Poultry Production

NTQF Level -II

Learning Guide -10

Unit of Competence: - Operate Personal Computer

Module Title: - Operating Personal Computer

LG Code: AGR PLP2 M04 LO1-LG-10

TTLM Code: AGR PLP2TTLM 1219v1

LO 1: Identify the functions of PC hardware components

Instruction Sheet	Learning Guide #-10

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics –

- ❖ Identifying hardware components in terms of device type and functions
- ❖ Identifying the interaction of components in terms of the flow of data between them

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, **you will be able to –**

- ❖ Identify hardware components in terms of device type and functions
- ❖ Identify the interaction of components in terms of the flow of data between them

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described in number 3 to 20.
3. Read the information written in the “Information Sheets 1”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
4. Accomplish the “Self-check 1” **in page -.**
5. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-check 1).
6. If you earned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #1.
7. Submit your accomplished Self-check. This will form part of your training portfolio.

Information Sheet-1	Identifying hardware components

The definition of a **personal computer** is a small **computer** with a microprocessor, designed for use by an individual. An **example** of **personal computers** is desktop **computers** used in homes, schools and small businesses.

Basic Personal Computer System

The computer system is basically categorized in to two components.

- The hardware component
- The software component

Computer hardware is made up of the parts of the computer that you can touch: Its ***physical components***. When you look at a computer and all the ***peripheral devices*** that are attached to it, you can see examples of hardware such as:

- Monitor
- keyboard
- mouse
- printer
- speakers
- scanner

Fig1: monitor

fig 2: speaker

The computer hardware falls in to four categories;

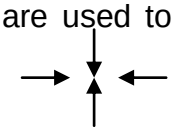
- Input devices
- Processor
- Output devices
- Secondary (Auxiliary) storage devices

1. **Input Devices** – are devices that are used to convey (provided) raw data input in to the CPU. Some examples of the input devices are;

   Input devices are components that you use to feed information to the computer system. Input devices are hardware items such as; Keyboard, Mouse, Scanner, Microphone, Joysticks, etc.

Fig 3: Examples of Input devices

I. **Keyboard** – Are the most common and widely used input devices. It is used to enter information in to our PC and consists of 101/102/105 keys. These keys can be divided in to five sections. **Sections of the keyboard:-**

1. ***Functional Keys*** – They perform different tasks based on the types software being used. E.g.F1, F2..F12
2. ***Typing Keys*** – A key work just like conventional typewriter. It contains the letter of the alphabet and frequently used symbols such as $, %, &, @, #…..
3. ***Numeric Keys*** – These keys that let you to enter numeric data more easily when you are working on number. To use this section of the keyboard make sure that the **Num lock key** is on.
4. ***Navigation keys*** /curser mov't key– Keys that are used to navigate through your document. E.g. Arrow keys (
   Page up, Page Down, Home and end
5. ***Computer key*** – These keys are not found on the typewriter. They perform different tasks when used alone or in conjunction with other keys. E.g. ESC, Alt, Ctrl, Delete, Insert

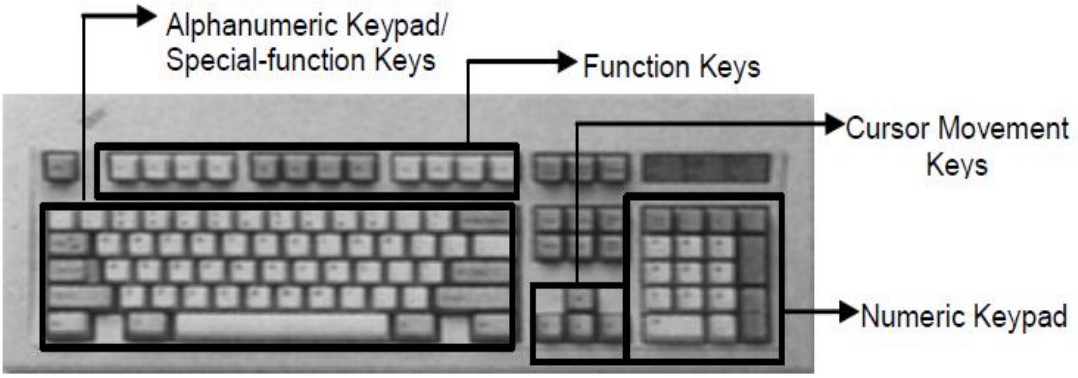


Fig 4. keyboard

II. **Mouse** – Is appointing device that is used to move the insertion point around the screen. On the underside of the mouse is a boll that rotates, causing a corresponding movement of a pointer (an arrow) on the display screen.

Fig 5: Mouse

III. **Image Scanner** – Is an input device that is used to input images like Drawings, Charts, Graphs, and Photographs in to the computer.

A scanner is a device that lets you take a copy of a document or image. You might want to copy a photo, a picture from a book, or from any document, etc.

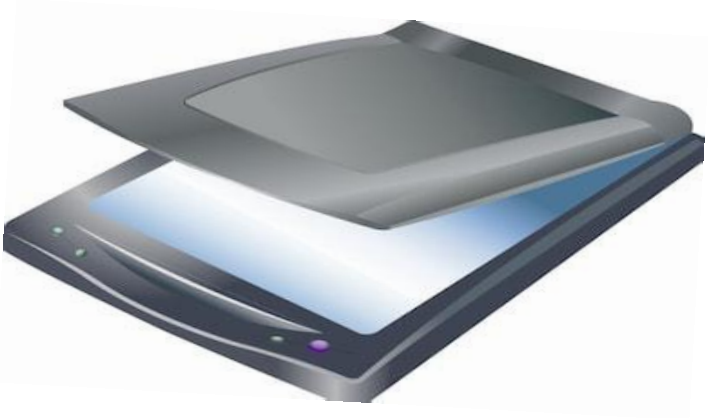


Fig 6: scanner

IV. **Disk Drives** – These are normally storage devices, however, information or data that is stored in disk drive can be in put to the computer for further processing.

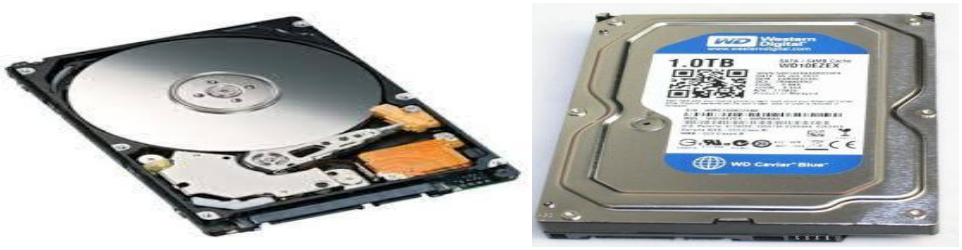


Fig 7: Disk driver

V. **Microphones** – Microphones are also used to input data to the computer when the computer is a multimedia system. A microphone is attached to a computer by a cable that can transmit sound.

Fig 8: microphones

2. The Processor (CPU) or Microprocessor

- CPU is the center for your computer processing activity.
- It processes the information you entered in to the computer and carry out your requests.
- It is a brain or/and the heart of a computer.

Fig 9: CPU (processor)

- The central processing unit (CPU) consists of three major parts.

  i. Controlling unit
  ii. The arithmetic and logic unit.
  iii. The memory.

i. **Controlling unit (CU)** – It is responsible for controlling the overall operations of the system. All computer activities occur based on the instruction that the controlling unit receives from user.

ii. **The Arithmetic and Logic unit** –

- It performs a task like calculation, comparison…based on the given instruction.
- Arithmetic operations include operations like addition, subtraction, multiplication and division. For example – Calculating of ***Total Price = Qty*Unit price***
- Logical operations include operations like comparison of one element with other. For example -Comparison of student point to give a rank.

  -Grouping of students by their sex

  -Arranging numbers in ascending or descending order.

iii. Memory – A computer need a place that store data this place is called Memory (main or internal memory). It is a means of storage that is found with in the computer itself and that is why it is called internal memory.

There are two types of main memory;

- RAM (Random-Access Memory) and
- ROM (Read- Only Memory)

1. **RAM (Random-Access Memory)** – It is the temporary workspace of a computer. The word **"random-access"** represents that data or information can be written in to or read from any internal memory address at any time. If the computer is turned off or electric power is off, all the information in the RAM will be lost (erased). In other words RAM is **volatile, changeable and powerdependent**.
2. **ROM (Read-Only Memory)** – It is a permanent memory that contain programs and instructions permanently.

- ROM usually contains information on how to start the computer and even instructions to the entire operating systems.
- The contents of ROM memory are loaded by the manufacturer during the last stage of the computer.

- ❖ It is not volatile (the content in the ROM does not change when the computer turn off).

3. Output Devices

Output devices are the devices that are used to display the processed information to the user either in softcopy or hardcopy.

Output devices are components that retrieve information from the computer. Output devices are hardware items such as; Monitors Printers, Speakers, Terminals, Facsimile, etc. **Some of input and output devices**

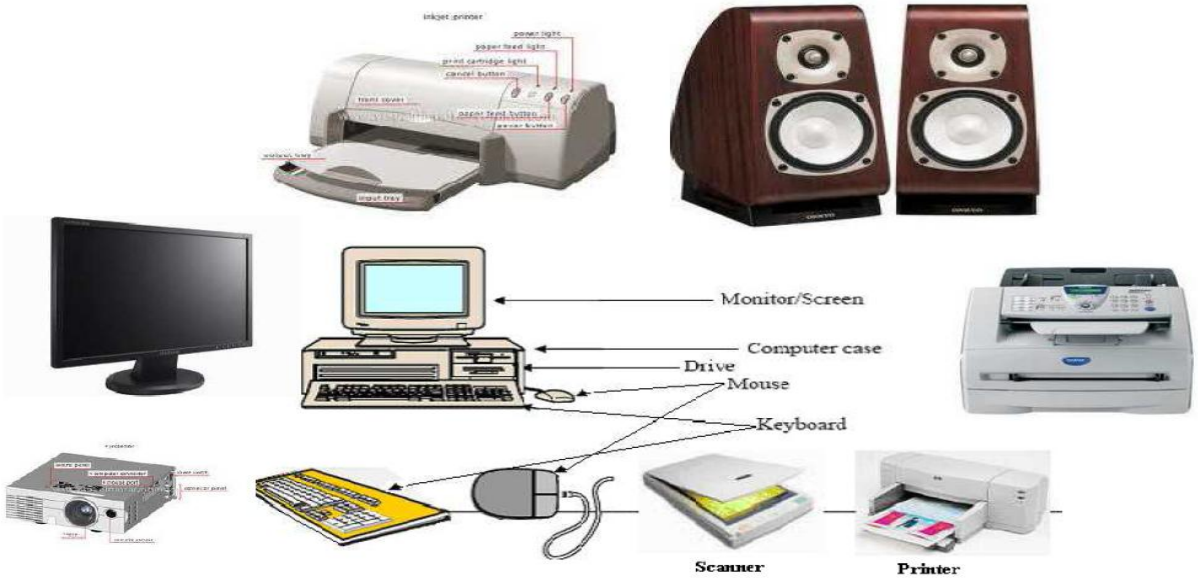


Fig 10: Collection of output devices

4. **Removable storage** - Removable storage devices allow you to add new information to your computer very easily, as well as save information that you want to carry to a different location. There are several types of removable storage:
   - ✓ **CD-ROM** - CD-ROM (compact disc, read-only memory) is a popular form of distribution of commercial software. Many systems now offer **CD-R** (recordable) an
   - ✓ **CD-RW** (rewritable), which can also record. CD-RW discs can be erased and rewritten many times.
   - ✓ **DVD-ROM** - DVD-ROM (digital versatile disc, read-only memory) is similar to CD-ROM but is capable of holding much more information.

Self-Check -1	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

I. Choose the correct answer from the following questions (2pts)

1. A machine that can receive and store information and change or process it.

   A. CD/DVD
   B. Computer
   C. Flop disk
   D. Flash

2._____ is the center for your computer processing activity.

   1. CPU
   2. Mouse
   3. Key board
   4. Microphones

II. Give short answer

1. Name 3 computer hardware components. (3pts)
2. Write key parts of keyboard (5pts)

Note: **Satisfactory rating - 10 points** **Unsatisfactory - below 10 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

I. 1._____

2._____

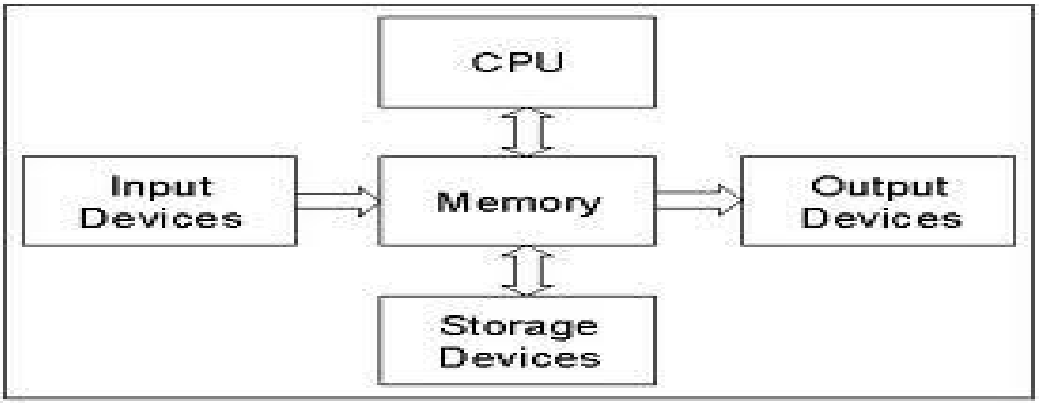
II. 1._____

2._____

Information Sheet-2	Identifying the interaction of components in terms of the flow of data

The five classic components of a computer are briefly described below.

The operation of the processor is best understood in terms of these components



A computer system consists of both hardware and information stored on hardware.

Information stored on computer hardware is often called *software*.

The **hardware** components of a computer system are the electronic and mechanical parts.

The **software** components of a computer system are the data and the computer programs.

The major hardware components of a computer system are:

- Processor(CPU)
- Main memory
- Secondary memory
- Input devices
- Output devices

For typical desktop computers, the processor, main memory, secondary memory, power supply, and supporting hardware are housed in a metal case.

The power supply supplies power for most of the components. Various input devices (such as the keyboard) and output devices (such as the monitor) are attached through connectors at the rear of the case.

The terms input and output say if data flow into or out of the computer. The picture shows the major hardware components of a computer system. The arrows show the direction of data flow.

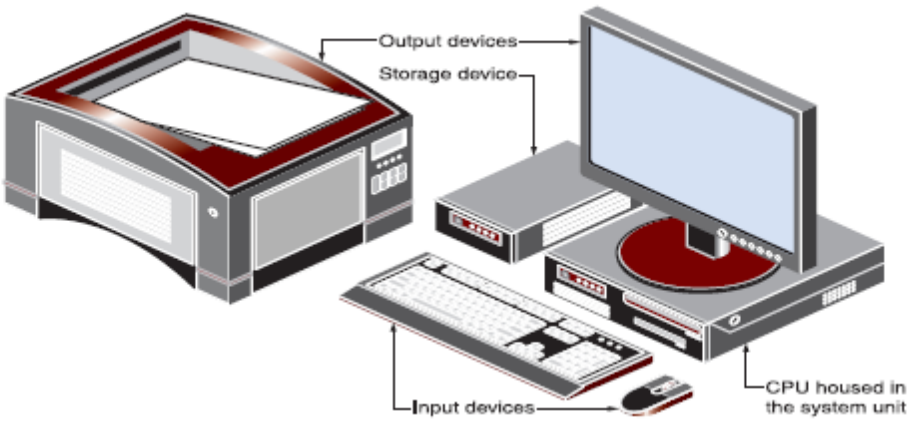


FIG1: interaction between hardware components

A **bus** is a group of wires on the main circuit board of the computer. It is a pathway for data flowing between components. Most devices are connected to the bus through a **controller** which coordinates the activities of the device with the bus.

Memory

The processor performs all the fundamental computation of the computer system. Other components contribute to the computation by doing such things as storing data or moving data into and out of the processor. But the processor is where the fundamental action takes place.

Complete programs and data sets are held in memory external to the processor.

This memory is of two fundamental types:

- Main memory, and
- Secondary memory.

Main memory is sometimes called **volatile** because it loses its information when power is removed. Secondary memory is usually non volatile because it retains its information when power is removed. (However, it needs power when information is stored into memory or retrieved from it.)

Main memory:

3. Closely connected to the processor.
4. Stored data are quickly and easily changed.
5. Holds the programs and data that the processor is actively working with.
6. Interacts with the processor millions of times per second
7. Needs constant electric power to keep its information.

Secondary memory:

- Connected to main memory through the bus and a controller.

- Stored data are easily changed, but changes are slow compared to main memory.
- Used for long-term storage of programs and data.
- Before data and programs can be used, they must be copied from secondary memory into main memory.
- Does not need electric power to keep its information
-

Input and Output interaction

Input and output devices allow the computer system to interact with the outside world by moving data *into* and *out of* the system. An *input device* is used to bring data into the system. Some input devices are:

- Keyboard
- Mouse
- Microphone
- Bar code reader
- Graphics table

An *output device* is used to send data out of the system. Some output devices are:

- Monitor
- Printer
- Speaker

A network interface acts as both input and output. Data flows from the network into the computer, and out of the computer into the network.

Self-Check -2	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

2. List five components of computer (5pts)
3. Which part of computer is the main circuit board of the computer? (2pts)
4. Write at least three input devices.(3pts)

Note: **Satisfactory rating – 10 points** **Unsatisfactory - below 10 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

List of Reference Materials

Avizienis, A., Laprie, J.C. and Randell, B., 2001, May. Fundamental concepts of computer system dependability. In *Workshop on Robot Dependability: Technological Challenge of Dependable Robots in Human Environments* (pp. 1-16). Citeseer.

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Poultry Production

NTQF Level -II

Learning Guide -11

Unit of Competence: - Operate Personal Computer

Module Title: - Operating Personal Computer

LG Code: AGR PLP2 M04 LO2-LG-11

TTLM Code: AGR PLP2TTLM 1219v1

LO2. Develop knowledge on the computer and application software

Instruction Sheet	Learning Guide #-11

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics –

- ❖ Identifying and describing system software in terms of its purpose and operation
- ❖ Identifying and stating application software and its purpose in terms of outputs
- ❖ Describing the interaction between system software and application software

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, **you will be able to –**

- ❖ Identify and describe system software
- ❖ Identify and state application software
- ❖ Describe the interaction between system software and application software

Learning Instructions:

8. Read the specific objectives of this Learning Guide.
9. Follow the instructions described in number 3 to 7.
10. Read the information written in the “Information Sheets 1, 2 and 3”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
11. Accomplish the “Self-check 1” **in page -5, 8 and 11.**
12. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
13. If you earned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #1.
14. Submit your accomplished Self-check. This will form part of your training portfolio.

Information Sheet-1	Identifying and describing system software in terms of its purpose and operation

Software is the general term for set of instruction that controls a computer or it is a series of instruction that tell the hardware what to do. It includes all set of information processing instruction.

Computer software is divided in to two major categories.

- ❖ System Software
- ❖ Application Software

1. **System software** – Consists of instructions or programs that are used to manage the hardware resources of a computer and perform required information processing tasks.

   - ➢ It provides the interface between the hardware and the user. Interface is the means by which a person interacts with a computer.
   - ➢ System software includes:
     - ✓ Operating system,
     - ✓ System support and
     - ✓ System development software.

   i. Operating system software – is a set of programs that control and supervises the overall performance of the computer. *E.g. Ms-DOS and MS-Window*

   ii. System support software – Provide system utilities and other operating services. *E.g. Disk format programs*.

   iii. System development – It includes the computer programming translators that are used to convert written programs to machine language for execution.

2. **Application software** – Consists of programs that in conjunction with system software instruct the computer to perform specific information processing activities. E.g. MS-Word, MS-Excel, MS-Access

Types of Operating System

a. Single-User, Single-tasking – Used to stand alone computer. It can only enable the user to perform one task at a time and can serve only one user at a time.
b. Single-User, Multi-tasking – an operating system, which can serve only one user at a time but enable the user to concurrently run multiple programs or performs multiple tasks.
c. Multi-user, Multi-tasking – an operating system, which serve many user at a time to perform different tasks.

An **operating system** has three main functions:

- Manage **the computer's** resources, such as **the** central processing unit, memory, disk drives, and printers,
- Establish a user interface, and
- Execute and provide services for applications **software**.

Self-Check -1	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Write categories of computer soft ware (2pts)
2. What is the function of operating system? (3pts)

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 5 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1. _____
   _____
   _____.
2. _____
   _____
   _____
   _____.

Information Sheet-2	Identifying application software and its purpose

Application software is special purpose software which is used by the user to perform a particular task.

It is Software that can perform a specific task for the user, such as word processing, accounting, budgeting or payroll, fall under the category of application software. Word processors, spreadsheets, database management systems are all examples of general purpose application software.

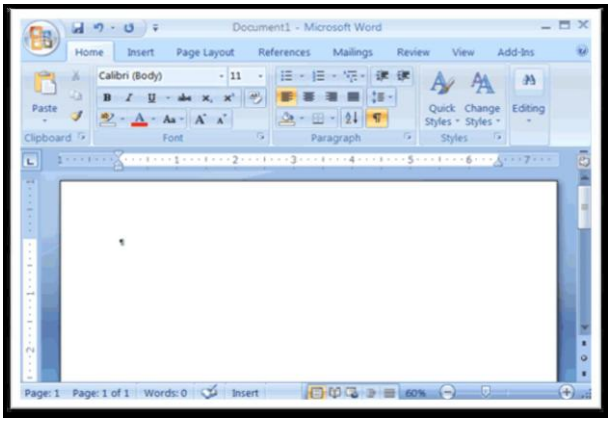
A program or group of programs designed for end users. Allows end users to accomplish one or more specific (non-computer related) tasks.

Types of application software are:

- **Word processing software:** The main purpose of this software is to produce documents. MS-Word, Word Pad, Notepad and some other text editors are some of the examples of word processing software.
- **Database software:** Database is a collection of related data. The purpose of this software is to organize and manage data. The advantage of this software is that you can change the way data is stored and displayed. MS access, dBase, FoxPro, Paradox, and Oracle are some of the examples of database software.
- **Spread sheet software:** The spread sheet software is used to maintain budget, financial statements, grade sheets, and sales records. The purpose of this software is organizing numbers. It also allows the users to perform simple or complex calculations on the numbers entered in rows and columns. MS-Excel is one of the example of spreadsheet software.
- **Presentation software:** This software is used to display the information in the form of slide show. The three main functions of presentation software is editing that allows insertion and formatting of text, including graphics in the text and executing the slide shows. The best example for this type of application software is Microsoft PowerPoint.
- **Multimedia software:** Media players and real players are the examples of multimedia software. This software will allow the user to create audio and videos. The different forms of multimedia software are audio converters, players, burners, video encoders and decoders.

Examples of Computer Application Software

- ❖ Word processor
- ❖ Spread sheet
- ❖ Presentation Software
- ❖ Database Management System
- ❖ Desktop Publisher
- ❖ Graphic Editor
- ❖ Communication
- ❖ Web Browser



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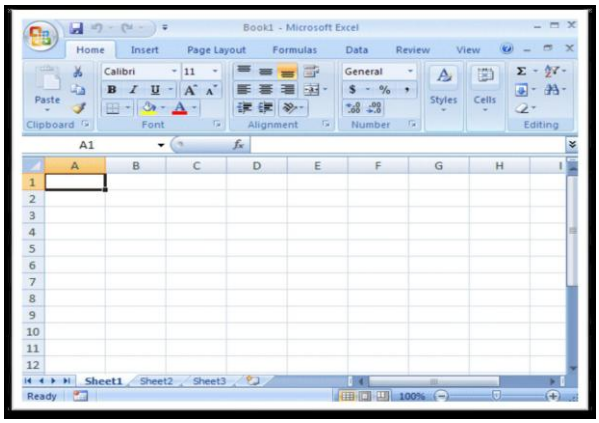

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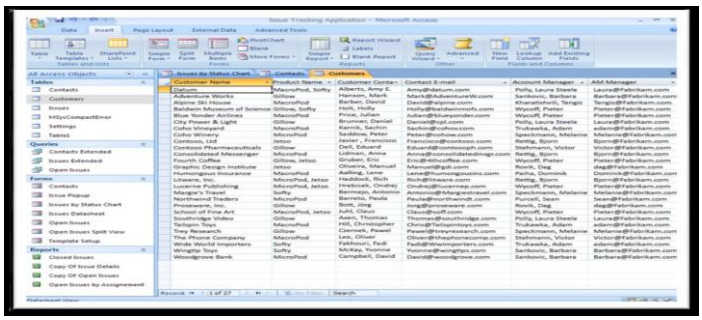


C

D

FIG 1: APPLICATION SOFTWARE: A. word processor B. spread sheet C. data base D. graph editors

Self-Check -2	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Define application system (2pts)
2. Give at least at least 4 example application software (4pts)

Note: **Satisfactory rating - 6 points** **Unsatisfactory - below 6 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1. _____
   _____
   _____
2. _____
   _____
   _____
   _____

Information Sheet-3	Describing the interaction between system software and application software

There are two broad categories of software: System Software and Application Software

- System software is general purpose software which is used to operate computer hardware. It provides platform to run application software.
- Application software is specific purpose software which is used by user for performing specific task.

System Software is a set of programs that manage the resources of a computer system. System Software is a collection of system programs that perform a variety of functions.

- File Editing
- Resource Accounting
- I/O Management Storage,
- Memory Management access management.

System Software can be broadly classified into three types as:

- **System control programs**

  Controls the execution of programs, manage the storage & processing resources of the computer & perform other management & monitoring function. The most important of these programs is the operating system. Other examples are database management systems (DBMS) & communication monitors.

- **System support programs**

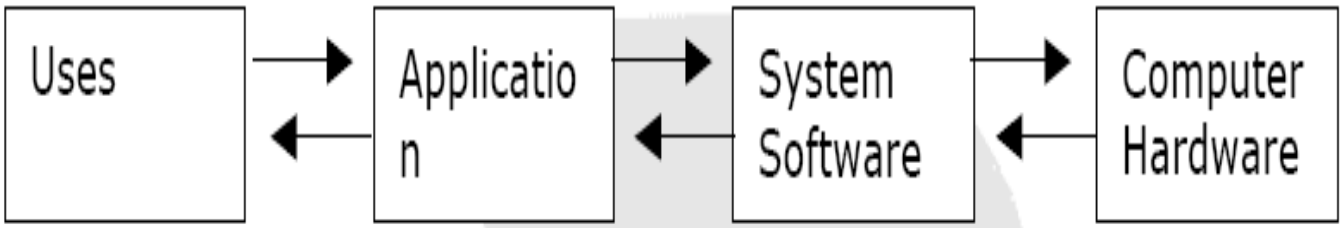
  Provide routine service functions to the other computer programs & computer users: E.g. Utilities, libraries, performance monitors & job accounting.

- **System development programs**

Assists in the creation of application programs

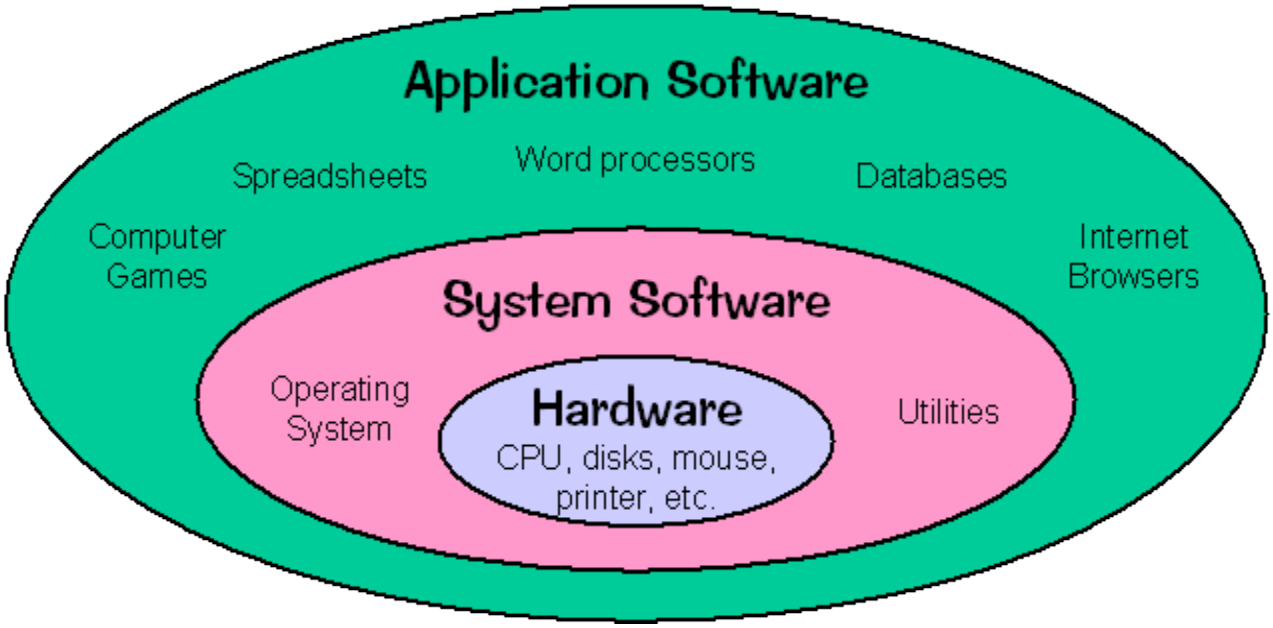
E.g., language translators such as BASIC interpreter & application generators

Computer users interact with application software. Application and system software act as interface between users & computer hardware. An application & system software become more capable, people find computer easier to use.



System Software controls the execution of the application software & provides other support functions such as data storage. E.g. when you use an electronic spreadsheet on the computer, MS-DOS, the computer's Operating System, handles the storage of the worksheet files on disk.

The language translators and the operating system are themselves programs. Their function is to get the users program, which is written, in a programming language to run-on the computer system.



How system soft ware interact with application software

- System software enables the application software to interact with the computer hardware.
- System software is the "background" software.
- It includes programs that help the computer to manage its own resources.
- The most important system software is the "operating system".
- System software frees the user to concentrate on solving problems rather than on the complexities of operating the computer

Self-Check -3	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Write the broader classification system soft ware?(3pts)
2. Which soft ware is interacting between user and computer hard ware? (2pts)

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 5 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1. _____
   _____
   _____
2. _____
   _____
   _____

List of Reference Materials

Casey, J., 2015. Computer Hardware: Hardware Components and Internal PC Connections.

HowStuffWorks, **2014**. A useful site for various computer articles, images and video. http://computer.howstuffworks.com

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Poultry Production

NTQF Level -II

Learning Guide -12

Unit of Competence: - Operate Personal Computer

Module Title: - Operating Personal Computer

LG Code: AGR PLP2 M04 LO3-LG-12

TTLM Code: AGR PLP2TTLM 1219v1

LO3. Perform basic operation and maintenance procedures

Instruction Sheet	Learning Guide #-12

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics –

- Connecting basic components of a PC system
- Powering up a PC system
- Identifying and correcting Simple hardware faults
- Maintaining and caring a PC system

This guide will also assist you to attain the learning outcome stated in the cover page.
Specifically, upon completion of this Learning Guide, **you will be able to –**

- Connect basic components of a PC system
- Power up a PC system
- Identify and correct Simple hardware faults
- Maintain and care a PC system

Learning Instructions:

15. Read the specific objectives of this Learning Guide.
16. Follow the instructions described in number 3 to 7.
17. Read the information written in the “Information Sheets 1, 2, 3 and 4”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
18. Accomplish the “Self-check 1” **in page -6, 11, 16 and 20.**
19. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
20. If you earned a satisfactory evaluation proceed to “Information Sheets”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #1.
21. Submit your accomplished Self-check. This will form part of your training portfolio.
22. Do LAP test in page 25

Information Sheet-1	Connecting basic components of a PC system

The **hardware** components of a computer system are the electronic and mechanical parts. A peripheral is a piece of computer hardware that is added to a computer in order to expand its abilities. The term peripheral is used to describe those devices that are optional in nature, as opposed to hardware that is either demanded or always required in principle. There are all different kinds of peripherals you can add your computer. It is defined as any auxiliary device that connects to and works with the **computer** in some way. E.g. **mouse, microphone** and **keyboard**, **monitor, printer, speaker etc**

The main distinction among peripherals is the way they are connected to your computer. They can be connected internally or externally

The major hardware components of a computer system are:

- Processor(CPU)
- Main memory
- Secondary memory
- Input devices
- Output devices

Computer systems also include a processor and memory. Computer systems are made up of many devices. Peripheral devices provide data for the processor or central processing unit (CPU) to work with and then to communicate the results of that processing. Without a processor there would be no computer system, the data you entered would have nothing done with it – no processing would have taken place. This session looks at the processor itself – the 'brain' of a computer system.

A **bus** is a group of wires on the main circuit board of the computer. It is a pathway for data flowing between components. Most devices are connected to the bus through a **controller** which coordinates the activities of the device with the bus

A bus is a subsystem that transfers data between computer components inside a computer or between computers. Unlike a point-to-point connection, a bus can logically connect several peripherals over the same set of wires. Each bus defines its set of connectors to physically plug devices, cards or cables together. There are two types of buses: internal and external. Internal buses are connections to various internal components. External buses are

connections to various external components. There are different kinds of slots that internal and external devices can connect to.

Fig 1. Connecting the keyboard and mouse to PC via the USB slots

Fig 2: Connect the cable to the monitor

These are connected to main circuit by computer ports. Monitor should connect with cpu through USB cable port as indicated on picture

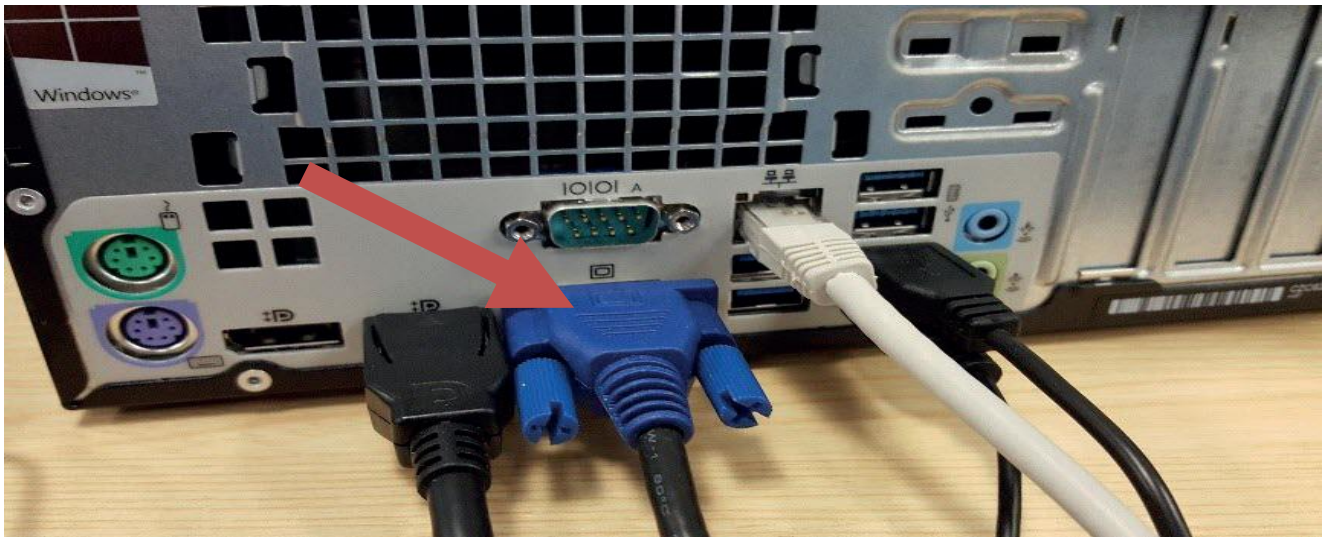


Fig2: Connecting hard ware through USB port

Many of the components are connected to the main circuit board of the computer, called the ***motherboard***. A motherboard (sometimes known as the main board or system board) is the main circuit board found in a computer.

It holds the crucial electronic components of the system, such as the processor (CPU) and main memory. It also provides connectors for other peripherals such as video and sound cards, and USB devices such as a mouse. The non-volatile memory that holds the system BIOS will also be directly attached to the motherboard. This is true not just for your desktop computer but also laptop/tablet and even your mobile phone. If the processor is the 'brain' of the system, then the motherboard is certainly the 'spine' onto which all other devices are connected.

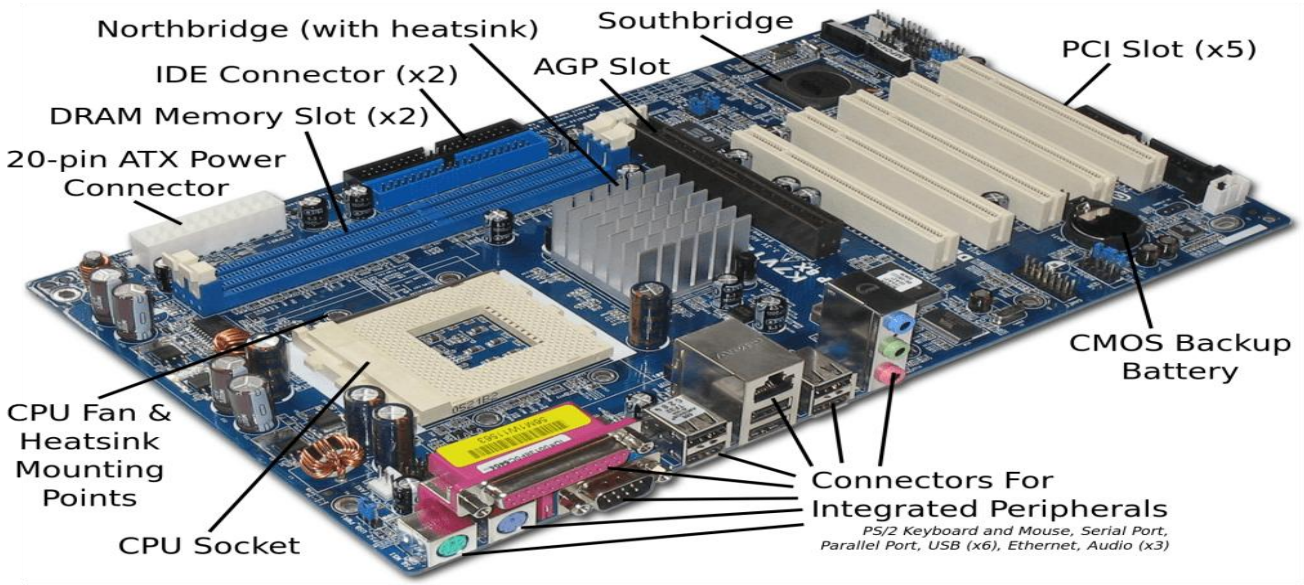


Fig1.Mother board

Self-Check -1	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Which one is the the main circuit board of the computer?
2. By what components computer Hard ware are connected to maincicuit?

Note: **Satisfactory rating - 3 points** **Unsatisfactory - below 3 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

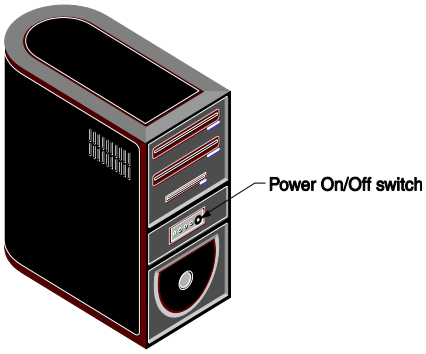
Short Answer Questions

1. _____
   _____
   _____
   _____
2. _____
   _____
   _____

Information Sheet-2	Powering up a PC system

2.1. Powering Up a PC

Starting your computer is also known as **booting** the computer. It is important to switch your computer on in the correct way because the computer will check the peripheral devices on start up. Starting the computer will also start the operating system.



- **Figure 1:** If the power switch on the system unit is off (no light), then you need to turn on the computer parts in the correct sequence

2.2. Sequence for starting a computer

1 Check peripheral device connections.

2 Turn on power at the power outlet.

3 If the monitor has a separate switch, turn it on.

4 Switch on the printer.

5 Check to see if there is a floppy disk in the floppy disk drive if your computer has one. Eject the disk to ensure the computer starts from the hard drive.

6 Switch on the system unit. If using a desktop PC the power switch is usually a button on the front or side of the system unit. If using a laptop the power switch is usually at the top of the keyboard.

The computer will perform a start-up routine. When the start-up routine has completed then the operating system will start.

Logging on

The computer you are using may have been set up so that you need to **log on** to the computer in order to be able to access the software and stored data, and commence using it. This is a security feature that is often in place for computers in the workplace, school, college or other large organisation.

When you log on you are connecting the computer with a **network** of other computers in the organisation.

If you need to log on you will see a box on the screen asking you for two items of information that you need to type in:

- **username**
- **Passwords**.

Usernames and passwords are set (for each authorised user) by the IT Administrator for the organisation. Your teacher or IT Department (in an organisation) will provide you with these details.

Inserting user name

Your username and password determines what information and features of the computer and network you have access to, and this is determined by the IT security policy of the organisation.

Therefore, it is important to note the conditions of use that apply to you when you log on to a computer with your username and password. These conditions appear on the screen before you are asked to enter your name and password. You must click on the **OK** button after you have read the conditions. This enables you to get to the log on screen where you enter your name and password.

2.3. Shutting down your computer

Shutting down a computer running Windows XP operating system

It is good practice to use the correct shut down procedure when you want to turn off your computer so that you do not lose data. If you still have any software applications or files open they will be displayed at the bottom of the screen. Each of the applications and files must be closed. You may get a message asking you to confirm whether files need to be saved. Make sure you save any work you have done before you turn off the computer.

Depending on whether or not you have to log on to start using a computer, you will need to follow a different sequence shutting down the computer.

Logging off

If you have to log on to the computer when you started the session, then you need to **log off** when you finish your session on the computer.

Logging off means you are disconnecting the computer from the network and no one else will be able to access the same computer unless they also have a log on (username and password). You must log off the computer regardless of whether or not you will be turning off the power.

If you don't log off the computer, then you will be preventing other people from using the same computer and being able to log on with their own name and password. In the workplace, failure to log off will probably also mean that other people (who may be unauthorised to use your computer) can access all the files that you have access to. This could mean a serious breach of security in an organisation.

To log off a computer:

1 Close all files (remember to save your latest work if necessary).
2 Close all software programs.
3 Remove floppy disks or other storage media from drives if necessary.
4 Click the **Start** button on the taskbar (at the bottom left corner of the screen) to see the **Start menu**.
5 Click on **Log Off** (at the bottom of the menu).
6 A message box will appear on the screen asking you to confirm that you want to log off. Click on **Log Off**
7 A final message box will appear telling you 'It is now safe to turn off your computer.'

You can now switch off the computer and the power outlet if you want to shut down the computer

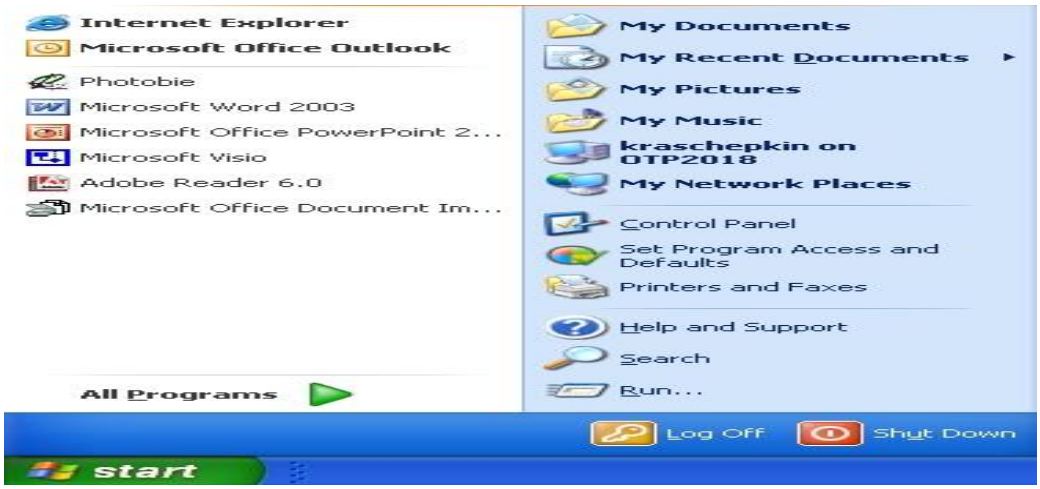


Figure 2: Logging off in Windows XP. From the Start menu, click on the Log off button at the bottom of the menu.

Sequence for shutting down a computer

Follow this sequence if you do not have to log off first.

1 Close all files (remember to save your latest work if necessary).

2 Close all software programs.

3 Remove floppy disks or other storage media from drives if necessary.

4 Click on **Start** on the taskbar. Select **Turn Off** computer from the **Start menu**.

6 Check that **Turn off** is selected.

7 Click on **OK** to confirm.

Your computer may automatically turn the power off but if not you will get a message like 'It is now safe to turn off your computer.'

Self-Check -2	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Write the sequence of starting computer. 10 points

Note: **Satisfactory rating - 10 points** **Unsatisfactory - below 10 points**

Note: **Satisfactory rating - 3 points** **Unsatisfactory - below 3 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1. _____
   _____
   _____
   _____
   _____
   _____
   _____-

Information Sheet-3	Identifying and correcting Simple hardware faults

All computer problems fall into two general categories:

- **Hardware problems**
- **Software problems**

Hardware Problems

Hardware issues are directly related to the physical components of the computer system. For instance, if there's no image on the screen, the computer simply refuses to power on, the monitor displays odd colors after start-up or the keyboard doesn't work. Hardware problem is classified as a fault in an actual component (e.g. electrical failure) - or in the configuration of that component - leading to issues with the computer. It is distinct from a software or firmware problem, which is normally caused by a defect in the software or operating system code respective

How to spot a Hardware Problem

It can often be quite difficult to distinguish hardware faults from software ones. The following are things which indicate the problem is likely to be hardware related:

- A problem begins to occur regularly even though no new software has been installed or the operating system patched prior to the problem beginning
- The problem occurs when a particular device is accessed or used
- The problem appears to occur unpredictably: for example, the computer freezing or rebooting apparently
- The computer fails to boot, shows errors on the POST (Power On Self Test) screen or emits multiple beeps at startup time

Common PC Hardware Problems

The following are some of the commonly found hardware related problems on your PC.

- **Blank monitors**

A blank monitor is the most common computer problem. Most people who work with computers might have dealt with such non-working blank monitor at least once. In such cases, first and foremost check the supply cord and power systems. Sometimes, the video

cable might be loosened. Just push the video cable and place it again, it should help your now.

- **Mouse Problems**

The mouse is used for a variety of purposes, such as playing games or opening files and moreover, it facilitates easy navigation, thus easy access to your data. The most common problems related to the mouse include failure to move, connection problems, freezing on the screen or damage to the mouse.

- **Jumpy Mouse**

Jumpy Mouse! Sounds strange right? Actually, a jumpy mouse is just a muted mouse i.e. cannot be scrolled. If you have a track and ball mouse, then simply turn it over and open the ball container, and remove the excess debris and clean the dirt that lines the rollers. For an optical mouse, eliminate the dust that has collected around the optical sensor.

- **PC won't recognize my USB camera**

In this case, even when you connect your USB camera, you PC might not be able to recognize it and hence throw errors like "Device not recognized" error. This might be due to the USB connector problems or the software malfunctioning. Before plugging in the camera, turn it on. This action can usually solve your problem.

- **My smart phone will not synch with my PC**

In order to ensure backup of your smart phone, it is important that you regularly synch your phone content with your computer. At times, your PC might fail to sync with your smart phone. It can be due to many reasons. Sometimes it is required that all programs are closed, during synching or backup.

- **Keyboard Problems**

As we all know the keyboard is a vital part of any computer. It not only allows typing, but it also gives commands as well. However, you might encounter some common potential problems with the keyboard that includes keyboards that will not connect to the computer, stuck keys, broken keyboards or keyboards where the letters end up jumbled.

❖ **Power Cord Problems**

Whether it is a laptop or a desktop, power cords are a vital part of any computer. The desktop needs the power cord to work. A laptop can run on batteries for a limited amount of time, but then needs the power cord for recharging. The most common problem with the power cord is an improper connection.

❖ **Motherboard Problems**

The motherboard contains several parts of the computer including the RAM, BIOS system, mass storage and CPU. The computer motherboard contains several devices, which can create numerous potential problems. Problems with the motherboard range from too little RAM to BIOS problems. Fixing the problems will depend on the specific problem and, in the worst case scenario, purchasing a new motherboard will fix the problems.

❖ **Insufficient Memory**

Processor-intensive programs also demand a lot of memory. Random access memory (RAM) aides the central processing unit (CPU) by storing instructions linked to common operations. Without enough RAM, software crashes and slowdowns can occur.

Above mentioned are some of the commonly found PC hardware problems. However, these are minor issues and you can easily find a solution for it. As you can observe most of these issues are related to PC peripherals, for example Mouse, keyboard, USB camera etc. Hence, one of the root causes for these issues lies with your devices. Actually some devices need third-party software to be connected to the PC and even for its proper functioning. The software is referred as Device drivers. Drivers help the operating system to communicate with the hardware and helps in proper functioning of these peripherals. Even your video cards, keyboards, mouse, or any USB device plugged into the computer requires device drivers.

Basic steps to identify the hardware problem:

- Check that your computer is plugged into a working outlet
- Check that everything is turned on. If something seems to be not working,
- Make sure the brightness is up or the on switch is in the appropriate position or the volume un muted depending on what you are having issues with.

- Check that keyboard, mouse, monitor, speakers, etc are plugged into your device. Try a different port, if one is available, to check if it is the port or the device that is damaged. Make sure that wireless hardware has a fully charged battery.

Self-Check -3	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. What are simple Common PC Hardware Problems (5pts)
2. write categories of computer problem (2pts)

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 5 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1. _____
   _____
   _____
2. _____
   _____
   _____

information Sheet 4	Maintaining and caring a PC system

Basic care and maintenance for your computer are very important. It prevents certain factors and issues from arising, affecting the PC performance. If you take good care of your computer, you can get rid of viruses, malware, and other threats in advance. Invest in software that protects your PC from viruses, cleans up drives, and performs overall PC maintenance.

Almost all households in the world have their desktop computers. In the modern world, computers are very important – education, business, research, and other functions. Of course, as computer users, we should take care of our computers. In this article, we will discuss the basic care and maintenance of your computers.

4.1. Keep your software up-to-date

Your computer will prompt you if there are software updates. It is important that you keep your software up-to-date, including your operating system to fix bugs, glitches, and vulnerabilities of the previous version. They also strengthen the security of your computer. Some computers perform automatic updates.

4.2. Install antivirus software

A computer virus is a primary threat to computer health. They damage not just certain programs and software in your computer, but your system as a whole. It is important that you keep these viruses from entering your computer. Install antivirus software that will detect, block, and eliminate all types of viruses. There are dozens of competitive antivirus software available on the internet.

4.3. Get rid of unused programs

Make it a habit to declutch your PC. Get rid of old files and programs that you do not need anymore. This will lessen the burden of your PC from running them in the background. The best way to do this is to install and run a disk cleanup program that deletes temporary files and clean your registry.

4.4. Activate the Firewall

Viruses can penetrate your computer systems through the internet. It is important to activate your firewall. A firewall acts as a gate or barrier that filters data from gaining unauthorized

access to the computer system. Typically, computers have a built-in firewall. But if you want to strengthen security, install a third-party firewall that provides maximum internet protection.

4.5. Safely remove devices

Most of you are guilty of this one – not safely removing external devices. It is a must that you eject devices, drives, and other media in a safe mode. This prevents corruption of data both in the computer and on the external drive.

4.6. Consider reformatting

If your computer is really full of viruses and loads, affecting PC performance, consider reformatting. Of course, to do this, make sure you back up your files. Reformatting will bring back your computer the way it is before. However, we recommend that you let PC technicians do this for you.

4.7. Clean your computer screens

When we tend to overuse the computer, we forget cleaning the computer externally, especially the screens. Like any other appliances, computers need regular cleaning. We advise that you use a soft cloth or special wipes in cleaning your computer screens and some other external parts of your computer. Get rid of dust, smudge, dirt, etc. Beyond just getting the dust out, here are some other steps to consider: Dust often collects inside the CPU and video card heat sinks, consider disassembling and cleaning them if you're comfortable doing so, or at least using compressed air to specifically blow them out

4.8. Invest in cooling pads

Another factor that affects PC performance is overheating. When you use your computers for a longer period of time, consider buying cooling pads. Cooling pads are external devices that prevent computers from overheating. Apart from cooling pads, you can use fans. But if you want it to be easy, avoid using your computers in an environment with extreme temperatures.

4.9. Take care of your battery

Laptop batteries do not last a lifetime. But you can extend its lifespan by taking good care of your battery. Avoid overcharging your battery. If it reaches 100%, make sure to unplug it. If you are not using your laptop, it is also recommended to remove the battery pack.

4.10. Protect your desktop

When we say “protect”, we meant literal protection. Buy cases or bags where you can safely store your laptops especially when traveling. Moreover, cover your desktop computer with a cloth. This can keep your computer away from dust.

4.11. Avoid eating near computers

This is a must! Avoid eating near your computers, or better, do not eat while using your computer. Food crumbs or pieces may get into your keyboard and other parts of your computer which will attract ants, termites, and other insects. If this happens, the insects might destroy some internal parts on your computer.

4.12. Consult a PC expert

Lastly, always ask a PC technician about your computer health. If you want to be 100% sure that your computer is doing okay, bring your unit to your favorite PC technician. Let them do the rebooting or reformatting, defragmentation, troubleshooting, and complete computer maintenance. If you are an owner of a website, make sure you consult an IT expert to make sure that your websites are safe and secure.

Self-Check -4	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Write at least 5 technique by which you can give care to you computer?(5pts)

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 5 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1._____

_____

_____

_____

_____

_____

Operation Sheet-1	Connecting components

A **peripheral** device connects to a **computer** system to add functionality. Examples are a mouse, keyboard, monitor, printer and scanner.

Procedures of connecting components

- Prepare all peripheral devices
- Indentify the structure and types of USB card and port
- Indentify and check the slot on CPU externally which fit the ports
- Try to push to plug in to the slot
- Power on and Open the computer to check whether it is functioned

Operation Sheet-2	Power up your computer and open

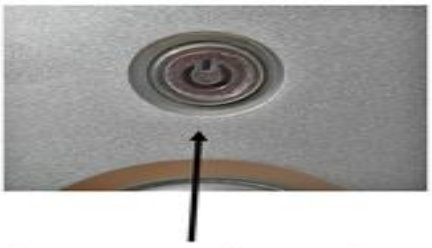
Follow these step-by-step instructions to help you turn on your computer

Step 1: check presence electric power and plug the divider electric power source

Step 2: connect the computer hard ware to the main circuit (CPU)

Step 3: plug the USB cable port of main circuit to divider and on divider

Step 4: Find the 'on' button. It probably looks like this (but might be square or oblong!):



This is a typical PC **on** button, on the front, in the middle of the tower

This is a typical laptop **on** button. Most laptops have the **on** button just above the keyboard but below the screen

Step 5: Push the button.

Step 6: Now you need to log in.

If you're the only user of your computer, once it's turned on it may go straight to the desktop:

If you're using a public computer or sharing computer with other people, each one will usually have their own account. When you turn on the computer, the screen will look something like this:

When you click the icon above your name, you'll be asked for a password. The main user or administrator should set this up for you before you begin. Type in your password and click the arrow.

Done!

Operation Sheet-3	Creating user name

Steps How to Create a New User Account on Your Computer

1. Power on your computer
2. Open the window by pressing button
3. Choose Start→ Control Panel and in the resulting window,
4. Click the Add or Remove User Accounts link. The Manage Accounts dialog box appears.
5. Click Create a New Account. ...
6. Enter an account name and then select the type of account you want to create.
7. Click the Create Account button and then close the Control Panel.

Operation Sheet-4	Log off a computer

Steps To log off a computer:

1 Close all files (remember to save your latest work if necessary).

2 Close all software programs.

3 Remove floppy disks or other storage media from drives if necessary.

4 Click the **Start** button on the taskbar (at the bottom left corner of the screen) to see the **Start menu**.

5 Click on **Log Off** (at the bottom of the menu).

6 A message box will appear on the screen asking you to confirm that you want to log off. Click on **Log Off**

7 A final message box will appear telling you 'It is now safe to turn off your computer.'

You can now switch off the computer and the power outlet if you want to shut down the computer

Operation Sheet-5	identifying the hardware problem:

Basic steps to identify the hardware problem:

- plug computer to power source
- Check that your computer is plugged into a working outlet
- Check that everything is turned on. If something seems to be not working,
- Make sure the brightness is up or the on switch is in the appropriate position or the volume un muted depending on what you are having issues with.
- Check that keyboard, mouse, monitor, speakers, etc are plugged into your device. Try a different port, if one is available, to check if it is the port or the device that is damaged. Make sure that wireless hardware has a fully charged battery

LAP Test	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 2 hour.

Task 1. Connect the components of computer

Task 2. Power up your computer and open

Task 3. Create your user name PC

Task 4. Log off a computer

Task 5: **identify the hardware problem**

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Poultry Production

NTQF Level -II

Learning Guide -13

Unit of Competence: - Operate Personal Computer

Module Title: - Operating Personal Computer

LG Code: AGR PLP2 M04 LO4-LG-13

TTLM Code: AGR PLP2TTLM 1219v1

LO4. Operate a printer

Instruction Sheet	Learning Guide #-13

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics –

- Displaying data from a personal computer on printer
- Identifying and remedying Simple printer hardware faults and printer

This guide will also assist you to attain the learning outcome stated in the cover page.

Specifically, upon completion of this Learning Guide, **you will be able to –**

- Display data from a personal computer on printer
- Identify and remedying Simple printer hardware faults and printer

Learning Instructions:

23. Read the specific objectives of this Learning Guide.
24. Follow the instructions described in number 3 to 20.
25. Read the information written in the “Information Sheets 1”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
26. Accomplish the “Self-check 1” **in page -.**
27. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-check 1).
28. If you earned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #1.
29. Submit your accomplished Self-check. This will form part of your training portfolio.

Information Sheet-1	Displaying data from a personal computer on print

1.1. Basic Printer Concepts

A printer is a device that accepts text and graphic output from a computer and transfers the information to paper, usually to standard size sheets of paper. Printers vary in size, speed, sophistication, and cost. In general, more expensive printers are used for higher-resolution color printing.

The four printer qualities of most interest to most users are:

- **Color**: Color is important for users who need to print pages for presentations or maps and other pages where color is part of the information.
- **Resolution**: Printer resolution (the sharpness of text and images on paper) is usually measured in dots per inch (**dpi**).
- **Speed**: If you do much printing, the speed of the printer becomes important. Inexpensive printers print only about 3 to 6 sheets per minute.
- Reliability
    - Warranty
    - Scheduled servicing
    - Meat time between failures

Some Examples of Computer printers:

- Inkjet Pinter.
- Laser Printer.
- Plotters Printer.
- Dot-matrix Printer and.
- Thermal Printer.
- Lexmark printer:

1.2. Selecting the default printer

Printers that you can access from your computer may be directly connected to your PC or you may have access to printers over a network. A network printer could serve many computers so you may not be the only person sending jobs to a printer. In this case it is particularly useful to be able to view the progress of your print jobs as they may be sitting in a queue waiting to be printed. You can also cancel a print job after you have sent it to the printer.

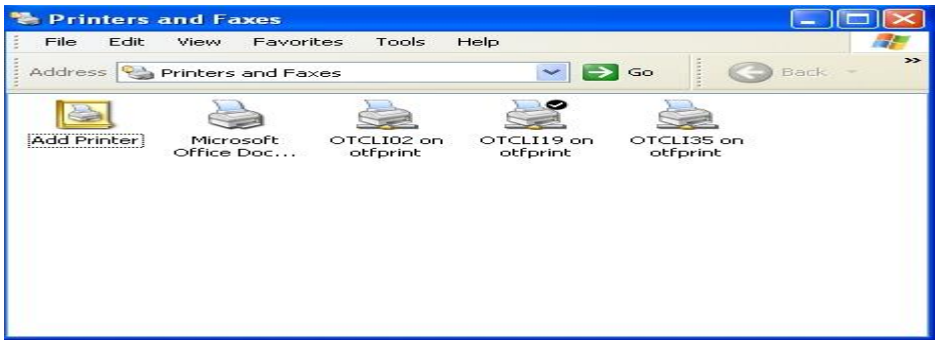
Check printers you can access

If printing over a network there may be more than one printer you can access. To check the printers that you have access to:

1 Click on **Start** and then select the **Control Panel**.

2 Double-click on **Printers and Faxes** to open this item.

3 In **Printers and Faxes** you see the names of the computer/s that you should be able to access.



4. Select **Set as Default Printer** from the menu

Check printing preferences for a printer

Printing preferences include options for printing such as:

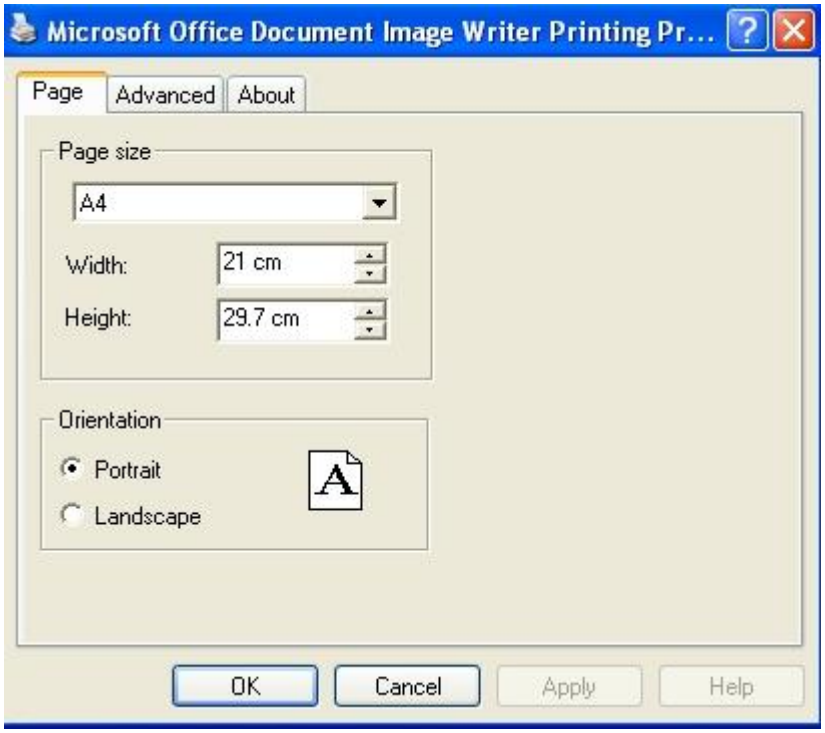
- the size of the paper you are printing to
- whether the document you are printing has a horizontal (landscape) or vertical (portrait) layout
- whether you want to print on both sides or only one side of the paper
- how many copies of the document you want to print.

You can change these options every time you send a document to the printer but you can also set **default** options so that your preferred options are the default until you change them.

To check or change the default printing preferences for your printer:

1 In the **Printers and Faxes** window right-click on the name or icon of the printer. (See **Figure 2**)

2 Select **Printing Preferences** from the menu.



3 To change the paper size you want to print on, click on the arrow next to the box under **Page size**. Select a different paper size from the popup menu.

4 To change the orientation of your document page click in the button next to either **Portrait** or **Landscape**.

5 Click **OK** to save any changes or **Cancel** to keep the same settings.

The preferences box for a printer will have different options depending on the model of the printer, but the basic options shown in above **Figure** should be available for all printers.

You can select more printing preferences in a program's **Print** box at the time of printing.

Operate a printer

Print documents

You can send a document to the printer from the desktop *or* from within the application program that created the document.

Print one or more documents from the desktop

To print one or more documents from the desktop:

1 Open a folder that contains one or more documents.

2 Click on the name of the file you want to print.

3 To print more than one file, hold down the **Control** (Ctrl) Key on your keyboard and keep clicking on files to add them to the selection.

4 When all the files are selected, right-click on one of the selected files. Select **Print** from the menu.

All the files you selected will be sent to the printer .

Self-Check -1	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. What are qualities of printer interested to most users?(4pts)
2. List at least 4 types of printer(4pts)

Note: **Satisfactory rating - 8 points** **Unsatisfactory - below 4 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1. _____
   _____
   _____
2. _____
   _____

Information Sheet-2	Identifying and remedying Simple printer hardware faults

2.1. Common Printer Problems

Some of the most common printer problems have easy solutions. Check out the printer problems many people deal with and compare them to some of the problems you may be having.

- Paper jams
- Image is not dark enough
- Image has streaky lines
- Wireless printer is not connecting
- Printer is printing too slow
- Inconsistency of image

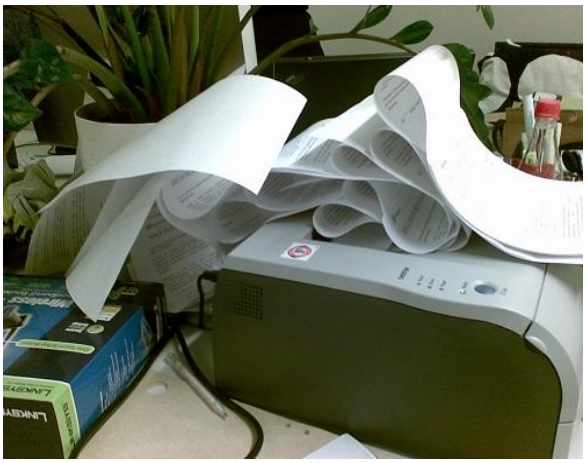
Fig1: printer

2.2. Remedying Simple printer hardware faults

➢ Preventing Paper Jams

While a paper jam is often unavoidable, taking actionable steps to prevent paper jams is a good way to minimize this problem in the future. Whether you're working with an inkjet, laserjet, or large office photocopier, some of the most common solutions to this printer problem include:

- Ensuring that your paper is properly aligned in the feed tray.
- Gently tapping one end of your paper stack until all of the pages sit evenly in the tray.
- Removing any wrinkled or damaged papers from the pile.
- Avoid placing too many pages in the tray.
- Using the right type of paper.
- Using the right size paper.



All of these are simple steps you can take before and after a printing job to mitigate paper jam problems. Keep in mind that some larger printers with multiple trays can cause feeding problems, as the printer is often set to feed from the wrong tray. Check the printer settings to make sure that the paper is feeding from the correct tray.

Fig 2: paper jam printer

- Preventing Inconsistent Images

Depending on how much you use your printer, toner and ink cartridges should be replaced about once a year. When it's time to replace your cartridges, follow these steps for safe and efficient removal and replacement.

Fig 2: Toner cartridge

- *Removing Toner Cartridges*

  - ✓ Open the printer door where the cartridges are located.
  - ✓ Pull the cartridge to remove it.

- *Replacing Toner Cartridges*

  - ✓ Before placing in the new cartridge, make sure that the plastic packaging isn't removed.
  - ✓ Shake the cartridge gently to distribute the toner evenly throughout the cartridge.
  - ✓ Shake it side-to-side, but never up and down to avoid spilling.
  - ✓ Remove the cartridge from its packaging.
  - ✓ Pull off the colored tab on the cartridge.
  - ✓ Do not touch the imaging drum on the bottom of the print cartridge.
  - ✓ Slide in the new cartridge and make sure it snaps into place securely.
  - ✓ Print out a page to check if the printer is functioning correctly.

➢ Check Connectivity internet and USB cables

Whether you choose to connect via Wi-Fi, Ethernet cable, or USB, the changes in print speed aren't usually dramatic. Often, people prefer Ethernet or USB connections simply because they minimize the chances of computer miscommunication or error. Experiment with each of the connections to see which works best with your printer.

Self-Check -2	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. What the simple common problems printer (5pts)
2. Write some remedies to resolve the printer problems

Note: **Satisfactory rating - 3 points** **Unsatisfactory - below 3 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1. _____
   _____
   _____
   _____
2. _____
   _____
   _____

Operation Sheet 1	Printing documents

Method of Printing one or more documents

3. Plug the USB cable to power sources
4. Power on the printer
5. Open a folder that contains one or more documents.
6. Click on the name of the file you want to print.
7. To print more than one file, hold down the Control (Ctrl) Key on your keyboard and keep clicking on files to add them to the selection.
8. When all the files are selected, right-click on one of the selected files
9. Then Select Print from the menu.
10. All the files you selected will be sent to the printer.

LAP Test	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 20 minutes

Task 1. Print one or more document from your computer

List of Reference Materials

Bell, C., 2014. *Maintaining and troubleshooting your 3D printer*. Apress.

Pham, H., 2007. *System software reliability*. Springer Science & Business Media.

Leveson, N.G. and Weiss, K.A., 2009. Software System Safety. In *Safety Design for Space Systems* (pp. 475-505). Butterworth-Heinemann.

Bernklau-halvor, D.I., Xerox Corp, 2004. *Printer diagnostics method*. U.S. Patent 6,763,482.

Poultry Production

NTQF Level -II

Learning Guide -14

Unit of Competence: - Operate Personal Computer

Module Title: - Operating Personal Computer

LG Code: AGR PLP2 M04 LO5-LG-14

TTLM Code: AGR PLP2TTLM 1219v1

LO5. Apply ergonomic principles for safe operation

Instruction Sheet	Learning Guide #- 14

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics –

- ❖ Explaining Ergonomic principles in terms of user physical well-being
- ❖ Explaining Ergonomic requirements in terms of environment

This guide will also assist you to attain the learning outcome stated in the cover page.

Specifically, upon completion of this Learning Guide, **you will be able to –**

- ❖ Explain ergonomic principles in terms of user physical well-being
- ❖ explain ergonomic requirements in terms of environment

Learning Instructions:

30. Read the specific objectives of this Learning Guide.
31. Follow the instructions described in number 3 to 7.
32. Read the information written in the “Information Sheets 1”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
33. Accomplish the “Self-check 1” **in page -7.**
34. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-check 1).
35. If you earned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #1.
36. Submit your accomplished Self-check. This will form part of your training portfolio.

Information Sheet-1	Explaining Ergonomic principles in terms of user physical well-being

What is Ergonomics?

Derived from the Greek words '**Ergon**' meaning work and 'nomos' meaning **laws**

Thus Ergonomics is the study of how working conditions, machines and equipment can be arranged in order that people can work with them more efficiently. As computers are probably the most ubiquitous type of machine in today's work and learning environments, the issue of ergonomically sound interaction with them has come to the fore.

In general, computers are clean, quiet and safe to use. However, poor interaction with and positioning of computer equipment can lead to health problems such as eyestrain, swollen wrists and backache.

Problems can be avoided by good workplace design and by good working practices.
Prevention is easiest if action is taken early through effective analysis of each workstation.

There are a number of practical steps that can be taken to achieve an ergonomically positive environment and, furthermore, to promote a safer learning environment. These are:

- Positioning of the person and equipment
- Arranging a safe working and learning environment
- Taking regular breaks

2. Positioning

Body positioning and the positioning of equipment are fundamental to ensuring a comfortable and healthy interaction with computers.

The following recommendations can help to reduce the risk of health problems:

- Sit up straight rather than slouch forward
- Use supports such as foot rests, wrist rests and adjustable chairs
- Adjust equipment to the correct height, distance and angle

The diagrams below highlight some positive and negative body and workstation positioning.

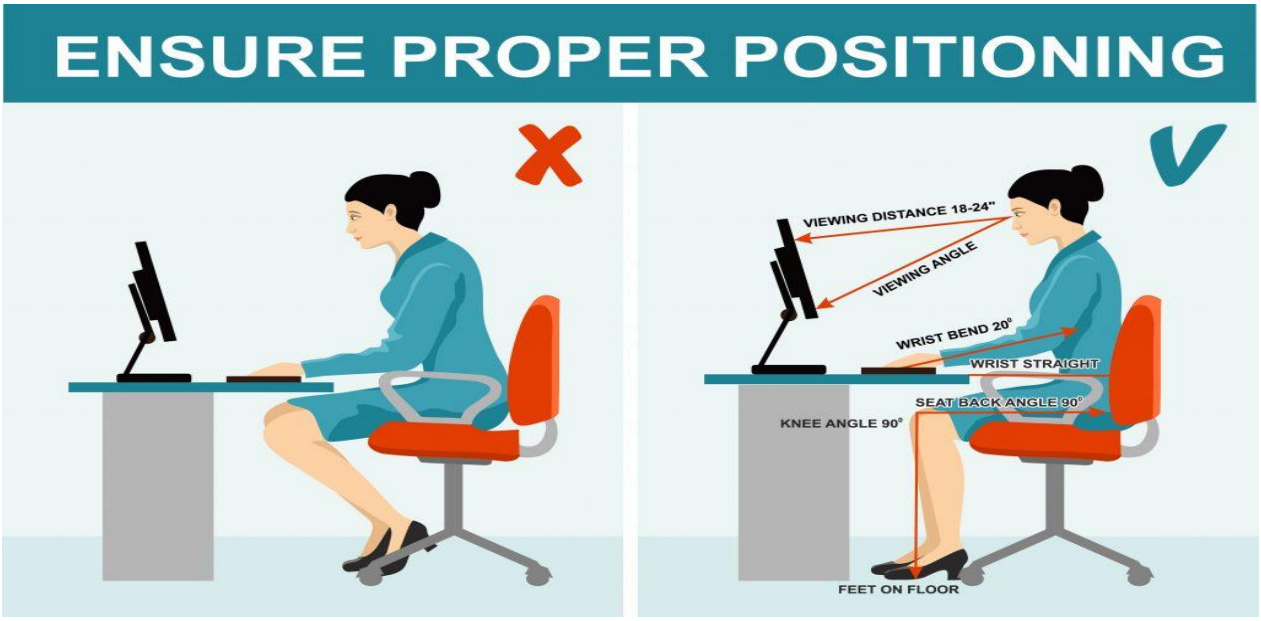


Fig 1. A) Inadvisable Positioning B) Recommended Positioning

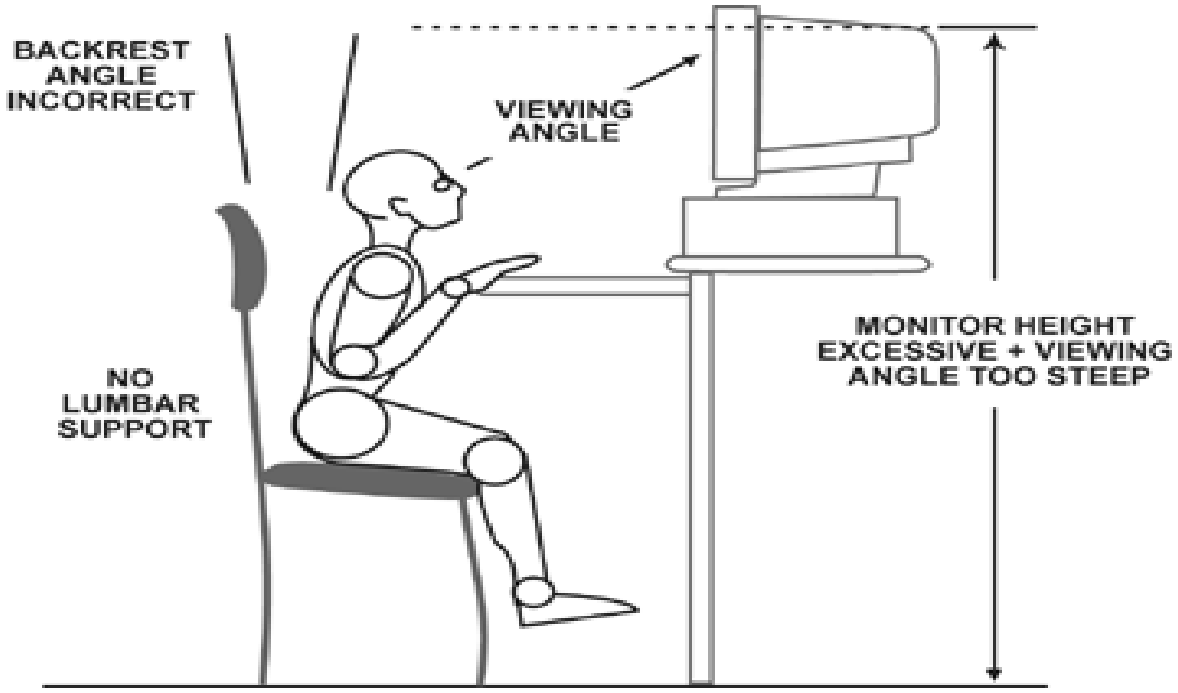


Fig2. Inadvisable Positioning

2. Arranging a Safe working and Learning Environment

As computers can generate heat, a well-ventilated room is an important consideration. Coiled cables also give off heat and may need to be rerouted. In addition, securing and covering trailing cables is necessary if hazards are to be avoided.

3. Regular Breaks

Computer users, both in workplaces and in schools, should be encouraged to take regular breaks if working for protracted periods on a computer. This may mean leaving the workstation for a few minutes every hour to avail of a work-break or to engage briefly in some other work-related activity. Not only will this allow eye muscles to readjust, it will also refresh all of the body's muscles, promoting personal health and a safe learning environment.

Importance of ergonomics

a) Increases productivity

- Best ergonomic solution enhances the productivity
- Ergonomic reduces the unwanted tension, awkward position of the body.
- Ergonomic is focused in making your work easier and comfortable; this thereby reduces any kind of stress, risk and enhances the satisfaction and productivity.

b) Reduces the cost

- Ergonomics can be considered as the one-time investment
- As ergonomics is focused about marinating the better health of the worker it can further reduce the cost of compensation that would be made by the injured or unhealthy staffs.
- It also reduces the indirect and the opportunity cost that could have incurred due to injury.

C) Improve the quality of the work

- Improved ergonomics favors the favorable environment where the workers can work efficiently.
- As the ergonomics improves; the level of satisfaction in the quality of the work increases.

Principles of Ergonomics

There are 10 fundamental principles of ergonomics which are:

1. Work in neutral postures
   - Proper posture maintenance is necessary
   - Working too long with “C” curve can cause strain
   - Keeping the proper alignment of neck hands wrist are also necessary
2. Reduce excessive force
   - Excessive pressure or force at the joints can cause injury
   - Better to minimize the work that requires more physical labor
3. Keep everything in reach
   - Keeping everything in reach would help in avoiding unneeded stretching and strain
   - More or less this principle is related with maintaining good posture.
4. Work at proper height
   - Working at right makes things way easier
   - Sometimes height can be maintained by adding extensions or avoiding extensions on the chair or tables
5. Reduce excessive motions
   - Repetitive motion needs to be avoided
   - This can cause disorder and numbness in long run
   - Motion scan be reduced by the use of power tools
6. Minimize fatigue and static load
   - Fatigue is common in strenuous work
   - Having to hold things for longer period is example of static load
   - Fatigue can be reduced by the intervals and the breaks between the works.
7. Minimize pressure points
   - One needs to be aware of pressure points
   - Almost everyone of has to sit on chairs that had cushioning, one of the pressure point is behind knees, which happens if air is too high or when you dangle your legs. Pressure point is also created in between your thigh and the bottom of a table when you sit.

- Anti-fatigue mats or insole can be used

8. Provide clearance
   - Work area should have enough clearance
   - Let the worker not worry about the bumps that they have to encounter on daily basis.
9. Move, exercise and stretch
   - Move and stretch when you can
   - It better to take intervals between the works and stretch and move along
   - Stretching technique may differ and depend on the work one does

10. Maintain a comfortable environment

- This principle is focused on the other component of the working environment.
- It is concerned about the lightening, space, cool air and many more.

Self-Check -1	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. How you can avoid or reduce computer ergonomic problems?(5pts)
2. Write at least five principles of ergonomic principles (5pts)

Note: **Satisfactory rating - 3 points** **Unsatisfactory - below 3 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1._____

_____

_____

_____

2._____

_____

_____

_____

Information Sheet-2	Explain ergonomic requirements in terms of environment

Computer ergonomic in terms environment refers to the ergonomic of working station.

The term ‘workstation’ refers collectively to the computer, the monitor, the keyboard, the desk, the chair and the space provided for doing work. Workstations should be comfortable and have sufficient space to allow for freedom of movement. A minimum of 4.65 square metres of floor space for adults is recommended for office or similar environments. Adequate space between workstations should be provided for students both in a classroom and compute suite context. This should exclude space taken up by fixtures such as presses and filing cabinets.

ICT offers a range of benefits for working station, but all computers and devices need to be used with care. This material looks at the health and safety issues involved in using computers in general, in the classroom and in the ICT suite.

- Ensure that no cabling is trailing on the floor.
- If you are using a data projector, make sure that all leads are safely located, and that pupils don’t walk around the back of working areas which have cables.
- If you are using an interactive whiteboard, ensure that all children can reach it without standing on anything.
- Children should be supervised at all times during the operation of data projectors or interactive whiteboards.
- Ensure that pupils never look directly into the beam of the projector, and if presenting to the class and entering the beam, pupils should not look towards the audience for more than a few seconds. Ideally they should keep their backs to the beam at all
- If you are working with programmable toys such as floor turtles, create a clearly defined working area; use markers or seating to define the work space to ensure that pupils do not accidentally fall over equipment.
- Ensure that all electrical installations are carried out by a qualified electrician.
- All equipment must be of a reliable standard and should be checked annually by qualified electricians.
- Follow health and safety guidance regarding the height, position and distance of monitors and keyboards from pupils when working.

- Locate the computers in areas where pupils can sit and work without distracting or disrupting others in the class.
- Ensure that this area is kept clear of school bags/ computer bag as pupils may trip on scattered school bags.
- Ensure that procedures for connecting peripherals (such as scanners, digital cameras, webcams, control technology equipment and monitoring equipment), adhere to school health and safety guidelines or manufacturer's instructions for safe use.
- If pupils are using laptops, ensure that they are located on firm desks or tables
- Ensure that area that contain have a no drinks policy to prevent spillages on electrical equipment

Fire safety in the working and class room

- Electrical equipment fires require either Carbon Dioxide or Dry Powder fire extinguishers.
- Electrical Fires are categorised as Class E type fires.
- Paper based displays should not be placed above where electrical equipment is located.
- If electrical equipment goes on fire, it will reduce the possibility of the fire spreading along that wall.
- Sockets area should be cleared of dust and scrap paper on regular basis to reduce fire risk.

The following table identifies how specific aspects of our environment can be organised to create the right ergonomic conditions for a safer working and learning environment.

Table 1: Right ergonomic conditions for a safer working and learning environment

Environment	**Health and safety considerations**	**Ergonomic recommendation**
VDU (visual display unit)	➢ Avoid discomfort caused by reflective glare and eyestrain ➢ Protect eyes against moisture loss	➢ Take adequate breaks regularly ➢ Adjust contrast and brightness ➢ Focus on distant object regularly ➢ Use an anti-glare screen with older monitor ➢ adjust height so that the top of the screen is at eye level ➢ Position in a downwards viewing angle ➢ Make sure the screen surface is clean
Keyboards	➢ Prevent wrist strain which can develop into RSI (repetitive strain injury	➢ Use a wrist rest ➢ Type with wrists floating above the keyboard ➢ Keep elbows relaxed ➢ Keep mouse at the same height as keyboard ➢ Tilt the keyboard to the most comfortable position
Chair	➢ Prevent back problems	➢ Adjust chair to a suitable height ➢ Tilt seat for lumbar support ➢ • Allow adequate knee clearance under the desk ➢ Do not sit in the same position for long periods
Light	➢ Prevent visual fatigue void reflective glare	➢ Provide natural light if possible ➢ Position monitors at right angles to windows, otherwise use blinds ➢ Avoid strong artificial lighting
Noise	➢ Minimize distraction	➢ Use headphones for software containing

	caused by noise	audio ➢ Position printers or photocopiers away from workstation
Heat	Prevent discomfort caused by heat	➢ ventilate rooms but avoid creating draughts ➢ Turn off equipment when not in use ➢ Consider air conditioning
Electrical Safety	Prevent accidents	➢ Leave technical repairs to experts ➢ Reroute, secure and cover stray leads ➢ Replace frayed leads and damaged plugs ➢ Aavoid overloading extension leads ➢ Be aware of coiled cables overheating

Self-Check -2	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Describe is work station in computer ergonomic (5pts)
2. What are **fire safety in the working and class room (5pts)**

Note: **Satisfactory rating – 10 points** **Unsatisfactory - below 10 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1._____

_____

_____

_____

2._____

_____

_____

List of Reference Materials

O'Reilly, M., Finder, B. and Werrell, M.K., 2007. *An Ergonomics Guide to Computer Workstations*. AIHA.

Collier, S.G. and Talbot, C.F., 1990. General ergonomics. *Applied Ergonomics*, p.163.

Oduroye, A.P., Aramide, O. and Elusoji, A.A.,(nd). possible health hazards on use of computer based systems by library and information science professionals in tertiary institutions: way forward.

National Centre for Technology in Education , 2009. Ergonomics, Health and Safety

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