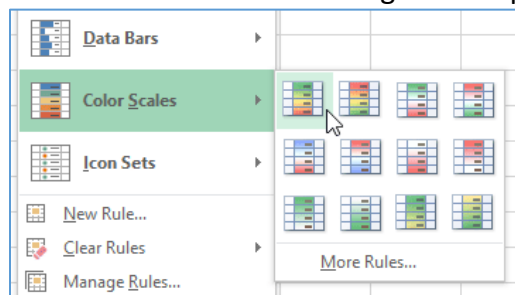
- **ICON SETS** add a specific icon to each cell based on its value.

↓ \$3,863.00	↓ \$1,117.00	↘ \$8,237.00	↘ \$8,690.00
↘ \$9,355.00	↓ \$1,100.00	↘ \$10,185.00	↑ \$18,749.00
↘ \$6,702.00	↓ \$2,116.00	↘ \$13,452.00	↘ \$8,046.00

1. Select the **desired cells** for the conditional formatting rule.

	A	B	C	D	E
1	Salesperson	May	June	July	Aug.
2	Albertson, Kathy	\$3,947.00	\$557.00	\$3,863.00	\$1,117.00
3	Allenson, Carol	\$4,411.00	\$1,042.00	\$9,355.00	\$1,100.00
4	Altman, Zoey	\$2,521.00	\$3,072.00	\$6,702.00	\$2,116.00

2. Click the **CONDITIONAL FORMATTING** command.
3. Hover the mouse over the desired preset and then choose a preset style. The conditional formatting will be applied to the selected cells.



HIGHLIGHT DUPLICATE ENTRIES

When you need to quickly compare two columns of data for duplicate entries, you can use Excel's conditional formatting with the **COUNTIF** function. For example, suppose you want to know which properties' selling prices matched their list prices in the worksheet shown below:

	A	B	C	D	E
1	Property	Size (sq ft)	List Price	Selling Price	
2	831 Berkley Rd	1200	85000	79600	
3	310 Monterey Rd	2500	190000	185000	
4	1130 Conway Dr	3600	375000	375000	
5	1430 Colony Dr	4500	550500	540000	

1. Select cells **C2 thru D17**.
2. Click **CONDITIONAL FORMATTING** and choose **NEW RULE**. Then, click **Use A Formula To Determine Which Cells To Format**.
3. Enter the formula in the **Format Values Where This Rule Is True** text box and enter the following formula:
 - = COUNTIF(\$C2:\$D2,\$C2)>1

- Click the **FORMAT** button. On the **FILL** tab, select yellow under **Background Color** and click **OK**. Click **OK** again to return to your worksheet.

	A	B	C	D	E
1	Property	Size (sq ft)	List Price	Selling Price	
2	831 Berkley Rd	1200	85000	79600	
3	310 Monterey Rd	2500	190000	185000	
4	1130 Conway Dr	3600	375000	375000	
5	1430 Colony Dr	4500	550500	540000	

USING STOP IF TRUE WHEN CONDITIONAL FORMATTING

When applying **Conditional Formatting**, you may have situations where you don't want to apply your rule to certain cells in a range.

- In cell A21 type On, in cell A22 type Off and in cell B1 type Formatting: .
- Select cells A21 and A22; name this range **options**.
- Select cell C1 and click the **DATA VALIDATION** button from within the **DATA** tab.
- Select **DATA VALIDATION**, choose **LIST** from the **ALLOW** dropdown and enter **=options** as the **SOURCE** to populate the List box. Click **OK**.

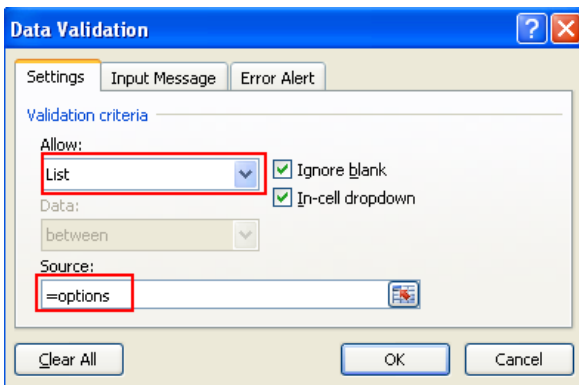
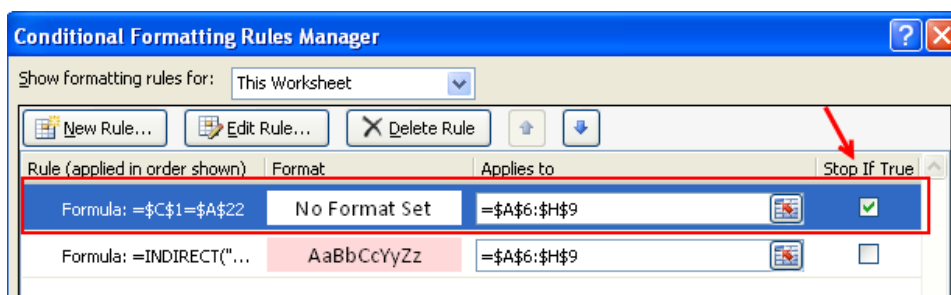


Figure 7: Data Validation dialog box

Select the data range again and click the **CONDITIONAL FORMATTING** button. Choose **MANAGE RULES**.

Click the **NEW RULE** button and choose **Use a Formula to Determine Which Cells to Format**. Enter a formula similar to the one below – you are comparing the selection from the list to the word “OFF”. If your selection = OFF, then don't format; if it doesn't = OFF then apply formatting.

Remember to check **STOP IF TRUE**.

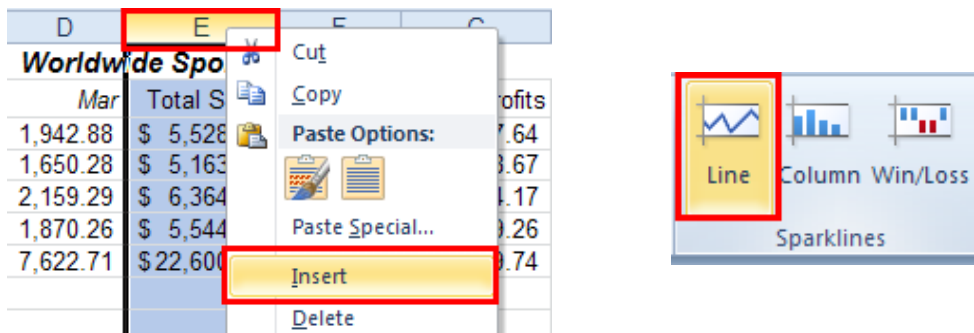



WORKING WITH CHARTS AND GRAPHS

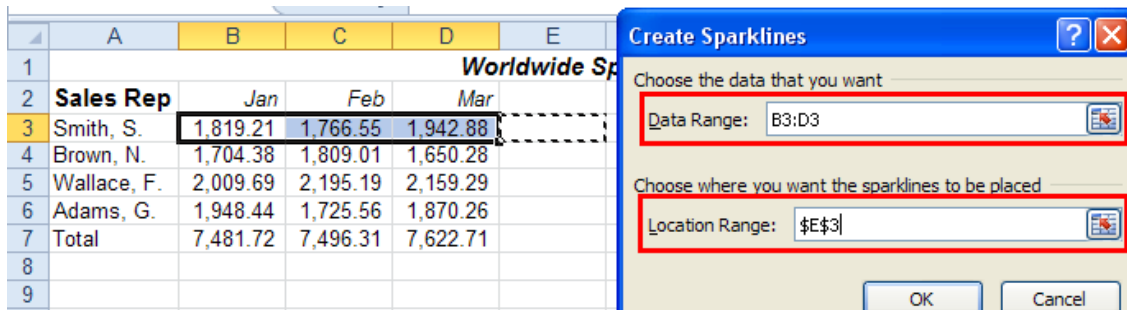
ADDING SPARKLINES

SPARKLINES are miniature charts that you can put into a cell if you have a large table of figures. Rather than making a chart that covers all the figures that sits somewhere else on the worksheet, you can put a bar chart or a trend line into the last row or column of the table. That way you can see exactly what's happening in the numbers, all of which you can see at the same time.

1. Open **ADDSAL1.XLSX**. Click on the **QTR 1** tab to make it the active worksheet if it is not currently active.
2. Select **COLUMN E**, click the right mouse button, and choose **INSERT** from the navigation menu to add a new empty column to the right of column D.



3. Select cells **B3** through **D3** to use as the data for the sparkline.
4. From the **SPARKLINE** group on the **INSERT** tab, select the **LINE** sparkline.
5. Do one of the following to specify **E3** as the target cell where you want the sparkline to be placed:
 - Type **E3** in the **LOCATION RANGE** box.
 - Click the **Collapse Dialog** button, , and select cell **E3** with your mouse.



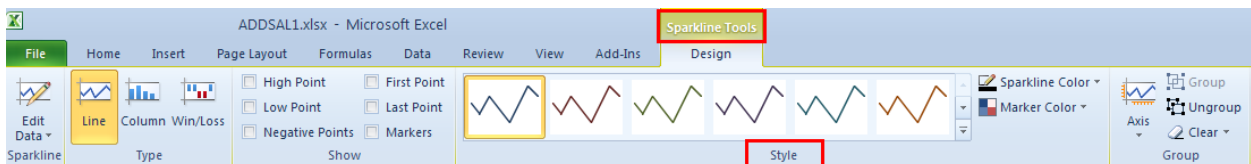
- Click **OK** to insert the sparkline in cell **E3**.

Worldwide Sp				
Sales Rep	<i>Jan</i>	<i>Feb</i>	<i>Mar</i>	
Smith, S.	1,819.21	1,766.55	1,942.88	
Brown, N.	1,704.38	1,809.01	1,650.28	
Wallace, F.	2,009.69	2,195.19	2,159.29	

- To quickly add sparklines to cells **E4** and **E5**, select cell **E3** and use the **Fill Handle** in the lower right corner of the cell to drag the sparkline format to cells **E4** and **E5**.

Worldwide Sp				
Sales Rep	<i>Jan</i>	<i>Feb</i>	<i>Mar</i>	
Smith, S.	1,819.21	1,766.55	1,942.88	
Brown, N.	1,704.38	1,809.01	1,650.28	
Wallace, F.	2,009.69	2,195.19	2,159.29	

- To format the sparkline, click the **DESIGN** tab from the **SPARKLINE TOOLS** contextual tab and choose from the preset options in the **STYLE** group.



CREATING A QUICK CHART

EXERCISE: CREATING A QUICK CHART

- If using OIT Training Room files, open the file **ADDSAL1.xlsx**.
- Click the **QTR1** worksheet tab and select the 3 month data for the salespersons.

	A	B	C	D	E	F	G
1	Worldwide Sporting Goods - QTR 1						
2	Sales Rep	<i>Jan</i>	<i>Feb</i>	<i>Mar</i>	Total Sales	Expenses	Net Profits
3	Smith, S.	1,819.21	1,766.55	1,942.88	\$ 5,528.64	1,241.00	\$ 4,287.64
4	Brown, N.	1,704.38	1,809.01	1,650.28	\$ 5,163.67	1,165.00	\$ 3,998.67
5	Wallace, F.	2,009.69	2,195.19	2,159.29	\$ 6,364.17	1,650.00	\$ 4,714.17
6	Adams, G.	1,948.44	1,725.56	1,870.26	\$ 5,544.26	1,345.00	\$ 4,199.26
7	Total	7,481.72	7,496.31	7,622.71	\$22,600.74	5,401.00	\$ 17,199.74

- Press the **[F11]** key. A basic column chart will be created on a new tab.
- With the new chart open, click the **CHANGE CHART TYPE** button in the **TYPE** group on the **DESIGN** tab.
- The Change Chart Type window will open. Select **BAR** in the Navigation Pane, and select the first choice (if it is not already selected). Then, click **OK**.
- To change the chart back, simply reselect the **COLUMN** style repeating the steps above.

CREATING A STANDARD CHART

5. Select the data in cells **A2:D6**.
6. Click the **INSERT** tab and click the **COLUMN CHART** button.
7. Select the **CLUSTERED COLUMN** choice under **2D CHARTS**. The chart will be created in the **1st Qtr** worksheet.
8. To move the chart to a separate sheet, click the **MOVE CHART LOCATION** button, and select **NEW SHEET**.
9. Name the chart "**MY CHART**".

CHARTING NON-ADJACENT RANGES

You to chart *Non-Adjacent Ranges*, which are ranges of cells that are not located next to each other.

1. Select the first range of cells that you want to chart.
2. Hold down the **[CTRL]** key and select the next range of cells.
3. Click on the **INSERT** tab, and select the appropriate chart type.

FORMATTING THE CHART

CHART STYLES


There are numerous *Chart Styles* available in the **CHART STYLES** group on the **DESIGN** tab. Click the **UP** and **DOWN** arrows to view additional choices or click the **MORE** button to see all the style options. Click on the style to apply it to your chart.

CHART LAYOUT

Basic *Chart Layout* options are available in the **CHART LAYOUT** group on the **DESIGN** tab. Note that these layout options are visually displayed in the selection buttons.

Extensive Chart Layout options are available on the *Layout* tab. From this tab, you can customize the *Primary Horizontal and Vertical Axes*, add a *Trendline* or *Data Table*, and add additional text to your graph.

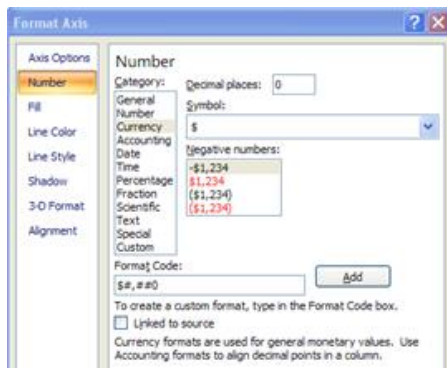
EXERCISE: CHANGING THE CHART LAYOUT

1. Click the first **CHART LAYOUT** button, . The layout will change.
2. Click on the **CHART TITLE** text box.
3. Select the text "**CHART TITLE**" and type in **FIRST QUARTER**.

FORMATTING THE AXIS

By default, charts will have a Primary Horizontal and Vertical axis. These axes can be formatted or deleted entirely. The axes can be selected by clicking the **AXES** button and then selecting either **PRIMARY HORIZONTAL** or **PRIMARY VERTICAL AXIS** and, then selecting a display choice. For additional formatting, select **MORE PRIMARY VERTICAL (OR HORIZONTAL) AXIS OPTIONS**. You may also right-click directly on the **AXIS** and select **FORMAT AXIS** from the menu.

1. From the **MY CHART** worksheet tab, click the **LAYOUT** tab.
2. Right-click on the **VERTICAL** axis and select **FORMAT AXIS** from the menu. The **FORMAT AXIS** window will open.
3. Select **NUMBER** under **AXIS OPTIONS**. Select **CURRENCY** under **Category**, and change the **DECIMAL PLACES** to **0**.
4. Click **CLOSE**.



FORMATTING AXIS TITLES

By default, charts will not have *Axis* titles. You can create *Axis* titles by selecting the **AXIS TITLES** button and selecting either **PRIMARY HORIZONTAL** or **PRIMARY VERTICAL AXIS TITLES**, and then selecting a display choice. For additional formatting, select **MORE PRIMARY VERTICAL (OR HORIZONTAL) AXIS TITLES OPTIONS**.

EXERCISE: FORMATTING THE AXES TITLES

1. Click the **AXIS TITLES** button and select **PRIMARY HORIZONTAL AXIS TITLE**.
2. Select **TITLE BELOW AXIS**.
3. Click in the **AXIS TITLE** text box and replace the text “**AXIS TITLE**” with **SALESPERSON**.
4. Next, click the **AXIS TITLES** button and select **PRIMARY VERTICAL AXIS TITLE**.
5. Click in the **AXIS TITLE** text box and replace the text “**AXIS TITLE**” with **MONTHLY SALES**.

FORMATTING GRIDLINES

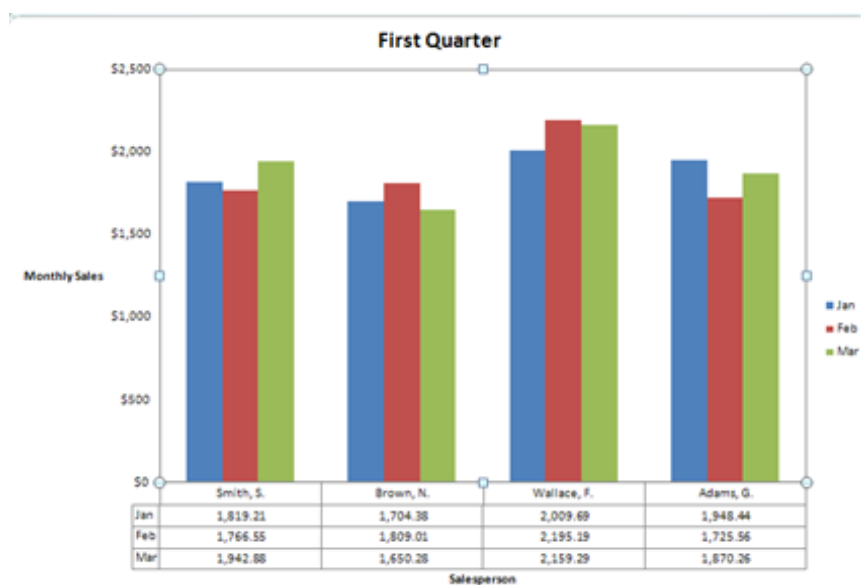
By default, charts created in Excel 2016 will have *Primary Horizontal* gridlines for major chart tracking units. These gridlines can be formatted or deleted entirely. Also, *Vertical* gridlines can be added to the chart. Gridlines can be selected by clicking the **GRIDLINES** button and selecting either **PRIMARY HORIZONTAL** or **PRIMARY VERTICAL GRIDLINES**, and then selecting a display choice. For additional formatting, select **MORE PRIMARY VERTICAL (OR HORIZONTAL) GRIDLINES OPTIONS**.

You may also right-click directly on a **GRIDLINE** and select **FORMAT GRIDLINES** from the menu.

ADDING A DATA TABLE

A **Data Table** is a table that displays all the ranges and labels that were used to create a chart. Data tables are useful when you want to explain the details of a chart during a presentation, or when exact figures need to be shown. Data tables are placed below the chart and can include a legend key.

1. Click the **DATA TABLE** button.
2. Select **SHOW DATA TABLE**.



ADDING DATA LABELS

Data Labels display the exact values of the data in a chart next to the graphic objects they represent. These values help add clarity to the chart. Data labels can be added to any chart type, but they are usually used for pie charts, due to space limitations.

To add a Data Label to a chart, click the **DATA LABELS** button. Then, select a placement choice. For additional formatting, select **MORE DATA LABEL OPTIONS**.

ADDING A TRENDLINE

Because of the varying height of the bars in a column chart, it is sometimes difficult to determine the general direction of the action. Excel enables you to quickly add a **Trendline** to a data series. A trendline has the effect of smoothing out the rough spots in a chart and gives you a better picture of the data series.

To add a Trendline to a chart, click the **TRENDLINE** button. Then select a trendline style. The **ADD TRENDLINE** window will open. Select the **SERIES** you wish to base the trendline on and click **OK**. You can also click on the data series directly in the chart.

EXERCISE: ADDING A TRENDLINE


1. Click the **TRENDLINE** button. The **ADD TRENDLINE** window will open.
2. Select **JAN** and click **OK**.
3. To remove the trendline, click the **TRENDLINE BUTTON**. Then select **NONE**.

APPLYING CHART THEMES

In addition to the built-in Chart Styles featured on the **DESIGN** tab, there are a number of built in **Themes**, located on the **PAGE LAYOUT** tab, that can be applied to instantly format your chart.

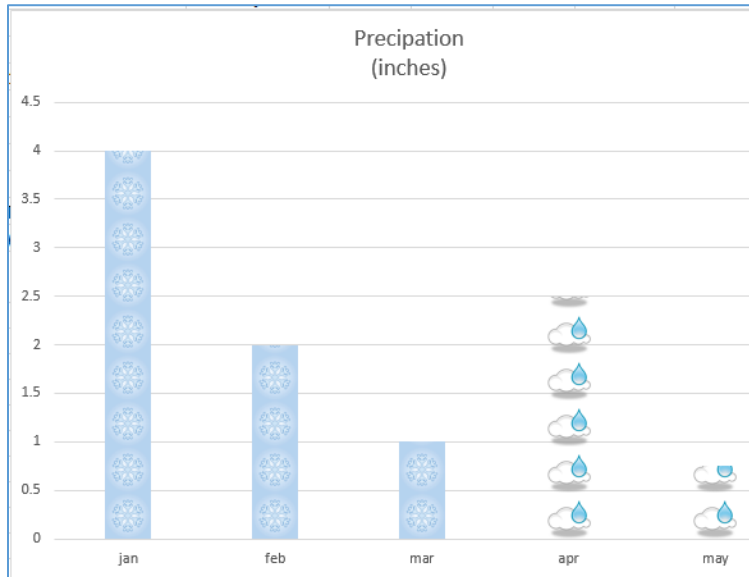
CHANGING COLORS OF INDIVIDUAL DATA SERIES

You can choose to customize the color or style of an individual **Data Series** to highlight the series within a chart by selecting and formatting the series.

1. Click the **March** data series. Then, select **Format Data Series**.
 - After selecting a series, click once on a single item in the series to select just that one data series.
2. Select **Fill** under series options.
3. Select **Solid Fill**.
4. Click the color button, , and select red from the color-picker.

INSERTING GRAPHICS ELEMENTS IN YOUR DATA SERIES

1. Create a bar or column chart and select one of the data series.
2. Right click and select **Format Data Series**.
3. Select **fill, picture** or **texture fill**.
4. Select file or online and, then, select an image.
5. Select stack.

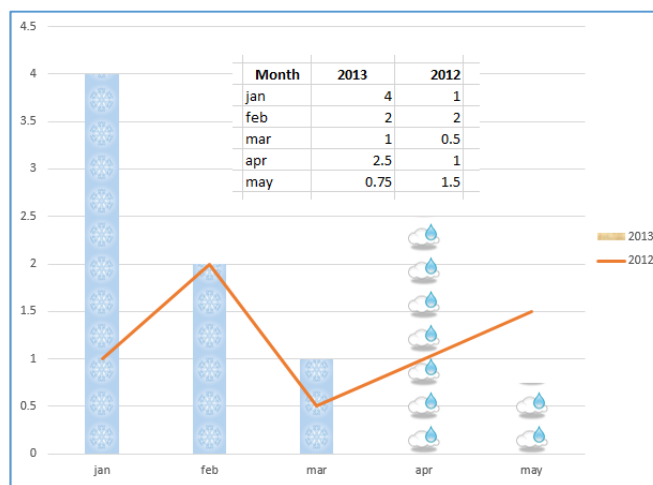
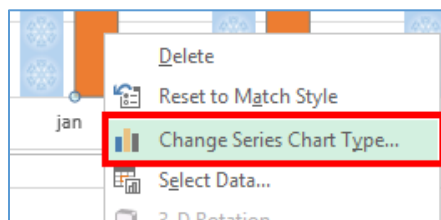


(snow in january, february, and march; rain in april and may.)

CREATING A COMBINATION CHART

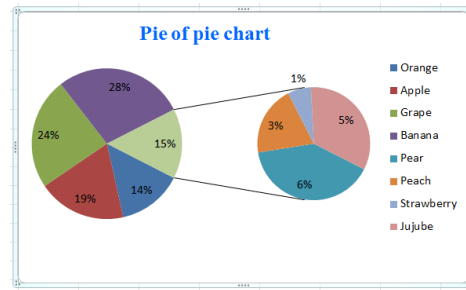
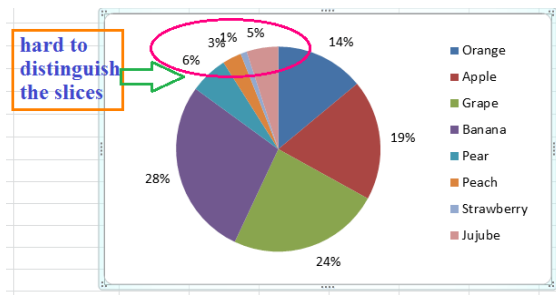
Change one of the axis in a bar chart to a line chart

1. Select the data series that you want to change.
2. Right click and select change series chart type.
3. Select line and choose a line chart type.
4. press ok, and the line appears over the top of the other series bar.



PIE OF PIE CHART

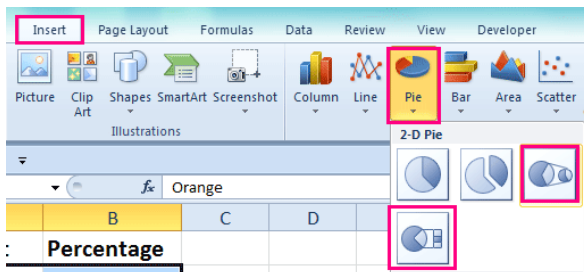
To make smaller slices more visible in a pie chart, Excel provides the **PIE OF PIE** and **BAR OF PIE** chart sub-types.



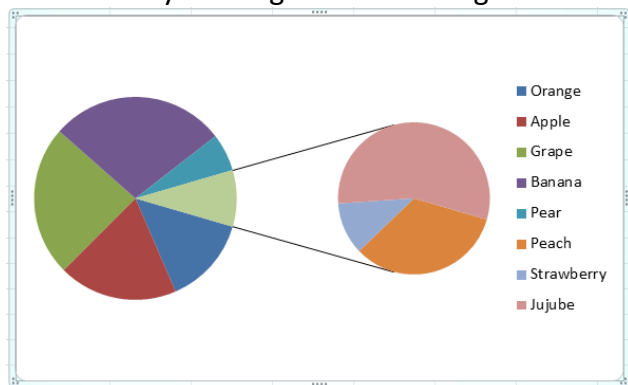
1. Create the data that you want to use as follows:

	A	B	C
1	Product	Percentage	
2	Orange	14%	
3	Apple	19%	
4	Grape	24%	
5	Banana	28%	
6	Pear	6%	
7	Peach	3%	
8	Strawberry	1%	
9	Jujube	5%	
10	Total	100%	

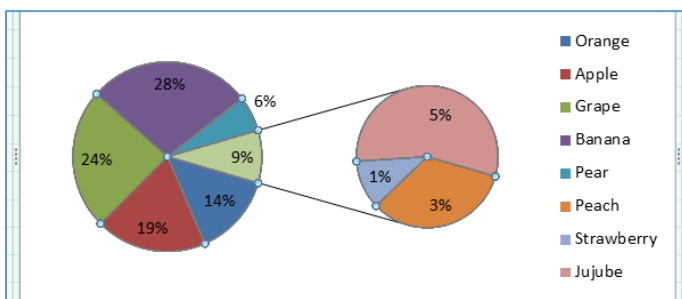
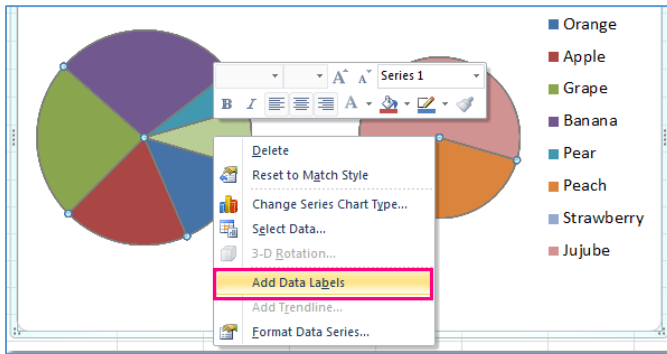
2. Select the data range, in this example, highlight cell A2:B9. Click **Insert > Pie > Pie of Pie or Bar of Pie**:



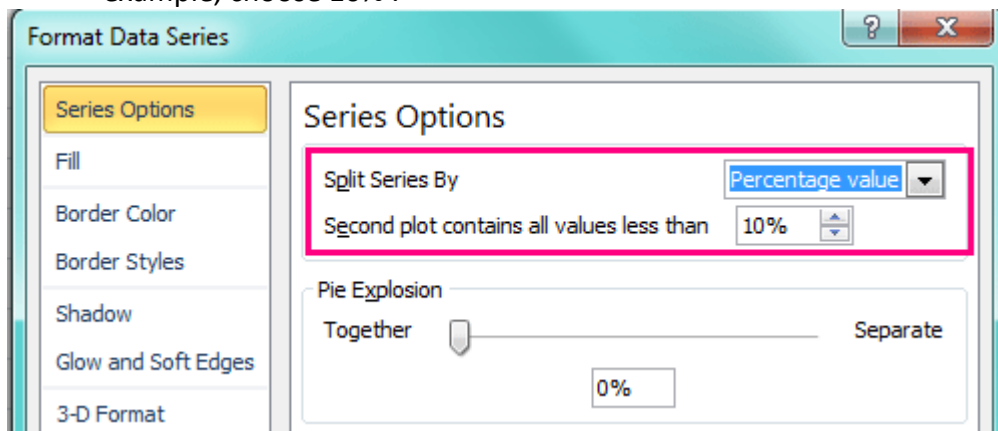
3. And you will get the following chart:



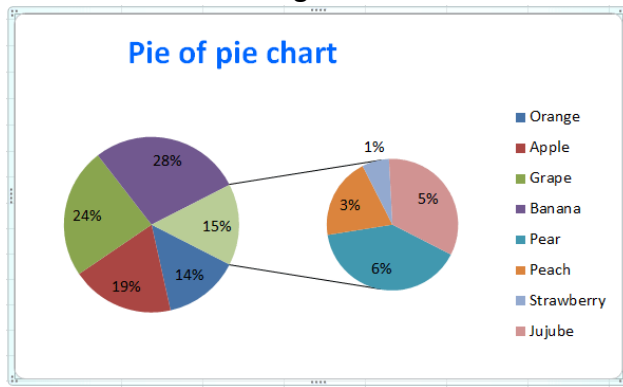
4. You can add the data labels for the data points of the chart; select the pie chart and right click, choose **Add Data Labels**:



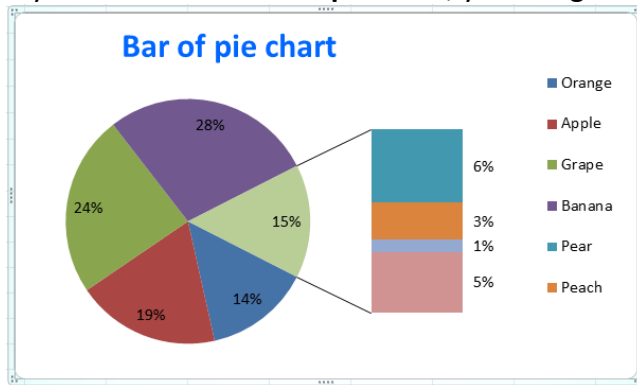
5. Right-click and choose **Format Data Series** from the context menu
6. In the **Format Data Series** dialog, click the drop down list beside **Split Series By** to select **Percentage value**, then set the value you want to display in the second pie, in this example, choose 10% .



7. Close the dialog box:



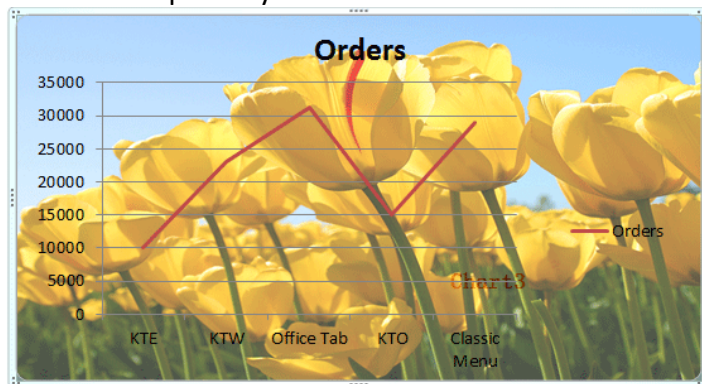
If you created the **Bar of pie chart**, you will get the following:



ADD BACKGROUND PICTURE

If you want to add a picture or your company's logo as background to the chart:

1. Select your chart and right click, then choose **Format Chart Area**.
2. Check **Picture or texture fill** radio button under **Fill** option, click **File** or **Clipboard** or **Clip Art** button under **Insert from** section to select a picture or clip art, change the transparency.

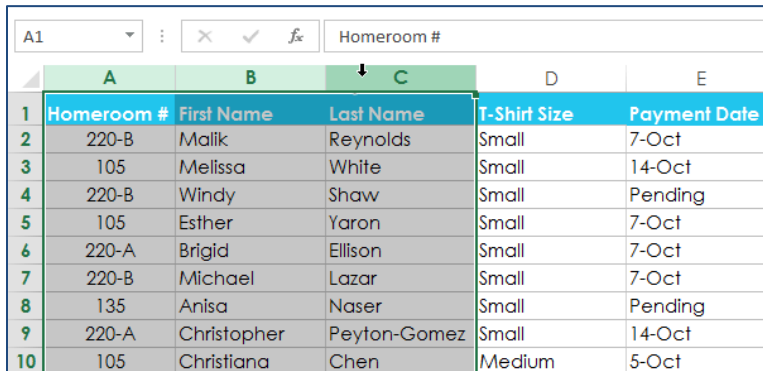


GROUPS AND SUBTOTALS

Worksheets with a lot of content can sometimes feel overwhelming and even become difficult to read. Fortunately, Excel can organize data in **groups**, allowing you to easily **show** and **hide** different sections of your worksheet. You can also summarize different groups using the **Subtotal** command and create an **outline** for your worksheet.

TO GROUP ROWS OR COLUMNS:

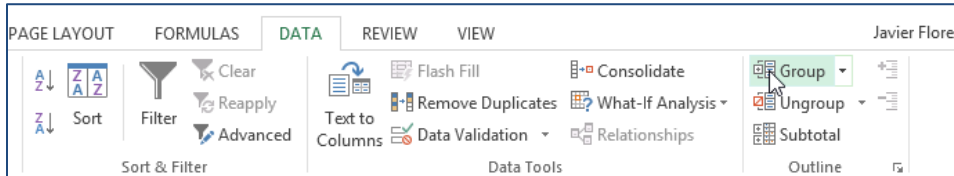
1. Select the **rows** or **columns** you want to group. In this example, we'll select columns **A**, **B**, and **C**.



The screenshot shows an Excel spreadsheet with the following data:

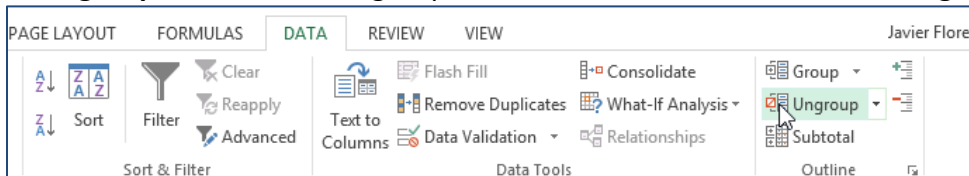
	A	B	C	D	E
1	Homeroom #	First Name	Last Name	T-Shirt Size	Payment Date
2	220-B	Malik	Reynolds	Small	7-Oct
3	105	Melissa	White	Small	14-Oct
4	220-B	Windy	Shaw	Small	Pending
5	105	Esther	Yaron	Small	7-Oct
6	220-A	Brigid	Ellison	Small	7-Oct
7	220-B	Michael	Lazar	Small	7-Oct
8	135	Anisa	Naser	Small	Pending
9	220-A	Christopher	Peyton-Gomez	Small	14-Oct
10	105	Christiana	Chen	Medium	5-Oct

2. Select the **Data** tab on the **Ribbon**, then click the **Group** command.




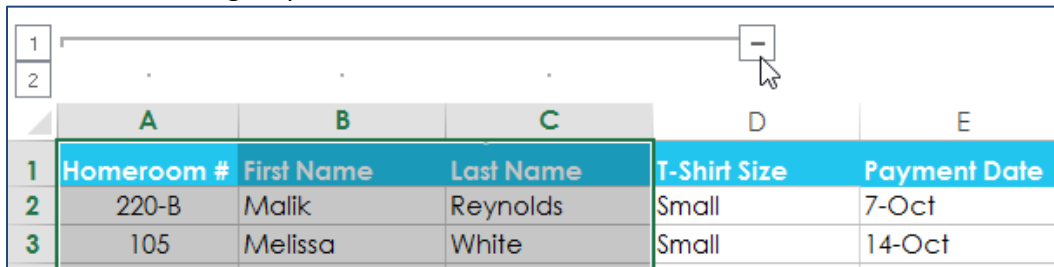
3. The selected rows or columns will be **grouped**.

To **ungroup** data, select the grouped rows or columns, then click the **Ungroup** command.




TO HIDE AND SHOW GROUPS:

1. To hide a group, click the **Hide Detail** button .



The screenshot shows an Excel spreadsheet with the first three rows hidden. The 'Hide Detail' button (minus sign icon) is visible in the top right corner of the spreadsheet area.

	A	B	C	D	E
1	Homeroom #	First Name	Last Name	T-Shirt Size	Payment Date
2	220-B	Malik	Reynolds	Small	7-Oct
3	105	Melissa	White	Small	14-Oct

2. The group will be **hidden**. To show a hidden group, click the **Show Detail** button .

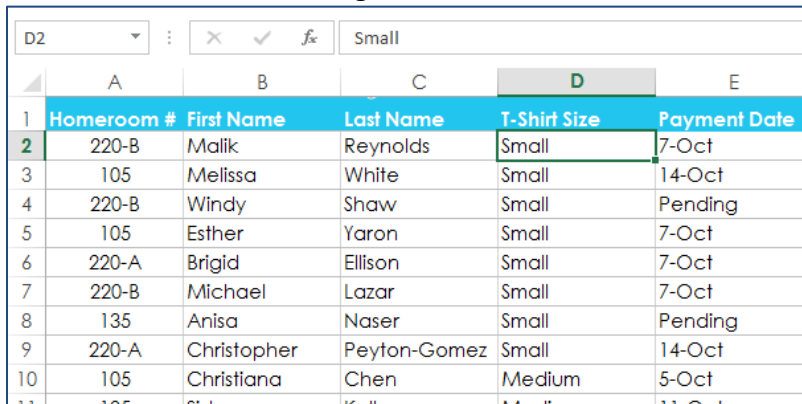
CREATING SUBTOTALS

The **Subtotal** command allows you to automatically **create groups** and use common functions like SUM, COUNT, and AVERAGE to help **summarize** your data. For example, the **Subtotal** command could help to calculate the cost of office supplies by type from a large inventory order. It will create a hierarchy of groups, known as an **outline**, to help organize your worksheet.

Your data must be correctly **sorted** before using the Subtotal command.

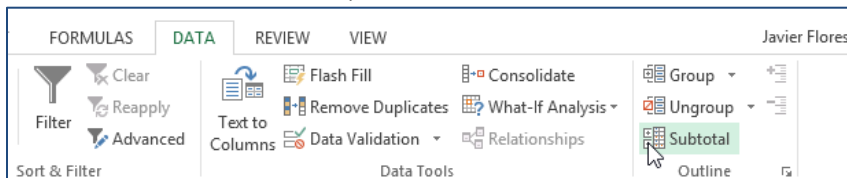
We will use the Subtotal command with a T-shirt order form to determine how many T-shirts were ordered in each size (Small, Medium, Large, and X-Large). This will create an **outline** for our worksheet with a **group** for each T-shirt size and then **count** the total number of shirts in each group.

1. First, **sort** your worksheet by the data you want to subtotal. In this example, we will create a subtotal for each T-shirt size, so our worksheet has been sorted by T-shirt size from smallest to largest.



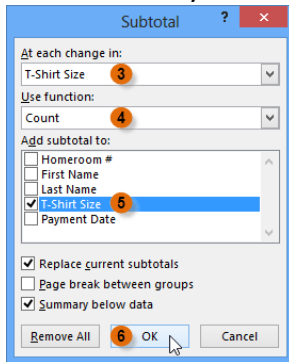
	A	B	C	D	E
1	Homeroom #	First Name	Last Name	T-Shirt Size	Payment Date
2	220-B	Malik	Reynolds	Small	7-Oct
3	105	Melissa	White	Small	14-Oct
4	220-B	Windy	Shaw	Small	Pending
5	105	Esther	Yaron	Small	7-Oct
6	220-A	Brigid	Ellison	Small	7-Oct
7	220-B	Michael	Lazar	Small	7-Oct
8	135	Anisa	Naser	Small	Pending
9	220-A	Christopher	Peyton-Gomez	Small	14-Oct
10	105	Christiana	Chen	Medium	5-Oct
11	105	Esther	Kelly	Medium	11-Oct

2. Select the **Data** tab, then click the **Subtotal** command.



3. The **Subtotal** dialog box will appear. Click the drop-down arrow for the **At each change in:** field to select the **column** you want to subtotal. In our example, we'll select **T-Shirt Size**.
4. Click the drop-down arrow for the **Use function:** field to select the **function** you want to use. In our example, we'll select **COUNT** to count the number of shirts ordered in each size.
5. In the **Add subtotal to:** field, select the **column** where you want the **calculated subtotal** to appear. In our example, we'll select **T-Shirt Size**.

6. When you're satisfied with your selections, click **OK**.



7. The worksheet will be **outlined** into **groups**, and the **subtotal** will be listed below each group. In our example, the data is now grouped by T-shirt size, and the number of shirts ordered in that size appears below each group.

	A	B	C	D	E
1	Homeroom #	First Name	Last Name	T-Shirt Size	Payment Date
2	220-B	Malik	Reynolds	Small	7-Oct
3	105	Melissa	White	Small	14-Oct
4	220-B	Windy	Shaw	Small	Pending
5	105	Esther	Yaron	Small	7-Oct
6	220-A	Brigid	Ellison	Small	7-Oct
7	220-B	Michael	Lazar	Small	7-Oct
8	135	Anisa	Naser	Small	Pending
9	220-A	Christopher	Peyton-Gomez	Small	14-Oct
10			Small Count		8
11	105	Christiana	Chen	Medium	5-Oct
12	105	Sidney	Kelly	Medium	11-Oct
13	105	Nathan	Albee	Medium	5-Oct
14	110			Medium	11-Oct
15	220-B			Medium	13-Oct
16	135			Medium	11-Oct
17	135	Chantal	Weiler	Medium	11-Oct
18	220-A	Chevonne	Means	Medium	13-Oct
19	110	Matt	Benson	Medium	15-Oct
20	220-B	Samantha	Bell	Medium	15-Oct
21			Medium Count		10

TO VIEW GROUPS BY LEVEL

When you create subtotals, your worksheet is divided into different levels. You can switch between these levels to quickly control how much information is displayed in the worksheet by clicking the **Level** buttons image of button for levels 1, 2, 3 to the left of the worksheet.

1. Click the lowest level to display the least detail. In our example, we'll select **level 1**, which contains only the grand count, or total number of T-shirts ordered.
2. Click the next level to expand the detail. In our example, we'll select **level 2**, which contains each subtotal row but hides all other data from the worksheet.
3. Click the highest level to view and expand all of your worksheet data.

TO REMOVE SUBTOTALS

Sometimes you may not want to keep subtotals in your worksheet, especially if you want to reorganize data in different ways. If you no longer want to use subtotalling, you'll need remove it from your worksheet.

1. Select the **Data** tab, then click the **Subtotal** command.
2. The **Subtotal dialog box** will appear. Click **Remove All**.

TABLES

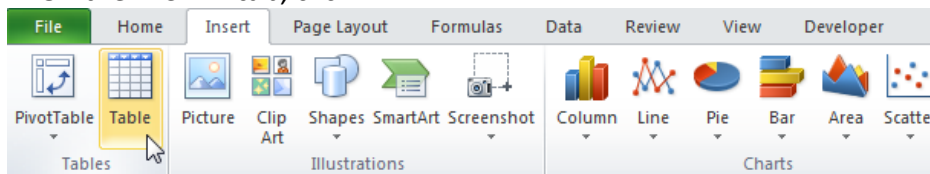
Just like regular formatting, tables can improve the look and feel of your workbook, and they'll also help you organize your content and make your data easier to use. Excel includes several tools and predefined table styles, allowing you to create tables quickly and easily.

INSERT A TABLE

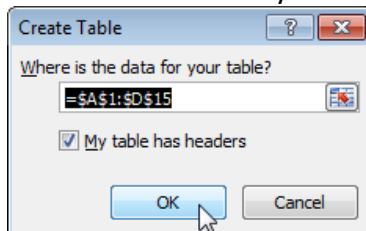
1. Click any single cell inside the data set.

	A	B	C	D	E
1	Last Name	Sales	Country	Quarter	
2	Smith	\$16,753.00	UK	Qtr 3	
3	Johnson	\$14,808.00	USA	Qtr 4	
4	Williams	\$10,644.00	UK	Qtr 2	
5	Jones	\$1,390.00	USA	Qtr 3	
6	Brown	\$4,865.00	USA	Qtr 4	
7	Williams	\$12,438.00	UK	Qtr 1	
8	Johnson	\$9,339.00	UK	Qtr 2	
9	Smith	\$18,919.00	USA	Qtr 3	

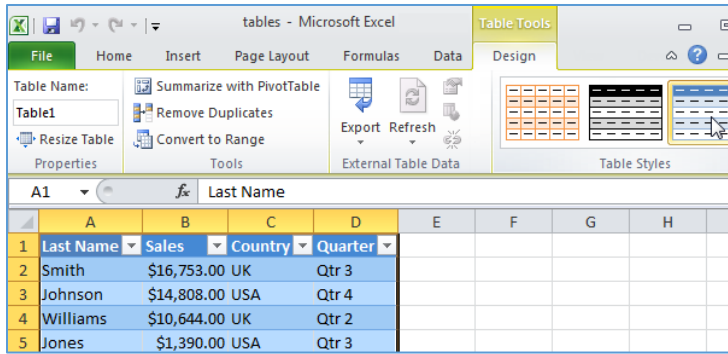
2. On the **INSERT** tab, click **TABLE**.



3. Excel automatically selects the data. Check **'My table has headers'** and click **OK**.



This may still seem like a normal data range to you but many powerful features are now just a click of a button away. The **TABLE TOOLS contextual tab** (with the underlying **Design tab** selected) is the starting point for working with tables. If at any time you lose this tab, simply click any cell within the table and it will activate again.



SORT A TABLE

To sort by **Last Name** first and **Sales** second, *first* sort by **Sales**, *next sort* by **Last Name** (the exact opposite).

1. Click the arrow next to **Sales** and click **Sort Smallest to Largest**.
2. Click the arrow next to **Last Name** and click **Sort A to Z**.

	A	B	C	D
1	Last Name	Sales	Country	Quarter
2	Brown	\$3,255.00	USA	Qtr 2
3	Brown	\$4,865.00	USA	Qtr 4
4	Johnson	\$9,339.00	UK	Qtr 2
5	Johnson	\$14,808.00	USA	Qtr 4
6	Jones	\$1,390.00	USA	Qtr 3
7	Jones	\$7,433.00	UK	Qtr 1
8	Jones	\$9,213.00	USA	Qtr 4
9	Smith	\$9,698.00	USA	Qtr 1
10	Smith	\$16,753.00	UK	Qtr 3
11	Smith	\$18,919.00	USA	Qtr 3
12	Williams	\$10,644.00	UK	Qtr 2
13	Williams	\$12,438.00	UK	Qtr 1
14	Williams	\$14,867.00	USA	Qtr 3
15	Williams	\$19,302.00	UK	Qtr 4

FILTER A TABLE

1. Click the arrow next to **Country** and only check **USA**.

	A	B	C	D
1	Last Name	Sales	Country	Quarter
2	Brown	\$3,255.00	USA	Qtr 2
3	Brown	\$4,865.00	USA	Qtr 4
5	Johnson	\$14,808.00	USA	Qtr 4
6	Jones	\$1,390.00	USA	Qtr 3
8	Jones	\$9,213.00	USA	Qtr 4
9	Smith	\$9,698.00	USA	Qtr 1
11	Smith	\$18,919.00	USA	Qtr 3
14	Williams	\$14,867.00	USA	Qtr 3

Filters are cumulative, which means you can apply multiple filters to help narrow down your results.

2. Click the drop-down arrow for the column you want to filter.
3. The **Filter** menu will appear.
4. Check or uncheck the boxes depending on the data you want to filter, then click **OK**.
5. The new filter will be applied.

ADVANCED FILTERS

If the data you want to filter requires complex criteria (such as **Type = "Produce" OR Salesperson = "Davolio"**) you can use the **Advanced Filter** dialog box.

The **Advanced** command works differently from the **Filter** command in several important ways.

- It displays the **Advanced Filter** dialog box instead of the **AutoFilter** menu.
- You type the advanced criteria in a separate criteria range on the worksheet and above the range of cells or table you want to filter.
 - Excel uses the separate criteria range in the Advanced Filter dialog box as the source for the advanced criteria.

Advanced Filter	Example
Multiple criteria, one column, any criteria true	Salesperson = "Davolio" OR Salesperson = "Buchanan"
Multiple criteria, multiple columns, all criteria true	Type = "Produce" AND Sales > 1000
Multiple criteria, multiple columns, any criteria true	Type = "Produce" OR Salesperson = "Buchanan"
Multiple sets of criteria, one column in all sets	(Sales > 6000 AND Sales < 6500) OR (Sales < 500)
Multiple sets of criteria, multiple columns in each set	(Salesperson = "Davolio" AND Sales >3000) OR (Salesperson = "Buchanan" AND Sales > 1500)
Wildcard criteria	Salesperson = a name with 'u' as the second letter
Text that matches a case-sensitive search (formula)	Type = an exact match of "Produce"
A value in a column greater than the average of all values in that column (formula)	Sales > the average of all Sales

WILDCARD CRITERIA

Boolean logic: Salesperson = a name with 'u' as the second letter

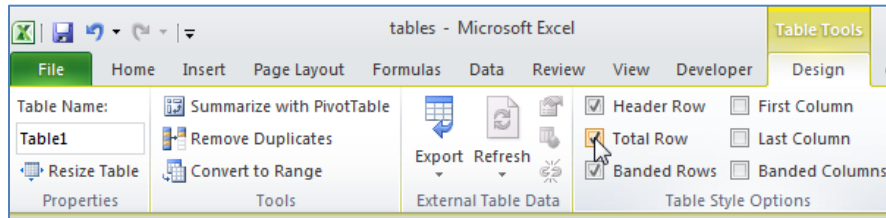
To find text values that share some characters but not others, do one or more of the following:

- Type one or more characters without an equal sign (=) to find rows with a text value in a column that begin with those characters. For example, if you type the text Dav as a criterion, Excel finds "Davolio," "David," and "Davis."
- Use a wildcard character.

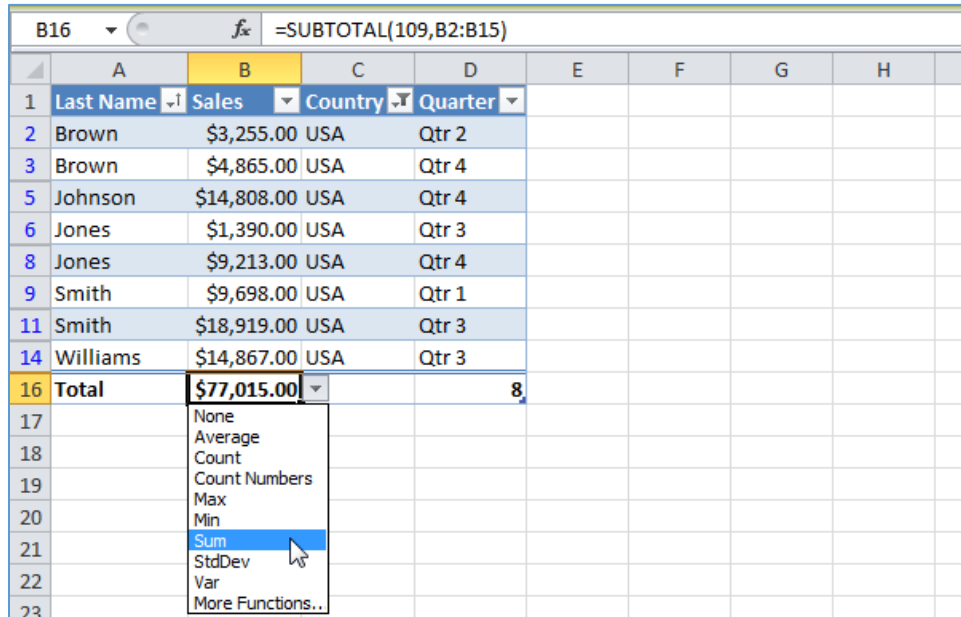
Use	To find
? (question mark)	Any single character For example, sm?th finds "smith" and "smyth"
* (asterisk)	Any number of characters For example, *east finds "Northeast" and "Southeast"
~ (tilde) followed by ?, *, or ~	A question mark, asterisk, or tilde For example, fy91~? finds "fy91?"

TOTAL ROW

1. On the **DESIGN** tab, in the **TABLE STYLE OPTIONS** group, check **Total Row**.



2. Click any cell in the last row to calculate the **TOTAL** of a column. For example, calculate the sum of the **Sales** column.



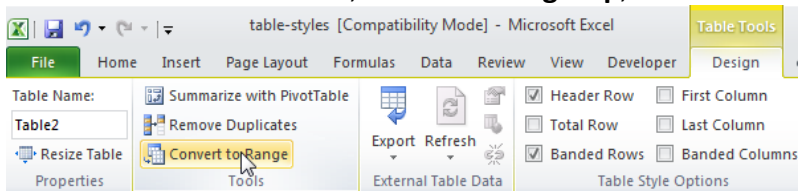
The screenshot shows an Excel spreadsheet with a table. The formula bar displays the formula `=SUBTOTAL(109,B2:B15)`. The table has columns for Last Name, Sales, Country, and Quarter. The 'Total' row is highlighted, and a dropdown menu is open over the 'Sales' cell, showing 'Sum' selected.

	A	B	C	D	E	F	G	H
1	Last Name	Sales	Country	Quarter				
2	Brown	\$3,255.00	USA	Qtr 2				
3	Brown	\$4,865.00	USA	Qtr 4				
5	Johnson	\$14,808.00	USA	Qtr 4				
6	Jones	\$1,390.00	USA	Qtr 3				
8	Jones	\$9,213.00	USA	Qtr 4				
9	Smith	\$9,698.00	USA	Qtr 1				
11	Smith	\$18,919.00	USA	Qtr 3				
14	Williams	\$14,867.00	USA	Qtr 3				
16	Total	\$77,015.00		8				
17		None						
18		Average						
19		Count						
20		Count Numbers						
21		Max						
22		Min						
23		Sum						
		StdDev						
		Var						
		More Functions...						

Note: in the formula bar see how Excel uses the **SUBTOTAL** function to calculate the sum. **109** is the argument for **Sum** if you use the **SUBTOTAL** function. Excel uses this function (and not the standard **SUM** function) to correctly calculate table totals of filtered tables.

To convert this table back to a normal range of cells (and keep the formatting), execute the following steps.

3. On the **DESIGN** tab, in the **TOOLS** group, click **CONVERT TO RANGE**.



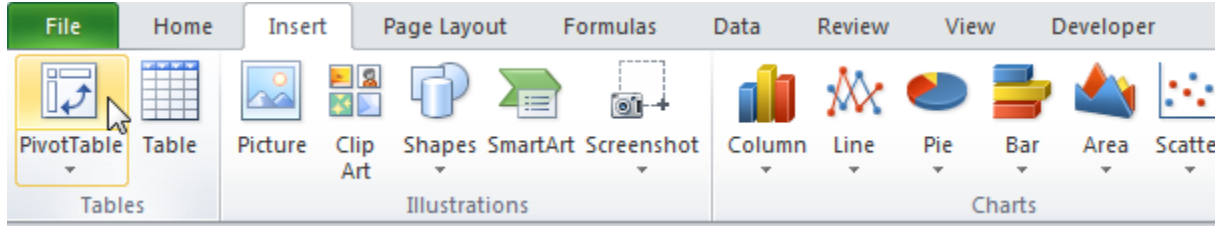
Note: to remove the table style, select the range of cells, on the **HOME** tab, in the **STYLES** group, click **NORMAL**.

PIVOT TABLES

A **pivot table** allows you to extract the significance from a large, detailed data set.

To insert a pivot table:

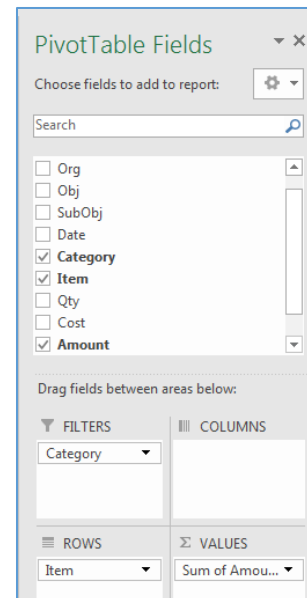
1. Click any single cell inside the data set.
2. On the **Insert** tab, click **PivotTable**.



The following dialog box appears. Excel automatically selects the data for you. The default location for a new pivot table is **New Worksheet**.

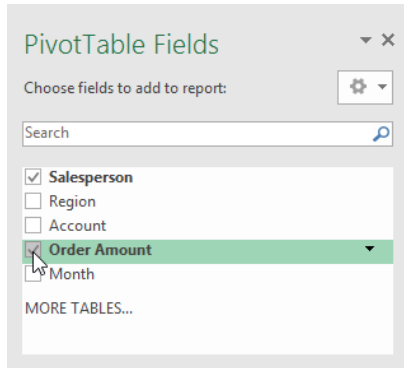
3. Click **OK**.

	A	B	C	D	E	F	G	H	I	J	K
8	Area	Org	Obj	SubObj	Date	Category	Item	Qty	Cost	Amount	
9	802	1050	7301	50	8/15/2006	Cleaning	CLEANER,409,	2	\$2.79	\$5.58	
10	802	1050	7301	50	1/12/2007	Cleaning	CLEANER,409,	2	\$4.82	\$9.64	
11	802	1050	7300	50	5/16/2007	Cleaning	CLEANER,409,	3	\$3.34	\$10.02	
12	802	1050	7302	50	6/29/2007	Cleaning	CLEANER,409,	4	\$3.09	\$12.36	
13	802	1050	7300	50	10/31/2006	Cleaning	CLNING SPLY,	6	\$5.47	\$32.82	
14	802	1050	7301	50	1/12/2007	Cleaning	CLNING SPLY,	4	\$8.00	\$32.00	
15	802	1050	7302	50	4/30/2007	Cleaning	CLNING SPLY,	3	\$4.86	\$14.58	
16	802	1090	7300	50	8/31/2006	Cleaning	DISPENSER,CL	3	\$1.94	\$5.82	
17	802	1050	7302	50	10/31/2006	Cleaning	DISPENSER,CL	2	\$1.94	\$3.88	
18	802	1050	7302	50	4/30/2007	Cleaning	DISPENSER,CL	2	\$1.94	\$3.88	
19	802	1090	7301	65	7/31/2006	Cleaning	LAB WIPES AC	15	\$3.45	\$51.75	
20	802	3810	7300	65	10/13/2006	Cleaning	LAB WIPES AC	20	\$3.45	\$69.00	
21	802	1090	7300	65	1/12/2007	Cleaning	LAB WIPES AC	6	\$3.45	\$20.70	
22	802	1050	7300	50	1/31/2007	Cleaning	SPRAY BOTTLE	2	\$5.56	\$11.12	
23	802	1050	7302	50	5/31/2007	Cleaning	SPRAY BOTTLE	1	\$5.65	\$5.65	
24	802	2250	7301	50	10/13/2006	Cleaning	TOWEL,PPR,2P	6	\$0.75	\$4.50	
25	802	1050	7301	50	4/30/2007	Cleaning	TOWEL,PPR,2P	6	\$0.89	\$5.34	
26	802	1050	7302	50	7/31/2006	Cleaning	WIPER,KIMMIP	1	\$3.30	\$3.30	

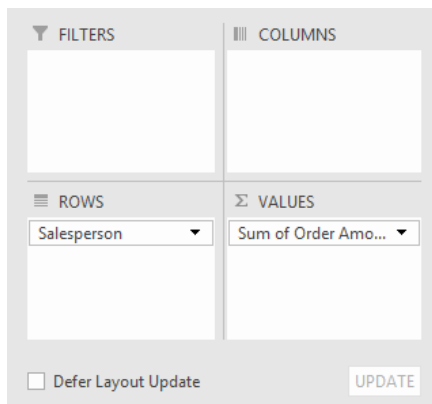


Once you create a PivotTable, you'll need to decide which fields to add. Each field is simply a column header from the source data. In the PivotTable **Field List**, check the box for each field you want to add.

In our example, we want to know the total amount sold by each salesperson, so we'll check the **Salesperson** and **Order Amount** fields.



The selected fields will be added to one of the four areas below. In our example, the **Salesperson** field has been added to the **Rows** area, while **Order Amount** has been added to **Values**. Alternatively, you can drag and drop fields directly into the desired area.



The PivotTable will calculate and summarize the selected fields. In our example, the PivotTable shows the amount sold by each salesperson.

	A	B
1		
2		
3	Row Labels	Sum of Order Amount
4	Albertson, Kathy	2650
5	Brennan, Michael	3700
6	Davis, William	1935
7	Dumlao, Richard	1490
8	Flores, Tia	4565
9	Post, Melissa	1690
10	Thompson, Shannon	3160
11	Walters, Chris	4375
12	Grand Total	23565
13		

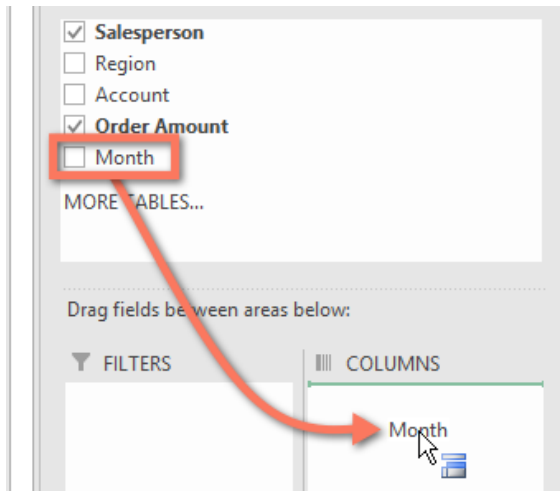
Pivoting data

One of the best things about PivotTables is that they can quickly pivot—or reorganize—your data, allowing you to examine your worksheet in several ways. Pivoting data can help you answer different questions and even experiment with your data to discover new trends and patterns.

To add columns:

So far, our PivotTable has only shown one column of data at a time. In order to show multiple columns, you'll need to add a field to the **Columns** area.

Drag a field from the **Field List** into the **Columns** area. In our example, we'll use the **Month** field.



The PivotTable will include multiple columns. In our example, there is now a column for each person's **monthly sales**, in addition to the **Grand Total**.

	A	B	C	D	E
1					
2					
3	Sum of Order Amount Column				
4	Row Labels	January	February	March	Grand Total
5	Flores, Tia	1655	985	1925	4565
6	Walters, Chris	355	2755	1265	4375
7	Brennan, Michael	2750	550	400	3700
8	Thompson, Shannon	1140	1720	300	3160
9	Albertson, Kathy	925	1375	350	2650
10	Davis, William	1100	235	600	1935
11	Post, Melissa	765	575	350	1690
12	Dumlao, Richard	400	965	125	1490
13	Grand Total	9090	9160	5315	23565
14					

To change a row or column:

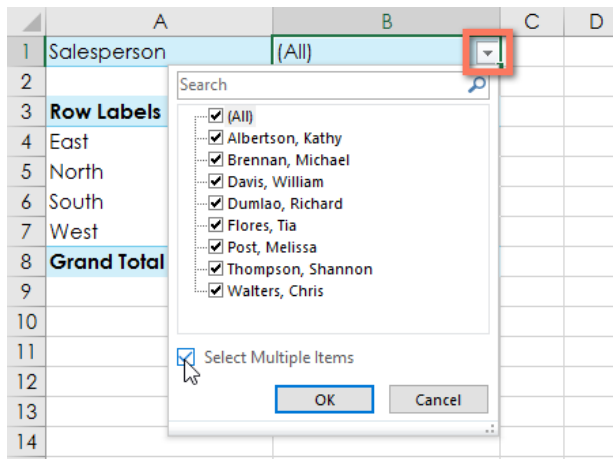
Changing a row or column can give you a completely different perspective on your data. All you have to do is remove the field in question, then replace it with another.

Drag the field you want to remove out of its current area. You can also uncheck the appropriate box in the Field List. In this example, we've removed the **Month** and **Salesperson** fields.

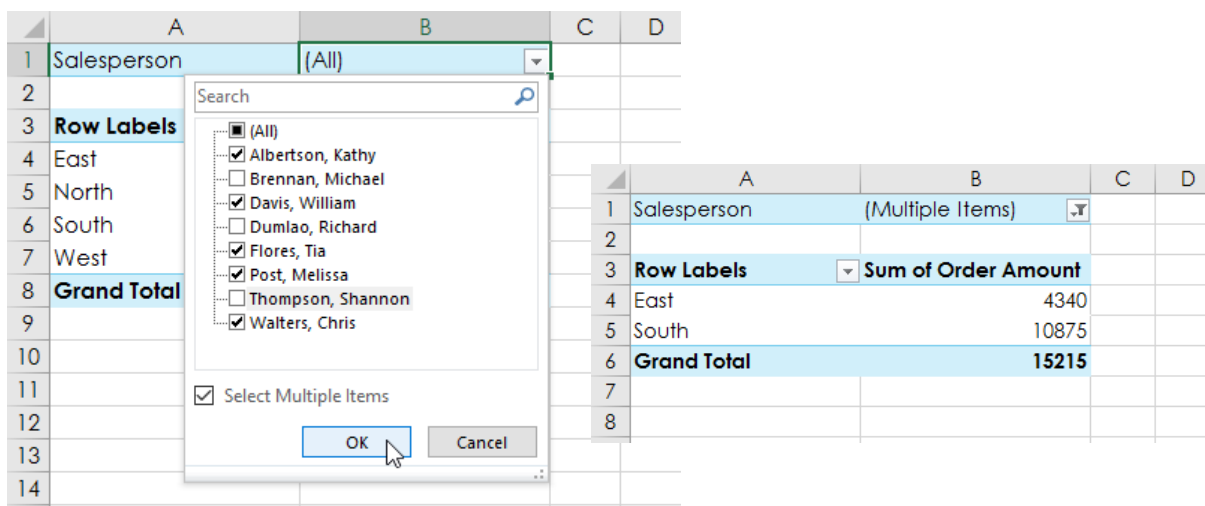
To add a filter:

In the example below, we'll filter out certain salespeople to determine how their individual sales are impacting each region.

The filter will appear above the PivotTable. Click the drop-down arrow, then check the box next to **Select Multiple Items**.



Uncheck the box next to any item you don't want to include in the PivotTable. In our example, we'll uncheck the boxes for a few salespeople, then click **OK**. The PivotTable will adjust to reflect the changes.



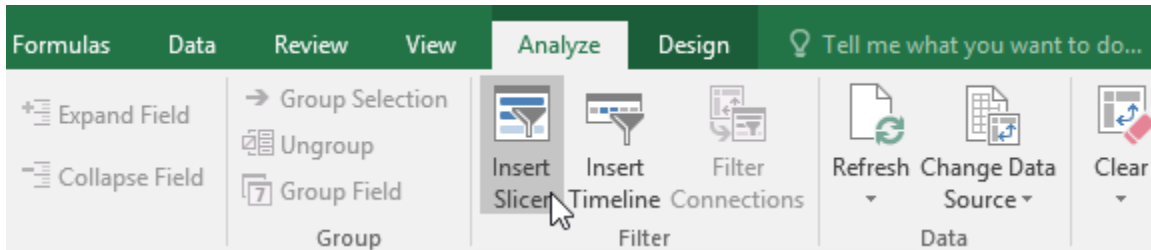
Slicers

Slicers make filtering data in PivotTables even easier. Slicers are basically just **filters** but are easier and faster to use, allowing you to instantly pivot your data. If you frequently filter your PivotTables, you may want to consider using slicers instead of filters.

To add a slicer:

Select any cell in the PivotTable.

From the **Analyze** tab, click the **Insert Slicer** command.



A dialog box will appear. Check the box next to the desired **field**. In our example, we'll select **Salesperson**, then click **OK**.

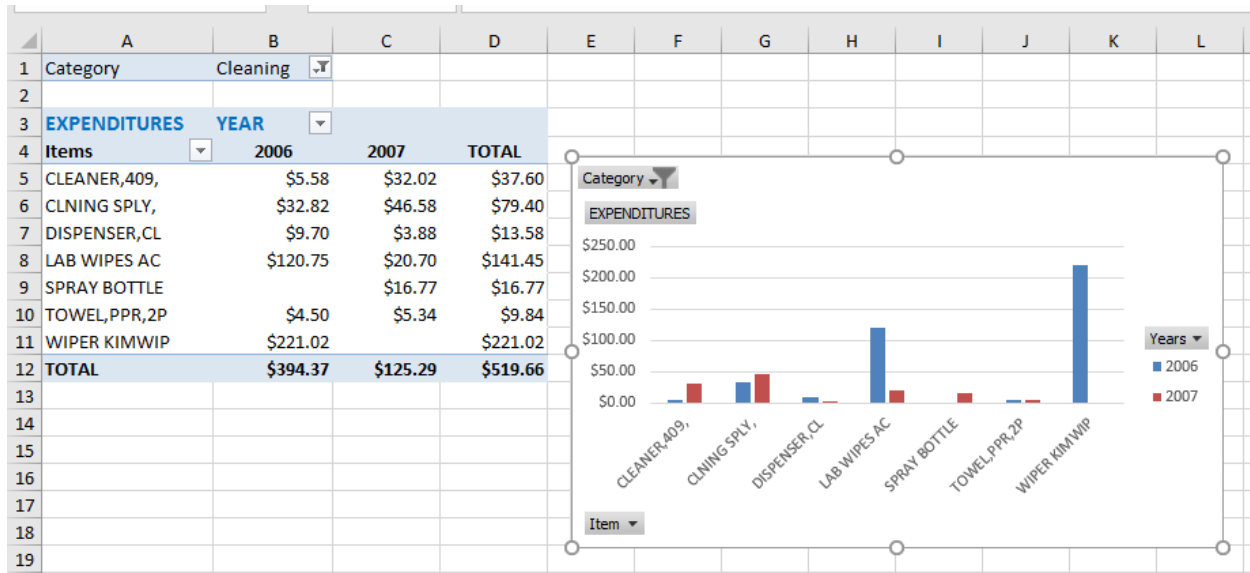
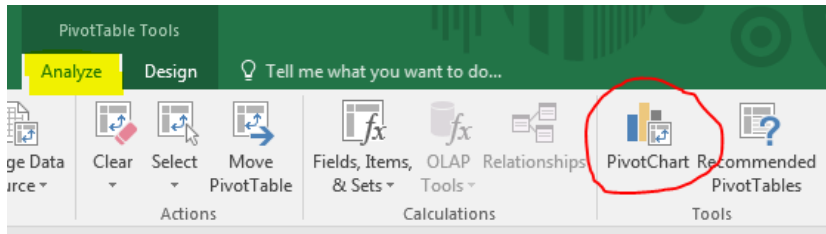
The slicer will appear next to the PivotTable. Each selected item will be highlighted in **blue**. In the example below, the slicer contains all eight salespeople, but only **five** of them are currently selected.

	A	B	C	D	E	F	G	H
1	Salesperson	(Multiple Items)		Salesperson				
2				Albertson, Kathy				
3	Row Labels	Sum of Order Amount		Brennan, Michael				
4	East	4340		Davis, William				
5	South	10875		Dumlao, Richard				
6	Grand Total	15215		Flores, Tia				
7				Post, Melissa				
8				Thompson, Shannon				
9				Walters, Chris				
10								
11								
12								
13								
14								
15								

Just like filters, only selected items are used in the PivotTable. When you select or deselect an item, the PivotTable will instantly reflect the change. Press and hold the **Ctrl key** on your keyboard to select multiple items at once.

PIVOT CHART

A pivot chart is the visual representation of a pivot table in Excel. Pivot charts and pivot tables are connected with each other.



By design, a **Pivot Chart** never displays data from the **Grand Total** column of a Pivot Table. The **Select Data** button on the **Pivot Chart Tools/Design** tab does not allow the user to reselect the Source data to include the Grand Total column. The only option left in this case is to copy the Pivot Table and paste it as **Paste Special > Values** in another range and then create a chart from this data. But in doing so, any change in the slicer or Base data will not have any effect on the Chart because the source of the Chart is a static range.

	A	B	C	D	E	F	G	H	I
1	Year	Quarter	Month	Company	Revenue	Date	M2	Q2	Y2
2	2008	1	January	FirmA	67	Jan-08	January	Q1	2008
3	2008	1	February	FirmA	69	Feb-08	February	Q1	2008
4	2008	1	March	FirmA	128	Mar-08	March	Q1	2008
5	2008	2	April	FirmA	78	Apr-08	April	Q2	2008
6	2008	2	May	FirmA	67	May-08	May	Q2	2008
7	2008	2	June	FirmA	88	Jun-08	June	Q2	2008
8	2008	3	July	FirmA	24	Jul-08	July	Q3	2008
9	2008	3	August	FirmA	65	Aug-08	Aug	Q3	2008
10	2008		September	FirmA	108	Sep-			08
11	2008				82	Oct-			08
12	2008				68	Nov-08	November	Q4	2008
13	2008				119	Dec-08	December	Q4	2008
14	2009	1	January	FirmA	128				
15	2009	1	February	FirmA	131				
16	2009	1	March	FirmA	34				

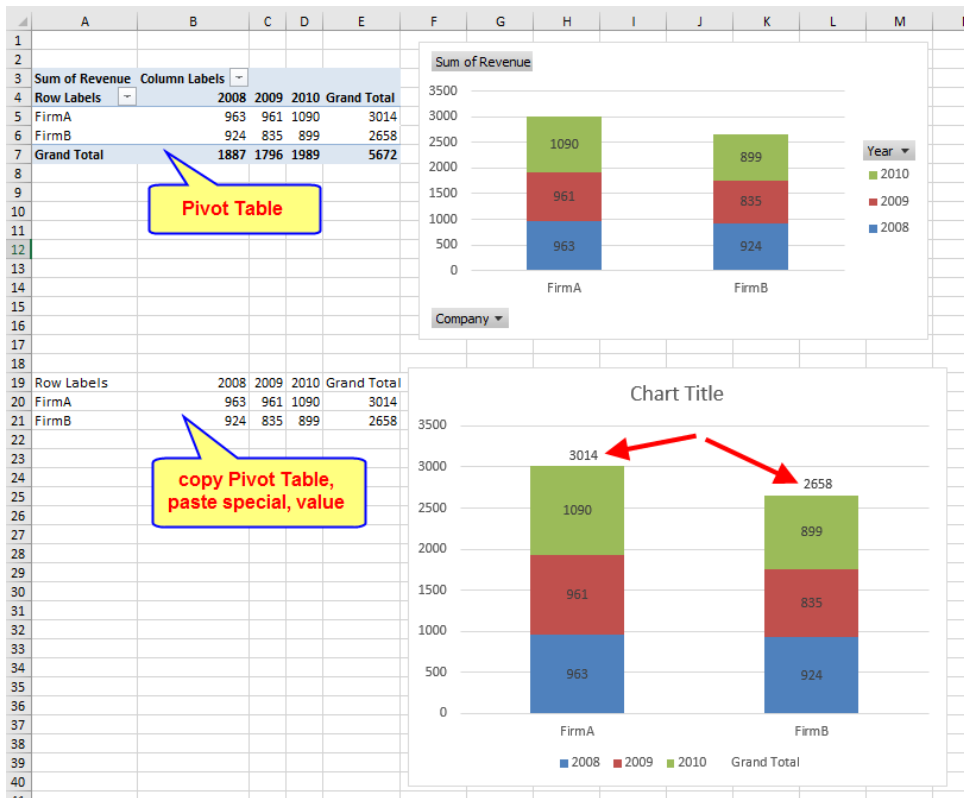
Manually-entered data

Use functions

- **Column F** – enter 1/1/2008, use Fill Handle for date (difference b/w left & right mouse button)
- **Column G** - =TEXT(DATE(YEAR(F2),MONTH(F2),DAY(F2)),"mmmm")
- **Column H** – calculate which Quarter of the year is the month, then add a 'Q' in front of it (we won't be using the Quarter as a number, so this is just extra formatting for a nicer display (optional))
 ="Q" & INT((MONTH(F2)+2)/3) &"-"& YEAR(A2)
- **Column I** - =YEAR(F2)

If adding additional years (2011, 2012, etc), and you need Revenue data, use the **RANDBETWEEN(bottom,top)** function. Remember to **copy/paste as value** to remove the formula.

	A	B	C	D	E	F	G
1							
2							
3	Sum of Revenue	Column Labels					
4	Row Labels		2008	2009	2010	Grand Total	
5	FirmA		963	961	1090	3014	
6	FirmB		924	835	899	2658	
7	Grand Total		1887	1796	1989	5672	
8							
9							
10							
11							
12	Sum of Revenue	Column Labels					
13	Row Labels		1	2	3	4	Grand Total
14	2008		584	459	317	527	1887
15	FirmA		264	233	197	269	963
16	FirmB		320	226	120	258	924
17	2009		540	507	476	273	1796
18	FirmA		293	317	233	118	961
19	FirmB		247	190	243	155	835
20	2010		569	611	232	577	1989
21	FirmA		364	307	155	264	1090
22	FirmB		205	304	77	313	899
23	Grand Total		1693	1577	1025	1377	5672
24							
25	Month	(All)					
26							
27	Sum of Revenue	Column Labels					
28	Row Labels		2008	2009	2010	Grand Total	
29	FirmA		963	961	1090	3014	
30	FirmB		924	835	899	2658	
31	Grand Total		1887	1796	1989	5672	
32							



Using GETPIVOT() to Link Values

To have the copy/paste data (from above example) automatically refresh, link the Grand Total values between the two tables. Type an equal sign, =, in the cell, and, then, click the Grand Total cell in the Pivot Table to create a linked formula.