

Microsoft Excel Advanced



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Advanced Microsoft Excel 2019

This class is designed to cover the following:

- Inserting comments into a cell
- Inserting a text box
- Conditional formatting
- IF function
- Protecting worksheet data
- Hiding/unhiding a column or row
- Referencing cells in multiple worksheets
- Relative/absolute/mixed addressing
- Pie Charts and Line Charts
- Chart Tools
- Parsing/Concatenating data
- Filtering data
- Subtotals
- VLOOKUP
- PivotTables

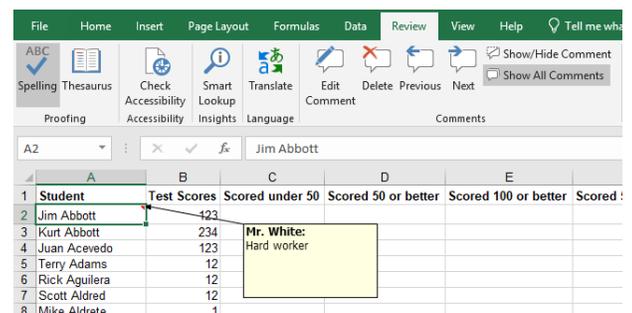
Inserting Comments into a Cell

Inserting a comment is like attaching a Post-it note to a specific cell. You can choose to display the comments or hide them after you've created them.

To insert a comment:

1. Select the cell to which you'd like to attach a comment
2. On the **Review** ribbon, click on **New Comment**

You can show/hide one or all comments by clicking on **Show/Hide Comment** or **Show All Comments**.



Inserting a Text Box

Similar to inserting a comment, a text box can also be inserted. A text box sits on top of the spreadsheet and can be used, similar to a Post-it note, to make a note about the entire worksheet. You can change the size of these text boxes and move them around to reposition them.

To insert a text box:

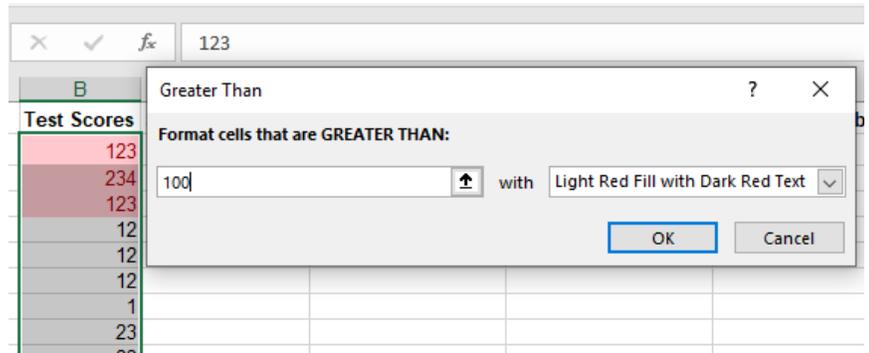
1. On the Home ribbon selection **Insert/Text/Text Box**
2. To place the textbox, click, drag and release the cursor on the worksheet area
3. To format the text box, select the text box, click on **Drawing Tools/Format**, then select the appropriate option to change the alignment, color fill, transparency, margins, etc.

Conditional Formatting

You can use conditional formatting to apply a style to a cell based on the cell's value.

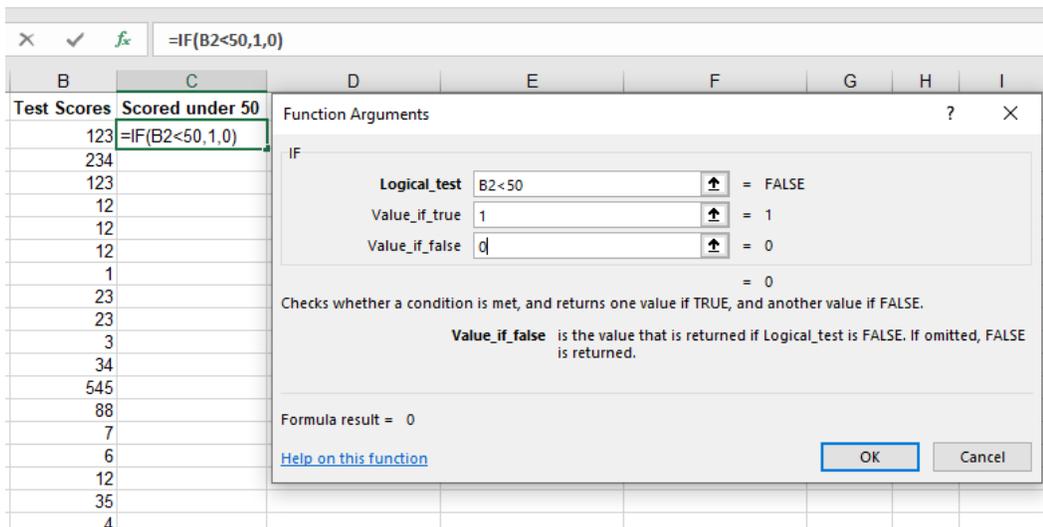
To apply conditional formatting:

1. Select the cell(s) to which you'd like to apply conditional formatting
2. Select **Home/Conditional Formatting**
3. Select the desired type of rule (for example: **Highlight Cells Rule** for cells **Greater Than** 100; you could choose to set these values to have a **Light Red Fill with Dark Red Text.**)
4. Click the OK button.



IF function

Using the **IF** statement in a formula allows you to create logically determined results. An **IF** statement could look something like this: **=IF (B3<50,1,0)**. This translates into: **IF** the content of B3 is less than 50, then put a 1 in the cell which has the **IF** formula. **IF** the content of B3 is not less than 50, then put a 0 in the cell which has the **IF** formula.



In this example, the above formula is entered into cell C2. If the value in cell B2 is less than 50, then the number 1 will be entered in cell C2. If not, the number 0 will be entered in cell C2.

Protecting Worksheet Data

If other users will be accessing your worksheet, you may want to prevent them from modifying the contents of some cells while allowing them to enter data into other cells. To do this, you can protect worksheets and workbooks, allowing access to some cells but not others.

Protecting data from being modified is a two-step process:

1. Locking/unlocking specific cells in your spreadsheet.

2. Applying the Protect Sheet option.

Until step 2 is completed, all data is vulnerable to change. By default, all cells in a worksheet are locked. This does not have any effect on data entry and editing until you apply protection to the sheet, at which point all locked cells are made unavailable. This means that if you want to have access to certain cells, but not others, you need to unlock those cells before applying sheet protection.

Unlocking cells:

1. Select the cells you want to be accessible
2. From **Home/Cells/Format**, select **Protection/Format Cells**
3. Select the **Protection** tab, then **Unlock** the cells. (The **Format/Lock Cells** command acts as a toggle.)
By unlocking the cells you selected, you ensure that they will be editable after you protect the worksheet.

Protecting a worksheet:

1. To protect the worksheet, select **Home/Cells/Format/Protect Sheet**.

Hiding and Unhiding a Column or Row

Not all the data on a worksheet should be available for everyone. You can hide sensitive information without deleting it by hiding selected columns or rows. For example, if you want to share a worksheet with others, but it includes confidential employee salaries, you can simply hide the salary column. Hiding columns and rows does not affect calculations in a worksheet; all data in hidden columns and rows is still referenced by formulas as necessary. Hidden columns and rows do not appear in a printout either. When you need the data, you can unhide the sensitive information.

How to hide a column or row:

1. Click the column or row you want to hide. (You can also select more than one column or row.)
2. From the **Home** ribbon, select **Cells/Format/Hide and Unhide**, select **Hide Columns**
3. Protect the sheet, if desired.

How to unhide a column or row:

1. (Unprotect the sheet if it has been protected.)
2. Drag to select the column or row on either side of the hidden column or row
3. From the **Home** ribbon, select **Cells/Format/Hide and Unhide**, select **Unhide Columns**.

Referencing cells in multiple worksheets

The various sheets in a workbook can be referred to in other worksheets by including the sheet reference as well as the cell reference in a formula. A sheet reference includes the sheet name followed by an exclamation point, e.g., **Sheet2!** refers to Sheet 2. To refer to cell A1 on Sheet2 (when working in any sheet other than Sheet2), the reference would be **Sheet2!A1**.

Notice that the exclamation point separates the *sheet reference* from the *cell reference*.

If you have named the sheet, simply use the new sheet name (followed by an exclamation point) and the cell reference. If the sheet name includes spaces you must surround the sheet name with single quotation marks.

To refer to cell A1 on a sheet named *Budget*, the reference would be:

=Budget!A1

To refer to cell A1 on a sheet named *Annual Budget*, the reference would be:

=‘Annual Budget’!A1

How to use the AutoSum function on data held on multiple worksheets:

1. Click a cell that you want to contain the calculated total of all the cells
2. Type a formula that includes references to the source cells on each worksheet that contains data you want to sum, e.g. =SUM('Worksheet Name'!B13:B23)

Helpful hint:

To enter a reference in a formula with less typing, enter the formula up to the point where you need to reference cells from another worksheet. If the cell/s is/are on another worksheet, first click that worksheet's tab, and then click the cell/s you'd like to be used in the formula. Press the Enter key.

Relative/Absolute/Mixed Addressing

Calling cells by just their column and row labels (such as "A1") is called **relative referencing**. When a formula contains relative referencing and it is copied from one cell to another, Excel does not create an exact copy of the formula. It will change cell addresses relative to the row and column they are moved to. For example, if a simple addition formula in cell C1 " $=A1+B1$ " is copied to cell C2, the formula would change to " $=A2+B2$ " to reflect the new row.

To prevent this change, cells must be called by **absolute referencing**. This is accomplished by placing dollar signs "\$" within the cell addresses in the formula. Continuing the previous example, the formula in cell C1 would read " $=\$A\$1+\$B\1 ". If this formula is copied, it will always yield the sum of cells A1 and B1, even if it is copied into C2. Both the column and row of both cells are absolute and will not change when copied.

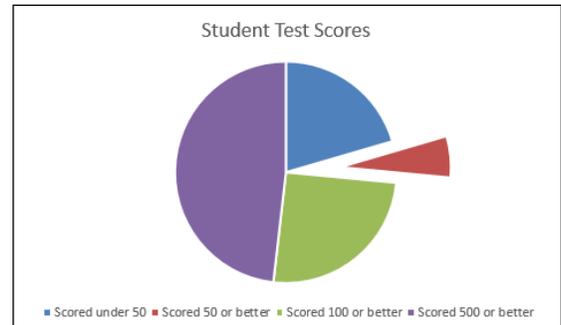
Mixed referencing can be used where only the row OR column is fixed. For example, in the formula " $=A\$1+\$B2$ ", the row of cell A1 is fixed and the column of cell B2 is fixed.

Charting with Pie Charts

Data for a chart doesn't have to exist all in one block. You can use CTRL+click to select non-adjacent cells. If you select values and their respective labels, you will create a legend within the chart box which is generated. If you only select values, your pieces of the pie will not be labeled.

1. Highlight the values and labels you wish to use to create a pie chart

2. On the **Insert** tab, in the **Charts** subsection, click on **Pie** chart and select the type of pie chart you'd like
3. To change the appearance of the pie chart, select the actual pie then **Chart Tools/Layout/Format Selection** to
 - Explode the pie
 - Change borders, 3-D effects, etc.



You can copy and paste your chart into Word. When doing this you can choose to link the two files dynamically (which would mean that updates to your Excel sheet would automatically update the Word document to which it links), or you can simply paste the chart into Word without linking the two files.

Charting multiple columns with Line Charts:

You can look at the values contained in multiple columns by charting these columns using a Line graph as follows:

1. Click on the column labels to highlight the columns you'd like to chart
2. Select **Insert/Charts/Line**

You can remove any of the charted lines using the **Chart Tools/Design/Select Data**. Highlight the column of data you'd like to remove and click on **Remove**.

To use the **Chart Tools** tab to make changes, click on the chart and then select one of the following:

- **Design** – change chart type or general appearance
- **Format** - change background fill (color and texture such as gradient), shape outline and effects. There are also options to change your text color and effects

You can also change objects on the chart by double-clicking on the object and then selecting the appropriate options.

Parsing and Concatenating

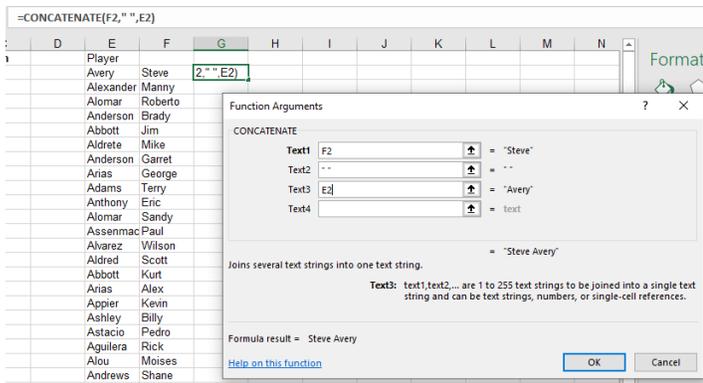
Parsing data is taking the contents of one cell and splitting it between two or more other cells. An example of this would be taking a cell which contains the first and last name of a person and splitting that information between two cells. As an end result there is one cell with the person's first name and another cell with the person's last name.

1. Decide where to place the separated data.
2. Highlight the column containing the original text.
3. From the **Data** ribbon, select **Text to Columns**.
4. Select **Delimited** or **Fixed Width**, and press **Next**.
5. Click on the delimiters that make sense, or click on the width you want for parsing your data.
6. Select the columns to contain the split data. Click **Finish**.

Concatenating cells joins the information contained in two cells together to make one cell.

1. Select the cell that will contain the result.

- From the **Formulas** ribbon, select the **Insert Function** and then the **Concatenate** formula.
- Enter the cells you wish to concatenate into the text boxes.



Original Text	Last Name	First Name	Full Name (concatenated from the two columns to the left.)
Fielder, Cecil	Fielder	Cecil	Cecil Fielder
Bonds, Barry	Bonds	Barry	Barry Bonds
Griffey, Ken	Griffey	Ken	Ken Griffey

Filtering data

Filtering is a quick and easy way to find and work with a subset of data. A filter displays only the rows that meet criteria that you choose. Unlike sorting, filtering does not rearrange a range. Filtering temporarily hides rows you do not want displayed. When Excel filters rows, you can edit, format, chart, and print your range subset without rearranging or moving it.

	A	B	C	D
1	Player	Salary	Team	League
70	Bonds, Barry	\$ 8,416,667	SF	NL
181	Dykstra, Lenny	\$ 6,200,000	Phi	NL
365	Justice, David	\$ 6,200,000	Atl	NL
424	Maddux, Greg	\$ 6,500,000	Atl	NL
591	Rijo, Jose	\$ 6,150,000	Cin	NL
635	Sheffield, Gary	\$ 6,100,000	Fla	NL
756	Williams, Matt	\$ 6,550,000	SF	NL
771				
772				

To create filter buttons at the top of data you'd like to filter:

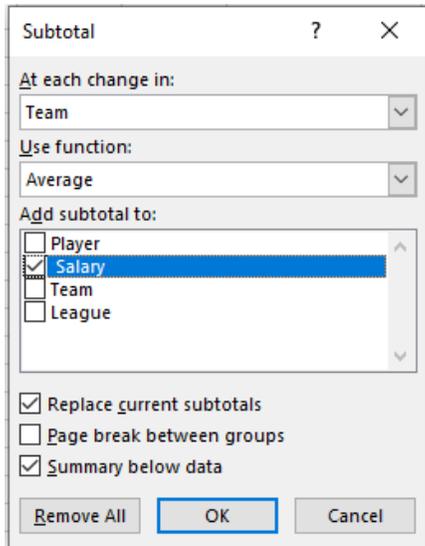
- Click on the column label for the column you wish to filter
- On the **Data** ribbon under the **Sort & Filter** subsection, click on the **Filter** button
- Click on the little arrow that appears at the top of the column for a drop-down menu in which you can select the appropriate text or numeric filter, e.g.:
 - Top 10 items or top 10 percent
 - Begins with, ends with, contains...

Subtotals

Microsoft Excel can automatically calculate subtotals and grand total values in a list. When you insert automatic subtotals, Excel outlines the list so that you can display and hide the detail rows for each

subtotal. To insert subtotals, you first sort your list so that the rows you want to subtotal are grouped together. You can then calculate subtotals for any column that contains numbers by using the following instructions:

1. Highlight the spreadsheet.
2. Select **Data/Subtotals**.
3. Identify the column that changes with each grouping.
4. Choose a function for the subtotal, e.g. Sum, Average, etc.
5. Identify the column to be totaled. Try collapsing the data to see the subtotals by themselves.



739	Stottlemire, Todd	\$ 3,800,000	StL	NL
740	Sweeney, Mark	\$ 125,000	StL	NL
741	Urbani, Tom	\$ 180,000	StL	NL
742		\$ 1,253,763	StL Average	
743	Brandenburg, Mark	\$ 118,500	Tex	AL
744	Buford, Damon	\$ 160,000	Tex	AL
745	Clark, Will	\$ 5,657,365	Tex	AL
746	Cook, Dennis	\$ 265,000	Tex	AL
747	Elster, Kevin	\$ 180,000	Tex	AL
748	Frazier, Lou	\$ 165,500	Tex	AL
749	Gil, Benji	\$ 200,000	Tex	AL
750	Gonzalez, Juan	\$ 7,100,000	Tex	AL
751	Greer, Rusty	\$ 258,333	Tex	AL
752	Valle, Dave	\$ 600,000	Tex	AL
753	Vosberg, Ed	\$ 178,000	Tex	AL
754	Whiteside, Matt	\$ 375,000	Tex	AL
755	Witt, Bobby	\$ 1,350,000	Tex	AL
756	Worthington, Craig	\$ 167,500	Tex	AL
757		\$ 1,198,228	Tex Average	
758	Bohanon, Brian	\$ 185,000	Tor	AL
759	Brito, Tilson	\$ 109,000	Tor	AL
760	Carrera, Giovanni	\$ 115,000	Tor	AL

VLOOKUP

VLOOKUP is a function in Excel which works with lists within an Excel worksheet. The list can be for anything – a list of employees, products, customers, parts, people, etc. You'll need to make sure that your list includes a column with a unique identifier for each item in the list. The column with the unique identifier needs to be in the first column of your source table. With a VLOOKUP you ask Excel to go to the source table, look up a unique identifier, find another piece of data associated with that unique identifier and put the piece of data in your target spreadsheet. For example, you could pass **VLOOKUP** an item code and it would return to you the corresponding item's description, its price, its availability, etc.

You'll need a list of items with at least two columns of data. The first column needs to be a unique identifier. Store this list on one sheet. On another sheet, enter one of the unique identifiers into a cell. Select the cell in which you want the retrieved information about your unique identifier to be placed by Excel. In other words: where do you want the information Excel lookups up to be put? – Go to that cell to enter the **VLOOKUP** function as follows:

1. From the **Formulas** ribbon click on **Insert Function**
2. In the Search for a Function box type in **VLOOKUP** and click Go
3. Select **VLOOKUP** from the list of results and click on **OK**
4. In the Function Arguments box that appears, enter the following information:

- Lookup_value** (What unique identifier are you looking up in your list?) e.g. A11 (what's the lookup value in my target table?)
- Table_array** (Where is your list?) e.g. 'NameOtherSheet'!A2:D7 (hint: don't include the header line when you select your source table!)
- Col_index_num** (Which column holds the information you want to have Excel retrieve from your list?) e.g. 2 (the second column in my source table)
- Range_lookup** (If the first column of the source list is sorted alphabetically/numerically in ascending order, then enter a value of true into this argument, or leave it blank. If the first column of the source list is not sorted, or it's sorted in descending order, then you must enter a value of false into this argument.) e.g. false

Pivot Tables

Imagine an Excel worksheet of sales figures for your company with hundreds or thousands of rows of data. Everyone has questions about what the data means. How do you get the answers? PivotTable reports organize and summarize your data, offer comparisons, reveal patterns and relationships, and analyze trends. To insert a PivotTable:

- Go to **Insert/Pivot Tables**
- The **Create PivotTable** pop up window will appear. Under **Select a table or range**, select the data, and then choose the location to place the pivot table (on this worksheet or on a new worksheet).
- From the **PivotTable Field** pane on the right-hand side, you can select each item and drag it to the drop items section on the actual PivotTable (e.g. **Filters, Columns, Rows, Values**).

This is the step where most people become frustrated but you just have to start clicking, dragging and dropping until you have the view that actually satisfies your needs – there is no right or wrong way of doing this, you can always click the **Undo** button, so drag and drop until you have the table that meets your specific requirements.

This shows the Average Yearly Earnings of employees according to Education (yrs.) and Sex. For this PivotTable, we dragged **Yearly Earnings** to the box in the lower right-hand corner labeled **Values**. We changed the original **Sum of Yearly Earnings** to **Average of Yearly Earnings** by left clicking on **Sum of Yearly Earnings**, clicking on **Value Field Settings** and selecting the desired calculation (e.g. **Average**). We dragged **Education (yrs.)** into the **Row Labels** field; and **Sex** into the **Column Labels**.

Row Labels	Illinois	Indiana	Michigan	Ohio	Wisconsin	(blank)	Grand Total
8	\$ 17,430	\$ 19,750	\$ 16,795	\$ 17,369	\$ 21,630	\$ 17,662	
9	\$ 20,006	\$ 28,606	\$ 11,390	\$ 61,890	\$ 21,816	\$ 24,044	
10	\$ 21,402	\$ 22,685	\$ 19,793	\$ 18,057	\$ 20,555	\$ 20,386	
11	\$ 18,314	\$ 16,650	\$ 21,797	\$ 24,752	\$ 17,598	\$ 19,976	
11.5	\$ 19,625	\$ 30,414	\$ 16,691	\$ 21,029	\$ 22,500	\$ 20,851	
12	\$ 23,789	\$ 25,924	\$ 28,161	\$ 28,580	\$ 25,605	\$ 27,934	
13	\$ 32,879	\$ 32,446	\$ 36,324	\$ 33,962	\$ 31,956	\$ 33,888	
14	\$ 30,582	\$ 33,160	\$ 35,924	\$ 45,519	\$ 26,125	\$ 35,687	
16	\$ 49,486	\$ 51,896	\$ 50,408	\$ 48,305	\$ 43,157	\$ 48,907	
18	\$ 72,983	\$ 51,583	\$ 87,768	\$ 79,335	\$ 72,459	\$ 76,187	
(blank)							
Grand Total	\$ 37,328	\$ 33,124	\$ 39,317	\$ 40,051	\$ 34,497	\$ 37,796	