# COMMON TYPES OF APPLICATION SOFTWARE

*(1) Word Processing software\*\*\**
*(2) Spread sheet software\*\*\**
*(3) Database software\*\*\**
*(4) Presentation software\*\*\**
(5) Software suit
(6) Computer aided design software
(7) Desktop publishing software
(8) Project management software
(9) Personal information managers
(10) Accounting software
(11) Pointing and Image editing software
(12) Video and Audio editing software
(13) Multimedia authorizing software
*(14) Web page authoring software\*\*\**
(15) Personal finance software
(16) Educational Reference software
(17) Entertainment software
(18) Communications software

*\*\*\* are the apps we study at O'level*

## GENERAL CHARACTERSISTICS OF APPLICATION PACKAGES

(a) They are targeted to a wide range of users with a popular and common objective.
(b) They are mostly user friendly. Many of them have graphic user interface in windows environment which makes it easy to learn and use.
(c) They are designed for power and flexibility. This ensures that most of the capabilities of the packages is addressed irrespective of the hardware.
(d) They are machine independent. The packages are designed to work on a range of computer systems and data can be transferred form one computer to another cheaply.

**NB:**
1. Different programs give different names to their default files and folders. For instance;

| | | |
|---|---|---|
| Word processors | = | Document |
| Spreadsheets | = | Workbook |
| Presentation software | = | A Presentation |
| Database Management systems | = | Database |
| Desktop Publishing Software | = | Publication |
| Accounting software | = | Company |

**Etc.**

**2.** Some software apps are installed individually, while others are installed as a collection of several apps at a go. Softwares installed as a single package at a go are known as **"Suits" or "Software Suits"**

## Software Suit

A software suit is a collection of individual application software packages sold as a single package. A software suit usually includes application software; a word processor, a spreadsheet software, a database software and a presentation software.

**Popular software suits include;**

▪ Microsoft office

- Lotus smart suit
- Corel WordPerfect suit

**Advantages of Software suits**

(a) A software suit normally costs significantly less than purchasing each of the application separately.
(b) Ease of use because applications within a suit usually use a similar interface and share common features

# 1. WORD PROCESSING SOFTWARE

Word processing software also known as electronic word processors are electronic applications used to create, edit, format and print documents that contains text and graphics.

**Creating a document** involves entering text or numbers, inserting graphics and performing other tasks using an input device such as a keyboard or a mouse.

**Editing** Is the process of making corrections to the existing content of the document. Editing is more or less proof reading and document. The most common document proof reading or editing features include:
- Autocorrect
- Thesaurus: A feature that suggests other words with similar meaning to the selected word. While synonyms are the words with similar meaning to the selected word.
- Auto complete
- Spelling and grammar checker.
- Inserting
- Deleting
- Cutting, copying, pasting, e.t.c..

**Formatting** This involves changing the appearance of a document. Different levels of formatting include; character formatting, paragraph formatting, section formatting, document formatting e.t.c.
Formatting can be;
Page formatting: Done through;
- Page orientation
- Margin settings
- Headers and footers
- Column settings
- Page size settings
- Page breaks
- Page layouts

Text and paragraph formatting: Done through;
- Bolding
- Italizing
- Change colour
- Line spacing

**Undo** and **redo** allows actions that have been performed to be reversed such that if some text was accidentally deleted, then the action can be undone.

**Saving** is the process of copying a document from random access memory (RAM) to a more permanent storage medium, like hard disk, flash, CD or memory card. Any document that has been saved exists as a file with a name. Saving has got two key options. That is;

**Save:** This saving option only saves changes made on the document.

**Save as:** This option brings back the "*save as*" dialogue box where the user can save changes made on a document, change document name and location.

**Clip Art gallery** allows a user to insert drawing s, diagrams and photographs into a document.

**Printing:** Is the process of turning a soft copy into a hard copy. A user can choose to print a document either in **Portrait** (vertical) or **Landscape** (horizontal) orientation.

Printing multiple copies: Producing one page many times.

Printing multiple pages: Producing more than one page of the same document.

**Footer:** This is any text or graphics that appears in the bottom margin of a page.

Header: Is any text or graphics that appears in the top margin of a page.

**Footnote:** Is a referencing feature at the bottom of a page giving more or further information about something mentioned in the content on that page.

**Endnote:** Is a referencing feature at the end of a document giving more or further information about something mentioned in the content of that document.

**Bibliography:** Is a list of all the sources of information cited in the document

**Caption:** Is a descriptive line of text that appears below an object to describe it.

**Citation:** A *citation* is a reference to a published or unpublished source of information in a document.

**Index:** An index lists the terms and topics that are discussed in a document, along with the pages that they appear on.

**Page break:** A point at which one page ends and another begins

Section break: Is a mark inserted into a document to show the end of a section


**Examples of word processing documents include,**
- Letters
- Memos
- Reports
- Mailing labels and newsletters.

Many word processing software are also capable of creating web pages.

## POPULAR FEATURES OF WORD PROCESSING SOFTWARE

(a) **Word wrap**. This is a word processor feature that automatically take the cursor to the next line the moment it touches the right hand margin.

(b) **Replace**. This allows the user to substitute existing characters, words or phrases with new ones.

(c) **Spell checker**. This allows a user to check the spelling of a whole document at one time or to check and even correct the spelling of individual words as they are typed (i.e auto correct)

(d) **Grammar checker**. Reports grammatical errors and suggests way to correct them.

(e) **Thesaurus.** This suggests alternative words with the same meaning (synonyms) for use in the document.

(f) **Mail merge.** This is a word processor feature that allows users to create documents for different recipients without retyping them.

(g) **Automatic page numbering** numbers the pages automatically in a document

(h) **Tables** allow the user to organize information into rows and columns.

(i) **Multi-columns**. This arranges text in two or more columns that look like or similar to newspaper columns or magazines.

(j) **Mathematical formulae typesetting**. This allows a user to typeset complex mathematical formulae with in the program.

**Popular word processors include;**
- Microsoft Office word
- Lotus AmiPro
- Lotus WordPro
- Corel WordStar
- WordPerfect
- K Word
- Word pad

## ADVANTAGES OF WORD PROCESSING OVER ORDINARY TYPEWRITTER

(a) Easy and fast to make changes to the document.
(b) Has many features to create documents that look professional and visually appealing.
(c) Documents can be previewed before being printed.
(d) Documents can e saved for future use for editing.
(e) Convenient to create and for letters and mailing labels.

## 2. SPREAD SHEET SOFTWARE

Spreadsheet software are applications that organize data in rows and columns. The power of electronic spreadsheets is derived from their ability to manipulate data arithmetically.

The mostly used data management tools in electronic spreadsheets are;
- Filters
- Sorters
- Forms
- Formulas: A formula is a user predefined mathematical expression that works with the spreadsheet engine to return some correct value or output.
- Function: **A function is an inbuilt predefined formula that returns some values with a given procedure.**
- Graphs
- Subtotals

**Applications of electronic spreadsheets**
- Statistics analysis
- Accounting
- Forecasting
- Invoices produced and statements compiled.
- Compilation and analyzing of data by traders, Researchers, and other professionals like teachers
- Assessment of things – grading and positioning of learners and items
- Recording or tabulation of things.
- Etc.

A spreadsheet document is often called a **workbook.** In each *workbook* there are **worksheets** or several *spreadsheets*.

A spreadsheet is an electronic grid of rows and columns. When a column intersects or meets a row they form a cell. It is in these cells that data is held.

Each cell is uniquely identified by its column letter, and row number. This unique identifier of a cell is called a *Cell Address* or *Cell Reference* or *Cell Name*.
A cell address is a location identity of the intersection between a row and a column. The cell content is as good as its cell address.
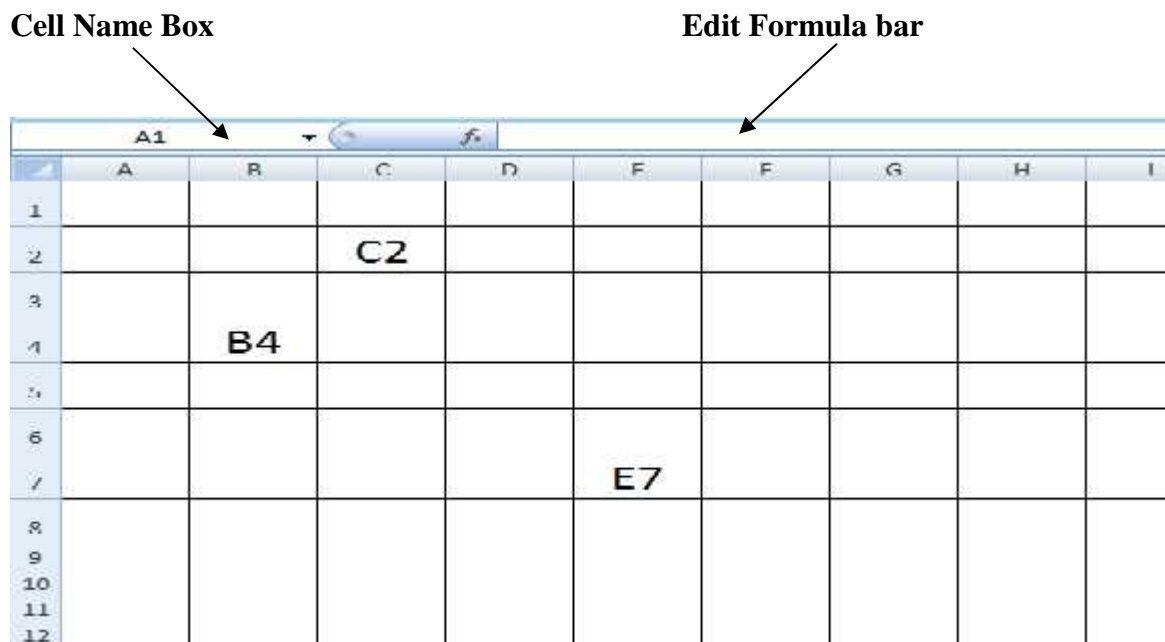
**Cell Name Box**                                                    **Edit Formula bar**



Table: Sample spreadsheet.

**Why do you think those cells are named B4, C2, and E7??**
It is called B4 because it is in column B, row 4, and so on.
A cell address, reference or cell name can take any of the following forms once used in a formula or function;

**Relative cell reference**: This is cell reference which keeps on changing whenever the formula containing it is pasted to another cell. It is usually without dollar signs. E.g. A1, C4, D1, etc.

**Absolute cell reference**: This is cell reference which does not change whenever the formula containing it is pasted to another cell. It is usually fixed with dollar signs. E.g. $A$1, $C$4, $D$1, etc.

**Mixed cell reference**: This is an address or reference which combines both features of Relative cell referencing, and absolute cell referencing. Example $A1. A is absolute while 1 is relative.

A cell can be empty or contain some data. Data in an electronic spreadsheet can be in classified as;
Value: Relates to numeric data which can be subjected to arithmetic operations.

**Label:** Refers to text data which cannot be subjected to arithmetic operations. Whenever a Label appears in a function or formula it must be clearly shown that it is a label by putting it in inverted quotation marks

**Formula**: Formulas are user defined mathematical expression that work with the spreadsheet engine to return some correct value or output. It usually starts with an equal sign (=)

**Function**: **Functions are inbuilt predefined formulas that return some values with a given procedure.**

# Key principles of working with electronic spreadsheets

- Data must be well organized and classified.

- Start with equal signs with all functions and formulas

- Whenever working with logical functions labels must be put in inverted quotation marks.

- Name of the function must be well spelt

- Follow the syntax or procedure well

- Be positive and start small.

# Common spreadsheet error messages where the principles are not well followed

| Error | Meaning |
|---|---|
| #DIV/0! | Trying to divide by 0 |
| #N/A! | A formula or a function inside a formula cannot find the referenced data |
| #NAME? | Text in the formula is not recognized<br>Wrong function name |
| #NULL! | A space was used in formulas that reference multiple ranges; a comma separates range references |
| #NUM! | A formula has invalid numeric data for the type of operation |
| #REF! | A reference is invalid |
| #VALUE! | The wrong type of operand or function argument is used |

## BASIC MATHEMATICAL OPERATIONS USED IN SPREAD SHEETS INCLUDE

| SYMBOL | DESCRIPTION | EXAMPLE |
|---|---|---|
| ( ) | Parentheses | =B2*(C4+D5) |
| * | Multiplication | =B2*C4 |
| / | Division | =B2/C10 |
| + | Addition | =(B2+C4) |
| - | Subtraction | =(B2-C4) |
| % | Percentage | =C5*60% |
| ^ | Exponential | =C5^2 |

Spreadsheet programs normally have enormous functions as summarized in the table below;

| | | |
|---|---|---|
| **Mathematical** | ABS (number ) | Returns the absolute value of a number |
| | INT(number ) | Round to the nearest integer |
| | LN(number ) | Calculate the natural logarithm of a number |
| | LOG(number base) | Calculates logarithm of a no. to a specified base |
| | ROUND(number, no. of digits) | Round to a specifies number of digits |
| | SQRT(number ) | Square root of a number |
| | SUM(range) | Calculates the total of range of numbers. |
| **Statistical** | AVERAGE(range) | Calculate the average value |
| | COUNT(range) | Counts how many cells in the range have entries |
| | MAX(range) | Returns the maximum value |
| | MIN(range) | Returns the minimum value |
| | STDEV(range) | Calculate the standard deviation |
| **Logical** | IF, COUNTIF, SUMIF. E.g. | **IF(logical test, value, if true, value if false)** <br> Performs a test and returns one value if the test of the result is true and another value if the result is false |
| **Financial** | FV(rate, no. of periods, payment) | Calculate the future value of investment. |
| | NPV (rate, range) | Calculate the net present value of investment. |
| | PMT (rate, no. of periods, present value | Calculates the periodic payment for annuity. |
| | PV(rate, no. of periods, payment | Calculates the present value of investment |
| | RATE(no. of periods, payment, present value | Calculates the periodic interest rate of an annuity. |
| **Date & Time** | DATE | Returns the current date |
| | NOW | Returns the current date and time |
| | TIME | Returns the current time |

## Popular features of spread sheets

(a) **Self Adjusting columns**. This allows the user ability to adjust columns
(b) **Date sorting**. Allows the user ability to sort data accordingly e.g descending , ascending
(c) **Printing**. Allows the user to print the entire worksheet, portions of a worksheet and several worksheets.
(d) **Charting**. Allows the user to display data in graphical rather than a numerical form. Popular chart types include; line charts, bar charts, pie charts e.t.c ..

### Popular spread sheet software

- Microsoft Excel
- Lotus 1-2-3
- Corel Quattro Pro
- Visicalc
- Smart Suite
- Open office Calc
- Super Calc

**ADVANTAGES OF SPREADSHEET SOFTWARE**

(a) Easy to make changes and corrections to data on the worksheet.
(b) The rest of the worksheet is recalculated whenever data on the worksheet changes.
(c) Operation is very fast with the help of built-in functions and macros.
(d) Calculation is always accurate, provided that data and formulae entered are correct.
(e) Easy to create different kinds of charts or to change chart types.
(f) Information on charts is updated automatically whenever related data on the worksheet changes.
(g) Electronic spreadsheets are much longer than manual worksheets. Manual worksheets are limited by size.
(h) Electronic spread sheets can perform mathematical, statistical and financial calculations quickly and accurately.
(i) They can be stored and retrieved for repeated use for example on diskettes, discs, e.t.c rather than searching through endless filing cabinets.

## 3. DATABASE MANAGEMENT SOFTWARE

*A* **database management system** *(DBMS) is a* **software** *package designed to define, manipulate, retrieve and manage* **data** *in a* **database.** *A DBMS generally manipulates the* **data** *itself, the* **data** *format, field names, record structure and file structure.*
A database is a collection of data organized in a way that allows access, retrieval and use of the data.

## Types of databases

a) **Manual databases:** Common manual or papers database include;

- Telephone books
- Dictionaries
- Recipe books
- Television guides

b) **Electronic databases:** These use electronic means in their operations. **Examples of computerized databases include;**

- Electronic flight information
- Electronic phone inquiry system
- Electronic database system in public libraries.

c) **A Flat file database:** This is a database with only one table.

d) **A Relational Database:** This is a database with more than one table. In a relational database all the tables in the database are related.

Database software or a Database Management System (DBMS) allows a user to create, access and manage a database.

Most PC databases consist of a collection of tables organized in rows and columns.

The data type of a field specifies the type of data that the field can contain. Common data types include;
(a) **Text data type** = **Data which cannot be subjected to arithmetic operations. It may hold letters, numbers, special characters, or a combination of all.**.

(b) **Numeric data type** = **This is data in form of general values subjectible to arithmetic operations but without a specific unit of measurement.**

(c) **Currency type** = Any form of numeric values assigned with some currency symbol. They can be in Dollars, Pounds, Francs, Shillings, Yens, Rands, etc.

(d) **Date data type** = Any form of data in date or time format. For example date of birth or arrival or purchase, time of arrival, etc.

(e) **Memo data type** = Any form of data that runs in a couple or group of words, phrase or phrases.

(f) **Boolean data type or logical data = It is a form of data entry restricted to two (a couple of) options.** For instance; it is True or False, On or Off, Male or Female, Yes or No .

(g) **Ole object** (Object linking and embedding) = Data in form of objects, or graphical images. Filed capacity is up to a gigabyte or limited by available disk space.


**LOOKUP WIZARD**
This is a facility that creates a field or look-up column with a checklist of options from where the data entrant chooses from.

**Validation** This is the process of ensuring that data being entered in the database conforms to specific or predefined guidelines.
**Validation rule:** This is an expression that limits the values to be entered in a given field.
**Validation text:** This is a predetermined error message (warning) that comes or pops up when the validation rule is violated.

## MANIPULATION OF DATA IN DATABASES
**In electronic databases data is manipulated in four main database objects. That is;**

(a) **For any database to be operational there must be a table.**
  **A table is literally a vertical line of boxes. In an electronic Database Management System (DMS) is an electronic grid of fields (known as Columns) and Records (known as Rows).**

**Tables:** *A table is the primary database object for holding data made up of fields and records.* A table can contain data about a particular subject, such as employees or products.

**A record** or a row is a collection information about a given item (it can be a person, a product, or an event) in a table. Each *record* in a table contains information about one item.
A record is a meaningful and consistent way to combine information about something.
In the table below, there are **three records**. That is, **Company A**, **Company B**, and **Company C** records,

**A field** or column is a specific piece of information within a record. A field is a single item of information — an item type that appears in every record. In the table below, there are three fields. That is, **Company**, **First Name**, and **Last Name** fields.



**Table: Sample database table**

(b) **Forms.** *A form is the primary database object for populating or entering, and viewing data in a table record by record.* This means that every professional database table must have its corresponding form.

(c) **Queries**. A query is a database object used to extract or get information of interest, and, manipulate data from other database objects.
Queries use wild card characters and functions to extract or manipulate data from other database objects.
This means that one can;
- Query a table.
- Query a form
- Query a query
- Query a report.

(d) **Reports**. Are used to produce various printed outputs or summaries of data preferably from queries in a database.
A report is a formatted result of **database** queries. Using reports, data in a specific category can be produced for consumption.

(e) **Macros:** These are objects created to allow users to automate common tasks, and add functionality to controls or objects.

(f) **Modules:** A **module** is a collection of declarations, statements, and procedures that are stored together as a unit to automate specific functions. **Modules** are very similar to Macros since they are objects that add functionality to the **database**.

### What a good database should be?
A DBMS should make efficient use of computer resources, be fast, interface smoothly with existing facilities, be acceptable, provide easy access to authorized users, preserve data integrity and ensure privacy of data.

### ADVANTAGES OF DATA BASE MANAGEMENT SYSTEM

(a) **Reduction of data redundancy**. Storing most of data in one place means less duplication and less required place.

(b) **Enhancement of data integrity**. Because data are centralized, fewer updating errors occur and greater accuracy can be maintained.

(c) **Ensured data independence**. Data are entered, stored, modified and accessed by methods that are not affected by application programs. Also changes made to data structures usually do not require changes in programs that access the database.

(d) **Improvement of access to data**. Data systems allow users to query that database directly without necessarily using an application program.

(e) **Facilities of data sharing and integration**. Database systems offers users the ability to combine or to cross-reference data in many different ways.

(f) **Centralization of security**. It is easier to limit access to information if it is grouped together instead of being kept in several scattered files. Many databases must be protected and kept private.

(g) **Reduction of costs**. Data entry, storage and development of new application programs are all made more economical. By eliminating the duplication of data, many organizations can realize substantial savings.

**DISADVANATAGES OF DATABASE MAGAMENT SYSTEM**

(a) **Complexity**.  Database systems include sophisticated software packages that may require special hardware. They are difficult and time consuming to develop.
(b) **Initial expense**. Primary, because of their complexity and efficiency, database systems can be expensive to set up.
(c) **Vulnerability**.  Data in  a database may be more susceptible to sabotage, theft or destruction. Although in one sense, databases are protected because of centralized security measures, in other senses, they are vulnerable because all eggs are in one basket.

# 4. PRESENTATION SOFTWARE

Presentation software is used to create presentations, which can communicate ideas and other information to a group of audience.  The presentation can be viewed as a **slide show** which usually displays on a large monitor or on a projection screen.

### Popular presentation software
- Microsoft power point
- Corel presentation
- Lotus freelance Graphics

### Features of presentation software
- Several "Auto" features that makes it easier for you to perform your work e.g auto correct to correct typing errors, auto clip art provide clip art suggestions.
- Style checker.
- Ability to present on screen presentation in colour.
- Using the new animation effects tool bar.
- Presentation conferencing
- Meeting minder

**Advantages of Presentation software**

(a) Presentation software usually provides a wide variety of presentation formats and lay outs for the slides.
(b) Multimedia components such as slip art images, video clips and audio clips can be incorporated into the slides.
(c) The timing of slides can be set so that the presentation automatically displays the next slide after a predetermined period of time.
(d)  Special transition effects can be applied between each slide.
(e) The presentation can normally be viewed and printed in different formats e.g outline format, audience handout format and notes page format.

# 6. COMPUTER AIDED DESIGN SOFTWARE

**Computer Aided Design Software** (**CAD)** is mainly designed for creating engineering, architectural and scientific drawings.  Popular CAD software includes;
- Auto desk
- Auto CAD and
- Microsoft Visio technical

**7. DESKTOP PUBLISHING SOFTWARE (DTP)**

Desktop Publishing software (DTP) is used to design and produce complicated documents that contain text, graphics and brilliant colours.
DTP software is ideal for the production of high quality colour documents such as;
- **Certificates**
- **Newsletters**
- **Catalogues**
- **Textbooks**
- **Posters**
- **Business cards**
- **Letter heads**
- **Magazines**
- **Brochures**
- **Banners**
- **Labels**
- **Fliers**
- **Annual reports.**

## Popular DTP software include
- Microsoft Publisher
- Adobe page maker
- Adobe in Design
- Quark Xpress
- Broderbund Print Shop pro.

DTP combines word processing and graphics to produce high quality documents with a laser printer. Components of a desktop publishing systems include; a powerful microcomputer, graphics display, mouse, Laser printer, Scanner, Desktop publishing software such as page maker, Ms publisher, Print shop e.tc.

## Feature of desktop Publishing software
In built templates providing already made layouts for use

## Qualities of a good Publisher
- **Communication:** a designer's job is to communicate a client or customer's story, brand or idea. Hence need for good communication and negotiation skills, charming, etc.
- Openness
- Problem solving
- Feedback
- Ability to take criticism
- Curiosity
- Passion and drive
- Self-doubt
- Patience

**Key Design Considerations**
- Dimensions

- Text and objects arrangements
- Use of space
- Color selection
- Font size
- Creativity
- Production /finishing /printing
- Basic and relevant information on the design

## Key concepts in desktop publishing

**Cropping:** Is the process of cutting out or trimming unwanted parts of an image or publication.

**Crop-marks:** They are marks or guides through which publications are trimmed or cut to avoid wastage of printing materials

**Master page**

**Plotter**: An output device for producing large hardcopies for architectural work, maps, adverts for Billboards, etc.

**Horizontal gap:** It is a gap that exist between two adjacent horizontal cards

**Vertical gap:** It is a gap that exist between two adjacent vertical cards

**Publication:** A product design of DTP software

**Kerning:** It is the adjustment of space between two characters to create the appearance of even spacing.

**Tracking:** Is the adjustment of letter spacing for words, phrases, and extended blocks of text.

**Page layout**: The structure in which components to be printed are laid out on a page.

## 8. MULTIMEDIA AUTHORING SOFTWARE

This combines text, graphics, animation audio and video into an application. Multimedia is widely used in video games, electronic newspapers and magazines, electronic books and references, simulations, virtual reality and computer based training.

**VIRTUAL REALITY (VR)** is the use of a computer to create an artificial environment that appears and feels like a real environment.  Virtual reality software users usually have to wear specialized headgear, body suits and gloves to enhance the experience of the artificial environment.

**COMPUTER BASED TRAINING (CBT).** This allows students to learn and complete exercises with instructional software.  Interactive CBT software often called course ware, is usually available on CD ROMS, DVD ROM or shared over a network.  CBT that employs the technologies of the Internet and World Wide Web is called **Web based training (WBT)**

### Advantages of Computer Based Training

(a) Students can learn at anytime and anywhere provided a computer system is available.
(b)  Students can receive instant feedback for their actions.
(c) Students can learn at their own pace.
(d) There are rich educational resources on CD ROMS and the internet.

(e) Teachers can present subject matter and explain abstract concepts more clearly with multimedia.
(f) Teachers can show experiments that are difficult to perform or dangerous in nature through simulations software.
(g) Advanced instructions can be given to students in areas where the teacher may not be qualified.

**Disadvantages of Using IT in Teaching and learning**

(a) Face to face interaction between students and teachers may be reduced.
(b)  Students can only follow what the CAL packages are predefined to offer.
(c) Initial investment cost of this project is not affordable by many schools.
(d) It benefits schools which have trained perfectly in English since the CD's come in American English.
(e) To run this kind of project, there has to be power.

## 9. COMMUNICATIONS SOFTWARE

This consists of programs that help to establish a connection to another computer or network and mange the transmission and information between computers and other devices.

**Software related to communications includes;**
- E-mail software
- Web browser
- Newsreader
- Instant messenger
- Video conferencing