

# Microsoft Excel 2019 - Pivot Tables

## What is a Pivot Table?

A Pivot Table is an interactive way to quickly summarize large amounts of data. Some of the capabilities of a Pivot Table include:

- Organizing large amounts of data in many user-friendly ways
- Summarizing data by categories and subcategories
- Expanding and collapsing levels of data to focus your results
- Moving rows to columns or columns to rows (or “pivoting”) to see different summaries of the source data
- Filtering, sorting, and grouping the most useful and interesting subset of data
- Presenting concise, attractive, and annotated online or printed reports!

## Setting Up a Pivot Table – Do's and Don'ts

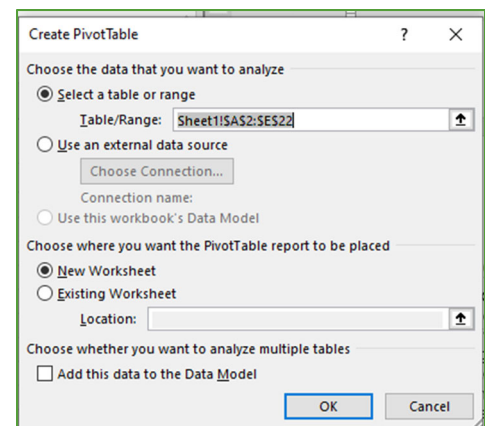
- DO organize your source data in columns with unique headings
- DON'T leave empty rows or columns (empty cells are ok)
- DO have consistent data – watch for abbreviations (N. instead of North) and typos

GOOD PIVOT TABLE LAYOUT			
Name	Branch	Year	Sales
Allen	North	2019	1234
Barbara	East	2018	5678
James	West	2019	9012

BAD PIVOT TABLE LAYOUT						
Year	2019		Branch	2018		Branch
Name	Allen	1234	North	Barbara	5678	East
	James	9012	West			

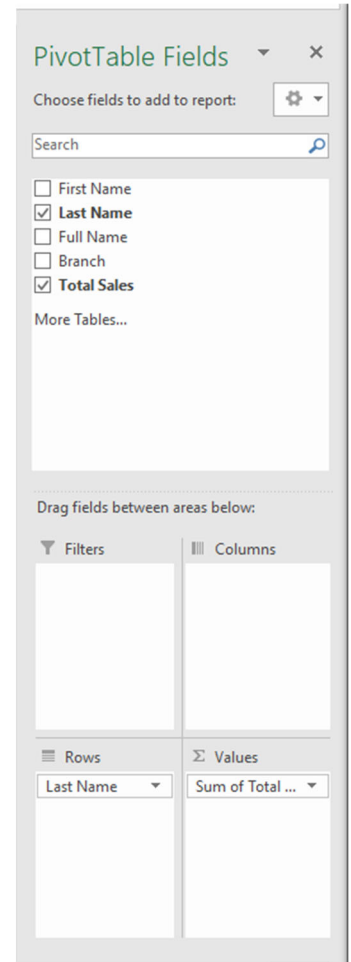
## Creating a Pivot Table

- Go to **Insert → Pivot Table**. Double-check to make sure the correct range of data is selected, then click OK.
- You can import data from an external source, such as a database or separate spreadsheet file.
- The Pivot Table can be placed in the same Sheet as the data, or in a separate Sheet
  - New Worksheet – creates a new sheet where the Pivot Table will be located.
  - Existing Worksheet – choose the cell reference (e.g. F6) where the Pivot Table should start.



## Arranging Your Pivot Table

- In a Pivot Table, a **field** is a category of data, such as name, total sales, branch, etc. It is identical to the Heading or first row of your source data.
- In the Pivot Table Field List, select Fields to add to the Table in one of four areas, *Filters*, *Column Labels*, *Row Labels*, and *Values*.
  - Use the checkbox to the left of the field name.
    - Text based fields will be added to the Row area
    - Number based fields will be added to the Values area
  - To move a field to a different area, click and drag.
  - You can also drag the Field to an area, or drag a second copy of a field. This helps when you need the data displayed in two different ways (e.g. a Value and a percent of a value)
- Keep in mind, moving the Fields to different areas can result in different results.



**Data arranged by Columns**

Sum of Total Sales	Branch			
Full Name	East Branch	North Branch	West Branch	Grand Total
Allen, Mike	5370			5370
Allen, Sharon	5552			5552
Alvarez, Judy		4942		4942
Bennington, Bruce		6376		6376
Bradbury, Ernie			4910	4910
Duffy, Ron		5426		5426
Edgeton, Karl	5521			5521
Greenland, John		7061		7061
Hakes, Angela			5584	5584
Johnson, Barry			5981	5981

**Data arranged by Rows**

Branch	Full Name	Sum of Total Sales
<b>East Branch</b>		
	Allen, Mike	5370
	Allen, Sharon	5552
	Edgeton, Karl	5521
	Osborne, John	6590
	Shanks, Susan	6408
	Vitale, Joanna	6226
<b>East Branch Total</b>		<b>35667</b>
<b>North Branch</b>		
	Alvarez, Judy	4942
	Bennington, Bruce	6376

## Formatting – Add visual elements to your Pivot Table

- Go to **PivotTable Tools Design → Pivot Table Styles**, and hover over a preset Style to preview how your Pivot Table changes.
- Use the *Pivot Table Style Options* check boxes to add or remove Row/Column Headers and Banding
- Renaming Pivot Table Components
  - Excel generally provides names for the Pivot Table title, column headings, etc. This can be changed by going to **PivotTable Tools Analyze → Pivot Table → Pivot Table Name**
  - Fields can be renamed as well. First click on the heading you need to rename, and then go to **Pivot Table Tools Analyze → Active Field**.

## Expanding/Collapsing and Grouping

- A Pivot Table with a lot of data to summarize may get overwhelming on the screen. Use **Expand** or **Collapse** to limit the amount of data visible at one time.



- Next to each Row Label is a plus or minus sign. Click the plus sign to Expand the category. Click the minus sign to Collapse the category.
- Or, Go to **PivotTable Tools Analyze** → **Active Field** → **Expand Field/Collapse Field**.

Row Labels
+ East
- North
- 1984
Orwell, George

- **Grouping** – Allows you to select multiple items and then view them together (e.g. Science Fiction and Fantasy could be grouped together, or you could divide the year into quarters by grouping months)
  - Select the items.
  - Go to **PivotTable Tools Analyze** → **Group** → **Group Selection**

## Field Settings and Calculations

**Summarizing Values** – choose the way data is tabulated.

- Go to **PivotTable Tools Analyze** → **Active Field** → **Field Settings** → **Summarize Values By** Tab, or Right-click the heading of any data field, then select Summarize Values By
  - Sum – adds the data in a column or field (e.g. the total sales of the East Branch)
  - Count – counts the number of items (e.g. the number of Nonfiction titles)
  - Average, Max(imum), Min(imum), Product (multiplies)

**Show Values As** – create running totals or percentages of your data

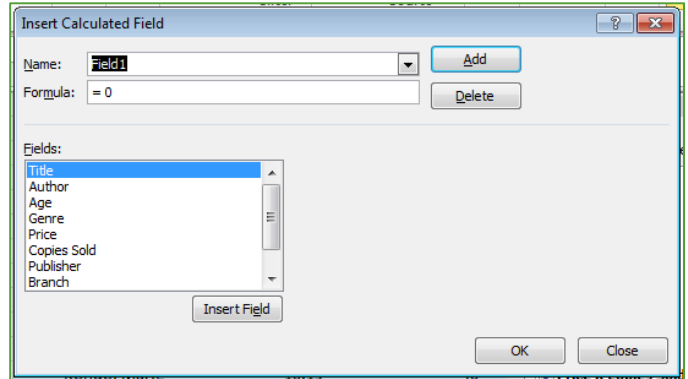
- Go to **PivotTable Tools Analyze** → **Active Field** → **Field Settings** → **Show Values As** Tab, or Right-click the heading of any data field, then select Show Values As.

<b>No Calculation</b>	Displays the value that is entered in the field.
<b>% of Grand Total</b>	Displays values as a percentage of the grand total of all the values or data points in the report.
<b>% of Column Total</b>	Displays all the values in each column or series as a percentage of the total for the column or series
<b>% of Row Total</b>	Displays the value in each row or category as a percentage of the total for the row or category.
<b>% Of</b>	Displays values as a percentage of the value of the <b>Base item</b> in the <b>Base field</b> .
<b>% of Parent Row Total</b>	Calculates values as follows: (value for the item) / (value for the parent item on rows)
<b>% of Parent Column Total</b>	Calculates values as follows: (value for the item) / (value for the parent item on columns)
<b>% of Parent Total</b>	Calculates values as follows: (value for the item) / (value for the parent item of the selected <b>Base field</b> )
<b>Difference From</b>	Displays values as the difference from the value of the <b>Base item</b> in the <b>Base field</b> .
<b>% Difference From</b>	Displays values as the percentage difference from the value of the <b>Base item</b> in the <b>Base field</b> .
<b>Running Total in</b>	Displays the value for successive items in the <b>Base field</b> as a running total.
<b>% Running Total in</b>	Calculates the value as a percentage for successive items in the <b>Base field</b> that are displayed as a running total.
<b>Rank Smallest to Largest</b>	Displays the rank of selected values in a specific field, listing the smallest item in the field as 1, and each larger value with a higher rank value.

<b>Rank Largest to Smallest</b>	Displays the rank of selected values in a specific field, listing the largest item in the field as 1, and each smaller value with a higher rank value.
<b>Index</b>	Calculates values as follows: $((\text{value in cell}) \times (\text{Grand Total of Grand Totals})) / ((\text{Grand Row Total}) \times (\text{Grand Column Total}))^2$

**Fields, Items & Sets – create a formula in the Pivot Table that did not exist in the original data.**

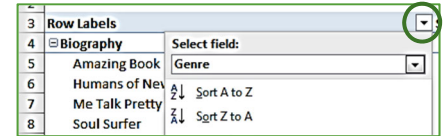
- Go to **Pivot Table Tools Analyze → Calculations → Fields, Items & Sets → Calculated Field**
- Assign a Name to the new field
- Formula – any recognized Excel formula is acceptable, but you must type it in the formula field (e.g. sum).
- Choose the Field or Fields that need to be calculated, then click *Insert Field*.



## Sorting and Filtering


**Sorting** - Alphabetically or numerically sort any column in the Pivot Table.

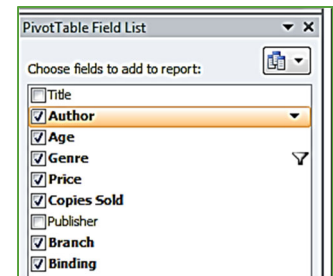
- From the Row Headings/Labels cell, click the pull-down menu, then select **Sort A to Z/Sort Smallest to Largest** or **Sort Z to A/Sort Largest to Smallest**
- You can sort individual items in the column, or you can sort SubTotals.



**Filtering** – allows you to view or hide elements of the Pivot Table

**Filter by Field List**

- In the Field List, move your mouse to the far right and click on the arrow.
- **Individual Items** – check or uncheck individual items in a list. Check *Select All* to toggle between all or none selected.
- **Label Filters** – used mostly to filter by text (e.g. all authors beginning with “H”)
- **Value Filters** – used mostly to filter numbers (e.g. any values between 50 and 150)
- Fields that have a filter show a funnel on the right side of the Field List 
- To remove the filter, click on the funnel, then click *Clear Filter*



**Filter by Report – adds additional data fields to the Pivot Table in the form of a filter**

- Drag fields to the Report Filter area
- The field appears at the top of the Pivot Table. Use the pull-down arrow to select individual items to filter.
- To remove the filter, click on the Report Filter at the top of the Pivot Table, and select *All*.



**Slicer – displays the contents of a field for easier or multiple filtering**

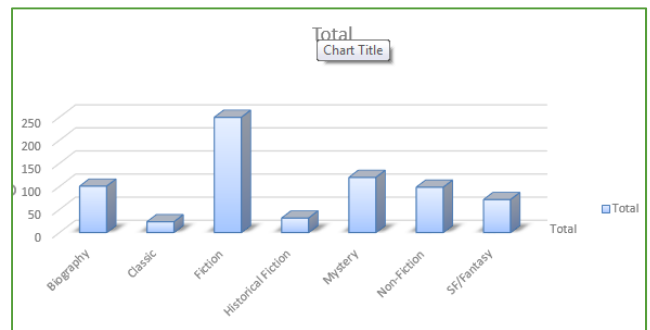
- Go to **PivotTable Tools Analyze → Filter → Insert Slicer**
- Select one or more categories. The slicer displays in a box near the Pivot Table.
- Go to **Slicer Tools → Options** for additional formatting and display options

**Charts - Go to Pivot Table Tools Analyze → Tools → Pivot Chart**

- Choose a Chart Style and then click OK
  - NOTE: the following styles are NOT available from a Pivot Table: *XY (Scatter), Stock, TreeMap, Sunburst, Histogram, Box & Whisker, and Waterfall.*
- Charts can be changed automatically by adding or removing fields, changing the order of data fields, or creating filters.

**Chart Options**

- **Analyze** – make the Chart simpler or more complicated by collapsing or expanding by fields. Also allows you to insert slicers and perform calculations
- **Design** – Change Chart type, switch row/column, change Chart styles (color schemes)
- **Format** – change the background color, the size, and the formatting of the Chart



IF YOU HAVE QUESTIONS, FEEL FREE TO EMAIL ME.

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<sup>1</sup> Microsoft. (2020). *Overview of PivotTable and PivotChart reports*. Retrieved February 14, 2020, from Microsoft Office: <https://support.office.com/en-us/article/Overview-of-PivotTable-and-PivotChart-reports-527c8fa3-02c0-445a-a2db-7794676bce96>

<sup>2</sup> Microsoft. (2020). *Show different calculations in PivotTable value fields*. Retrieved February 14, 2020, from Microsoft Office: <https://support.office.com/en-us/article/Show-different-calculations-in-PivotTable-value-fields-014d2777-baaf-480b-a32b-98431f48bfec>