

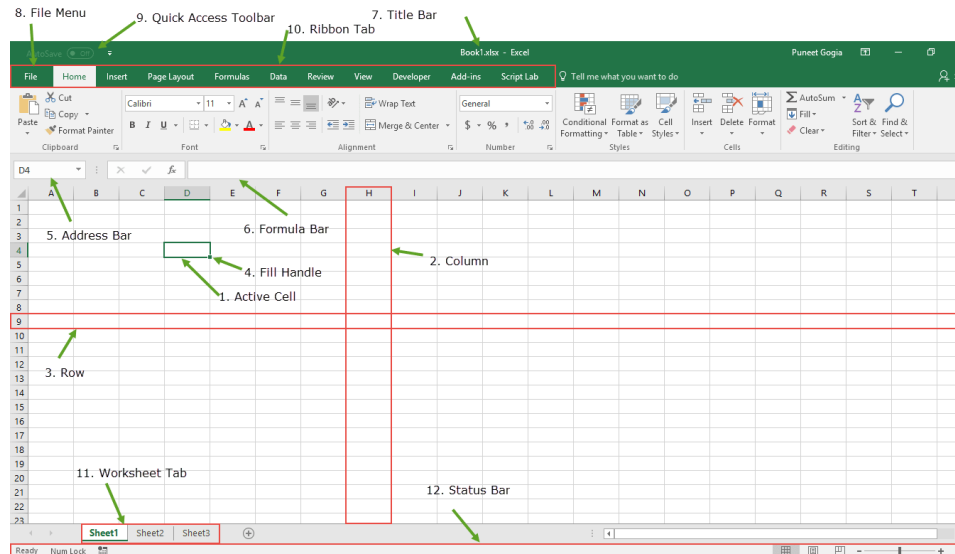
SPREAD SHEETS

A spreadsheet is an electronic document that stores various types of data. There are vertical columns and horizontal rows. An Excel spreadsheet can contain workbooks and worksheets. The workbook is the holder for related worksheets.

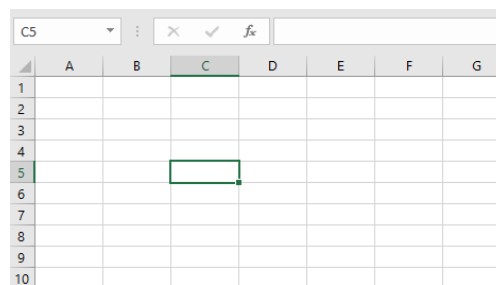
Understanding cells

Every worksheet is made up of thousands of rectangles, which are called **cells**. A cell is the **intersection** of a **row** and a **column**—in other words, where a row and column meet.

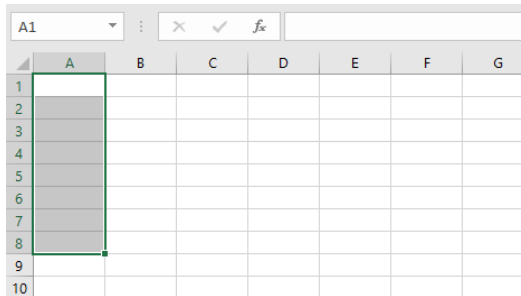
A cell can contain data and can be used in calculations of data within the spreadsheet.



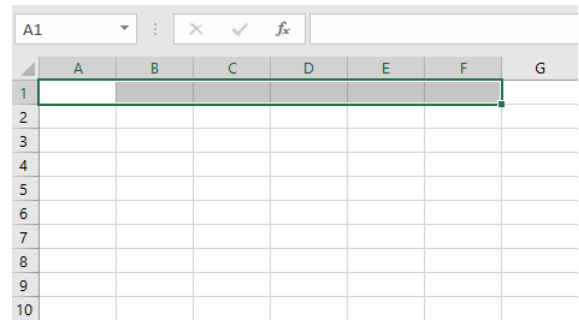
Columns are identified by **letters (A, B, C)**, while rows are identified by **numbers (1, 2, 3)**. Each cell has its own **name**—or **cell address**—based on its column and row. In the example below, the selected cell intersects **column C** and **row 5**, so the cell address is **C5**.



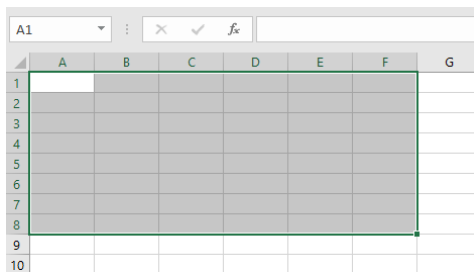
You can select **multiple cells** at the same time. A group of cells is known as a **cell range**. You will refer to a cell range using the cell addresses of the **first** and **last** cells in the cell range, separated by a **colon**. For example, a cell range that included cells A1, A2, A3, A4, and A5 would be written as **A1:A5**. Take a look at the different cell ranges below:



Cell range A1:A8



Cell range A1:F1



Cell range A1:F8

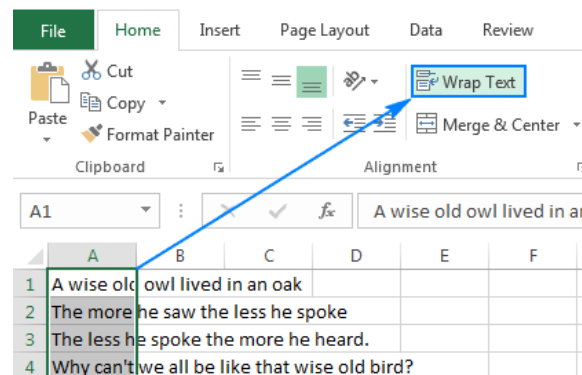
Wrapping text and merging cells

Whenever you have too much cell content to be displayed in a single cell, you may decide to **wrap the text** or **merge** the cell rather than resize a column. Wrapping the text will automatically modify a cell's **row height**, allowing cell contents to be displayed **on multiple lines**. Merging allows you to combine a cell with adjacent empty cells to create **one large cell**.

To wrap text in cells:

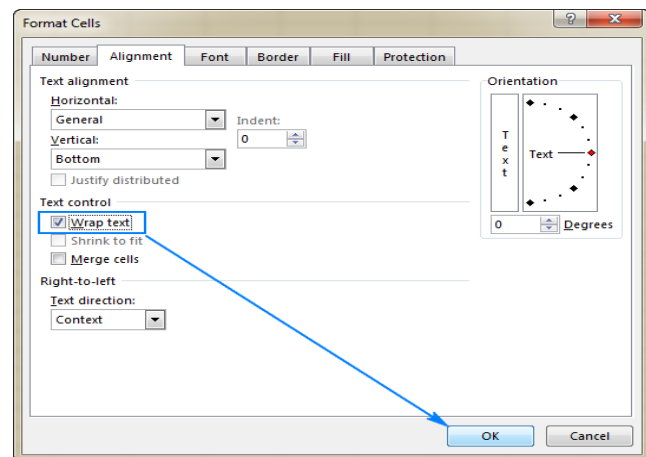
Method: 1

1. Select the cells you want to wrap. In this example, we'll select the cells in **column A**
2. Click the **Wrap Text** command on the **Home** tab.
3. The text in the selected cells will be **wrapped**



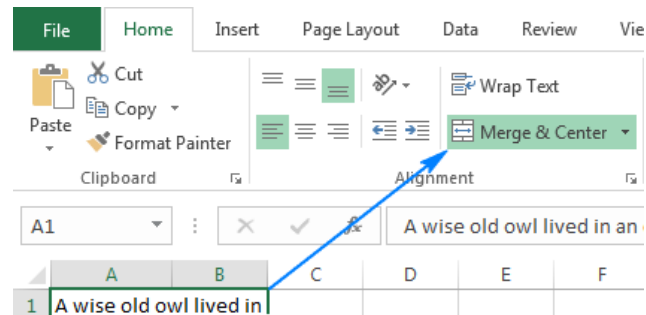
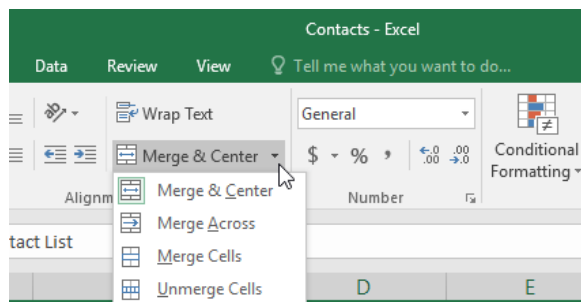
NB Click the **Wrap Text** command again to **unwrap** the text

Method 2. Press **Ctrl + 1** to open the *Format Cells* dialog (or right-click the selected cells and then click *Format Cells...*), switch to the *Alignment* tab, select the *Wrap Text* checkbox, and click OK



To merge cells using the Merge & Centre command:

1. Select the **cell range** you want to merge.
2. Click the **Merge & Center** command on the **Home** tab.
3. The selected cells will be **merged**, and the text will be **centered**.



To access more merge options:

If you click the drop-down arrow next to the **Merge & Center** command on the **Home** tab, the **Merge** drop-down menu will appear. From here, you can choose to:

- **Merge & Center:** merges the selected cells into **one cell** and **centers** the text
- **Merge Across:** merges the selected cells into **larger cells** while keeping each **row** separate
- **Merge Cells:** merges the selected cells into one cell but **does not center** the text
- **Unmerge Cells:** unmerges selected cells

Common words used in excel

Worksheet/Spreadsheet – is a grid of columns (indicated by letters) and rows (indicated by numbers)

Workbook – is a collection of worksheets.

A row – is the horizontal arrangement of cells from left to right of the worksheet

A column – is the vertical arrangement of cells from top to down

Labels – is text within a cell, usually describing data in the rows or columns surrounding it.

A cell – is the intersection of a column and a row

Cell address/cell references - are the combination of column letter and row number. For example, the upper-left cell of a worksheet is A1.

Absolute cell reference - is a cell reference in a spreadsheet application that remains constant even if the shape or size of the spreadsheet is changed, or the reference is copied or moved to another cell or sheet.

Range – is the selected group of adjacent cells

Modifying Columns, Rows, and Cells

Introduction

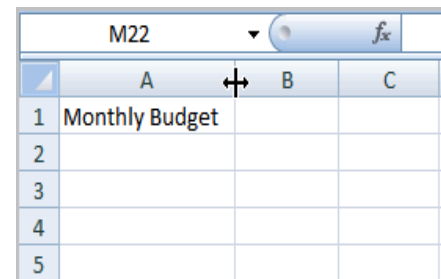
When you open a new blank workbook, the cells, columns, and rows are set to a **default size**. You have the ability to change the size of each, as well as to insert new columns, rows, and cells as needed. In this lesson, you will learn various methods to modify the column width and row height, as well as how to insert new columns, rows, and cells.

Columns, rows, and cells

To modify column width:

Method:1

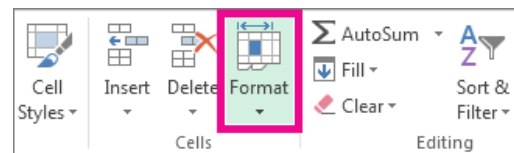
- Position the **cursor** over the **column line** in the column heading, and a **double arrow** will appear.
 - Left-click the mouse, then **drag** the cursor to the **right** to **increase** the column width or to the **left** to **decrease** the column width.
 - **Release** the mouse button.
- OR
- Left-click the **column heading** of a column you'd like to modify. The entire column will appear **highlighted**



Method: 2

Set a column to a specific width

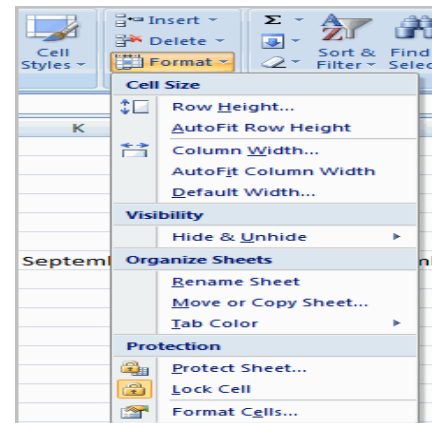
1. Select the column or columns that you want to change.
 2. On the **Home** tab, in the **Cells** group, click **Format**.
1. Under **Cell Size**, click **Column Width**.
 2. In the **Column width** box, type the value that you want.
 3. Click **OK**.



Click the **Format** command in the Cells group on the **Home** tab. A menu will appear

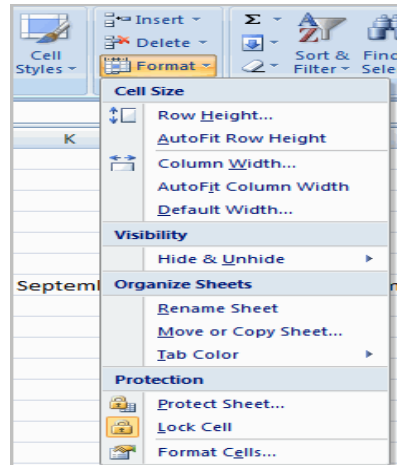
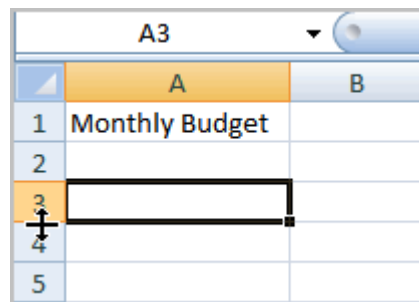
- Select **Column Width** to enter a specific column measurement.
- Select **AutoFit Column Width** to adjust the column so all of the text will fit

NB: If you see **pound signs** (#####) in a cell, it means that the column is not wide enough to display the cell content. Simply **increase the column width** to show the cell content.



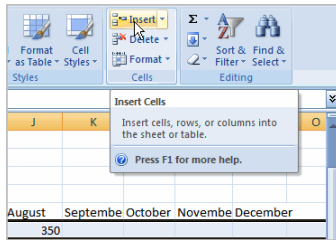
To modify the row height:

- Position the **cursor** over the **row line** you want to modify, and a **double arrow** will appear.
- Left-click the mouse, then **drag** the cursor **upward** to **decrease** the row height or **downward** to **increase** the row height.
- **Release** the mouse button. OR
- Click the **Format** command in the Cells group on the **Home** tab. A menu will appear.
- Select **Row Height** to enter a **specific row measurement**.
- Select **AutoFit Row Height** to adjust the row so all of the text will fit



To insert rows:

- Select the row **below** where you want the new row to appear.
- Click the **Insert** command in the Cells group on the **Home** tab. The row will appear.



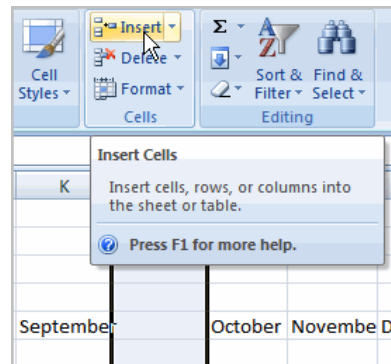
NB: The new row always appears above the selected row.

Make sure you select the **entire row** below where you want the new row to appear and **not** just the **cell**. If you select just the cell and then click Insert, only a new cell will appear.

To insert columns:

- Select the column to the right of where you want the column to appear.
- Click the **Insert** command in the Cells group on the Home tab. The column will appear

NB: The new column always appears to the left of the selected column. For example, if you want to insert a column between September and October, select the October column, then click the Insert command.



Make sure you select the **entire column** to the right of where you want the new column to appear and **not** just the **cell**. If you select just the cell and then click Insert, only a new cell will appear.

To delete rows and columns:

- Select the row or column you'd like to delete.
- Click the Delete command in the Cells group on the Home tab.

Freezing Panes and View Options

Introduction

Whenever you're working with a lot of data, it can be difficult to **compare** information in your workbook. Fortunately, Excel includes several tools that make it easier to view content from different parts of your workbook at the same time, including the ability to **freeze panes** and **split** your worksheet.

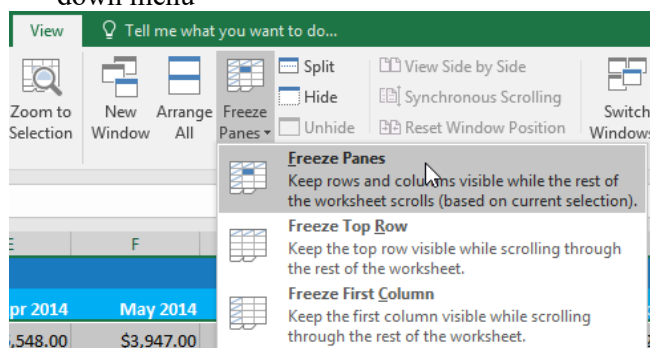
To freeze rows:

You may want to see certain rows or columns all the time in your worksheet, especially **header cells**. By **freezing** rows or columns in place, you'll be able to scroll through your content while continuing to view the frozen cells.

1. Select the **row** below the row(s) you want to **freeze**. In our example, we want to freeze rows **1** and **2**, so we'll select row **3**.

	A	B	C	D	E	F
1	2014-2015 Sales Data					
2	Salesperson	Jan 2014	Feb 2014	Mar 2014	Apr 2014	May 2014
3	Albertson, Kathy	\$3,799.00	\$4,162.00	\$10,491.00	\$6,548.00	\$3,947.00
4	Allenson, Carol	\$18,930.00	\$3,993.00	\$9,133.00	\$19,845.00	\$4,411.00
5	Altman, Zoey	\$5,725.00	\$4,848.00	\$8,741.00	\$11,138.00	\$2,521.00
6	Bittiman, William	\$1,344.00	\$3,693.00	\$15,346.00	\$17,253.00	\$4,752.00

- On the **View** tab, select the **Freeze Panes** command, then choose **Freeze Panes** from the drop-down menu



- The rows will be **frozen** in place, as indicated by the **gray line**. You can **scroll down** the worksheet while continuing to view the frozen rows at the top. In our example, we've scrolled down to row **18**.

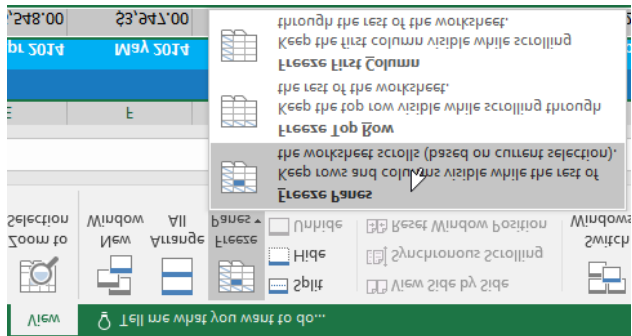
	A	B	C	D	E	F
1	2014-2015 Sales Data					
2	Salesperson	Jan 2014	Feb 2014	Mar 2014	Apr 2014	May 2014
18	Hodges, Melissa	\$4,624.00	\$14,772.00	\$19,830.00	\$6,303.00	\$5,667.00
19	Jameson, Robinson	\$2,552.00	\$1,627.00	\$4,382.00	\$9,083.00	\$4,269.00
20	Kellerman, France	\$4,281.00	\$7,375.00	\$17,730.00	\$19,998.00	\$3,502.00
21	Mark, Katharine	\$4,679.00	\$3,058.00	\$1,497.00	\$5,722.00	\$5,853.00

To freeze columns:

- Select the **column** to the right of the column(s) you want to **freeze**. In our example, we want to freeze **column A**, so we'll select column **B**.

	A	B	C	D	E	F
1	2014-2015 Sales Data					
2	Salesperson	Jan 2014	Feb 2014	Mar 2014	Apr 2014	May 2014
3	Albertson, Kathy	\$3,799.00	\$4,162.00	\$10,491.00	\$6,548.00	\$3,947.00
4	Allenson, Carol	\$18,930.00	\$3,993.00	\$9,133.00	\$19,845.00	\$4,411.00
5	Altman, Zoey	\$5,725.00	\$4,848.00	\$8,741.00	\$11,138.00	\$2,521.00
6	Bittiman, William	\$1,344.00	\$3,693.00	\$15,346.00	\$17,253.00	\$4,752.00

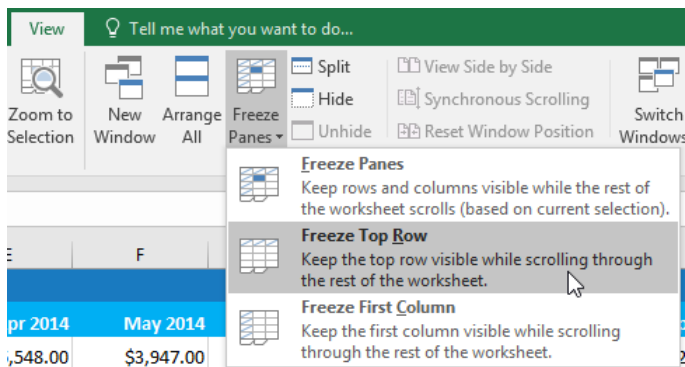
- On the **View** tab, select the **Freeze Panes** command, then choose **Freeze Panes** from the drop-down menu.



3. The column will be **frozen** in place, as indicated by the **gray line**. You can **scroll across** the worksheet while continuing to view the frozen column on the left. In our example, we've scrolled across to column **E**

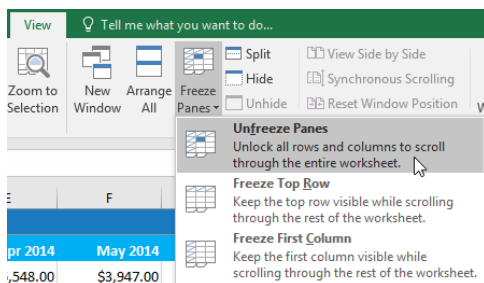
	A	E	F	G	H	I
1	2014-2015 Salesperson					
2	Salesperson	Apr 2014	May 2014	Jun 2014	Jul 2014	Aug 2014
3	Albertson, Kathy	\$6,548.00	\$3,947.00	\$557.00	\$3,863.00	\$1,117.00
4	Allenson, Carol	\$19,845.00	\$4,411.00	\$1,042.00	\$9,355.00	\$1,100.00
5	Altman, Zoey	\$11,138.00	\$2,521.00	\$3,072.00	\$6,702.00	\$2,116.00
6	Bittiman, William	\$17,253.00	\$4,752.00	\$3,755.00	\$4,415.00	\$1,089.00

NB. If you only need to freeze the **top row** (row 1) or **first column** (column A) in the worksheet, you can simply select **Freeze Top Row** or **Freeze First Column** from the drop-down menu



To unfreeze panes:

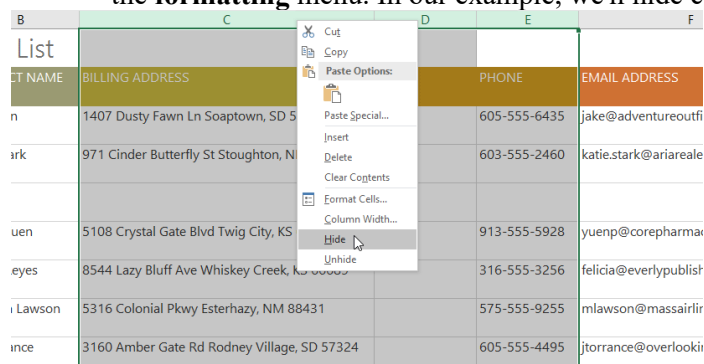
If you want to select a different view option, you may first need to reset the spreadsheet by unfreezing panes. To **unfreeze** rows or columns, click the **Freeze Panes** command, then select **Unfreeze Panes** from the drop-down menu.



To hide and unhide a row or column:

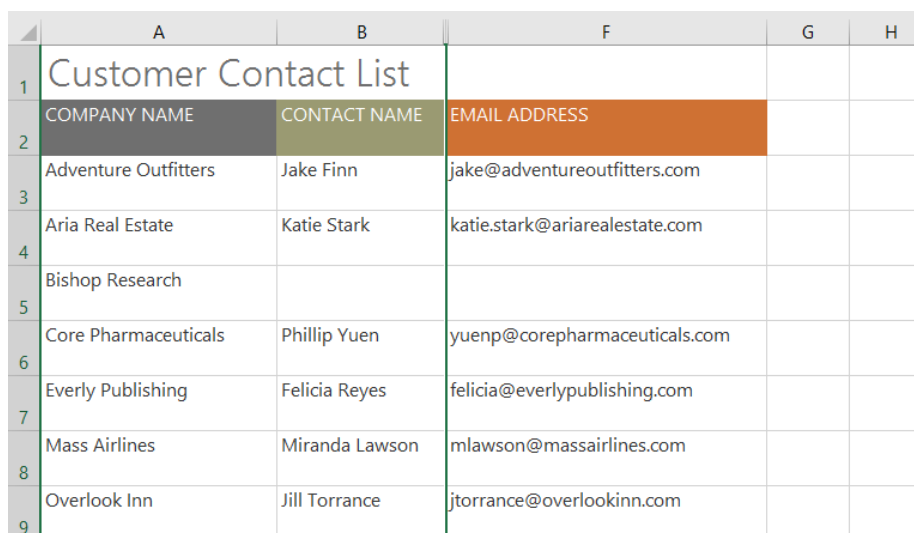
At times, you may want to **compare** certain rows or columns without changing the organization of your worksheet. To do this, Excel allows you to **hide** rows and columns as needed. In our example we'll hide a few columns, but you can hide rows in the same way.

1. Select the **columns** you want to **hide**, right-click the mouse, then select **Hide** from the **formatting** menu. In our example, we'll hide columns C, D, and E.



	B	C	D	E	F
	List				
CT NAME		BILLING ADDRESS		PHONE	EMAIL ADDRESS
n		1407 Dusty Fawn Ln Soaptown, SD 5		605-555-6435	jake@adventureoutfi
rk		971 Cinder Butterfly St Stoughton, N		603-555-2460	katie.stark@ariareale
uen		5108 Crystal Gate Blvd Twig City, KS		913-555-5928	yuenp@corepharma
eyes		8544 Lazy Bluff Ave Whiskey Creek, K		316-555-3256	felicia@everlypublis
i Lawson		5316 Colonial Pkwy Esterhazy, NM 88431		575-555-9255	mlawson@massairlir
nce		3160 Amber Gate Rd Rodney Village, SD 57324		605-555-4495	jtorrance@overlookii

2. The columns will be **hidden**. The **green column line** indicates the location of the hidden columns.



	A	B	F	G	H
1	Customer Contact List				
2	COMPANY NAME	CONTACT NAME	EMAIL ADDRESS		
3	Adventure Outfitters	Jake Finn	jake@adventureoutfitters.com		
4	Aria Real Estate	Katie Stark	katie.stark@ariarealestate.com		
5	Bishop Research				
6	Core Pharmaceuticals	Phillip Yuen	yuenp@corepharmaceuticals.com		
7	Everly Publishing	Felicia Reyes	felicia@everlypublishing.com		
8	Mass Airlines	Miranda Lawson	mlawson@massairlines.com		
9	Overlook Inn	Jill Torrance	jtorrance@overlookinn.com		

3. To **unhide** the columns, select the columns on **both sides** of the hidden columns. In our example, we'll select columns **B** and **F**. Then right-click the mouse and select **Unhide** from the **formatting** menu.

	A	B	F	G	H
1	Customer Contact List				
2	COMPANY NAME	CONTACT NAME	EMAIL ADDRESS		
3	Adventure Outfitters	Jake Finn	jake@adventureoutfitters.com		
4	Aria Real Estate	Katie Stark	katie.stark@ariarealestate.com		
5	Bishop Research				
6	Core Pharmaceuticals	Phillip Yuen	yuenp@corepharm.com		
7	Everly Publishing	Felicia Reyes	felicia@everlypublishing.com		
8	Mass Airlines	Miranda Lawson	mlawson@massairlines.com		
9	Overlook Inn	Jill Torrance	jtorrance@overlookinn.com		

4. The hidden columns will reappear

Overlook Inn	3100 Amber Gate Rd Rodney Village, SD 57354		602-222-4482	jtorrance@overlookinn.com
Mass Airlines	2310 Colonial Park Estates, IN 46241		212-222-8522	mlawson@massairlines.com
Everly Publishing	8244 Lash Blvd Wintkey Creek, K2 88888		318-222-3528	felicia@everlypublishing.com
Core Pharmaceuticals	2108 Crystal Gate Blvd Twin City, K2 88508		813-222-2858	yuenp@corepharm.com
Aria Real Estate	811 Cinder Butterfly St Zionsville, IN 46054		803-222-5480	katie.stark@ariarealestate.com
Adventure Outfitters	1401 Dugby Farm Ln Zionsville, SD 57888		802-222-8432	jake@adventureoutfitters.com
COMPANY NAME	BUSINESS ADDRESS	FAX	PHONE	EMAIL ADDRESS

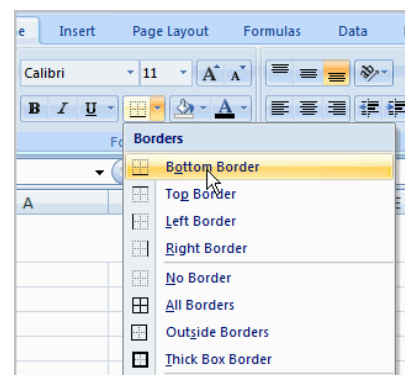
To add a border:

- Select the cell or cells you want to format.

Click the **drop-down arrow** next to the **Borders** command on the **Home** tab. A menu will appear with border options

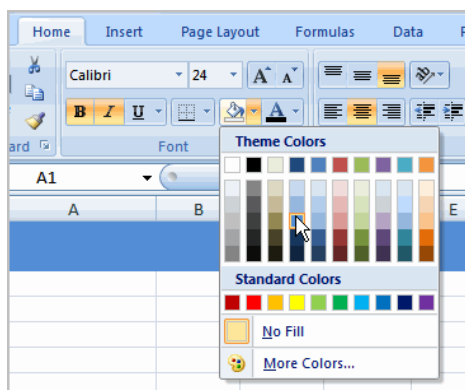
Left-click an option from the list to select it

NB: You can change the **line style** and **color** of the border



To add a fill color:

- Select the cell or cells you want to format.
- Click the **Fill** command. A color palette will appear.
- Select a color.



OR

- Select **More Colors**. A dialog box will appear.
- Select a color.
- Click **OK**.

You can use the **fill color feature** to format columns and rows and format a worksheet so it's easier to read.

Understanding Number Formats

What are number formats?

Whenever you're working with a spreadsheet, it's a good idea to use appropriate **number formats** for your data. Number formats tell your spreadsheet exactly what type of data you're using, like percentages (%), currency (\$), times, dates, and so on.

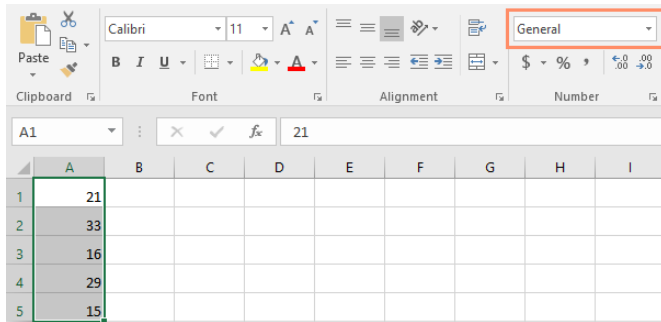
Why use number formats?

Number formats don't just make your spreadsheet easier to read—they also make it easier to use. When you apply a number format, you're telling your spreadsheet exactly **what types of values** are stored in a cell. For example, the **date** format tells the spreadsheet that you're entering **specific calendar dates**. This allows the spreadsheet to better understand your data, which can help ensure that your data remains consistent and that your formulas are calculated correctly.

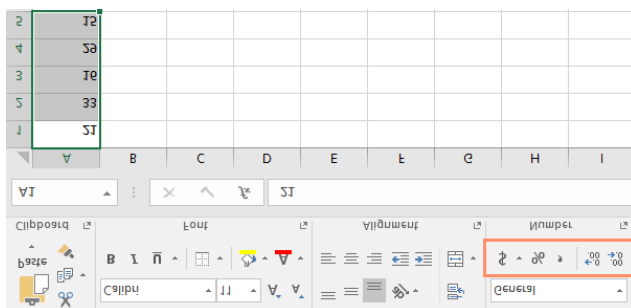
NB: If you don't need to use a specific number format, the spreadsheet will usually apply the **general** number format by default. However, the general format may apply some small formatting changes to your data.

Just like other types of formatting, such as changing the font color, you'll apply number formats by selecting cells and choosing the desired formatting option. There are two main ways to choose a number format:

- Go to the **Home** tab, click the **Number Format** drop-down menu in the **Number** group, and select the desired format.

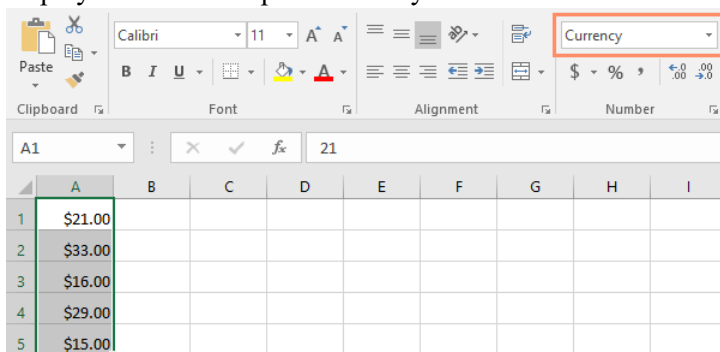


- You can also click one of the quick number-formatting commands below the drop-down menu

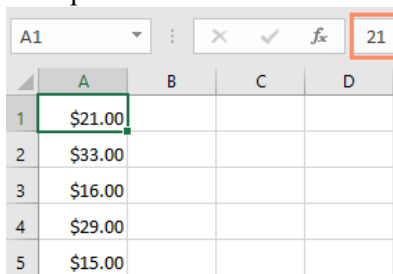


NB: You can also select the desired cells and press **Ctrl+1** on your keyboard to access more number-formatting options.

In this example, we've applied the **Currency** number format, which adds currency symbols (\$) and displays two decimal places for any numerical values.

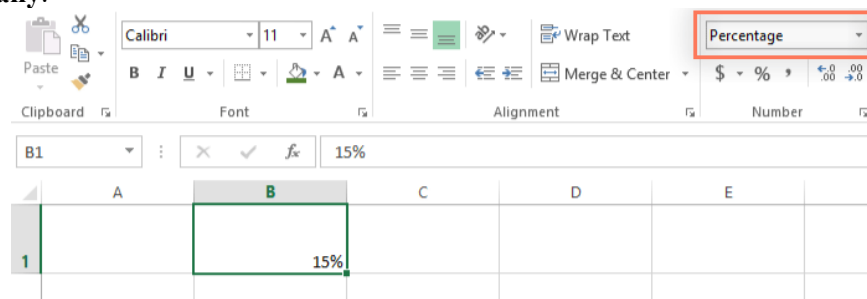


If you select any cells with number formatting, you can see the **actual value** of the cell in the formula bar. The spreadsheet will use this value for formulas and other calculations.



Percentage formats

One of the most helpful number formats is the **percentage (%)** format. It displays values as percentages, such as **20%** or **55%**. This is especially helpful when calculating things like the cost of sales tax or a tip. When you type a percent sign (%) after a number, the percentage number format will be applied to that cell **automatically**.



As you may remember from math class, a percentage can also be written as a **decimal**. So 15% is the same thing as 0.15, 7.5% is 0.075, 20% is 0.20, 55% is 0.55, and so on. You can review [this lesson](#) from our **Math tutorials** to learn more about converting percentages to decimals.

There are many times when percentage formatting will be useful. For example, in the images below, notice how the **sales tax rate** is formatted differently for each spreadsheet (5, 5%, and 0.05):

No percentage formatting			Percentage formatting			Written as decimal		

The table shows three side-by-side Excel spreadsheets. Each spreadsheet has columns B (Item), C (Price), and D (Sales Tax). The first spreadsheet, labeled 'No percentage formatting' with a red X icon, shows a 'Sales Tax Rate' of 5 in cell C1, which results in a 'Sales Tax' of \$112.50 in cell D2. The second spreadsheet, labeled 'Percentage formatting' with a blue checkmark icon, shows a 'Sales Tax Rate' of 5% in cell C1, which results in a 'Sales Tax' of \$1.13 in cell D2. The third spreadsheet, labeled 'Written as decimal' with a blue checkmark icon, shows a 'Sales Tax Rate' of 0.05 in cell C1, which also results in a 'Sales Tax' of \$1.13 in cell D2.

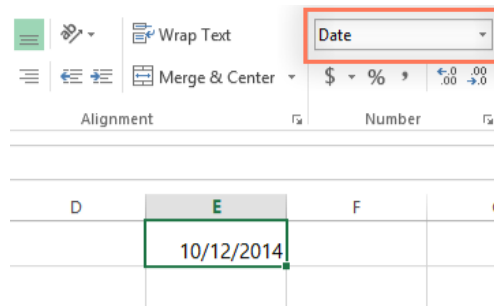
As you can see, the calculation in the spreadsheet on the left didn't work correctly. Without the percentage number format, our spreadsheet thinks we want to multiply \$22.50 by 5, not 5%. And while the spreadsheet on the right still works without percentage formatting, the spreadsheet in the middle is easier to read.

Date formats

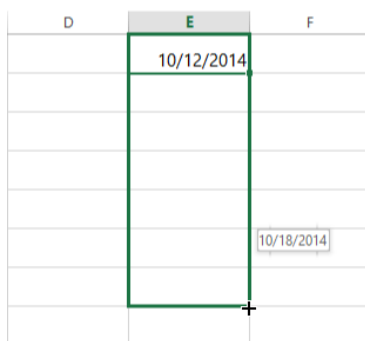
Whenever you're working with **dates**, you'll want to use a date format to tell the spreadsheet that you're referring to **specific calendar dates**, such as July 15, 2014. Date formats also allow you to work with a powerful set of date functions that use time and date information to calculate an answer.

Spreadsheets don't understand information the same way a person would. For instance, if you type **October** into a cell, the spreadsheet won't know you're entering a date so it will treat it like any other text. Instead, when you enter a date, you'll need to use a **specific format** your spreadsheet understands,

such as **month/day/year** (or **day/month/year** depending on which country you're in). In the example below, we'll type **10/12/2014** for October 12, 2014. Our spreadsheet will then automatically apply the date number format for the cell.

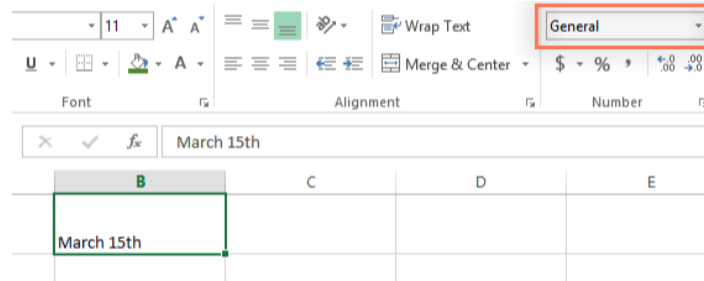


Now that we have our date correctly formatted, we can do many different things with this data. For example, we could use the fill handle to continue the dates through the column, so a different day appears in each cell:



D	E	F
	10/12/2014	
	10/13/2014	
	10/14/2014	
	10/15/2014	
	10/16/2014	
	10/17/2014	
	10/18/2014	

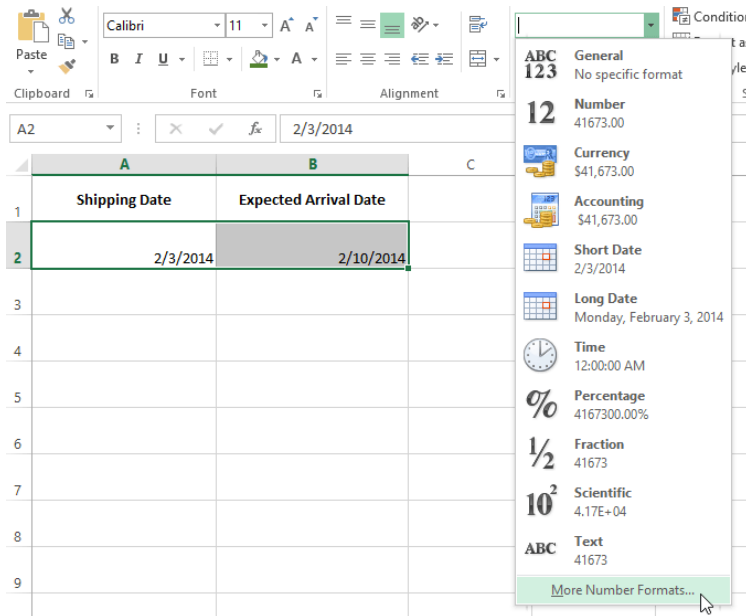
If the date formatting isn't applied automatically, it means the spreadsheet did not understand the data you entered. In the example below, we've typed **March 15th**. The spreadsheet did not understand that we were referring to a date, so this cell is still using the **general** number format



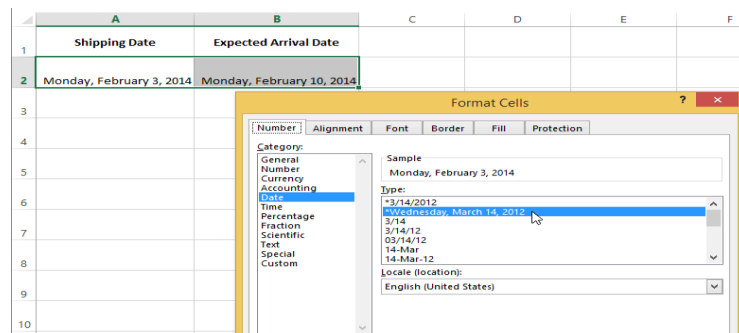
On the other hand, if we type **March 15** (without the "th"), the spreadsheet **will** recognize it as a date. Because it doesn't include a year, the spreadsheet will automatically add the current year so the date will have all of the necessary information. We could also type the date several other ways, such as **3/15**, **3/15/2014**, or **March 15 2014**, and the spreadsheet would still recognize it as a date.

Other date formatting options

To access other date formatting options, select the **Number Format** drop-down menu and choose **More Number Formats**. These are options to display the date differently, like including the day of the week or omitting the year.



The **Format Cells** dialog box will appear. From here, you can choose the desired date formatting option

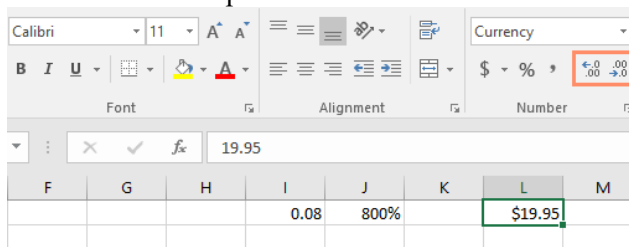


As you can see in the formula bar, a custom date format doesn't change the actual date in our cell—it just changes the way it's displayed.

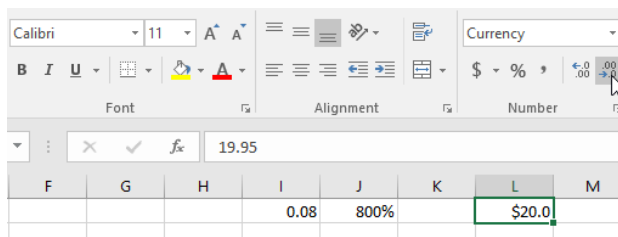
A2		✕	✓	<i>f_x</i>	2/3/2014
	A	B			
1	Shipping Date	Expected Arrival Date			
2	Monday, February 3, 2014	Monday, February 10, 2014			

Increase and Decrease Decimal

The **Increase Decimal** and **Decrease Decimal** commands allow you to control how many decimal places are displayed in a cell. These commands don't change the value of the cell; instead, they display the value to a set number of decimal places.



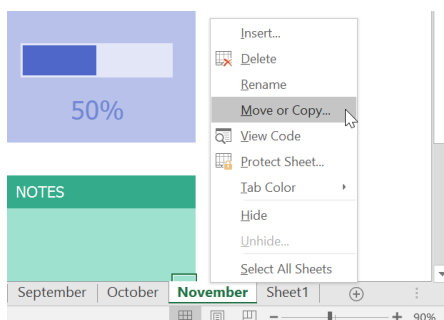
Decreasing the decimal will display the value rounded to that decimal place, but the actual value in the cell will still be displayed in the formula bar.



To copy a worksheet:

If you need to **duplicate** the content of one worksheet to another, Excel allows you to **copy** an existing worksheet.

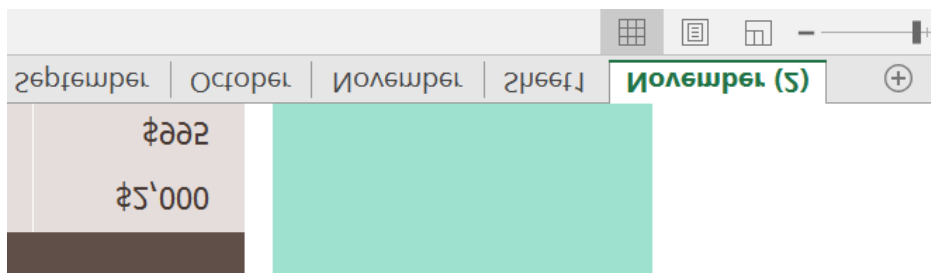
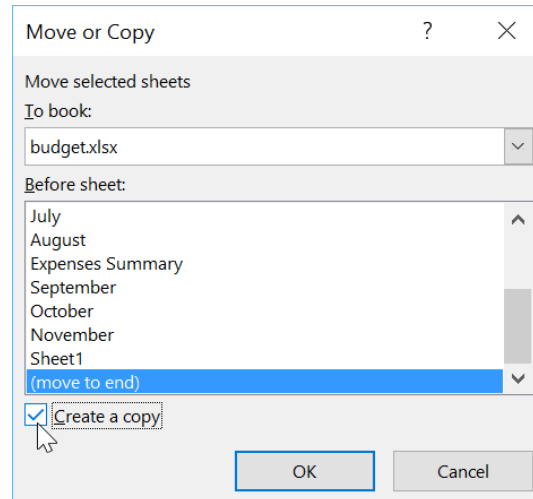
1. Right-click the worksheet you want to copy, then select **Move or Copy** from the worksheet menu.



2. The **Move or Copy** dialog box will appear. Choose where the sheet will appear in the **Before sheet:** field. In our example, we'll choose **(move to end)** to place the worksheet to the right of the existing worksheet.

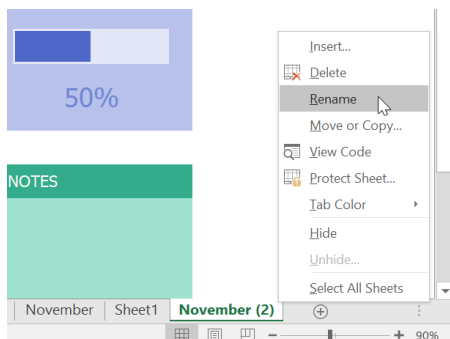
3. **Check the box next to Create a copy**, then click **OK**

4. The worksheet will be **copied**. It will have the same title as the original worksheet, as well as a **version number**. In our example, we copied the **November** worksheet, so our new worksheet is named **November (2)**. All content from the November worksheet has also been copied to the new worksheet



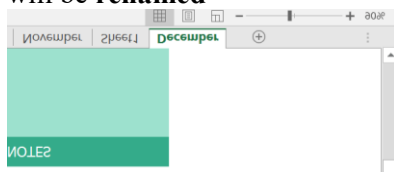
To rename a worksheet:

1. Right-click the **worksheet** you want to rename, then select **Rename** from the worksheet menu.



2. Type the **desired name** for the worksheet

3. Click anywhere outside the worksheet tab, or press **Enter** on your keyboard. The worksheet will be **renamed**



Intro to Formulas

Introduction

One of the most powerful features in Excel is the ability to **calculate** numerical information using **formulas**. Just like a calculator, Excel can add, subtract, multiply, and divide. In this lesson, we'll show you how to use **cell references** to create simple formulas.

Mathematical operators

Excel uses standard operators for formulas, such as a **plus sign** for addition (+), a **minus sign** for subtraction (-), an **asterisk** for multiplication (*), a **forward slash** for division (/), and a **caret** (^) for exponents.

Addition	+
Subtraction	-
Multiplication	*
Division	/
Exponents	^

All formulas in Excel must begin with an **equals sign** (=). This is because the cell contains, or is equal to, the formula and the value it calculates.

Understanding cell references

While you can create simple formulas in Excel using numbers (for example, **=2+2** or **=5*5**), most of the time you will use **cell addresses** to create a formula. This is known as making a **cell reference**. Using cell references will ensure that your formulas are always accurate because you can change the value of referenced cells without having to rewrite the formula.

In the formula below, cell A3 adds the values of cells A1 and A2 by making cell references:

	A	B
1	5	
2	2	
3	=A1+A2	
4		

When you press Enter, the formula calculates and displays the answer in cell A3:

	A	B
1	5	
2	2	
3	7	
4		

If the values in the referenced cells change, the formula automatically recalculates:

	A	B
1	6	
2	2	
3	8	
4		

By combining a mathematical operator with cell references, you can create a variety of simple formulas in Excel. Formulas can also include a combination of cell references and numbers, as in the examples below

=A1+A2	Adds cells A1 and A2
=C4-3	Subtracts 3 from cell C4
=E7/J4	Divides cell E7 by J4
=N10*1.05	Multiplies cell N10 by 1.05
=R5^2	Finds the square of cell R5

To create a simple formula that adds two numbers:

- Click the cell where the formula will be defined (C5, for example).
- Type the equals sign (=) to let Excel know a formula is being defined.
- Type the first number to be added (e.g., 1500).
- Type the **addition sign (+)** to let Excel know that an add operation is to be performed.
- Type the second number to be added (e.g., 200).
- Press **Enter**, or click the **Enter button** on the Formula bar to complete the formula.

	A	B	C
2	Total Income		=1200+500
3	Part-time Job		2500.00
4	Primary Job		2750.00
5			

NB: If the result of a formula is too large to be displayed in a cell, it may appear as **pound signs (#####)** instead of a value. This means that the column is not wide enough to display the cell content. Simply **increase the column width** to show the cell content.

To create a simple formula that adds the contents of two cells:

- Click the cell where the answer will appear (C5, for example).
- Type the equals sign (=) to let Excel know a formula is being defined.
- Type the cell number that contains the first number to be added (C3, for example).
- Type the **addition sign (+)** to let Excel know that an add operation is to be performed.
- Type the cell address that contains the second number to be added (C4, for example).
- Press **Enter**, or click the **Enter button** on the Formula bar to complete the formula.

	A	B	C	D
1				
2				
3	Primary Job		\$1,500.00	\$1,799.00
4	Part-time Job		\$200.00	\$250.00
5	Total Income		=C3+C4	\$2,049.00
6				

To create a simple formula using the point-and-click method:

- Click the cell where the answer will appear (C30, for example).
- Type the equals sign (=) to let Excel know a formula is being defined.
- Click on the **first cell** to be included in the formula (C5, for example).

- Type the **subtraction sign (-)** to let Excel know that a subtraction operation is to be performed.
- Click on the **next cell** in the formula (C29, for example).

	SUM	X	✓	<i>f_x</i>	=C5-
	A	B	C	D	
24	Credit				
25	Visa	8/5/2008	\$75.00	\$0.00	
26	Mastercard	8/5/2008	\$37.42	\$23.51	
27	Discover	8/5/2008	\$30.52	\$30.00	
28	Store Credit Card	8/5/2008	\$87.56	\$66.79	
29	Total		\$1,397.62		
30	Remaining		=C5-		
31					

- Press **Enter**, or click the **Enter button** on the Formula bar to complete the formula.

	SUM	X	✓	<i>f_x</i>	=C5-C29
	A	B	C	D	
24	Credit				
25	Visa	8/5/2008	\$75.00	\$0.00	
26	Mastercard	8/5/2008	\$37.42	\$23.51	
27	Discover	8/5/2008	\$30.52	\$30.00	
28	Store Credit Card	8/5/2008	\$87.56	\$66.79	
29	Total		\$1,397.09		
30	Remaining		=C5-C29		
31					

Copying formulas with the fill handle

Formulas can also be **copied** to adjacent cells with the **fill handle**, which can save a lot of time and effort if you need to perform the **same calculation** multiple times in a worksheet. The **fill handle** is the small square at the bottom-right corner of the selected cell(s).

1. Select the cell containing the formula you want to copy. Click and drag the **fill handle** over the cells you want to fill.

D4	X	✓	<i>f_x</i>	=B4*C4
	B	C	D	E
2				
3	QUANTITY	PRICE PER UNIT	LINE TOTAL	
4	15	\$8.75	\$131.25	
5	18	\$2.59		
6	9	\$14.25		
7	12	\$2.99		
8				
9				

2. After you release the mouse, the formula will be copied to the selected cells.

8				
9	15	\$8.75	\$131.25	
10	18	\$2.59	\$46.62	
11	9	\$14.25	\$128.25	
12	12	\$2.99	\$35.88	
13	QUANTITY	PRICE PER UNIT	LINE TOTAL	
14				
	B	C	D	E
D4	X	✓	<i>f_x</i>	=B4*C4

Relative and Absolute Cell References

Introduction

There are two types of cell references: **relative** and **absolute**. Relative and absolute references behave differently when copied and filled to other cells. Relative references **change** when a formula is copied to another cell. Absolute references, on the other hand, remain **constant** no matter where they are copied.

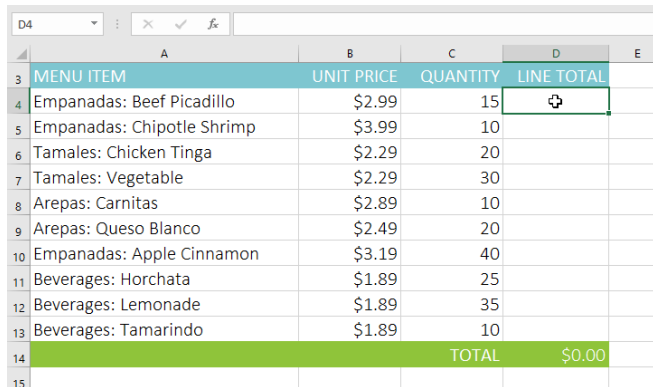
Relative references

By default, all cell references are **relative references**. When copied across multiple cells, they change based on the relative position of rows and columns. For example, if you copy the formula **=A1+B1** from row 1 to row 2, the formula will become **=A2+B2**. Relative references are especially convenient whenever you need to repeat the same calculation across multiple rows or columns.

To create and copy a formula using relative references:

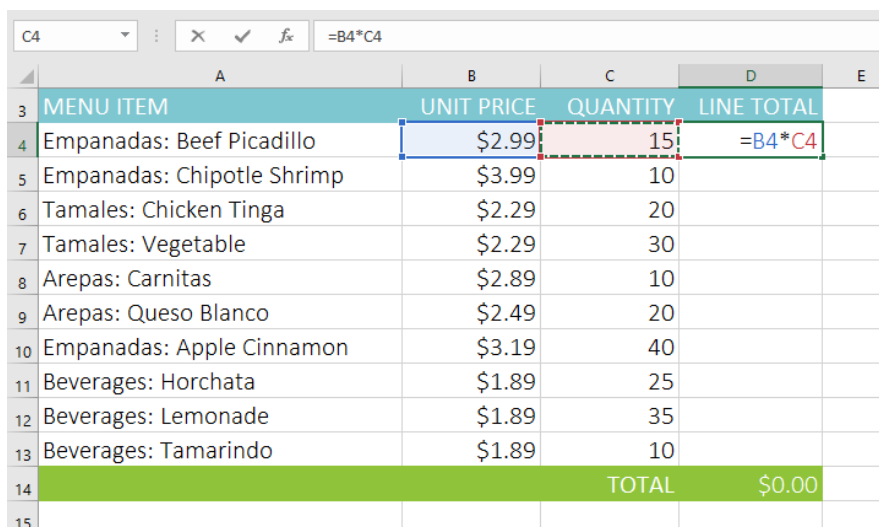
In the following example, we want to create a formula that will multiply each item's **price** by the **quantity**. Instead of creating a new formula for each row, we can create a single formula in cell **D4** and then copy it to the other rows. We'll use relative references so the formula calculates the total for each item correctly.

1. Select the **cell** that will contain the formula. In our example, we'll select cell **D4**.



	A	B	C	D	E
3	MENU ITEM	UNIT PRICE	QUANTITY	LINE TOTAL	
4	Empanadas: Beef Picadillo	\$2.99	15		
5	Empanadas: Chipotle Shrimp	\$3.99	10		
6	Tamales: Chicken Tinga	\$2.29	20		
7	Tamales: Vegetable	\$2.29	30		
8	Arepas: Carnitas	\$2.89	10		
9	Arepas: Queso Blanco	\$2.49	20		
10	Empanadas: Apple Cinnamon	\$3.19	40		
11	Beverages: Horchata	\$1.89	25		
12	Beverages: Lemonade	\$1.89	35		
13	Beverages: Tamarindo	\$1.89	10		
14		TOTAL		\$0.00	
15					

2. Enter the **formula** to calculate the desired value. In our example, we'll type **=B4*C4**.



	A	B	C	D	E
3	MENU ITEM	UNIT PRICE	QUANTITY	LINE TOTAL	
4	Empanadas: Beef Picadillo	\$2.99	15	=B4*C4	
5	Empanadas: Chipotle Shrimp	\$3.99	10		
6	Tamales: Chicken Tinga	\$2.29	20		
7	Tamales: Vegetable	\$2.29	30		
8	Arepas: Carnitas	\$2.89	10		
9	Arepas: Queso Blanco	\$2.49	20		
10	Empanadas: Apple Cinnamon	\$3.19	40		
11	Beverages: Horchata	\$1.89	25		
12	Beverages: Lemonade	\$1.89	35		
13	Beverages: Tamarindo	\$1.89	10		
14		TOTAL		\$0.00	
15					

3. Press **Enter** on your keyboard. The formula will be calculated, and the result will be displayed in the cell

4. Locate the **fill handle** in the bottom-right corner of the desired cell. In our example, we'll locate the fill handle for cell **D4**

D4				
	A	B	C	D
3	MENU ITEM	UNIT PRICE	QUANTITY	LINE TOTAL
4	Empanadas: Beef Picadillo	\$2.99	15	\$44.85
5	Empanadas: Chipotle Shrimp	\$3.99	10	
6	Tamales: Chicken Tinga	\$2.29	20	
7	Tamales: Vegetable	\$2.29	30	
8	Arepas: Carnitas	\$2.89	10	
9	Arepas: Queso Blanco	\$2.49	20	
10	Empanadas: Apple Cinnamon	\$3.19	40	
11	Beverages: Horchata	\$1.89	25	
12	Beverages: Lemonade	\$1.89	35	
13	Beverages: Tamarindo	\$1.89	10	
14	TOTAL			\$44.85

5. Click and drag the **fill handle** over the cells you want to fill. In our example, we'll select cells **D5:D13**

12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
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90				
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92				
93				
94				
95				
96				
97				
98				
99				
100				

6. Release the mouse. The formula will be **copied** to the selected cells with **relative references**, displaying the result in each cell

D4				
	A	B	C	D
3	MENU ITEM	UNIT PRICE	QUANTITY	LINE TOTAL
4	Empanadas: Beef Picadillo	\$2.99	15	\$44.85
5	Empanadas: Chipotle Shrimp	\$3.99	10	\$39.90
6	Tamales: Chicken Tinga	\$2.29	20	\$45.80
7	Tamales: Vegetable	\$2.29	30	\$68.70
8	Arepas: Carnitas	\$2.89	10	\$28.90
9	Arepas: Queso Blanco	\$2.49	20	\$49.80
10	Empanadas: Apple Cinnamon	\$3.19	40	\$127.60
11	Beverages: Horchata	\$1.89	25	\$47.25
12	Beverages: Lemonade	\$1.89	35	\$66.15
13	Beverages: Tamarindo	\$1.89	10	\$18.90
14	TOTAL			\$537.85

Absolute references

There may be times when you do not want a cell reference to change when filling cells. Unlike relative references, **absolute references** do not change when copied or filled. You can use an absolute reference to keep a row and/or column **constant**.

An absolute reference is designated in a formula by the addition of a **dollar sign (\$)** before the column and row. If it precedes the column or row (but not both), it's known as a **mixed reference**.

\$A\$2	The column and the row do not change when copied
A\$2	The row does not change when copied
\$A2	The column does not change when copied

NB: You will use the relative (**A2**) and absolute (**\$A\$2**) formats in most formulas. Mixed references are used less frequently.

When writing a formula in Microsoft Excel, you can press the **F4** key on your keyboard to switch between relative, absolute, and mixed cell references. This is an easy way to quickly insert an absolute reference.

To create and copy a formula using absolute references:

In the example below, we're going to use cell **E2** (which contains the tax rate at 7.5%) to calculate the sales tax for each item in **column D**. To make sure the reference to the tax rate stays constant—even when the formula is copied and filled to other cells—we'll need to make cell **\$E\$2** an absolute reference.

1. Select the **cell** that will contain the formula. In our example, we'll select cell **D4**
2. Enter the **formula** to calculate the desired value. In our example, we'll type **=(B4*C4)*\$E\$2**, making **\$E\$2** an absolute reference.

NETWORK...	X	✓	f _x	=(B4*C4)*\$E\$2		
	A	B	C	D	E	
2				TAX RATE:	7.5%	
3	MENU ITEM	UNIT PRICE	QUANTITY	SALES TAX	LINE TOTAL	
4	Empanadas: Beef Picadillo	\$2.99		=(B4*C4)*\$E\$2	\$44.85	
5	Empanadas: Chipotle Shrimp	\$3.99	10		\$39.90	
6	Tamales: Chicken Tinga	\$2.29	20		\$45.80	
7	Tamales: Vegetable	\$2.29	30		\$68.70	
8	Arepas: Carnitas	\$2.89	10		\$28.90	
9	Arepas: Queso Blanco	\$2.49	20		\$49.80	
10	Empanadas: Apple Cinnamon	\$3.19	40		\$127.60	
11	Beverages: Horchata	\$1.89	25		\$47.25	
12	Beverages: Lemonade	\$1.89	35		\$66.15	
13	Beverages: Tamarindo	\$1.89	10		\$18.90	
14	TOTAL				\$537.85	
15						

3. Press **Enter** on your keyboard. The formula will calculate, and the result will display in the cell.

4. Locate the **fill handle** in the bottom-right corner of the desired cell. In our example, we'll locate the fill handle for cell **D4**

5. Click and drag the **fill handle** over the cells you want to fill (cells **D5:D13** in our example)

6. Release the mouse. The formula will be **copied** to the selected cells with an **absolute reference**, and the values will be calculated in each cell

	A	B	C	D	E
2				TAX RATE:	7.5%
3	MENU ITEM	UNIT PRICE	QUANTITY	SALES TAX	LINE TOTAL
4	Empanadas: Beef Picadillo	\$2.99	15	\$3.36	\$48.21
5	Empanadas: Chipotle Shrimp	\$3.99	10	\$2.99	\$42.89
6	Tamales: Chicken Tinga	\$2.29	20	\$3.44	\$49.24
7	Tamales: Vegetable	\$2.29	30	\$5.15	\$73.85
8	Arepas: Carnitas	\$2.89	10	\$2.17	\$31.07
9	Arepas: Queso Blanco	\$2.49	20	\$3.74	\$53.54
10	Empanadas: Apple Cinnamon	\$3.19	40	\$9.57	\$137.17
11	Beverages: Horchata	\$1.89	25	\$3.54	\$50.79
12	Beverages: Lemonade	\$1.89	35	\$4.96	\$71.11
13	Beverages: Tamarindo	\$1.89	10	\$1.42	\$20.32
14				TOTAL	\$578.19
15					

NB: You can double-click the **filled cells** to check their formulas for accuracy. The absolute reference should be the same for each cell, while the other references are relative to the cell's row

Functions

Introduction

A **function** is a **predefined formula** that performs calculations using specific values in a particular order.

Excel includes many common functions that can be used to quickly find

the **sum**, **average**, **count**, **maximum value**, and **minimum value** for a range of cells. In order to use

functions correctly, you'll need to understand the different **parts of a function** and how to

create **arguments** to calculate values and cell references.

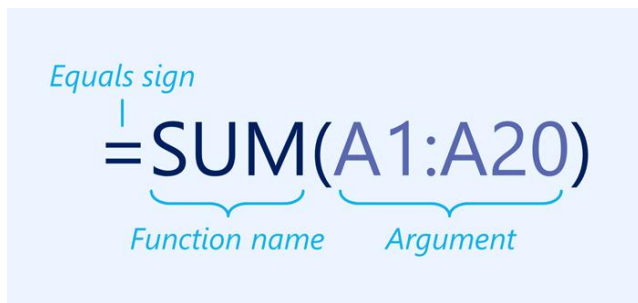
The parts of a function

In order to work correctly, a function must be written a specific way, which is called the **syntax**. The

basic syntax for a function is the **equals sign (=)**, the **function name** (SUM, for example), and one or

more **arguments**. Arguments contain the information you want to calculate. The function in the example

below would add the values of the cell range A1:A20.



Working with arguments

Arguments can refer to both **individual cells** and **cell ranges** and must be enclosed within **parentheses**. You can include one argument or multiple arguments, depending on the syntax required for the function.

For example, the function **=AVERAGE(B1:B9)** would calculate the **average** of the values in the cell range B1:B9. This function contains only one argument.

	A	B	C	D	E
1		1			
2		4			
3		5			
4		6			
5		8			
6		2			
7		3			
8		5			
9		6			
10		=AVERAGE(B1:B9)			
11					

Multiple arguments must be separated by a **comma**. For example, the function **=SUM(A1:A3, C1:C2, E1)** will **add** the values of all of the cells in the three arguments.

	A	B	C	D	E	F
1	4		6		20	
2	8		10			
3	12					
4						
5	=SUM(A1:A3, C1:C2, E1)					
6						

Creating a function

There are a variety of functions available in Excel. Here are some of the most common functions you'll use:

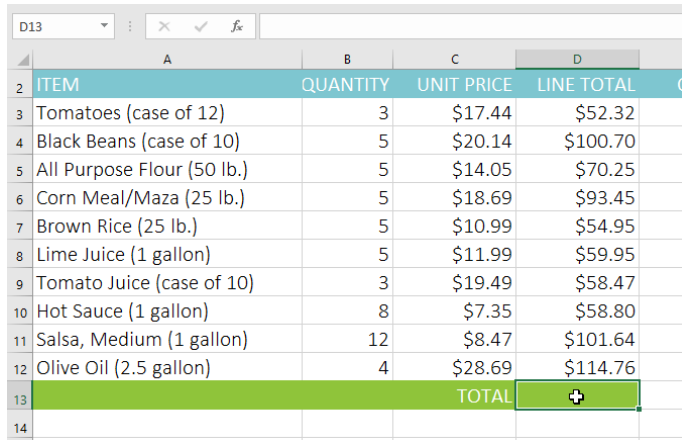
- **SUM**: This function **adds** all of the values of the cells in the argument.

- **AVERAGE:** This function determines the **average** of the values included in the argument. It calculates the sum of the cells and then divides that value by the number of cells in the argument.
- **COUNT:** This function **counts** the number of cells with numerical data in the argument. This function is useful for quickly counting items in a cell range.
- **MAX:** This function determines the **highest cell value** included in the argument.
- **MIN:** This function determines the **lowest cell value** included in the argument.

To create a function using the AutoSum command:

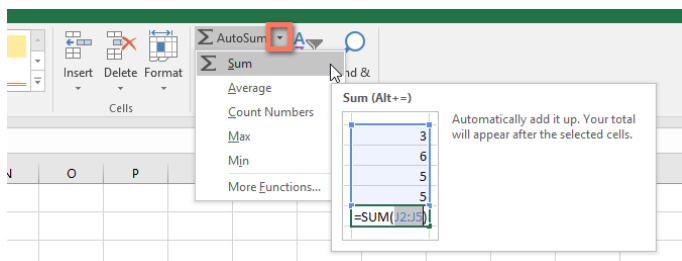
The **AutoSum** command allows you to automatically insert the most common functions into your formula, including SUM, AVERAGE, COUNT, MIN, and MAX. In the example below, we'll use the **SUM** function to calculate the **total cost** for a list of recently ordered items.

1. Select the **cell** that will contain the function. In our example, we'll select cell **D13**.



	A	B	C	D
2	ITEM	QUANTITY	UNIT PRICE	LINE TOTAL
3	Tomatoes (case of 12)	3	\$17.44	\$52.32
4	Black Beans (case of 10)	5	\$20.14	\$100.70
5	All Purpose Flour (50 lb.)	5	\$14.05	\$70.25
6	Corn Meal/Maza (25 lb.)	5	\$18.69	\$93.45
7	Brown Rice (25 lb.)	5	\$10.99	\$54.95
8	Lime Juice (1 gallon)	5	\$11.99	\$59.95
9	Tomato Juice (case of 10)	3	\$19.49	\$58.47
10	Hot Sauce (1 gallon)	8	\$7.35	\$58.80
11	Salsa, Medium (1 gallon)	12	\$8.47	\$101.64
12	Olive Oil (2.5 gallon)	4	\$28.69	\$114.76
13		TOTAL		
14				

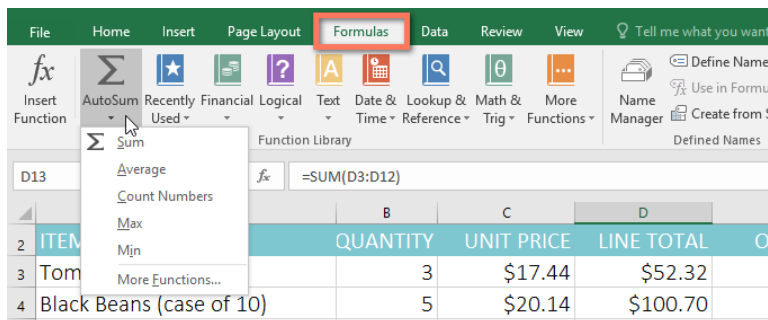
2. In the **Editing** group on the **Home** tab, click the **arrow** next to the **AutoSum** command. Next, choose the **desired function** from the drop-down menu. In our example, we'll select **Sum**



3. Excel will place the **function** in the cell and automatically select a **cell range** for the argument. In our example, cells **D3:D12** were selected automatically; their values will be **added** to calculate the total cost. If Excel selects the wrong cell range, you can manually enter the desired cells into the argument
4. Press **Enter** on your keyboard. The function will be **calculated**, and the **result** will appear in the cell. In our example, the sum of D3:D12 is **\$765.29**.

D13				=SUM(D3:D12)
	A	B	C	D
2	ITEM	QUANTITY	UNIT PRICE	LINE TOTAL
3	Tomatoes (case of 12)	3	\$17.44	\$52.32
4	Black Beans (case of 10)	5	\$20.14	\$100.70
5	All Purpose Flour (50 lb.)	5	\$14.05	\$70.25
6	Corn Meal/Maza (25 lb.)	5	\$18.69	\$93.45
7	Brown Rice (25 lb.)	5	\$10.99	\$54.95
8	Lime Juice (1 gallon)	5	\$11.99	\$59.95
9	Tomato Juice (case of 10)	3	\$19.49	\$58.47
10	Hot Sauce (1 gallon)	8	\$7.35	\$58.80
11	Salsa, Medium (1 gallon)	12	\$8.47	\$101.64
12	Olive Oil (2.5 gallon)	4	\$28.69	\$114.76
13	TOTAL			\$765.29
14				

NB. The **AutoSum** command can also be accessed from the **Formulas** tab on the **Ribbon**



To enter a function manually:

If you already know the function name, you can easily type it yourself. In the example below (a tally of cookie sales), we'll use the **AVERAGE** function to calculate the **average number of units sold** by each troop.

1. Select the **cell** that will contain the function. In our example, we'll select cell **C10**.

C10			
	A	B	C
1	Frontier Kids Cookie Sales		
2	Troop Name	Troop ID	Units Sold
3	North Bend	#3506	1004
4	Silver Lake	#2745	938
5	Mountain Top	#1038	745
6	Rocky Trail	#3759	729
7	Forest Path	#4157	862
8	Green Valley	#1932	890
9	River View	#4233	775
10	Average Units		
11			

2. Type the **equals sign (=)**, and enter the desired **function name**. You can also select the desired function from the list of **suggested functions** that appears below the cell as you type. In our example, we'll type **=AVERAGE**

NETWORK...			
	A	B	C
1	Frontier Kids Cookie Sales		
2	Troop Name	Troop ID	Units Sold
3	North Bend	#3506	1004
4	Silver Lake	#2745	938
5	Mountain Top	#1038	745
6	Rocky Trail	#3759	729
7	Forest Path	#4157	862
8	Green Valley	#1932	890
9	River View	#4233	775
10	Average Units		=AVERAGE
11			
12			
13			
14			

3. Enter the **cell range** for the argument inside **parentheses**. In our example, we'll type **(C3:C9)**. This formula will add the values of cells C3:C9, then divide that value by the total number of values in the range

C10			=AVERAGE(C3:C9)
	A	B	C
1	Frontier Kids Cookie Sales		
2	Troop Name	Troop ID	Units Sold
3	North Bend	#3506	1004
4	Silver Lake	#2745	938
5	Mountain Top	#1038	745
6	Rocky Trail	#3759	729
7	Forest Path	#4157	862
8	Green Valley	#1932	890
9	River View	#4233	775
10	Average Units		=AVERAGE(C3:C9)
11			

4. Press **Enter** on your keyboard. The function will be calculated, and the **result** will appear in the cell. In our example, the average number of units sold by each troop is **849**

C10			=AVERAGE(C3:C9)
	A	B	C
1	Frontier Kids Cookie Sales		
2	Troop Name	Troop ID	Units Sold
3	North Bend	#3506	1004
4	Silver Lake	#2745	938
5	Mountain Top	#1038	745
6	Rocky Trail	#3759	729
7	Forest Path	#4157	862
8	Green Valley	#1932	890
9	River View	#4233	775
10	Average Units		849
11			

Sorting Data

Introduction

As you add more content to a worksheet, organizing this information becomes especially important. You can quickly **reorganize** a worksheet by **sorting** your data. For example, you could organize a list of contact information by last name. Content can be sorted alphabetically, numerically, and in many other ways.

Types of sorting

When sorting data, it's important to first decide if you want the sort to apply to the **entire worksheet** or just a **cell range**.

- **Sort sheet** organizes all of the data in your worksheet by one column. Related information across each row is kept together when the sort is applied. In the example below, the **Contact Name** column (column **A**) has been sorted to display the names in alphabetical order.

	A	B	C	D
1	Customer Contact List			
2	CONTACT NAME	BILLING ADDRESS	PHONE	EMAIL ADDRESS
3	Chaturvedi, Rick	2428 S Redding St #2 B	360-555-5422	info@newhaventraders.com
4	Dean, Hank	3034 Foggy Wharf Looj	308-555-1050	hdean@venturebrewing.com
5	Figgis, Mallory	3520 Sleepy Hearth Dr	425-555-5370	malloryf@archerproperties.com
6	Finn, Jake	1407 Dusty Fawn Ln So	605-555-6435	jake@adventureoutfitters.com
7	Kinkade, Chris	1028 Quiet Dale Rd Hoi	443-555-4942	chris.kinkade@placervilleins.com
8	Lawson, Miranda	5316 Colonial Pkwy Est	575-555-9255	mlawson@massairlines.com
9	Reyes, Felicia	8544 Lazy Bluff Ave Wh	316-555-3256	felicia@everlypublishing.com
10	Sebastian, Lil	9060 Easy Evening Ln V	207-555-7225	lil@knopeequestrian.com
11	Silva, Vivica	8595 Thunder Brook Cii	360-555-4289	vivica@rileygardensupply.com
12	Stark, Katie	971 Cinder Butterfly St	603-555-2460	katie.stark@ariarealestate.com
13	Torrance, Jill	3160 Amber Gate Rd Ri	605-555-4495	jtorrance@overlookinn.com
14	Yuen, Phillip	5108 Crystal Gate Blvd	913-555-5928	yuenp@corepharmaceuticals.com

- **Sort range** sorts the data in a range of cells, which can be helpful when working with a sheet that contains several tables. Sorting a range will not affect other content on the worksheet

	A	B	C	D	E
1					
2	EXERCISES	SET 1		SET 2	
3		REPS	WEIGHT (lbs)	REPS	WEIGHT (lbs)
4	Bench Press	14	65	12	75
5	Bench Press (Decline)	10	60	8	70
6	Triceps Extension	15	35	20	35
7	Average	13.9	50.5	12.5	54
8					
9		Running Log			
10		Date	Distance (miles)	Time (hrs:mins)	
11		25-Jun	2.8	0:45	
12		26-Jun	3	0:44	
13		27-Jun	2.75	0:42	
14		29-Jun	3.25	0:44	
15		30-Jun	3.25	0:45	
16		2-Jul	2.5	0:44	
17		3-Jul	3	0:30	
18		Total	20.55		
19					

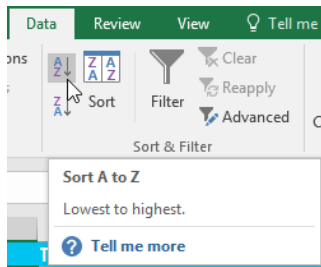
To sort a sheet:

In our example, we'll sort a T-shirt order form alphabetically by **Last Name** (column C).

1. Select a **cell** in the column you want to sort by. In our example, we'll select cell **C2**.

	A	B	C	D	E
1	Homeroom #	First Name	Last Name	T-Shirt Size	Payment Method
2	105	Christiana	Chen	Medium	Check Bounced
3	105	Derek	MacDonald	Large	Cash
4	105	Esther	Yaron	Small	Pending
5	105	Melissa	White	Small	Debit Card
6	105	Nathan	Albee	Medium	Check
7	105	Sidney	Kelly	Medium	Check
8	110	Gabriel	Del Toro	Medium	Cash
9	110	Kris	Ackerman	Large	Money Order

2. Select the **Data** tab on the **Ribbon**, then click the **A-Z** command to sort A to Z, or the **Z-A** command to sort Z to A. In our example, we'll sort A to Z.



3. The worksheet will be **sorted** by the selected column. In our example, the worksheet is now sorted by **last name**.

	A	B	C	D	E
1	Homeroom #	First Name	Last Name	T-Shirt Size	Payment Method
2	110	Kris	Ackerman	Large	Money Order
3	105	Nathan	Albee	Medium	Check
4	220-B	Samantha	Bell	Medium	Check
5	110	Matt	Benson	Medium	Money Order
6	105	Christiana	Chen	Medium	Check Bounced
7	110	Gabriel	Del Toro	Medium	Cash
8	220-A	Brigid	Ellison	Small	Cash
9	220-A	Juan	Flores	X-Large	Pending

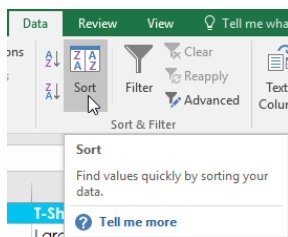
To sort a range:

In our example, we'll select a **separate table** in our T-shirt order form to sort the number of shirts that were ordered in each grade.

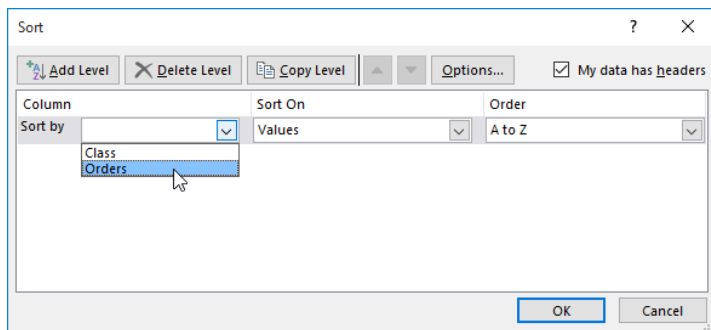
1. Select the **cell range** you want to sort. In our example, we'll select cell range **G2:H6**.

F	G	H	I
	Total Orders (by Grade)		
	Class	Orders	
	Freshmen	5	
	Sophomore	7	
	Junior	10	
	Senior	5	

2. Select the **Data** tab on the **Ribbon**, then click the **Sort** command

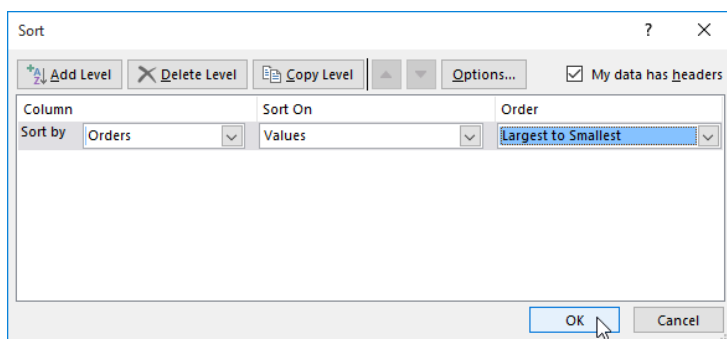


3. The **Sort** dialog box will appear. Choose the **column** you want to sort by. In our example, we want to sort the data by the number of T-shirt orders, so we'll select **Orders**



4. Decide the **sorting order** (either ascending or descending). In our example, we'll use **Largest to Smallest**

5. Once you're satisfied with your selection, click **OK**.



6. The cell range will be **sorted** by the selected column. In our example, the Orders column will be sorted from **highest to lowest**. Notice that the other content in the worksheet was not affected by the sort

F	G	H	I
	Total Orders (by Grade)		
	Class	Orders	
	Junior	10	
	Sophomore	7	
	Freshmen	5	
	Senior	5	

Filtering Data

Introduction

If your worksheet contains a lot of content, it can be difficult to find information quickly. **Filters** can be used to **narrow down** the data in your worksheet, allowing you to view only the information you need.

To filter data:

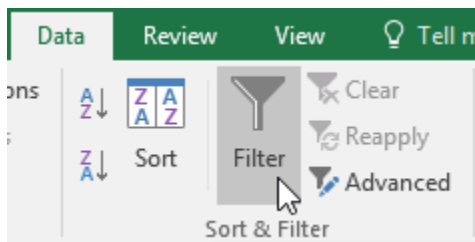
In our example, we'll apply a filter to an equipment log worksheet to display only the laptops and projectors that are available for checkout.

1. In order for filtering to work correctly, your worksheet should include a **header row**, which is used to identify the name of each column. In our example, our worksheet is

organized into different columns identified by the header cells in row 1: **ID#**, **Type**, **Equipment Detail**, and so on.

	A	B	C	D	E	F
1	ID #	Type	Equipment Detail	Checked Out	Checked In	Checked Out By
2	3000	Camera	Saris Lumina Digital Camera	12-May-15	15-May-15	Shannon Nguyen
3	3005	Camera	Saris Zoom Z-60 Digital Camera	27-Jul-15	06-Aug-15	Sela Shepard
4	1021	Laptop	15" EDI SmartPad L200-3 Laptop	15-Sep-15	01-Oct-15	Sofie Ragnar
5	1022	Laptop	15" EDI SmartPad L200-3 Laptop	14-Aug-15	16-Aug-15	Hank Sorenson
6	1023	Laptop	15" EDI SmartPad L200-3 Laptop	08-Aug-15	15-Aug-15	Jennifer Weiss
7	3070	Camera	Omega PixL Digital Camcorder	06-Oct-15		Min Seung
8	1025	Laptop	15" EDI SmartPad L200-4X	26-Sep-15	04-Oct-15	Min Seung
9	1031	Laptop	17" Saris X-10 Laptop	04-Oct-15		Nick Ortiz
10	1032	Laptop	17" Saris X-10 Laptop	19-Sep-15		Stanley Geyer
11	1033	Laptop	17" Saris X-10 Laptop	24-Sep-15	26-Sep-15	George D'Agosta

2. Select the **Data** tab, then click the **Filter** command.



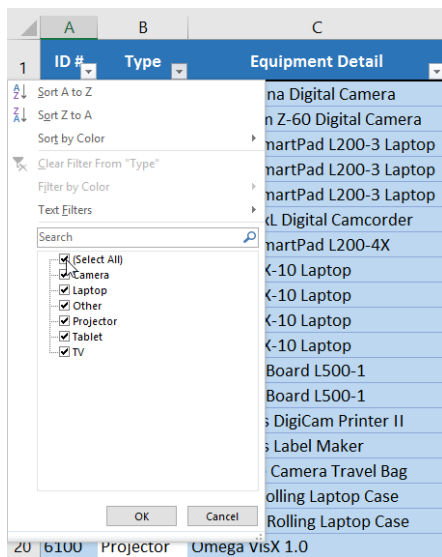
3. A **drop-down arrow** will appear in the header cell for each column

4. Click the **drop-down arrow** for the column you want to filter. In our example, we will filter column **B** to view only certain types of equipment

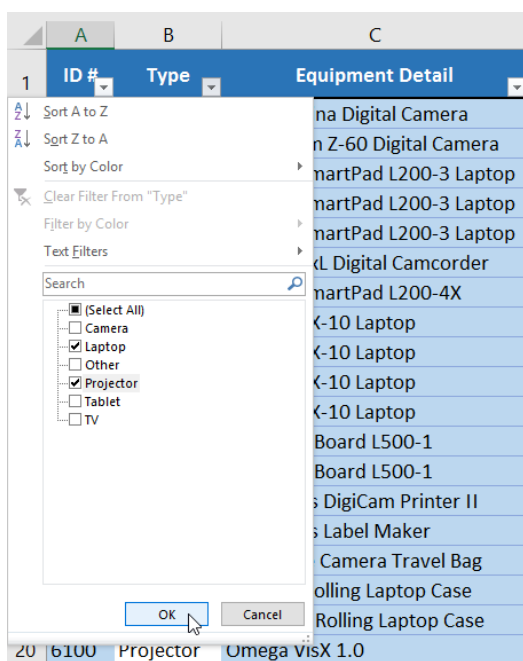
	A	B	C
1	ID #	Type	Equipment Detail
2	3000	Camera	Saris Lumina Digital Camera
3	3005	Camera	Saris Zoom Z-60 Digital Camera
4	1021	Laptop	15" EDI SmartPad L200-3
5	1022	Laptop	15" EDI SmartPad L200-3
6	1023	Laptop	15" EDI SmartPad L200-3

5. The **Filter** menu will appear.

6. **Uncheck** the box next to **Select All** to quickly deselect all data



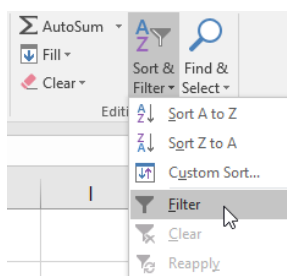
7. **Check** the boxes next to the data you want to filter, then click **OK**. In this example, we will check **Laptop** and **Projector** to view only these types of equipment.



8. The data will be **filtered**, temporarily hiding any content that doesn't match the criteria. In our example, only laptops and projectors are visible

	A	B	C	D	E	F
1	ID #	Type	Equipment Detail	Checked Out	Checked In	Checked Out By
4	1021	Laptop	15" EDI SmartPad L200-3 Laptop	15-Sep-15	01-Oct-15	Sofie Ragnar
5	1022	Laptop	15" EDI SmartPad L200-3 Laptop	14-Aug-15	16-Aug-15	Hank Sorenson
6	1023	Laptop	15" EDI SmartPad L200-3 Laptop	08-Aug-15	15-Aug-15	Jennifer Weiss
8	1025	Laptop	15" EDI SmartPad L200-4X	26-Sep-15	04-Oct-15	Min Seung
9	1031	Laptop	17" Saris X-10 Laptop	04-Oct-15		Nick Ortiz
10	1032	Laptop	17" Saris X-10 Laptop	19-Sep-15		Stanley Geyer
11	1033	Laptop	17" Saris X-10 Laptop	24-Sep-15	26-Sep-15	George D'Agosta
12	1034	Laptop	17" Saris X-10 Laptop	25-Aug-15	27-Aug-15	Jay Peralta
20	6100	Projector	Omega VisX 1.0	28-Sep-15	01-Oct-15	Win Armitage
21	6101	Projector	Omega VisX 1.0	26-Sep-15	27-Sep-15	Michael Earley
22	6102	Projector	Omega VisX 1.0	22-Aug-15	23-Aug-15	Jamila Kyle
23	6200	Projector	Saris Lux T-80	01-Sep-15	04-Sep-15	Jolie Chaturvedi
24	6301	Projector	Saris Lux T-81 Lite	10-Sep-15		Marques Herndon
25	6302	Projector	Saris Lux T-81 Lite	08-Sep-15	15-Sep-15	Dean Sorenson
31						
32						

NB: Filtering options can also be accessed from the **Sort & Filter** command on the **Home** tab



To apply multiple filters:

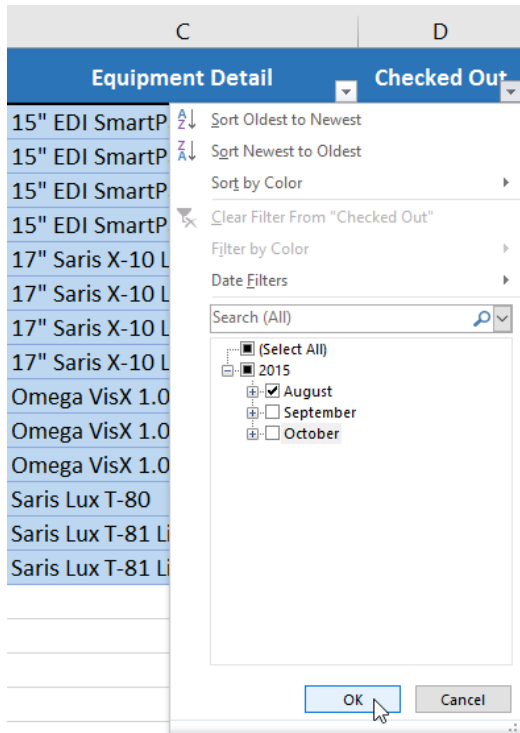
Filters are **cumulative**, which means you can apply **multiple filters** to help narrow down your results. In this example, we've already filtered our worksheet to show laptops and projectors, and we'd like to narrow it down further to only show laptops and projectors that were checked out in August.

1. Click the **drop-down arrow** for the column you want to filter. In this example, we will add a filter to column **D** to view information by date.

	A	B	C	D	E	F
1	ID #	Type	Equipment Detail	Checked Out	Checked In	Checked Out By
4	1021	Laptop	15" EDI SmartPad L200-3 Laptop	15-Sep-15	01-Oct-15	Sofie Ragnar
5	1022	Laptop	15" EDI SmartPad L200-3 Laptop	14-Aug-15	15-Aug-15	Hank Sorenson
6	1023	Laptop	15" EDI SmartPad L200-3 Laptop	08-Aug-15	15-Aug-15	Jennifer Weiss
8	1025	Laptop	15" EDI SmartPad L200-4X	26-Sep-15	04-Oct-15	Min Seung
9	1031	Laptop	17" Saris X-10 Laptop	04-Oct-15		Nick Ortiz
10	1032	Laptop	17" Saris X-10 Laptop	19-Sep-15		Stanley Geyer
11	1033	Laptop	17" Saris X-10 Laptop	24-Sep-15	26-Sep-15	George D'Agosta
12	1034	Laptop	17" Saris X-10 Laptop	25-Aug-15	27-Aug-15	Jay Peralta
20	6100	Projector	Omega VisX 1.0	28-Sep-15	01-Oct-15	Win Armitage
21	6101	Projector	Omega VisX 1.0	26-Sep-15	27-Sep-15	Michael Earley
22	6102	Projector	Omega VisX 1.0	22-Aug-15	23-Aug-15	Jamila Kyle
23	6200	Projector	Saris Lux T-80	01-Sep-15	04-Sep-15	Jolie Chaturvedi
24	6301	Projector	Saris Lux T-81 Lite	10-Sep-15		Marques Herndon
25	6302	Projector	Saris Lux T-81 Lite	08-Sep-15	15-Sep-15	Dean Sorenson
31						
32						

2. The **Filter** menu will appear

3. **Check** or **uncheck** the boxes depending on the data you want to filter, then click **OK**. In our example, we'll uncheck everything except for **August**



4. The new filter will be applied. In our example, the worksheet is now filtered to show only laptops and projectors that were checked out in August

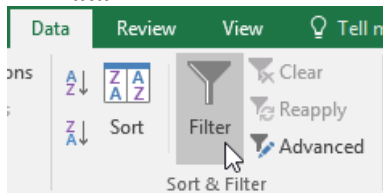
To clear a filter:

After applying a filter, you may want to remove—or **clear**—it from your worksheet so you'll be able to filter content in different ways.

1. Click the **drop-down arrow** for the filter you want to clear. In our example, we'll clear the filter in column **D**.
2. The **Filter menu** will appear.
3. Choose **Clear Filter From [COLUMN NAME]** from the Filter menu. In our example, we'll select **Clear Filter From "Checked Out"**
4. The filter will be cleared from the column. The previously hidden data will be displayed.

	A	B	C	D	E	F
1	ID #	Type	Equipment Detail	Checked Out	Checked In	Checked Out By
4	1021	Laptop	15" EDI SmartPad L200-3 Laptop	15-Sep-15	15-Sep-15	Sofie Ragnar
5	1022	Laptop	15" EDI SmartPad L200-3 Laptop	14-Aug-15	14-Aug-15	Hank Sorenson
6	1023	Laptop	15" EDI SmartPad L200-3 Laptop	08-Aug-15	15-Aug-15	Jennifer Weiss
8	1025	Laptop	15" EDI SmartPad L200-4X	26-Sep-15	04-Oct-15	Min Seung
9	1031	Laptop	17" Saris X-10 Laptop	04-Oct-15		Nick Ortiz
10	1032	Laptop	17" Saris X-10 Laptop	19-Sep-15		Stanley Geyer
11	1033	Laptop	17" Saris X-10 Laptop	24-Sep-15	26-Sep-15	George D'Agosta
12	1034	Laptop	17" Saris X-10 Laptop	25-Aug-15	27-Aug-15	Jay Peralta
20	6100	Projector	Omega VisX 1.0	28-Sep-15	01-Oct-15	Win Armitage
21	6101	Projector	Omega VisX 1.0	26-Sep-15	27-Sep-15	Michael Earley
22	6102	Projector	Omega VisX 1.0	22-Aug-15	23-Aug-15	Jamila Kyle
23	6200	Projector	Saris Lux T-80	01-Sep-15	04-Sep-15	Jolie Chaturvedi
24	6301	Projector	Saris Lux T-81 Lite	10-Sep-15		Marques Herndon
25	6302	Projector	Saris Lux T-81 Lite	08-Sep-15	15-Sep-15	Dean Sorenson
31						
32						

NB: To remove all filters from your worksheet, click the **Filter** command on the **Data** tab



Simple single IF

The IF function checks whether a condition is met, and returns one value if true and another value if false.

It is made up of 3 parts;

IF(logical_test, [value_if_true], [value_if_false])

1
2
3

=IF(TEST, TRUE, FALSE)

- ❖ A condition (**logical test**)
- ❖ What to do if the condition is met (**value if true**)
- ❖ What to do if the condition is not met (**Value if False**)

1a. For example, take a look at the IF function in cell B2 below

=IF(A2>500,"High","Low")

B2									
	A	B	C	D	E	F	G	H	I
1	Price	Result							
2	\$644	High							
3	\$911	High							
4	\$74	Low							
5	\$312	Low							
6	\$970	High							
7									

Explanation: *if the price is greater than 500, the IF function returns High, else it returns Low.*

1b. The following IF function produces the exact same result

=IF(A2<500,"Low","High")

B2									
	A	B	C	D	E	F	G	H	I
1	Price	Result							
2	\$644	High							
3	\$911	High							
4	\$74	Low							
5	\$312	Low							
6	\$970	High							
7									

Note: *you can use the following comparison operators: = (equal to), > (greater than), < (less than), >= (greater than or equal to), <= (less than or equal to) and <> (not equal to).*

2. Always enclose text in double quotation marks.

=IF(A2="USA",5,0)

B2									
	A	B	C	D	E	F	G	H	I
1	Country	Result							
2	USA	5							
3	UK	0							
4	USA	5							
5	UK	0							
6	UK	0							
7									

3a. The formula below calculates the progress between two points in time

=B2-A2

C2									
	A	B	C	D	E	F	G	H	I
1	Start	End	Progress						
2	17	119	102						
3	25	141	116						
4	13	131	118						
5	30		-30						
6	14	107	93						
7									

3b. You can use the IF function to display an empty string if the end value hasn't been entered yet (see row 5)

=IF(B2<>"",B2-A2,"")

C2									
	A	B	C	D	E	F	G	H	I
1	Start	End	Progress						
2	17	119	102						
3	25	141	116						
4	13	131	118						
5	30								
6	14	107	93						
7									

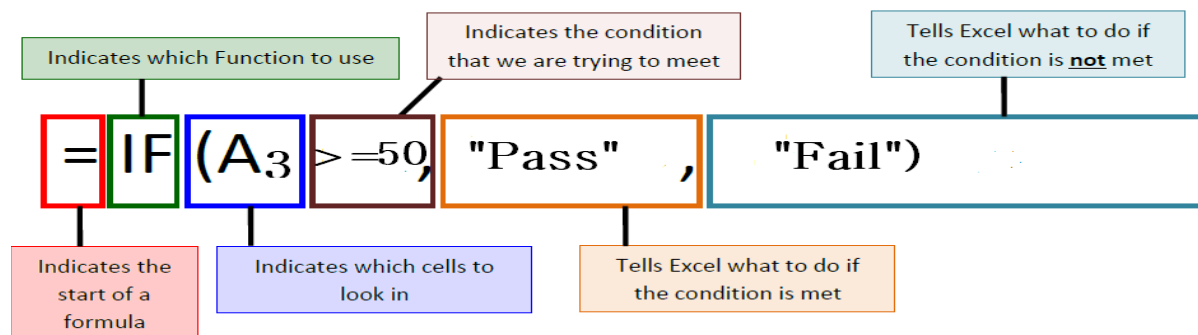
Explanation: if the end value is not empty (<> means not equal to), the IF function calculates the progress between the start and end value, else it displays an empty string (two double quotes with nothing in between)

An example of an IF function is shown below

	A	B	C
1	Pass/Fail Calculator		
2	Mark	Grade	
3	49	Fail	
4	51	Pass	
5	65	Pass	
6	33	Fail	
7	89	Pass	

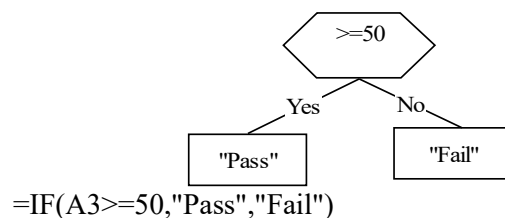
=IF(A3>=50,"Pass","Fail")

Breakdown of the formula



Assume you wish to convert a test mark into a simple **Pass/Fail** result.

The Diagram below shows how a single If statement returns **"Pass"** if a mark entered is greater or equal to 50 and **"Fail"** for any mark lower than 50.



Nested IF's

The IF function in Excel can be nested, when you have multiple conditions to meet. The FALSE value is being replaced by another IF function to make a further test

1. For example, take a look at the nested IF formula in cell C2 below.

=IF(B1=1,"bad",IF(B2=2,"Good",IF(B2=3,"Excellent","Not Valid")))

C2	:	=IF(B2=1,"Bad",IF(B2=2,"Good",IF(B2=3,"Excellent","Not Valid")))							
	A	B	C	D	E	F	G	H	I
1	Name	Score	Result						
2	Richard	3	Excellent						
3	Jennifer	1	Bad						
4	James	2	Good						
5	Lisa	25	Not Valid						
6	Sharon	2	Good						
7									

Explanation: *if the score equals 1, the nested IF formula returns Bad, if the score equals 2, the nested IF formula returns Good, if the score equals 3, the nested IF formula returns Excellent, else it returns Not Valid. If you have Excel 2016 or later, simply use the IFS function.*

2. For example, take a look at the nested IF formula in cell C2 below.

=IF(B2<60,"F",IF(B2<70,"D",IF(B2<80,"C",IF(B2<90,"B","A"))))

C2	:	=IF(B2<60,"F",IF(B2<70,"D",IF(B2<80,"C",IF(B2<90,"B","A"))))							
	A	B	C	D	E	F	G	H	I
1	Name	Score	Grade						
2	Richard	41	F						
3	Jennifer	95	A						
4	James	82	B						
5	Lisa	73	C						
6	Sharon	60	D						
7									

Explanation: *if the score is less than 60, the nested IF formula returns F, if the score is greater than or equal to 60 and less than 70, the formula returns D, if the score is greater than or equal to 70 and less than 80, the formula returns C, if the score is greater than or equal to 80 and less than 90, the formula returns B, else it returns A*

Nested functions contains a **function within another function**. They can handle **more than two outcomes** (A limitation of the normal IF Function)

Sometimes nested functions can contain several functions nested within each other

	A	B	C	D
1				
2	Name	Job	Years experience	Category
3	Iaila Aboli	Programmer	3	
4	Jane Apio	programmer	2	
5	Peter Lubega	Analyst	12	
6	John ochen	Sales	5	
7	Simon Rukundo	Engineer	7	
8	Cathy nansubuga	Programmer	6	
9	Joseph Leku	Sales	10	
10	Mary Tino	Sales	14	

For this task, three conditions exist:

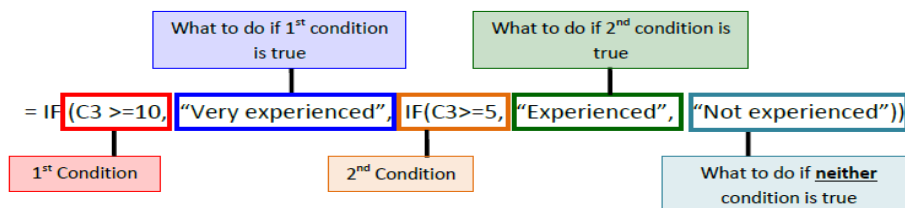
- ❖ ≥ 10 should display “Very experience” (more than or equal to 10)
- ❖ ≥ 5 should display “Experience” (more than or equal to 5)
- ❖ < 5 should display “Not experience” (Less than 5)

Place the cursor into cell D3 and change the formula so that it becomes;

=IF(C3 $\geq$ 10,”Very experience”,IF(C3 $\geq$ 5 “Experience”,”Not experience”))

	A	B	C	D
1				
2	Name	Job	Years experience	Category
3	Iaila Aboli	Programmer	3	Not experience
4	Jane Apio	programmer	2	Not experience
5	Peter Lubega	Analyst	12	Very experience
6	John ochen	Sales	5	Experience
7	Simon Rukundo	Engineer	7	Experience
8	Cathy nansubuga	Programmer	6	Experience
9	Joseph Leku	Sales	10	Very experience
10	Mary Tino	Sales	14	Very experience

Breakdown of the formula



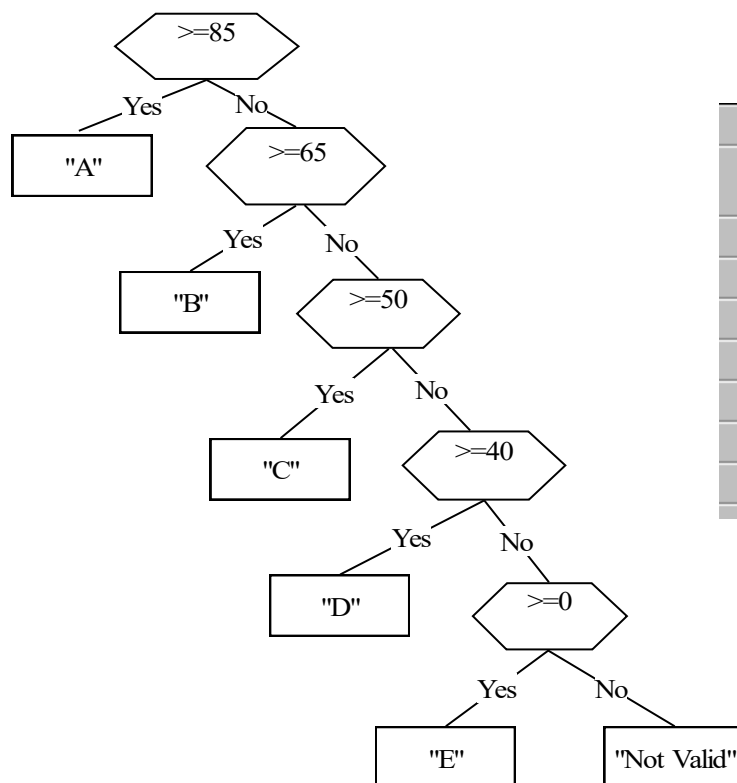
These are simply single IF's strung together to give multiple binary decisions. Suppose you wish convert test marks into grades A to E where:

Greater than or equal to 85	A
Greater than or equal to 65	B
Greater than or equal to 50	C
Greater than or equal to 40	D
Greater than or equal to 0	E
Otherwise	Not Valid

The structure diagram below shows graphically how a number of simple binary decisions are used to separate a grade out into the categories A, B, C, D, E shown in the table above.

At the finish, make sure there are an equal number of closing brackets to opening brackets

In the example the branch "Not Valid" only applies to numbers less than zero.



	A	B	C
1	Grade Calculator		
2	Mark	Grade	
3	49	D	
4	51	C	
5	65	B	
6	33	E	
7	89	A	
8	-78	Not Valid	

=IF(A3>=85,"A",IF(A3>=65,"B",IF(A3>=50,"C",IF(A3>=40,"D",IF(A3>=0,"E","Not Valid")))))



Using Lookups

The term "Look up" as used in the examinations, means to look up (search) from a list.

There are two main LOOKUP functions that can be used within Excel. These are;

- ❖ VLOOKUP
- ❖ HLOOKUP

VLOOKUP (Vertical Lookup)

What exactly is VLOOKUP?

Basically, VLOOKUP lets you **search for specific information** in your spreadsheet. For example, if you have a list of products with prices, you could search for the price of a specific item.

We're going to use VLOOKUP to find the price of the **Photo frame**. You can probably already see that the price is \$9.99, but that's because this is a simple example. Once you learn how to use VLOOKUP, you'll be able to use it with larger, more complex spreadsheets, and that's when it will become truly useful.

	A	B	C	D	E	F	G
1	Item	Price					
2	Spice rack	\$19.99					
3	Stationery	\$5.49					
4	Gift basket	\$25.99					
5	Cutting board	\$24.99					
6	Landscape painting	\$35.99					
7	Greeting card	\$4.99					
8	T-shirt	\$15.49					
9	Scarf	\$29.99					
10	Coffee mug	\$8.99					
11	Tea set	\$16.99					
12	Serving bowl	\$12.99					
13	Wrapping paper	\$3.99					
14	Photo frame	\$9.99					
15	Handmade soap	\$4.49					
16	Gourmet hot cocoa	\$5.99					

We'll add our formula to cell **F2**, but you can add it to any blank cell. As with any formula, you'll start with an equals sign (=). Then type the formula name. Our arguments will need to be in parentheses, so type an open parenthesis. So far, it should look like this:

=VLOOKUP(

Adding the arguments

Now, we'll add our arguments. The arguments will tell VLOOKUP what to search for and where to search.

The first argument is the **name of the item** you're searching for, which in this case is **Photo frame**.

Because the argument is text, we'll need to put it in double quotes:

=VLOOKUP("Photo frame"

The second argument is the **cell range that contains the data**. In this example, our data is in A2:B16. As with any function, you'll need to use a comma to separate each argument:

=VLOOKUP("Photo frame", A2:B16

NB: It's important to know that VLOOKUP will **always search the first column** in this range. In this example, it will search column A for "Photo frame". The value that it returns (in this case, the price) will always need to be **to the right** of that column.

The third argument is the **column index number**. It's simpler than it sounds: The first column in the range is 1, the second column is 2, etc. In this case, we are trying to find the **price of the item**, and the prices are contained in the **second column**. This means our third argument will be **2**:

=VLOOKUP("Photo frame", A2:B16, 2

The fourth argument tells VLOOKUP whether to look for **approximate matches**, and it can be either TRUE or FALSE. If it is TRUE, it will look for approximate matches. Generally, this is only useful if the first column has numerical values that have been sorted. Because we're only looking for exact matches, the fourth argument should be **FALSE**. This is our last argument, so go ahead and close the parentheses:

=VLOOKUP("Photo frame", A2:B16, 2, FALSE)

That's it! When you press Enter, it should give you the answer, which is **9.99**.

=VLOOKUP("Photo frame", A2:B16, 2, FALSE)					
C	D	E	F	G	H
			9.99		

How it works

Let's take a look at how this formula works. It first **searches vertically** down the first column (VLOOKUP is short for **vertical lookup**). When it finds "Photo frame", it **moves to the second column** to find the price.

	A	B	C	D	E	F
1	Item	Price				
2	Spice rack	\$19.99				9.99
3	Stationery	\$5.49				
4	Gift basket	\$25.99				
5	Cutting board	\$24.99				
6	Landscape painting	\$35.99				
7	Greeting card	\$4.99				
8	T-shirt	\$15.49				
9	Scarf	\$29.99				
10	Coffee mug	\$8.99				
11	Tea set	\$16.99				
12	Serving bowl	\$12.99				
13	Wrapping paper	\$3.99				
14	Photo frame	\$9.99				
15	Handmade soap	\$4.49				
16	Gourmet hot cocoa	\$5.99				

As we mentioned earlier, the price needs to be **to the right** of the item name. VLOOKUP **cannot** look to the left of the column that it's searching.

If we want to find the price of a different item, we can just change the first argument:

=VLOOKUP("T-shirt", A2:B16, 2, FALSE)

or:

=VLOOKUP("Gift basket", A2:B16, 2, FALSE)

Example 2. Use the Vlookup to grade the following students using the given grading system.

	A	B	C
1	Class Average		
2			
3			
4	Name	Average	Grade
5	John	92	
6	Andrew	50	
7	Joseph	96	
8	Mary	65	
9	Assumpta	82	
10	Richard	95	
11	Agnes	90	
12	Jenifer	80	
13			
14	Grading System		
15		0 - 63	F
16		64 - 72	D
17		73 - 84	C
18		85 - 94	B
19		95 - 100	A

	A	B	C
1	Class Average		
2			
3			
4	Name	Average	Grade
5	John	92	
6	Andrew	50	
7	Joseph	96	
8	Mary	65	
9	Assumpta	82	
10	Richard	95	
11	Agnes	90	
12	Jenifer	80	
13			
14		Grading System	
15		0	F
16		64	D
17		73	C
18		85	B
19		95	A
20			

Upper class limit

Comparison Values – Single Column

Values to be looked-up using comparison

C5 : =VLOOKUP(B5,\$B\$15:\$C\$19,2,TRUE)

	A	B	C
1	Class Average		
2			
3			
4	Name	Average	Grade
5	John	92	B
6	Andrew	50	F
7	Joseph	96	A
8	Mary	65	D
9	Assumpta	82	C
10	Richard	95	A
11	Agnes	90	B
12	Jenifer	80	C
13			
14		Grading System	
15		0	F
16		64	D
17		73	C
18		85	B
19		95	A
20			

Please enter this formula: **=VLOOKUP(B5,\$B\$15:\$C\$19,2,TRUE)**

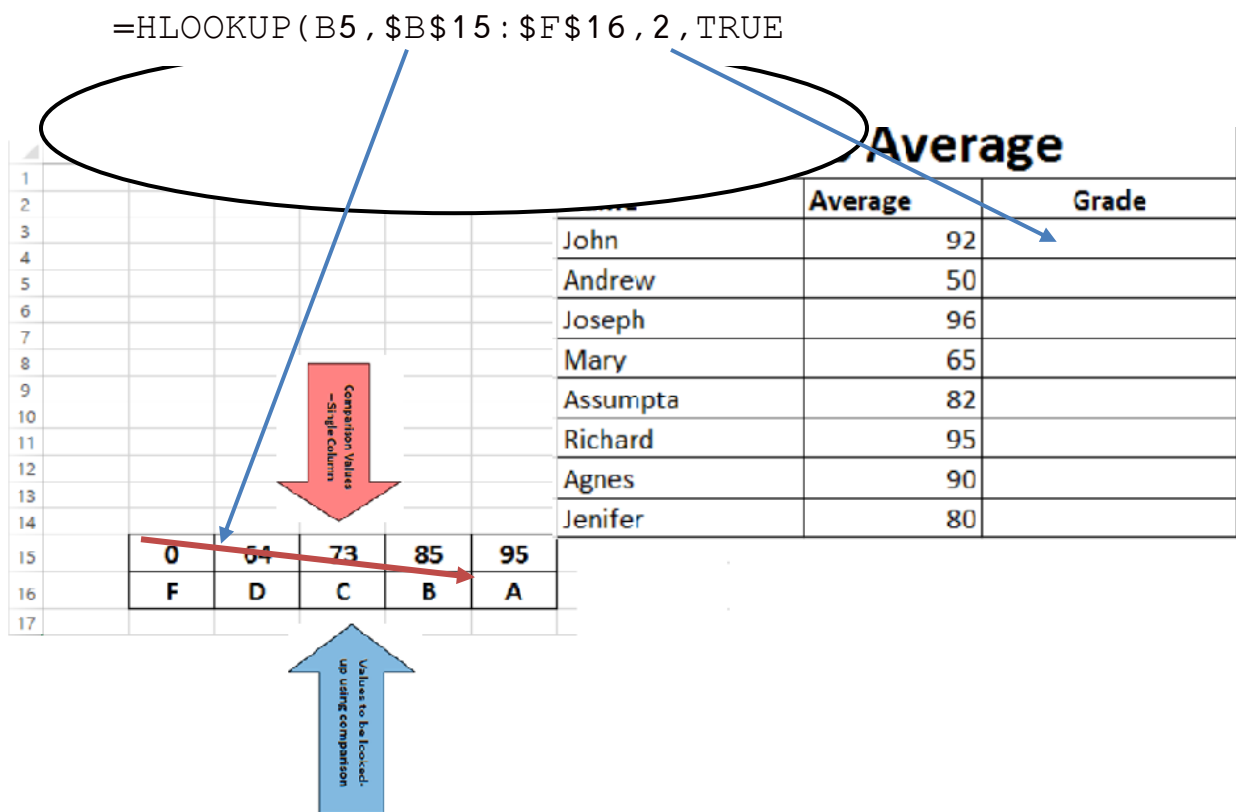
Note: In the above formula, **B5** is the cell which you want to calculate the letter grade, **B15:C19** is the table range you want to look for, the number **2** indicates the lookup table column number which contains the values you want to return.

HLOOKUP(Horizontal Lookup)

HLOOKUP is a function that perform a horizontal look-up of data.

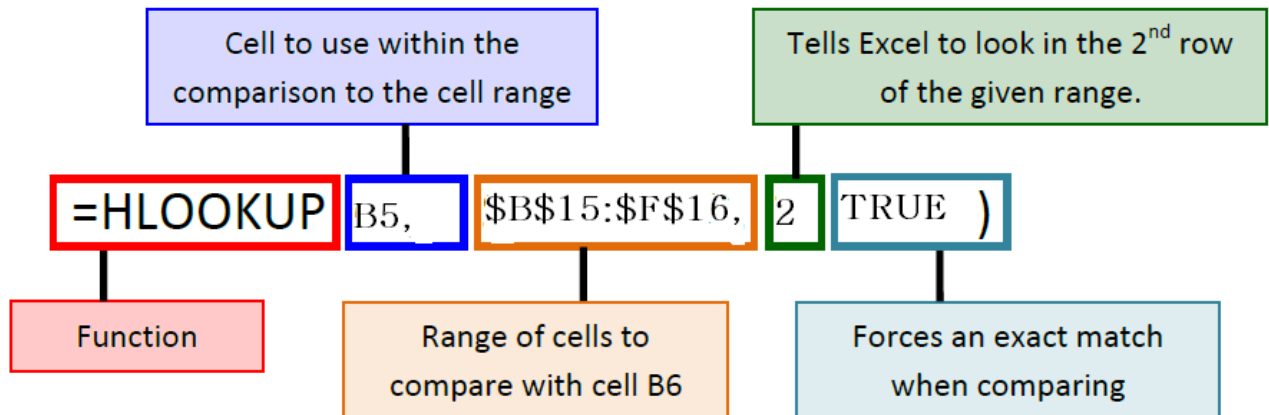
HLOOKUP Should be used when the values you wish to compare your data with are store in a single row.

The values to be looked up are stored in the rows below the comparison values. This is shown in the diagram below



=HLOOKUP(B5,\$B\$15:\$F\$16,2,TRUE)

Breakdown of the formula



RANK Function

If you give the RANK function a number, and a list of numbers, it will tell you the rank of that number in the list, either in ascending or descending order.

For example, in the screen shot below, there is a list of 10 student test scores, in cells B2:B11.

To find the rank of the first student's score in cell B2, enter this formula in cell C2:

	A	B	C	D	E
1	Student	Scores	Rank		
2	Al	46	<code>=RANK(B2,\$B\$2:\$B\$11)</code>		
3	Ben	31			
4	Cam	39			
5	Dee	32			
6	Ed	36			
7	Flo	20			
8	Gil	45			
9	Hal	23			
10	Ivy	38			
11	Joe	38			
12					



`=RANK(B2,$B$2:$B$11,0)`

Then, copy the formula from cell C2 down to cell C11, and the scores will be ranked in descending order.

	A	B	C	D
1	Student	Scores	Rank	
2	Al	46	1	
3	Ben	31	8	
4	Cam	39	3	
5	Dee	32	7	
6	Ed	36	6	
7	Flo	20	10	
8	Gil	45	2	
9	Hal	23	9	
10	Ivy	38	4	
11	Joe	38	4	
12				

COUNTIF function:

=COUNTIF(range,criteria)

We could create a table under the data to count the occurrences of each builder:

	A	B	C
1	Date	Region	Builder
2	6-Jan-08	Central	Doug
3	9-Feb-08	East	Dave
4	15-Mar-08	North	Dave
5	18-Apr-08	South	Brian
6	5-May-08	West	Larry
7	22-May-08	Central	Brian
8			Total
9			
10	COUNTIF	Builder	Occurrences
11	Total	Doug	1
12	Total	Dave	2
13	Total	Brian	2
14	Total	Larry	1
15			6

Our formula in cell C12 would be:



=COUNTIF(C2:C7,"Dave")

Sort and Filter

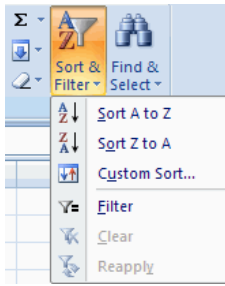
Sorting and Filtering allow you to manipulate data in a worksheet based on given set of criteria

Basic Sorts

To execute a basic descending or ascending sort based on one column:



- Highlight the cells that will be sorted
- Click the **Sort & Filter** button on the **Home** tab
- Click the **Sort Ascending** (A-Z) button or **Sort Descending** (Z-A) button

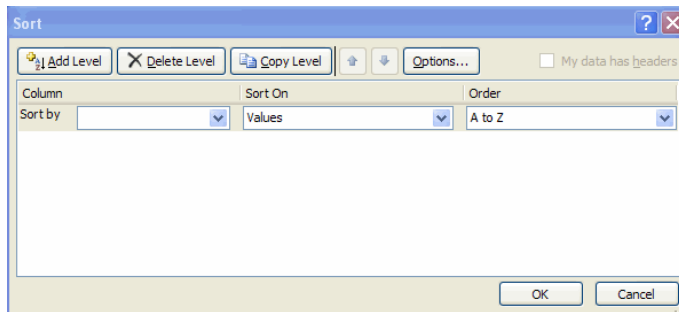


Custom Sorts

To sort on the basis of more than one column:



- Click the **Sort & Filter** button on the **Home** tab
- Choose which column you want to sort by first
- Click **Add Level**
- Choose the next column you want to sort
- Click **OK**

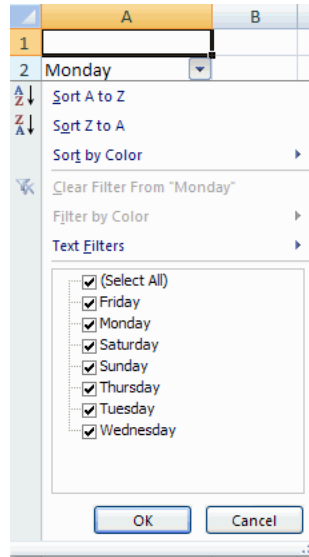


Filtering

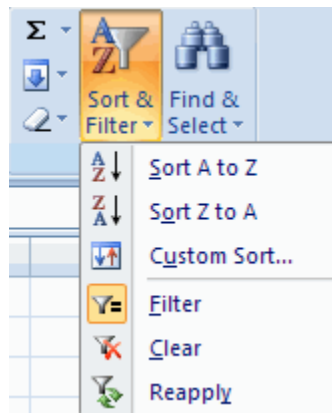
Filtering allows you to display only data that meets certain criteria. To filter:



- Click the column or columns that contain the data you wish to filter
- On the **Home** tab, click on **Sort & Filter**
- Click **Filter** button
- Click the **Arrow** at the bottom of the first cell
- Click the **Text Filter**
- Click the **Words** you wish to Filter



-  To clear the filter click the **Sort & Filter** button
- Click **Clear**



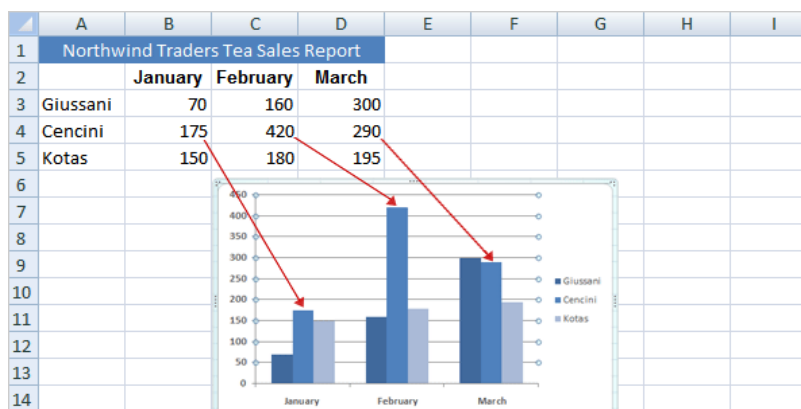
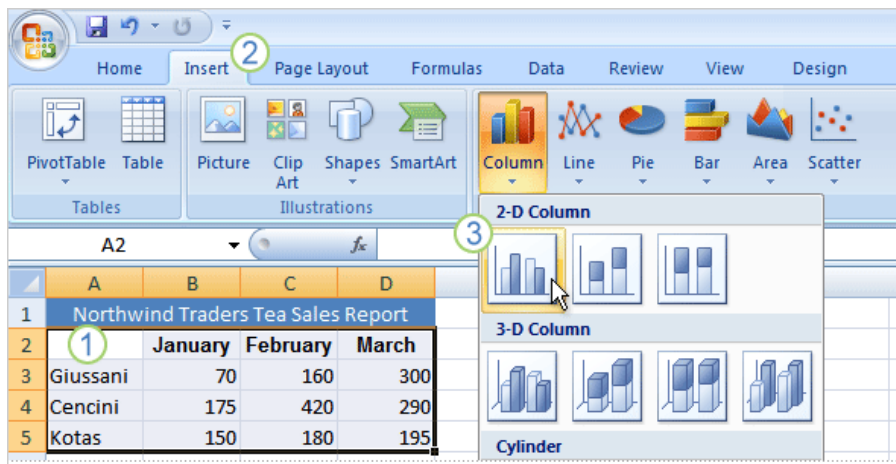
Charts

Charts allow you to present information contained in the worksheet in a graphic format. Excel offers many types of charts including: Column, Line, Pie, Bar, Area, Scatter and more. To view the charts available click the Insert Tab on the Ribbon.

How to create a chart

- 1  Select the data that you want to chart, including the column titles (January, February, March) and the row labels
- 2 Then click the **Insert** tab, and in the **Charts** group, click the **Column** button.
- 3 After you click **Column**, you'll see a number of column chart types to choose from. Click **Clustered Column**, the first column chart in the **2-D Column** list.

Tip If you want to change the chart type after you create your chart, click inside the chart. On the **Design** tab under **Chart Tools**, in the **Type** group, click **Change Chart Type**, and select another chart type.



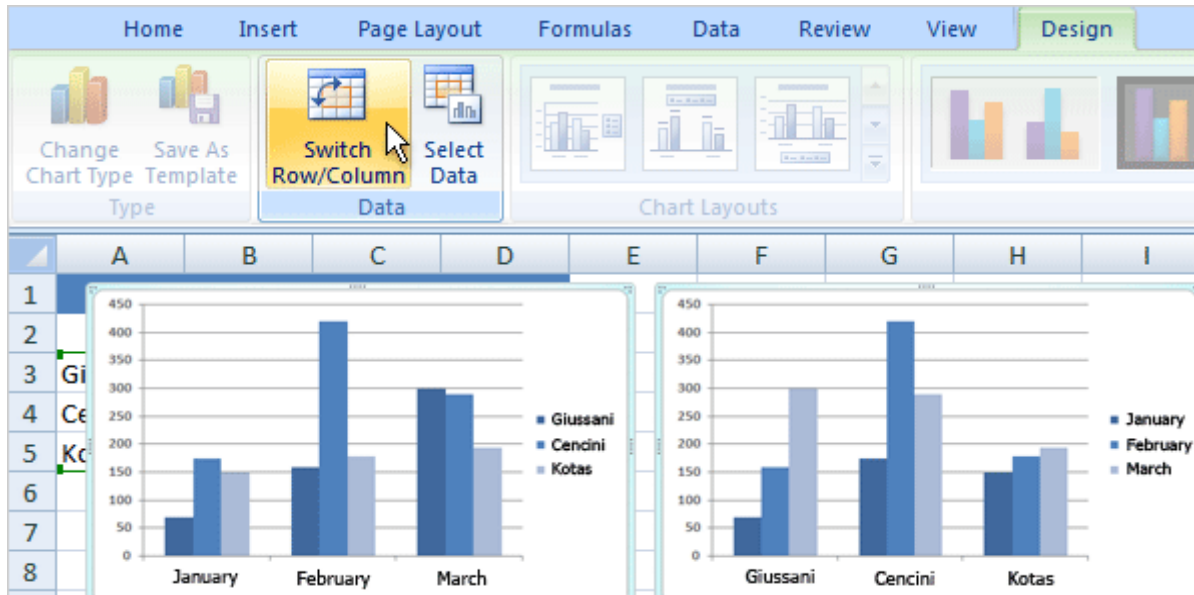
Data for each salesperson appears in three separate columns, one for each month. The height of each chart is proportional to the value in the cell that it represents.

Each row of salesperson data has a different color in the chart.

The column titles from the worksheet, January, February, and March, are now at the bottom of the chart. On the left side of the chart, Excel has created a scale of numbers to help you to interpret the column heights.

After the chart is inserted on the worksheet, the **Chart Tools** appear, with three tabs: **Design**, **Layout**, and **Format**. On these tabs you'll find the commands you need to work with charts.

When you complete the chart, click outside it. The **Chart Tools** go away. To get them back, click inside the chart. Then the tabs reappear.

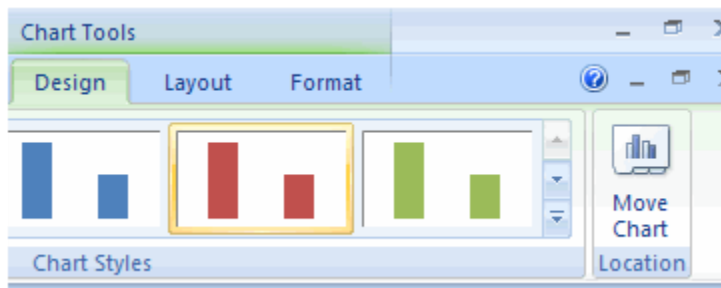


Modify a Chart

Once you have created a chart you can do several things to modify the chart.

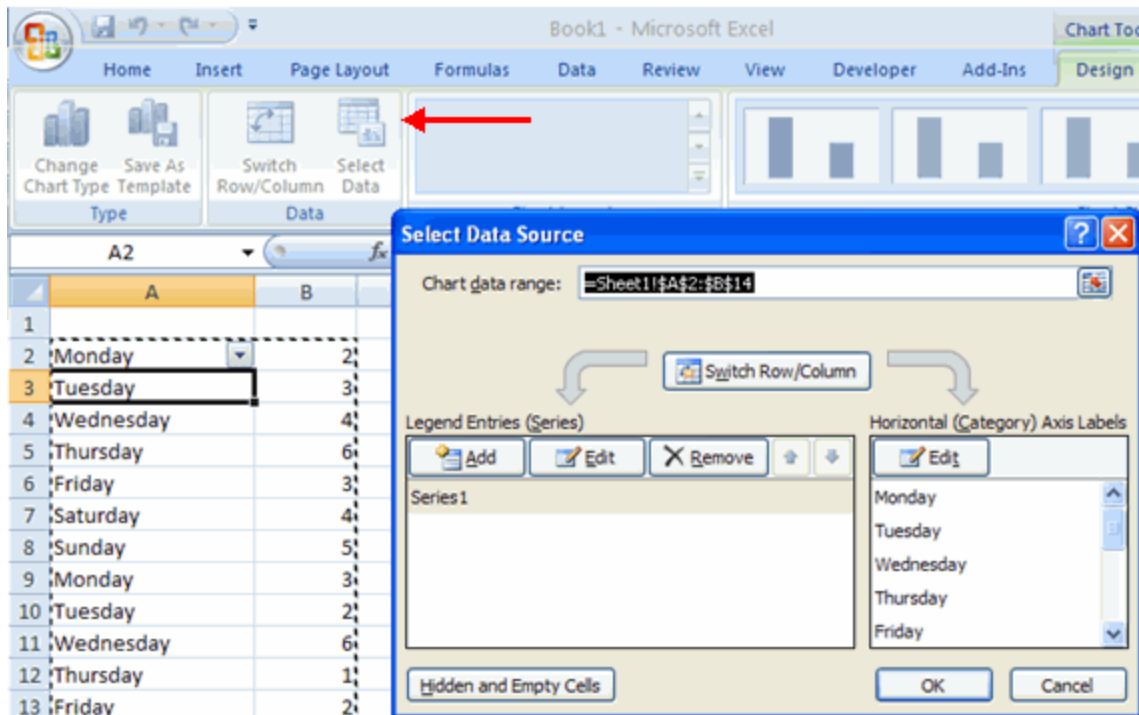
To move the chart:

-  Click the **Chart** and **Drag** it another location on the same worksheet, or
- Click the **Move Chart** button on the **Design** tab
- Choose the desired location (either a new sheet or a current sheet in the workbook)



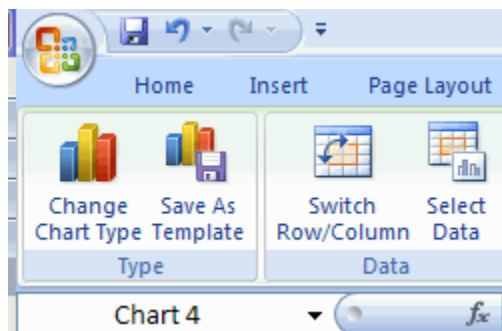
To change the data included in the chart:

-  Click the **Chart**
- Click the **Select Data** button on the **Design** tab



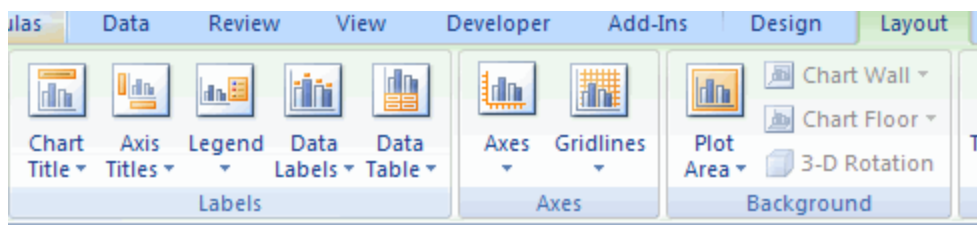
To reverse which data are displayed in the rows and columns:

-  Click the **Chart**
- Click the **Switch Row/Column** button on the **Design** tab



To modify the labels and titles:

-  Click the **Chart**
- On the **Layout** tab, click the **Chart Title** or the **Data Labels** button
- Change the **Title** and click **Enter**

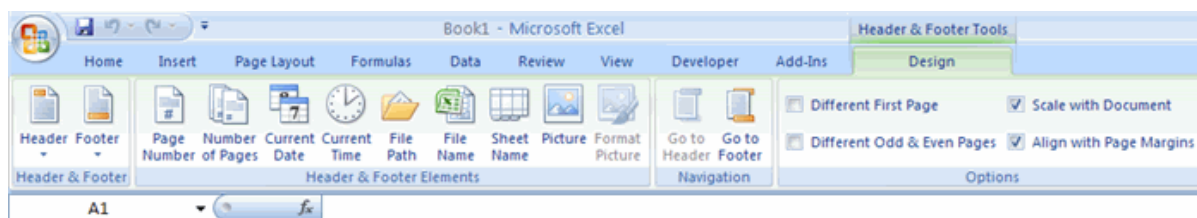


Page Properties and Printing

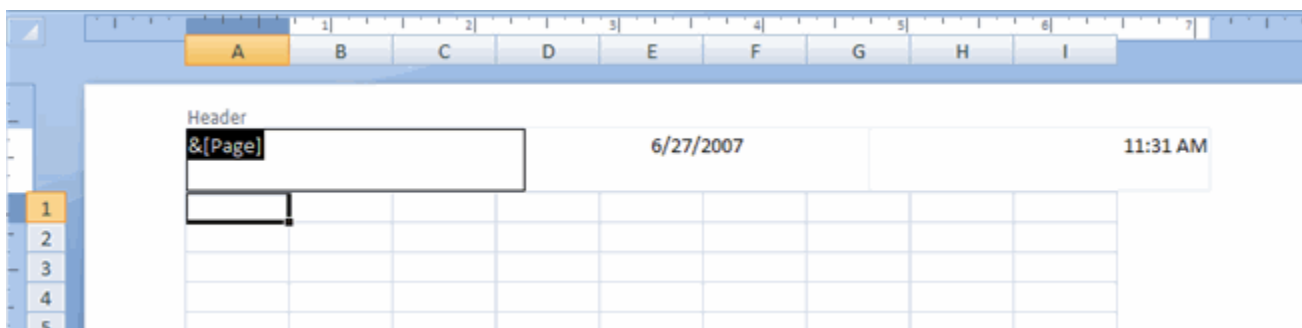
Create a Header or Footer

To create a header or footer:

-  Click the **Header & Footer** button on the **Insert** tab
- This will display the **Header & Footer Design Tools Tab**
- To switch between the Header and Footer, click the **Go to Header** or **Go to Footer** button



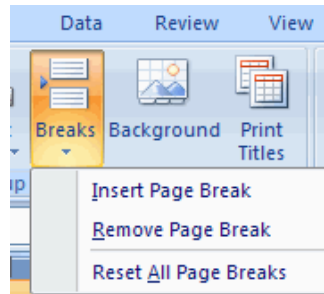
- To insert text, enter the text in the header or footer
- To enter preprogrammed data such as page numbers, date, time, file name or sheet name, click the appropriate button
- To change the location of data, click the desired cell



Set Page Breaks

You can manually set up page breaks in a worksheet for ease of reading when the sheet is printed. To set a page break:

-  Click the **Breaks** button on the **Page Layout** tab
- Click **Insert Page Break**



Print a Range

There may be times when you only want to print a portion of a worksheet. This is easily done through the Print Range function. To print a range:

- Select the area to be printed
- Click the **Print Area** button on the **Page Layout** tab
- Click **Select Print Area**



Microsoft excel Exercises

Qn 1. The information below shows rainfall distribution over a period of six months from Rakai, Wakiso, Mbarara and Kumi districts. Use it to answer questions that follow.

In Jan, **Rakai** received 450 mm, **Wakiso**-600 mm, **Mbarara**-631 mm and **Kumi**-632 mm.

In Feb, **Rakai** received 610mm, **Wakiso**-652mm, **Mbarara** -737 mm and **Kumi**-632mm.

In March, **Rakai** received 650 mm, **Wakiso**- 700 mm, **Mbarara** -735 mm, and **Kumi**-650mm.

In April, **Rakai** received 800mm, **Wakiso**- 751 mm, **Mbarara** -801mm and **Kumi**-660mm.

In May, **Rakai** received 800mm, **Wakiso**-792mm, **Mbarara** -802 mm and **Kumi**-770mm.

- i. Use a spread sheet program to tabulate the data with districts starting with cell A1.
- ii. Insert a **column** heading for **TOTAL** and calculate the total rainfall received per district.
- iii. Insert a **row** heading for **AVERAGE** and calculate the average rainfall received per month.
- iv. Insert a **row** heading for **HIGHEST** and calculate the highest value received per month.
- v. Insert a **row** heading for **LOWEST** and calculate the lowest value received per month.
- vi. Insert a **column** heading for **FOOD** and use a function to indicate Matooke for districts that received a total rainfall of 3900mm and above. Cassava for districts that received less than 3900mm.
- vii. Put **all-boarders** around your data
- viii. Create a pie-chart for **Kumi** district with its key indicating months. Position the pie-chart below the table.
- ix. Save with your name and Print your work

Qn 2 a) Enter the following data into spreadsheet

- i. In cell A1, enter State
- ii. In cell B1, enter Ice Cream
- iii. In cell C1, enter Shakes
- iv. In cell D1, enter Soda
- v. In cell A2, enter California.
- vi. In cell A3, enter Idaho.
- vii. In cell A4, enter Nevada.
- viii. In cell A5, enter Total.
- ix. In cell B2, enter 295.
- x. In cell C2, enter 44.
- xi. In cell D2, enter 63.
- xii. In cell B3, enter 420.
- xiii. In cell C3, enter 102.
- xiv. In cell D3, enter 209.
- xv. In cell B4, enter 250.
- xvi. In cell C4, enter 66.
In cell D4, enter 56.

- b) In cell B5, enter a formula to add cells B2 through B4.
- c) Select cells A5 through D5 and make the font bold.
- d) Select all cells that have data and apply a thick-lined border.

Qn 3).**Spreadsheet**

The following information represents data concerning employee pay roll of TRADERS **group** of companies.

Employ Number	Employee Name	Gross Payment	Deductions	Allowances	Net pay
001	Manda Ben	UGX 500,000	50,000		
002	Ariho G	UGX 550,000	20,000		
003	Genda R	UGX 450,000	30,000		
004	Wanda H	UGX 650,000	14,000		
005	Opolot J	UGX 230,000	55,000		

- Open up a spreadsheet application and enter the above data
- Insert an appropriate title and fill the cells with one color
- If each employee is given an allowance of 12% on the gross pay, use an **absolute reference** to compute employee allowances
- Determine Net pay if Net pay is equal to gross pay plus allowances minus deductions
- Sort your data in ascending order according to Net pay
- It was agreed that each employee makes a cash contribution to the SACCO according to how he/she earns and the following method is used to determine how much each employee pays.
Those earning 601,000 and above to contribute 7K; 401,000 to 600,000 to contribute 5K and Less than or 400,000 to contribute 2K
 Use IF function and the following conditions to indicate how much each employee is to contribute.
- Create a labeled **pie chart** for net pay and move the chart to a new sheet
- Insert a header of your name
- Print and Save the work as your name and number

Qn.4) This information is extracted from the school canteen of TOPA Academy. Study it carefully and answer the questions that follow.

Item	Cost price (ugx)	School tax	Profits	Expenses	Selling price
Sumbiz					7000
Meat pie					25000
Maghata					60000
Daso					35000
Banana chips					40000

Chapuz	16000
Eggs	12000
Packed juice	15500
Short cakes	35000

Additional information

Selling price = Cost price + school tax + expenses + profits

Expenses are= 40% of the selling price

Profits are = 30% of the selling price

School tax is 10% of the selling price

REQUIRED:

As someone who appreciates spreadsheets principle and functions;

- (i) Enter the above information in a spreadsheet application of your choice. Save it with your real name.
- (ii) Determine the amount of the following items for each item
 - (a) School tax
 - (b) Profits
 - (c) Expenses
- (iii) Determine the average and amount of tax the school collects from the canteen
- (iv) By use of a function/formula determine the most expensive item from the canteen.
- (v) Calculate the cost price for all items
- (vi) At the beginning of next year, the canteen operator has asked the school management that he is going to increase selling price by 20%. Insert a new column to work out the new prices for all the canteen items for the next year
- (vii) Format all figures with **UGX** currency symbol with one decimal place
- (viii) On a separate sheet, plot a line chart to represent the items, cost price and

selling price

(ix) Wrap your text in selling price title cell and sort the list of items, in descending order

(x) Save your work and make a print out.

Qn 3. (a) Enter the following distribution figures as given (in tonnes) in spreadsheets

	A	B	C	D	E	F
1	Item	1968	1970	1972	1974	1976
2	Rice	440	500	520	600	400
3	Coffee	600	660	700	880	900
4	Cotton	450	501	470	550	402
5	Fruits	700	690	704	560	640
6	Copper	800	840	790	804	820
7	Total					
8		1000				

- (b) Calculate the total for each year and save it as 'totals'
- (c) Calculate the average distribution of rice, cotton and copper
- (d) In the cell B8 is the price (in shillings) of a tonne of fruits between 1970-1974. Using a formula compute the amount of fruits sold in 1974 in cell H2
- (e) Save your spreadsheet as "Export"
- (f) Plot a pie – chart to represent the total export distribution for the years 1968, 1972 and 1976.
- (g) Save the graph as 'chart'

Qn 4. Luyombo General Merchandise is a company dealing in general hardware products. The table below shows the sales they made at the end of last month.

	A	B	C	D
1	ITEM	QUANTITY	UNIT COST (Shs)	
2	Rings	8,400	200	
3	Twisted bars	2,000	350	
4	Round bars	5,000	1,000	
5	Ordinary cement	4,000	18,000	
6	Supa cement	250	20,000	
7	Lime	200	12,000	
8	Red oxide	800	8,500	

- (i) Enter the above data into an electronic spreadsheet starting from A1 to C8
- (ii) Create another column in your worksheet at D1 with the heading "TOTAL COST", and by use of a

formula find the total for each item.

(iii) Arrange the items on the copied sheet in descending order according to "TOTAL COST"

Qn 5. A company deals in six (6) stationary items namely; note books, counter books, printing papers, box files, diaries and clip files. The table below represents the opening stock (O), closing stock (C), quantity sold (Q), selling price (S) and value of sales (V) respectively; where $Q = O - C$ and $V = S \times Q$.

A	B	C	D	E	F
Item	Opening stock (O)	Closing stock (C)	Quantity sold (Q)	Selling price (S)	Value of sales (V)
Note books	350	250		1500	
Counter books	490	400		3000	
Printing papers	200	150		10000	
Box files	200	100		5000	
Diaries	500	300		2000	
Clip files	400	200		1000	
Total value of sales.					

- Create a spread sheet of the data above, starting with the item title in cell A1 and save the work book as "Sales" and the worksheet as "stationary 1"
- Put the appropriate formula in cell D2 to compute the amount sold. Copy it to the rest of the column.
- Put the appropriate formula in cell F2 to compute V.
- Sum column F to find the total value of sales.
- Use the graph function to draw a bar graph of sales for the various items. Include your name and index number in the footer.
- Save the graph in a new worksheet as "My graph"
- Print the data and the graph separately.

Qn 6. Using a suitable spreadsheet program of your choice, enter the following records in respect to Pacific Computer's sales for two days.

		Sales	
Item	Unit Price	Monday	Tuesday
Keyboard	20,000	15	05
Mice	15,000	45	06
Hard drive	100,000	46	05

Ipod	23,000	78	04
Flash drives	50,000	87	03
Extension adapter	25,000	65	04
Mother board	130,000	43	02
X550 terminal	900,000	01	03
19" monitors	300,000	12	01
Foam cleaner	50,000	00	02
Printer	300,000	12	03

Instructions:

- Using a suitable spreadsheet program of your choice, enter the above data and save as 'pacific'.
- Format numbers to appear in the format provided above.
- Insert a new column and name it total sales and determine the amount obtained given that (Monday + Tuesday) as a product of Unit Price.
- Insert separator formats in the column for unit price and total price respectively.
- Using the column for item and total sales, represent this data series on a line graph. Remember to use appropriate title. Place your legend at the bottom of your chart.
- Send your chart to appear as an object in sheet three of your workbook.
- Rename sheet1 to 'data' and sheet3 to 'chart'.
- Insert a row between X550 and Motherboard for Celeron D Processor for Unit price as 1,800,000; Monday and Tuesday as 23, 02 respectively. Make sure that your worksheet updates automatically.
- Print two copies of your work.

Qn 7. The table below shows records of stock at DD & MM Quality Stationary Shop Limited.

DD & MM QUALITY STATIONARY SHOP LIMITED

Item	Quantity	Cost Price Per Item	Total Cost Price	Sale Per Item	Total Sales	Profit
Ream of Printing Paper	20	Shs15,000				
Art Pencil	150	Shs300				
Bic Pen	160	Shs500				
Black Board Duster	100	Shs1,000				
96 Pages Exercise book	40	Shs400				
Metre Rule	200	Shs500				
Mathematical Set	400	Shs1,300				

The Highest total sale

The Lowest total Sale

Considering the following DD & MM Quality Stationary Shop Limited conditions:

- (i) A profit of 95% on each item sold.
- (ii) Goods once sold are not returnable.
- (iii) Cash payment must be made at the counter before departure with the item bought.

Use it to answer the following questions:

- (a) Enter the record in any available spreadsheet application.
- (b) Compute the:
 - (i) Total Cost Price
 - (ii) Sales Per Item
 - (iii) Total Sales
 - (iv) Profit
 - (v) Highest total sales
 - (vi) Lowest total sales
- (c) Introduce a column between columns B and C. Determine positions of the selling items in ascending order by quantity.
- (d) Introduce a new column after the profit column for **Remarks**. Use VLOOKUP Function to give Remarks as follow:

Quantity	Remarks
400	The Best selling Item
200	The second best Selling Item
40	Second least Selling Item
20	The Least Selling Item

- (e) Plot a column graph showing item sold on the x-axis and profit made in a month on the y-axis for this business
- (f) Save the work as Sales in the folder created in question 1.

Qn 8. The spreadsheet below contains some marks of a selected students in S.5 taking PEM/ICT/GP combination. Use it to perform the following tasks associated with it;

i. Enter the information below in an electronic spreadsheet of your choice.

Save your work with your First name and Personal number.

D8		=Fx									
	A	B	C	D	E	F	G	H	I	J	K
1	First Name	PHYS	ECON	MATHS	SUB-ICT	GP	FIRST TOTAL	ACTUAL TOTAL	AVERAGE	POSITION	CATA
2	Ann	40	78	73	80	60	341				
3	Tito	85	82	80	86	58	401				

4	Alex	90	88	82	89	65	424				
5	Theresa	85	80	78	86	64	413				
6	Twaha	68	70	66	72	50	336				
7	Swabulah	45	44	41	58	58	256				
8	Angella	51	49	48	60	54	272				
9	Tobias	75	43	30	52	48	258				
10											
11							10				
12	Highest Maths										
13	Mode GP										

ii) Paste your spreadsheet to sheet two and use it to answer the questions below:

- Wrap the text in cell A1 such that “Name” appears at the bottom of “First”.
- Assuming that the first totals were exaggerated by 10 marks given in cell G11, use absolute cell referencing to determine the actual total for all learners.
- Compute the average score for all students.
- By use of the “Rank function” position those students basing on their average scores.
- Students are categorized as “C” when their average score is below 50, as “B” when their average is below 75, and as “A” for those whose average is above 74. By use of a simple IF function provide categories for all the learners.
- On a separate sheet named “Average Graph” Represent all students against their Average scores on a Clustered Column chart.
- Apply cell borders to the worksheet.
- Add your surname and personal Number in the header section, but centered.

ii) Go back to your original worksheet and perform the following;

- Arrange all the students in ascending order of their Physics scores.
- Filter out all those students whose First Total is less than 260 and paste them to an independent sheet called “Kadala”
- Use a function to determine the highest Maths score, and the mode for “GP”.

Qn 9. (a) Create a new workbook and name it as form 2 computer Exams.

Name	Class	Adm. No:	CAT 1	CAT2	CAT3	Total	Average	Class Position	Remark
Maina John	E	7984	80	70	59				
Ken Korir	W	7896	75	55	72				
Bernard K.	E	8092	86	59	75				
John Soi	E	7460	80	79	70				
Kipsang Bett	W	7892	76	75	80				
Mitei E.	E	7800	38	48	25				
Mark J.	W	8490	37	51	29				
Koech Ben	W	8184	30	86	75				
James W.	E	8082	25	27	20				
Abuya Ken	E	8083	30	25	25				
Leonand B.	W	8047	39	24	25				

(b) **Enter** the following data in sheet 1

(c) **Rename** the sheet as Term one results

(d) Find :

- i) Totals
- ii) Average

(e) Use the **IF** function to award remarks as follow

- A student whose average is above or equals 65 is given “Excellent”
- An average of 55 or above but less than 65 award “average work”
- An average less than 55 award “work below average”

(f) i) **Award** position to student basing on the average scored.

ii) On the last rows enter formulas to count students from both classes

(g) **Sort** the students list by class position in ascending order.

(h)

i) **Copy** the entire worksheet onto sheet2 and rename it “lower group”

ii) Filter “Lower group” sheet to display students from “E” class and whose average score is below 50.

(i) **Draw** a bar graph to display the following information

- The three cats

- Names
- Title as “TERM ONE COMPUTER RESULTS”
 - i) **Place** the legend at the bottom of the graph
 - ii) **Save** the chart on a new sheet and name it graphical analysis

(j) **Print:**

- i) The filtered lower group
- ii) The chart
- iii) Term one results sheet

Qn 10. A farmer’s income and expenditure is shown in the spreadsheet below:

	A	B	C	D	E
1	RATES				
2		Increase	3%		
3		Decrease	2.5%		
4					
5					
6	INCOME	Maize sales	2000		
7		Wheat sales	25000		
8		Millet sales	12500		
9					
10		Total Income		39500	
11	EXPENDITURE				
12		Fertilizer	16000		
13		Labour	10000		
14		Transport	8000		
15					
16		Total Expenditure		34000	
17					
18	PROFIT			5500	
19					

If expenditure is decreased by 2.5% and income goes up by 3%

(i) Calculate the figures in cells E10 and E16 to find the total income and expenditure in each case?

- (ii) Calculate the figures in cell E18 to find the profit
- (iii) Calculate the new income in cells F6, F7 and F8
- (iv) Calculate the new expenditure in cells F12, F13 and F14
- (v) Calculate the new profit in cell G18
- (vi) Save your work
- (vii) Print your work

Qn 11. The Pre-Mock results 2014 of Paidha P7 School are displayed below.

Using an appropriate spreadsheet application;

a) Enter the record as is.

**PAIDHA P7 SCHOOL - 2014 PRE-MOCK
RESULTS**

REGN O	NAME	MT H	grade	EN G	grade	SC I	grade	SS T	grade	TOTAL AGGT	MEA N MAR K
001	Santo	70		90		80		85			
002	Melody	80		50		99		82			
003	Patricia	50		58		90		77			
004	Joel	66.5		62		89		40			
005	Methe w	71		66		78		99			
006	Jacob	50		49		76		69			
007	Batha	49		81		75		60			
008	Cathy	30		30		75		88			
009	Ann	44		75		70		80			
010	Pamela	50		73		56		88			

b) Compute the mean mark of each candidate.

c) Insert columns to grade Math, English Language, Science and SST based on the following grading system:

Marks	90-100	80-89	75-79	70-74	65-9	60-64	55-59	50-54	0-49
Aggts	1	2	3	4	5	6	7	8	9

Required:

- i. IF function to grade Math and English Language.
 - ii. VLOOKUP function to grade Science and SST.
- d) Compute the total aggregates for each candidate.
 - e) Use a function to determine the numbers of candidates whose TOTAL AGGT is less than or equal to 12.
 - f) Plot a line graph showing Name, Total Aggt and Mean Marks of the candidates. Name all the axes of the graph and the title.
 - g) Name the sheet Pre-Mock.
 - h) Copy the graph and paste in sheet 2, name it Graph.
 - i) Save the work and show the print preview of your work.

Qn 12. The following is a payroll for Employees of Big is Big Companies. Their Basic Pay is as follows

Name of Employee	Title	Age	Basic Salary	Transport Allowance	Rent Allowance	Gross Pay	Tax	Net Salary
Musoke Carol	General Manager	36	950,000					
Kabali Fred	Production Manager	31	2,000,000					
Malema Julius	Engineer	35	800,000					
Tugume Mary	Stores Manager	36	820,000					
Opio Jerry	Transport Director	56	700,000					
Kivumbi Nathan	Vehicle Mechanic	41	550,000					

Required:

- (i) Using a spreadsheet software of your choice enter the above data.
- (ii) Using suitable formulae compute the following.
 - Transport allowance at 5% of Basic Salary
 - Rent allowance at 10% of Basic salary
 - Gross Pay as the Total of Basic, Transport, and Rent allowances
 - Tax is 10% of Gross Pay
 - Net pay is the Difference between Gross Pay and Tax
- (iii) Below the entered data, determine the “Oldest Employee” using a function.
- (iv) Put borders around all the entered data.
- (v) Insert a centered heading “ BIG IS BIG PAYROLL”
- (vi) Sort your data basing on the basic salary in Ascending order
- (vii) Generate a column graph using data series for Name of Employee and Net pay.
- (viii) Save your work as “Payroll” and print all your work

Qn 13. The Chemistry Grade Book for S.4 students of Kikawa secondary School.

a. Recreate the table shown below and save as Kikawa.

Name	Exam 1	Exam 2	Exam 3	Final	Total	Average	Letter Grade
Otheino Paul	80	88	87	94			
Mabia More	74	64	55	70			
Twinomugisha Allan	50	78	45	78			
Lule Nabil	78	27	45	90			
Bukenya Isaac	99	92	96	100			
Tendo Shadia	85	99	82	95			
Kuwuma Moses	56	76	74	70			
Barigye Mark	45	35	56	60			
Akena Paul	100	90	95	100			
Bbosa Fahad	75	88	97	89			
Mpaata Hakim	90	90	85	89			
Max							
Min							

- Determine the total and average for each student
- Alphabetize the list according to the students name
- Using a formulae calculate the minimum and maximum for Exam1, Exam2, Exam3 and the final exam.
- Using the Lookup formula, calculate the letter grade for each student whereby anything over 90 is an A, 80 is a B, 70 is a C, 60 is a D, 50 as E and anything lower is an F
- Create a clustered column chart with a 3-D visual effect for names and average,
- Your charted should insert on a new sheet
- Print your work

Qn 14. The Manager **SWALLOWER’S HOTEL** provided the following information concerning their employees' salaries paid monthly.

No	Name of employee	Basic Pay
001	DANDILA SHOCK	600,000
002	QUIZERA POP	170,000
003	TAGUDI IRE	250,000
004	SEKA WAJA	300,000
005	ESTHER ESEZA	800,000
006	NAKATO MARIA	140,000
007	GUMONYE DAN	140,000
008	NABULO FATIMA	80,000
009	BABALANDA STIVE	250,000
010	JACKOTO PETWA	700,000

The following adjustments are also made monthly on the employees’ salaries.

- (a) Each employee receives HOUSE ALLOWANCE of 10% on basic pay.
- (b) PAYE tax of Shs 50,000 is deducted from each employee earning basic pay of not less than shs 300,000 , while those earning basic of shs 250,000 and below , each gets MEDICAL ALLOWANCE of 5% on his/her basic.
 - (i) Open up a spread sheet application and enter the above information including the adjustments columns.
 - (ii) Calculate the NET PAY for each employee using appropriate formula
 - (iii) Determine the total amount paid by the HOTEL at the end of the month.
 - (iv) Copy and paste all the work on sheet 2 and re-name sheet 2 as “NEW WORK”
 - (v) Make a column graph from the data in sheet one. using net pay (04 marks)
 - (vi) Filter data in sheet 2, to show only basic pay of 300,000 and above.
 - (vii) Put a header of your name
 - (viii) Save your work as your name and index number.
 - (ix) Print your work in sheet 1.

Qn 15. The following spreadsheet shows employees of **Mawerere Company**

A B C D E F G H

1	Name of employee	Basic pay	Transport allowance	Night duty allowance	Gross pay	Revenue tax	Net pay	Category
2	Andrew	200000	20000					
3	Joseph	500000	30000					
4	Ritah	500000	15000					
5	Abdu	300000	50000					
6	Ali	400000	30000					
7	James	300000	20000					
8	Among	100000	10000					
	Revenue tax	10%						

Open up a spreadsheet application and enter in the given data.

Useful information

Gross profit is the equivalent of basic pay plus all allowances

Net pay is the equivalent of gross pay minus tax

Each employee is to get a value of shs 20000 as duty allowance

- Insert a new row above the data table and type the heading **Mawerere Co .Payroll**.
 - Use absolute cell referencing to calculate the revenue tax for all employees which is 10% of the basic pay.
 - Use relevant formulas to determine the:
 - Gross pay
 - Net pay
 - Value for the highest tax payer
 - Sort your table in ascending order according to net pay.
 - Employees whose Revenue tax is less than 40,000 are categorized as **Lazy**, those between 40,000 and 60,000 **Promising** while others **Active**. Use IF function to determine the category of each employee.
 - Apply a printable border on the whole table
 - Create an area chart that will consider **Employee names** and **net pay**
 - Transfer a chart to a new sheet
 - Insert a footer of your name
- Print and save the **My work_** (your name)work as the work

Qn 16. Below is a spreadsheet showing employees record Blue Print Ltd in Mukono District. You are required to;

- Open a suitable application program and enter the data below exactly as it appears maintaining the respective cell addresses.
- Save it as Absolute Day Book

A	B	C	D	E	F	G	H	I	J
Blue Print Ltd Employees Records									
	Name	Basic Pay	Transport Allowance	Night Duty Allowance	Gross Pay	Revenue Tax	Net Pay	Rank	Employee Category
1	Timothy	800000	4100	2000					
2	Titus	600000	6000	2000					
3	Theresa	160000	2500	2000					
4	Twaha	120000	9000	2000					
5	Swabulah	150000	10000	2000					
6	Tobias	200000	5000	2000					
	Revenue tax =		10%						

Additional information:

-Gross pay is the equivalent of basic pay plus all allowances

-Net pay is a function of gross pay minus tax

(i) Using absolute cell referencng, calculate the Revenue Tax for all employees having in mind that it is 10% of basic pay.

(ii) Calculate the Gross Pay.

(iii) Calculate the Net Pay.

(iv) Determine the highest tax payer by use of a function

(v) Add the name Hood between Twaha and Swabulah. By use of functions determine his gross pay, revenue tax and net pay.

(vi) Rank all the employees basing on their basic pay.

(vii) All employees whose revenue tax is less than 20,000= are categorized as “Form” while others are categorized as “**Substance**”. Use a simple if function to determine the category to which each of employee.