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MICROSOFT EXCEL 2016.

STEP BY STEP GUIDELINES.

Nadeem Khan

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WORKBOOKS, CELLS AND FORMULAS.

GET STARTED.

❖ **WHAT IS EXCEL?**

With Excel on your PC, Mac, or mobile device, you can:

- Streamline data entry with AutoFill.
- Spot trends and patterns with data bars, sparklines, color coding, and icons.
- Get chart and PivotTable recommendations based on your data, and create them with one click.
- Share your work from within Excel, using OneDrive.
- Edit spreadsheets with others, wherever they are.

❖ **CREATE A WORK BOOK.**

A workbook is a file that contains one or more worksheets, to help you organize your data. You can create a workbook from a blank workbook or a template.

➢ **Create a workbook**
1. Select **File** > **New**.
2. Select **Blank workbook**.
   Tip: Press CTRL+N to quickly create a new workbook.

➢ **Create a workbook using a template**
1. Select **File** > **New**.
2. Do one of the following:
   - Select a template from the available list of templates, and then select **Create**.
   - From **Suggested searches**, select a category (such as **Business, Personal**, or **Industry**), select a template, and then select **Create**.

❖ **ADD, DELETE OR RENAME SHEET.**

By default, Excel gives you one worksheet in a workbook, but you can add more worksheets, rename them, or delete them, as needed.

➢ **Insert a worksheet**
1. Do one of the following:
   - On the **Sheet** tab, select ⊕. A new worksheet will be added to the right of the current sheet.

   | Sheet1 | **Sheet2** | ⊕ |

   - Select **Home** > **Insert** > **Insert Sheet**.
   - Right-click a sheet, click **Insert**, and in the **Insert** box, click **Worksheet**, and then click **OK**.

- **Rename a worksheet**
    1. On the **Sheet** tab, right-click the worksheet you want to rename, and then click **Rename**.
    2. Type a new name for the **Sheet**, and then press **Enter**.
    Tip: Double-click the sheet name on the Sheet tab to quickly rename it.

- **Remove a worksheet**
    1. On the **Sheet** tab, right -click the sheet you want to delete.
    2. Click **Delete** .
    3. If the sheet is empty, it will be **Delete**d, but if there is data on the sheet, then a pop-up message will appear. Select **Delete** to confirm the deletion.

- **Hide a worksheet**
    1. On the **Sheet** tab, right -click the sheet you want to hide.
    2. Click **Hide**.

DESIGN WORKBOOKS.

❖ **HIDE OR UNHIDE COLUMNS.**
Hide or unhide columns in your spreadsheet to show just the data that you need to see or print.

➢ **Hide columns**
1. Select one or more columns, and then press Ctrl to select additional columns that aren't adjacent.
2. Right-click the selected columns, and then select **Hide**.
Note: The double line between two columns is an indicator that you've hidden a column.

➢ **Unhide columns**
1. Select the adjacent columns for the hidden columns.
2. Right-click the selected columns, and then select **Unhide**.
Or double-click the double line between the two columns where hidden columns exist.

❖ **FREEZE TOP AND LEFT PANES.**
Freeze rows and columns to keep specific areas visible when you scroll in a worksheet.
➢ **Freeze the first column**
• Select **View** > **Freeze Panes** > **Freeze First Column**.
Note: The faint line that appears between Columns A and B indicates that your first column is frozen.

➢ **Unfreeze rows and columns**
• Select **View** > **Freeze Panes** > **Unfreeze Panes.**

➢ **Freeze rows and columns**
1. Select the cell below the rows and to the right of the columns you want to keep visible when you scroll.
2. Select **View** > **Freeze Panes** > **Freeze Panes.**

❖ **MOVE OR COPY WORKSHEET.**
You can move or copy a worksheet in the same workbook, or copy a worksheet to another workbook.

➢ **Move a worksheet within a workbook**
• Select the worksheet tab, and drag it to where you want it.
Note: Be aware that calculations or charts that are based on worksheet data might become inaccurate if you move the worksheet.

- **Copy a worksheet to a new workbook**
    1. Right-click the worksheet tab and select **Move or Copy**.
    2. Check **Create a copy**.
    3. Under **To book**, select **(new book)** or another workbook you have open.
    4. Select **OK**.
    5. Press CTRL + TAB to go back to the other workbook.

- **Copy a worksheet in the same workbook**
    1. Press CTRL and drag the worksheet tab to the tab location you want, or right-click the worksheet tab and select **Move or Copy**.
    2. Select the **Create a copy** checkbox.
    3. Under **Before sheet**, select where you want to place the copy.
    4. Select **OK**.

- **Rename a worksheet tab**
    1. Double-click the worksheet tab.
    2. Type a new name.

❖ **APPLY THEMES TO CHANGE THE LOOK OF A WORKBOOK.**
Use or customize a theme in your Excel workbook to make your data stand out.
    1. Select **Page Layout** > **Themes.**
    2. Select a theme you want to use from the available list.
    Note: You will see theme previews in your worksheet as you hover over different themes.

ADD TEXT AND DATA.

❖ **ADD AND EDIT DATA.**
Explore the basics of adding and editing data in Excel.

➤ **Add data**
1. To add data in a cell, place the mouse cursor in a cell and select it or use the arrow keys on a keyboard to navigate to the correct cell.
   Note: The address of the selected cell displays in the top left part of the screen above the worksheet and the selected cell now has a border to visually indicate it is the active cell.
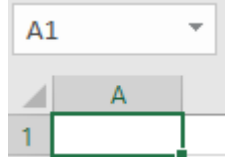
2. After you have selected a cell:
   o Type in the active cell.
   o Select **Formula Bar** located above the worksheet, and then type in the data.
   o Double-click the cell, and then enter data.
   o Press F2 and then enter data.

➤ **Edit data**
   o Select a cell to display the data in **Formula Bar**, and then select **Formula Bar** to edit the data.
   o Double-click a cell and then edit the data.
   o Select a cell in the worksheet, and then start typing to replace the cell content with new data.

➤ **Change active cell**
   o Press Tab to change the location of the active cell to the cell in the next column.
   o Press Enter to change the location of the active cell to the cell in the next row.
   o Use the mouse cursor to choose another cell.

❖ **RESIZE AND MERGE CELLS AND ALIGN DATA.**
You can change the way data appears in a cell by merging cells, and aligning, wrapping, or rotating text.

➤ **Align cell data**
1. Select a cell or cell range in your worksheet**.**
2. On the **Home** tab select a text alignment option. You can align text at the top, middle, or bottom of the cell, and to the left, center, or right of the cell.
   Note: You may not be able to change the alignment, based on the format of the cell.

➤ **Add a line break within a cell**
1. Select the cell.
2. Type the text you want on the first line.

      3. On the keyboard, press Alt + Enter to add a line break.
      4. Type the next you want on the next line.
      5. Press Enter.

➢ **Make a cell taller or wider**
      1. Place the cursor on the line between the cell and next cell.
   2. Drag the line to the height or width you want.

➢ **Wrap Text**
      1. Select a cell or cell range.
      2. Select **Home > Wrap Text**.

➢ **Merge cells**
      1. Select the cells you want to merge**.**
      2. Select **Home > Merge & Center**.
         Note: To later unmerge cells, select **Unmerge Cells** from the **Merge & Center** drop-down.

➢ **Rotate cell data**
      1. Select a cell or cell range.
      2. Select **Home > Alignment Settings** .
      3. In **Orientation**, edit the degree of rotation the cell data.
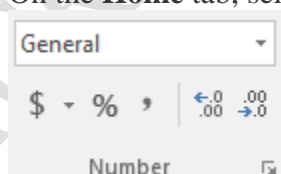   4. Select **OK**.

         Note: Note: You can also select **Home > Orientation** and select an option from the drop-down.

❖ **FORMAT NUMBERS IN CELLS.**
In Excel, you can display number formats as currency, percentages, decimals, dates, phone numbers, or social security numbers.

➢ **Number format**
      1. Select a cell or a cell range.
      2. On the **Home** tab, select **Number** from the drop-down.

         Or, you can choose one of these options:
            o Press **Ctrl + 1** and select **Number**.
            o Right-click the cell or cell range, select **Format Cells…** , and select **Number**.

            o Select the dialog box launcher next to **Number** and then select **Number**.

➢ **Currency**
      1. Select a cell or a cell range that has numeric value.
      2. Select **Home** > **Currency** .

➢ **Decimal**
1. Select a cell or a cell range that has numeric value.
2. Select **Home** > **Increase Decimal** or **Home** > **Decrease Decimal** .

➢ **Date**
1. Select a cell or a cell range.
2. On the **Home** tab, select **Number Format** .
3. Select **Date**, and then select the **Type**.
4. Select **OK**.

➢ **Phone number or social security number**
1. Right-click a cell or a cell range, and then select **Format Cells…**
2. Select **Special**.
3. For **Type**, select either **Phone Number** or **Social Security Number**.
4. Select **OK**.

❖ **CHANGE THE LOOK OF CELLS.**
Format cells to make them stand out using fonts, font size, color, and borders.

➢ **Cell styles**
1. Select a cell or cell range in the worksheet.
2. Select **Home** > **Cell Style** .
3. Select the cell style that you want to apply.

➢ **Select a font, font size, font color, and border**
1. Select a cell or cell range.
2. On the **Home** tab, select a **Font** and **Font Size** from the drop-down.
3. To change the font color, select **Font Color** and select a color from the drop-down. to change the text color.
Note: If you want to see more colors, select **More Colors** from the drop-down, and select a color from the **Standard** or **Custom** tab.
4. To change the font style, select **Bold**, **Italic**, or **Underline**.
5. To change the **Border**, select a border from the drop-down.

❖ **COPPY CELL FORMATTING.**
Copy cell formatting in your worksheet using copy and paste options, Format Painter, and dragging techniques.

Copy cell formatting
Method 1

1. Select the cells that have the formatting you want to copy.

2. Copy the cells, using Ctrl+C.
   Or, right-click the cells, and then select **Copy**.
3. Select the cells where you want to use the copied format.
4. Right-click the cells, and in **Paste Options**, select **Formatting (R).**
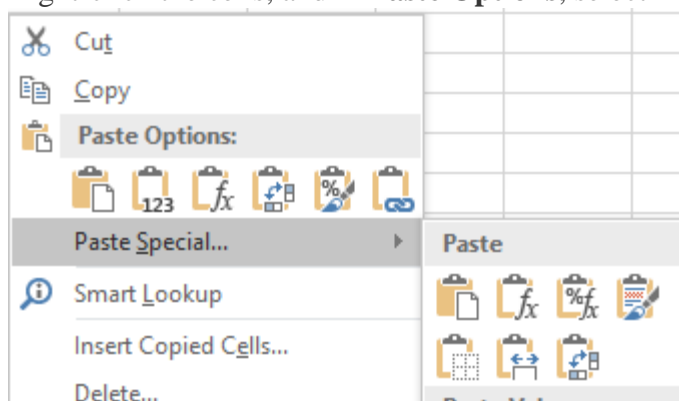
Method 2

1. Select the cells that have the formatting you want to copy.
2. Copy the cells, using Ctrl+C.
   Or, right-click the cells, and then select **Copy.**
3. Select the top cell where you want to use the copied format.
4. Press Ctrl+Alt+V.
5. In the **Paste Special** box, in Paste, select **Formats**, and then select **OK**.

Method 3

1. Select the cells that have the formatting you want to copy.
2. Select **Home** > **Format Painter**, and then select the cells where you want to use the format.

Copy formatting to multiple cells

1. Select the cells that have the formatting you want to copy.
2. Select **Home** > **Format Painter**, and then select the top cell to paste the format.

Copy formatting on non-adjacent cells

1. Select the cells that have the formatting you want to copy.
2. Select **Home** > **Format Painter**, and then select cells to paste the format.
3. Press Esc on the keyboard to deactivate the paint brush.

Copy formatting by dragging

1. Select the column that contains the formatting you want to copy.
2. Hold the right mouse button, drag the right edge of the column, and then select **Copy Here as Formats Only**.

Copy formatting by dragging down the column

1. Select the cell that contains the formatting you want to copy.
2. Place the mouse cursor on the lower-right corner of the cell (pointing towards the Fill handle), hold the right mouse button, and then drag downwards.
3. Select **Fill Formatting Only** when you release the right mouse button.

❖ SELECT CELL CONTENTS.

In Excel, select cell contents to help manage your work efficiently across a workbook.

Select a cell

- You can select a cell using a mouse or by navigating to that cell using the arrow keys on your keyboard.

Select a cell range

- Select a cell, hold the right bottom edge of the cell and drag over the cell range you want to select.
- Or to select a range using the keyboard, hold the Shift key while navigating across the cell range using the arrow keys.

Select a row, column, or worksheet

- Use one of the following methods to select a column:
    If you don't want to select the title of the column, select the cell below the title, press Shift, and then double-click the bottom edge of that cell.
    To select the entire column, select any cell in that column (for e.g., **A2**), and then press Ctrl + Space.
- To select the entire row, select any cell in that row (for e.g., **A2**), and then press Shift + Space.
- To select a list, select any cell in that list, and then press Ctrl + A.
- To select the entire worksheet, select any cell and press Ctrl + A + A.
- To select a table without the heading or title of the table, select any cell and then press Ctrl + A.
- To select a table with heading or title of the table, select any cell in that table and then press Ctrl + A + A.
- To select the entire worksheet which is in table format, select any cell and then press Ctrl + A + A.
- Select the letter at the top of a column to select the entire column.
- You can also select the **Select All** ◢ button at the top left corner of the worksheet to select the entire worksheet**.**

Select non-adjacent columns

- Hold Ctrl while selecting the column headings of the non-adjacent columns. For example, hold Ctrl and select **A**, **C**, **E**, **G**, **H**, **I**, **K**.

Select non-contiguous cells or ranges

- Hold Ctrl while selecting non-contiguous cells or ranges.

Type data in non-contiguous cells at once

1. Select non-contiguous cells.
2. Start typing data.
3. Press Ctrl + Enter.

Hide columns

1. Select a column.
2. Right-click and select **Hide**.

Hide non-contiguous columns

1. Select non-contiguous column ranges.
2. Right-click one of the selected column ranges and select **Hide**.

Copy only visible columns

1. Select a cell range with hidden columns.
2. Press Alt + ; and then Ctrl + C to copy only visible columns.
3. You can paste them in any worksheet in your workbook by simply pressing Ctrl + V.

❖ **MOVE OR COPY CELL CONTENTS.**

You can use the **Cut**, **Copy**, and **Paste** commands to move or copy cells or their contents.

Move cells

1. Select a cell or a cell range.
2. Select **Home > Cut** ✂ or press Ctrl + X.
3. Select a cell where you want to move the data.
4. Select **Home > Paste** or press Ctrl + V.

Copy cells

1. Select a cell or a cell range.
2. Select **Home > Copy** or press Ctrl + C.
3. Select a cell where you want to copy the data.
4. Select **Home > Paste** or press Ctrl + V.

By default, drag-and-drop editing is turned on so that you can use the mouse to move and copy cells.

1. Select the cells or range of cells that you want to move or copy.
2. Do one of the following:
   o To move a cell or range of cells, point to the border of the selection. When the pointer becomes a move pointer ![move pointer], drag the cell or range of cells to another location.
   o To copy a cell or range of cells, hold down Ctrl while you point to the border of the selection. When the pointer becomes a copy pointer ![copy pointer], drag the cell or range of cells to another location.

Move cells between existing cells

1. Select a cell range.

2. Hold **Shift** and when the pointer becomes a move pointer ![move pointer], drag the cell range to the new location between existing cells.

❖ INSERT OR DELETE ROWS OR COLUMNS.

Small changes in the layout of your worksheet can give you big improvements in readability. Insert and delete rows, columns, and cells to organize your worksheet.

Insert a column

1. Select the letter at the top of a column to select the column.
2. Select **Home > Insert > Insert Sheet Columns**
   Or, right-click the top of the column, and then select **Insert**.

   Note: Excels inserts a new column to the left.

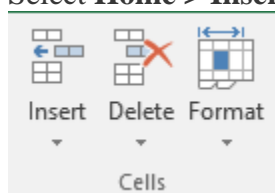**Delete a column**

1. Select the column.
2. Select **Home > Delete > Delete Sheet Columns**.

   Or, right-click the top of the column, and then select **Delete**.

Insert a row

1. Select the row number to select a row.
2. Select **Home > Insert > Insert Sheet Rows**.

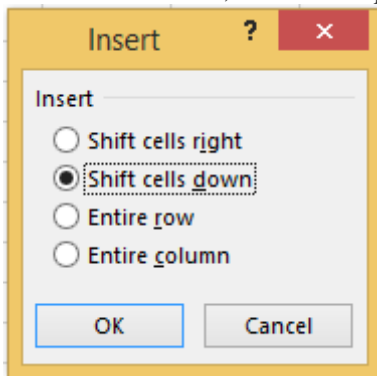Or, right-click the selected row, and then select **Insert**.

Note: A new row is inserted above the selected row.

Delete a row

1. Select the row.
2. Select**Home > Delete > Delete Sheet Rows**.
   Or, right-click the selected row, and then select **Delete.**

Insert a cell

1. Select a cell or a cell range.
2. Right-click the selected cells, and then select **Insert**.
3. In the **Insert** box, select an option:

   - **Shift cells right** – shifts cells right to make space for the new cell(s).
   - **Shift cells down** – shifts cells down to make space for the new cell(s).
   - **Entire row** – inserts a new row.
   - **Entire column** – inserts a new column.
4. Select **OK**.

❖ **RESIZE ROWS OR COLUMNS.**

You can manually adjust the column width or row height by dragging the cell boundaries, or automatically resize columns and rows to fit the data.

Note: The boundary is the line between cells, columns, and rows. If a column is too narrow to display the data, you will see ### in the cell.

Resize columns

1. Select a column or a range of columns.
2. Place the pointer on the boundary between the column headers.

   H ✛ I
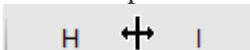
3. Drag the boundary to change the width. This resizes all of the selected columns to the same width.

Resize rows

1. Select a row or a range of rows.
2. Place the pointer on the boundary between row numbers.
3. Drag the boundary to change the height.

Automatically resize columns or rows to fit the data

1. Select columns or rows with data.
2. Double-click a boundary. All columns or rows resize to fit the data.

   Note: If only one column is selected, double-click the right boundary of the column header. If only one row is selected, double-click the lower boundary of the row.

Automatically resize all columns and rows to fit the data

1. Select the **Select All** button ◢ at the top of the worksheet, to select all columns and rows.
2. Double-click a boundary. All columns or rows resize to fit the data.

❖ AUTOFILL TIME SPANS.

With the AutoFill feature, you can automatically fill cells with data that follow a pattern or series.

1. Select a cell and type the first word of a series (e.g. type "January" for a 12-month series).

2. Select the fill handle ▭ at the lower-right corner of the cell, hold down, and drag to fill the rest of the series. Fill handles can be dragged up, down, or across a spreadsheet.

| January |
| February |
| March |
| April |
| May |
| June |
| July |
| August |
| September |
| October |
| November |
| December |

   Note: If you only enter a three-letter abbreviation (e.g. "Jan") in the cell, AutoFill will automatically fill in the rest of the

❖ **SPLIT AND COMBINE DATA.**

With Flash Fill, you can automatically fill data in a specific pattern across multiple columns.

1. Select a cell and then enter data from a specific pattern.
2. Press Enter.
3. In the next cell, enter data. Excel will begin to automatically fill data in cells from a set pattern.

Employee Name	
Abbott, James	James
Acosta, Robert	robert
Adams, David	David
Adkins, Kevin	Kevin
Agullar, test	test
Test, test	test

4. To use **Flash Fill**, select **Data** > **Data Tools** > **Flash Fill** or press Ctrl + E.

❖ **BUILD CUSTOM NUMERIC FORMATS.**

Excel has many built-in numeric formats you can use, or you can build your own.

1. Right-click the column header, and then select **Format Cells**.

   Or, select a column, and then select **Home** > **Number**.
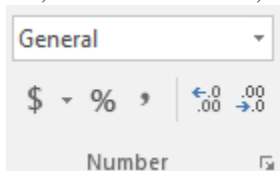
   The **Format Cells** dialog box opens, with the **Number** tab selected by default.

   Note: You can also press Ctrl + 1 to open the **Format Cells** dialog box.

2. In **Category**, select **Custom**.
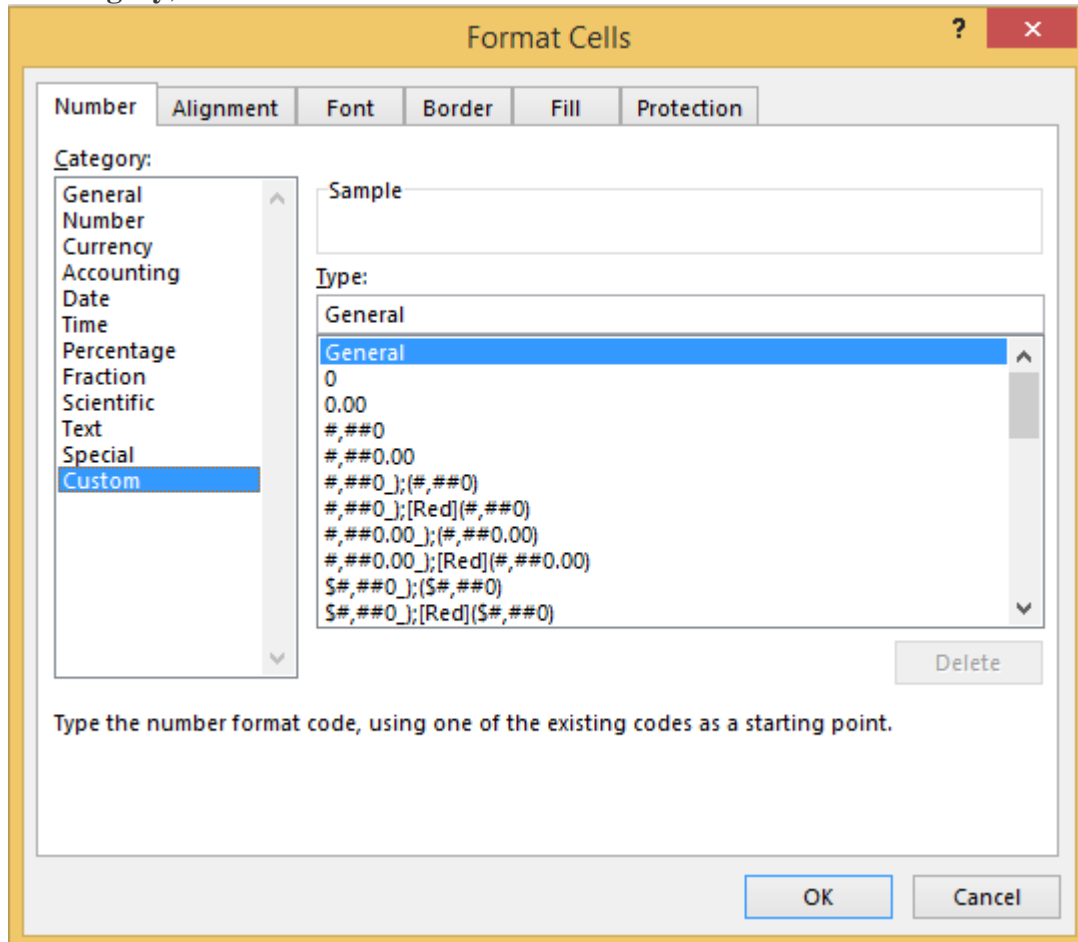
3. In **Type**, select an existing format.

    Or, type a new format in the **Type** box, to create one.

4. Select **OK**.

❖ **VALIDATE CELL DATA.**

When you create worksheets that will be used by others, it's important to make sure they can only enter valid data. Use Excel's data validation features to make rules to restrict the type of data or values that others can enter into a cell.

1. Select the cell(s) you want to create a rule for.
2. Select **Data > Data Validation**.
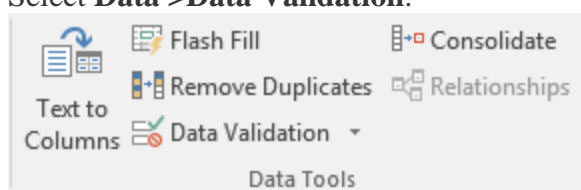
3. On the **Settings** tab, under **Allow**, select an option:
    o **Whole Number** - to restrict the column to accept only whole numbers.
    o **Decimal** - to accept decimal numbers.

- o **List** - to pick data from the drop-down list.
- o **Date** - to restrict the cell to accept only date.
- o **Time** - to restrict the cell to accept only time.
- o **Text Length** - to restrict the length of the text.
- o **Custom** – for custom formula.

4. Under **Data**, select a condition:
   - o **between**
   - o **not between**
   - o **equal to**
   - o **not equal to**
   - o **greater than**
   - o **less than**
   - o **greater than or equal to**
   - o **less than or equal to**

5. On the **Settings** tab, under **Allow**, select an option:
6. Set the other required values, based on what you chose for **Allow** and **Data**.
   For example, if you select **between,** then select the **Minimum:** and **Maximum:** values for the cell(s).
7. Select the **Ignore blank** checkbox if you want to ignore blank spaces.
8. If you want to add a **Title** and message for your rule, select the **Input Message** tab, and then type a title and input message.
9. Select the **Show input message when cell is selected** checkbox to display the message when the user selects or hovers over the selected cell(s).
10. Select **OK**.

Now, if the user tries to enter a value that is not valid, a pop-up appears with the message, "This value doesn't match the data validation restrictions for this cell."

❖ CREATE REUSABLE LISTS.

For lists that you use often, you can create a reusable list, so you don't have to type the list every time you need it.

Create a custom list

1. Select the cells within the list that you want to reuse.
2. Select **File** > **Options**.

3. Select **Advanced**, scroll-down, and in the **General** section, select **Edit Custom Lists**.
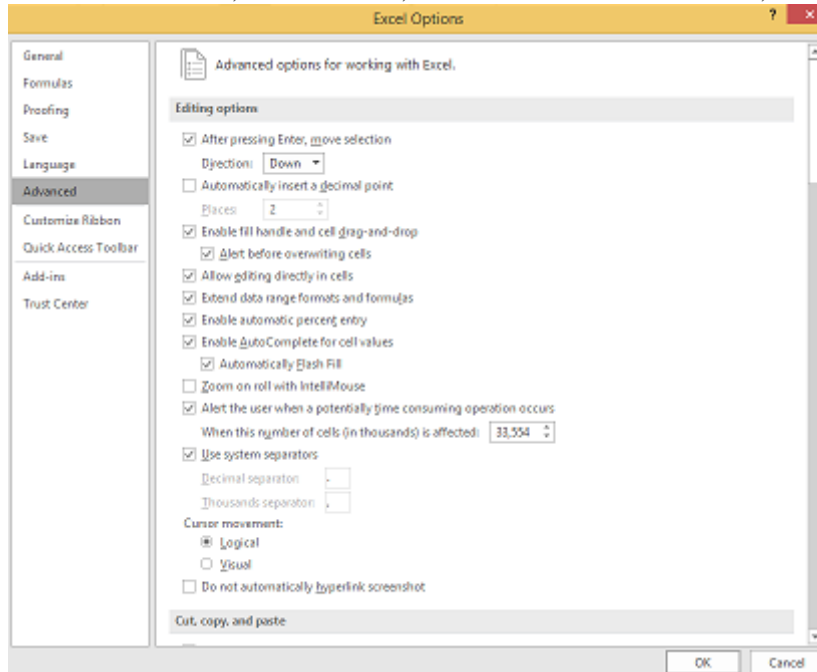
4. Select **Import**, and then select **OK**.
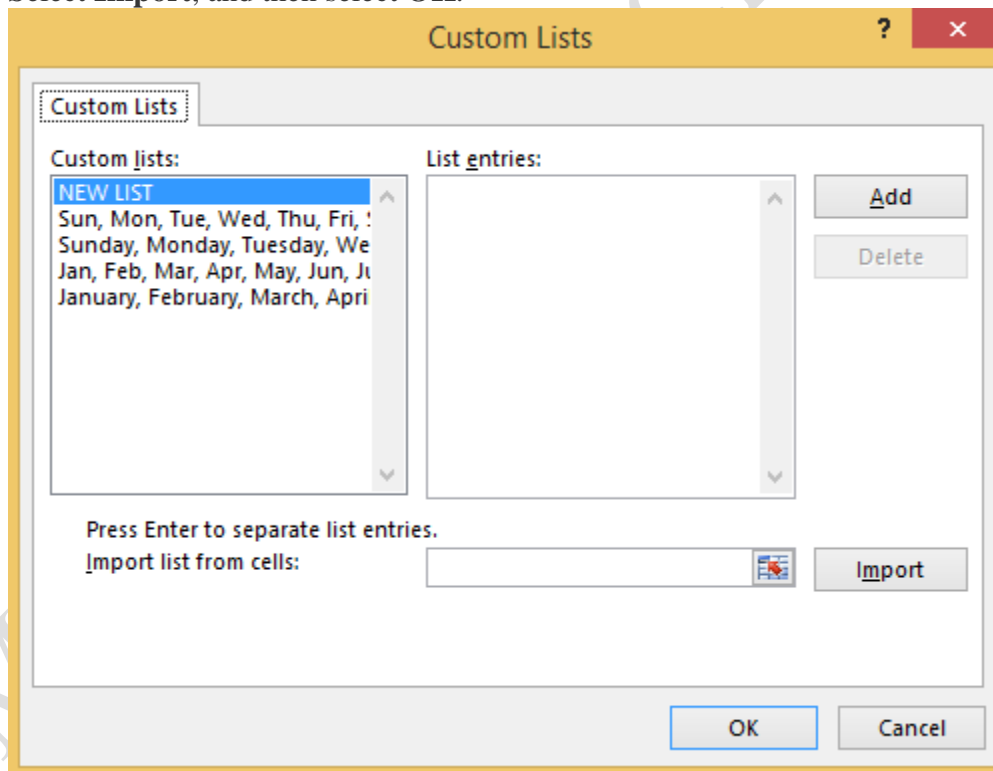
   Tip: You can also create a custom list by typing the list into **List entries**.

5. Select **OK** to exit the **Excel Options** dialog box.

Use a custom list

- Type any data in a cell from the custom list, and then drag the fill handle across cells.

Sort by custom list

1. Select a cell in the column you want to sort.
2. Select **Data > Sort**.
3. For **Sort by**, select the column you want to sort.
4. For **Sort on**, select **Values**.
5. For **Order**, select **Custom list**.
6. In **Custom lists**, select the custom list.
7. Click **OK** to close the **Custom Lists** dialog box.
8. Click **OK** to close the **Sort** dialog box.

USE FORMULAS AND FUNCTIONS.

❖ CREATE FORMULAS.

Get started on how to create formulas and use built-in functions to perform calculations and solve problems.

Formula bar

- When a formula is entered into a cell, it also appears in the **Formula bar**.

Create a formula that refers to values in other cells

1. Select a cell.

2. Type the equal sign =.

   Note: Formulas in Excel always begin with the equal sign.

3. Select a cell or type its address in the selected cell.

4. Enter an operator. For example, – for subtraction.
5. Select the next cell, or type its address in the selected cell.

6. Press Enter. The result of the calculation appears in the cell with the formula.

To see a formula

1. Select a cell, and see the formula in the formula bar.

×	✓	*fx*	=SUM(B2,B3)

Enter a formula that contains a built-in function

1. Select an empty cell.
2. Type an equal sign = and then type a function. For example, =SUM for getting the total sales.
3. Type an opening parenthesis (.
4. Select the range of cells, and then type a closing parenthesis).

	Jan	Feb	Mar	Apr		May	Jun	Total
Sales	100	200	250		150	300	500	=SUM(B2:G2

5. Press Enter to get the result.

Relative references

- A relative cell reference in a formula, such as B2:G2, is based on the relative position of the cell that contains the formula, such as H2. If the position of the cell that contains the formula changes, the reference is changed. If you copy or fill a formula across rows or down columns, the reference automatically adjusts. By default, new formulas use relative references. For example, if the formula in H2 is copied to H3, it automatically adjusts from =SUM (B2:G2) to =SUM (B3:G3).

Absolute references

- An absolute cell reference, like $B$2, in a formula always refers to a cell in a specific location. The formula in H2 with absolute references would be =SUM ($B$2: $G$2). If the position of the cell that contains the formula changes, the absolute reference remains the same. For example, if the formula in H2 with absolute reference is copied to H3, H2 and H3 will have the same formula =SUM ($B$2: $G$2).

❖ **NAMES CELLS AND RANGES.**

In Excel, you can name cells and cell ranges, and use those names in formulas. This is a useful feature that makes the formulas easier to understand and maintain.

Name a cell or cell range

1. Select a cell or a cell range.
2. In the **Name Box**, type a name.

A1	▼	⋮	×	✓	*fx*
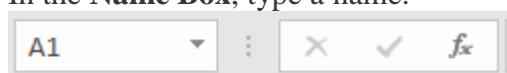
You can click the drop-down arrow to see the list of existing range names, if any. Names:

- o Cannot begin with a number.
- o Cannot contain spaces.
- o Can contain Upper and lowercase letters.
- o Can include underscores.

Press F3 to use the name

1. Select a cell.
2. Press the F3 function key.
3. In the **Paste Name** box, select the name, and then select **OK**.

Use names in formulas

1. Select a cell and enter a formula**.**
2. Place the cursor where you want to use the name in that formula.
3. Type the first letter of the name, and select the name from the list that appears.
4. Press Enter.

Delete a name

1. Select **Formulas** > **Name Manager**.
2. Or, press Ctrl + F3.

   Note: With **Name Manager**, you can create **New** names, **Edit** names, or **Delete** names.
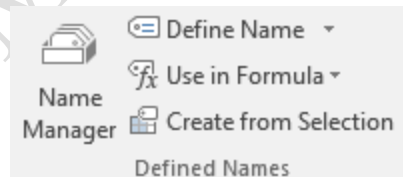
3. Select the name, and then select **Delete**.

   Note: If you delete a name that is used in formulas on your worksheet, it will create errors in your worksheet.

4. Select **Close**.

View and paste all names into your workbook

1. Select an empty cell.
2. Select **Formulas** > **Use in Formula**.

3. Select **Paste Names** from the drop-down.
   This pastes the names, sheet name, and cells in that range, into your workbook.

❖ **USE TRACE TO FIX FORMULA ERRORS.**

Checking formulas for accuracy and finding the source of an error is hard when the formula uses precedent or dependent cells. To help, use **Trace Dependents** and **Trace Precedents** to graphically show the relationships between these cells and formulas with tracer arrows.

- **Dependent cells** contain formulas that refer to other cells.
  For example, if cell D10 contains the formula =B5, cell D10 is a dependent of cell B5.
- **Precedent cells** are referred to by a formula in another cell.
  For example, if cell D10 contains the formula =B5, cell B5 is a precedent to cell D10.

Trace cells that reference a cell (dependents)

1. Select the cell for which the dependent cells need to be identified.
2. On the **Formulas** tab, select **Trace Dependents** to display a tracer arrow to each cell that is dependent on the active cell.
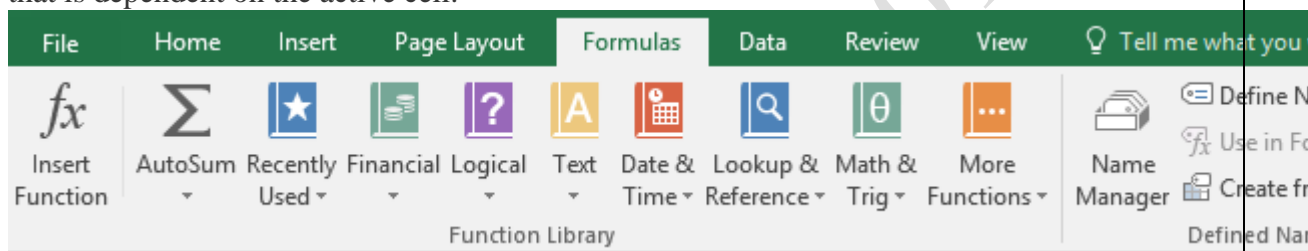
- o Blue arrows - show cells with no errors.
- o Red arrows - show cells that cause errors.
- o Black arrows - if the selected cell is referenced by a cell on another worksheet or workbook, a black arrow points from the selected cell to a worksheet icon

  ⊞ . The other workbook must be open before Excel can trace these dependencies.

3. Select **Trace Dependents** again to identify the next level of cells that depend on the active cell.

   Note: At some point, a beep will be heard, otherwise the arrows will stop appearing.

4. To remove tracer arrows one level at a time, starting with the dependent cell furthest to the active cell, select the arrow next to **Remove Arrows** on the **Formulas** tab, and then select **Remove Dependent Arrows**.
5. To remove another level of tracer arrows, select **Remove Dependent Arrows** again.
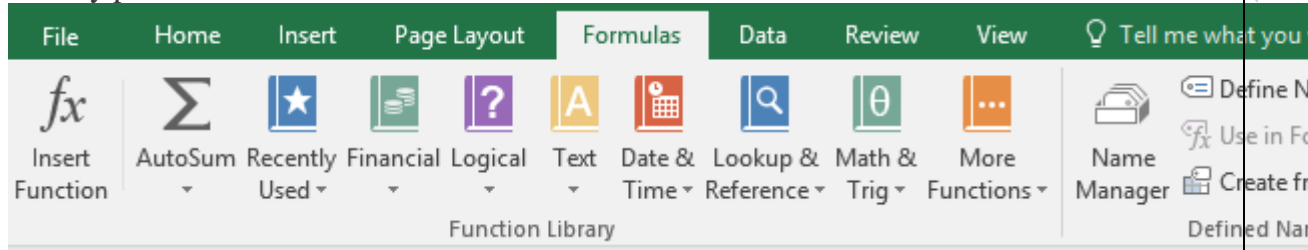
   Note: You can use **Ctrl** + **Shift** + **]** to highlight all the dependents of a cell.

Trace cells that provide data to a formula (precendents)

1. Select the cell for which the precedent cells need to be identified.

2. Select **Formulas** > **Trace Precedents** to display a tracer arrow to each cell that directly provides data to the active cell.

- o Blue arrows - show cells with no errors.
- o Red arrows - show cells that cause errors.
- o Black arrows - if the selected cell is referenced by a cell on another worksheet or workbook, a black arrow points from the selected cell to a worksheet icon ▦ . The other workbook must be open before Excel can trace these dependencies.

3. Select **Trace Precedents** again to identify the next level of cells that provide data to the active cell.

   **Note:** At some point, a beep will be heard, otherwise the arrows will stop appearing.

4. To remove tracer arrows one level at a time, starting with the precedent cell furthest to the active cell, select the arrow next to **Remove Arrows** on the **Formulas** tab, and then select **Remove Precedent Arrows**.
5. To remove another level of tracer arrows, select **Remove Precedent Arrows** again.

❖ **LOCATE FUNCTIONS.**

Excel groups functions into many categories and you can use help to understand what each function does.

Find functions and categories of functions

1. Select **Formulas**.
2. The **Function library** group displays categories of functions that are available.
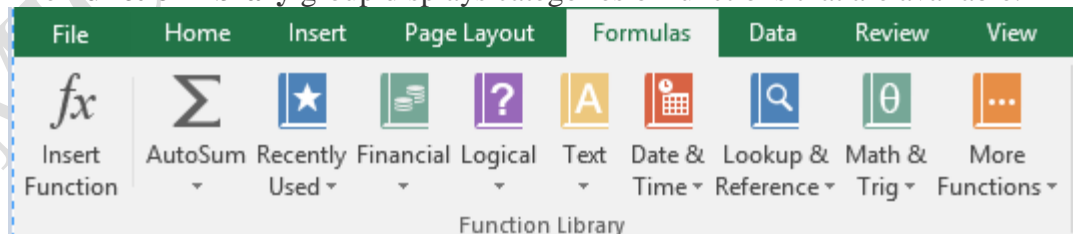
3. If the function you are looking for is unlikely to be in the categories listed, select **More Functions**.

Use help to get more information about functions

1. Select **Formulas**.
2. Select a category of function, and then hover the mouse cursor over the function.
3. Select **Tell me more**.

❖ **CALCULATIONS USING FUNCTIONS.**

Excel provides a vast number of built-in functions to perform simple or complex calculations.

Use functions

1. Select a cell in the worksheet.
2. Select **Formulas,** and then select a function from a category in the **Function Library** group.
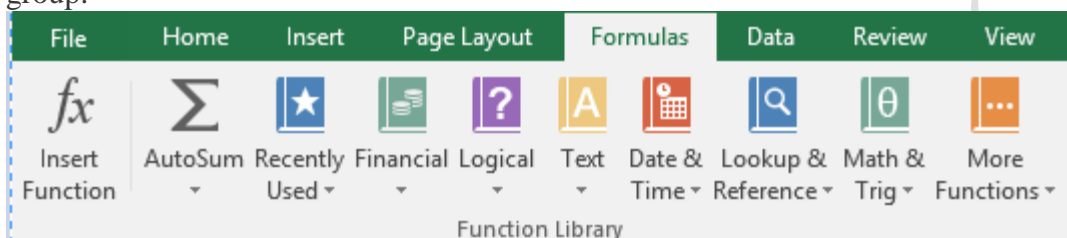
3. Specify data in the **Function Arguments** box for a range of cells.
4. Press **Enter**, or select **OK**.
   By default, the resulting value appears in the selected cell, and the formula is displayed in the formula bar.

Use Insert function

1. Select a cell in the worksheet.
2. Select **Formulas** and then select **Insert Function.**
3. Type the function name in the **Search for a function** box, or select the category of the function.
4. Select a function, and then select **OK**.
5. Specify data in the **Function Arguments** box for a range of cells.
6. Press Enter, or select **OK**.
   To insert a function, type equal sign = and the likely function name in the cell. A list will be visible. Select a function from the list. For example, =SUM.

TABLES, CHARTS AND ANALYSIS.

ADD AND FORMAT TABLES.

❖ **CREATE AND FORMAT TABLES.**

You can create and format a table, to visually group and analyze data.

Shortcuts

1. To create a table, select the data and select **Home** > **Format as Table**.

   Tip: You can also press CTRL + T or CTRL + L.

2. To make sure there are no empty columns or rows in the data, select a cell within the data, press CTRL + A, then press CTRL + . a few times to move around the data.

Create a table

1. Select a cell or range of cells to include in the table.
2. Select **Insert** > **Table** .
3. A **Create Table** box appears with the cells to include in the table. Edit if needed.
4. If your table has a header, check the **My table has headers** checkbox
5. Select **OK**. A **Design** tab appears in the Ribbon.

Format a table

1. Select a cell within the table.
2. On the **Design** tab, select a **Table Style**.
3. In the **Table Style Options** group, you can check and uncheck different boxes to get the look you want, for example **Banded Rows** or **Banded Columns**.

   Note: If a new row or column is added in the table, it will be automatically added with the table style. Formulas are applied as you add new rows, or create a formula within a column.

❖ **SORT DATA IN A TABLE.**

Sorting is one of the most common tools for data management. In Excel, you can sort your table by one or more columns, by ascending or descending order, or do a custom sort.

Before sorting a table:

1. Make sure that there are no empty rows or columns in the table.
2. Get table headers into one row across the top.
3. Make sure there is at least one empty column between the table you want to sort, and other information on the worksheet not in that table.
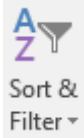
Check for empty rows or columns

1. Select a cell within the data and press CTRL + A.
2. Press CTRL + . a few times to move the active cell around the corners, and check for empty cells.
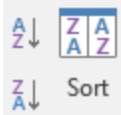
Sort the table

1. Select a cell within the data.

2. Select **Home** > **Sort & Filter**.
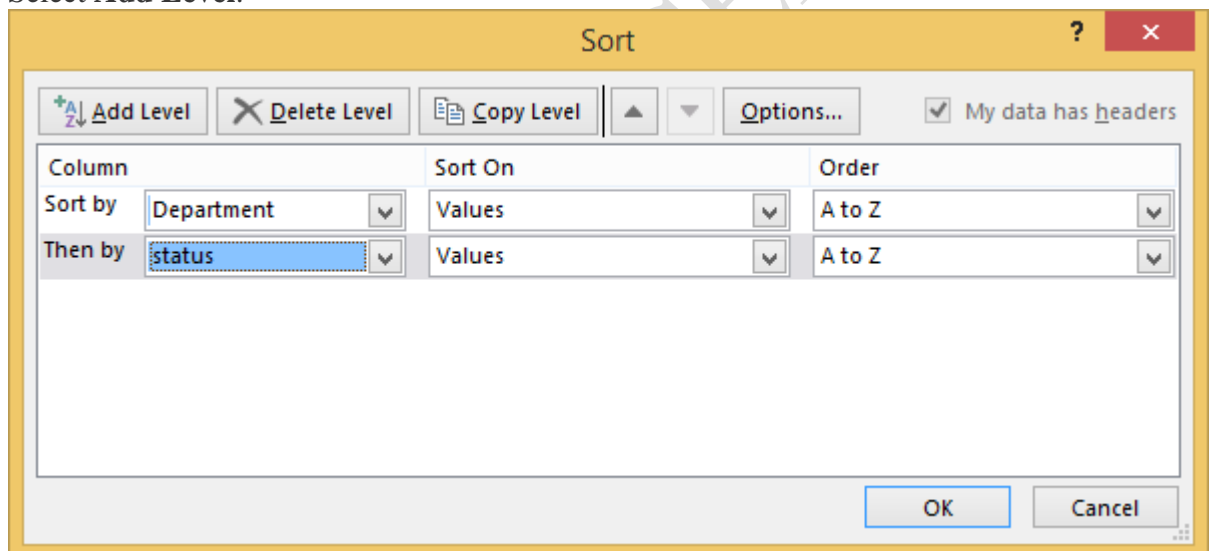

Or, select **Data** > **Sort**.

3. Select an option:
   o **Sort A to Z** - sorts the selected column in an ascending order.
   o **Sort Z to A** - sorts the selected column in a descending order.
   o **Custom Sort** - sorts data in multiple columns by applying different sort criteria.

For a Custom Sort:

1. Select **Custom Sort**.
2. Select **Add Level**.

3. For **Column**, select the column you want to **Sort by** from the drop-down, and then select the second column you **Then by** want to sort. For example, **Sort by** Department and **Then by** Status.
4. For **Sort On,** select **Values**.
5. For **Order**, select an option, like **A to Z**, **Smallest to Largest**, or **Largest to Smallest**.
6. For each additional column that you want to sort by, repeat steps 2-5.

   Note: To delete a level, select **Delete Level**.

7. Check the **My data has headers** checkbox, if your data has a header row.
8. Select **OK**.

❖ **FILTER DATA IN A TABLE.**

Filters provide a quick way to find and work with a subset of data in a range or table. When you filter a list, you temporarily hide some of the data, so you can focus on the data you want.
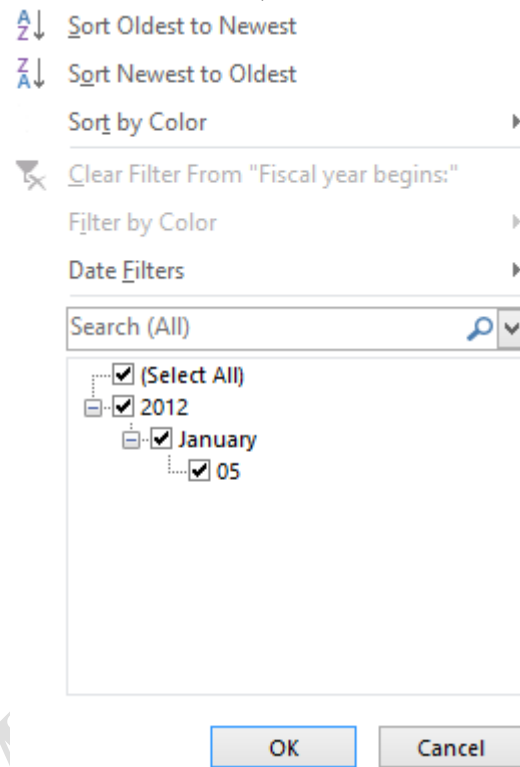
Filter data

1. Select a cell within the data that you want to filter.

    Note: Before you filter your data, make sure there are no empty rows or columns.

2. Select **Home** > **Sort & Filter** > **Filter**.
    Or, select **Data** > **Filter**.
3. Select the filter drop arrow of the column you want to filter.

S.No	Date
1	1/2/2016
2	1/3/2016
3	1/4/2016

4. Uncheck **Select All,** and check the filters you want.

5. Select **OK**. The filter drop arrow changes to a filter to show the column is filtered. The Blue row numbers show which rows are included in the filtered data.
6. To remove the filter, select **Clear**. All data displays.
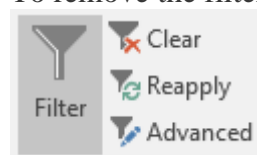
    Note: To apply filters on multiple columns, select the first column, apply the filter, and then select the next column and apply a filter on one.

Apply a custom filter

1. Select the filter drop arrow and then select:
   - **Text Filters** - available when the column **Contains** text or a mix of text and numbers: **Equals**, **Does Not Equal**, **BeginsWith**, **EndsWith,** or Contains.
   - **Number Filters** - available when the column contains only numbers: **Equals**, **Does Not Equal**, **Greater Than**, **LessThan,** or **Between.**
   - **Date Filters** - available when the column contains only dates: **Last Week**, **Next Month**, **This Month**, and **Last Month**.
   - **Clear Filter from 'Column'** - available when the column is already filtered. Select this option to clear the filter.
   - Select **And** if both conditions must be true.
   - Select **Or** if only one of the conditions needs to be true.
2. Enter the filtering conditions.
3. For example, to view the numbers greater than a specific number, select **Number Filters** > **Greater Than Or Equal To** and then enter the specific number.
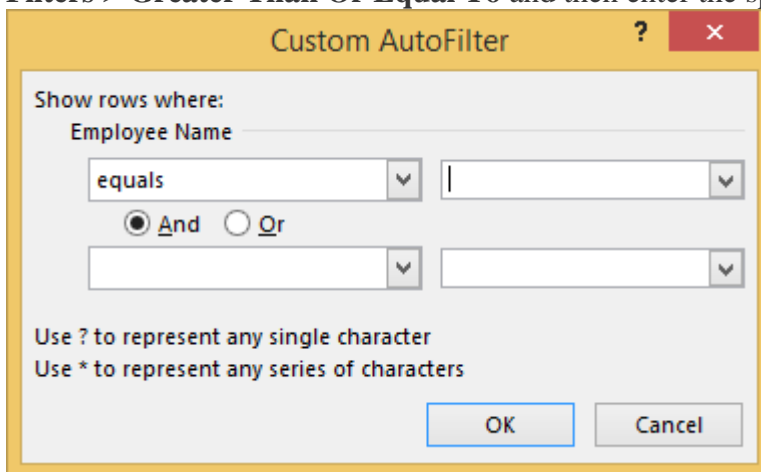

4. To filter results by two conditions, enter the filter conditions in both boxes.
5. To change the order of the filter results, select the filter drop-down, and then select either **Sort Largest to Smallest** or **Sort Smallest to Largest**.

❖ **ADD A TOTAL ROW TO A TABLE.**

You can add totals to a table by selecting the **Total Row** checkbox on the **Design** tab. You can also add a function from the total row drop-down.

1. Select a cell in a table.
2. Select **Design** > **Total Row**.
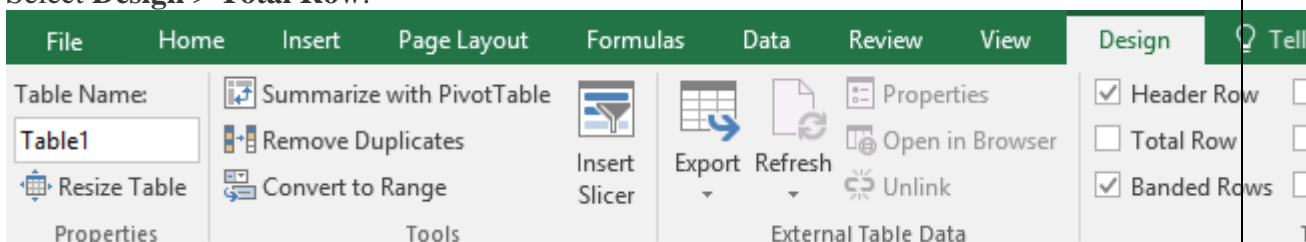
3. The **Total** row is added to the bottom of the table.

Note: To add a new row, uncheck the **Total Row** checkbox, add the row, and then recheck the Total Row checkbox.

4. From the total row drop-down, you can select a function, like **Average, Count, Count Numbers, Max, Min, Sum, StdDev, Var**, and more.

❖ **FILTER DATA WITH SLICERS.**

When working with large amounts of data, you can use slicers in your table, to filter and view your data.

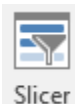**Convert data into a table**

1. There are four ways to convert data into a table:

   Note: In order to use a slicer, you must convert your data into a table first.

   o Press **Ctrl + t**.
   o Press **Ctrl + l**.
   o Select **Home** > **Format as Table**.
   o Select **Insert** > **Table**.
2. Select **OK**.

Use a slicer to filter data

1. Select **Insert** > **Slicer**.

   Slicer

2. Select the fields you'd like to filter.
3. Select **OK** and adjust your slicer preferences, such as **Columns**, under **Options**.

   Note: To select more than one item, hold **Ctrl**, and then select the items that you want to show. Select and hold the corner of a slicer to adjust and resize it.

4. Select **Clear Filter** to clear the slicer filter.

ADD AND FORMAT CHARTS.

   ❖ **CREATE CHARTS.**

Charts help you visualize your data in a way that creates maximum impact on your audience. Learn to create a chart and delete a chart.

Create a chart

1. Select the data for your chart.
2. Select **Insert** > **Recommended Charts**.
3. Select a chart on the **Recommended Charts** tab, to preview the chart.

   Note: You can select the data you want in your chart and press ALT + F1 to create a chart immediately, but it might not be the best chart for the data. If you don't see a chart you like, select the **All Charts** tab to see all chart types.

4. Select a chart.
5. Select **OK**.

Delete a chart

1. Select the chart.
2. Press Delete.

❖ **ADD SPARKLINE CHARTS.**

Sparklines are mini-charts placed in single cells, to show visual data trends. You can quickly add and format a Sparkline chart in your worksheet.

Add a Sparkline chart

1. Select the data for your Sparkline chart.
2. Select **Quick Analysis** in the lower-right corner of the selected data.
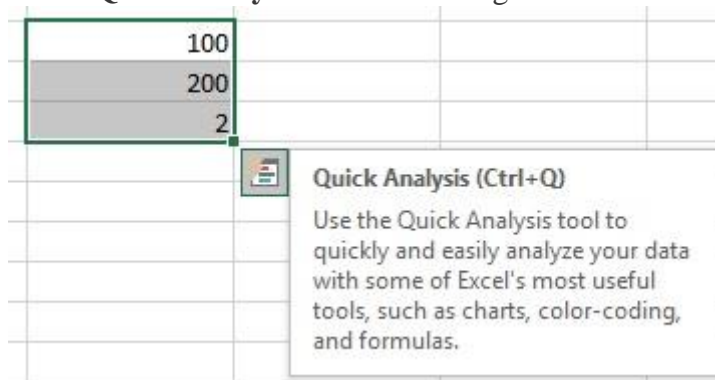
3. Select **SparkLines** and then select **Line**, **Column**, or **Win/Loss**.
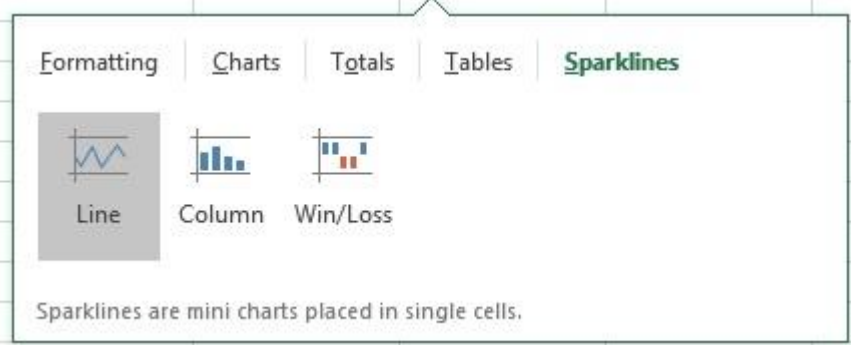
Format a Sparkline chart

1. Select the Sparkline chart.

2. Select **Design** and then select an option:

- o Select **Line**, **Column**, or **Win/Loss** to change the chart type.
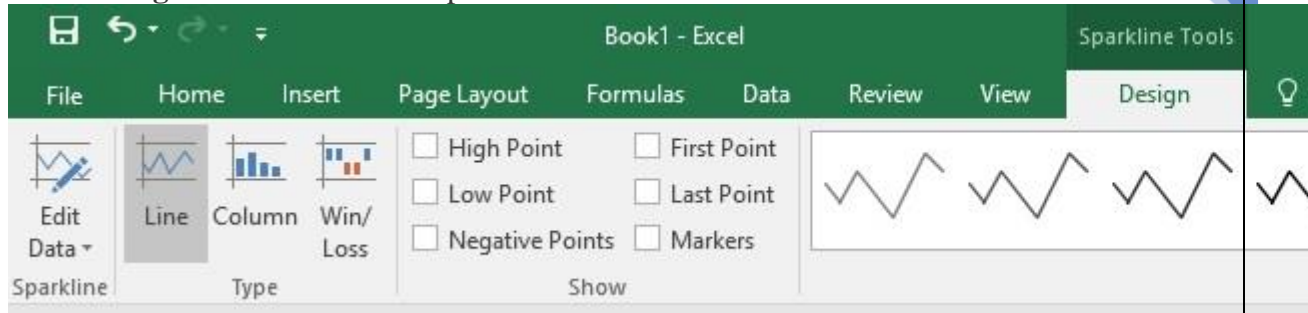- o Check **Markers** to highlight individual values in the Sparkline chart.
- o Select a **Style** for the Sparkline.
- o Select **Sparkline Color** and the color.
- o Select **Sparkline Color** > **Weight** to select the width of the Sparkline.
- o Select **Marker Color** to change the color of the markers.
- o If the data has positive and negative values, select **Axis** to show the axis.

❖ FORMAT CHARTS.

To customize the looks of your chart, use Excel's formatting options to change the title, layout, chart style and theme color.

Create a Chart

1. Select a range of cells.
2. Select **Insert** > **Recommended Charts**.
3. Select **Recommended Charts**, and then select a chart of your choice.
4. Select **OK**.

   A chart consists of various sections such as the Chart Title, Plot Area, Vertical (Value) Axis Title, Horizontal (Category) Axis Title, and Legends.
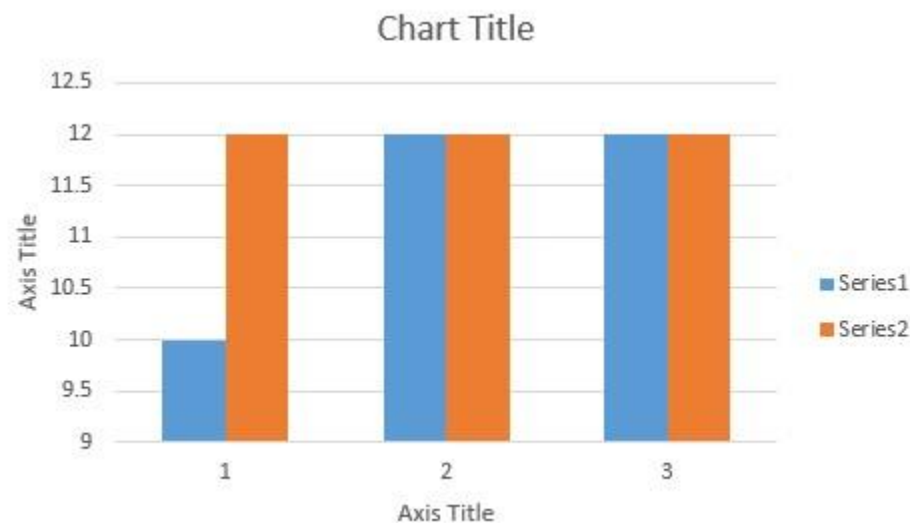
Add a chart title

1. Select **Chart Title** and type a title.
   Or, to pick up the title from data in a cell, select the Chart Title, type = **cell** (for example, =D1) in the formula bar, and press ENTER.
2. To format the title, use the **Font** options on the **Home** tab to:
   - ○ Select a **Font** and **Font Size**
   - ○ Make the font **Bold, Italic, or Underline**
   - ○ Change the **Font Color**:

        Note: You can use these options to format the Axis Titles as well.

Change the chart layout

1. Select the chart.
2. Under **Chart Tools**, select **Design > Quick Layout**.
3. Hover over the options to see a preview, then select a layout.

Change the chart style

1. Select **Design** and select the drop-down arrow to see all the options.
2. Select a chart style.
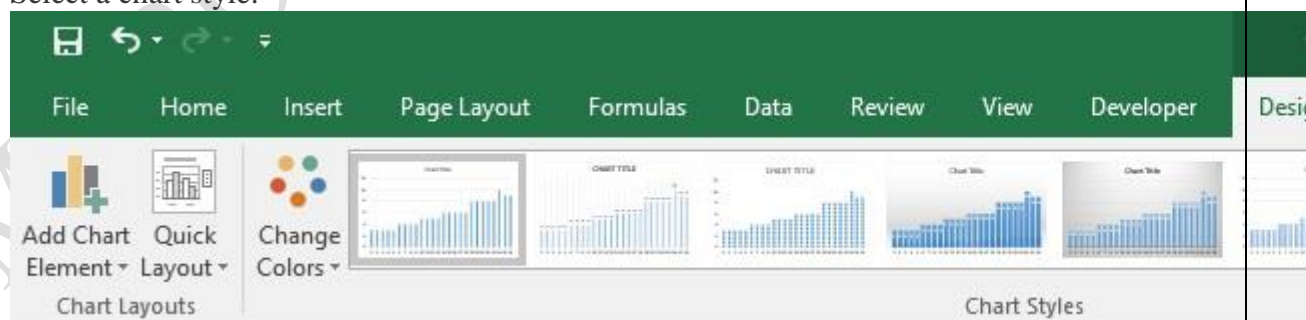
Select a theme style to add color

1. In the chart, select the **Plot Area**, the inner area that shows the plotted data.
2. Under **Chart Tools**, select **Format**.

3. Select a **Theme Styles**.
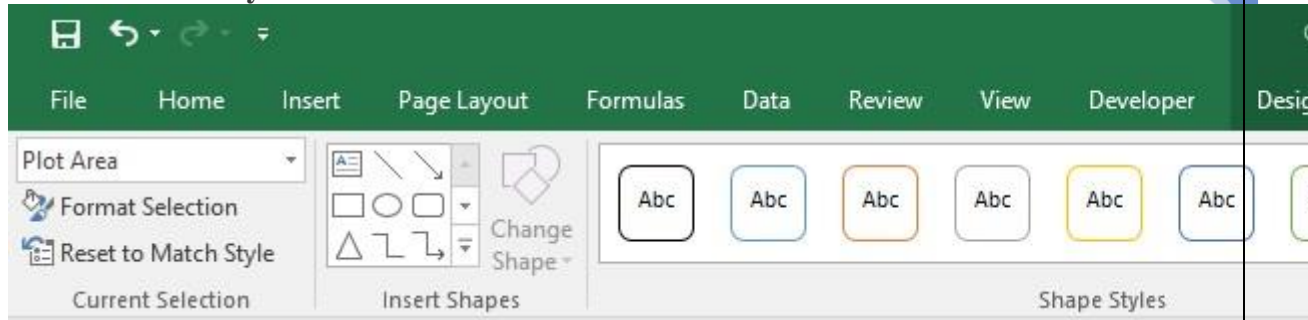
The selected style will be applied to the **Plot Area**.

❖ ADD TRENDLINES AND DROP LINES.

In Excel, you can add trendlines and drop lines to your charts to forecast data and show visual data trends.

Add a trendline

1. Select a chart.
2. Select a point in the data series (e.g. line chart, column chart, or bar chart).
3. Right-click and select **Add Trendline**.

Format a trendline

1. In the **Format Trendline** pane, select a **Trendline Option** to choose the trendline is a statistical way to measure data:
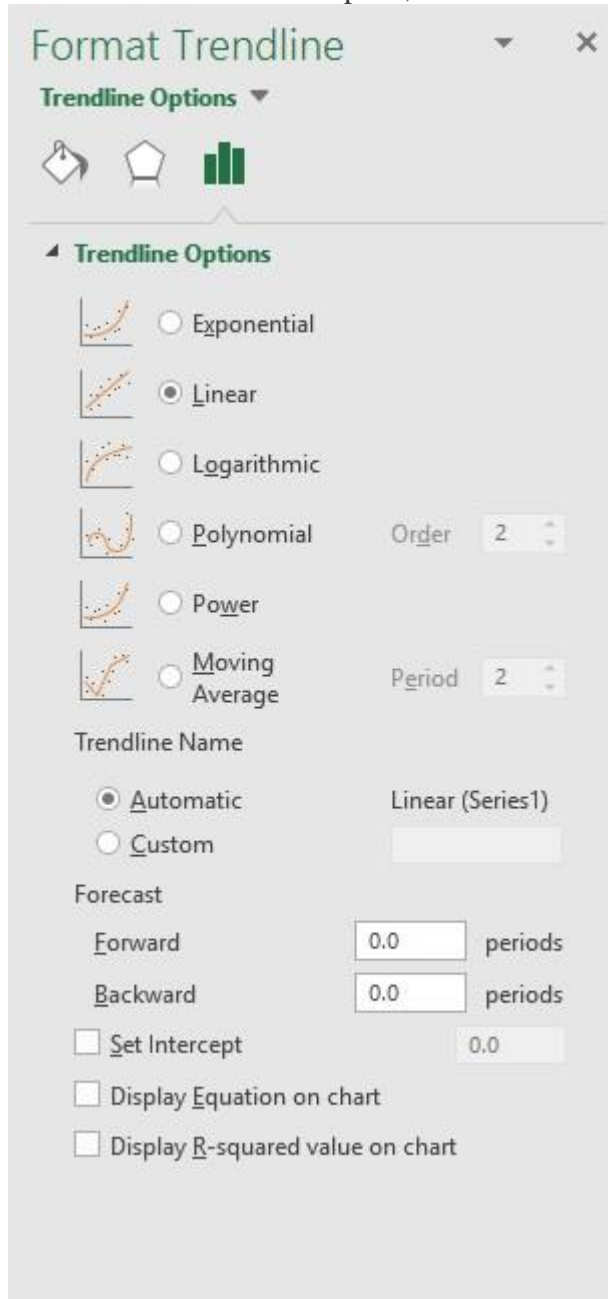
2. Set a value in the **Forward** and **Backward** fields to project your data into the future.

Add drop lines

1. Select the chart in which you want to add drop lines.
2. Select **Design** > **Add Chart Element** > **Lines** > **Drop Lines**.
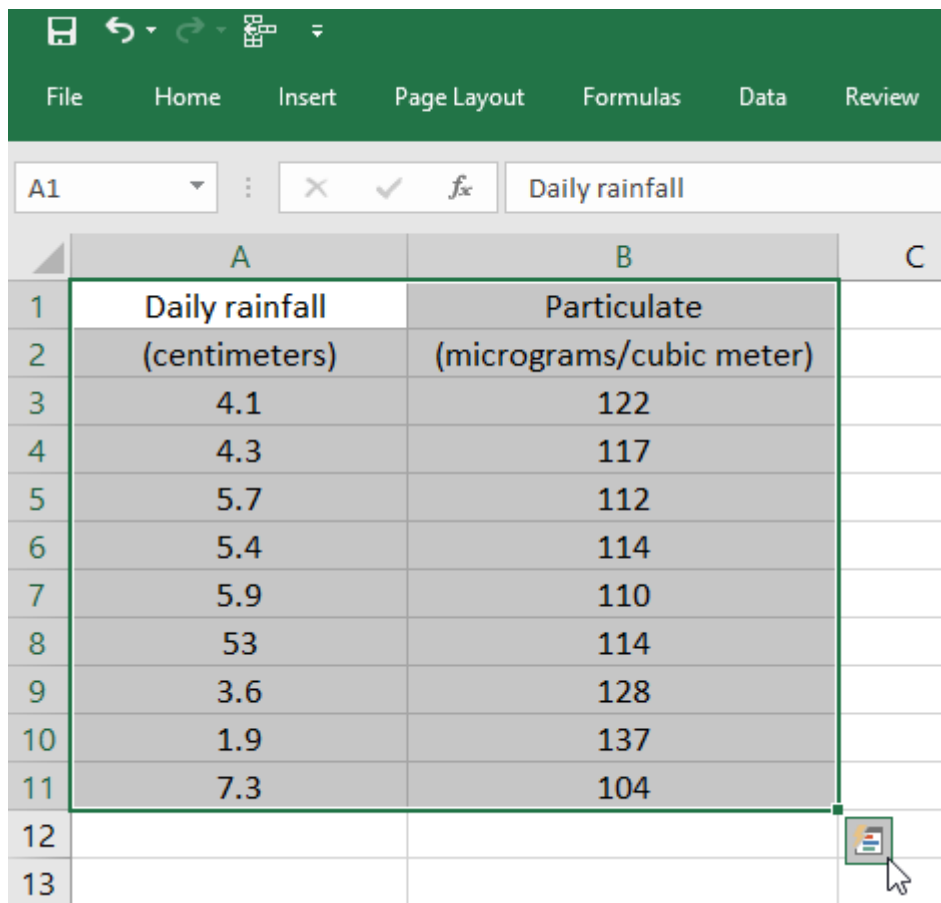
ANALYZE AND CHART DATA.

❖ **QUICK ANALYSIS OF DATA.**

Excel's Quick Analysis button lets you instantly create different types of charts, like clustered, stacked, and scattered charts.

1. Select a range of cells.
2. Select **Quick Analysis**, a button that appears at the bottom right corner of the selected range.

   Or, press Ctrl + Q.

3. Select **Charts**.

4. Hover over the chart types to get a preview, and then select the chart you want.

PIVOT TABLES, COLLABORATION AND MAC.

CREATE AND FORMAT PIVOT TABLES AND PIVOT CHARTS.

❖ CREATE PIVOT TABLES.

A PivotTable is a powerful tool to calculate, summarize, and analyze data that lets you see comparisons, patterns, and trends in your data.

Create a PivotTable

1. Select the cells you want to create a PivotTable from.

   Note: Your data shouldn't have any empty rows or columns. It must have only a single-row heading.

2. Select **Insert** > **PivotTable**.
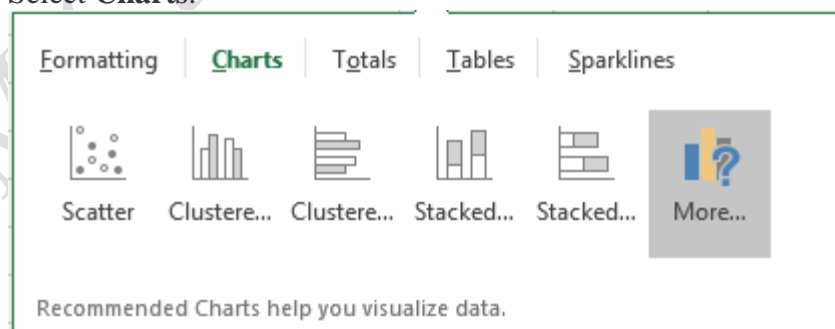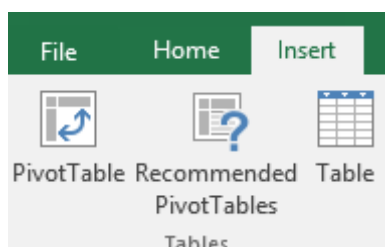

3. Under **Choose the data that you want to analyze**, select **Select a table or range**.
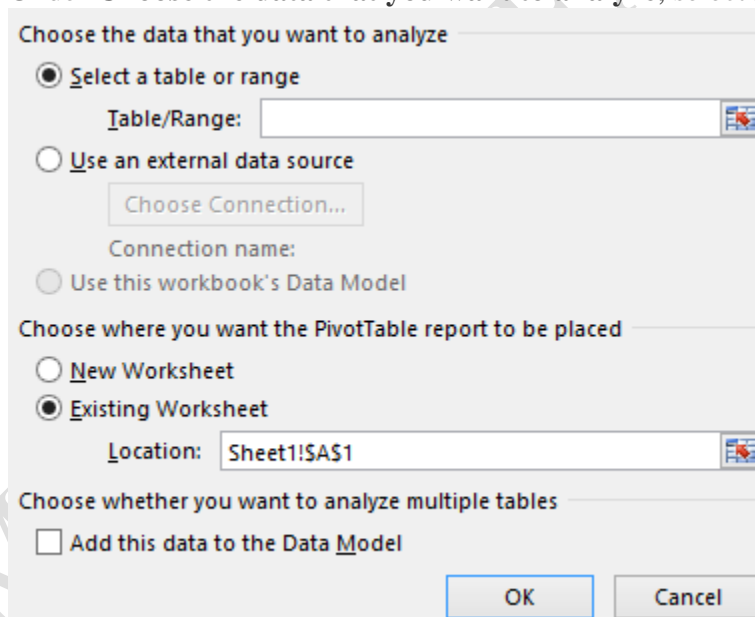
4. In **Table/Range**, verify the cell range**.**
5. Under **Choose where you want the PivotTable report to be placed**, select **Newworksheet** to place the PivotTable in a new worksheet.
6. Select **OK**.

Building out your PivotTable

1. To add a field to your PivotTable, select the field name checkbox in the **PivotTables Fields** pane.

Note: Selected fields are added to their default areas: non-numeric fields are added to **Rows**, date and time hierarchies are added to **Columns**, and numeric fields are added to **Values**.
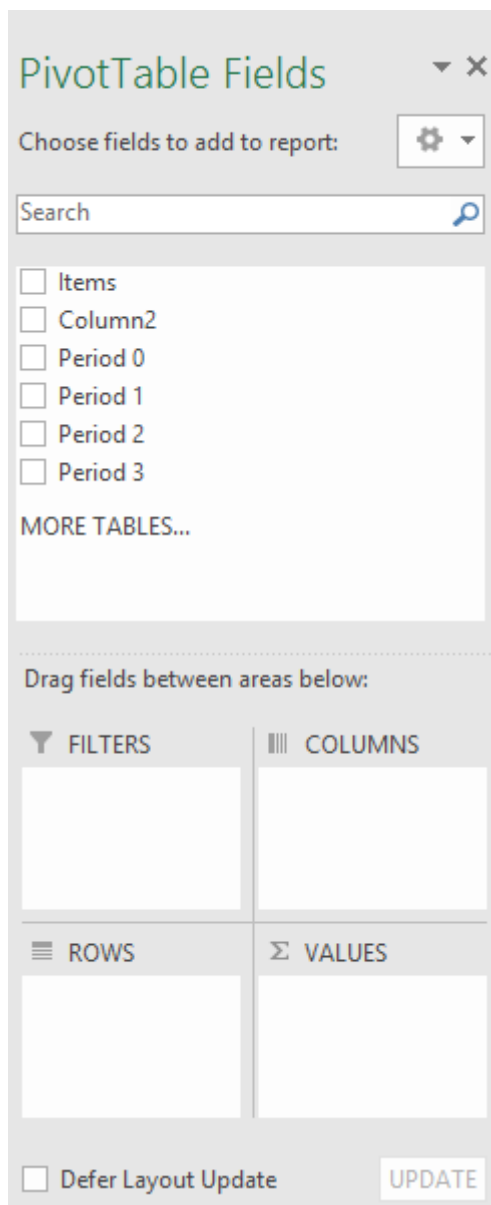
2. To move a field from one area to another, drag the field to the target area.

❖ **WORK WITH PIVOT TABLES.**

When you have a large amount of data, you may want to rearrange the data in your PivotTable to make it easier to work with. You can also add or change the fields in a PivotTable.

Rearrange fields

1. Select a cell anywhere in the PivotTable.

2. Select **Analyze** > **Field List**.
3. In the **PivotTable Fields** pane, select the fields you want to show in your PivotTable.

	A	B	C	D	
3		Column Labels ▾			
4		Count of Building	Count of Hire Date	Total Count of Building	Total Cour
5	Row Labels ▾	Account Management	Account Management		
6	Anderson, Teason	1	1	1	
7	Andrews, Diane	1	1	1	
8	Ashley, Michael	1	1	1	
9	Atkinson, Danielle	1	1	1	
10	Austin, William	1	1	1	
11	Ayala, Polly	1	1	1	
12	Barker, Heidi	1	1	1	
13	Bean, Deborah	1	1	1	
14	Booth, Raquel	1	1	1	
15	Bowman, Michael	1	1	1	
16	Burnett, Kevin	1	1	1	
17	Cabe, Max	1	1	1	
18	Cain, Lon	1	1	1	
19	Cameron, John	1	1	1	
20	Cannon, Jenny	1	1	1	
21	Carter, Allan	1	1	1	
22	Castillo, Sheri	1	1	1	
23	**Grand Total**	**17**	**17**	**17**	

Typically, non-numeric fields are added to **Rows**, numeric fields are added to **Values**, and Online Analytical Processing (OLAP) date and time hierarchies are added to **Columns**.

4. To rearrange fields, drag the fields to the areas you want them to be.
   o **Filters** are the top-level report filters, above the PivotTable.
   o **Columns** are shown at the top of the PivotTable.

   Note: Depending on the hierarchy of the fields, columns may be nested inside higher-level columns.

   o **Rows** are shown on the left side of the PivotTable.

   Note: Depending on the hierarchy of the fields, rows may be nested inside higher-level rows.

   o **Values** are the summarized numeric values in the PivotTable.

Note: If you have more than one field in an area, you can rearrange their order by dragging them. To delete a field from the PivotTable, drag the field out of its area. Any changes to the data in the PivotTable do not change the source data.

To update the PivotTable with the latest source data:

1. Select any cell on the **PivotTable**.
2. Select **Analyze** > **Refresh**.
   Or, press Alt + F5.

❖ **GROUP DATA IN PIVOT TABLES.**

PivotTables are a great way to summarize, analyze, explore, and present your data. You can even group the data in a PivotTable to enhance the layout and format of your PivotTable reports.

Group data

1. In the PivotTable, right-click a cell with a date in it, and then select **Group**.
2. In the **Grouping** box, select the **Starting at** and **Ending at** checkboxes, and type or edit the start and end date, if needed.
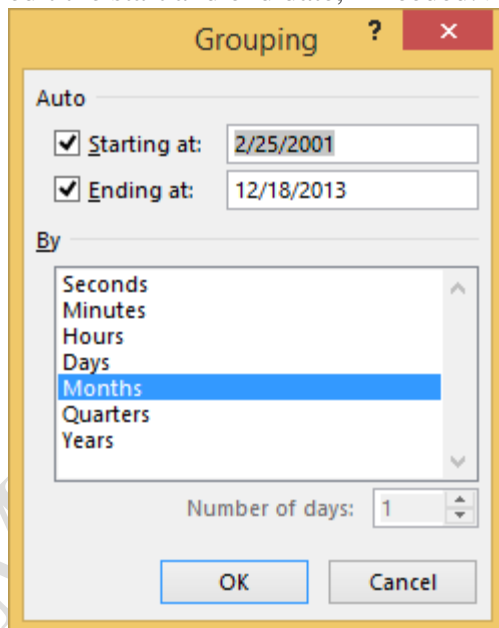
3. Under **By**, select one or more options to group the dates.
4. Select **OK**.

❖ **FILTER DATA WITH SLICERS IN PIVOT TABLES.**

Slicers are a quick and effective way to filter large amounts of data in your PivotTable. Slicers are buttons you can click to filter the data. They stay visible, so you always know what fields are shown or hidden in the filtered PivotTable.

Insert slicers

1. Select a PivotTable.
2. Select **Analyze** > **Insert Slicer** .
3. In the **Insert Slicers** box, select the fields you want to create slicers for.

    Note: You can select fields in the PivotTable, as well as fields in the source data that are not part of the PivotTable.

4. Select **OK**.
5. Select a slicer and do one of the following:
    o   Drag the slicer where you want.
    o   Resize the slicer.
    o   Select a color or style in **Options** > **Slicer Styles**.
    o   Change the number of **Columns** in the slicer in **Options** > Columns.
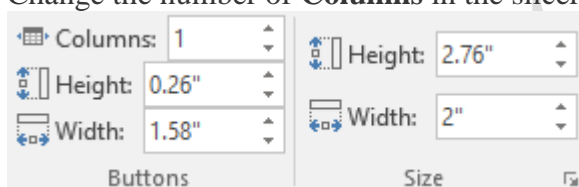

6. In each slicer, select an item to view results in the PivotTable.
    To select more than one item, hold the **Ctrl** key, and then select the items that you want to view in the PivotTable.
7. To clear a **Filter**, select the X on the **Filter** icon in the slicer.

❖ **CREATE PIVOT CHARTS.**

PivotCharts help you make sense of large amounts of complex data. While a PivotChart shows data series, categories, and chart axes the same way a standard chart does, it also gives you interactive filtering and zoom controls right on the chart, so you can quickly analyze a subset of your data, and see comparisons, patterns, and trends.

**Create a PivotChart on a new worksheet**

1. Select a range of cells or a table.
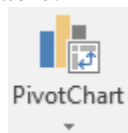
2. Select **Insert** > **PivotChart** .
3. In the **Create PivotChart** box, under **Choose the data that you want to analyze**, choose **Select a table or range**, and then in **Table/Range**, verify the cell range**.**

4. Under **Choose where you want the PivotChart to be placed**, select
   Newworksheet to place the PivotChart in a new worksheet.
   Or, select **Existing worksheet**, and then select the **Location**.
5. Select **OK**.
   A new worksheet opens, with a PivotTable placeholder, PivotChart placeholder, and
   PivotChart Fields pane.
6. In the **PivotChart Fields** pane, select the fields you want to include in your
   PivotChart.
7. Drag the items you want from the field list into the **LEGEND (SERIES)** area.

   Note: You can also drag the items from the LEGEND (SERIES) area into the **AXIS
   (CATEGORIES)** area.
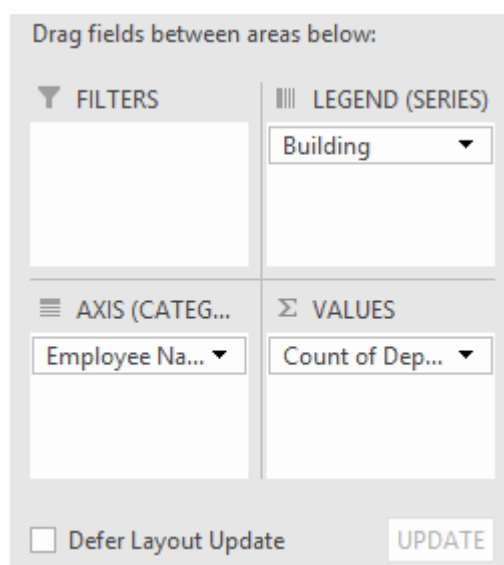
Think of the LEGEND area like **COLUMNS** in the **PivotTable Fields** box, and
AXIS like **ROWS**.
The PivotChart and PivotTable are created simultaneously. Any changes to one are
reflected in the other.

Change PivotChart style

1. Select a PivotChart.
2. Select **Design** > **Chart styles**.

COLLABORATE WITH OTHERS.

❖ **SHARE WORKBOOKS.**

Share a workbook with others, right within Excel. You can let them edit the workbook or just
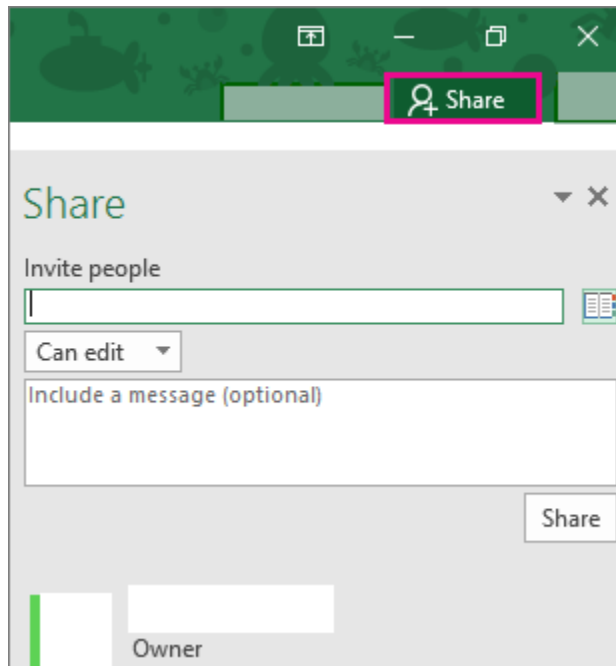view it.

Share a workbook

1. Create or open the workbook that you want to share.

2. Select **Share** in the top-right corner of Excel.

3. Under **Invite people**, enter the email address of the person you'd like to share your workbook with.

Tip: If you have the person's contact info stored in your contacts, just enter their name.

4. Select **Share**.
5. If asked, choose where to upload a copy of your workbook.

❖ **ADD AND REVIEW COMMENTS.**

Add comments to cells to explain what the cells contain.

Add a comment

1. Right-click a cell and click **Insert Comment**.
2. In the comment box, type your comment.
3. Click outside the comment box.

   The comment box disappears, but a red comment indicator remains. To see the comment, hover over the cell.

   Tip: To format your comment, highlight the text you want to change, right-click on the comment and choose **Format Comment**.

Review comments

- Select the **Review** tab, and click **Next** or **Previous** to see each comment in sequence.

See all comments at once

- Select **Review** > **Show All Comments** to show or hide comments.

  You may need to move or resize overlapping comments.

  Note: Select **Review** > **Show/Hide Comment** to show or hide individual comments.

Move a comment

- Drag the border of the comment box.

Resize a comment

- Drag one of the handles on the sides or corners of the comment box.

PASSWORD – PROTECT WORKBOOKS.

❖ PASSORD – PROTECT WORKBOOKS.

Protect a workbook with a password to prevent others from adding, moving, deleting, hiding, or renaming the worksheets in the workbook.

Require a password to open an Excel file

1. Select **File** > **Save As**, or press F12.
2. In the **Save As** box, select **Tools**, and then select **General Options**.
3. Enter a password in the **Password to open** box, and then select **OK**.
4. Re-enter the password in the **Confirm Password** box, and then select **OK**.
5. Select **Save**, and then select **Yes** If you wish to replace the existing file.

Require a password to modify an Excel file

1. Select **File** > **Save As**, or press F12.
2. In the **Save As** box, select **Tools**, and then select **General Options**.
3. Enter password in the **Password to modify** box, and then select **OK**.
4. Re-enter the password in the **Confirm Password** box, and then select **OK.**
5. Select **Save**, and then select **Yes** If you wish to replace the existing file.

Require separate passwords to open and modify an Excel file.

1. Select **File** > **Save As**, or press F12.
2. In the **Save As** box, select **Tools**, and then select **General Options**.

3. Enter different passwords in the **Password to modify** and **Password to open** boxes, and then select **OK**.
4. In the **Confirm Password** box, re-enter the password in the **Reenter password to proceed** field and then select **OK.**
5. In the **Confirm Password** box, re-enter the password in the **Reenter password to modify** field and then select **OK.**
6. Select **Save**, and then select **Yes** If you wish to replace the existing file.

EXCEL FOR MAC TIPS.

❖ CREATE CHARTS ON A MAC.

Charts help you visualize your data in a way that creates the most impact on your audience.

Create a chart

1. Select the data you want to represent in a chart.

   Tip: You can hold down the Command key to select non-contiguous ranges.

2. Select **Insert**.
3. Select from among the chart choices listed.
4. To delete an unwanted chart, select the chart, and press Delete.

❖ CREATE REUSABLE LISTS ON A MAC.

Creating a custom list is useful if you have a list that you frequently need in your worksheets. For example, you could have a list of all your products stored as a custom list. Every time you need the list in a spreadsheet, you just need to type in one item from the list, usually the first item, and then drag the + sign in the lower right-hand corner of the cell to automatically fill in the rest of the list.

Create a custom list

1. Select **Excel** > **Preferences**.
2. Select **Custom Lists**.
3. Select **Import list from cells**.
4. Select and drag through the cells containing the list.
5. Select **Import**, and close the dialog box.

Using a custom list

1. Select a cell
2. Type the first word of the custom list that you created.
3. Drag the + sign in the lower right-hand corner of the cell and drag it downward.

Note: Sometimes, you might want to type a word and drag the + sign in the lower right-hand corner of the cell to repeat it a few times. However, if that word is a part of a custom list, you'll get the other entries from the custom list. To avoid that, hold down the Option key, and then drag the + sign in the lower right-hand corner of the cell to repeat it a few times.

Sort data using a custom list
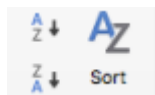
1. Select **Sort**.

   Note: As always, with sorting, make sure your list has no empty rows or columns within it.

2. In the **Sort** pop-up box, under **Order**, select **Custom List**.
3. Select the custom list entry of your choice.
4. Select **OK** > **OK**.

❖ **HIDE OR UNHIDE COLUMNS ON A MAC.**

You can hide or unhide rows or columns in your spreadsheet to show only the data you want.

Hide columns

1. Select the column or columns that you want to hide.

   Tip: To select non-adjacent columns, hold the Command key and select the columns.

2. Control + click any selected column, and then select **Hide**.

Unhide columns

1. Select the columns around the columns that you want to unhide.
2. Control + click any selected column, and select **Unhide.**
   Or, double-click the boundary between the selected columns.

   Tip: To unhide all hidden columns, select the upper left-hand corner   to select the entire worksheet, right-click any column, and select **Unhide**.