South Sudan

Secondary
ICT
Information Communication Technology
Student's Book

1

THE REPUBLIC OF SOUTH SUDAN · MINISTRY OF GENERAL EDUCATION AND INSTRUCTION

Printer
Puts text and images from the computer to paper.

Monitor
Displays information on a screen.

Case
Contains the brains of your computer that processes information, including the central processing unit (CPU) and other parts.

Keyboard
A device for typing letters, numbers and symbols into the computer.

Mouse
A hand held device for moving a cursor around the screen.

Modem / Router
Sends network signal to the computer used to connect many computers to the network or the internet.

How to take care of your books.

Do's

1. Please cover with plastic or paper. (old newspaper or magazines)
2. Please make sure you have clean hands before you use your book.
3. Always use a book marker do not fold the pages.
4. If the book is damaged please repair it as quickly as possible.
5. Be careful who you lend your schoolbook to.
6. Please keep the book in a dry place.
7. When you lose your book please report it immediately to your teacher.

Don'ts

1. Do not write on the book cover or inside pages.
2. Do not cut pictures out of the book.
3. Do not tear pages out of the book.
4. Do not leave the book open and face down.
5. Do not use pens, pencils or something thick as a book mark.
6. Do not force your book into your schoolbag when it is full.
7. Do not use your book as an umbrella for the sun or rain.
8. Do not use your book as a seat.

ICT STUDENT'S BOOK 1

Table of Contents

Unit 1 — Application Software

Learning outcomes

By the end of this unit the learner should be able to;

1. Know about application software and how to manipulate data using, e.g. word processing, spreadsheets and graphic design

2. Identify the right tools for appropriate use

3. Write and edit documents

4. Manipulate data

5. Make creative use of graphics

6. Produce multimedia products

Key enquiry questions

☐) How can abstract data be manipulated into meaningful information?

☐) How do we integrate data in different formats, e.g. Excel, PowerPoint, graphics etc. into a document?

☐) What is the importance of computing in today's world?

☐) How can students demonstrate the importance of ICT to others e.g. parents?

☐) How adequate are present MS applications for the world beyond the 21st century?

1.0 Introduction to applications

Computer software, or simply software, is a part of a computer system that consists of data or computer instructions.

1.0.1 Application software

An application software is a computer program designed to perform a group of coordinated functions, tasks, or activities for the benefit of the user. This software allows users to do things like create text documents, play games, listen to music, or web browsers to surf.

Activity 1.1

Name some of the application softwares you have come across and their functions.

1.0.2 System software

Application software refers to all applications collectively. This contrasts with system software, which is mainly involved with running the computer. Examples of system software include operating systems, computational science software,

their

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Fig 1.1: Parts of a computer

Your keyboard
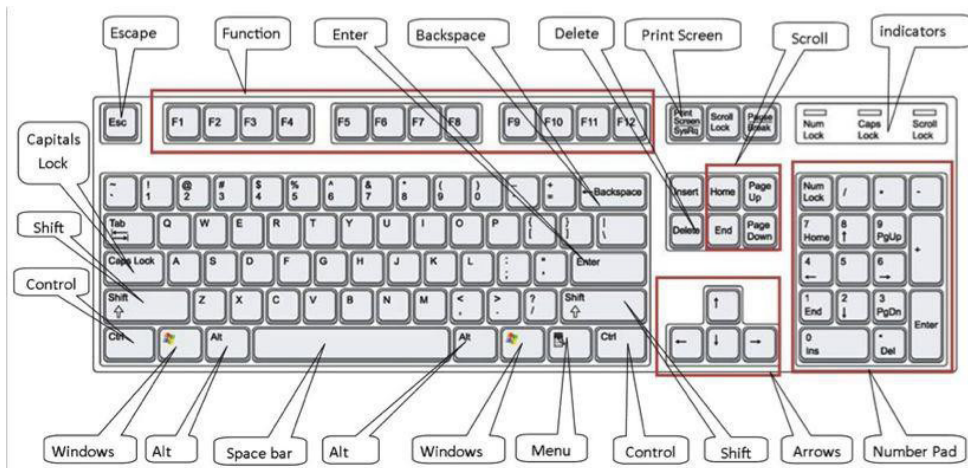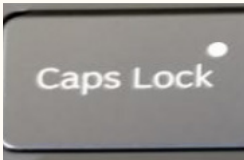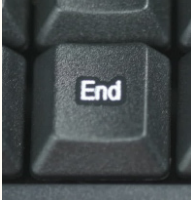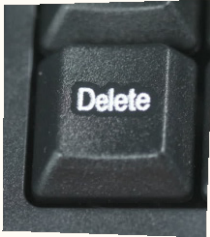
Fig. 1.2: Parts of a keyboard.

Your keyboard

The keyboard has many keys that make typing and layout easier. Here is a list with a short explanation of useful keys:

Esc	This means escape and is what you press to escape from any control key you have pressed.
Tab	This makes indents [a bigger than normal space between the text and the margin.]
Caps Lock	If you press this key, a green light will appear on the right hand side of the keyboard and any typing you do will be in capital letters.

Shift	This button shifts you into a capital letter when you just want to use it briefly for example to start a sentence. Press shift and the key you want to use. It is also useful when you want to put in the punctuation marks or other symbols that are on top on the keys of the numbers and some of the punctuation keys on the keyboard.
Home	If you press this you will get to the first letter of the line you are typing. If you press CTRL [control] and Home same time you will get to the first letter of the first word of your document. This is useful if you have typed a long document and want to type or make a change in the first paragraph.
End	It takes you to the end of a line. Ctrl and End at the same time takes you to the very end of the whole document.
Delete	This is an eraser. It erases or deletes any letter or word, or line or paragraph you decide you don't want anymore. If it is a letter, use the mouse to go to the letter and click on the letter. Then press delete. The letter in front of the cursor will be deleted. Sometimes it is easier and quicker to use the

	The arrow just above the Enter button can be used if you want to delete the last letter you have typed. The letter should disappear. If it is a whole word, or line or paragraph then use your mouse to go to the beginning of the part you want to delete. Keep your finger clicked down on the left hand mouse button and drag it over the whole bit you want to delete. This is called HIGHLIGHTING a section and the screen shows this by making the section black and the typing white. Then press delete and the whole bit will disappear.
	Page Up and Page Down - take you to the top and bottom of the page you are currently busy on.
	Arrows - Use the arrows on the right hand side of the letters to move the cursor (line on the screen showing your position - where the next letter will be typed) up, down or sideways. You can also use the mouse to do this. If you want to add or delete something, move your cursor to the right place and then either delete or add letters.

Activity 1.2

1. In groups, look at a keyboard.

2. Identify the buttons highlighted in the text above.

3. What do you see on the screen or monitor when you press some of the buttons?

1.1 Ms Word

1.1.1 What can you use Ms- Word for?

Many organisations now use computers to produce and organise written material, correspondence, membership lists and so on. Your Ms Word programme is called a word-processing package. This means that it is useful for typing and storing letters, articles and anything that consists mainly of words. It is basically a fancy typewriter with a built in filing-system. The more you use your computer the more you will learn about what it can do.

1.1.2 How to use Ms- Word

Switch on your computer and wait until a whole lot of picture symbols appear with a Start button on the bottom left of the screen. Use the left button on the mouse to click on the Start button. Then click on programmes and then double-click on the Ms Word programme. Some computers have a Ms Word symbol that will come up when your computer is on and you do not have to go to start – simply double click the left button of the mouse on the symbol.

The Microsoft word programme will appear on the screen. There will be a blank screen called Document 1. Everything you type is called a document. Above the blank screen there are various terms and signs you should know about.
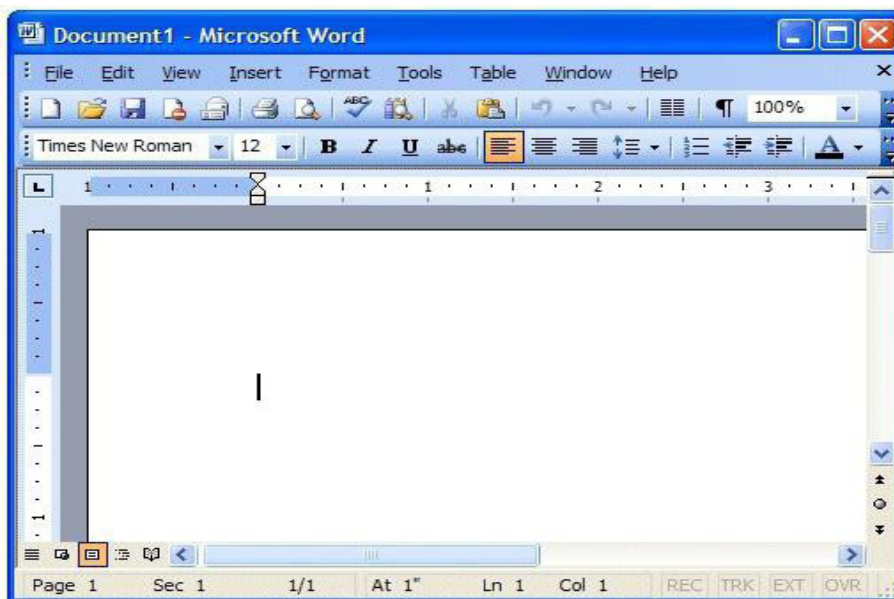
Fig. 1.3: Microsoft word layout.

- The first line has a list of titles called commands - File, Edit, View, etc.

- The second and third lines are called the toolbar and have different blocks that you can use to give quicker commands to the computer.

- The fourth line [if there is one] shows your page margins – it is called the ruler.

The File title

Click on this and a box with different sections will appear. This is your file organiser and you use the first section:
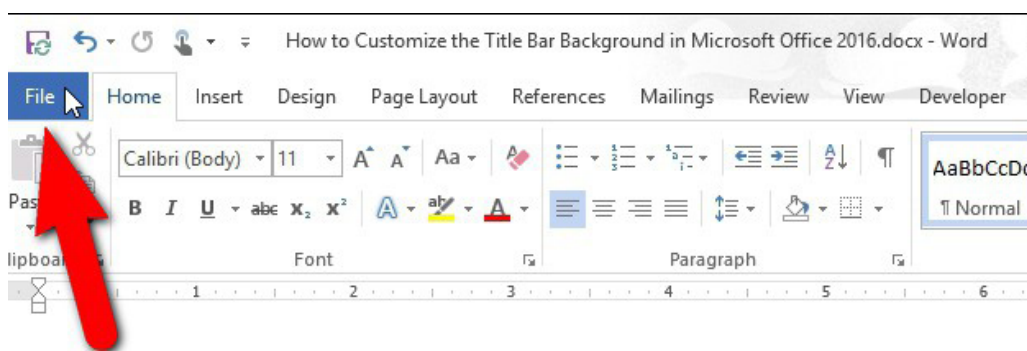
Fig. 1.4: File title in Ms-word

- To start a **new** document (click on new) you can use the block with a folder on it on the toolbar to do this more quickly. Use your mouse to click on it.

- To **open** an old document (click on open) and then click on the name of the document you want to open.

- To **close** a document. The computer will ask you if you want to save it before you close it and then you click on Yes or No.

The next section is to do with saving documents

If you press **save**, the document will be saved under its heading in the general folder called My Documents. You can do this with the block on the toolbar showing stiffy disk. Click on it with your mouse.

Save As allows you to save a document under a new name in the folder of your choice. When you click on Save as, a new box will open on screen. First go to the Save In square. It should say My Documents. In the block below yellow folders will appear if you have made them. (See Step 2 in Using MSWORD as an Office) Click on the folder you want to save the document in. Click on Open. Then check that you like the name of the document. If you like it press save. If you don't like it delete the file name and type a new name. Then click save.

If your document is an update of an old document but you want to save it as a new version click on **Version** in the Save box under file. Type in your comments and click Save.
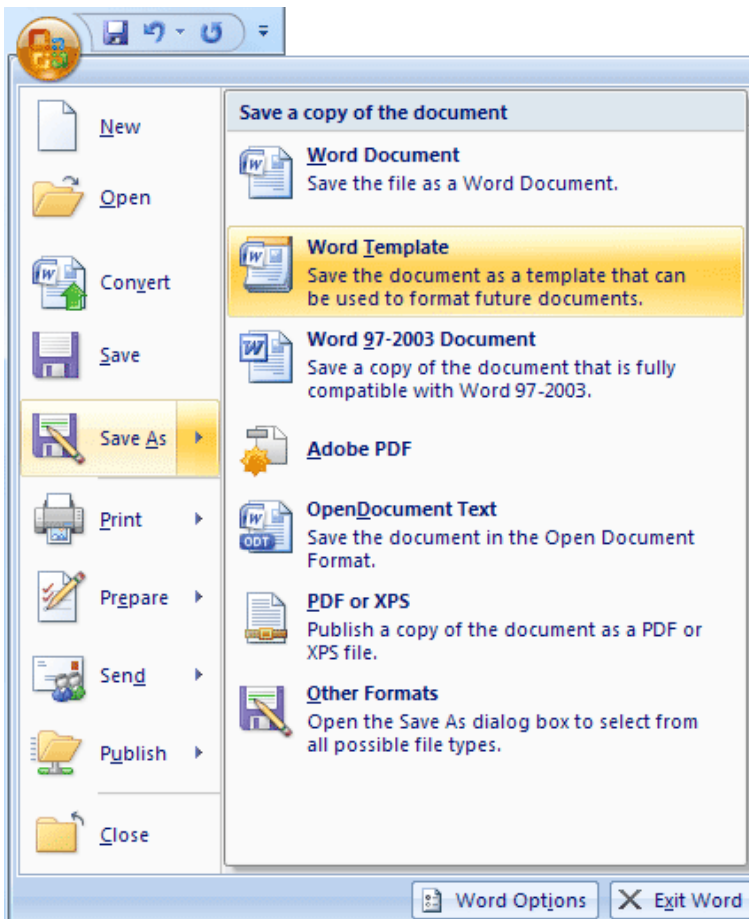
Fig. 1.5: Saving a document.

The next section is to do with how the document looks (Page Set Up)

and Print Preview and to print documents.

Page set up allows you to change the margins of the page so that you can get more (or less) typing on a page. If you click on Paper Size it allows you to change the page into Portrait (normal A4) or Landscape (sideways A4)
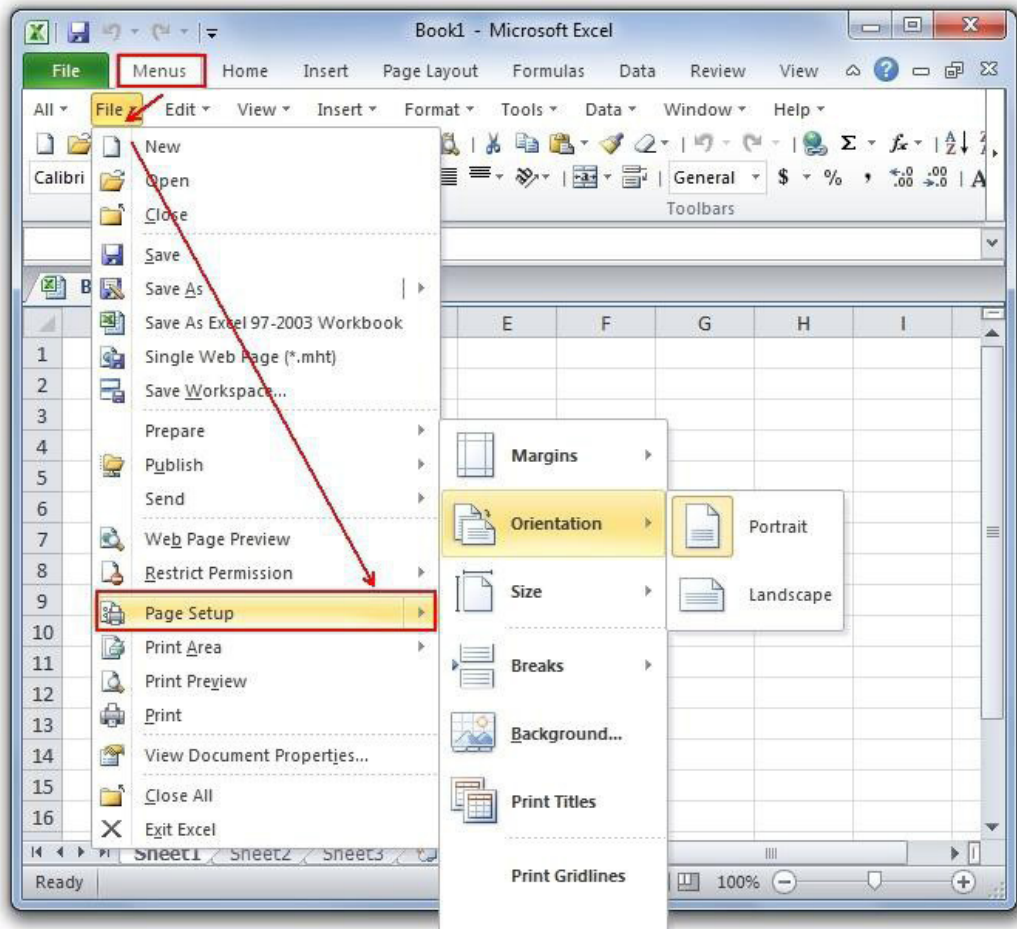
Fig. 1.6: Setting up a page.

Print preview allows you to see what the document will look like on a printed page. You can also do this by using the block on the toolbar with a page and magnifying glass on it.

Print allows you to print the document if your computer is connected to a printer. You can also print quickly by using the block with a printer on your toolbar.
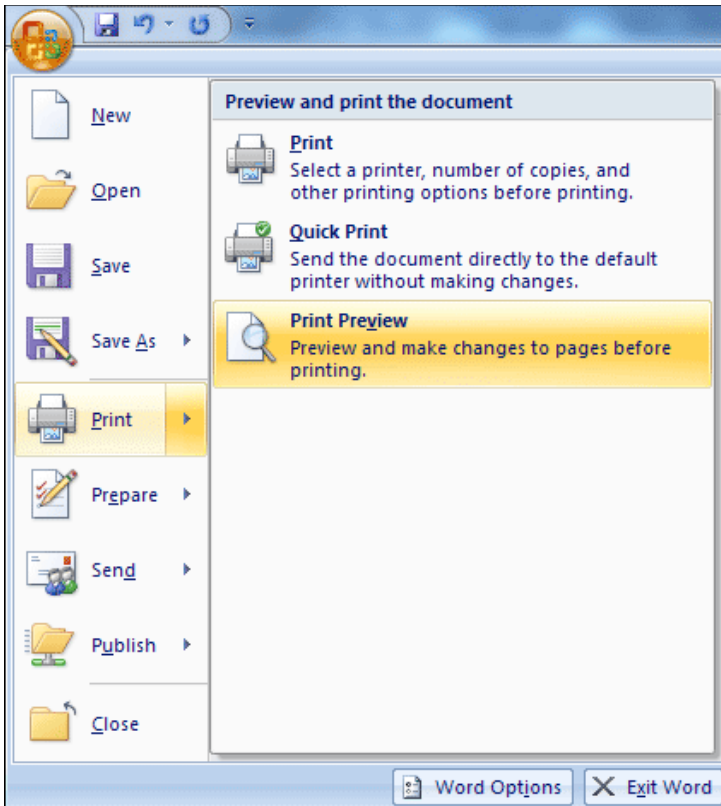
Fig. 1.7: Print options In Ms-word.

The next section allows you to **Send** your document either to another computer via email or to a fax machine. Your computer has to be set up for this. You can also email your document by using the block on the bottom toolbar with an envelope on it. **Properties** allows you to store information about your document.

The next section is a list of the **last four documents** you worked on. Clicking on the right file name is a quick way of opening any of these documents.

The last section says **Exit.** If you click on this the Ms Word programme will shut down and you can return to Windows. If you have forgotten to save any documents the computer will ask you if you want to Save. Click on Yes or No. You can also exit or close down MSWORD by clicking on the X in the last square on the top right hand side of the screen.

The Edit title

This section allows you to change or edit your work.

The most useful tools in the list are Cut, Copy and Paste.
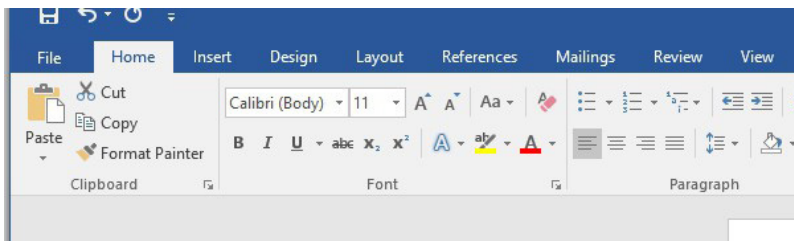
Cut: this allows you to delete a section but not to throw it away completely in case you need it later.

You use the **Paste** command to move the section to a new place. Take your cursor to where you want to place the section. Click on Edit.
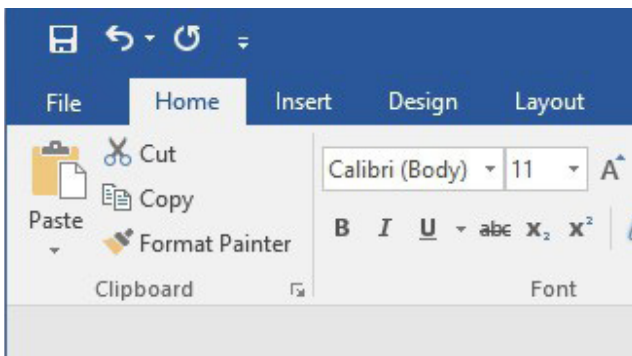
Click Paste and the cut section will be pasted or put in this new place. We call this Cutting and Pasting.
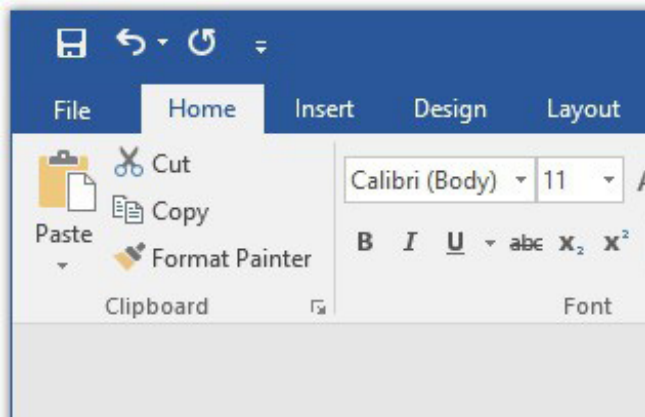
You can also **Copy** a section of your work and use it again. Highlight the section with your mouse. Click on edit. Click on Copy. Then take your cursor to the new place you want to put it. Click on Edit. Click Paste and the section will be repeated.

WARNING: Your computer will only keep the last section that you cut or copied. As soon as you cut or copy another section, the first one will be deleted.

Activity 1.4

In groups, practice using the Cut, Copy and Paste commands on an

Ms Word document. What do you notice when you **Cut**?

How is **Cut** different from **Copy**?

The View title

When you type a document, the view on screen is in **Normal** mode – or as it appears on the screen. You can look at it in **Layout** (as it would appear) printed or in other ways. A quick way of looking at your page layout is to use the toolbar and click on the blank page with a magnifying glass on it.
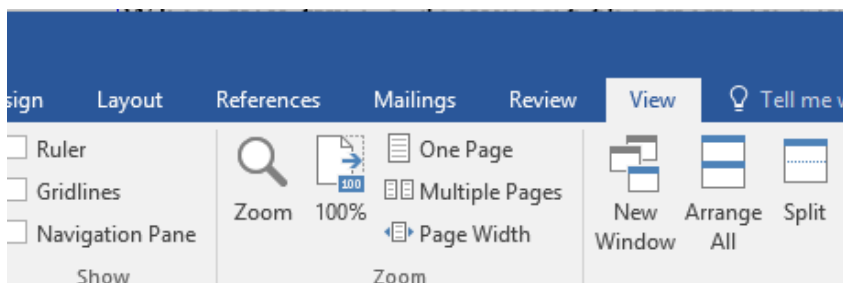
If you have poor eyesight you can change the size of the letters you see on screen. Use the **Zoom** command at the bottom of View and set your view to 100% or more.

Activity 1.5

In pairs, review the instructions on The View Title by following them on your computer.

The Insert title

This is useful for inserting **Page Breaks** (that is, beginning a new page), page numbers, footnotes, pictures and so on.

You can also use this box to insert **page numbers**. Click on Page

Numbers and then click on OK.
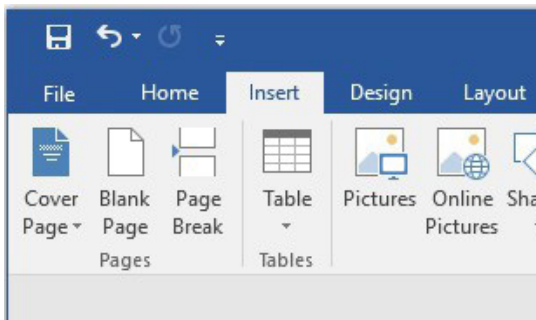
Activity 1.6

In groups, use the Insert box on a practice document to see what you can do with it.

The Format title

This is useful for layout or making your document look attractive. There are various headings.
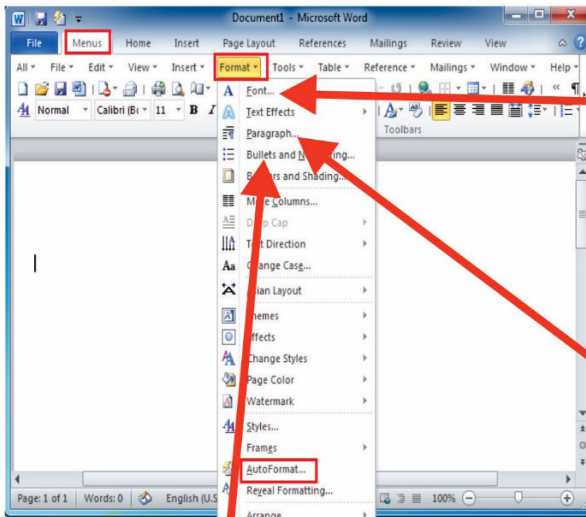
Font is the type of print or shape of print you are using. Your Ms Word programme comes with a few options like Arial, New Times Roman, Century Gothic and so on.

The **Paragraph** section allows you to change the margins of a paragraph. It also allows you to change your line spacing to single, or bigger.

Bullets allow you to mark points in different ways, using dots, or arrows or blocks and so on.
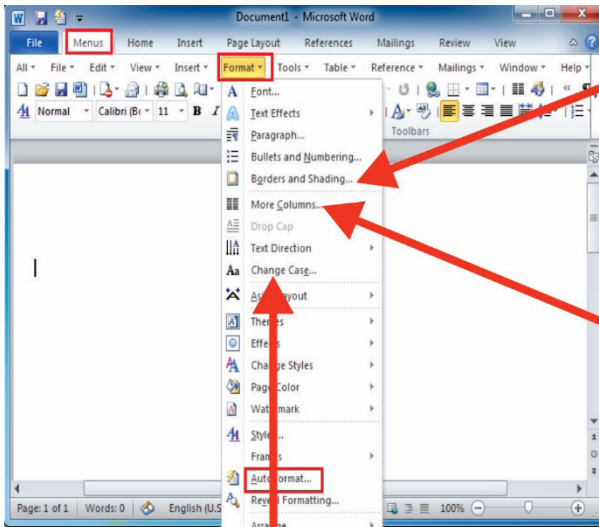
Borders and shading: Allows you to put a border around your whole document or to put a box or border around a paragraph.

Columns: Allows you to arrange your whole document into columns. Normally it is in one column, but you may want to make it look like a newspaper and have different columns.

Change case: Sometimes one types in capitals by mistake. Rather than retyping the whole section you can highlight it. Go to Format. Go to Change case. Click on Sentence case and it will correct it for you.

Activity 1.7

In groups, practice formatting a document.

The tools title
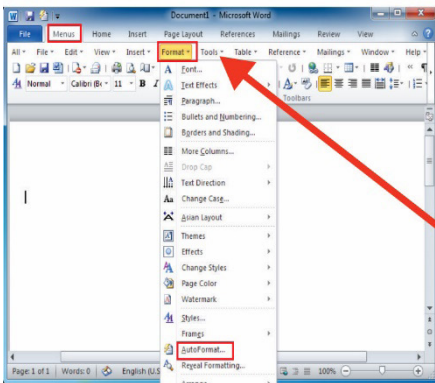
This has a helpful button to check the spelling in your whole document.

Miss-spelt words are underlined in red as you make the error. It is quicker to correct all the errors at the end, rather than do them one by one. You do this by going to **Tools.** Click on **Spelling**. The spell-check will give you options. You can also highlight a word you are not sure of and the click on the ABC symbol on your toolbar.

The Table title
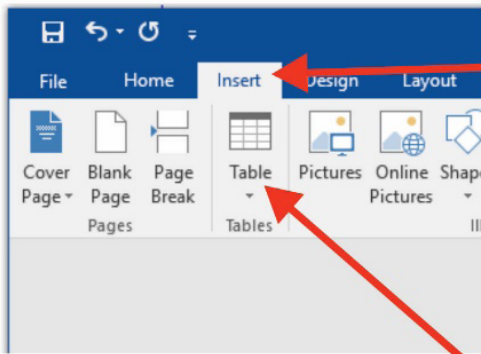
Often we want to arrange information in tables. Decide whether you need a table. Decide how many columns you want. Then go to Table before you type the information you want in the table.

Insert Table allows you to make a new table. Click on the number of lines and columns you need.

The Window title
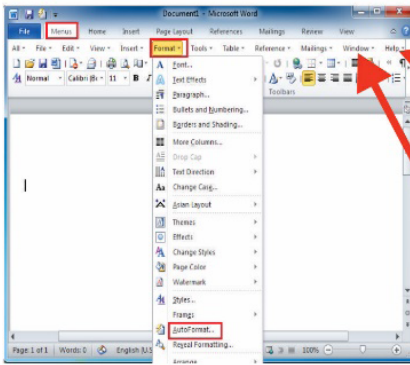
Help tool: Play with this. It will tell you how to do things.The contents are arranged alphabetically and you find out more about what you want your Ms Word to do.

Wondow: This allows you to work on two documents at once.

Activity 1.8

In groups, determine what the Help button can be used for.

As a group, make a list of these uses and compare to the next group.

The toolbar

Look at your toolbar. On the top left it will show the **font** and **size** in white boxes. You can change your font and its size by clicking on the arrows next to each and selecting what you want.
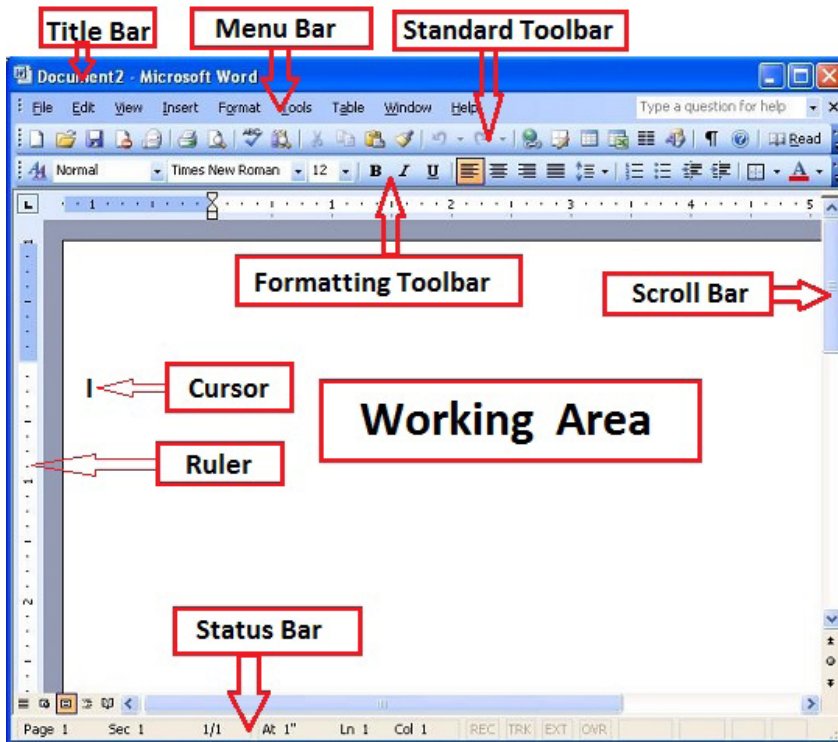
These are a quick way for you to make some words or headings Bold (B), to type some words in **italics** (I) or to **underline** them (U).

There are 4 blocks with lines in them. These can **align** your typing in different ways. The first one is the normal way your text will be aligned. The second one centres your typing in the middle of the page. It is most useful to make headings if you want them in the centre of the page. The third one is not used often since it aligns the right side of page and the left side is uneven. The fourth one is used to align both sides – this makes your document look nice, but it sometimes stretches out the spaces between words and can make a line look strange.

Then there are the **numbers** and **bullets** tools. Highlight the section you want numbered or bulleted and click on the right tool. If you do not like the type of bullets or numbers you will have to go to format and change the bullet type and then click on Reset [if you want to use this type for bullets in your whole document] and OK.

If you go to any other tool on the third line with your mouse, it will light up and tell you what it is for. We covered most of them already. A very useful tool is the curved blue arrow. This is called the **undo** button and it reverses an action you have taken that you don't like. So if you deleted something and want to put it back – click undo immediately.

4. How to set up a filing system on MSWORD

Your Ms Word programme can be a mini – office if you set it up in an organised way from the beginning. In the same way as you would file paper copies of documents, all your Ms Word documents should be filed in folders so that they are easy to find.

Activity 1.11

Work in groups.

- **Step One**

  Imagine that you are setting up a filing system and decide what files you will need. For example, you will need a file for subjects, with sub folders for each subject. Where possible your computer files should be the same as your class paper files. Make a list of all the separate files you think you will need and write them on a piece of paper and then go to your computer.

- **Step Two**

  Switch the computer on and click on the icon [symbol] saying **My Computer**. Then click on **C drive**. Then click on the folder marked **My Documents**. Go with your mouse to **File.** Click on **New**. Click on **Folder**. Make the folders you need by typing the name and remember to press enter each time you have typed in the name of the folders from the list you made in Step ONE.

  Now, under the main heading of My Documents you will have separate folders with different titles. Every time you use Ms Word and click **Open** these folders will appear and you can open an old document by clicking on the folder and then on Open. The list of documents in that folder will then appear. When you click on Save As, the list of folders will also appear. Save your new documents or letters or anything you type in the correct folder.

- **Step Three**

  You can now file all your old documents into the right folders. Switch on your computer and click on My Computer. Click on C and then on My Documents. All the folders and all the old documents should appear on the screen. Simply put your cursor on a document and hold the left mouse button down. Now drag the file document to the right folder and release the button. If some of your documents are on the C drive and not on My Documents, you first have to move them to My Documents. Click the right mouse button on the document and a new box of commands will open. Then click on Send To and then on My Documents.

1.1.3 How to make back-up copies

A back-up is a file saved onto a separate drive. It is a good idea to store your completed documents on disks in case your computer is stolen, or gets a virus and crashes. This means you have a copy which you can use on another computer. Get into the habit of doing this at least once a week. Use a different disk for each folder.

Activity 1.12

Work in groups

Go to My Computer, then click on My Documents. Put in a disk and click the right hand mouse button on the first folder. Click on Send To and then on disk. If you want to take a document to another computer, you can simply click Save As and the click on disk.

A hard copy is a paper copy. You do this by using the printer. Very important documents [like financial records and reports] should always be printed out. In this way you also have a readily available copy which someone may want to look at without using the computer. Store hard copies in files in a filing cabinet.

1.2 Ms excel

Microsoft Excel is a spreadsheet developed by Microsoft for Windows, macOS, Android and iOS operating systems. It features calculation, graphing tools, pivot tables, and a macro programming language called Visual Basic for Applications.

A spreadsheet is an interactive computer application for organization, analysing and storage of data in tabular form. They are developed as computerized simulations of paper accounting worksheets. The program operates on data entered in cells of a table. Ms excel is an example of a spreadsheet. Each cell may contain either numeric or text data, or the results of formulas that automatically calculate and display a value based on the contents of other cells. A spreadsheet may also refer to one such electronic document.

Spreadsheet users can adjust any stored value and observe the effects on calculated values. Accounting, bookkeeping, financial analysis, and statistical analysis are the main uses of this statistical software.
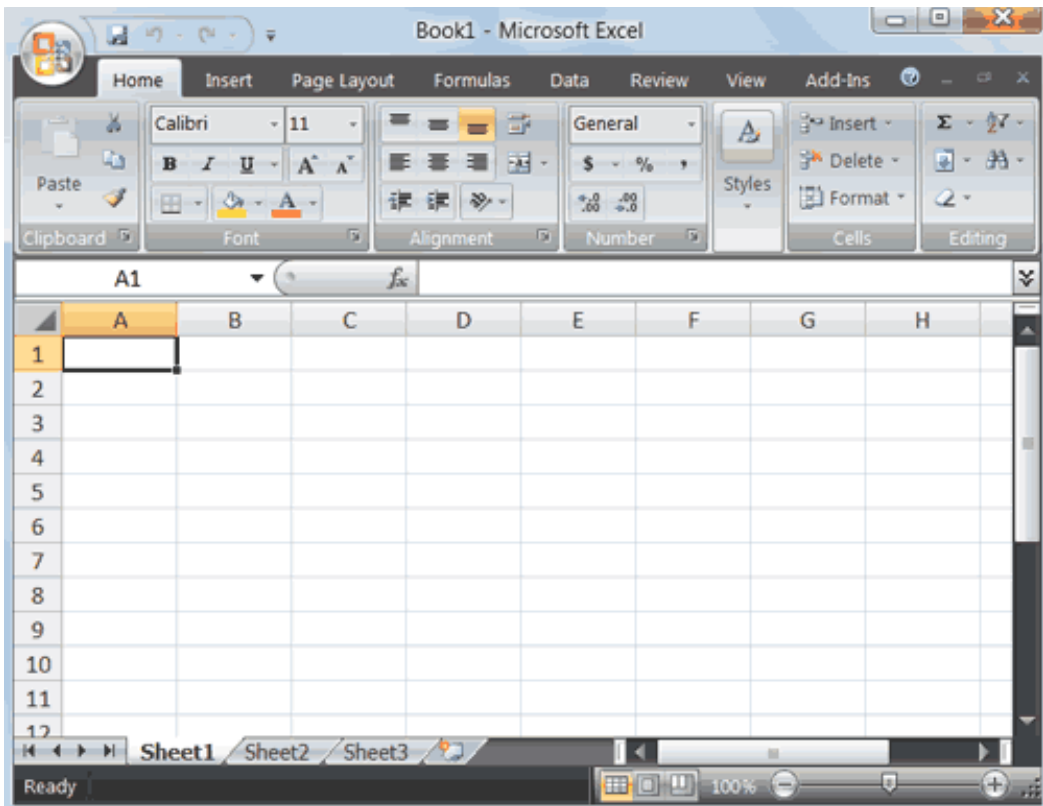
Fig 1.8: Ms-excel layout.
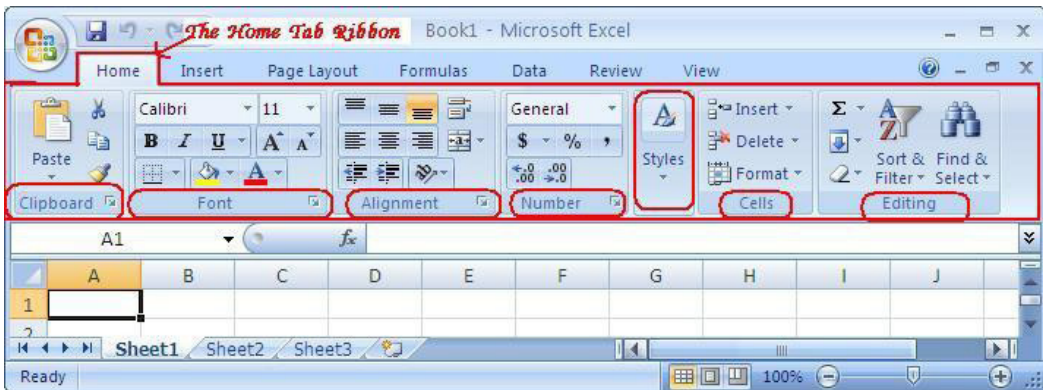
Fig 1.9: Icons found on Ms excel page

a) Excel tools

1. **Quick Access Toolbar:** This is a place where all the important tools can be placed. When you start Excel for the very first time, it has only 3 icons (Save, Undo, and Redo). But you can add any feature of Excel to Quick Access Toolbar so that you can easily access it from anywhere (hence the name).

2. **Ribbon:** Ribbon is like an expanded menu. It depicts all the features of Excel in easy to understand form. Since Excel has many features, they are grouped in to several ribbons. The most important ribbons are – Home, Insert, Formulas, and Page Layout & Data.

3. **Formula Bar:** This is where any calculations or formulas you write will appear. You will understand the relevance of it once you start building formulas.

4. **Spreadsheet Grid:** This is where all your numbers, data, charts & drawings will go. Each Excel file can contain several sheets. But the spreadsheet grid shows few rows & columns of active spreadsheet. To see more rows or columns you can use the scroll bars to the left or at bottom. If you want to access other sheets, just click on the sheet name (or use the shortcut CTRL+Page Up or CTRL+Page Down).

5. **Status bar:** This tells us what is going on with Excel at any time. You can tell if Excel is busy calculating a formula, creating a pivot report or recording a macro by just looking at the status bar. The status bar also shows quick summaries of selected cells (count, sum, average, minimum or maximum values). You can change this by right clicking on it and choosing which summaries to show.

1.2.1 Excel Formulas and Functions

Formula is an expression which calculates the value of a cell. **Functions** are predefined formulas and are already available in **Excel**.

For example, cell A3 below contains a formula which adds the value of cell A2 to the value of cell A1.

Fig 1.10: Expressing formula in Ms-excel.

For example, cell A3 below contains the SUM function which calculates the sum of the range A1:A2 as shown above.

A3		⋮	✕	✓	_fx_	=SUM(A1:A2)	
	A	B	C	D	E	F	
1	2						
2	3						
3	5						
4							
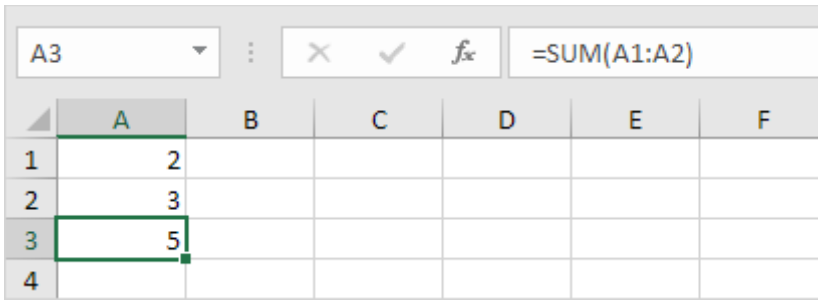
Fig 1.11: Expressing functions in Ms-excel.

a) Enter a Formula

To enter a formula, execute the following steps.

1. Select a cell.
2. To let Excel know that you want to enter a formula, type an equal sign (=).
3. For example, type the formula A1+A2.

A3		⋮	✕	✓	_fx_	=A1+A2	
	A	B	C	D	E	F	
1	2						
2	3						
3	5						
4							
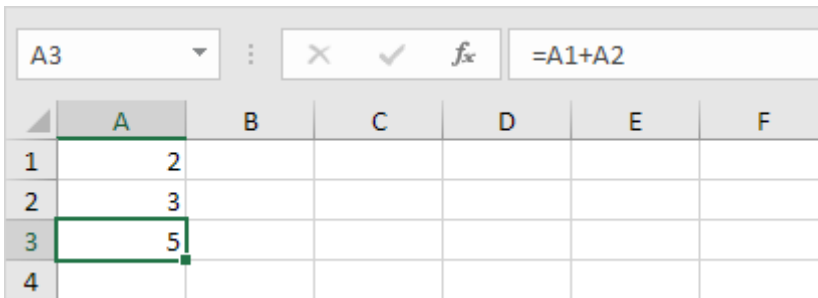
Fig 1.12: Entering a formula.

Tip: instead of typing A1 and A2, simply select cell A1 and cell A2.

4. Change the value of cell A1 to 3.

Fig 1.13: Entering a formula.

Excel automatically recalculates the value of cell A3. This is one of Excel's most powerful features!

b) Edit a Formula

When you select a cell, Excel shows the value or formula of the cell in the formula bar.
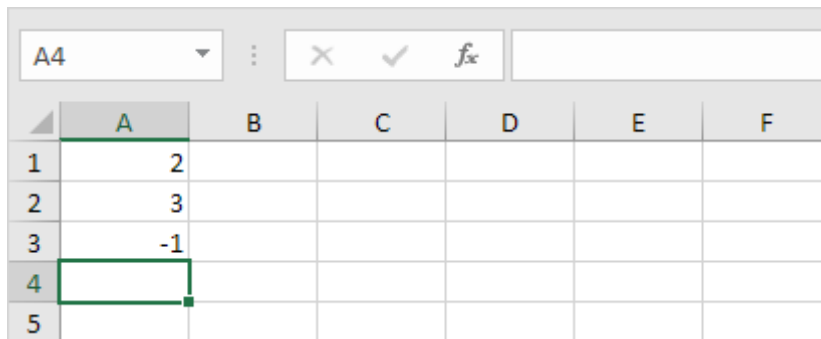
Fig 1.14: Editing a formula.

1. To edit a formula, click in the formula bar and change the formula.

Fig 1.15

2. Press Enter.
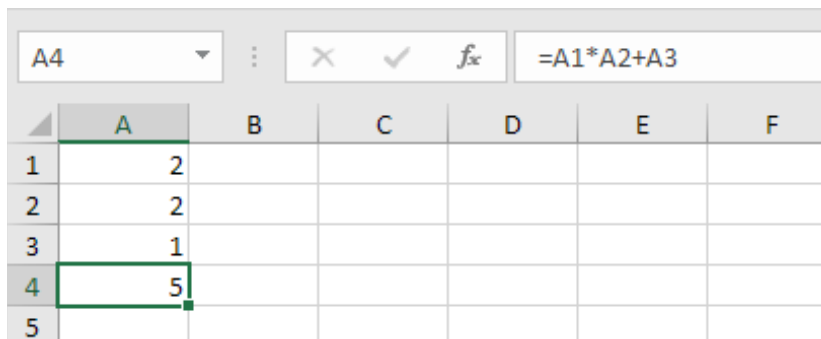
Fig 1.16

c)   Operator Precedence

Excel uses a default order in which calculations occur. If a part of the formula is in parentheses, that part will be calculated first. It then performs multiplication or division calculations. Once this is complete, Excel will add and subtract the remainder of your formula. See the example below.

Fig 1.17

First, Excel performs multiplication (A1 * A2). Next, Excel adds the value of cell A3 to this result.

Another example,

Fig 1.18

First, Excel calculates the part in parentheses (A2+A3). Next, it multiplies this result by the value of cell A1.

d) Copy / Paste a Formula

When you copy a formula, Excel automatically adjusts the cell references for each new cell the formula is copied to. Follow these steps.

1. Enter the formula shown below into cell A4.

Fig 1.19: Copying a formula.

1. Select cell A4, right click, and then click Copy (or press CTRL + c).
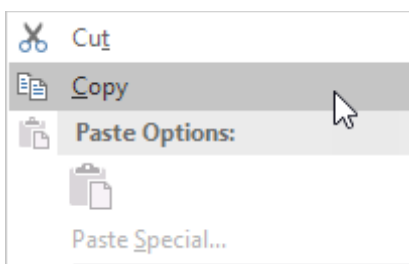
Fig 1.20

Next, select cell B4, right click, and then click Paste under 'Paste Options:' (or press CTRL + v).
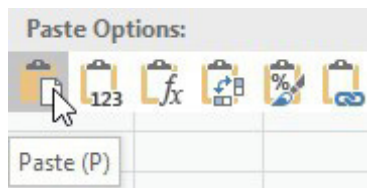
Fig 1.21: Pasting a formula.

2. You can also drag the formula to cell B4. Select cell A4, click on the lower right corner of cell A4 and drag it across to cell B4. This is much easier and gives the exact same result!

Fig 1.22

Result. The formula in cell B4 references the values in column B.

Fig 1.23

e) Insert a Functon

Every function has the same structure. For example, SUM(A1:A4). The name of this function is SUM. The part between the brackets (arguments) means we give Excel the range A1:A4 as input. This function adds the values in cells A1, A2, A3 and A4. It's not easy to remember which function and which arguments to use for each task. Fortunately, the Insert Function feature in Excel helps you with this.

To insert a function, execute the following steps.

1. Select a cell.

2. Click the Insert Function button.
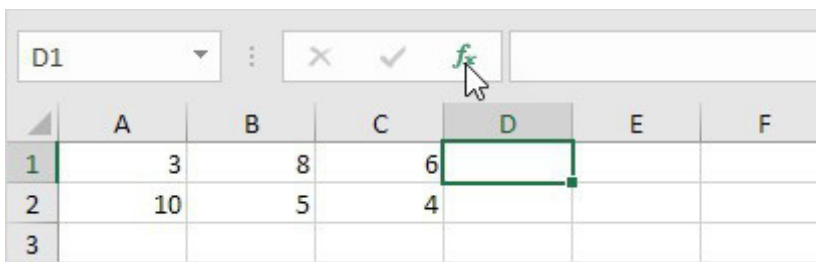
Fig 1.24: Inserting a function.

The 'Insert Function' dialog box appears.
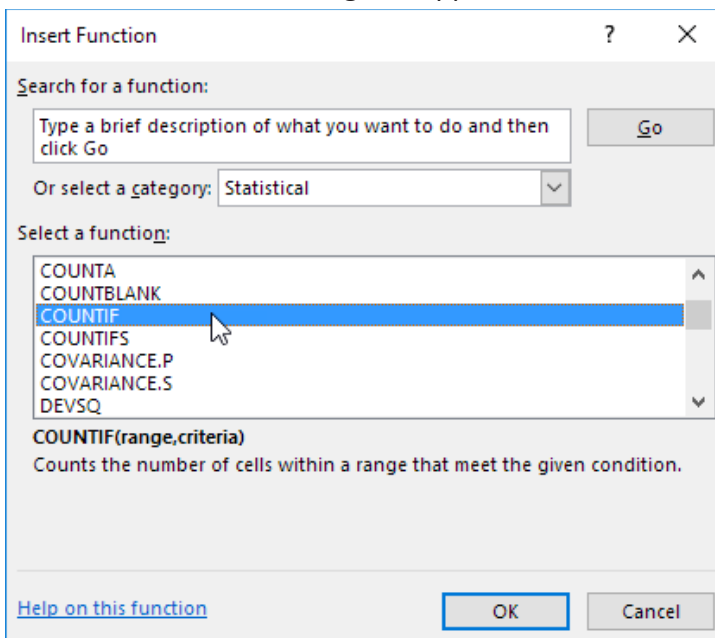
Fig 1.25: Inserting a function.

3. Search for a function or select a function from a category. For example, choose COUNTIF from the Statistical category.

4. Click OK.

The 'Function Arguments' dialog box appears.

5. Click in the Range box and select the range A1:C2.

6. Click in the Criteria box and type >5.

7. Click OK.
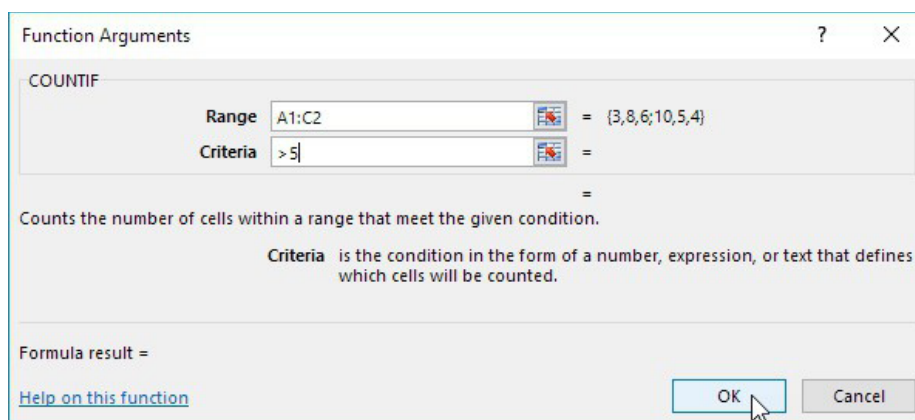
Fig 1.26

Result. Excel counts the number of cells that are higher than 5.
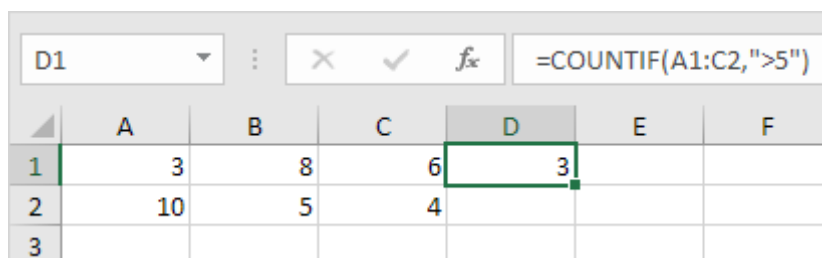
Fig 1.27

Note: instead of using the Insert Function feature, simply type =COUNTIF(A1:C2,">5"). When you arrive at: =COUNTIF(instead of typing A1:C2, simply select the range A1:C2.

1.2.2 Excel Statistical Functions

a) Average

To calculate the average of a range of cells, use the AVERAGE function.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
A3							fx	=AVERAGE(A1:O1)								
1	0	7	8	6	5	9	8	7	4	8	0	3	5	6	8	
2																
3	5.6															
4																

Fig 1.28: Calculating average of a range of cells.

b) Average

To average cells based on one criteria, use the AVERAGEIF function. For example, to calculate the average excluding zeros.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
A3							fx	=AVERAGEIF(A1:O1,"<>0")								
1	0	7	8	6	5	9	8	7	4	8	0	3	5	6	8	
2																
3	6.46															
4																

Fig 1.29: Calculating averageif function.

Note: <> means not equal to. The AVERAGEIF function is similar to the SUMIF function.

c) Median

To find the median (or middle number), use the MEDIAN function.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
A3							fx	=MEDIAN(A1:O1)								
1	0	7	8	6	5	9	8	7	4	8	0	3	5	6	8	
2																
3	6															
4																

Fig 1.30: Calculating median

Check:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	0	0	3	4	5	5	6	6	7	7	8	8	8	8	9	

d) Mode

To find the most frequently occurring number, use the MODE function.

A3			fx	=AVERAGE(A1:O1)											
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	0	7	8	6	5	9	8	7	4	8	0	3	5	6	8	
2																
3	5.6															
4																

Fig 1.31: Finding mode.

e) Standard Deviaton

To calculate the standard deviation, use the STDEV function.

A3			fx	=STDEV(A1:O1)											
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	0	7	8	6	5	9	8	7	4	8	0	3	5	6	8	
2																
3	2.82															
4																

Fig 1.32: Finding standard deviation.

f) Min

To find the minimum value, use the MIN function.

A3			fx	=MIN(A1:O1)											
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	0	7	8	6	5	9	8	7	4	8	0	3	5	6	8	
2																
3	0															
4																

Fig 1.33: Finding maximum value.

g) Max

To find the maximum value, use the MAX function.

A3			fx	=MAX(A1:O1)											
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	0	7	8	6	5	9	8	7	4	8	0	3	5	6	8	
2																
3	9															
4																

Fig 1.34: Finding minimum value

h) Large

To find the third largest number, use the following LARGE function.

A3   ▾   ⋮   ✕   ✓   *fx*   =LARGE(A1:O1,3)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	0	7	8	6	5	9	8	7	4	8	0	3	5	6	8	
2																
3	8															
4																

Fig 1.35: Finding the largest number.

Check:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	0	0	3	4	5	5	6	6	7	7	8	8	8	8	9	

Fig 1.36

i) Small

To find the second smallest number, use the following SMALL function.

A3   ▾   ⋮   ✕   ✓   *fx*   =SMALL(A1:O1,2)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	0	7	8	6	5	9	8	7	4	8	0	3	5	6	8	
2																
3	0															
4																

Fig 1.37: Finding the smallest number

1.2.3 Inserting a pie chart

1. Open Excel.
2. **Enter** your data.
3. **Select** all of your data.
4. Click the **Insert tab.**
5. Click the **"Pie Chart"** icon.
6. Click a **pie chart template.**
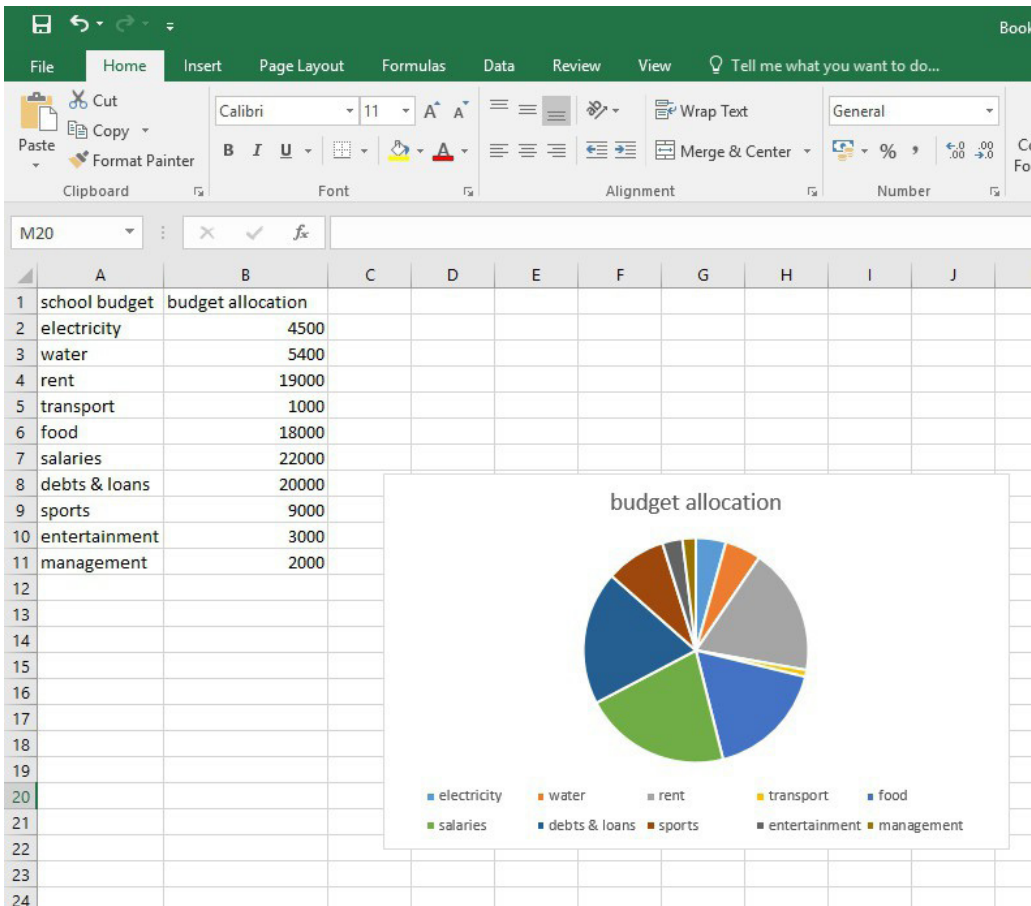
Fig 1.38: Creating a pie chart.

Activity 1.13

Use these tables to create a pie chart and a bar graph in MS excel.

Table 1: Different types of diseases

NUMBER	DISEASE	NUMBER OF CASES
1	Malaria	170,000
2	HIV Aids	75,000
3	Typhoid	150000
4	Tuberculosis (TB)	1,575
5	Cholera	49,100

Table 2: Population in some states in South Sudan

STATE	POPULATION	AREA
Northern Bahr el Ghazal	820,834	30,543.30
Western Bahr el Ghazal	358,692	91,075.95
Lakes	782,504	43,595.08
Warrap	1,044,217	45,567.24
Western Equatoria	658,863	79,342.66
Central Equatoria	1,193,130	43,033.00
Eastern Equatoria	962,719	73,472.01
Jonglei	1,443,500	122,580.83
Unity	645,465	37,836.39
Upper Nile	1,013,629	77,283.42
South Sudan	8,923,553	644,329.37
Jonglei	1,443,500	122,580.83
Unity	645,465	37,836.39

1.2.4 Microsoft Excel - Worksheet navigation

1. Ctrl + Home Cursor at beginning of worksheet.
2. Home Cursor at beginning of row.
3. Ctrl + Arrow Keys Moves to edge of current data region.
4. Tab Moves to next cell.
5. Shift + Tab Moves to previous cell.
6. Alt + Page Up, Page Down Move one screen to the left, right.
7. Ctrl + Page Up, Page Down Move to the next/previous worksheet.
8. Ctrl + Tab, Shift + Tab Move to the next/previous workbook.

1.2.5 Edit Worksheet

1. F2 Edit active cell/put cursor at end of line.
2. Ctrl + Shift + Plus Sign (+) Insert blank cells or rows and columns.
3. Ctrl + Hyphen (-) Delete selected cells.
4. Shift + Space Bar Highlights entire row.
5. Ctrl + Space Bar Highlights entire column.
6. Shift + Arrow Keys Highlights cells.
7. Delete Clear contents of selection.
8. Ctrl + Z Undo last action.
9. Shift + F11 Insert a new worksheet.

(**Note**: For Mac users, substitute the Command key for the Ctrl key. This substitution will work for the majority of commands)

1.3 Ms PowerPoint

PowerPoint is a slideshow presentation program that's part of the Microsoft office suite of tools. This program is widely used in business and classrooms and is an effective tool when used for training purposes.

PowerPoint uses a graphical approach to presentations in the form of imagery that accompany the oral delivery of the topic.

Getting started on PowerPoint

a) Choose a theme

When you open PowerPoint, you will see some built-in themes and templates. A theme is a slide design that contains matching colors, fonts, and special effects like shadows, reflections, and more.

- Choose a theme.

- Click **Create**, or pick a color variation and then click **Create**.
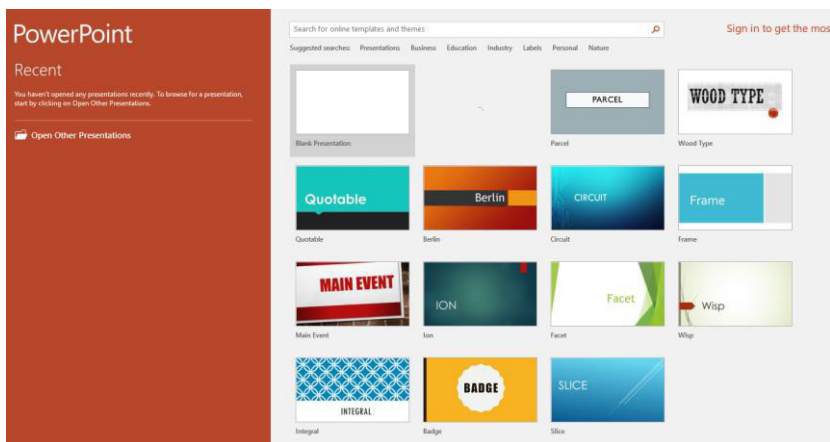
Fig 1.39: An Example of a PowerPoint page.

b) Insert a new slide

- On the Home tab, click he bottom half of New Slide, and pick a slide layout.
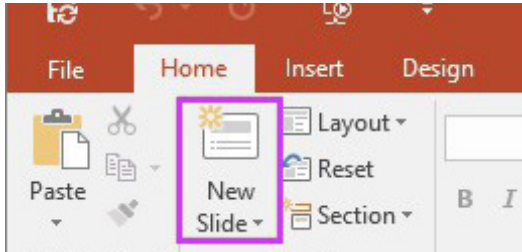
Fig 1.40: Inserting a new slide

c) Save your presentation

- On the **File** tab, choose **Save**.

- Pick or browse to a folder.

- In the **File name** box, type a name for your presentation, and then

d) Add text

Select a text placeholder, and begin typing.
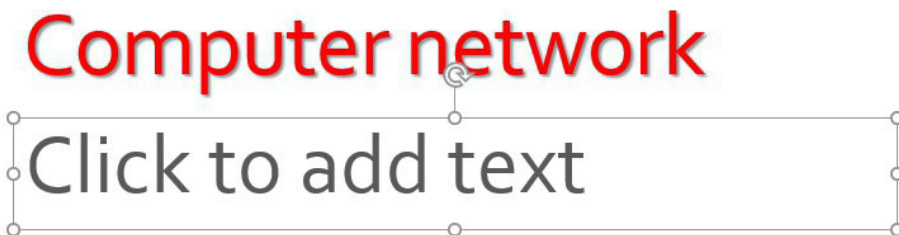
e) Format your text

- Select the text.

- Under **Drawing Tools**, choose **Format**.
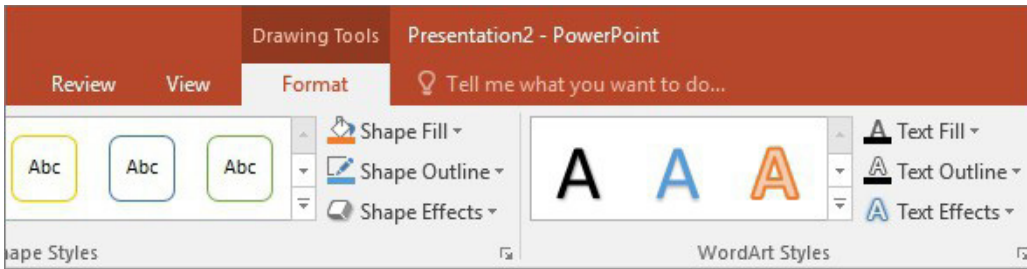
Fig 1.41: Formatting your text.

- To change the color of your text, choose **Text Fill**, and then choose a color.

- To change the outline color of your text, choose **Text Outline**, and then choose a color.

- To apply a shadow, reflection, glow, bevel, 3-D rotation, a transform, choose **Text Effects**, and then choose the effect you want.

f) Add pictures

On the **Insert** tab, do one of the following:

- To insert a picture that is saved on your local drive or an internal server, choose **Pictures**, browse for the picture, and then choose **Insert**.

- To insert a picture from the Web, choose **Online Pictures**, and use the search box to find a picture. Choose a picture, and then click **Insert**.

g) Give your presentaton

On the **Slide Show** tab, do one of the following:

- To start the presentation at the first slide, in the **Start Slide Show** group, click **From Beginning**.
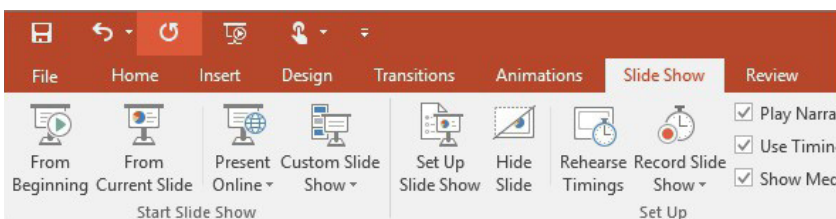
Fig 1.42: Adding pictures to a slide.

- If you're not at the first slide and want to start from where you are, click **From Current Slide**.

- If you need to present to people who are not where you are, click **Present Online** to set up a presentation on the web

h) Get out of Slide Show view

To get out of Slide Show view at any time, on the keyboard, press **Esc**.

Activity 1.14

1. Using a MS PowerPoint create a PowerPoint presentation of physical features of South Sudan.

2. Create a PowerPoint presentation about the importance of ICT education in South Sudan.

3. Discuss the importance of PowerPoint presentation in business conference.

1.3.1 Microsoft PowerPoint - Navigation

1. Page Up/Down Moves to next/previous slide
2. Ctrl + M Insert a slide in current presentation
3. Ctrl + W Close a presentation
4. F5 View slide show from beginning
5. Shift+F5 View slide show from current slide
6. Esc Cancel an action
7. Alt + V, then D View slide sorter
8. Alt + O, then N Format text box (colours and lines)
9. Alt + I, then X Insert text box

1.3.2 Select and move text/objects

1. Tab Selects and cycles forward through objects (if cursor is in text box, press ESC; box can now be moved, copied, pasted, formatted, etc.)

2. Shift + Tab Selects and cycles backward through objects

3. Enter Positions cursor within an object when the object is selected

4. Arrow keys Shifts location of text box once selected (press 'Esc' to deselect)

(**Note**: *For Mac users, substitute the Command key for the Ctrl key. This substitution will work for the majority of commands).*

1.4 Ms Publisher

Microsoft Publisher is a graphic design application that focuses on page layout and design. It provides easy-to-use and less expensive publishing options for creating a variety of publications, designs, business cards, greeting cards, calendars, newsletters and logos for small businesses.

a) Creating a New Publication
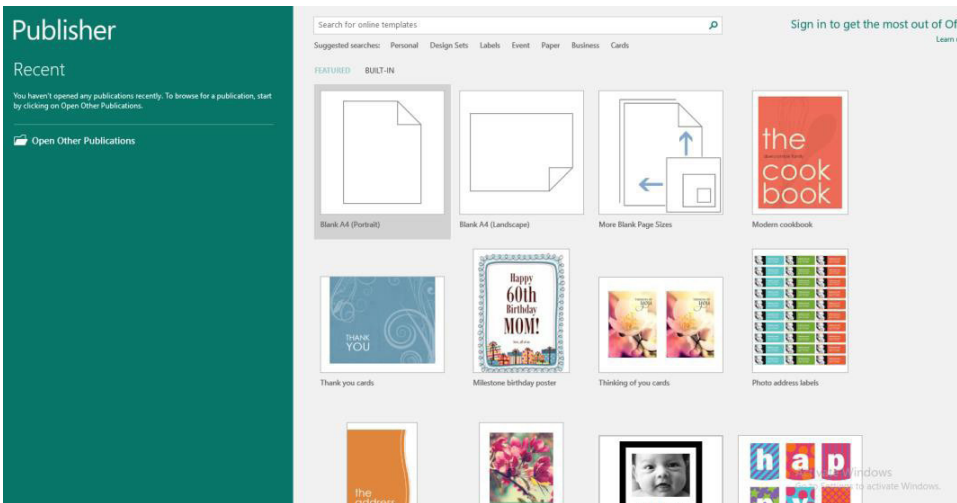
Fig 1.43: Creating a document using Ms-publisher.

When you open Publisher, you'll see a selection of templates on the backstage screen you can use to jump start your publication. To create a new **birthday card**, follow these steps:

1. Click the **Built-In** link at the top of the backstage screen.

2. Then, click **Greeting Cards** on the Built-In templates screen.

3. You will see different categories of greeting cards on the next screen. The Birthday category should be at the top. For this example, click on a Birthday template to select it.

4. Then, click the **Create** button in the right pane.

b) Saving your Publication

1. Click the **File** tab on the Ribbon.

2. Click **Save As** in the list of items on the left side of the backstage screen.

3. Click **This PC** under the Save As heading.

4. Then, click **Browse**.

5. On the Save As dialog box, navigate to the folder where you want to save your birthday card.

6. Enter a name in the **File name** box. Be sure to keep the .pub extension on the file name.

7. Then, click **Save**.

c) Changing Existing Text in Your Publication
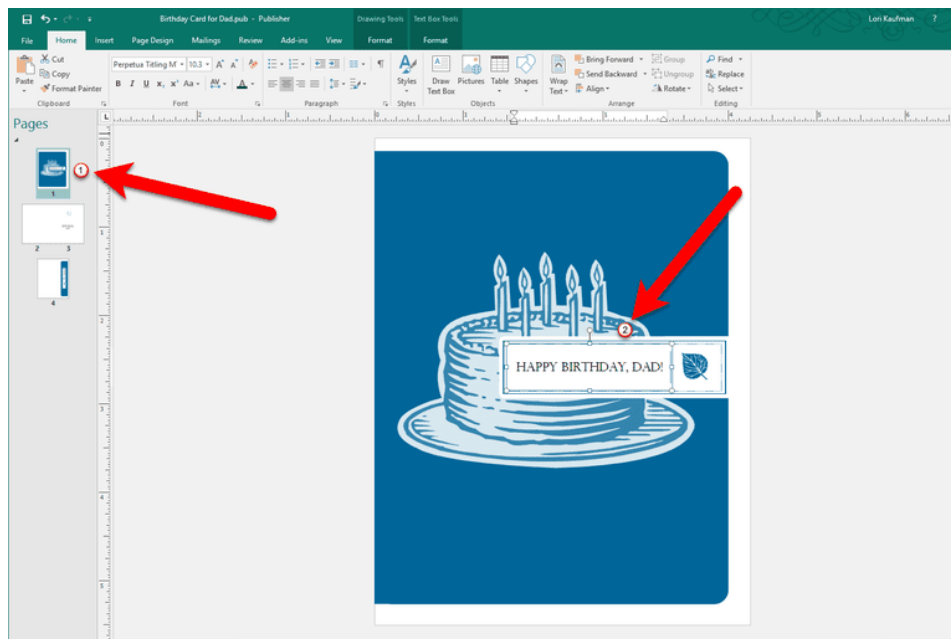
Fig 1.44: Changing text in publications.

1. Click in the text box to put the cursor inside it.

2. Position the cursor where you want to add or change text using your mouse or the arrow keys on your keyboard. To replace text, you can either, click and

drag your mouse to select the text you want to change, or you can use the Backspace key to delete the text.

3. Then, type the new text.

Adding New Text to Your Publication
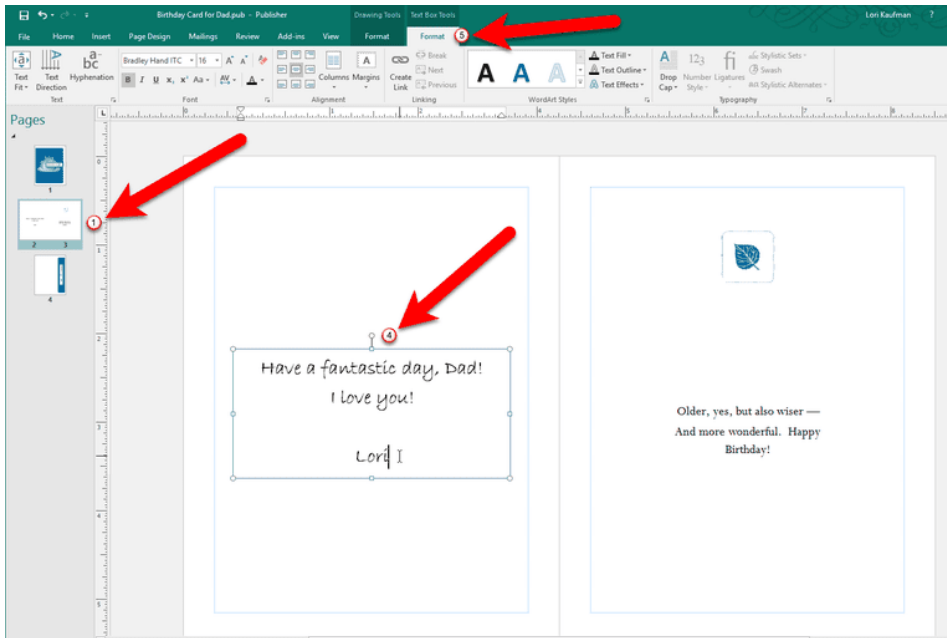
Fig 1.45: Adding text to publication

1. Click the page you want to add your text to in the left pane.

2. Then, click the **Insert** tab on the Ribbon and click the **Draw Text Box** button in the Text section.

3. The cursor changes to a cross, or plus sign. Click and drag to draw a text box where you want to add your text.

4. Release the mouse button when you're finished drawing the text box. The cursor is automatically placed inside the text box. Start typing your text.

5. The **Format** tab becomes available on the Ribbon when the cursor is inside a text box, and you can use it to change the Font and the Alignment, as well as other formatting.

6. To resize the text box, click and drag one of the handles in the corners and on the edges.

7. To move the text box, move the cursor to one edge until it turns into a cross with arrows. Then, click and drag the text box to another location.

8. When you're done customizing your text, click outside the text box to de-select it.

e) Adding Pictures to Your Publication
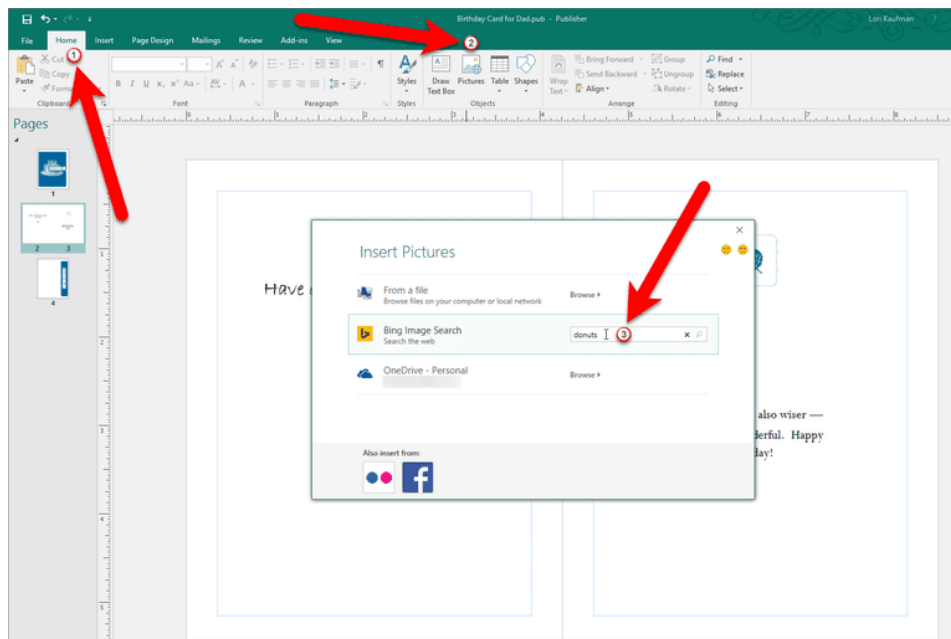
Fig 1.46: Adding pictures to publication.

1. Click the **Home** tab, if it's not already active.

2. Click the **Pictures** button in the Objects section.

3. On the dialog box that displays, click in the box to the right of **Bing Image Search**.

4. Type what you want to search for, which, in my case, is "donuts". Then, press Enter.

5. A selection of images displays. Click the image you want to use and then click the **Insert** button.

6. Click and drag the inserted image to move it where you want and use the handles on the sides and corners to resize it as desired.

7. Press **Ctrl+S** to save your publication.

f) Printing Your Publication
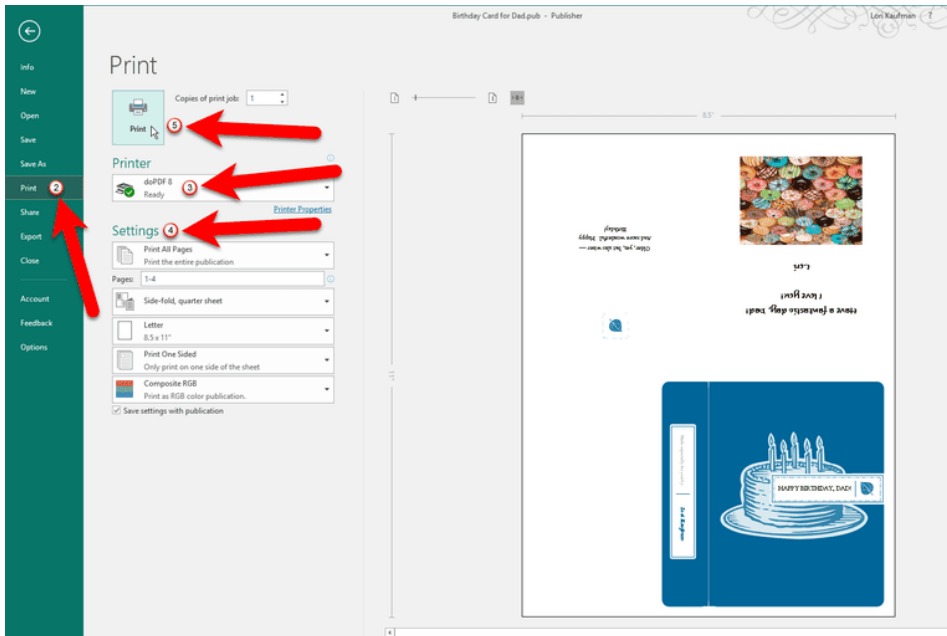
Fig 1.47: Printing publications.

1. Click the **File** tab.

2. Click **Print** in the list of items on the right side of the backstage screen.

3. Select a **Printer**.

4. Change **Settings**, if you want. I'm accepting the default settings for this card.

5. Click **Print**.

Activity 1.15

1. Using MS publisher create a birthday invitation card for your friends.

2. Design an exam report book and a timetable.

3. Design a calendar for next year.

4. Design a poster for a school sports activity.

1.5 Ms Paint

Microsoft Paint, is a simple raster graphics editor that has been included with all versions of Microsoft Windows. The app can be in color mode or two-color black-and-white. It is still widely used for simple image manipulation tasks. Ms Paint allows users to use draw, paint and edit basic image features.

Ms Paint opens and saves files in Windows bitmap (BMP), JPEG, GIF, PNG, and single-page TIFF formats. The program can be in color mode or two-color black-and-white, but there is no greyscale mode.
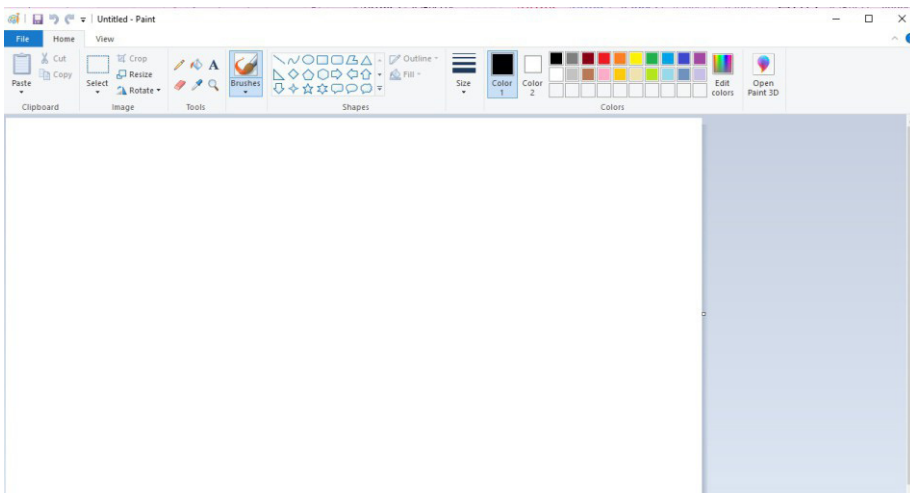
Fig 4.8 MS paint workspace.

Activity 1.16

1. Using MS paint draw the flag of South Sudan.
2. Using MS Paint software design an illustration of your school.

Computing

This is the process of utilizing computer technology to complete a task.

Computing includes designing, developing and building hardware and software systems; processing, structuring, and managing various kinds of information; doing scientific research on and with computers; making computer systems behave intelligently; and creating and using communications and entertainment media.

Types of computing –Grid, Cloud, Utility, Distributed and Cluster computing

1. **Grid computing** - Grid computing is a distributed architecture of large numbers of computers. This is a collection of computer resources from multiple locations connected to solve a complex problem. It is a distributed system with non-interactive workloads that involve a large number of files.

2. **Cloud computing** - cloud computing means storing and accessing data and programs over the Internet instead of computer hard drive. Cloud computing allows companies to avoid or minimize up- front IT infrastructure costs.

3. **Utility computing** - this is the process of providing computing service through an on-demand, pay-per-use billing method. It is a business model that charges customers for computing, memory and bandwidth based on how much is used.

4. **Distributed computing** - this is a model in which components of a software system are shared among multiple computers to improve efficiency and performance.

5. **Cluster computing** - Cluster is a term meaning independent computers combined into a unified system through software and networking.

Importance of computing

Activity 1.17

In groups, discuss the vital role the computer plays in every day life.

Today, we are living in a computer age. Computers will be found everywhere. There is hardly an industry, which does not use computers. It is not anymore thought of as a mere calculating machine. Computers are used in banks, factories, in Government offices, education institutions, for research and development and even supermarkets. The Computer plays a very vital role in the following fields:

1. Trade and Commerce:

The technological advances have made computers to be one of the most important machine or device that help the business community and the society at large.

It is now possible for the commercial establishments to reach the people globally. This has been possible by the advancement of networking technologies such as WAN. The acceptance of computer by the business community has proved the fact that computers are definitely reliable.

2. Education:

The education system is one of the key elements in producing good human beings in any society and a computer is definitely considered as one of the better teaching aids. The visual impact leaves a better impression than the conventional way of teaching. The imagination and the creativity of both teacher and taught is enhanced. The advanced countries have already adopted computers as a teaching aid.

3. Transportation:

Another important role the computer has played is in transport sector. One can book flights, trains, and even buses through the computer.

4. Home and Hobby:

There are many games that use the full capabilities of a computer to provide many hours of challenging and exciting leisure, offering relaxation.

5. Professional:

This category includes persons whose occupations are suited to the Desk-top use of personal computer. Authors are professionals who make extensive use of word processing. Other occupations are accountants, financial advisors, stockbrokers, tax consultants, lawyers, architects, engineers, educators and managers at all levels.

6. Engineering and Scientific:

Personal computers do the performance of both routine and complex calculations in fields such as Chemistry, Engineering, Physics and Aerodynamics. They are used to design and test new products such as missiles, aircrafts, home appliances and communications equipment.

7. Meteorological Department:

The MET department has successfully utilized the computer in forecasting the weather. People residing in the coastal areas have enormously been benefitted by such forecast especially at the time of cyclones. It has also helped in forecasting of timely onset of monsoon.

Fig 1.49: Computers are used at airports to control air traffic.

Activity 1.18

1. In groups, discuss how computing is used in the picture above.

2. What do you think would happen if there were no computers in the picture above? Or if the computers failed?

3. Discuss is the importance of computing in today's world.

Data manipulation and integration

Data manipulation is the process of changing data in an effort to make it easier to read or be more organized. For example, a log of data could be organized in alphabetical order, making individual entries easier to locate.

Data integration is the combination of technical and business processes used to combine data from different sources into meaningful and valuable information. A complete data integration solution delivers trusted data from a variety of sources.

	exam1	▼ (	*fx*				
	A	B	C	D	E	F	G
1		SE II	Multivariate Calculus	Relational DBMS	Data communication	Total	
2	Lado	20	18	17	15	25	
3	Bol	20	20	21	23	25	
4	Achien	13	15	17	15	25	
5	Deng	13	23	17	12	25	
6	Dak	12	14	18	17	25	
7	Poni	23	19	18	21	25	
8	Wani	23	13	16	18	25	
9	Chol	12	13	14	24	25	
10	Kiden	17	13	24	19	25	
11	Gai	23	14	16	23	25	
12	Ijanga	12	20	12	23	25	
13							
14							
15							
16							
17							

⏮ ◀ ▶ ⏭ | Sheet1 / Sheet2 / Sheet3 / Sheet5 / Final / 📂

Fig. 1.1 Data on an excel spreadsheet.

Users in the accounting field or other fields that work with numbers often manipulate data to figure out costs of products, trends in sales, potential tax obligations, or how well goods are selling per week or month. Stock market analysts frequently use data manipulation to predict trends in the stock market and how stocks might perform in the near future.

Computers may also use data manipulation to display information to users in a more meaningful way, based on code in a software program, web page, or data formatting defined by a user.

There are various application software used to manipulate data include Ms excel, Ms PowerPoint, Ms Publisher, Ms Paint.

Revision Exercise

i. What is an application software?

ii. What is the importance of application software in today's world?

iii. Define data manipulation and integration.

iv. Which are the main software used to manipulate data.

v. What is the importance of MS excel in data manipulation?

vi. What is a spreadsheet?

vii. Why is a MS excel a spreadsheet?

viii. How can you demonstrate the importance of ICT in your community?

ix. Define and explain the uses of these application software.

    a. MS word

    b. MS excel

    c. MS Powerpoint

    d. MS publisher

    e. MS paint

x. What is the importance of computing in South Sudan?

APPLICATION SOFTWARE

Application integration: the process of bringing data or a function from one application program together with that of another application program.

Application program: A program that is written for or by a user that applies to the user's discipline.

Application software: A group of programs designed to perform tasks that can be tailored to a user's specific needs.

Animations /Animation Schemes: In Microsoft PowerPoint, animations are visual effects applied to individual items on the slide such as graphics, titles or bullet points, rather than to the slide itself.

Array formula: A formula (in excel) that performs multiple calculations on one or more sets of values, and then returns either a single result or multiple results. Array formulas are enclosed between braces { } and are entered by pressing CTRL+SHIFT+ENTER.

Audit: A personal or computerized review process that accounts for the adequacy, effectiveness, security and overall functionality of a data activity.

Authentication: Process of establishing who you are.

Backup: A resource that is or can be used as a substitute when a primary resource fails or when a file has been corrupted or to save as in to make a copy in case of future failure or corruption.

Bug: a coding error in a computer program.

Cell: A box formed by the intersection of a row and column in a worksheet or a table, in which you enter information.

Data processing: The systematic performance of operations upon data, for example, handling, merging, sorting and computing.

Data source driver: A program file used to connect to a specific database. Each database program or management system requires a different driver.

Database: A collection of data related to a particular subject or purpose. Within a database, information about a particular entity, such as an employee or order, is categorized into tables, records, and fields.

Debugging: the process of locating and fixing or bypassing bugs (errors) in computer program code or the engineering of a hardware device.

Digital: Used in computers to describe information that can be represented by a collection of bits.

Driver: a program that interacts with a particular device or special kind of software. The driver contains special knowledge of the device or special software interface that programs using the driver do not.

Embedded chart: A chart that is placed on a worksheet rather than on a separate chart sheet. Embedded charts are beneficial when you want to view or print a chart or a PivotChart report with its source data or other information in a worksheet.

Ergonomics: the science of refining the design of products to optimize them for human use. Human characteristics, such as height, weight, and proportions are considered, as well as information about human hearing, sight, temperature preferences, and so on.

Excel add-in: Components that can be installed on your computer to add commands and functions to excel. These add-in programs are specific to Excel. Other add-in programs that are available for Excel or Office are Component Object Model (COM) add-ins.

Font: A graphic design applied to all numerals, symbols, and alphabetic characters. Also called type or typeface. Arial and Courier New are examples of fonts. Fonts usually come in different sizes, such as 10 point, and various styles, such as bold.

Formula: A sequence of values, cell references, names, functions, or operators in a cell that together produce a new value. A formula always begins with an equal sign (=).

Index: A database component that speeds up searching for data. When a table has an index, data in the table can be found by looking it up in the index.

Matrix: A rectangular array of values or a range of cells that is combined with other arrays or ranges to produce multiple sums or products. Excel has predefined matrix functions that can produce the sums or products.

Parameter: In Excel, you can add, change, or remove parameters to specify cells that are editable in the viewable worksheet data of Excel Services. When you save the workbook, the changes are automatically reflected on the server.

Query: In Query or Access, a means of finding the records that answer a particular question you ask about the data stored in a database.

Record: A collection of information about a particular person, place, event, or thing. When Query displays a result set in the Data pane, a record is represented as a row.

Regression analysis: A form of statistical analysis used for forecasting. Regression analysis estimates the relationship between variables so that a given variable can be predicted from one or more other variables.

Scenario: A named set of input values that you can substitute in a worksheet model.

Slide/ Slide Show: this is each page of a PowerPoint presentation. **SQL:** A language used to retrieve, update, and manage data. When you create a query, Query uses SQL to build the corresponding SQL SELECT statement. If you know SQL, you can view or change the SQL SELECT statement.

Template: A workbook that you create and use as the basis for other similar workbooks. You can create templates for workbooks and worksheets. The default template for workbooks is called Book.xlt. The default template for worksheets is called Sheet.xlt.

User interface: everything designed into an information device with which a human being may interact, including display screen, keyboard, mouse, light pen, the appearance of a desktop, illuminated characters, help messages, and how an application program or a Web site invites interaction and responds to it.

Value: The text, date, number, or logical input that completes a condition that a field must meet for searching or filtering. For example, the field Author with the condition equals must include a value, such as John, to be complete.

Worksheet: The primary document that you use in Excel to store and work with data. Also called a spreadsheet. A worksheet consists of cells that are organized into columns and rows; a worksheet is always stored in a workbook.

XML: Extensible Markup Language (XML): A condensed form of Standard Generalized Markup Language (SGML) that enables developers to create customized tags that offer flexibility in organizing and presenting information.

Internet

Learning outcomes

By the end of this unit the learner should be able to:

1. Know about advanced search engines and search strings to search for information on the internet and extract and use the relevant information, e.g. AltaVista, Google, Bing, and Wikipedia.

2. Use advanced web browsers and search engines (e.g. Google)

3. Explore for information in the internet

4. Be able to download and save information from the internet

5. Be able to recognize that www is a huge information resource center.

Key enquiry questions

1. What is the www and how is it organized?

2. How can one navigate pages and sites in www?

3. How can one find specific and valid information in the internet?

4. What role do the internet and www play in information services?

2.0 Introduction

- The Internet is a global network connecting millions of computers. It is a means of connecting a computer to any other computer anywhere in the world via dedicated routers and servers. When two computers are connected over the Internet, they can send and receive all kinds of information such as text, graphics, voice, video, and music. You can do all of this by connecting a computer to the Internet, which is also called going online. When someone says a computer is online, it is just another way of saying it is connected to the Internet.

- The Internet has revolutionized the computer and communications world like nothing before. The invention of the telegraph, telephone, radio, and computer set the stage for this unprecedented integration of capabilities. The Internet is at once a world-wide broadcasting capability, a mechanism for information dissemination, and a medium for collaboration and interaction between individuals and their computers without regard for geographic location.

- No one owns the Internet, although several organizations in the world have collaborated in its functioning and development. The high-speed, fiber-optic cables (called backbones) through which the bulk of the Internet data travels are owned by telephone companies in their respective countries.

The **World Wide Web** (www)—usually called the Web for short—is a collection of different websites you can access through the Internet. A website is made up of related text, images, and other resources. Websites can resemble other forms of media—like newspaper articles or television programs—or they can be interactive in a way that is unique to computers.

The purpose of a website can be almost anything: a news platform, an advertisement, an online library, a forum for sharing images, entertainment or an educational site.

Webpages may contain links to images, video, and software components that are rendered to users of a web browser application, running on the user's computer, as coherent pages of multimedia content. Embedded hyperlinks permit users to navigate between web pages. When multiple web pages are published with a common theme or within a common domain name, the collection is usually called a web site.
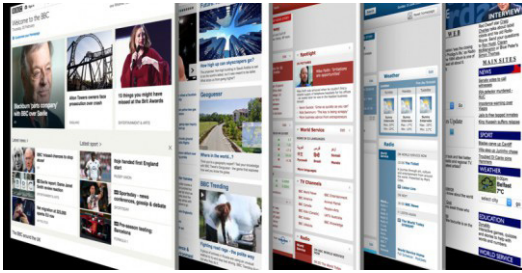
2.1 History of the internet

The Internet as we know it today first started being developed in the late 1960's and transmitted its first message on Friday, October 29, 1969.

The Internet started in the 1960s as a way for government researchers to share information.

Computers in the '60s were large and immobile and in order to make use of information stored in any one computer, one had to either travel to the site of the computer or have magnetic computer tapes sent through the conventional postal system.

A major catalyst in the formation of the Internet was the heating up of the Cold War. The Soviet Union's launch of the Sputnik satellite spurred the U.S. Defense Department to consider ways information could still be disseminated even after a nuclear attack.

This eventually led to the formation of the ARPANET

(Advanced Research Projects Agency Network), the network that ultimately evolved into what we now know as the Internet.

Other networks were later created to provide information sharing.

Prior January 1, 1983 computer networks did not have a standard way to communicate with each other. A new communications protocol was established called Transfer Control Protocol/Internetwork Protocol (TCP/IP).

This allowed different kinds of computers on different networks to "talk" to each other. ARPANET and the Defense

Data Network officially changed to the TCP/IP standard on January

1, 1983, hence the birth of the Internet.

This history revolves around three distinct aspects

1. **Technological evolution** - this began with early research on packet switching and the ARPANET (and related technologies), and where current research continues to expand the horizons of the infrastructure along several dimensions, such as scale, performance, and higher-level functionality.

2. **Operations and management** aspect of a global and complex operational infrastructure.

3. **Social aspect**, which resulted in a broad community of Internets working together to create and evolve the technology. And there is the commercialization aspect, resulting in an extremely effective transition of research results into a broadly deployed and available information infrastructure.

The Internet today is a widespread information infrastructure, the initial prototype of what is often called the National (or Global or Galactic) Information Infrastructure. Its history is involves aspects such as - technological, organizational, and community. And its influence reaches not only to the technical fields of computer communications but throughout society as we move toward increasing use of online tools to accomplish electronic commerce, information acquisition, and community operations.

Activity 2.1

1. Discuss various ways the internet could be used to resolve conflicts in the society.

2. How can internet be used to promote culture in South Sudan.

3. Discuss various ways in which internet can be used in sharing data & information from different schools in various states e.g. schools in Jubek with schools in Jonglei state.

2.1.1 Use of the internet in daily life

Activity 2.2

What do you know about how the internet is used in different aspects of daily life.

1) Business & Advertising:

Almost all the businesses these days have websites, through which they promote and advertise themselves. Internet has been used extensively for promotional

campaigns. Not only promoting your business but also effectively advertising events or any cause on this medium. There are many businesses that depend on the Internet for their survival like stocks and call centers, to name a few. It has promoted faster access to necessary information which strengthens the business processes.

2) Education:

It also is a popular medium used by students. Many students use it for educational purposes, like for finding study material or for applying for college or university admission. It is now a virtual world and all the applications are done online through the website of the concerned educational body. Students use websites for these and many other purposes like checking exam results, exam schedule, application procedure to any course, etc. Students also take the help of the Internet for project help and for obtaining the required images.

3) Communication & Networking:

The use of the Internet for networking is very popular among all age groups. There are many good social networking websites that are used by people for communication. These websites provide an effective and easy platform that facilitates interaction. It is widely used as a means of communication through means like networking websites, chat websites, blogs, etc. Through these websites you can also share your photographs with your near and distance ones. It is widely used by job seekers for job applications and job searching. Facilities like video conferencing has made it possible to conduct interviews online.

Fig 2.1 teleconference.

4) Entertainment:

Another popular use of the Internet is for entertainment. Facilities like listening to online music, downloading music and movies provides a platform for entertainment. There are plenty of other ways through which you can entertain yourselves.
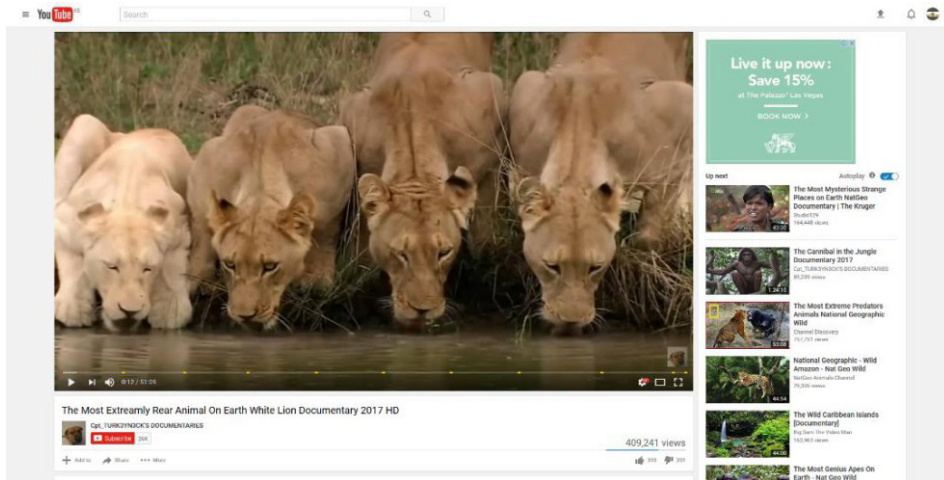
Fig 2.2 a video sharing website.

5) Other Popular Uses:

It is popularly used for banking. Almost all the banking transactions are possible through this medium. Apart from these common uses, it can also be used for shopping. Online shopping is very popular among masses and on the Internet you can buy anything and get it delivered at home. There are also many people who use it to work from home.

2.1.2 Advantages of internet:

1. Using Internet one can access millions of articles easily and study material on any topic is available.
2. Online education is possible with the help of internet.
3. Free email service to anyone around the world and Internet video chatting is possible.
4. Internet group discussion - People can discuss and share their ideas and views on internet.
5. One can make friends on internet using social networking websites.

6. Access of News. The internet is relatively inexpensive and powerful way for publishing content online

7. Live sports or other live events can be watched on internet.

8. Over internet online movies, Songs, Videos, Chatting is possible.

9. Internet is Easy, cheap, fast and effective way to communicate.

10. With internet, anyone can publish information or articles online.

11. With internet one can Book tickets of hotels, flights or movies.

12. Internet banking is also available and paying bills online.

13. Online shopping is possible.

14. Marketing of businesses and product promotion all over the world is now possible on the internet.

15. Internet: One can earn online by working on various online websites.

16. Thousands of online useful applications such are Location tracking, Google maps, etc are available on internet.

17. Online games and other useful websites are available for entertainment.

18. Over internet: One can share small or big files with others easily.

19. One can download files, movies, games and other digital products on internet.

20. Safety is increased because of watching online cameras, which is attached at Stores, Companies, Market Places, Hotels, Banks, Schools, and other institutions.

21. With the help of internet, online examination is possible.

22. Technical support of various products to customers on internet.

23. Online discussion forum on specific topic.

24. Internet can be operated 24hours and 7 days a week

25. Announcement, online survey or customer feedback is possible on internet.

2.1.3 Disadvantages of the internet:

The internet is a wonderful tool that has lots of benefits and can make your life better. Unfortunately, the features that make it easy for honest people to use can also be exploited by criminals and people intending to cause disruption.

1. Nowadays people only meet on social networking websites on internet. Face to face contact is reduced hence no direct contact with friends and family.

2. All information shared on internet is not 100% accurate.

3. (Spamming)

4. Sometime people spend more time on internet on surfing unusual websites which may affect their work or study.

5. Theft of personal information on internet.

6. Cyber Crime is common now a days on internet.

7. Pornography videos or other inappropriate content on internet which may not be suitable for children.

8. On internet Virus attack which may slow down your computer.

2.1.4 Safety rules for using the Internet

Malware. Trojans. Spyware. Phishing. Viruses. They have different names depending on what their intent is, but these are all programs designed to infect your computer without you knowing it and they can slow down your computer, spy on you, or possibly even destroy data and cause your computer to "crash" (or stop working).

You can do a few things to take precautions when you use the internet. If you have a home computer, always be sure to run current, updated antivirus software to help protect yourself from the many different types of computer viruses and other malware. You can also help yourself stay protected from viruses by not opening any emails (especially email attachments) that seem strange or are from people you don't know. Avoid websites offering "free" music or movies as these sites are often rife with bad stuff. To protect yourself from scam artists and identity thieves, avoid giving out personal information on the internet. Online safety is a continuing process. Here are some guidelines;

1. Never give your last name,
2. Never give your address,
3. Never give your phone number,
4. Never tell where you go to school
5. Never email a picture of yourself to someone you've met online,
6. Tell your parent or guardian if someone says something online that makes you uncomfortable,
7. Never meet an online acquaintance unless a parent comes along,
8. Never give your password to anyone,
9. Always follow your family's Internet rules,
10. Never open an email from someone you don't know,
11. Never order anything online unless your parents are there, or have given you permission to place the order

In groups of three discuss the role of internet in communication and information services.

2.1.5 Methods/ways to connect to the internet

Home Internet

Fixed access is usually much faster and reliable than mobile and is used for connecting homes/offices. The main Access mechanisms are:

- ADSL over traditional Phone Lines (most common).

- Cable (limited to cable TV areas)

- Fibre broadband – Currently being rolled out

Mobile Internet

When travelling away from the fixed location mobile access is used. The main access mechanisms are:

- Mobile broadband over 3G Network (common but slow) or 4G

- Public/ Private Wii-FI (common)

Open the Connect to the Internet wizard by clicking the Start button , and then clicking Control Panel. In the search box, type network, click Network and Sharing Center, click Set up a new connection or network, and then double-click Connect to the Internet.

Wireless

Choose this if you have a wireless router or network, even if you also have a broadband connection. Also choose this if you're connecting to a hotspot.

Fig 2.3 wireless router.

Broadband (PPPoE)

Choose this if your computer is connected directly to a broadband modem (also called a Digital Subscriber Line (DSL) or cable modem), and you have a Point-to-Point Protocol over Ethernet (PPPoE) Internet account. With this type of account, you need to provide a user name and password to connect.

Dial-up

Choose this if you have a modem but it's not a DSL or cable modem, or if you want to use Integrated Services Digital Network (ISDN) to connect your computer to the Internet.

2.2 Getting online

Getting online simply means being connected to the internet. To search the internet effectively you need a search engine.

A search engine will scan through thousands of websites and webpages on the internet and collect and organise the information it thinks is most relevant to you.

2.2.1 Web browser

You view websites and webpages in a web browser. A web browser is simply a computer program/software that helps you to view webpages.

The most common internet browsers enable you to manage your settings such as allowing and blocking selected websites, blocking pop ups and browsing in private. Respective browsers will tell you to do this in slightly different ways, so we recommend that you visit the security and privacy section of their websites, or the help area of the browsers themselves.

Some of the most popular browsers are:

Fig 2.4: Chrome, Safari, Opera mini, Internet Explorer & Firefox logos.

Typically, when you first pull up a website there will be a row of links across the top of the webpage or down one side.

These links divide the website's content into categories. Some of the categories you are likely to find:

o **Home** – This allows you to return to the main page (or "Home page") of the website at any time.

o **About Us** – This usually lists some information about the purpose, history and owners of an organization.

o **Locations** – This will give you information about the various locations of an organization as well as telephone numbers and street addresses.

o **Register New User** - This allows you to create an account with the website

o **Sign In** – This allows you to log in to an existing account.

o Across the bottom of the page you will generally find a small print that act as links to even more categories, such as:

o **Contact Us** – This will give you one, or several methods to contact the organization (phone, mail, or email).

o **Privacy Policy and/or Terms & Conditions** – Legal information about the terms of using the website and about what the organization may or may not do with your personal information, etc.

o **Help** – This is a good place to start if you are having trouble locating what you need.

Some browsers also have the ability to identify fraudulent websites by default.

Always ensure that you are running the latest version of your chosen browser that your system will support. Also, be sure to download and install the latest updates.

It is important to remember that turning on the private browsing setting or deleting your browsing history will only prevent other people using your computer from seeing which sites you have visited. Your internet service provider, search engine, law enforcement agencies and possibly (if browsing at work) your employer, will still be able to see which sites you have visited or keywords you have searched for.

Always remember to log out of a secure website when you have completed your transaction, and before you close the browser. Closing the browser does not necessarily log you out.

2.3 Search engines

A search engine is a software system that is designed to search for information on the World Wide it will scan through thousands of websites and webpages on the internet and collect and organise the information it thinks is most relevant to you.

Search engines are programs that search documents for specified keywords and returns a list of the documents where the keywords were found.

This tool is used to search for information on the Internet. It resides within a Browser however, the term is often used to specifically describe systems like *Google, bing and Yahoo!* Search that enable users to search for documents on the World Wide Web.

To use a search engine, for example Internet Explorer or Mozilla Firefox, you need to open your web browser

- Type in the address of the search engine you want to use in the address bar

- Click the arrow key on the address bar or press the enter key on the keyboard. This will take you to the search engine

- The search engine has a search box or search field.

- To search you type key words into the search box and press the search button

- Key words are words that describe what you are looking for in the most simple and direct way, for example "growing tomatoes"

- The result from your search will appear as a list of websites and links. The most popular or relevant will be at the top of the list

- To visit a site, click on a link.

You can make your searching more effective by following a few handy tips:

1. Use key words not full sentences or questions. For example,

2. instead of typing "I need tips for growing onions" simply type

3. "growing onions"

4. If you can't find what you want, try to use different words or a different way of expressing it

5. Practise putting key words into the search box and pressing the search button

6. A list of search results will appear, with the most popular websites near the top of the list

7. To view a website, simply click on the link

2.3.1 Differences between web browser and search engine

Activity 2.4

Research the differences between a web browser and a search engine.

Web browser	Search engine
1) A web browser is a software application that needs to be installed on a system.	1. Search engines do not require any installation on any system and are openly
2) Used to browse web pages.	2. accessible to anyone through the use of a w browser
3) Browser is the basic element in accessing the Internet.	3. Used to search web pages.
4) A web browser is there to display what a website might have to offer.	4. A search engine is to simply search for keywords in a search engine's database.

2.3.2 How to Decipher Search Engine Results

A search engine results page displays a lot of different information; in fact, you may not even be aware of all the different types of results you get. From vertical search engine results to related news stories to suggested spellings the results page offers all sorts of ways for you to dig deeper into a subject.

The following descriptions give you more information:

Search Box: The box where you type your search query.

Search Verticals: Links to the vertical search engines, the specialized ones that narrow your search into a specific type of result, such as news or images.

Page Count: The number of Web pages Google found that match your search query in some way.

Time Search Took: How long the search engine took to retrieve your results.

Related Searches: Other topics that contain your query or other searches Google thinks might be relevant.

Images: Picture files that match your query.

News Results: Any news results pertaining to your query or containing a keyword.

Sponsored Links: The paid ads. Note how some of them relate to a specific geographic location near you

Organic Results: The listing results from a general search of

Google's index, with algorithms applied to determine relevance.

Pagination: Links to the additional pages of results.

Disambiguation: (not pictured) The "Did you mean . . . ?" suggestions that usually display after a misspelled search query or search queries that turned up very few results.

Activity 2.5

1. Using websites like Wikipedia search the meaning of the following:
   - Human evolution
   - Population of South Sudan
   - Capital cities of all countries.
   - Climate change
   - Hygiene

2.4 Electronic mail (Email)
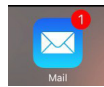
Short for e*lectronic* mail (or e-mail)*,* email is defined as the transmission of messages over communications networks. Typically the messages are notes entered from the keyboard or electronic files stored on disk. Most mainframes, minicomputers, and computer networks have an email system.

An email address identifies an email box to which email messages are delivered. The universal standard for the format and meaning of an email address today is the model developed for Internet electronic mail systems since the 1980s, but some earlier systems, and many proprietary commercial email systems used different address formats.

Electronic mail or email is a quick way of sending messages to people using the internet. You send an email to a person's email address. An email address is made up of the following parts:

```
project report
```

```
christineborn@gmail.com
```

```
project report
```

```
Hello,
kindly find the attached project report as discussed earlier.
it entails all the survey report carried out in the field by the research team.
```

- *Christine born* is the person's name or username - the name they use.

- The @ stands for the word 'at' and means that they are connected to the Gmail part of the email address.

- *.com* is a top level domain which stands for 'company'.

NB: *Email interface differs from search engine to search engine.*

You open an email by clicking twice on it. Once an email is open you can reply to it. You reply by clicking on the **Reply** button.

- This will open a new email

- The address will already be completed as you are replying to the email

- The subject line will be completed and will start with RE:

- You type out your message in the main body of the page

- You send by clicking on the **Send** button

- To create a new email you click on the **New** button

- You type the email address in the address bar and a subject in the subject bar

- Type in your message and then press **Send**

Sending attached files
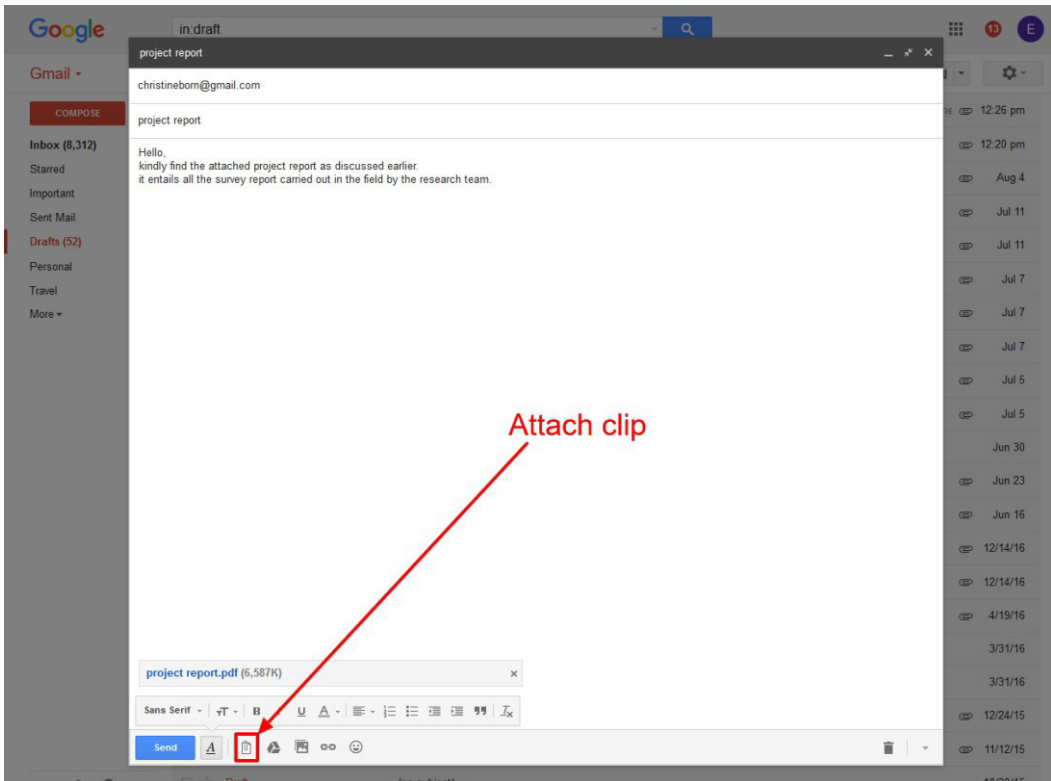
Fig 2.6: Sending attached file using email.

1. Open a new email message window, usually by clicking the "New Message" or "Compose Email" icon or the CTRL + N keyboard shortcut.

2. Click on the menu item with a paperclip icon that says "Attach a file" or something similar (e.g., "Attach Files")

3. Browse through your computer's folders and click to select the files/folders you want to attach. In most cases, you can select multiple files by holding down the CTRL key while clicking on each file.

4. Click the "Open" or "Choose File" or another similar button to attach the file to your email.

5. Then continue composing your email (put the email address of the person you want to send the attachment to in the To: field, add a subject and message in the body, and hit Send).

2.4.1 Downloading an attachment

- A paperclip icon next to an email indicates that there is an attachment

☐ ☆ ▯	SantaMonica003	vacation photos			✇	12/10/11
☐ ☆ ▯	SantaMonica004	**Vacation photos** - Hi			✇	12/10/11
☐ ☆ ▯	SantaMonica012	hi - im in the email class at santa monica				12/10/11

Fig 2.7: Downloading attachment from your email.

- Open the email; you will see a preview of any attachments
- Click on **Download**
- A window will appear
- Click on **Save**
- Choose the location where you tosave the file
- Click on **Save** to finish

Fig 2.8: Downloading attachment from your email.

2.4.2 Downloading other files

To download is to receive data from a remote system, typically a server such as a web server, an FTP server, an email server, or other similar systems.

From the Internet user's point-of-view, to download a file is to request it from another computer (or from a Web page on another computer) and to receive it.

To download;

- Click on the download icon.
- Set the destination you want the file to be saved.
- Click okay

Uploading is the transmission of a file from one computer system to another, usually larger computer system. From a network user's point-of-view, to upload a file is to send it to another computer that is set up to receive it

Activity 2.6

Billions of emails are sent everyday. Research why it is a popular means of communication

2.4.3 Advantages of emails

- Emails are easy to use. You can organize your daily correspondence, send and receive electronic messages and save them on computers.

- Emails are fast. They are delivered at once around the world. No other form of written communication is as fast as an email.

- The language used in emails is simple and informal.

- When you reply to an email you can attach the original message so that when you answer the recipient knows what you are talking about. This is important if you get hundreds of emails a day.

- It is possible to send automated emails with a certain text. In such a way it is possible to tell the sender that you are on vacation. These emails are called auto responders.

- Emails do not use paper. They are environment friendly and save a lot of trees from being cut down.

- Emails can also have pictures in them. You can send birthday cards or newsletters as emails.

- Products can be advertised with emails. Companies can reach a lot of people and inform them in a short time.

Activity 2.7

Can you think of any disadvantages of email?

2.4.4 Disadvantages of email

- Emails may carry viruses. These are small programs that harm your computer system. They can read out your email address book and send themselves to a number of people around the world.

- Many people send unwanted emails to others. These are called spam mails. It takes a lot of time to filter out the unwanted emails from those that are really important.

- Emails cannot really be used for official business documents. They may be lost and you cannot sign them.

- Your mailbox may get flooded with emails after a certain time so you have to empty it from time to time.

Mailbox

You can create your own folders in which to store your messages and even instruct att.net Mail to deliver certain messages to specific folders. On first glance you'll notice that your mailbox has five special- purpose, permanent folders that you can't remove or rename:

- Inbox—all incoming messages automatically go to your Inbox folder (except suspected spam). You can read your mail in the Inbox, then delete it, move it to another folder, or leave it in the Inbox.

- Drafts—The Drafts folder holds messages that you have composed or are in the process of composing and have not sent. A message saved in your Drafts folder remains there until you send it or delete it.

- Sent—you have the option of saving copies of the email messages you have sent in your Sent folder (this is the default when you begin using Mail). This makes it simple for you to review or resend the message if necessary.

- Spam—when you receive messages that Mail service identifies as junk mail, it directs the messages to the Spam folder. Using caution, you can read these emails, move them to other folders, and delete them.

- Trash—when you delete messages they are stored in the Trash folder. You can also empty the Trash folder yourself. Once messages are emptied from the folder, they're permanently deleted from your account, so you can't recover them.
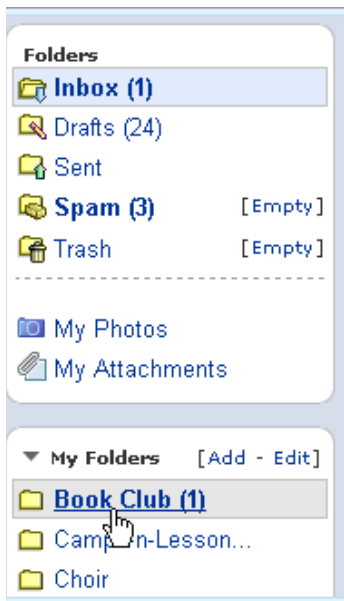
Fig 2.10: Creating personal folders

You can create your own personal folders and manage your email further in a way that makes sense to you. All mail folders, permanent and those you create; appear on the left side of the window, except when you are composing an email message. To open a folder and see its contents, click its name.

Log out when you are done
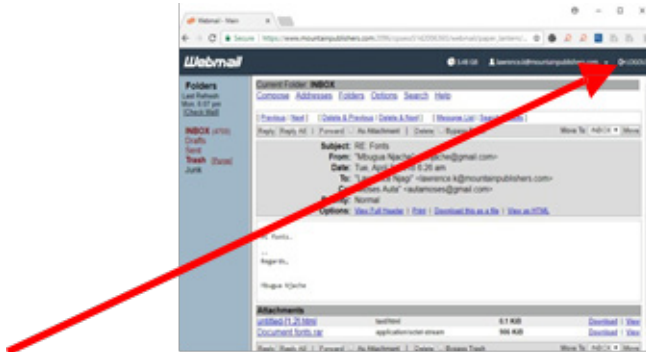
Fig 2.11: Log out.

When you are finished, log out by clicking on your email address (located on the top right).

Then click on LOGOUT

Activity 2.8

1. Create your own personal email account.

2. Send an email to your classmate regarding exam timetable (attach as a word document).

Revision Exercise

1. What is internet?
2. What is a web browser?
3. What is a search engine?
4. What is the difference between web browser and search engine?
5. Explain various ways in which the internet could help the economy of South Sudan grow.
6. What is the disadvantage of internet in the society?
7. Send your class teacher an email about your study plan.

INTERNET

Anti-virus Software: Software that is installed on your computer that attempts to prevent viruses and other dangerous software from getting onto your computer.

Auto-suggest (or auto-complete): A popular feature in web browsers and on websites that begins to display commonly searched for keywords or web sites as you begin typing.

Back Button: Located in a web browser, allows you to go back to the previous page you were on.

Broadband: A way of connecting to the internet that offers faster connection speeds than dial up. Cable, DSL, and Fiber Optics all fall into this category.

Bit: A binary digit, either a 0 or 1. In the U. S., 8 bits make up one byte; in Europe, byte equals one word.

Browser: A software program on the computer that is used to display web pages.

Buffer: A temporary memory for data, normally used to accommodate the difference in the rate at which two devices can handle data during a transfer.

Byte: A group of adjacent binary digits, usually 8, on which a computer operates as a unit; often used to represent a single character.

Dial Up: A way of connecting to the internet over a phone line. **Forward Button:** Located within your web browser, allows you to return to a page after you have clicked the back button.

Fiber optics: A high-speed channel for transmitting data. Made of high-purity glass sealed within an opaque tube. Much faster than conventional copper wire such as coaxial cable.

Home Page: The first web page you see when you connect to the internet.

HTTP: Hypertext Transfer Protocol, one of the many languages used on the internet, controls how web pages are displayed.

Hyperlink: Clickable text, images, or videos that forward you to another web page.

Internet: A massive "network of networks" that connects millions of computers together globally.

Keyword: One word that is most important in doing a search; for example "pizza" if you are looking for a pizza restaurant.

Protocols: Rules.

Search Box: Located on many websites, typing in a keyword here only search the current site you are on.

Search Engine: A web site used for searching the internet for information. Google, Yahoo, and Bing are popular examples.

Sponsored Links: Paid advertisements that appear when you a search using a search engine. Companies pay money to have these links appear first when you do specific keyword searches.

Toolbar: Located on the top part of most computer programs, this is where all of your options, effects, and other preferences will be located.

Top Level Domain Name: Located at the end of every web address, this tells you what type of website you are dealing with (.com, .org,gov, etc.)

Web Address: The specific location of a web domain on the internet,for example www.cincinnatilibrary.org.

Web Page (or web document): Refers to a single page on the internet. **Web Site:** Refers to an entire web domain and all of its sublevels.

Wi-Fi: A way to connect to the internet wirelessly. Works on technology similar to mobile phones.

World Wide Web: A way of accessing information over the internet; an information sharing model that's built on top of the internet.

Unit 3

Troubleshooting

Learning outcomes

1. By the end of this unit the learner should be able to:
2. Understand the correct procedures to troubleshoot simple computer problems and the reasons for using them.
3. Investigate common computer faults
4. Use appropriate troubleshooting procedures and techniques to diagnose simple computer problems.
5. Perform troubleshooting of simple computer problems.

Key enquiry questions

- What is an operating system and what does it do?
- What is troubleshooting and why is it important?
- What are common computer faults/problems?
- How are faulty computers/files recovered?
- What are troubleshooting procedures and techniques?
- What is hardware and software support?

3.0 Introduction to troubleshooting

Troubleshooting is a systematic approach to problem solving that is often used to find and correct issues with complex machines, electronics, computers and software systems.

The first step in troubleshooting is gathering information on the issue, such as an undesired behavior or a lack of expected functionality. Other important information includes related symptoms and special circumstances that may be required to reproduce the issue.

Once the issue and how to reproduce it are understood, the next step might be to eliminate unnecessary components in the system and verify that the issue persists, to rule out incompatibility and third- party causes.

After common causes are ruled out, the troubleshooter may resort to the more systematic and logical process of verifying the expected function of parts of a system. One common method is the split-half troubleshooting approach: With a problem resulting from a number of possible parts in series, one tests half-way down the line of components. If the middle component works, one goes to the middle of the remaining parts, approaching the end. If the test finds a problem at the mid-point, one does a split towards the start of the line until the problem part is found. The split-half process can save time in systems that depend on many components.

3.0.1 Operating system

Operating system is a program that controls and manages the hardware and other software on a computer.

All computer devices have operating systems, including your laptop, tablet, desktop, smartphone, smartwatch, router etc.

Examples include versions of Microsoft Windows (like Windows 10, Windows 8, Windows 7, Windows Vista, and Windows XP), Apple's macOS (formerly OS X), iOS, Chrome OS, BlackBerry Tablet OS, and flavors of the open source operating system Linux.

Software developers also often release additional versions of their software that work with other operating systems.

3.0.2 Common faults in an operating system

Failure to boot

Failure of computer to boot can be as a result of a corrupt operating system or some possible changes in one's system's boot order. One can go to the Basic Input Output System setup and try to look at the boot sequence. If that does not work, then one should consider reinstalling the operating system.

Improper shutdown

At times, computer may shutdown improperly due to instances of power loss or crushing. In case of such an incidence, restarting the computer might not take one directly to Windows and therefore one should run Windows Error Recovery which automatically checks the file system and drives for any problems. With that, all system files are placed in their right positions and Windows now starts without any problems.

Spontaneous shutdown/restart

This is a problem that mostly occur commonly where one's computer keeps looping over the start-up process where it appears to be starting and then restarts. In such a case, the first step should be to try and establish the occurrence point of the problem either in the course of the Basic Input Output System check where the Power on Self-test is undergoing among some other possible reasons. Once that is established, then one can easily decide if the problem is hardware related or related to the Windows configuration.

Activity 3.1

1 . Discuss the importance of troubleshooting.
2 . Define the uses of an operating system in computer device.

3.1 Hardware and software support

This is the process of providing diagnostic, troubleshooting, maintenance and repair services to a computer or similar device. It allows the users to seek and receive specialized computer maintenance and management services, either locally from their home/office or remotely via the Internet.

Hardware Support	This involves taking care of the computer's physical components, such as its keyboard, hard drive, usb ports and internal CD /D VD drives. Cleaning the computer, keeping its fans free from dust, and defragmenting its hard drives regularly are all parts of a computer hardware maintenance.
Software support	These services are generally technical support or break/fix services that are delivered for specific software products. Software support services typically include remote troubleshooting capabilities, installation assistance and basic usability assistance.

3.2 Common computer faults and diagnostics

3.2.1 Power failure

A bad power supply can be the root of many PC problems.

There are also some obvious clues that should lead you to suspect a faulty power supply. These include:

- A system that is completely dead (nothing happens when the system is turned on)

- Circuit breakers popping when the PC is turned on

- Smoke

a) *Measure the output voltages*

This will show whether the supply is operating correctly and if the supplied voltage is within the proper tolerance range. Note that you must check the

output voltages while the supply is under a load, which means that it will be installed and running in the PC.

b) Remove any power strips,

Battery backups, or other power distribution devices between your PC and the wall outlet.

If your computer starts getting power after doing this, it means that something that you removed from the equation is the cause of the problem. Even if nothing improves, continue troubleshooting with the computer plugged into the wall to keep things simple.

c) Remove the main batery

In the laptop or tablet and try using AC power only. Yes, it's perfectly fine to run your portable computer without the battery installed

d) Check the cables

One of the most common causes of computer problems is that a connector comes loose. In order to troubleshoot, check all the cables on the outside of the computer. If you find all of those in place, you may want to check the cables on the inside of your computer.

Activity 3.2

Discuss how you could improve the speed of the computer when it is too slow.

3.2.2 Computer too slow

To keep your PC clean and optimized so that it runs as fast as possible there are many manual things you can do. Windows 10 is probably the quickest Windows OS so far, but it is still vulnerable to common issues that slow down PCs like a hard drive full of junk files and background applications that waste memory.

a) Reduce startup programs

Many programs will load when Windows start, even though they do not need to. This wastes your resources. To trim the fat follow these steps:

1. Type "System configuration" into the Windows search field

2. Open the app

3. Click on the "Services" tab and check "Hide all Microsoft services"

4. Now turn off the programs you don't think you need and click apply
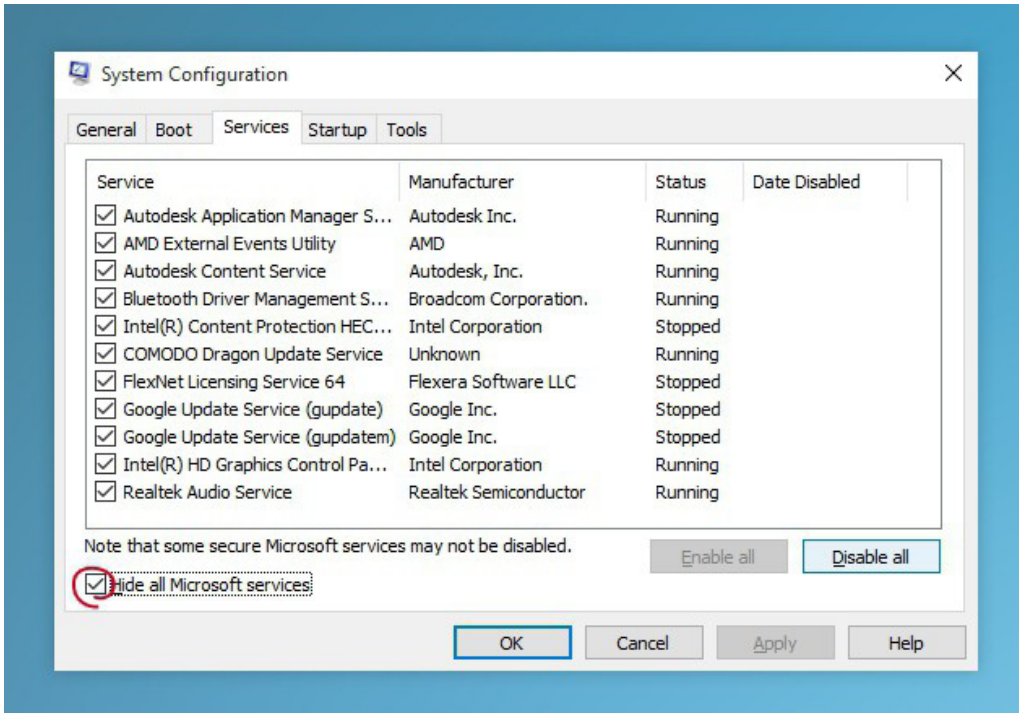
Fig 3.1: Reducing start up programs that slow down your computer.

b)   Uninstall programs you no longer use

The next step is to remove programs from your system that you no longer use. This will free up space and speed up your PC. Here's what you do:

1. Type "Programs and features" into the Windows search field

2. Open the app

3. Highlight an app you are sure you no longer need and click "Uninstall/Change"
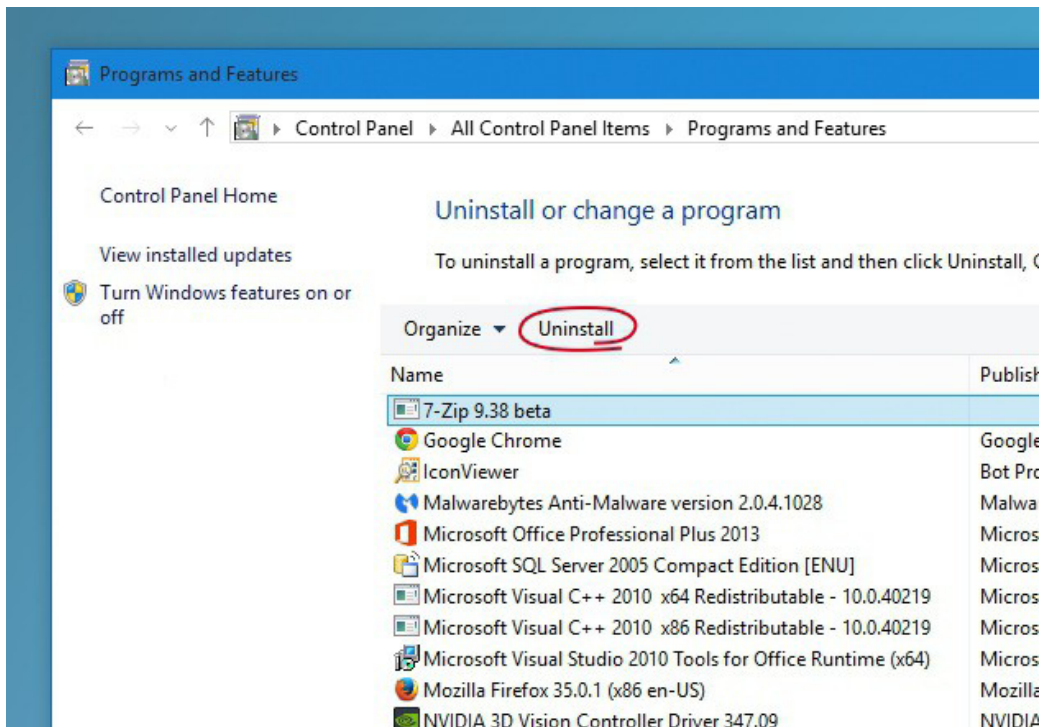
Fig 3.2: Uninstalling a program from windows.

c) *Find junk files and delete them to free up space*

Another way to lighten your hard drive and speed up Windows is to identify all the temporary junk files that apps build up on your system. Follow these steps:

1. Type "Disk cleanup" into the Windows search field

2. Open the app

3. Select the drive to clean (normally c :)

4. Select the files you want cleaned - if you're unsure highlight the item and Windows will explain in more detail
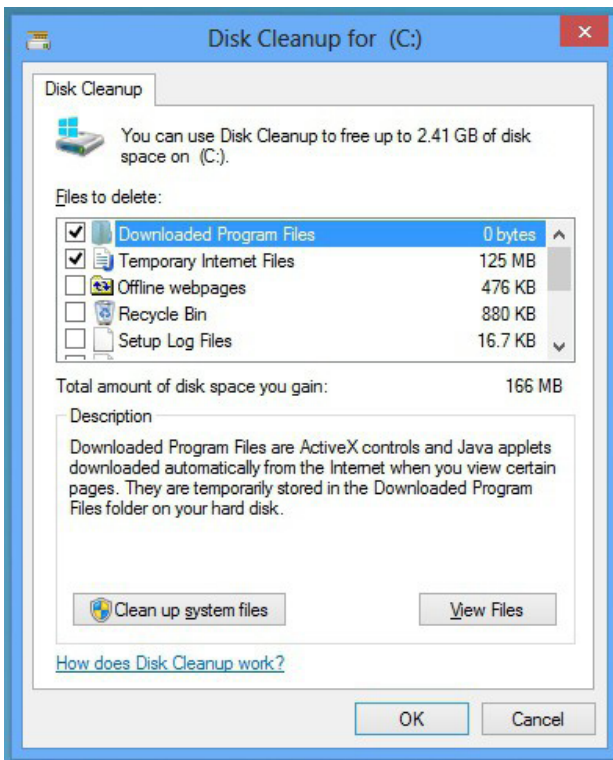
Fig 3.3: Cleaning up your computer by deleting unused information.

Activity 3.3

What would you recommend to you friend when their computer keeps hanging up.

3.2.3 Computer hanging up

This occurs when either a computer program or system ceases to respond to inputs. A typical example is a graphical user interface that no longer responds to the user's keyboard or mouse, but the term covers a wide range of behaviors in both clients and servers, and is not limited to graphical user interface issues.

a)   Software related issue

A computer locking up or freezing is often is caused by software related issues. If you are encountering lockups when the computer is opening a particular program, make sure you have all the latest updates for all running programs. You can find the latest updates for your software through the software developer or publisher.

If the computer has any malware, virus, or other malicious software it can also cause many problems. Make sure your computer is clean.

b) Too many programs open

Each program or window you open on your computer takes some of the computers resources to keep it running. If you have too many programs open at one time, your computer may be low on resources, and as a result, is freezing. Try only running one program at a time to make sure your freezing is not being caused by multiple programs running at the same time.

c) Driver related issue

A computer lock up can also be caused by outdated or corrupted drivers. For example, if there is an issue that exists with your video adapter drivers, your computer could lock up while playing a game or watching a movie.

First, make sure no errors exist in the Windows Device Manager by opening the Device Manager and verifying that no "Other Devices" are listed. You will also want to check the device list to see if any of them have a yellow exclamation mark or red X next to them. If they do, you will want to visit our page on identifying problems in Windows Device Manager.

Next, make sure you have the latest drivers for all major devices in your computer (video, sound, modem, and network).

d) Operating system related issue

Make sure your operating system has all of the latest updates installed on it.

e) Heat related issue

If the computer processor is getting too hot, it can cause the computer to freeze. If you have heard any abnormal noises coming from your computer recently, such as a high squealing, it could be an indication of a failing fan.

You can first start by verifying the fan on the power supply is working by examining the back of the computer and seeing if the fan is moving and moving smoothly. For the other fans in the computer, you have a few options. You can either open the computer and physically inspect them or, if the computer monitors the RPM of the fans, enter CMOS setup and make sure the BIOS does not report any errors.

Laptop users may also want to try propping up their laptop on a book or notepad so that air can reach the bottom of the laptop to help verify if the laptop is having heat related issues.

Users may also be able to determine how hot their computer is by onboard thermal sensors. If your computer comes equipped with these sensors, make sure your CPU is not running too hot.

f) Hardware issue

A hardware malfunction or misconfiguration can cause a computer to lock up. If you have recently added any new hardware into the computer, temporarily remove it to make sure it is not the cause of your issue.

Before attempting to remove any hardware, make sure the computer has no conflicts in Device Manager.

If you have not recently installed any new hardware, the next best solution is to remove certain components one by one. For example, you may remove your modem, network card, sound card, or any other expansion cards because they are not needed for the computer to operate. Run the computer without these cards to see if they are the cause of your issue.

3.2.4 Printer not responding
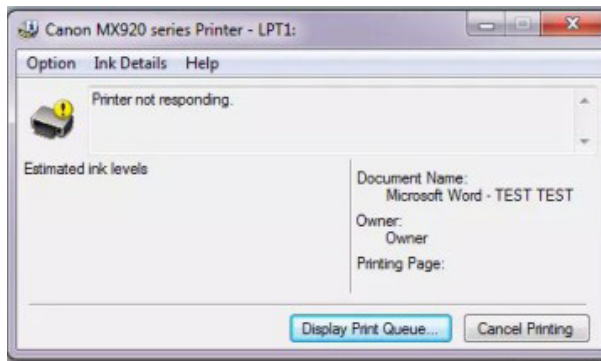
Fig 3.4: Printer not responding.

This is an error which occurs from time to time when the computer is connected to a printer.

a) Printer does not have power indicator

Make sure that the printer is on. When a printer is on, it should have some light or LED (usually green) indicating it's receiving power.

If you do not have any indicator light, make sure the printer is connected to a working power outlet by verifying each end of the power cable. Next, press the printer power button.

b) Cables not connected properly

Your printer should have two cables connected to it: the power cable and the

data cable. Make sure the power and data cables (parallel cable or USB cable) are connected to both the printer and computer

c) Printer error (orange or blinking light)

After your printer has completed its initial startup, you should see a solid colored light. If the indicator is blinking or is orange, often this is an indication of a printer error, like a paper jam or an issue with the ink or toner cartridge. As there are not standards for all printers, if you see a blinking light, visit the manufacturer's site or review the printer manual for specific error details.

d) No paper or paper jam

Without paper, your printer will not be able to print. Make sure you have paper loaded into the printer paper cartridge or tray. Next, verify that no printer paper is jammed or partially fed into the printer.

e) Inkjet printer ink related issues

Fig 3.5: Ink related issues with printer

o   Often when you are encountering an ink related issue, your printer status indicator light should be flashing.

o   Verify the tab protecting the ink from dispersing is not still on the cartridge.

o   Verify the ink cartridge(s) has been inserted properly.

o   If a lever has been changed from its original position to allow the installation of ink cartridges, ensure it has been returned to its original position.

o   Perform a head cleaning on printer if available.

o   Try resetting the ink cartridge counter. Consult your device's documentations to get instructions for your specific model.

o   Verify no software errors are occurring and print a test page.

o   If you are installing an ink cartridge not authorized by your printer's manufacturer, it may not be compatible.

3.2.5 Forgotten password

Gaining access to an account or computer that is not yours without permission is against the law. There are various options and utilities that can make it possible to gain access to a computer with a lost password.
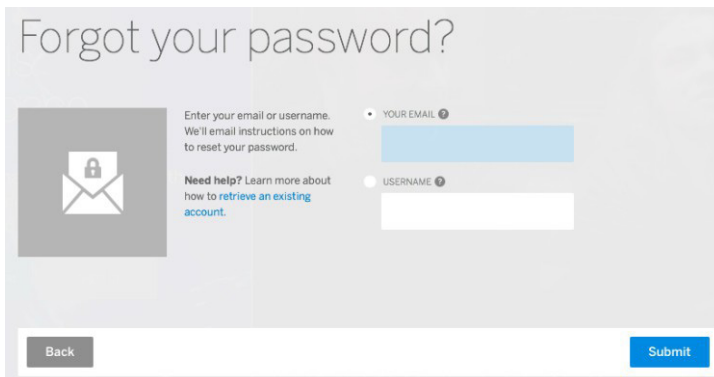
Fig 3.6: Forgotten icon.

a)   Log into an alternate account

Often many users will leave the administrator account alone or have other accounts with administrator rights. If you are not logging into the computer using the administrator account or have other accounts that you can utilize, follow the steps below to reset your other account's password.

a) Reboot the computer into Safe Mode.

b) When logging into Safe Mode, you should be prompted with an option of which account you want to use. Select the Administrator account. If prompted for a password, try pressing Enter on the keyboard for no password. If this does not work, try other passwords you may have used. If you are unable to log into the Administrator account, skip to the next suggestion.

c) Once you have logged into the Administrator account, open the Control Panel and User Accounts.

d) In User Accounts, select the account you want to change, click Change Password, and then enter the new password or click remove the password to remove the password from the account.

b) *Have an administrator change your password*

This will only work if one of the other people you share your computer with has a Windows logon account that is setup with administrator level access. One account usually is, so be sure to give this a try with as many accounts as you can

c) *Emergency Boot CD*

The EBCD (Emergency Boot CD) has many useful features. One of the most important is the ability to change the password of any user without needing to know the previous password including the administrator password.

d) *Data recovery*

There are companies that retrieve data under these circumstances.

e) *Format and reinstalling*

Finally, if after trying all of the above steps you are still unable to access your computer, the only alternative solution is to erase everything on the computer and reinstall Windows.

3.2.6 Virus and malware attacks

a) *Identify infection.*

Look for issues characteristic of a malware infection:

- Does your web browser freeze or become unresponsive?

- Do you get redirected to web pages other than the ones you are trying to visit?

- Are you bombarded with pop-up messages?

- Does your computer run slower than usual?

- Do you see new icons on your desktop that you don't recognize?

b) *Enter safe mode.*

Remove CDs and DVDs, and unplug USB drives from your computer. Then shut down.

When you restart, press the F8 key repeatedly. This should bring up the Advanced Boot Options menu. Select Safe Mode with Networking and press Enter. Only the bare minimum programs and services are used in this mode. If any malware

is programmed to automatically load when Windows starts, entering safe mode may block the attempt.

c)   *Back up your files.*

Do not back up program files, as those are where infections like to hide. You can always download these programs again if files are lost.

d)   *Download an anti-virus or anti-malware*

Follow set-up instructions and install the program.

e)   *Disconnect from the Internet*

Then run a scan.

f)   *Restart your computer. g)   Confirm the results*

By running a full scan with another malware detection program. Restart again if the program found additional infections.

h)   *Update your operating system, browser, and applications .*

If there is an update available on any of your software, go ahead and update. Some of the most dangerous forms of malware are delivered by "exploits" that take advantage of out-of-date software.

i)   *Reset all of your passwords.*

Before being deleted, malware could have captured your passwords and forwarded them to hackers. Change each and every password you can think of, and make sure they're strong.

Activity 3.4

In groups discuss and demonstrate the correct procedure for troubleshooting common computer problems like;

• Password forgotten

• Computer too slow

• Virus attack

• Printer not responding

3.3 Troubleshooting procedures & techniques

The ultimate goal of troubleshooting is to get the computer device back into operation. This is a very important job because the entire production operation may depend on the troubleshooter's ability to solve the problem quickly and economically, thus returning the device to service.

Computer problems can be hardware or software-related. Through a well-executed diagnostic procedure, you can pinpoint the exact problem that is impairing your computer's functionality. After you've plainly defined the problem, you can them work your way to finding the perfect remedy.

Although the actual steps the troubleshooter uses to achieve the ultimate goal may vary, there are a few general guidelines that should be followed.

3.3.1 Re-booting

This is the process of restarting a working computer using hardware (e.g. a power button) instead of software. Re-booting is sometimes necessary after installing a software program, installing operating system updates, to recover from an error, or to re-initialize drivers or hardware devices. This also fixes low-level error and its fixed when you restart because the problem code can start over again.

Essentially, when you restart your computer you're clearing off the current state of your software and starting over again. You're basically dumping out the junk and starting over again fresh. This includes whatever problems you've run into.

3.3.2 Re-installing

This is the process of installing a software program over the version that is already installed. This step is commonly performed when a program has worked in the past, but now is experiencing issues that cannot be resolved.

If a re-install does not work try touninstall the program and then install the program again. It is advisable to backup your personal data before uninstalling or reinstalling a program.

3.3.3 Roll back

This is the process of returning a hardware product or software program back to an earlier version after encountering issues with a later version.

Step 1

Type "System Restore" at the Windows Start screen and then select "Recovery" in the search results.

Step 2

Click "Open System Restore" on the Advanced Recovery Tools window. If Windows asks for an administrative password or confirmation to proceed, enter your password or confirm to continue.

Step 3

Click "Next" to view a list of restore points from which you can choose. Each point has a date, description and indication of whether it was manually or automatically created. To check which programs and drivers will be affected by using a specific restore point, highlight the restore point and click "Scan for Affected Programs." Click "Close" after you view the lists of items that will deleted and old items that may be restored.

Step 4

Select the restore point you want to use for rolling back your computer and click "Next."

Step 5

Click "Finish" and "Yes" to begin the System Restore process. Windows will restart, automatically roll back your computer to the selected restore point and then restart again. After it restarts the final time, Windows shows a message letting you know if the System Restore was successful.

Activity 3.5

1. In groups discuss how to recover a computer through;

    a. Re-booting

    b. Re-installing

2. In pairs, Explain and demonstrate the steps for rollback technique troubleshooting.

Revision Exercise

1. What is troubleshooting?

2. What is hardware and software support?

3. What is an operating system?

4. What are the common computer faults?

5. What are the correct procedures to troubleshoot simple computer problems and the reasons for using them?

    a. Power failure

    b. Computer hanging up

    c. Computer too slow

    d. Printer not responding

    e. Password forgotten

    f. Virus attacks

6. Why should we protect our computer from virus attacks?

7. Define the following terms

    a. Rebooting

    b. Reinstalling

    c. Rollback

8. Describe the procedures and techniques used when troubleshooting.

TROUBLESHOOTING

Cursor: A symbol on a display screen that indicates the position at which the next character entered will be displayed. The symbol often blinks so that it can be easily noticed.

DNS Domain Name Services (DNS): provides a mechanism that allows clients to remember logical machine names rather than IP addresses.

Ethernet: is a hardware and software specification used for much of the campus network.

Execute: To interpret a computer instruction and carry out the operations specified in the instruction.

IP or TCP/IP: Transmission Control Protocol/Internet Protocol is the network protocol used to network computers on the Internet. IP devices each have a unique IP address.

IP Address: this is an address is a series of four numbers separated by dots ('.'), each of which is between 0 and 255. An IP address must be unique to a machine or the network will not be able to properly delivery network information to that machine. An IP address is made up of network number, a subnet number and a node number.

Ping: is a simple program that attempts to make a very basic kind of connection to a target machine. If the target machine responds ping alerts you that it is "alive", otherwise ping returns a message that the machine is unreachable.

Protocol: A network protocol describes the "language" that a computer speaks on a network -- the actual structure of the data contained in the network packets. Example protocols in this sense include TCP/IP, AppleTalk, and IPX.

Router or Gateway: A router is the device that connects subnets together.

Subnet: is a section of the campus' TCP/IP network.

Learning outcomes

By the end of this unit the learner should be able to:

1. Understand the need for and methods of access control, security and privacy, and know how to set up password protected accounts.

2. Perform set up of electronic devices.

3. Carry out set up of access control for electronic devices.

4. Apply security measures to electronic devices.

Key enquiry questions

- What are device settings and access control?

- What is security and privacy?

- How can one secure and protect a device and a user account?

- Why are security and privacy issues so important in electronic devices computers, phones)?

4.0 Introduction to Access Control

Access control is a security technique that can be used to regulate who or what can view or use resources in a computing environment.

There are two main types of access control: physical and logical. Physical access control limits access to campuses, buildings, rooms and physical IT assets. Logical access limits connections to computer networks, system files and data.

Access control systems perform authorization identification, authentication, access approval, and accountability of entities through login credentials including passwords, personal identification

numbers (PINs), biometric scans, and physical or electronic keys.

4.0.1 Access control list

An access control list (ACL) is a table that tells a computer operating system which access rights each user has to a particular system object, such as a file directory or individual file. Each object has a security attribute that identifies its access control list. The list has an entry for each system user with access privileges. The most common privileges include the ability to read a file (or all the files in a directory), to write to the file or files, and to execute the file (if it is an executable file, or program). Microsoft Windows NT/2000, Novell's NetWare, Digital's OpenVMS, and UNIX-based systems are among the operating systems that use access control lists. The list is implemented differently by each operating system.

4.1 Creating admin accounts in windows

Windows admin accounts are user accounts that have permission to makes changes on your PC that effect all users. Often, admin permission is necessary to install and uninstall apps and to change the computer's configuration settings.

Giving admin permissions to a user could pose a security risk, so be careful who you give them to, and make sure that you've always got the accounts under control. It's also a good idea to make sure the admin user accounts are protected with a password.

4.1.1 The traditional method

The most popular way of creating a new administrator account is **via the Control Panel**. To do this, go to *Control Panel > Users Accounts and Family Safety > User Accounts > Manage another account.*

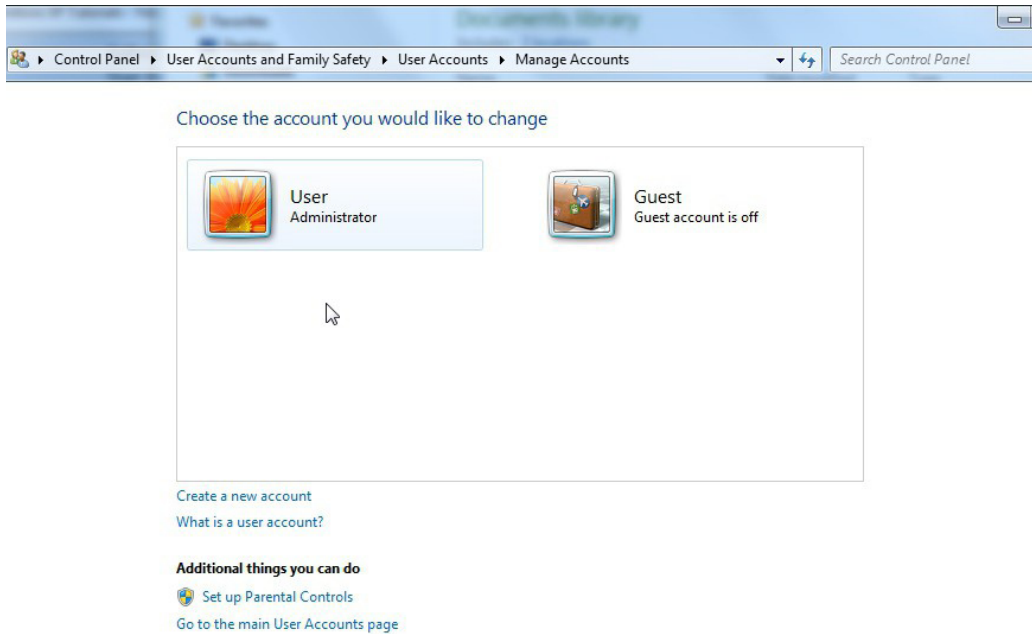Or just type "user accounts" in the Windows search menu.

Fig 4.1: Creating new administrator accounts.

Now choose *Add a new user in PC settings* (Windows 8.1) or *Create new account* (Windows7 and earlier). Write a name and **select the type of account.** In this case, it'll be *Administrator*:
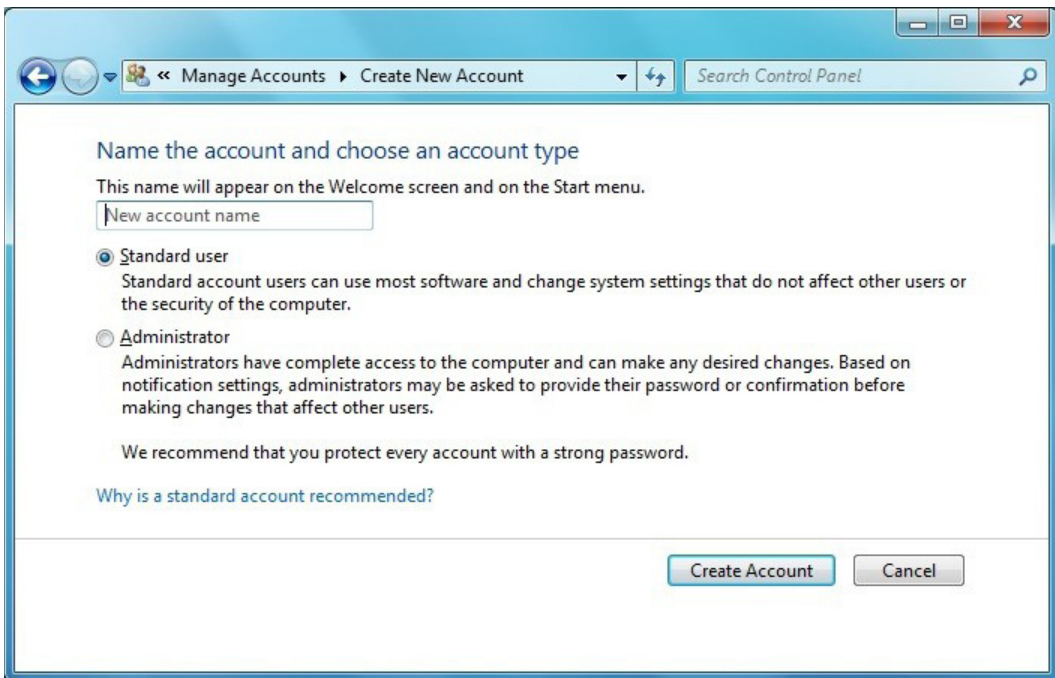
Fig 4.2 account creation menu in Windows 7

There are **several limitations** in this method. You can't, for example, create multiple accounts at once, and it doesn't let you configure password security options. It also doesn't let you add a description for the account.

1. Access the Users and Local Users menu

You can access this menu via *Control Panel > System and Security > Administrative Tools > Computer Management.*

In Windows 8.1, you can open this option quickly by pressing the Windows key + X and selecting Computer Management. On older version of Windows, just type "Computer Management" into the search menu.

When it opens, you'll find the option inside *System Tools*.
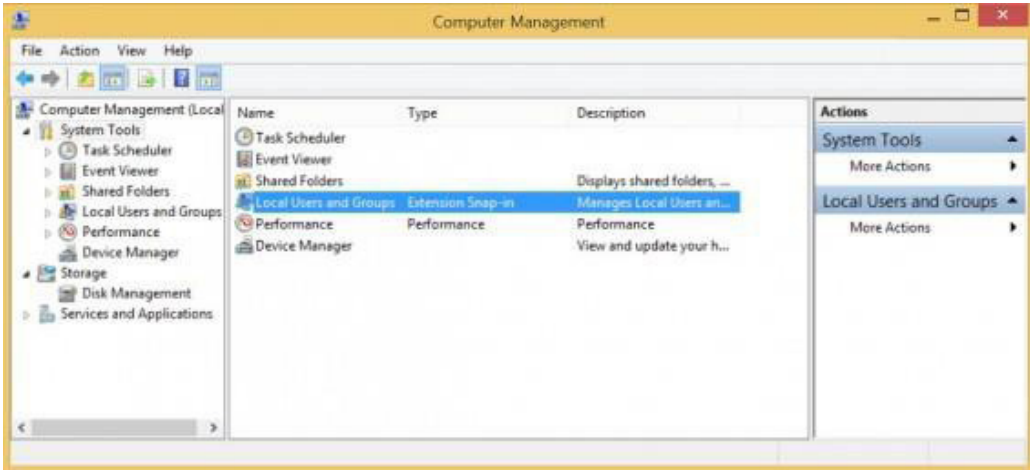
Fig 4.3: Accessing users and local users menu.

4.1.2 Create a new user

Click on *Users and Local Groups > Users* and you'll see a list of the computer's current users.

To **create a new user account**, right-click inside the windows and select *New User*.
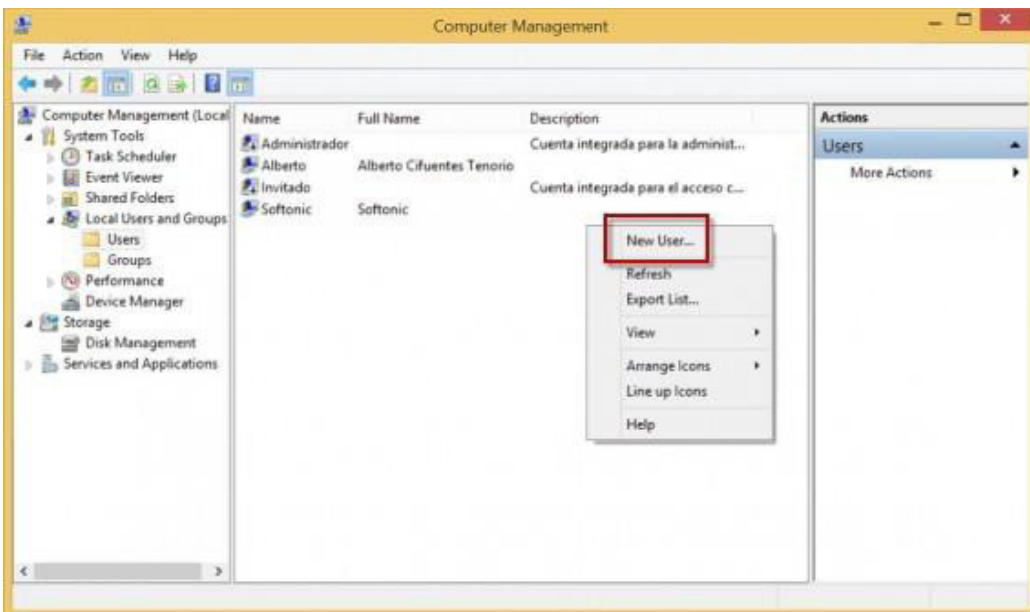
Fig 4.4: Creating a new user account.

4.1.3 Configure the new user

In the window that appears, you'll have to ent1er the following data:

- Name

- Full name

- Description

- Password: if you don't want to use a password, leave this blank

Password options: here, you can deactivate the account without deleting it, force the user to change the password when they begin the next session, prevent the password from being changed, or set it so that the password never expires Once everything is ready, click *Create*.
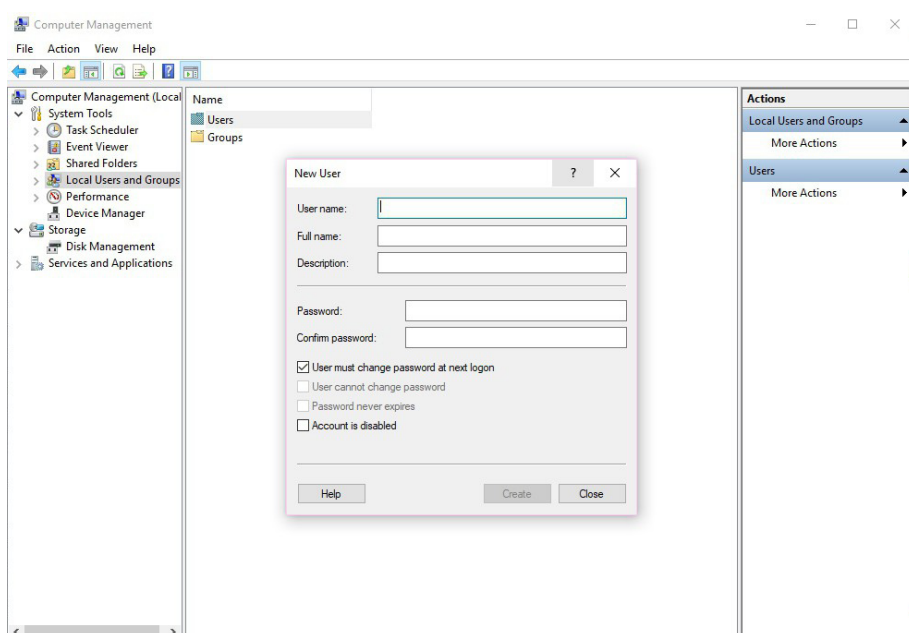
Fig 4.5: Configuring new user.

4.1.4 Add the new user to the Admin Group

The final step is to add the new user to the Admin group. Windows allows you to create user groups so that you can **manage multiple accounts at once**. The Admin Group is created by default, and all users in the group have admin privileges.

To add a new user to the group, right click on the username and choose *Properties*. Then open the *Member Of* tab and click *Add*.
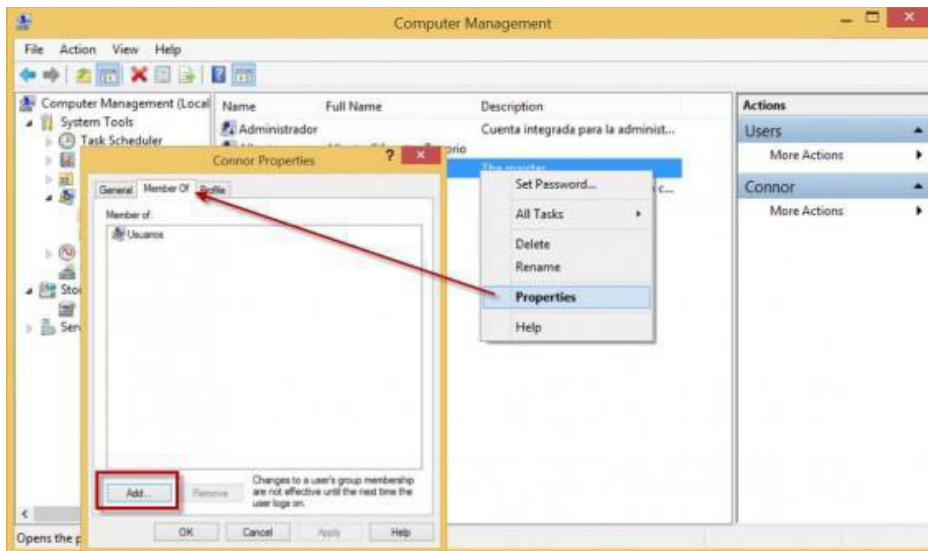
Fig 4.6: Adding a new user.

Now **write "Administrators"** in the field, and click *Check Names*. The system will recognize the group and put everything in the right format.
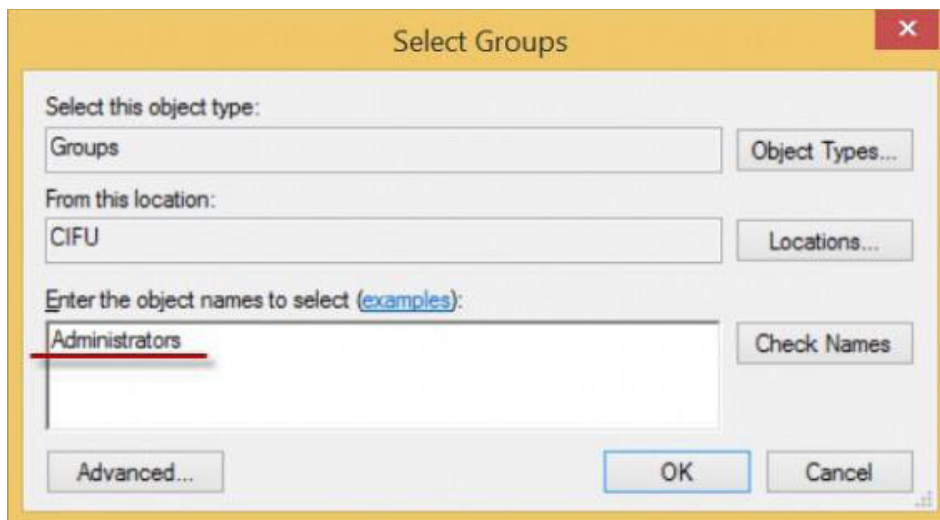
Fig 4.7: Selecting administrators in groups.

Finally, click on *Accept,* and you'll have a new admin user.

4.2 Setting permissions for directories

On computer file systems, different files and directories have permissions that specify who and what can read, write, modify and access them

4.2.1 Understanding File and Folder Permissions

File permissions include Full Control, Modify, Read & Execute, Read, and Write. Anytime you work with file and folder permissions, you should keep the following in mind:

1. Read is the only permission needed to run scripts. Execute permission doesn't matter.

2. Read access is required to access a shortcut and its target.

3. Giving a user permission to write to a file but not to delete it doesn't prevent the user from deleting the file's contents. A user can still delete the contents.

4. If a user has full control over a folder, the user can delete files in the folder regardless of the permission on the files.

> *Set, View, Change, or Remove Permissions on Files and Folders*
>
> Applies To: Windows 7, Windows Server 2008 R2

When a file or folder is created, Windows assigns default permissions to that object.

Modify is the minimum permission required to complete this procedure.

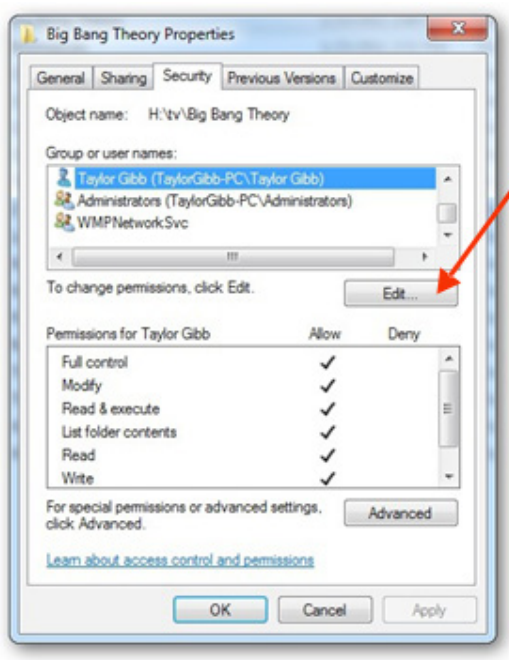## To set, view, change, or remove permissions on files and folders

1. Right-click the file or folder for which you want to set permissions, click **Properties**, and then click the **Security** tab.

2. Click **Edit** to open the **Permissions for <Object>** dialog box.

3. Do one of the following:

- To set permissions for a group or user that does not appear in the **Group or user names** box, click **Add**.

- Type the name of the group or user you want to set permissions for, and then click **OK**

- To change or remove permissions from an existing group or user, click the name of the group or user.

4. Do one of the following:

- To allow or deny a permission, in the **<User or Group>** box, select the **Allow** or box.

- To remove the group or user from the

- **User names** box, click **Remove**.

4.2.1 Additional considerations

- For a description of all permissions, see Permission Entry Dialog Box.

- Performing this procedure might require you to elevate permissions through User Account Control.

- To open Windows Explorer, click **Start**, point to **All Programs**, click **Accessories**, and then click **Windows Explorer**.

- You can set file and folder permissions only on drives formatted to use NTFS.

- To change permissions, you must be the owner or have been granted permission to do so by the owner.

- Groups or users that are granted Full Control permission for a folder can delete files and subfolders within that folder, regardless of the permissions that protect the files and subfolders.

- If the check boxes under **Permissions for <User or Group>** are shaded or if the **Remove** button is unavailable, the file or folder has inherited permissions from the parent folder.

- When adding a new user or group, by default, this user or group will have Read & Execute, List Folder Contents, and Read permissions.

Activity 4.2

Discuss how to secure and protect an electronic device and a user account in a computer device.

4.2.3 NFTS

NTFS (New Technology File System) This is a file system first introduced by Microsoft in 1993 with the release of Windows NT 3.1 it is the primary file system used in Microsoft's Windows 10, Windows 8, Windows 7, Windows Vista, Windows XP, Windows 2000, and Windows NT operating systems. The Windows Server line of operating systems also primarily use NTFS.

NTFS has several technical improvements over the file systems that it superseded – File Allocation Table (FAT) and High Performance File System (HPFS) – such as improved support for metadata and advanced data structures to improve performance, reliability, and disk space use. Additional extensions are a more elaborate security system based on access control lists (ACLs) and file system journaling.

NTFS is supported in other desktop and server operating systems as well. Linux and BSD have a free and open-source NTFS driver, called NTFS-3G, with both read and write functionality. macOS comes with read-only support for NTFS; its disabled-by-default write support for NTFS is unstable.

How to See If a Drive Is Formatted as NTFS

a) **Windows Explorer** - right-clicking or tap-and-holding on the drive in question, either from File Explorer or Windows Explorer, depending on your version of Windows. Next, choose Properties from the drop-down menu. Check the File system listed right there on the General tab. If the drive is NTFS, it will read File system: NTFS.

b) **Through a Command Prompt Command** - another way to see which file system a hard drive is using is through the command- line interface. Open Command Prompt and enter fsutil fsinfo volumeinfo drive_letter to show various details about a hard drive, including its file system. For example, you can use fsutil fsinfo volumeinfo C: to do this for the C: drive. If you don't know the drive letter, you can get a printout using the fsutil fsinfo drives command.

c) **NTFS File System Features** - Theoretically, NTFS can support hard drives up to just under 16 EB. Individual file size is capped at just under 256 TB, at least in Windows 8 and Windows 10, as well as in some newer Windows Server versions.

- NTFS supports disk usage quotas. Disk usage quotas are set by an administrator to restrict the amount of disk space that a user can take up. It's used mainly to control the amount of shared disk space someone can use, usually on a network drive.

- File attributes previously unseen in Windows operating systems, like the compressed attribute and indexed attribute, are available with NTFS-formatted drives.

- Encrypting File System (EFS) is another feature supported by NTFS. EFS provides file-level encryption, which means that individual files and folders can be encrypted. This is a different feature than full-disk encryption, which is the encryption of an entire drive

- NTFS is a journaling file system, which means it provides a way for system changes to be written to a log, or a journal, before the changes are actually written. This allows the file system to revert to previous, well-working conditions in the event of a failure because the new changes have yet to be committed.

- Volume Shadow Copy Service (VSS) is an NTFS feature that can be used by online backup service programs and other backup software tools to back up files that are currently being used, as well as by Windows itself to store backups of your files.

- Another feature introduced in this file system is called transactional NTFS. This feature allows software developers to build applications that either completely succeed or completely fail. Programs that take advantage of transactional NTFS don't run the risk of applying a few changes that do work as well as a few changes that don't, a recipe for serious problems.

- Transactional NTFS is a really interesting topic. You can read more about it on in these pieces from Wikipedia and Microsoft.

- NTFS includes other features as well, such as hard links, sparse files, and reparse points.

4.2.4 Alternatives to NTFS

The FAT file system was the primary file system in Microsoft's older operating systems and, for the most part, NTFS has replaced it.

However, all versions of Windows still support FAT and it's common to find drives formatted using it instead of NTFS.

The exFAT file system is a newer file system but is designed to be used where NTFS doesn't work well, like on flash drives.

On NTFS volumes, you can set security permissions on files and folders. These permissions grant or deny access to the files and folders. You can view security permissions for files and folders by completing the following steps:

1. In Windows Explorer, right-click the file or folder you want to work with.

2. From the pop-up menu, select Properties, and then in the Properties dialog box click the Security tab.

3. In the Name list box, select the user, contact, computer, or group whose permissions you want to view. If the permissions are dimmed, it means the permissions are inherited from a parent object.

4.3 Device settings

4.3.1 Device setting in phones and tablets

Tablets and smart phones have special operating-system needs. They use solid state storage, which is expensive, so the amount of storage space is limited. Therefore a large operating system is impractical; the OS must be simple, easy to use, and above all, compact in size.

The OS comes preinstalled on a static memory chip on tablets and smart phones, so these platforms are often referred to as system-on- chip (SoC). A separate memory chip (or group of chips) is used to hold the data you create and the extra applications you install.

Portable Apple devices (iPhone and iPad) use an operating system called iOS. Its main advantage is popularity — because it's so popular, thousands of apps are available for it via the Apple Store.

The main competitor to iOS is Android, an open-source OS created by Google. Android is popular on low-end tablets because it is free, and because many apps are available for it, and most of them are free. Many smart phones also use a version of Android.

Microsoft has two different versions of Windows for portable devices. For tablets, there is Windows RT, which looks a lot like the Start screen from Windows 8.1 but lacks the desktop component; it is designed to run on SoC devices such as tablets. Most desktop applications won't run on a Windows RT system. For smart phones, there is Windows Phone, an OS designed specifically for phone use.

How to open Windows Device Manager

Below are the steps for entering the Device Manager in each of the major versions of Windows. Click on one of the links below to link directly to the steps for that version of Windows or browse through them all.

Press the shortcut key Windows key and the Pause key at the same time to open Device Manager or System information to get into the Device Manager.

- Windows 10
- Windows 8
- Windows Vista and Windows 7
- Windows 2003
- Windows XP and 2000
- Windows 95, 98, 98 SE, and ME
- Windows NT 4.x
- Windows NT 3.x and Windows 3.x

How to open the Device Manager in Windows 10

1. Press the **Windows key + X** or right-click on <u>Start</u> to open the

<u>PowerUserMenu</u>.

2. Select **Device Manager** in the menu. You should see something similar to the example below.
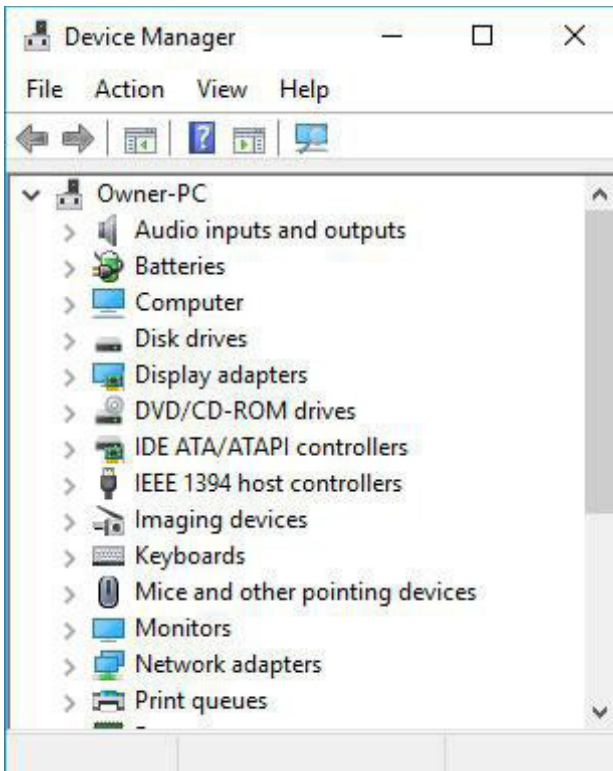
Fig 4.9 : How to open device manager in windows 10

Note: In Windows 10, you can also access the Device Manager by right-clicking on the Windows button (the Start button) in the lower left corner of the Desktop screen or by pressing the **Windows Key + X** on the keyboard. In the menu that opens, click **Device Manager**.

How to open Device Manager in Windows 8

1. From the Windows Start Screen, type **device manager**. Or on the Desktop screen, you can press the **Windows** key + **C** key on your keyboard to open the Charms menu.

2. Click **Settings** and then click the **Device Manager** icon. You should see something similar to the example below.

Note: In Windows 8.1, you can also access the Device Manager by right-clicking on the Windows button (the Start button) in the lower left corner of the Desktop screen. In the menu that opens, click **Device Manager**.

How to open the Device Manager in Windows Vista and 7

1. Click on the StartOrb.

2. In the Start Menu Search box, type **device manager** and then press enter. You should see something similar to the example below.

F.4.10: Opening device manager on windows 7.

Once in Device manager you can start identifying problems in Windows Device Manager.

How to open the Device Manager in Windows 2003

1. Open the **Administrative Tools** in <u>Control Panel</u>.
2. Within the Administrative Tools, click **Computer Management**.

Once in Device manager you can start identifying problems in Windows Device Manager.

How to open the Device Manager in MicrosoWindows XP and 2000

1. On the <u>desktop</u> or in the Start Menu, <u>**right-click**</u> on My Computer and select **Properties**.
2. In the System Properties window, click the **Hardware** <u>tab</u>.
3. On the Hardware tab, click the **Device Manager** button.

or

1. Open the Control Panel
2. In the Control Panel, double-click the **Systems** icon.
3. In the System Properties window, click the **Hardware** tab.
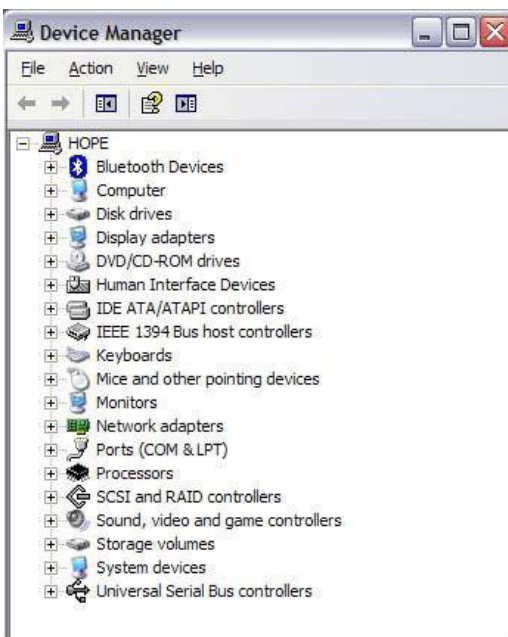4. On the Hardware tab, click the **Device Manager** button and you should see something similar to the example below.

Once in Device manager you can start identifying problems in Windows Device Manager.

How to open the Device Manager in MicrosoWindows 95, 98, 98 SE, and ME

1. On the <u>desktop</u>, <u>right-click</u> on My Computer and select **Properties**
2. Click the **Device Manager** tab.

or

1. OpentheControlPanel
2. In the Control Panel, double-click the **Systems** icon.
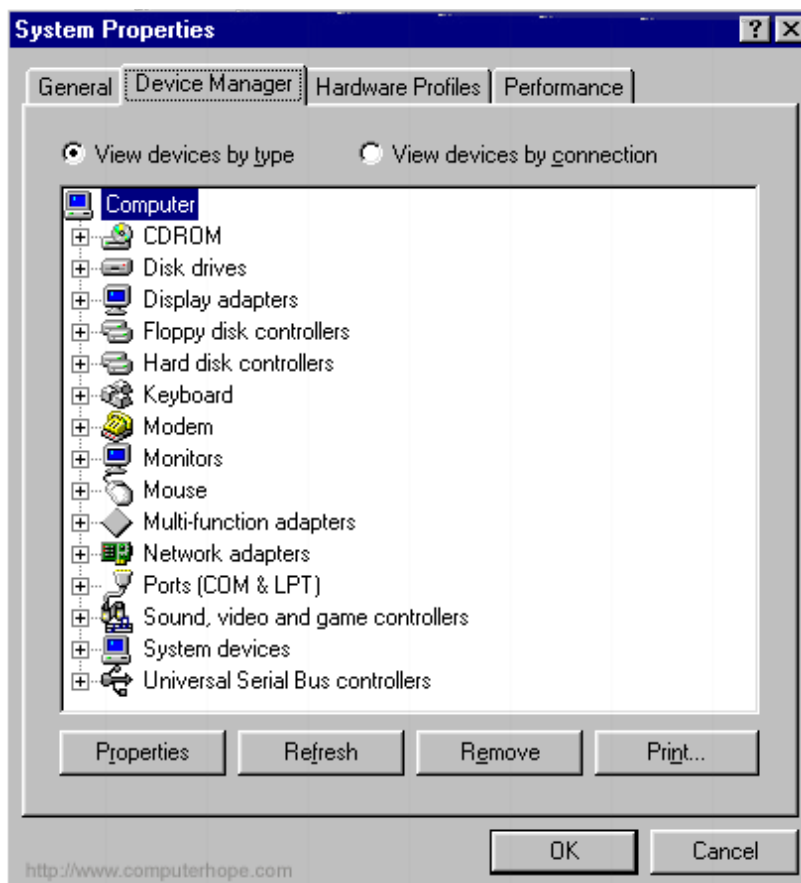3. Click the **Device Manager** tab and you should see something similar to the example below.

Fig 4.11: Opening device manager IN WINDOWS 95

Once in Device manager you can start identifying problems in Windows Device Manager.

4.4 Security and Privacy settings

As electronic device usage increases, so have dangers like viruses, malware and cyber criminals. Protecting your electronic devices is essential to prevent your financial and personal information from being stolen or compromised.

4.4.1 Common security threats.

- **No Passwords**. Many people rely on a simple finger swipe, or even no passcode, to protect their electronic device.

- **Malware.** Malware, or malicious software, is designed to gain access to sensitive information or systems. With a mobile device or tablet, malware can be picked up when downloading apps.

- **Out-of-date Software and Operating Systems**. When running your electronic device with an out-of-date software or operating system, you open your device up to hackers and viruses.

- **Lack of Firewalls**. Many mobile devices lack the firewalls necessary to limit internet connections. This allows potential hackers to access a device in wide-open network areas.

- **Viruses**. When downloading apps or documents to your electronic device, viruses can enter the system and damage a device or permit access to sensitive information.

4.4.2 Protecting computer devices

- **Add Security Software.** Basic, free security software (and more secure security "suite") products are available everywhere. Inventing in a good protection software will save you from future issues.

- **Check Firewalls.** A firewall is a software or hardware that examines information coming from the Internet, then either blocks it or allows it to pass. Check the settings on your device to ensure that your system has a built-in firewall.

- **Know Your Privacy Settings.** Review your privacy settings on all website you use frequently. Security settings change frequently so you need to ensure that you are fully protected.

- **Strengthen Your Passwords.** Lock whatever device you have with a hard-to-crack password. Don't use the same password on

- Every device. Use a free password checker to determine the strength of the password.

- **Email**. Never open an attachment from someone you do not know and be wary of opening attachments from someone you do know. If you were not expecting it, call your friend and check before you open.

- **Update your Software**. When there is a new update to your system, be sure to update. Do not wait!

Activity 4.4

What are the importance of security and privacy settings in electronic devices?

4.4.3 Antivirus

Anti-virus software is a program or set of programs that are designed to prevent, search for, detect, and remove software viruses, and other malicious software like worms, trojans, adware, and more.

Windows is the most virus-prone operating system (OS) out of the three major OSes. It has the most users and the weakest built-in security. Antivirus programs will defend your computer from malware that comes through email,　　ash drives, downloads, websites and more.

An anti-virus is critical for users to have installed and up-to-date because a computer without anti-virus software installed will be infected within minutes of connecting to the internet. The bombardment is constant, with anti-virus companies update their detection tools constantly to deal with the more than 60,000 new pieces of malware created daily.

Anti-virus software basic functions include:

Virus Detection – This is the primary function of antivirus software. To detect and remove computer viruses. This is typically done by scanning files on your computer and comparing data in the files to a database of known virus signatures. This database is updated regularly, often several times each day, to ensure that your antivirus program has the most up-to-date virus definitions to detect all known virus threats.

System Analysis - many antivirus programs also monitor your computer for signs that system components are not functioning correctly, which can be an indication that your system is infected even if a virus has not been detected. Upon recognizing system problems that are likely caused by a virus, the antivirus software can initiate a scan to detect the cause of the problem. If the scan detects a virus, the infected file will be quarantined, deleted, or otherwise treated.

Malware Removal - Some antivirus software also detects and removes malware and other harmful programs that may be installed on your computer. Separate malware scanners were needed in the past due to coding differences between virus programs and malware, resulting in computer users who just installed an antivirus becoming infected with malware and not knowing it. An increasing number of antivirus programs now include malware detection and removal to offer more complete protection for your computer.

File Quarantine - The ability to quarantine files without deleting them is an important feature of many antivirus programs because quarantines help protect your computer against false positives during virus scans. A false positive occurs when a program or file that is not infected is identified by your antivirus as a virus file and action is taken against it. If your antivirus is set up to quarantine files for later review, the detected file is cut off from system resources but is not deleted until you manually choose to delete it or a pre-set period of time has passed. If the file is safe you have the option of removing it from quarantine and protecting it from future detection.

Threat Identification - As new viruses and malware threats are released, antivirus programs can aid in their identification. If your antivirus has the ability to recognize potential threats that aren't in its virus definition database it may send a copy of the potential threat to its manufacturer for identification. This speeds up the process of new viruses being officially identified and added to virus definition fles, ensuring more complete protection not just for you but for others as well.

Online Security - Just as some antivirus software helps protect against malware and other threats, some programs also feature components that help in other ways to keep you safe online. Built-in intrusion detection, fraud monitoring, and

phishing recognition alert you if someone attempts to access your computer from a remote location or if a website attempts to redirect your browser or steal your personal information. Untrustworthy sites or pages with potentially harmful downloads may be blocked, protecting your computer by preventing the damaging action before the site can load.

Data Protection - Because there is still a risk of file corruption or other damage if a virus isn't detected immediately, some antivirus software offers online backups of vital files that can later be restored if the files become infected, corrupted, or otherwise damaged. This feature is typically available only with paid antivirus subscriptions; the subscription price helps cover the cost of hosting and the bandwidth involved in creating and restoring the backups

Setting up an anti-virus

1. **Acquire an antivirus program**. There are several popular free options available that do a good job of protecting the average user. These programs are updated frequently with new virus definitions that recognize the latest threats.

   If you frequently deal with files or websites that are virus-infected, you may want to opt for more powerful paid protection. Paid antivirus programs are typically available for a yearly subscription fee.

   When downloading free or paid antivirus programs, ensure that you are downloading from a trusted source. There are many programs out there that claim to be antivirus/antimalware but instead install malware themselves. Read reviews and download products from companies that have been around for a long time. Windows 10 and 8 have Windows Defender, which is a free anti- malware application provided by Microsoft. It's already built-in.

2. **Install the antivirus program.** Make sure that no other programs are running while you install the antivirus.in some cases you will most likely need to be connected to the internet to download additional files and updates. Some free antivirus programs come packaged with toolbars for your web browser.

   These can add protection but also change your search options and bog down older computers. You have the opportunity to opt out of these changes during the installation process.

3. **Update the program**. After the installation is complete, reboot your computer and update the program. The file that you downloaded is likely not the most up to date version, so you will need to connect to your antivirus program's servers and download the latest updates. Most antivirus programs allow you to right- click on the icon in the System Tray while it is running and click Update.

Most antivirus programs are set to automatically update. Double check the settings for your program to ensure that you are receiving the necessary updates

4. **Scan your computer.** Once you have the program installed and updated, it's time to scan your computer. This could take several hours, depending on the number of files being scanned and your computer's speed.

4.4.4 Firewall

A firewall is a network security system, either hardware- or software- based, that uses rules to control incoming and outgoing network traffic.

A firewall acts as a barrier between a trusted network and an untrusted network. A firewall controls access to the resources of a network through a positive control model. This means that the only traffic allowed onto the network is defined in the firewall policy; all other traffic is denied.

Setting up a Firewall in Windows 7

1. Set up system and security settings

1. From the Start menu, click **Control Panel**, then click **System and Security**

2. Under Windows Firewall, select either **Check firewall status** to determine whether the firewall is turned on or off, or **Allow a program through Windows Firewall** to allow a blocked program through the firewall

Fig 4.12. : Setting up security systems
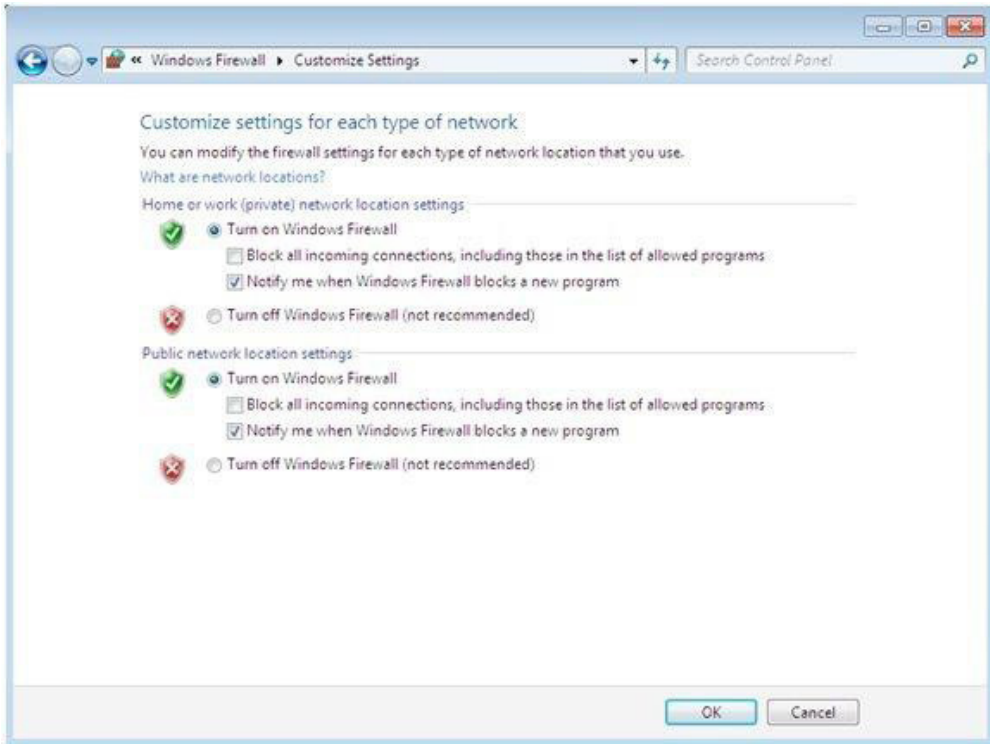
2. Select program features

1. Click **Turn Windows Firewall on or off** from the left side menu

2. Configure the settings for your home/work (private) or public network

3. Click **OK** to save your changes

Fig 4.13   : Selecting program features

3. Choose firewall settings for different network location types

1. Turn on Windows Firewall for each network location you use - Home or work (private) or Public

- Click What are network locations? for more information on network types

- Domain network locations are controlled by your network administrator and can't be selected or changed

2. Select Turn on Windows Firewall under the applicable network location type (in image below, both locations are selected)

3. Select Notify me when Windows Firewall blocks a new program for each network type, if the box is not already checked

4. Click OK to save your changes

Fig 4.14: Selecting program features.

4.4.5 Spamware

Electronic spamming is the use of electronic messaging systems to send an unsolicited message called spam, especially advertising, as well as sending messages repeatedly on the same site.

Spamware is a software utility designed specifically by spammers for spamming. Spamware enables a user to search, sort and compile a list of email addresses and provides an automated email broadcasting solution. This can be used to send spam or unsolicited emails to unsuspecting recipients.

Not all software that sends bulk email is spamware, as email listserver software can be used for legitimate purposes, rather than spam.

Most antivirus software have an in built anti-spamware.

Activity 4.5

1. Demonstrate how to set up firewall software in a computer?
2. Discuss the importance of a security software in a computer.

Revision Exercise

1. What is access control?
2. What are the ways of creating new admin account?
3. How do you create a new admin account via control panel
4. What is the importance of having a password protected account?
5. What is a NTFS?
6. How do you test if a drive is NTFS formatted?
7. What are device settings in an electronic device?

ACCESS CONTROL

ACAMS (Access Control and Alarm Monitoring System): An electronic system or network of integrated systems designed to control physical access and monitor events such as intrusion.

ACU (Access Control Unit): this is an electronic control panel to which readers and alarm devices are wired. The ACU can be a standalone unit or wired to a CPU.

Biometrics: A family of products that electronically scans or reads unique traits of the human body for verification or identification purposes. Biometrics can utilize unique patterns of the iris, retina, hand geometry, or fingerprint.

Biometric Reader: A device that stores enrolled templates of a unique human trait such as a fingerprint, hand geometry, voice, or retina pattern and looks for a match against a live presentation, to grant access to a secure area. Used as an alternate to card readers.

Dual Technology: Utilization of two different technologies in one device to increase reliability and functionality. Dual technology motion sensors, for example, use both passive infrared and microwave technology in order to reduce false alarms and increase detection.

Keypad: A device that provides a localized user interface to control a security system or subsystem. Typically includes a numerical 10-key touchpad to allow entering of passcodes and commands.

Magnetic Stripe: The black or brown stripe that you see on your credit card, airline ticket or access card. The stripe is made up of tiny magnetic particles in a resin. The magnetic property of the stripe allows it to be encoded with a number of bits. In access control this data would include a facility code and card number.

Smart Card: A card containing a microchip that can store significantly larger amounts of data than a standard magstripe or proximity card. Bank account details, Social Security Numbers and employee identification numbers are examples of data that can be stored on a Smart Card.

Wiegand: this is a communication protocol widely accepted as an industry standard in the manufacturing of access control equipment. Wiegand data is typically the protocol used between the reader and the host panel.

South Sudan

Secondary
ICT
Information Communication Technology
Student's Book

1

Secondary ICT has been written and developed by Ministry of General Education and Instruction, Government of South Sudan in conjunction with Subjects experts. This course book provides a fun and practical approach to the subject of Information Communication Technology, and at the same time imparting life long skills to the pupils.

The book comprehensively covers the Secondary **1** syllabus as developed by **Ministry of General Education and Instruction.**

Each year comprises of a Student's Book and a Teacher's Guide.

The Student's Book provides:
- Full coverage of the national syllabus.
- A strong grounding in the basics of mathematics.
- Clear presentation and explanation of learning points.
- A wide variety of practice exercises, often showing how mathematics can be applied to real-life situations.
- It provides opportunities for collaboration through group work activities.
- Stimulating illustrations.

All the courses in this primary series were developed by the Ministry of General Education and Instruction, Republic of South Sudan. The books have been designed to meet the primary school syllabus, and at the same time equiping the pupils with skills to fit in the modern day global society.