



Excel Basic: Create Formulas

Overview: Let Excel do your math for you! After an introduction to some basic functions, you'll use a spreadsheet format to create a very simple budget.

Student Skill Level: Basic

Requirements: Good mouse skills (ability to move the mouse on the computer screen and click or double click as required with minimal assistance).

Objectives

- The student will be able to understand the basics of using Microsoft Excel:
 - Understand the function of the File Tab
 - Use Ribbon, Tabs, and Groups to select commands
 - Select single cells and groups of cells in order to format them properly
 - Change Column Width
- The student will use these skills to set up a mock budget:
 - Decide how the spreadsheet will appear
 - Enter information using:
 - The keyboard
 - AutoFill
 - Create and edit formulas

This is the Example Budget we will create in this class.

	A	B	C	D
1		January	February	March
2	Job 1	913.96	900.26	961.47
3	Job 2	1,996.02	560.28	426.91
4				
5	Total Income	2,909.98	1,460.54	1,388.38
6				
7	Rent	900.00	900.00	1,250.00
8	Telephone	125.00	135.00	450.32
9	Electric	560.23	400.85	235.85
10	Groceries	280.69	263.52	460.87
11				
12	Total Expenses	1,865.92	1,699.37	2,397.04
13				
14	Difference	1,044.06	(238.83)	(1,008.66)
15				

Open Excel

Click on the icon on the taskbar

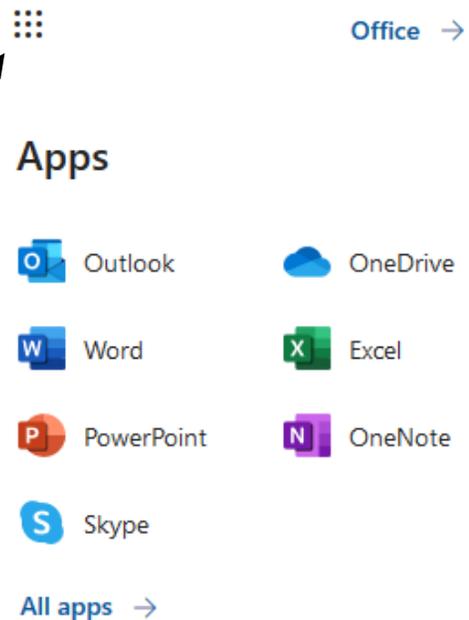


Special Note: Accessing Excel Online with Microsoft Account

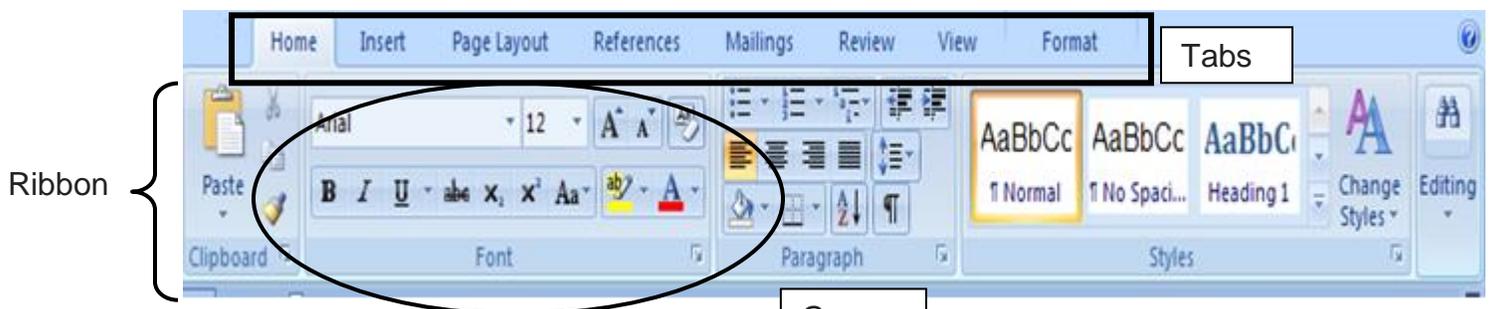
If you choose to go to www.live.com you can create a free online account with Microsoft and get access to Word, Excel, and Power Point for free (with your Internet access).

Once you create an account and sign in, the “App Drawer” (the grid) is on the left side of the web page. Click it and you’ll see the list of available applications. Click the one you wish to use.

All changes made to files created online are AUTOMATICALLY saved to your OneDrive account and can be downloaded to your computer – but I would only download the FINAL COPY because, unless you’re online or you pay for Office, you cannot edit the file. All changes must be done online and again, are saved to the OneDrive. (Same as Google Sheets and Google Drive – different companies).



The Ribbon, Tabs, and Groups



The area above the blank page is called the **Ribbon**.

To use commands and options available to you in Excel, simply click the **button** on the correct **Tab**: Home, Insert, Page Layout, References, Mailings, Review, View, or Format.

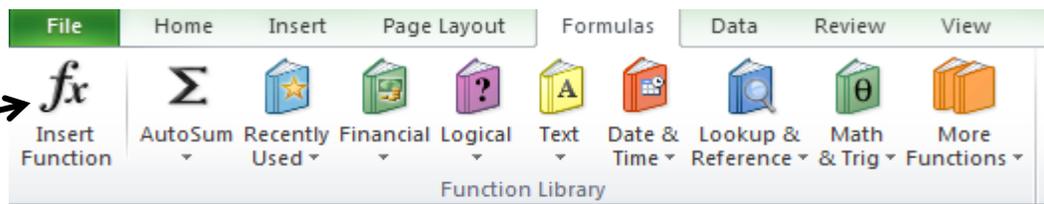
Buttons are arranged in **Groups**. In general, the most used commands are in the **Home** Tab. For example, it contains the **Clipboard** and **Basic Text Groups**.

Cut, Copy, Paste, Bold, Italicize, Underline, Center, Font Type: They’re all included in these two groups.

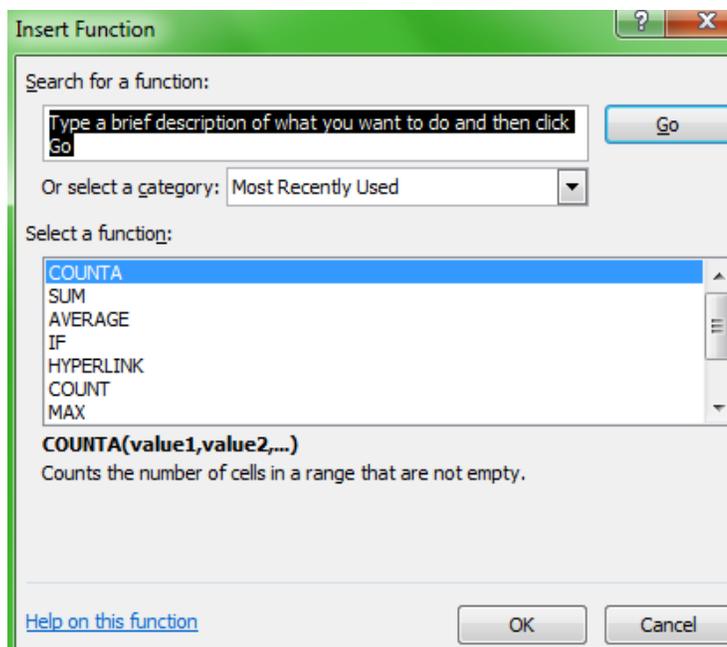
Special Note on the Ribbon: The Formulas Tab

Many people ask, “How do I find out what formulas to use in Excel?” There are really three ways to do this: use the Formulas Tab, the Help menu, or Google. A word on each:

Here’s **part** of the Formulas Tab. Click the **Insert Function** button



This is one way to find the name of a formula in Excel. All math functions are done by **name**.



The **Help menu** may also be used to search for formula names. Type your question in and, hopefully, it will display an answer.



Last, but not least, you may type your Excel question into the Google search engine. Be sure to be very specific with your question and Excel version, because Google will search the entire Web to find any answer pertaining to almost anything in your question. This can mean a lot of irrelevant answers!

The cursor, cells, and the formula bar

Cells are boxes in which the rows and the columns intersect. It (a cell) is bound on four sides like any other block. All types of information are kept in a cell – including numbers and text.

Cells are delineated by a letter (across top of worksheet) and a number (down the side). For example, cell G3 is selected on this sheet:

	A	B	C	D	E	F	G	H
1								
2								
3								

Cursor “marks the position where text or data can be entered, modified, or deleted” (HP). In Excel, the cursor is in **both** the **cell** and the **formula bar**. What is shown in the cell is not always what is in the formula bar – as we will see as we practice.

Formula bar is the place where formulas are entered; formulas are “use[d] to add, subtract, multiply or divide the values in a spreadsheet” (Author Unknown). It’s located directly **below** the **Ribbon** with an “fx” at the start:



This is important because the formula bar is where you will make corrections to virtually anything in the cells.

Click once in the proper **cell** then click once in the **formula bar**. You will see the **cursor** in the bar, and then you are ready to make corrections (with the **Backspace** or **Delete** keys)

Select Cells

Before performing any task in Excel, you must select the cells you want to work with. Selected cells appear highlighted on your screen.

To select one cell:

Click the cell you want to select

The cell becomes the active cell and displays a thick border

Use **Scroll Bars** to move up and down or across the worksheet

TAB brings you across rows to the right

Enter moves you down the column

Shift/TAB brings you across columns to the left

Arrow keys bring you up, down, left, or right across cells

Page Down brings you to the next page of worksheet

Page Up brings you to previous page of worksheet

CTRL/Home brings you to cell A1 at the beginning of worksheet

Selecting a Group of Cells:

Position the mouse over the **first** cell you want to select

Click and hold the mouse button and drag the mouse to highlight all the cells you want to select (a thick black line will surround the selected cells with the first cell in **white**, the rest **blue**)

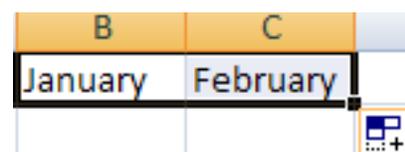
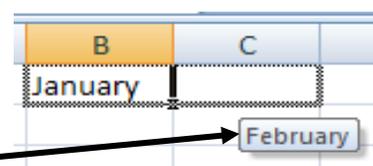
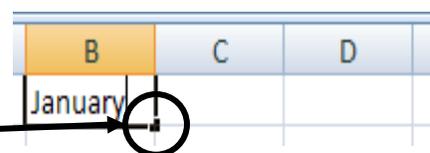
	A
1	
2	

A	B	C	D
	January	February	March
phone			
ric			
eries			
Expenses			
Income			
erence			

AutoFill

AutoFill is used on **patterns** of numbers or text in cells.

Enter the start of a sequence (**January**)
 Position the mouse cursor over the **bottom right corner** of the cell (mouse turns into a plus sign (+))
 Click and hold the mouse button and drag the mouse cursor (+) over the cells you want to receive your data
 The cells will be outlined in gray and the results appear in small type
 Let the mouse button up and the cells will automatically fill with your data



Note: **AutoFill** will also fill in a number or text sequence **you** create, or **known sequences** (for example, days of the week or months of the year)

.....Practice.....

Click cell A2. Type **Job 1**

Now use the **Enter** key to continue typing the income labels

Please type in **four types** of expenses (we're only using four different expenses in this class)

Click cell B1. Type "January." Use **AutoFill** to complete the sequence of months in Row 1, if you haven't already.

	A	B	
1		January	Febr
2	Job 1		
3	Job 2		
4			
5	Total Income		
6			
7	Rent		
8	Telephone		
9	Electric		
10	Groceries		
11			
12	Total Expenses		
13			
14	Difference		

Change Column Width

Total Expenses now hangs over our **January** column. Correct this by changing the column width (first, make sure you're in an empty cell):

Position the mouse indicator over the right edge of the column heading. (The **column heading** is between the letters at the top of the column.) You will know you're in the right place when the cursor appears as such:



Click and hold the mouse button, dragging the column edge until the dotted line displays the column width you want.

OR

Position the mouse indicator over the right edge of the column heading and double click.

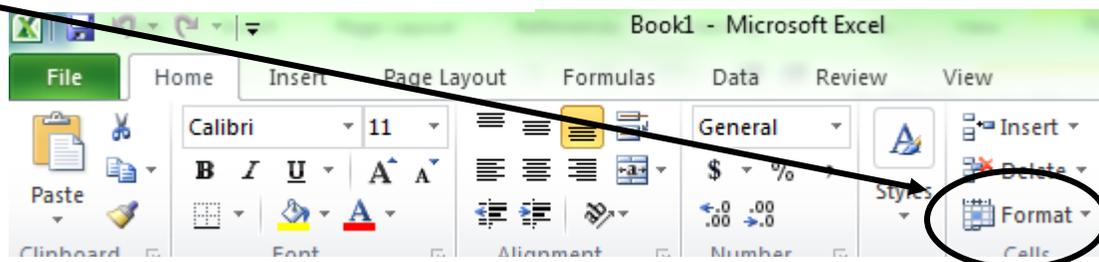
	A	B	
1		January	Febr
2	Job 1		
3	Job 2		
4			
5	Total Income		
6			
7	Rent		
8	Telephone		
9	Electric		
10	Groceries		
11			
12	Total Expenses		
13			
14	Difference		
15			

Format Cells (for numeric values)

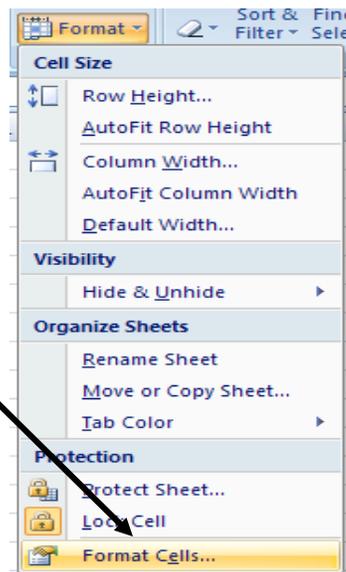
REMEMBER to select the cells you wish to format FIRST. Since we're entering data into cells B2 to D14, we will use the mouse. Your spreadsheet should look like this:

	A	B	C	D
		January	February	March
Job 1				
Job 2				
Total Income				
Rent				
Telephone				
Electric				
Groceries				
Total Expenses				
Difference				

Once you have selected the proper cells, go to the **Home** Tab, find the **Cells Group**, and click **Format**.

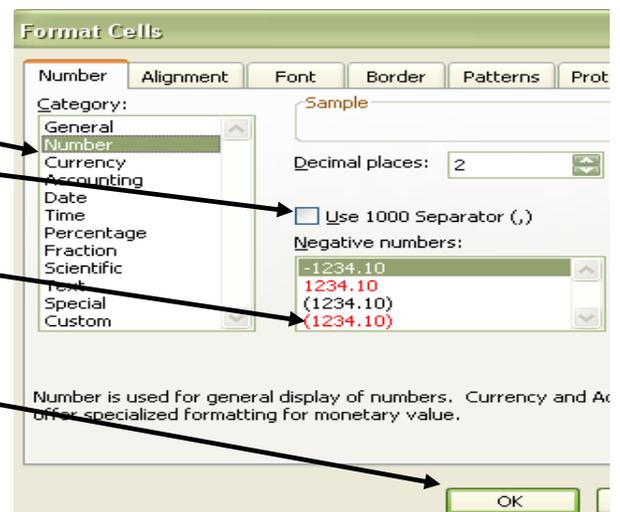


Click **Format Cells** at the bottom



In the **Format Cells** Dialog box, select:
Number – click on the word (under Category)
Use 1,000 Separator – click checkbox
Red (negative numbers) – click on the red colored number

Click **OK**



Enter Numeric Values (Expenses Only)

As we look at our example budget, we may quickly note that some expenses are in a monthly format, while others are generally weekly. **Rent**, **Telephone**, and **Electric** bills are usually due **once a month**, while **Groceries** may be a weekly or biweekly expense.

To account for this, we may enter the numeric values for **Rent**, **Telephone**, and **Electric**.

Use the **Tab** and **Enter** keys to move from one cell to the next.

Note the formula bar – it displays one number for each cell (**B7** is **900** and nothing more). Please enter values now. **Leave Groceries blank**.

	A	B	C	D
1		January	February	March
2	Job 1			
3	Job 2			
4				
5	Total Income			
6				
7	Rent	900.00	900.00	1,250.00

Formulas

There are many different kinds of formulas. **ALL** formulas in Excel begin with an **equal sign (=)**.

We will enter formulas **manually** (meaning we won't use the Formula Wizard).

We will create several simple formulas. These formulas are the building blocks of every other one you may use in Excel, including:

Adding **numbers** (starting with our **Groceries** expense and moving to **Job 1** and **Job 2**) (Cells B10, B2, B3)

Using the SUM formula with **cells** (not numbers!) (Cells B5 and B12)

Using a subtraction formula (with cells) (Cell B14)

Formulas with Numeric Values – January only

Remember to type the equal sign (“=”) in front of all formulas!

We'll practice with **January** together; you may move on to the other months on your own in class.

We can use Excel to account for weekly expenses, even in the monthly format of our budget, by using an **addition formula with numbers**.

For each grocery expense, we see a string of numbers added together in the formula bar, **NOT** a single number.

So in our first **Grocery** cell, **B10**, we see:

=80+56+102.34+42.35

	B	C	D	E
	January	February	March	
	900.00	900.00	1,250.00	
	125.00	135.00	450.32	
	560.23	400.85	235.85	
	280.69			

Remember, you may simply take your weekly shopping receipts and add them together by:

Clicking once on the cell

Clicking once in the formula bar

Typing in a **plus sign** and the **amount spent** on groceries that week

Perhaps we had a New Year's party and needed to account for an extra grocery trip. We would click on cell B10 and add the new expense. Our formula would add it together:

=80+56+102.34+42.35+**92.75** (displaying **373.44** in cell B10)

No need to wait until the end of the month! Excel will add, subtract, multiply, or divide any numbers and display the result in the cell you choose.

SKIP UP TO JANUARY JOBS (Income) (we'll cover **Totals** later)

Our **jobs (income)** may be tallied in the same manner. Most people are paid weekly or biweekly.

To achieve a "monthly" format, we may simply create a simple addition formula in cell **B2**:

=250.23+250.10+213.62+200.01

	B	C	D	E	F
	January	February	March		
Job 1	913.96				
Job 2	1,996.02				

Again, the results will display as a single number in cell B2. You will see the formula in the formula bar. Please create another formula for Job 2 in **January only** (you may practice the rest later)

Formulas with Cell Values – January only

Creating formulas with numbers works well, as long as there's a small amount (as in our example) and only one cell to deal with. Some formulas work better based on **cells** rather than individual numeric values. Using **cell references** instead of "hard" or unchanging values allows us to correct mistakes, add numbers, add cells containing other formulas, or even add rows or columns and Excel will **automatically correct** any formula containing those specific cell references. This is the fun of using the spreadsheet!

In our example budget, the **totals** and **differences** are easily calculated using built-in Excel formulas. Remember, there are no spaces in any formula and capitalization does not matter.

Excel uses the following:

= – remember all formulas start with the equal sign

FORMULA NAME – we will use the SUM formula with cell references to get our answer (totals)

(– open parentheses tells Excel that a cell reference follows – "B3" as an example

: or , – "through" colons tell Excel to see the reference as a group, commas or math symbols indicate non-continuous cell references **You may also use math symbols (+ - * /) for non-continuous cell references. We'll see this in the difference formula**

) – closed parentheses tells Excel that the cell reference has ended

EXAMPLE FORMULA: =sum(b2:b3) is read in "English" as follows: "Equal sign, sum, open parenthesis, b2 through b3, close parenthesis"

Look at the following examples for January:
For **Total Expenses**, our formula in cell **B12** will be as follows:

=sum(b7:b10) Note the equal sign, name of formula, and continuous cell reference – with the parentheses and colon. We also see a blue square around the cells being added. This is a nice visual reference we can use to be sure we're adding the right numbers.

Once we press the Enter key, we see the formula in the formula bar and the answer displayed in the cell itself.

7	Rent	900.00	900.00
8	Telephone	125.00	125.00
9	Electric	560.23	400.00
10	Groceries	280.69	280.69
11			
12	Total Expenses	=sum(b7:b10)	

January's **total income** is in cell B5:
=sum(b2:b3)

COUNTA			
	A	B	
1		January	Feb
2	Job 1	913.96	
3	Job 2	1,996.02	
4			
5	Total Income	=sum(b2:b3)	

Formulas – Mixed (Cell References and Math Symbols)

The **difference** formula is a combination of cell references and math signs:

=(b5-b12)

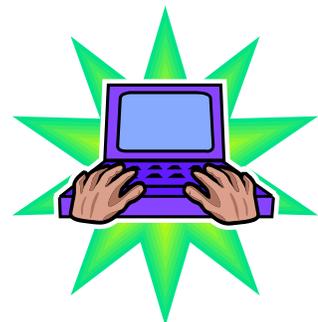
This takes into account non-continuous cells and allows Excel to correct the answers if needed.

fx		
		=(B5-B12)
C	D	
14	Difference	1,044.06
15		

Once the difference formula is in place, change **any** number (including any number we entered in the **Grocery** formula) in the January column – if you've entered the formula correctly, your answer, in cell B14, will change!

.....Practice.....

Please use the remaining class time to practice creating formulas for February and March. Remember to change your cell references as you create the totals and differences!



Resources

****These items are available in the NIOGA Library System!****

****Contact your local library for assistance!****

Author	Title
Bluttman, K	Excel formulas & functions for dummies
McFedries, P	Teach Yourself Visually: Excel 2016
Price, M	Excel 2016 : in easy steps
Nelson, S	Excel data analysis for dummies

Edited 2021

Funding for computer training is provided by the Nioga Library System



NIOGA LIBRARY SYSTEM

6575 Wheeler Road - Lockport, NY 14094
Phone - (716) 434-6167 Fax - (716) 434-8231



Microsoft®

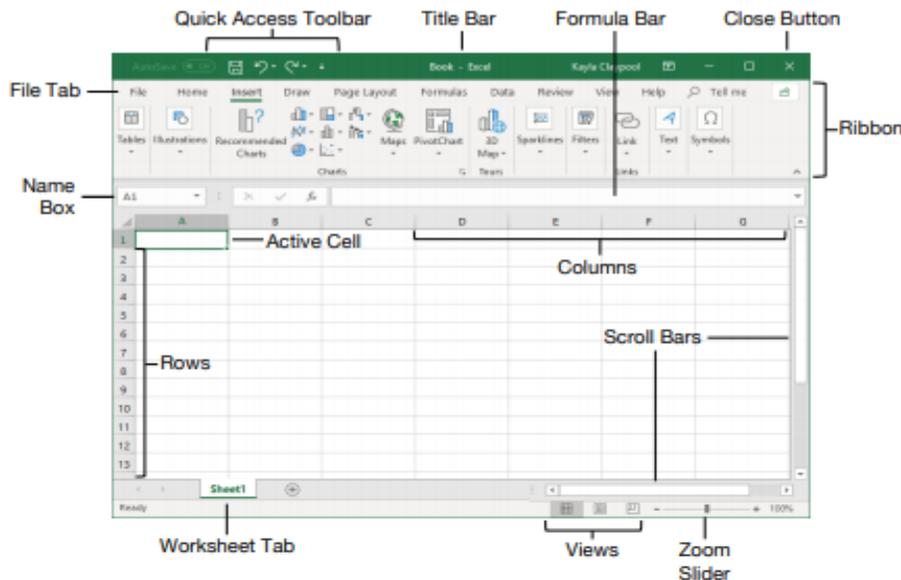
Excel 2019 Basic

Quick Reference Card



Free Quick References
Visit ref.customguide.com

The Excel 2019 Program Screen



Keyboard Shortcuts

General

Open a workbook	Ctrl + O
Create a new workbook.....	Ctrl + N
Save a workbook.....	Ctrl + S
Print a workbook.....	Ctrl + P
Close a workbook.....	Ctrl + W
Help	F1
Activate Tell Me field	Alt + Q
Spell check	F7
Calculate worksheets.....	F9
Create absolute reference	F4

Navigation

Move between cells	↑, ↓, ←, →
Right one cell	Tab
Left one cell	Shift + Tab
Down one cell	Enter
Up one cell.....	Shift + Enter
Down one screen.....	Page Down
To first cell of active row.....	Home
Enable End mode	End
To cell A1.....	Ctrl + Home
To last cell.....	Ctrl + End

Editing

Cut	Ctrl + X
Copy.....	Ctrl + C
Paste	Ctrl + V
Undo.....	Ctrl + Z
Redo.....	Ctrl + Y
Find	Ctrl + F
Replace	Ctrl + H
Edit active cell.....	F2
Clear cell contents	Delete

Formatting

Bold.....	Ctrl + B
Italics	Ctrl + I
Underline	Ctrl + U
Open Format Cells dialog box.....	Ctrl + Shift + F
Select All.....	Ctrl + A
Select entire row	Shift + Space
Select entire column	Ctrl + Space
Hide selected rows	Ctrl + 9
Hide selected columns.....	Ctrl + 0

Getting Started



Info
New
Open
Save
Save As
Print
Share
Export
Publish
Close
Account
Options

The File tab opens Backstage view, which contains commands for working with your files like Open, Save, New, Print, Share, and Close.

Create a Workbook: Click the **File** tab and select **New** or press **Ctrl + N**. Double-click a workbook.

Open a Workbook: Click the **File** tab and select **Open** or press **Ctrl + O**. Select a recent file or navigate to the location where the file is saved.

The Excel 2019 Screen

Preview and Print a Workbook: Click the **File** tab and select **Print**.

Undo: Click the **Undo** button on the Quick Access Toolbar.

Redo or Repeat: Click the **Redo** button on the Quick Access Toolbar. The button turns to Repeat once everything has been re-done.

Close a Workbook: Click the **Close** X button in the upper-right corner.

Use Zoom: Click and drag the zoom slider to the left or right.

Cell Address: Cells are referenced by an address made from their column letter and row number, such as cell A1, B2, etc. Find the address of a cell by looking at the Name Box to the left of the formula bar.

Select a Cell: Click a cell or use the keyboard arrow keys to select it.

Select a Cell Range: Click and drag to select a range of cells. Or, press and hold down the **Shift** key while using the arrow keys to move the selection to the last cell of the range. Use the **Ctrl** key to select non-adjacent cell ranges.

Select an Entire Worksheet: Click the **Select All** button where the column and row headings meet.

Change Program Settings: Click the **File** tab and select **Options**.

Change Views: Click a **View** button in the status bar. Or, click the **View** tab and select a view.

Your Organization's Name Here

Add your own message, logo, and contact information!

© 2019 CustomGuide, Inc.

To learn more, contact ref@customguide.com | 612.871.5004

Edit a Workbook

Edit a Cell's Contents: Select a cell and click in the Formula Bar, or double-click the cell. Edit the cell's contents and press **Enter**.

Clear a Cell's Contents: Select the cell(s) and press the **Delete** key. Or, click the **Clear**  button on the Home tab and select **Clear Contents**.

Cut or Copy Data: Select cell(s) and click the **Cut**  or **Copy**  button on the Home tab.

Paste Data: Select the cell where you want to paste the data and click the **Paste**  button in the Clipboard group on the Home tab.

Preview an Item Before Pasting: Place the insertion point where you want to paste, click the **Paste**  button list arrow in the Clipboard group on the Home tab, and hold the mouse over a paste option to preview.

Paste Special: Select the destination cell(s), click the **Paste**  button list arrow in the Clipboard group on the Home tab, and select **Paste Special**. Select an option and click **OK**.

Move or Copy Cells Using Drag and Drop: Select the cell(s) you want to move or copy, position the pointer over any border of the selected cell(s), then drag to the destination cells. To copy, hold down the **Ctrl** key before starting to drag.

Insert a Column or Row: Right-click to the right of the column or below the row you want to insert. Select **Insert** in the menu, or click the **Insert**  button on the Home tab.

Delete a Column or Row: Select the row or column heading(s) you want to remove. Right-click and select **Delete** from the contextual menu, or click the **Delete**  button in the Cells group on the Home tab.

Hide Rows or Columns: Select the rows or columns you want to hide, click the **Format**  button on the Home tab, select **Hide & Unhide**, and select **Hide Rows** or **Hide Columns**.

Basic Formatting

Format Text: Use the commands in the Font group on the Home tab, or click the dialog box launcher  in the Font group to open the dialog box.

Format Values: Use the commands in the Number group on the Home tab, or click the dialog box launcher  in the Number group to open the Format Cells dialog box.

Change Cell Alignment: Select the cell(s) you want to align and click a vertical alignment  button or a horizontal alignment  button in the Alignment group on the Home tab.

Wrap Text in a Cell: Select the cell(s) that contain text you want to wrap and click the **Wrap Text**  button on the Home tab.

Basic Formatting

Merge Cells: Select the cells you want to merge. Click the **Merge & Center**  button list arrow on the Home tab and select a merge option.

Cell Borders and Shading: Select the cell(s) you want to format. Click the **Borders**  button and/or the **Fill Color**  button and select an option to apply to the selected cell.

Copy Formatting with the Format Painter: Select the cell(s) with the formatting you want to copy. Click the **Format Painter**  button in the Clipboard group on the Home tab. Then, select the cell(s) you want to apply the copied formatting to.

Adjust Column Width or Row Height: Click and drag the right border of the column header or the bottom border of the row header. Double-click the border to AutoFit the column or row according to its contents.

Basic Formulas

Enter a Formula: Select the cell where you want to insert the formula. Type = and enter the formula using values, cell references, operators, and functions. Press **Enter**.

Insert a Function: Select the cell where you want to enter the function and click the **Insert Function**  button next to the formula bar.

Reference a Cell in a Formula: Type the cell reference (for example, B5) in the formula or click the cell you want to reference.

The Sum Function: Click the cell where you want to insert the total and click the **Sum**  button in the Editing group on the Home tab. Enter the cells you want to total, and press **Enter**.

The Min and Max Functions: Click the cell where you want to place a minimum or maximum value for a given range. Click the **Sum**  button list arrow on the Home tab and select either **Min** or **Max**. Enter the cell range you want to reference, and press **Enter**.

The Count Function: Click the cell where you want to place a count of the number of cells in a range that contain numbers. Click the **Sum**  button list arrow on the Home tab and select **Count Numbers**. Enter the cell range you want to reference, and press **Enter**.

Complete a Series Using AutoFill: Select the cells that define the pattern, i.e. a series of months or years. Click and drag the fill handle to adjacent blank cells to complete the series.



Insert Objects

Insert an Image: Click the **Insert** tab on the ribbon, click either the **Pictures**  or **Online Pictures**  button in the Illustrations group, select the image you want to insert, and click **Insert**.

Insert Objects

Insert a Shape: Click the **Insert** tab on the ribbon, click the **Shapes**  button in the Illustrations group, and select the shape you wish to insert.

Hyperlink Text or Images: Select the text or graphic you want to use as a hyperlink. Click the **Insert** tab, then click the **Link**  button. Choose a type of hyperlink in the left pane of the Insert Hyperlink dialog box. Fill in the necessary informational fields in the right pane, then click **OK**.

Modify Object Properties and Alternative Text: Right-click an object. Select **Edit Alt Text** in the menu, and make the necessary modifications under the Properties and Alt Text headings.

View and Manage Worksheets

Insert a New Worksheet: Click the **Insert Worksheet**  button next to the sheet tabs below the active sheet. Or, press **Shift + F11**.

Delete a Worksheet: Select the sheet you want to delete, click the **Delete**  button list arrow in the Cells group on the Home tab, and select **Delete Sheet**. Or, right-click the sheet tab and select **Delete** from the menu.

Rename a Worksheet: Double-click the sheet tab, enter a new name for the worksheet, and press **Enter**.

Change a Worksheet's Tab Color: Right-click the sheet tab, select **Tab Color**, and choose the color you want to apply.

Move or Copy a Worksheet: Click and drag a worksheet tab left or right to move it to a new location. Hold down the **Ctrl** key while clicking and dragging to copy the worksheet.

Split a Window: Activate the cell where you want to split the window. Click the **View** tab and click the **Split**  button in the Window group. Or, press **Alt + WS** (one at a time).

Freeze Panes: Activate the cell where you want to freeze the window, click the **View** tab on the ribbon, click the **Freeze Panes**  button in the Window group, and select an option from the list.

Select a Print Area: Select the cell range you want to print, click the **Page Layout** tab on the ribbon, click the **Print Area**  button, and select **Set Print Area**.

Adjust Page Margins, Orientation, Size, and Breaks: Click the **Page Layout** tab on the ribbon and use the commands in the Page Setup group, or click the dialog box launcher  in the Page Setup group to open the Page Setup dialog box.

Recover Autosaved Versions: Click the **File** tab on the ribbon and select **Info**. Select an autosaved version from the versions list. Or, click the **Manage Workbook** button and select **Recover Unsaved Workbooks**.

