Introduction to

SPREAD SHEETS

WITH

2010

A Practical self-study Guide

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INTRODUCTION

Microsoft Excel is a powerful spreadsheet application that allows users to produce tables containing calculations and graphs. These can range from simple formulae through to complex functions and mathematical models.

SECTION 1 THE BASICS

Basic concepts to be learnt

1 Understand and use common Windows elements
2 Launch Excel
3 Understand the concept of a spreadsheet
4 Recognise Excel screen elements
5 Work with Toolbars
6 Use Menus

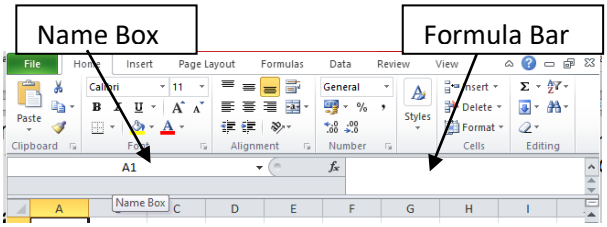
THE MICROSOFT EXCEL WINDOW CONCEPTS

Excel is an application that runs under the Windows graphical user interface. When launched, Excel sits in its own "window" – the box that surrounds the application elements. The window can be moved, sized, closed, minimised and maximised using the features common to the Windows environment (*As described and used in Microsoft Word*)

The Ribbon, Tabs, Tool Bars and Menus

All these are similar to those seen in Microsoft word except to the few additions below:

Name Box

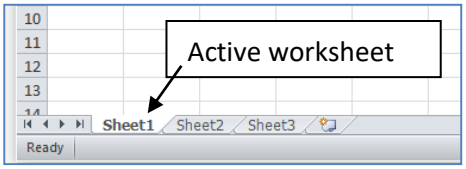


The NAME BOX is the small white box to the left of the FORMULA BAR. It displays the cell reference of the selected cell. Entering a cell reference in the name box and pressing return will navigate you to the specific cell entered. Using the drop down arrow to the right of it will allow you to select any specified names in the workbook. When creating functions the box will have a different appearance and will allow you to choose the most popular functions used in that workbook.

Formula Bar

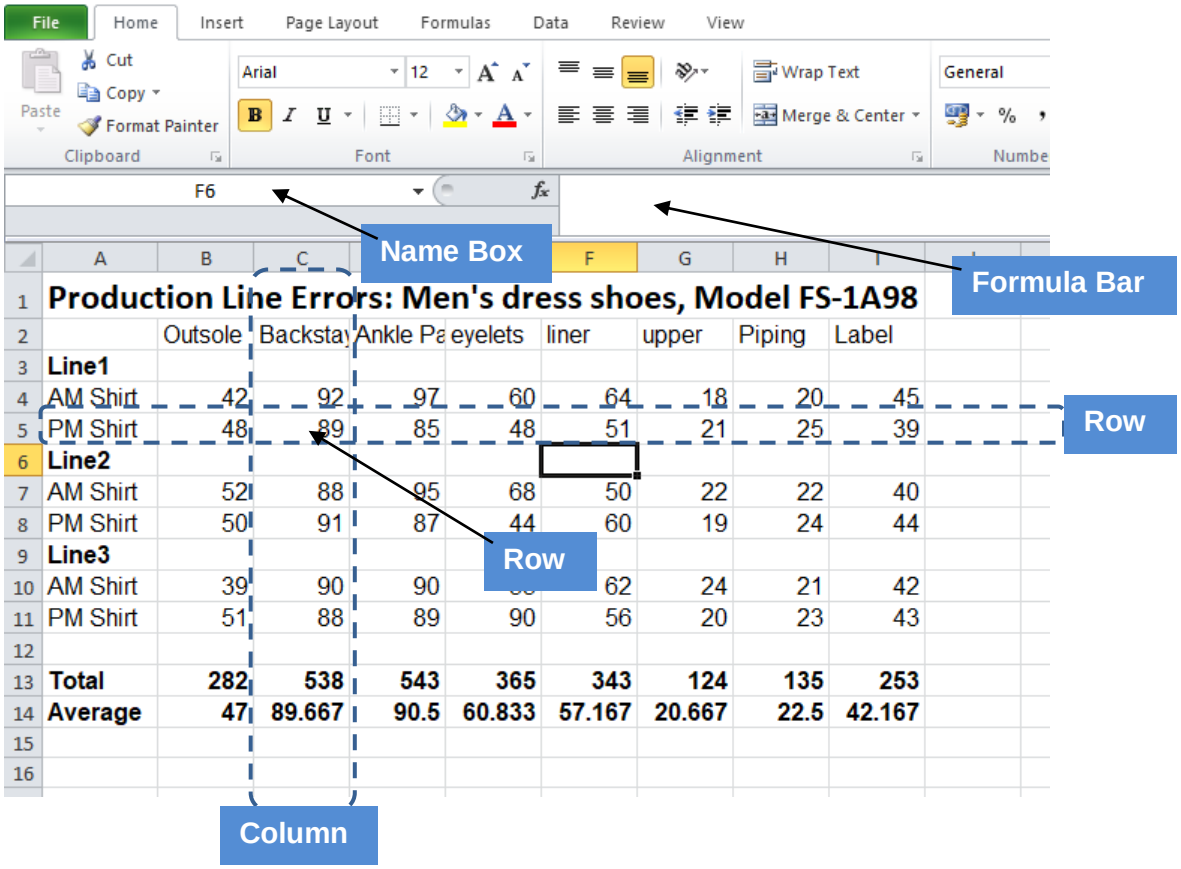
The FORMULA BAR is the white bar to the right of the NAME BOX. It displays the formulae, function or content of the selected cell. It can be used for entering and editing data, Creating and editing functions and formulae. The construction of Formulae and functions can be seen in this bar even when the cell containing the formula is showing a calculated value. (Unless cell is formatted to HIDDEN and the sheet protected). The fx button on the left of the bar is a tool to create functions and formulae

Worksheets

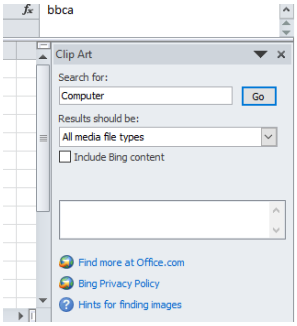


You use worksheets to list and analyse data. You can enter and edit data on several worksheets simultaneously and perform calculations based on data from multiple worksheets. When you create a chart, you can place the chart on the worksheet with its related data or on a separate chart sheet. The names of the worksheets appear on tabs at the bottom of the workbook window. The name of the active sheet is bold.

The worksheet is made of already drawn tables that can be modified according to the your need. The intersection of Rows and Columns make CELLS in which all data is entered.



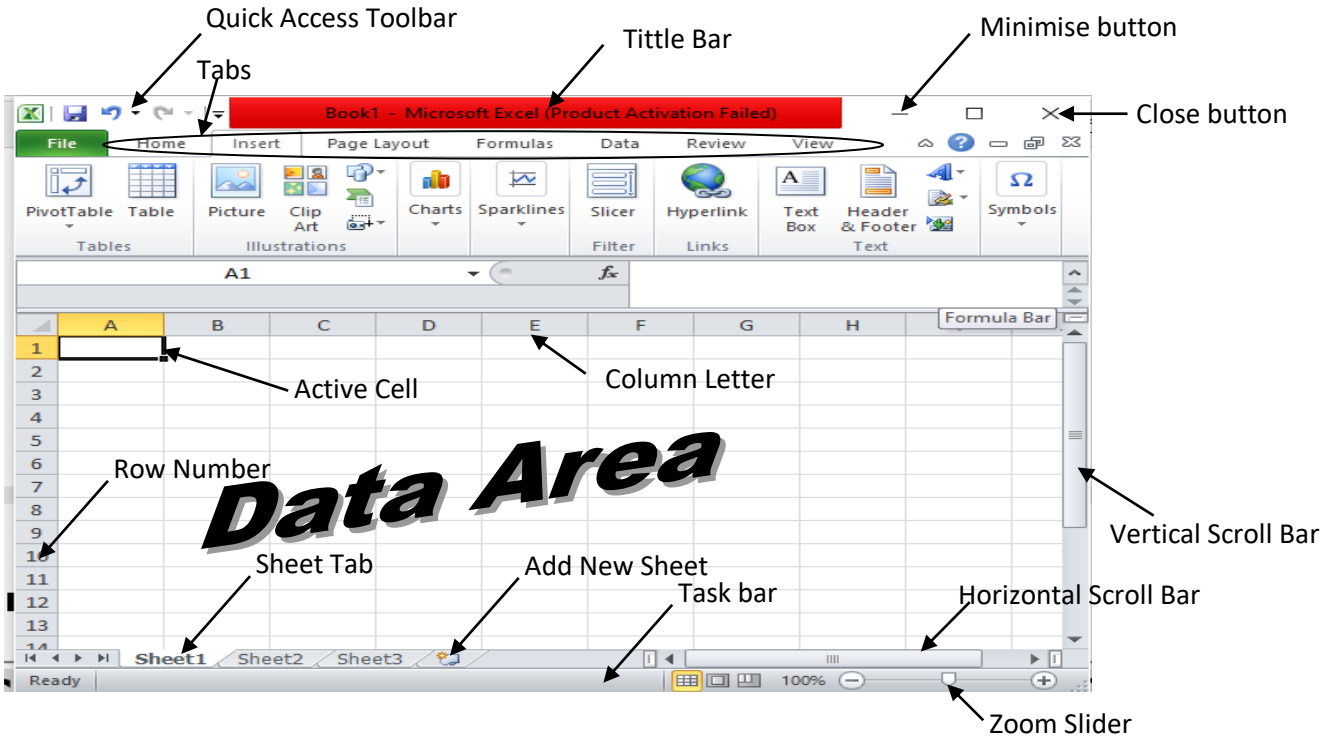
Task Pane



A task pane is a window that collects commonly used actions in one place. The task pane enables you to quickly create or modify a file, perform a search, or view the clipboard. It is a Web-style area that you can either, dock along the right or left edge of the window or float anywhere on the screen. It displays information, commands and controls for choosing options. Like links on a Web page, the commands on a task pane are highlighted in blue text, they are underlined when you move the mouse pointer over them, and you run them with a single click.

A task pane is displayed automatically when you perform certain tasks, for example when you choose INSERT, Ribbon and then CLIPART to insert a picture

The Microsoft Excel Window



Launch Excel

See section 2: Starting Excel

SECTION 2 NAVIGATION AND ENTERING DATA

Basic Concepts to be Learnt

1 Navigate to any point in a worksheet.
2 Navigate between worksheets.
3 Creating a new workbook
4 Enter numerical or textual data.
5 Edit entered data or delete it.
6 Selecting various parts of sheet or workbook simultaneously.

1. NAVIGATING/MOVING AROUNG A WORKSHEET

Moving around Worksheet with such a large working area available, you need to be aware of some of the techniques used for moving around the worksheet.

It is possible to move using either with the keyboard or the mouse.

Mouse

(i) The mouse is good if you want to move small distances. Click the white plus on any cell that you want to move to. The cell you clicked on becomes the selected cell. Depending on the position of the mouse in relation to the active cell, Excel displays different pointer shapes. The shape that must be displaying when moving to a cell or selecting cells is a white cross. (✚)

Keyboard

(i) You can select a cell by moving around with your cursor keys. (Arrow keys on your keyboard).
(ii) Having selected a cell, by double clicking the cell it becomes the active cell with a flashing cursor. You can also make a cell active by clicking in the FORMULA BAR or by pressing the F2 key

Note:

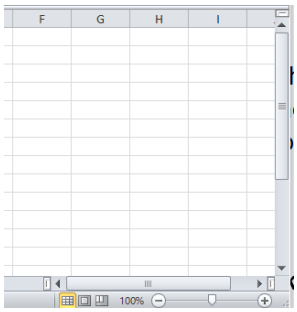
(i) While any cell is active various commands will not be available until the cell is no longer active.
(ii) You may close the cell by pressing Enter or cancelling whatever was entered by pressing esc.

Scrolling

The vertical and horizontal scroll bars do not move the active cell but they do allow you to see areas of the worksheet that are not currently visible.

- Having scrolled to an area of the worksheet, if you then need to move the active cell into that region, click the mouse onto a cell of your choice.

To use the scroll bars:



(a) Click on the scroll arrows up/down or left/right.

(b) Drag the scroll box until the relevant cell becomes visible. The size of a scroll box indicates the proportional amount of the used area of the sheet that is visible in the window. The position of a scroll box indicates the relative location of the visible area within the worksheet.

Note: *The size of a scroll box indicates the proportional amount of the used area of the sheet that is visible in the window. The position of a scroll box indicates the relative location of the visible area within the worksheet.*

USEFUL KEYS FOR NAVIGATION

The table below lists some useful tips for scrolling:

To scroll	Do this
One row up or down	Click the arrows in the vertical scroll bar.
One column left or right	Click the arrows in the horizontal scroll bar.
One window up or down	Click above or below the scroll box in the vertical scroll bar.
One window left or right	Click to the left or right of the scroll box in the horizontal scroll bar.

Note: *When dragging the scroll box a scroll tip will display, showing the row or column you will move to when you release the mouse.*

Keyboard

When you need to move further, it is better to use the keyboard. The table below lists useful movement keys.

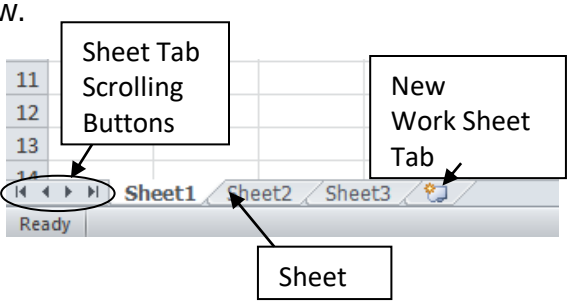
To Move	DO THIS
One Cell Up, Down, Left or Right	[↑] [↓] [←] [→]
Up One Screen	[PAGE UP]
Down One Screen	[PAGE DOWN]
Left One Screen	[ALT][PAGE UP]
Right One Screen	[ALT][PAGE DOWN]

To Edge of Worksheet (or current block of data)	[CTRL][RELEVANT ARROW KEY]
To a Particular Cell	[F5] then type the reference for the cell required and press Enter
To column A in the current row	[HOME]
To cell A1	[CTRL][HOME]

2. NAVIGATING BETWEEN WORKBOOK SHEETS

To move between sheets

Each new workbook contains worksheets, named sheets 1 to sheet 3. The sheet name appears on a tab at the bottom of the workbook window.



Mouse

(i) You may click on any sheet tab to go to that sheet

Keyboard

(i) Press [CTRL]+[PAGE DOWN] to move to the next sheet, or [CTRL]+[PAGE UP] to move to the previous sheet.

Note:

(i) If the sheet required is not in view, use the tab scrolling buttons to display the sheet.

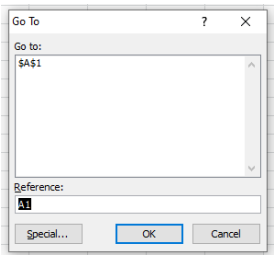
(ii) *The last tab is to allow the creation of a new worksheet, be careful or any new sheets may need to be deleted*

Moving to a point in a Sheet

- **To move to a specific cell: (Go To)**

You can use [F5] to tell Excel to move to a specific cell. [F5] is the Microsoft Office Go To key. When you press [F5] in Excel a dialog box is displayed where you can type in a cell reference.

Keyboard



(i) Press [F5] on the keyboard. The following dialog box will appear.

(ii) Type the cell reference that you want to move to in the REFERENCE box and press [ENTER].

(iii) You can use [F5] to move to a cell in a different sheet. E.G. To go to Sheet 7 cell A1 you can press [F5] and then type Sheet7!A1. (*The exclamation mark tells excel that the text immediately before it, is*

a sheet name. The sheet name must exist in the workbook)

(iv) Excel keeps a log of the cells you have visited using the 'Go to' key, and lists them in the 'GO TO' list area of the dialog. You can go back to a previously visited cell by pressing [F5] and double-clicking on the cell reference you want from the list.

(v) Named ranges are also listed in the GO TO list if they have been set up.

3. CREATING NEW WORK BOOK AND SAVING

Concepts

Microsoft Excel 2010, which is part of the Microsoft Office Suite, is a spread sheet application used to create, edit and print documents requiring the use of calculations of a variety of types

When Excel 2010 is launched at the beginning of a work session, it provides a blank work book with three blank sheets ready for use. Excel assigns the name "**Book1**" and this appears on the title bar at the top of the screen until you save the work book and allocate a filename. Each time a new work book is created, Excel will assign this temporary name with the number of the work book going up in sequence (e.g. the second work book created in any one session would be "**Book2**" and so on).

Learning Example 2.1

The class teacher of S.3A wanted to assess his best 10 students' performance in the basic compulsory subjects of English, Mathematics, Physics, Chemistry and Biology during the Mid term examinations of 2020 and below is his recordings:

NAME	ENGLISH	MATHEMATICS	PHYSICS	CHEMISTRY	BIOLOGY
Okuni Peter	80	75	90	66	80
Nyakaana Isaac	75	81	88	70	90
Nantayi Jane	84	75	67	82	95
Aboth Justine	65	78	78	68	88
Magino Bob	85	59	98	78	95
Ajambo Mega	87	85	65	87	84
Cuinyai Jesca	90	65	62	76	52
Mwijukye Joel	65	82	80	90	78
Akankwasa Loy	87	78	71	58	95
Njagala Martin	89	85	64	78	45

Required:

(i) Enter the information above into a spread sheet application of your choice

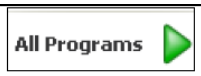
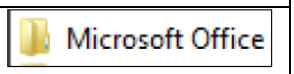
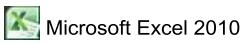
(ii) Save the document as ***Mid term 1*** on the desktop.

(iii) Close the work book.

(iv) Reopen the work book

STARTING EXCEL 2010 (*Windows 7*)

Steps to start Microsoft Excel:

1. Select the **Start** button on the taskbar *The **Start** menu appears*.	Click 
2. Point to **All Programs** *The **All Programs** menu appears*	Click 
3. Select **Microsoft Office 2010** *The **Microsoft Office 2010** submenu appears.*	Click 
4. Select **Microsoft Excel 2010**. *The Microsoft Excel window opens*	Click 

Starting a new workbook

When Excel 2010 is launched at the beginning of a work session, it provides a blank workbook with one open worksheet ready for you to enter data.

But if Excel 2010 is already open to get a new workbook:

Mouse:

(i) Click on File Tab
(ii) Select New from the drop down menu
(iii) Click Blank workbook
(iv) Select Create
(v) A new blank workbook will be opened for you to enter data

Or

Keyboard

(i) Press CTRL N
(ii) A new blank workbook will be opened for you to enter data

4. Entering and inserting data

You can enter four types of data in a worksheet's cells:

(i) Labels - text or numbers not used in calculations.
(ii) Values - numbers that can be used in calculations.

(iii) Dates - a necessary part of most worksheets.

(iv) Formulas - commands to perform calculations based on numbers or formulas.

- **Enter Text and Numbers**

Things to note:

(i) You can enter data into a cell by positioning the cursor in the cell and typing the information. The maximum number of characters that a cell can contain is 32,000.

(ii) Excel recognizes text and numeric entries and initially displays them with different alignments (*left for text and right for numbers*).

(iii) You can override these with other formats if required.

- **To enter data/information:**

Mouse

(i) Move to the cell where you want the entry and type a word (*for example NAME in cell A1*). The text will appear in the Formula bar as well as in the current cell. The cursor will be visible as a flashing insertion point in the formula bar.

(ii) Click on the tick mark on the formula bar to confirm the entry.

OR

Keyboard

(i) Press [ENTER] to confirm the entry.

Note: *Until you confirm an entry, Excel remains in "Enter" mode, and the cell is active (see Status bar). Excel will return to the "Ready" mode, and the text will appear in the cell.*

When you press [ENTER] to confirm an entry, Excel will by default move the selected cell down to the cell below. You can disable this setting or choose to move the selected cell in a different direction using the EXCEL OPTIONS dialog box (FILE RIBBON). See the Customisation section for more information.

Cancelling and Editing Data Entries

You may find that you have typed an entry into the wrong cell. Provided you have not confirmed the entry by pressing [ENTER] or clicking the green tick from the formula bar, you can abandon it.

- **To abandon or cancel an entry:**

Mouse

(i) Click the cross from the FORMULA BAR.

OR

Keyboard

(i) Press [ESC] to cancel entry

When you have confirmed an entry, while the cell is still selected, the current cell reference will be displayed in the Name box and the cell contents are displayed in the Formula bar.

Text information, as opposed to numeric information, will initially appear left aligned within the cell. If you enter text which is longer than the column width, the display on the worksheet will seem to overlap into the next cell to the right (*if that cell is empty*).

To edit an unconfirmed entry

Occasionally, you may make a typing error prior to confirming an entry. You cannot use the arrow keys to move backward because using the arrow keys merely confirms the entry and moves you from the focus of the selected cell. Here you MUST use the formula bar at that point

To edit a confirmed entry

(i) Double click on cell containing the data to be edited

OR

(i) Press [F2] key

OR

(i) Edit directly in formula bar

Using any of these methods above will allow change the cell to an active cell and allow you to use the cursor keys [←][→]to move around the data you wish to edit. Use the [BACKSPACE] to delete characters behind the cursor or [DELETE] to delete characters in front of the cursor within the data or you may add information to the entry before confirming it.

Enter Dates

It is possible to enter dates into Excel and have them accepted and displayed as such provided you use a recognised format. Excel 2010 will allow entry of dates from 1900 onward.

- **Recognised formats for dates**

  Use a forward slash (/) as the day/month/year separator: 01/01/01

  Or

  Use a dash (hyphen) as the day-month-year separator: 1-1-01

  Note: *Do not use full stops as a date separator as excel will read this as text and the value will not be*

entered as a true date

Dates entered in excel appear as dates but are actually numbers formatted to appear as dates this allows calculation with them so it is important to enter them correctly. A date once entered correctly will ALWAYS have a four digit year in the formula bar however that date may appear in the cell.

If you omit the year from a date, Excel will assume the current year. You will not see the year in the cell but if you look at the cell contents on the Formula bar, you will see that Excel has added it.

With some recognized date styles, Excel will automatically format the date to display in a certain way. You can choose how your dates are displayed by formatting them yourself (see the section on formats for more information).

Editing entered data or delete it.

There are various ways in which you can change or remove data you have entered in cells on the worksheet.

Overwriting Selection

This option is a feature that is standard throughout the Microsoft Office suite. It ensures that if you type when an item is selected, your typing replaces the selected item.

- **To overwrite a cell entry:**

  Keyboard

  (i) Move to the cell you want to change.
  (ii) Type in the new entry (*the former one will disappear as soon as you start typing*).
  (iii) Press [ENTER] to confirm the changed entry.

  Mouse

  Perhaps one character has been omitted, or two characters have been transposed, and only a slight adjustment needs to be made. You can add or change characters using edit mode Or You can edit directly in the cell or on the Formula bar.

- **To edit in cell:**

  (i) Double-click the cell to change – this will access Edit mode (*the prompt on the Status bar will say* 'Edit').
  (ii) Use the arrow keys to move the cursor to the edit position within the entry and the [DELETE] and [BACKSPACE] keys to remove characters if necessary.
  (iii) Press [ENTER] to confirm the changes.

- **To edit in the Formula bar:**

  (i) Move to the cell to change.
  (ii) Click in the Formula bar where the cell contents appear. This will drop you straight into Edit Mode and a cursor appears in the Formula bar.

(iii) Use the arrow keys to move the cursor to the edit position within the entry and the [DELETE] and [BACKSPACE] keys to remove characters if necessary.
(iv) Press [ENTER] to confirm the changes.

Using the Keyboard

You can access edit mode using a function key.

- To edit a cell:
  (i) Select the cell to be edited.
  (ii) Tap the [F2] function key. Excel will go into Edit mode. A cursor will appear at the end of the active cell.
  (iii) Use the arrow keys to move the cursor to the edit position within the entry and the [DELETE] and [BACKSPACE] keys to remove characters if necessary.
  (iv) Press [ENTER] to confirm the changes.

5. Select Information

When you want to issue a command that will affect several cells, you should select those cells first. When you select a block of cells, Excel shows you which cell is the active cell within that selection by leaving it white, while the rest of the cells are highlighted black. There are a variety of ways you can select different items on the worksheet.

I. To select cells with the mouse

When you select with the mouse, you need to make sure that the selection pointer is displayed. This is the white plus that appears when the mouse is positioned over the middle of a cell.

To select	Do this
A single cell	Click the cell, or press the arrow keys to move to the cell.
A range of cells	Click the first cell of the range, and then drag to the last cell.
All cells on a worksheet	Click the Select All button.
Nonadjacent cells or cell ranges	Select the first cell or range of cells, and then hold down [CTRL] and select the other cells or ranges.
A large range of cells	Click the first cell in the range, and then hold down [SHIFT] and click the last cell in the range. You can scroll to make the last cell visible.
An entire row	Click the row number.
An entire column	Click the column letter.
Adjacent rows or columns	Drag across the row or column headings. Or select the first row or column; then hold down [SHIFT] and select the last row or column.
Nonadjacent rows or columns	Select the first row or column, and then hold down [CTRL] and select the other rows or columns.
More or fewer cells than the active selection	Hold down [SHIFT] and click the last cell you want to include in the new selection

Select Multiple Sheets

There are some situations where you need to select more than one worksheet.

- **To select adjacent worksheets:**
  Mouse
  (i) Click the tab of the first worksheet that you want to include in your selection.
  (ii) Hold down the [SHIFT] key and click on the tab of the last worksheet that you want included in your selection. All the sheets between the first and the last will be selected. The selected sheet tabs will turn white and the word 'Group' will appear on the title bar.
- **Select Non-Adjacent Sheets**
  Mouse
  (i) Click the on the first worksheet's tab that you want to include in your selection.
  (ii) Hold down the [CTRL] key and click each other worksheet's tab that you want included in your selection. The selected sheet tabs will turn white and the word '[group]' will appear on the title bar. You can cancel sheet selection by clicking on a sheet tab that is not included in the current selection.

SECTION 3 FORMULAE AND FUNCTIONS

Basic concepts to be learnt

1. Understand the difference between functions and formulae
2. Enter by typing, simple functions and formulae
3. Understand and use BoDMAS
4. Enter functions and formulae in using mouse, keyboard or ribbon.
5. Use basic conditional functions
6. Use the Fill handle to enter multiple formulae
7. Understand and use Absolute and Relative cell references

Learning Example 3.1

Use the class teacher of S.3A Mid term examinations of 2020's results below to help him do the assessment:

NAME	ENGLISH	MATHEMATICS	PHYSICS	CHEMISTRY	BIOLOGY	TOTAL	AVERAGE
Okuni Peter	80	75	90	66	80		
Nyakaana Isaac	75	81	88	70	90		
Nantayi Jane	84	75	67	82	95		
Aboth Justine	65	78	78	68	88		
Magino Bob	85	59	98	78	95		
Ajambo Mega	87	85	65	87	84		
Cuinyai Jesca	90	65	62	76	52		
Mwijukye Joel	65	82	80	90	78		
Akankwasa Loy	87	78	71	58	95		
Njagala Martin	89	85	64	78	45		

Required:

(vi) Use a formula to calculate the total marks per student
(vii) Use a formula to fine the average mark per student
(viii) Use a formula to find the average performance per subject.
(ix) Save your workbook as "***assessment***"

FORMULAE

- *Formulae are commands to perform calculations based on numbers or formulae.*

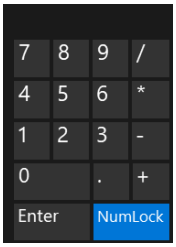
In a spreadsheet application, values often need to be added, subtracted, multiplied and divided. To allow for the fact that individual values might change, spreadsheet formulae generally do not refer to actual values, but to the cells where those values are being held (*Cell references*). If values have been entered into A1 and A2, then A1+A2 will return an answer which will automatically recalculate if the value of A1 changes. It is this automatic recalculation which makes spreadsheets invaluable.

Excel recognises formulae only if they are preceded by an equals sign (=).

When entering basic formulae, the mathematical operators defining the operation to be carried out are as follows:

Addition	+
Subtraction	-
Multiplication	*
Division	/
Exponentiation	^

You will find all of these mathematical operators arranged across the top and down the right hand side of the numeric keypad.

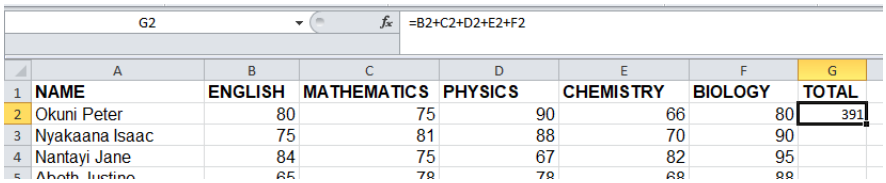


Typing Formula

You enter formulae by typing them in the cell where you want the formula's result to appear.

	A	B	C	D	E	F	G	H
1	NAME	ENGLISH	MATHEMATICS	PHYSICS	CHEMISTRY	BIOLOGY	TOTAL	
2	Okuni Peter	80	75	90	66	80	=B2+C2+D2+E2+F2	
3	Nyakaana Isaac	75	81	88	70	90		
4	Nantayi Jane	84	75	67	82	95		

When you confirm entry of a formula, Excel will display the result on the worksheet, but the underlying calculation appears on the Formula bar.



- **To enter a formula:**

  Keyboard

  (i) Move to the cell where you want to enter the formula.

  (ii) Type an equals sign (=).

(iii) Type the formula (e.g. =B2+C2+D2+E2+F2).
(iv) Press [ENTER] to confirm the entry.
(v) Excel automatically recalculates formulae.

If you change one of the cells referenced in your formula, as soon as you press [ENTER] to confirm the changed value, your formula result will update.

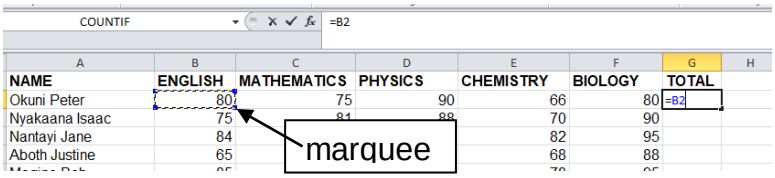
Or

Entering Formulae by Pointing

You can make use of a pointing technique to indicate which cells are to be included.

Pointing can be quicker and more efficient than typing cell references as it reduces the chances of errors.

- **To enter a formula using keyboard AND mouse:**
  (i) Position the cursor in the cell where you want the formula.
  (ii) Type an equals sign (=).
  (iii) Click the first cell whose reference should be included in your formula. (A moving dotted line, known in Excel as a 'marquee', will appear around that cell and the cell reference will appear in the formula bar immediately after the equals sign)



  (iv) Type in the mathematical operator
  (v) Click the second cell whose reference should be included in the formula.
  (vi) Repeat (iv) and (v) until all desired cells for your formula are completed
  (vii) Press Enter to accept the formula

Errors in Formulae

Sometimes you may get surprising results from a formula. This is most often because you have referenced the wrong cell, but it could also be that you have multiplied where you should have added and so on. You can correct formulae using the editing techniques described earlier in this manual.

- **To edit a formula:**
  Mouse
  (i) Double-click on the cell containing the formula. *(The cell will switch from displaying the result of the formula to the formula itself).*
  (ii) Click the mouse over the part of the formula to change to anchor the cursor there. Type any new characters or use the [BACKSPACE] and [DELETE] keys to remove characters.

(iii) Press [ENTER] to confirm the changes.

OR

(i) Move to the cell containing the erroneous formula.
(ii) Click on the Formula bar which will show you the formula where you want to make the change.
(iii) Type any new characters or use the [BACKSPACE] and [DELETE] keys to remove characters. iv. Press [ENTER] to confirm the changes.

OR

Keyboard

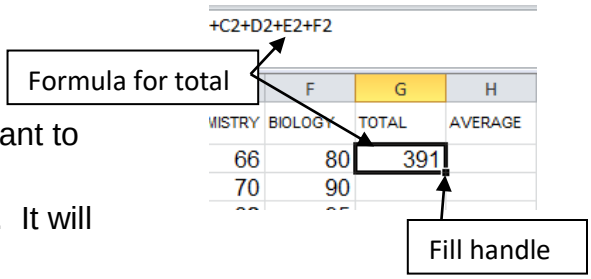
(i) With the cell containing the formula selected, Press [F2] to access edit mode.
(ii) Use the arrow keys to move the cursor to the edit position. Type any new characters or use the [BACKSPACE] and [DELETE] keys to remove characters.
(iii) Press [ENTER] to confirm the changes

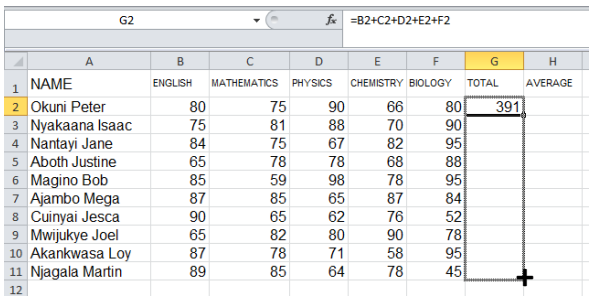
Filling Formula

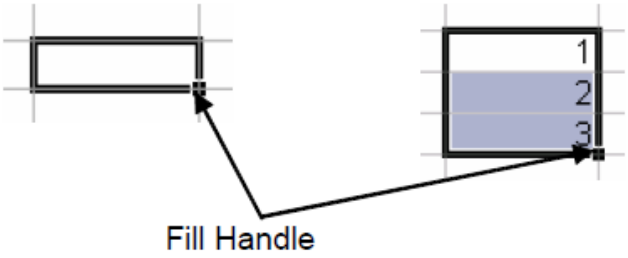
Having entered an initial formula in the first cell of a column or row, you often find that you want to generate results for the other cells in that column or row without typing the formula again and again.(e.g. In the learning exercise 3.1 you are required to find the total per student).

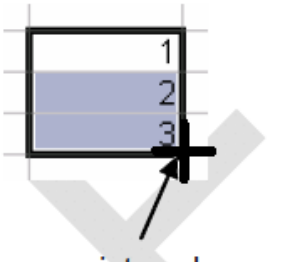
I. Using the fill handle to copy formulae:
Mouse

(i) Move to the cell that has the formula that you want to fill and select it.
(ii) Position your mouse pointer over the fill handle. It will change to a black plus.
(iii) Drag the black plus down, up, left or right over the cells where you want your copied formula to generate results. You will see an outline around those cells.
(iv) Release the mouse when the outline includes all the cells where you want results.









Mouse pointer when positioned over fill handle

Or

(i) Move to the cell that has the formula that you want to fill and select it.
(ii) Position your mouse pointer over the fill handle. It will change to a black plus.
(iii) Double click. The formula will fill all the cells in the column

II. **Fill Formulae Using Keystrokes**

Here you fill a column or a row of formulae using the keyboard.

- **To fill using keystrokes:**

Keyboard

(i) Select the cell containing the formula to fill and the cells where you want to copy it.
(ii) Press [CTRL]+[D] to fill down.

OR

(iii) Press [CTRL]+[R] to fill right.

Note: *There are no keystrokes to fill up or left. Instead, repeat step 1 above and then click Edit from the menu bar, choose Fill and select the direction for the fill from the resulting sub-menu.*

3. Understand and use BoDMAS

With Formulae BoDMAS is a mathematical acronym that simply reminds us of the order of operations that mathematics uses to step through more complicated formulae. **B**rackets➔**D**ivision➔**M**ultiplication➔**A**ddition➔**S**ubtraction. Excel follows this rule to a point please take note of the following table to see the order of preference that excel uses when working out calculations To change the order of evaluation, enclose in brackets the part of the formula to be calculated first.

1ST	-	Negative (e.g. -1)
2ND	%	Percent
3RD	^	Exponentiation
4TH	*And /	Multiplication and Division
5TH	+and -	Addition and Multiplication
6TH	&	Connects two strings of text (Concentration)

7TH	= <> <= >= ><	Comparison

Example:

Type =5+2*3 press [enter] Result =11

The formula produces 11 because Excel calculates multiplication before addition. The formula multiplies 2 by 3 and then adds 5 to the result.

In contrast,

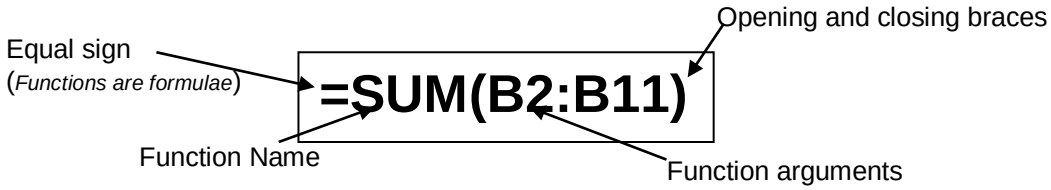
Type =(5+2)*3 press [enter] result = 21

Excel adds 5 and 2 together and then multiplies the result by 3 to produce 21.

4. FUNCTIONS

Having mastered how to set up your own custom formulae, you will be able to carry out any calculations you wish. However, some calculations are complicated or involve referring to lots of cells making entry tedious and time consuming. For example, the formula to generate the average performance in English at the bottom of column **=(B2+B3+B4+B5+B6+B7+B8+B9+B10+B11)/10** works well, but if there were 400 students in the class to average and not just 10, you would get bored with entering the individual cell references.

When formulae become complex, Excel comes to the rescue with its own built-in formulae known as functions.
Functions always follow the same syntax:



The name of the selected function tells Excel what you want to do and the arguments generally tell Excel where the data is that you want to calculate.

Excel has a huge number of functions, not all of them are relevant to everyone. The functions are categorised according to what they do. In this manual, we outline some of the functions that can be usefully used at a general level.

Learning Example 3.2

Using the class teacher of S.3A Mid term examinations of 2020's results in Learning Example 3.1,

Required:

(xi) Use a function to calculate the total marks per student
(xii) Use a function to fine the average mark per student
(xiii) Use a function to find the average performance per subject.
(xiv) Save your workbook as "***Functions***"

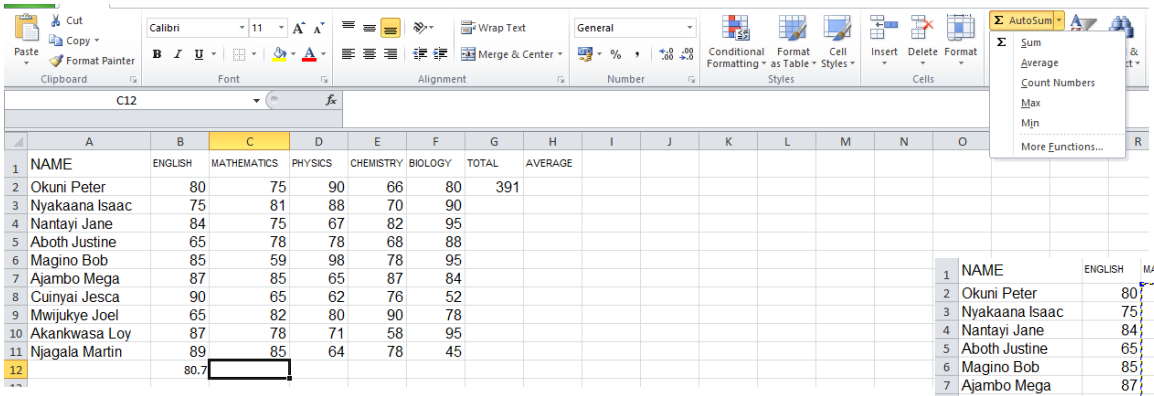
Autosum (Finds the sum of a continuous column or row data)

- Using Autosum

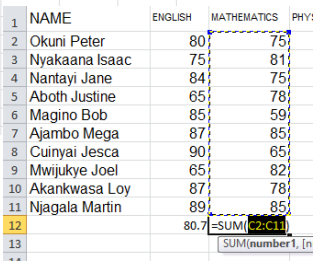
  Mouse

  (i) Select the cell to bottom of column or end of row where you want the sum.

  (ii) Click on the FORMULAS Ribbon, then click on AUTOSUM. From the menu select the SUM function



	NAME	ENGLISH	MATHEMATICS	PHYSICS	CHEMISTRY	BIOLOGY	TOTAL	AVERAGE
2	Okuni Peter	80	75	90	66	80	391	
3	Nyakaana Isaac	75	81	88	70	90		
4	Nantayi Jane	84	75	67	82	95		
5	Aboth Justine	65	78	78	68	88		
6	Magino Bob	85	59	98	78	95		
7	Ajambo Mega	87	85	65	87	84		
8	Cuinyai Jesca	90	65	62	76	52		
9	Mwijukye Joel	65	82	80	90	78		
10	Akankwasa Loy	87	78	71	58	95		
11	Njagala Martin	89	85	64	78	45		
12		80.7						



	NAME	ENGLISH	MATHEMATICS	PHY
2	Okuni Peter	80	75	
3	Nyakaana Isaac	75	81	
4	Nantayi Jane	84	75	
5	Aboth Justine	65	78	
6	Magino Bob	85	59	
7	Ajambo Mega	87	85	
8	Cuinyai Jesca	90	65	
9	Mwijukye Joel	65	82	
10	Akankwasa Loy	87	78	
11	Njagala Martin	89	85	
12		80.7	=SUM(C2:C11)	
13			SUM(number1, [n	

  (iii) A 'marquee' will appear around the suggested range to sum and a pre-built function will appear in selected cell.

  (iv) If suggested range is correct then press [ENTER]. If not redefine range by selected the figures you wish to include in the function and press [ENTER].

Other Common Functions

The AutoSum icon can also be used to for some other common functions like: **Average** (*of the selected figures*), **Count** (*the number of selected figures*), **Max** (*the largest selected figure*) and **Min** (*the smallest selected figure*) using the same procedures as in auto sum.

Function Box

There are some functions that are accessed more than others and for that reason Excel gives you a slightly quicker method for entering them. The Function box, groups the most commonly used functions for quick and easy access.

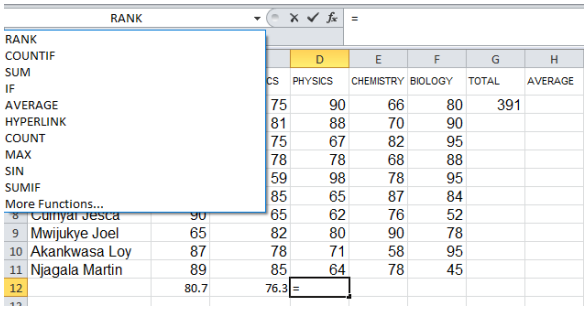
- **To enter a function using the Function box:**

Mouse

(i) Type the equals sign (=) on the formula bar (or directly into your cell). Excel displays the function box to the left of the Formula bar.

(ii) Click the drop-down list arrow to the right of the function box to display a list of function names.

(iii) Select the function you require by clicking its name from the list.



OR

(i) If your function is not listed, click the More Functions... option to access the Paste function dialog.

Type Functions

When you get more familiar with functions and start to remember how they are constructed, you can type them rather than selecting them using the previously described methods.

- **To type a function:**

Keyboard

(i) Move to the cell where you want the function.

(ii) Type an equals sign (=) followed immediately by the function name and an open bracket.

(iii) A tool tip appears to indicate the arguments the function needs.

(iv) Select (or type) the cells you want the function to act upon using the mouse or arrow keys.

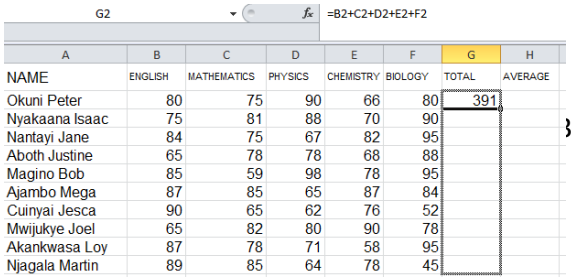
(v) Press [ENTER] to confirm the entry.

Note: *As long as your formula only contains one function, you do not need to type the closing bracket. Pressing [ENTER] makes Excel close the bracket automatically.*

5. Absolute and Relative cell references

Relative References

- **If a formula uses a relative cell reference,**



it automatically dates if (copied or moved), to a different place.

When you fill formulae, you tell Excel to base the formulae it creates on the one you have entered by starting from the cell that contains it. In the example shown right, the formula being copied says =B2+C2+D2+E2+F2. However, once copied, if you click on any of the copies, Excel will have updated the references to keep the row numbers current (B3+C3+D3+E3+F3, B4+C4+D4+E4+F4 and so on). This is because Excel, by default, uses relative referencing. When you enter a formula, you enter specific cell references. Behind the scenes, Excel 'translates' those references into positions relative to the result cell. So, in our example above, Excel would take the formula:

=B2+C2+D2+E2+F2

And translate it as follows:

=[Five cells to the left]+ [Four cells to the left]+ [Three cells to the left]+ [Two cells to the left]+ [One cell to the left]

It therefore does not matter which row you copy the formula into, Excel will always use "[Five cells to the left]+ [Four cells to the left]+ [Three cells to the left]+ [Two cells to the left]+ [One cell to the left]" to generate the result.

Most of the time, this is what you would want, but there are occasions where you need to stop Excel updating cell references when you copy formulae.

Absolute References

- **An absolute cell reference always refers to the same cell even if the formula is moved to a different place.**

Consider the example of discount offered to customers (table below)

AVERAGE | =B10*F2

	A	B	C	D	E	F	G
1	Order date	Customer	Product	Quantity	Unit Price	TotalPrice	Discount
2	01/04/2010	John Agaba	Extension cable	2	30,000	60,000	=B10*F2
3	01/04/2020	Innocent Aya	Radio set	1	70,000	70,000	
4	02/04/2010	Majorine Tino	TV set	1	250,000	250,000	
5	03/04/2010	Mary Njuki	Decorder	2	120,000	240,000	
6	05/04/2010	Magda Adala	Woofer	1	145,000	145,000	
7	05/04/2010	Mondo Ajira	Extension cable	1	25,000	25,000	
8	06/04/2010	Jafar Okwar	Wall socket	3	4,500	13,500	
9							
10	Discount Rate	15%					
11							

The example above shows a formula being created to work out the amount of discount each order would receive. The order totals are in column F and the discount rate is in B10. The initial formula has therefore been set up as: **=B10*F2** The formula will generate a result for the first order. However, when copied, you will get zeros against the discount amounts for the other orders. This is due to the relative referencing that Excel applies to all formulae by

default.

If you click on any of the copied formulae in the Discount amount column below the first one, you will see that Excel has updated the references (**=B11*F3**, **=B12*F4, etc.**). [WRONG!]

The right thing would be keep the discount rate cell reference constant and only to change the TotalPrice reference.

This type of referencing is called Absolute referencing.

- **To make a reference absolute:**
  Keyboard
  (i) Move to the cell where you have typed the formula and press [F2] to access Edit mode.
  (ii) Move the cursor with the arrow keys so that it is next to the reference we want to fix.
  (iii) Press [F4]. Dollar signs will appear against the column letter and the row number.
  (iv) Press [ENTER] to confirm the change.
  (v) In our example, amending the formula to read: **=B10*F2**
  (vi) This would prevent Excel from changing the B10 reference when the formula is copied.

Fill Handle

You can fill formulas down to the same level as the entries in the previous column by double-clicking on the fill handle or dragging it as seen before.

Absolute References

Pressing [F4] repeatedly over a reference allows you to toggle between making both the row and column absolute (A1), just the column absolute ($A1), just the row (A$1), or nothing absolute (A1).

SECTION 4 MOVING AND COPYING DATA

Basic concepts to learn

1. Use cut copy and paste
2. Drag and drop information
3. Transfer data between files

Having entered information in a worksheet, you may decide that you need to reposition it or use cell entries in another worksheet or file that you have created.

Excel allows you to move or copy information/data once entered into a worksheet to anywhere – the work sheet/workbook, other Excel files and even to files that belong to other applications.

All Microsoft products use the same terminology when describing moving and copying items – cut, copy and paste (*As already seen in Microsoft Word*).

Copying/Cutting or Moving Items

- **To Copy/move items:**

  Mouse

  (i) Select the cells that you want to Copy/move.

  (ii) Click the Copy or CUT button (*where applicable*) on the HOME Ribbon. The selected cells will display a marquee around them and Excel will show a prompt on the Status bar to tell you what to do next.

  (iii) Move to the cell where you want to place the cells you copied or cut. If you have cut a block of cells, the cell you select before you paste is where you want the top left cell in the cut block to move to.

  (iv) Click the Paste button from the HOME ribbon

  OR

  (i) Press [ENTER].

  OR

  Keyboard

  (i) Select the cells you want to move.

  (ii) Press [CTRL][C] to copy or [CTRL][X] to cut the cells out a marquee will appear around the cells, and you will see a prompt on the status bar.

  (iii) Move to the cell where you want the cut cells to jump to. If you have cut a block of cells, the cell you select before you paste is where you want the top left cell in the cut block to move to.

  (iv) Press [CTRL][V] to paste the cells into their new location.

SECTION 6 FORMATTING

Basic concepts to learn

1 Format cell appearance
2 Format data appearance
3 Format rows and columns
4 Use and understand the format dialog box
5 Merge and unmerge cells
6 Change row and column heights
7 Change orientation of cells and data

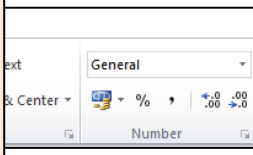
Learning Exercise 6.1

The table below shows a marking record extracted from Uganda Senior School data.

	A	B	C	D	E	F	G	H
1	Name	English (100%)	Physics (100%)	ICT Subsidiary			Total	Rank
2				Theory (40%)	Practical (60%)	ICT Total (100%)		
3	Paddy Mussana	68	40	24	28			
4	Kaggwa Maurice	82	56	16	60			
5	Kagume Mugisha	52	72	20	48			
6	Mbabazi Mande	74	50	28	56			
7	Kumakech Micheal	66	72	36	10			
8	**Average**							
9	**Highest Mark**							
10	**Lowest Mark**							

a) Open a new excel sheet and enter this data as it appears.
b) Using appropriate formulae fill all the table columns of ICT Total and Total.
c) Using appropriate function put a Position (Rank) of each student using the Total.
d) Using appropriate function find all Average marks for each subject
e) Find the highest mark and lowest mark of each subject.
f) Save your work in your folder

QUICK FORMATS



Having produced a spreadsheet, it may be formatted to achieve a more professional and more easily readable layout of data for both screen display and printout. There are several different ways of formatting data in Excel 2010 to produce extremely impressive effects, and many of the tools in the FORMATTING groups on the HOME ribbon are used for the most popular formatting tasks.

Note: *Most tools are similar to those in **Microsoft Word** and work the same.*

e.g.

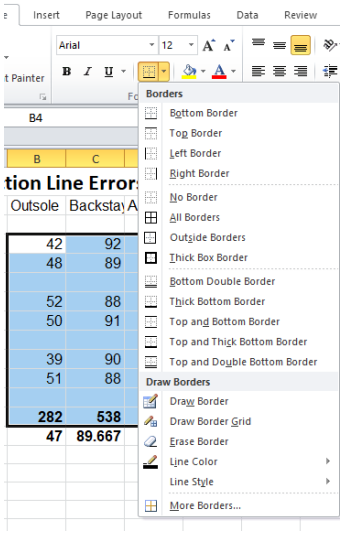
To change:

(i) Font style, Font size/point size, Bold, Italics, Underline, Font colour;
Select the cells you want to format and use the format tools as already seen in Microsoft Word.

(ii) Borders

When you print a worksheet, Excel allows you to choose whether you want all the cell gridlines to print or not. Often, you want to print some but not all of the lines – this is when you need to apply borders. You can then tell Excel not to print the gridlines but your borders will be printed.

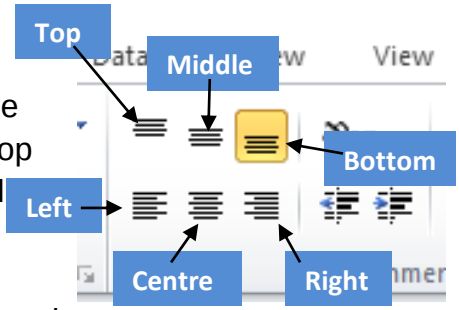
- **To apply borders:**
  Mouse
  (i) Select the area you want to border.
  (ii) Click the drop-down list arrow to the right of the Borders button on the Formatting toolbar.
  (iii) From the palette, click on the required border option.
  If the palette does not have the bordering option that you want to apply, use the Format cells dialog to apply the borders.



- **To remove borders:**
  Mouse
  (i) Select the area with the borders you want to remove.
  (ii) Click the drop-down list arrow to the right of the Borders button on the Formatting toolbar.
  (iii) From the palette, click on the No borders option.

(iii) Alignment

You can select from three different cell alignment options in Excel by clicking the relevant button. The buttons determine how data lines up between the top and bottom, left and right edges of the selected cell



- **To change alignment:**
  Mouse
  (i) Select the cell(s) whose alignment you want to change.
  (ii) Click on the button for the alignment you require.
  (**Top, Middle or Bottom** *for vertical alignment* and **Left, Centre or Right** *for Horizontal alignment*)
  This will make each cell entry in the selection position itself get aligned as

specified.

Note:

(i) The default vertical alignment for all data is bottom

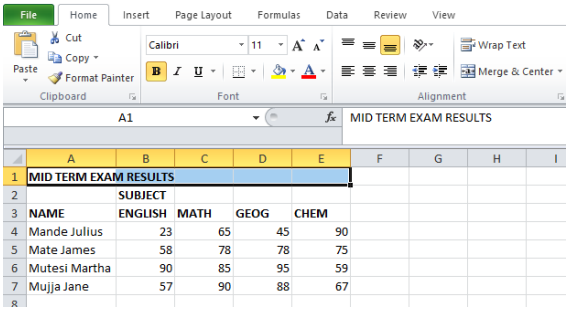
(ii) The default horizontal alignment for:

- *Text data is left align*
- *Numeric data is Right align*

(iv) Merge Cells

If you want to type a heading across the top of a table of data or data to be contained in more than one cell, it can be quite difficult to line it up in the centre.

This can be by merging the cells across which you want the heading, centring it at the same time.



	A	B	C	D	E
1	MID TERM EXAM RESULTS				
2		SUBJECT			
3	NAME	ENGLISH	MATH	GEOG	CHEM
4	Mande Julius	23	65	45	90
5	Mate James	58	78	78	75
6	Mutesi Martha	90	85	95	59
7	Mujja Jane	57	90	88	67

- **To merge cells:**

Mouse

(i) Select the cells you want to merge.

(ii) Click the MERGE AND CENTRE button from the Formatting toolbar

	A	B	C	D	E
1	MID TERM EXAM RESULTS				
2	NAME	SUBJECT			
3		ENGLISH	MATH	GEOG	CHEM
4	Mande Julius	23	65	45	90
5	Mate James	58	78	78	75
6	Mutesi Martha	90	85	95	59
7	Mujja Jane	57	90	88	67

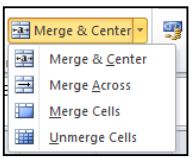
- **To Unmerge cells**

Mouse

(i) Select the cells you want to unmerge

(ii) Click the Merge and Centre button again and this will unmerge the cells selected

(iii) As you can see from the figure right if you click the drop down arrow to the right of the merge cell button you have options to merge cells with different alignments.



(V) Number Formats

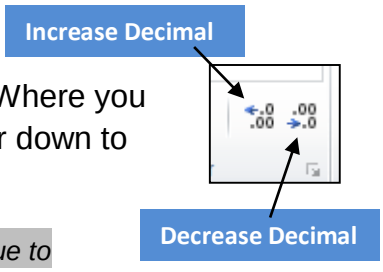
Initially, numbers in Excel use a General format: Results of formulae run to different numbers of decimal places.

But you might want to display numbers for example as monetary values with a currency symbol and two decimal places.

There is no need for you to enter the numbers in the way you want them displayed – it is far better to use Excel's number formatting buttons.

Increase and decrease decimal places

You can add and remove decimal places from numeric data using the Increase Decimal and Decrease Decimal buttons. Where you decrease or increase decimal, Excel will round numbers up or down to the nearest unit.



Note: *However many places that you may increase or decrease the value to excel will still use the entered value to calculate not the value that appears in the cell as this is only an appearance not a true value*

- **To increase/decrease decimals:**

  Mouse

  (i) Select the cells with the numbers you want to change.

  (ii) Click the INCREASE or DECREASE DECIMAL button from the ALIGNMENT group on the HOME ribbon

  (iii) Keep clicking the INCREASE or DECREASE DECIMAL button until your numbers display the correct number of decimal places.

To apply comma style:

Mouse

(i) Select the cells with the numeric data you want to format.

(ii) Click the Comma Style button from the Number group on the HOME ribbon

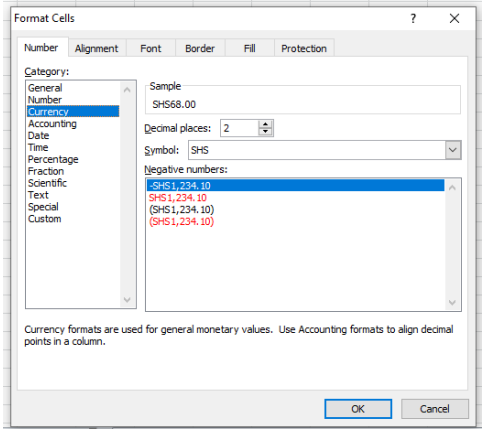
Currency

Applying this style will add a £ sign and two decimal places (pence) to the selected numbers by default.

- **To apply currency style:**

  Mouse

  (i) Select the cells with the numeric data you want to format.



(ii) Click the Currency button from the Number group on the HOME ribbon.

(iii) Using the drop down arrow to the right of the currency button gives access to the most likely used currency formats in use you can choose from different currency symbols using the FORMAT CELLS dialog (*more details discussed later*).

Percent Style

Where you have typed decimals on the worksheet, you may want to express those values as percentages. You can do this with the Percent Style format.

e.g. 0.5 would become 50% when you apply Percent Style.

- To apply Percent Style:

  Mouse

  (i) Select the cells with the numeric data you want to format.

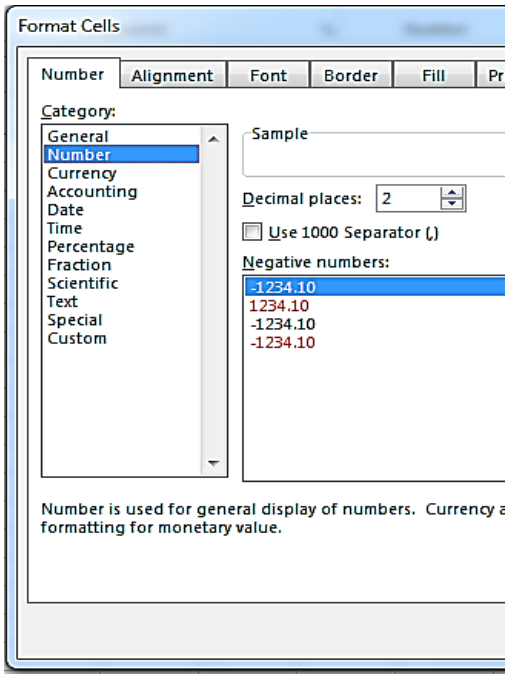
  (ii) Click the Percent Style button from the Formatting toolbar.

  Note: *The number formats (apart from Increase and Decrease Decimal) are mutually exclusive. Applying Comma Style to cells that already have Currency formats would lose the currency symbol. If you need to return to the default General style for numbers, you can use the Format Cells dialog discussed later.*

  Note: *If you see ####### in cells that normally display numbers, it is because the format you have applied is too wide for the column. To show the numbers normally again, either change to a format that fits or widen the column.*

ADVANCED FORMATS (*Format Cells Dialog*)

When you want to apply formats that Excel does not give buttons for on the Formatting toolbar, you need to use the Format Cells dialog. This dialog contains all the formatting options (*including those accessible via the Formatting toolbar*) that you can use within the Excel application.



The Format Cells dialog is divided into tabs, each tab dealing with a format category.

- **To Access The Format Cell Dialog:**

  Mouse

  (i) Click the DIALOG BOX LAUNCHER. From either the FONT, ALIGNMENT or NUMBER group on the HOME ribbon

  OR

Keyboard

(i) Press [CTRL]+[1]

- **To apply custom number formats**

To set custom number formats such as applying the Shs. Symbol before the values (e.g. Shs 9,000,000)

(i) Launch the Format cell Dialog
(ii) Select Number category
(iii) Select Custom in the category list
(iv) Type the custom number format code under the "Type:" text box before the "0". (*For example, the code **"Shs. "0** appends the Shs. Symbol before the value in a cell as shown. The 0 acts as a placeholder to the values.*)

- **To apply change cell data orientation**

We can use the Format cell dialog to change cell data orientation like text direction

To change Tet direction:

(i) Select the cells you want to format.
(ii) Launch the Format cell Dialog
(iii) Select the ALIGNMENT tab
(iv) In the ORIENTATION section, click the picture that corresponds to the text direction of your choice.

Or

(i) Drag the red dot marker up or down to give a degree value of plus or minus 90° from the base position (horizontal).
(ii) Click OK to apply the new formats and close the dialog.

To wrap text or shrink text:

Sometimes the text entered into a cell may overflow the cell and you desire it to be contained without overflowing. Here either we apply wrap text or shrink tools.

To wrap text or shrink text:

(i) Select the cells with the text you want to format.
(ii) Launch the Format cell Dialog
(iii) Select the ALIGNMENT tab
(iv) In the TEXT CONTROL section, click either of wrap text or shrink to fit

according to your need.

(v) Click OK to apply the new formats and close the dialog.

SECTION 7 CHARTS

Basic concepts to learn

1 Inserting charts
2 Formatting charts
3 Combined charts

- **A chart is a graphical representation of the data in a worksheet.**
- Spreadsheets provide tools that make it easy to create a chart from worksheet data.
- You can use many different types of charts, and apply many effects to a chart, to present your data in the most appropriate way.

Learning exercise 7.1

The table below shows the results of Mid term exams for S.1 2019 as recorded by the class teacher.

(i) Using a spreadsheet application of your choice enter the data below as it appears and answer the questions that follows.

	A	B	C	D	E	F	G	H	I
1	NAME	SUBJECT					GRADING		
2		ENG	MATH	PHY	CHE	ICT	TOTAL	AVREAGE	POSITION
3	Obbo	69	47	58	69	69			
4	Okello	85	70	82	93	58			
5	Okoth	74	71	97	64	47			
6	Nsasa	45	89	56	23	65			
7	Njuki	87	97	64	46	79			
8	Nsiko	96	93	82	71	46			
9	AVERAGE								

(ii) Use a function to find:
- The total and average marks per student.
- The average mark per subject
- The position of each student in this exam

(iii) Insert the following charts:
- A column chart of student's name against the performance in English below the table
- A line chart of subjects against their average marks
- A column chart showing the average mark of each student against their names on sheet 2.

Creating a chart

- To create a chart
  (i) Select the data (columns or rows) you want to include in the chart
  (ii) Click INSERT tab.
  (iii) From the CHARTS group click on the arrow below the desired chart type.
  (iv) Select the chart type from the list.
  Excel will generate the default chart on your sheet (*most times overlapping the data table*)

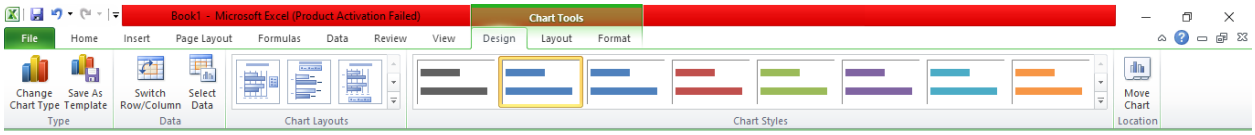
To format the created chart

Most times the default charts inserted by Excel do not have titles and axis labels which ingredients are required for authentic charts. This therefore calls for formatting the chart after inserting.

To format a chart

(i) Select the inserted chart (Click on it)

(ii) Click on the arrow to the right of Chart Layouts in Design in Chart Tools



(iii) Select the chart layout that has the desired features

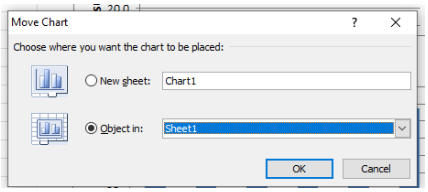
(iv) Change the features as required.

To move a chart

(i) Select the chart to be moved (Click on it)

(ii) Click on 'Move Chart' on the right most end of the tools in the Chart Tools.

(iii) You Specify where you want the chart to be located in the dialog that comes (*either on new sheet or object in the same sheet*)



(iv) Click Ok to confirm your choice.
Excel will move the chart where you have specified.

Or

(i) Select the chart to be moved (Click on it)

(ii) Drag the chart where you want it to be.

Or

(v) Select the chart to be moved (Click on it)

(vi) Copy or cut the chart

(vii) Paste it where you want it to be

To create a combined chart

You can create a combined column and line chart.

(i) Select the data to be used in the chart.

(ii) Select the INSERT tab and select the arrow to the right of the Insert Column Chart box in the Charts group.

(iii) Select a chart type.

(iv) Select Change Chart type in the CHART TOOLS DESIGN tab.

(v) Select Combo.

(vi) Select Line in the Chart Type drop down list

(vii) Tick the Secondary Axis box. Ensure any other series have the chart type Clustered Column and that the secondary axis is not ticked.

(viii) Click OK.

SECTION 8 PAGE/PRINT LAYOUT

Basic concepts to be learnt

1. Page preferences
2. Insert and edit Headers and Footers
3. Use Print preview and page layout views
4. Scale printing to a fixed set of pages
5. Set page breaks
6. Set up and change Margins by various methods
7. Print and collate multiple copies
8. Set up print areas

Page preferences

This helps you to set up how we want the worksheet to appear on paper (i.e. when printed).

Note: Most of the page preferences are found in the ***Page Layout*** Tab.