Advanced Google Sheets

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Advanced Google Sheets

This class is designed to cover the following:

- Inserting notes/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
- VLOOKUP
- PivotTables

Note: Google Sheets will often have several ways to do a task. There might be one option under the menus, another option on the toolbar, another available with a right-click, and also a keyboard shortcut. Use whatever method works for you. If you forget where to find a command, you can perform a search under the **Help** menu.

Inserting Notes into a Cell

Inserting a note is like attaching a Post-It note to a specific cell. A little black triangle will appear in the corner of the cell to let you know it has a note. Hovering over the cell will display the note.

To insert a note:

1. Select the cell you'd like to add a note to.
2. Choose **Insert** from the menu, then select **Note**.
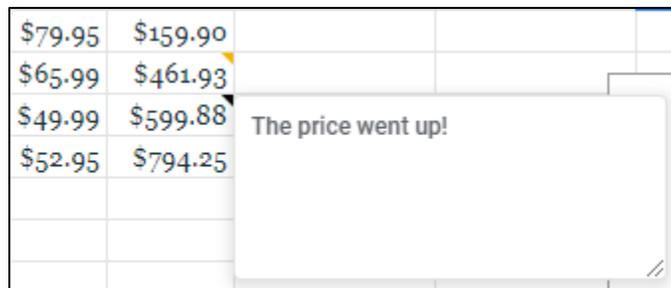
To delete a note:

1. Right-click on the cell.
2. Select **Clear Notes** from the menu.

Inserting Comments into a Cell

A comment is similar to a note, but it will have your name and a timestamp attached. If you're collaborating with someone, you can hold a conversion about the comment you've left. If you've resolved the issue the comment was addressing, you can mark it resolved and hide it. You can see a cell has a comment by the orange marker in its corner.
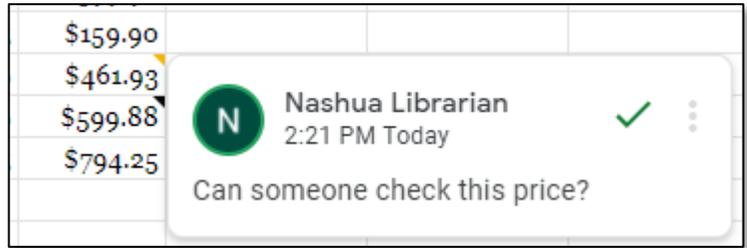
To insert a comment:

1. Select the cell you'd like to comment on.
2. Choose **Insert** from the menu, then select **Comment**.

To resolve a comment:

1. Select the cell so the comment box is visible.
2. Click on the **green checkmark**.

To delete a comment:

1. Click on the cell so the comment box is visible.
2. Click on the **three dots**.
3. Choose **Delete**.

Inserting a Text Box

If you'd like to make a note that's always visible, you can use a text box. You have control over the font and color and you can change the size of these text boxes and move them around to reposition them.

To insert a text box:

1. Choose **Insert,** then **Drawing.**
2. From the drawing popup, click on the **Text box** icon on the toolbar.
3. Type in the text you'd like to add.
4. Customize it with the options on the toolbar.
5. When you're done, click **Save and Close** in the upper-right corner of the drawing popup.
6. To position the textbox, click on it when the hand icon is showing and drag it. Resize with the controls on the borders of the box.

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 **Format**, then **Conditional formatting**.
3. Select the desired type of rule (for example: **Greater than** and then the value or other information).
4. Choose the **Formatting style** you want, such as bold or a different color.
5. Click **Done**.
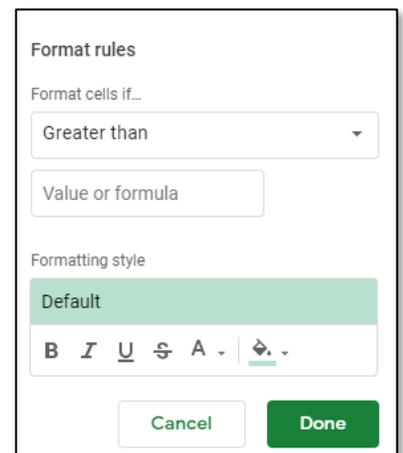
IF function

Using the **IF** statement in a formula allows you to create logically determined results. An **IF** statement could look something like this: =**IF** (B2<50,1,0). This translates into: **IF** the content of B2 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 Sheet Data

If other users will be accessing your sheet, 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 ranges and sheets, allowing access to some cells but not others.

Protecting cells:

1. Right-click on a cell you want to protect and select **Protect range**.
   -OR-
   Right-click on a sheet you want to protect and select **Protect sheet**.
   -OR-
   Go to **Tools**, then **Protect sheet**.
2. The **Protected sheets & ranges** box will appear on the right. Click **+ Add a sheet or range**.
3. This box has a **Range** tab and a **Sheet** tab. Make your selection.
4. Click **Set Permissions**.
5. Choose who can edit the cells, then click **Done**.

Note: The **Enter a description** box is optional, but if you're protecting several ranges, a description can help you manage them.

Unprotecting cells:

1. Open the **Protect sheets and ranges** box.
2. Click **Cancel** so you can see a list of protected ranges.
3. Click on the one you want to remove.
4. Click on the **trash can** icon.
5. It will ask you to confirm. Click **Remove**.

Hiding and Unhiding a Column or Row

Sometimes a row or column is outdated or cluttering up your view, yet you still might want the information later. In that case, you can temporarily hide the row or column. Unlike in Excel, hiding data does NOT prevent other people from viewing it. Even someone with only View access and not Edit access can Make a Copy and then Unhide the row or column in the copy. Don't share sheets with sensitive information in them to people who should not have access to that information.

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.

How to hide a column or row:

1. Select the column or row you want to hide. (You can also select more than one column or row.)
2. Right-click and select **Hide row** or **Hide column**.

How to unhide a column or row:

1. Click on the arrows between the adjacent rows/columns.
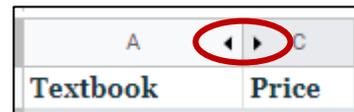
Referencing cells in multiple sheets

The various sheets in a document can be referred to in other sheets 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. If you rename a sheet, Google Sheets will update all previous references to the new name.

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 a function on data held on multiple sheets:

1. Click a blank cell that you want the calculated total to be in.
2. Type a formula that includes references to the source cells on each sheet 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 sheet, first click that sheet'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, Sheets 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 "=(A1+B1)". 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. Click **Insert**, then **Chart**. The **Chart Editor** box appears. It has two tabs, **Setup** and **Customize**. On the **Setup** tab, set your **Chart type** to **Pie chart**.
3. Use the **Setup** tab to control what data is shown in the chart. Use the **Customize** tab to change its appearance.
    o Explode the pie by changing **Distance from center** under **Pie slice**.
    o Use **Legend** to control where the labels for the different slices go.
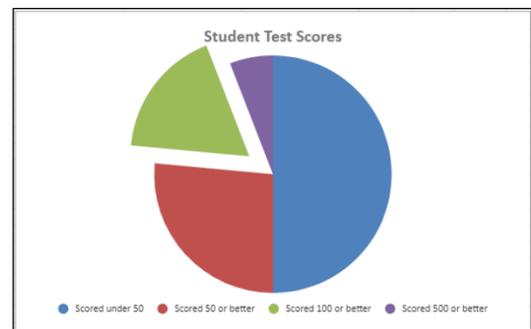
You can copy and paste your chart into Google Docs. When doing this you can choose to link the two files dynamically (which would mean that updates to your sheet would automatically update the document to which it links), or you can simply paste the chart unlinked.

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**, then **Chart**, then select a **Line chart** from the **Chart type** list.

You can remove any of the charted lines under **Series** on the **Setup** tab. Click on the three dots next to the column you want to move and select **Remove**.

To use the **Chart editor** to make any other changes, click on the chart and then select one of the following:

- **Setup** – change chart type or included data
- **Customize** – change the color, font, and other display options

You can also change objects on the chart by double-clicking on the object. This will pull up the appropriate section in the Chart editor to change that object.

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. The end result is one cell with the person's first name and another cell with the person's last name.

1. Highlight the column containing the original text.
2. Click **Data**, then select **Split text to columns**.
3. A **Separator** box will appear at the bottom. It will guess what character separates your data (such as a comma in Lastname, Firstname).
4. Change the **Separator** if necessary.

Separator: Detect automatically ⬍
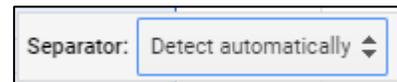
Concatenating cells joins the information contained in two cells together to make one cell.

1. Select the cell that will contain the result.
2. Click the **Function**, then select CONCATENATE. Its most easily found under the **Text** menu.
3. Enter the cells you want to join together, with a separator between them if desired.
   - For joining two names, you might do =CONCATENATE(C2," ",B2)
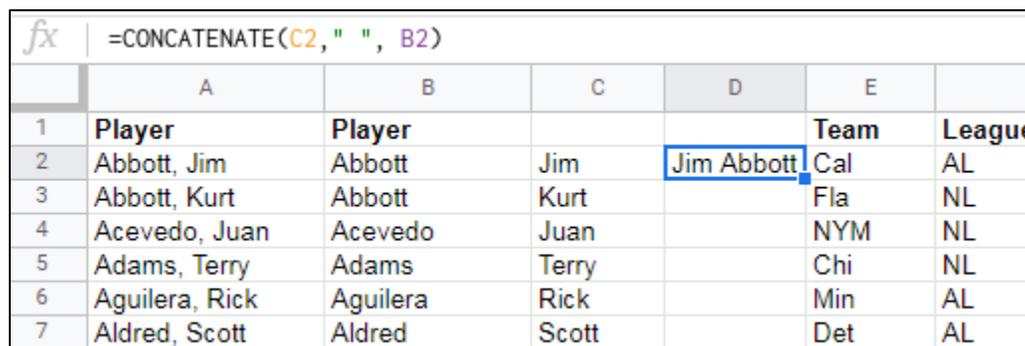
fx | =CONCATENATE(C2," ", B2)

	A	B	C	D	E	
1	Player	Player			Team	League
2	Abbott, Jim	Abbott	Jim	Jim Abbott	Cal	AL
3	Abbott, Kurt	Abbott	Kurt		Fla	NL
4	Acevedo, Juan	Acevedo	Juan		NYM	NL
5	Adams, Terry	Adams	Terry		Chi	NL
6	Aguilera, Rick	Aguilera	Rick		Min	AL
7	Aldred, Scott	Aldred	Scott		Det	AL

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 Sheets filters rows, you can edit, format, chart, and print your range subset without rearranging or moving it.

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

1. Click on the column label for the column you wish to filter
2. Click on the **Create a filter icon** in the toolbar, then **Create new filter view**.
3. Click on the green striped arrow that appears at the top of the column for a drop-down menu in which you can select the appropriate color, text or numeric filter,
   e.g.: **Filter by condition**, then select from the menu
   a. Greater than, less than, in between…
   b. Text starts with, ends with, contains…

VLOOKUP

VLOOKUP is a function in Sheets which works with lists within a sheet. 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 Sheets 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 sheet. 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 Sheets. In other words: where do you want the information Sheets looks up to be put? – Go to that cell to enter the **VLOOKUP** function as follows:

1. Under the **Functions** icon on the toolbar, select **Lookup**->**VLOOKUP**
2. In the Function enter the following information separated by commas:
    VLOOKUP(search_key, range, index, [is_sorted])

    a. **search_key** (What unique identifier are you looking up in your list?) e.g. A11 (what's the value to search for in my target table?)
    b. **range** (Where is your list?) e.g. 'NameOtherSheet'!A2:D7 (hint: don't include the header line when you select your source table.)
    c. **index** (Which column holds the information you want to have Sheets retrieve from your list?) e.g. 2 (the second column in my source table)
    d. **is_sorted** (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, as it defaults to TRUE. 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
    The result might look something like this: =VLOOKUP(A11,VTable!A2:D7,2,FALSE)

Pivot Tables

Imagine a spreadsheet 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:

1. Click on the **Data** menu then **Pivot table**.
2. The **Create pivot table** pop up window will appear. Under **Data range**, select the data, and then choose whether the table will **Insert To** a **New sheet** or the **Existing sheet**.
3. From the **Pivot table editor** on the right-hand side, you can **Add** what will appear on the PivotTable (e.g. **Filters, Columns, Rows, Values**).

This is the step where most people become frustrated but you just have to start adding 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 experiment until you get a table that meets your specific requirements.

This shows the Average Yearly Earnings of employees according to Education (yrs.) and Gender. For this PivotTable, we added **Yearly Earnings** from the **Values** list. We changed the original **Sum of Yearly Earnings** to **Average of Yearly Earnings** by selecting AVERAGE from **Summarize by** instead of SUM. We added **Education (yrs.)** from the **Rows** list; and **Gender** from the **Columns** list.

fx	AVERAGE of Yearly Earnings			
	A	B	C	D	E

	AVERAGE of Yearl	Gender			
	Education (yrs)	Female	Male	Nonbinary	Grand Total
3	8	$ 13,798	$ 19,157		$ 17,662
4	9	$ 13,634	$ 31,949	$ 3,000	$ 24,044
5	10	$ 12,418	$ 24,985	$ 11,000	$ 20,386
6	11	$ 15,997	$ 22,303	$ 25,000	$ 19,976
7	11.5	$ 14,832	$ 22,629		$ 20,851
8	12	$ 21,422	$ 32,476	$ 19,688	$ 27,934
9	13	$ 26,104	$ 39,841	$ 30,200	$ 33,888
10	14	$ 31,058	$ 40,358		$ 35,687
11	16	$ 36,016	$ 57,907	$ 24,000	$ 48,907
12	18	$ 52,584	$ 90,498	$ 45,000	$ 76,187
13	**Grand Total**	$ 28,218	$ 44,465	$ 21,727	$ 37,796