

IT Support Service

Level I

Learning guide #23

Unit of Competence: Operate Personal Computer

Module Title: Operating Personal Computer

LG Code: ICT ITS1 M07 L01-LG-23

TTLM Code: ICT ITS1 TTLM07 1019v1

LO1: Start the computer



Instruction Sheet 1 Learning Guide # 23

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

- Checking Peripheral device connections
- Understanding OHS standards
- Checking Input voltage
- Switching on Power at both the power point and computer

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 –

- Check **peripheral device** connections for correct position
- Understand OHS standards
- Check input voltage for the device based on the OHS standards
- Switch the power on at both the power point and computer

Learning Instructions:

- 1. Read the specific objectives of this Learning Guide.
- 2. Follow the instructions described below 3 to 6.
- 3. Read the information written in the information "Sheet 1, Sheet 2, Sheet 3 and Sheet 4" in page -3, 9, 15 and 19 respectively.
- Accomplish the "Self-check 1, Self-check 2, Self-check 3 and Self-check 4" in page 8, 14, 18 and 21 respectively.
- 5. If you earned a satisfactory evaluation from the "Self-check" proceed to "Operation Sheet 1, Operation Sheet 2 and Operation Sheet 4" in page -22,23 and 24 respectively.
- 6. Do the "LAP test" in page 25 -26 (if you are ready).
 - Your teacher will evaluate your output either satisfactory or unsatisfactory. If unsatisfactory, your teacher shall advice you on additional work. But if satisfactory you can proceed to the next topic.

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Information Sheet 1	Checking Peripheral device connections
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1.1. Computer

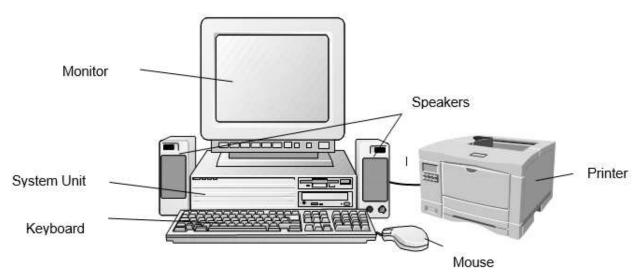
An electronic device that can store, retrieve and process data, and can be programmed with instructions that it remembers. The physical parts that make up a computer (the central processing unit, input, output and memory) are called "hardware". Programs that tell a computer what to do are called "software".



The computing concept

A computer (also referred to as a PC) can be used for various functions, eg word processing, spreadsheets, databases, business accounting, desktop publishing, accessing the Internet, sending email, playing games, movies, music, etc.

A typical stand alone home computer system is shown below.



- 1. Monitor (or Screen or VDU Visual Display Unit)
- 2. The monitor (or screen) enables the operator to view data (and to alter it before printing it out).
- 3. System Unit containing CPU (Central Processing Unit)
- 4. The System Unit can contain storage devices such as a hard disk, floppy disk drive and CD ROM drive. A chip (called a Central Processing Unit) within the system unit processes data and relays messages to and from the keyboard, monitor, disk drives and printer.

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- 5. **Keyboard**: The computer keyboard has the standard QWERTY layout with extra keys for specific functions.
- 6. **Speakers**: The speakers play sound when on-capable features are accessed on the computer.
- 7. **Mouse**: A mouse is used to select menu options, text and graphics displayed on the monitor.
- 8. **Printer**: A printer is used to print text and graphics onto paper.
- 9. **Hardware:** The physical components of a computer system everything that you can touch are called **hardware**.
- 10. **Software:** The programs used on a computer are called **software.** This includes system software and application software such as Microsoft Word, Microsoft Excel, etc. System software is necessary in order to run a computer and all applications within it.
- 11. **The System Unit**: The System Unit contains the Central Processing Unit (CPU, also referred to as the "processor"), motherboard, memory, video card, sound card, and other internal devices. It also has disk drives for storage media, and ports for external devices.

12. The Processor

The Central Processing Unit (CPU) is the brain of your computer. It is a "chip" where your computer interprets and processes information. It relays messages to and from the keyboard, monitor, disk and printer.

13. Hard Disk, Floppy Disk and CD ROM Drives

Drives are used to store and access data. A hard disk drive is a permanent storage device within your computer. Floppy disk and CD ROM drives allow you to read data from portable media (CDs and floppy disks).

14. Video Card

A video card fits inside your computer and determines the resolution (fineness of information) and number of colors your monitor can display. In addition to color, some video cards allow the display of graphics such as graphs, circles and geometric designs as well as text.

15. **Memory**

Your computer has a brain that processes information and a memory that stores the information. The memory is not a permanent storage place for information. It is only active while your computer is turned on. To avoid losing your work you should save data on a disk (i.e. hard disk or floppy disk) for permanent storage (ie USB or memory stick).

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1.2. Identifying the parts of a personal computer

A **peripheral** device is defined as a **computer** device connects to a **computer** system to add functionality., such as a keyboard or printer, that is not part of the essential **computer** (i.e., the memory and microprocessor). These auxiliary devices are intended to be connected to the **computer** and used.

There are many different models of personal computers. They include desktop personal computers (PC), notebooks and laptops but they all have the same basic hardware parts:

- a keyboard
- mouse/touch pad/trackball
- monitor (screen)
- System unit.

The diagram below shows a typical set up of a personal computer.

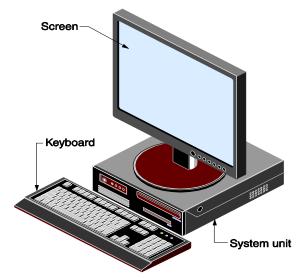


Figure 1: The typical set up of a personal computer

Another type of personal computer is a notebook. A notebook is a compact computer that is easily transported and can be powered by batteries.

Figure 2: Notebook computer

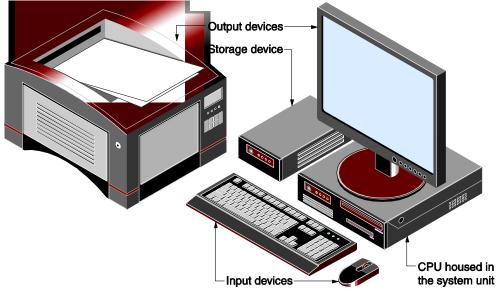
Next time you see a shop that sells have a look at some of the computers, palm pilots that are available.



computers you could notebooks, laptops and

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1.2.1. How computer works

The computer system needs people, data, hardware and software to operate. The process for getting data in, processing the data and getting the information out is known as **input/process/output**.

1.2.2. Input

Input is the data that is entered into the computer. It is entered through input devices. Some examples of input devices are:

- mouse
- keyboard
- microphone
- scanner
- digital camera
- joy stick
- touch pad
- MP3 player
- Digital video player (plays DVDs).

Using a mouse (input device)



The mouse is used to move the mouse pointer around the screen and to perform tasks such as moving and opening folders or files. A mouse could be attached to a computer with a cord or it may be cordless (a remote mouse).

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You see the position of the mouse on the screen by seeing a symbol. The mouse symbol moves around the screen as you move the mouse. Depending on the task you are doing, the mouse symbol could look like any of the following.



A mouse pointer: means you can click on an item, such as a folder icon, to select it or move it.



A timer: means the computer is busy processing a task so you need to wait until the computer finishes the task and the symbol changes back.

Flashing insertion point: When you click the mouse the insertion point will flash if text can be entered or deleted.

I-beam: This shows you where your mouse is when it is hovering over text.

1.2.3. Output

Output is what the computer displays as a result of processing data (eg calculations or instructions). Some examples of output devices are:

- printers
- speakers
- monitor/screen.
- Etc.

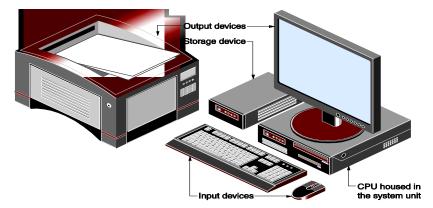


Figure 3: A computer with typical input and output devices

1.2.4. Process

Processing refers to the computer performing operations and calculations (using the data that has been input and software). This processing of data is done by the central processing unit (CPU) that is housed in the system unit.

Table 1: Computer system have the following two mail parts Eg		
Hardware	Software	

Hardware		Software	
Peripherals:		Microsoft Windows	
Mouse Monitor Keyboard	External CD Writer Printer Scanner	Microsoft Word Microsoft Excel Microsoft PowerPoint Microsoft Internet Explorer Computer Games	

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Self-Check -1	Written Test

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

1.	M	latching Type. Column A	Match Column A with	Column B. Column B
	_ 1.	B	A.	Flashing Insertion Point
	_ 2.	X	В.	I-beam
	_ 3.		C.	Mouse pointer
	_ 4.	I	D.	Timer

2. Type whether the device is an **Input Device** or **Output Device**. (7 points)

Peripherals	Type of Device
Printer	
Speaker	
Monitor	
Scanner	
Mouse	
Microphone	
Keyboard	

Note: Satisfactory rating - 10 points		
You can ask you teacher for the copy of the co	er Sheet	Score = Rating:
Name:	D	ate:

http://www.euro.who.int/data/assets/pdf_file/0007/115486/E77650.pdf

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Information Sheet 2

Understanding OHS standards

2.1. Definition

Occupational Safety and Health (**OSH**) - A planned system of working to prevent illness and injury where you work by recognizing and identifying hazards and risks. - Health and safety procedure is the responsibility of all persons in the computer and technology industries.

The **Occupational Safety** and **Health Standards** was formulated in 1978 in compliance with the constitutional mandate to safeguard the worker's social and economic well-being as well as his physical **safety** and **health**.

2.2. Purpose of OHS

The purpose of the Health and Safety **policies and procedures** is to guide and direct all employees to work safely and prevent injury, to themselves and others. All employees are encouraged to participate in developing, implementing, and enforcing Health and Safety **policies and procedures**. The six main categories of hazards are:

- **Biological**. Biological hazards include viruses, bacteria, insects, animals, etc., that can cause adverse health impacts. ...
- **Chemical**. Chemical hazards are hazardous substances that can cause harm. Gases, dusts, fumes, vapors and liquids.
- **Physical**: Slippery floors, objects in walkways, unsafe or misused machinery, excessive noise, poor lighting, fire.
- · Safety....
- **Ergonomic**: poor design of equipment, workstation design, (postural) or workflow, manual handling, repetitive movement.
- Psychosocial.

2.3. 5 basic workplace hazards

The most common hazards are from chemicals, fires, repetitive motion, electricity and fall related injuries. Keeping your employees safe can ensure a happier, more productive workplace. Build safety policies that address the specific hazards in your workplace.



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There are a number of **safety hazards** linked with using computers and ICT devices. This section looks into some of these potential hazards and what you can do to prevent them. We will also look at some of the **medical conditions** and **health problems** that prolonged use of ICT devices can cause and what you can do to avoid them.

Health problems

There are a number of health problems that you can suffer if you use **ICT devices incorrectly** or for **too long**. The main ones are:

- 1. Repetitive Strain Injury (RSI)
- 2. Back and Neck Strain
- 3. Eye Strain and Headaches
- 2.4. Description of these health problems, their causes and how to prevent them
- RSI causes painful swelling of the wrist and fingers. Sufferers with really bad
 RSI are unable to use their hands at all.
- RSI is caused by doing the same small movements over and over again across a long period of time. For example, clicking a mouse button repeatedly.
- Computer users who **type** and **use a mouse all day long** are commonly affected.
- Back ache and neck ache can cause great pain and really affect the quality of your life. Both back and neck ache can be caused by sitting incorrectly and using poor quality chairs without back rests. This is called poor posture
- 2.5. Staring at a computer screen for too long can strain your eyes and cause headaches. Eye strain can cause your vision to blur. Common causes of eye strain are screen flicker and having direct light causing screen glare

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2.6. Safety Issues

There are a number of safety issues that can arise from using ICT devices. Some of these safety issues include:

- 1. Electrocution
- 2. Tripping over wires
- 3. Heavy equipment falling on you
- 4. Fire risks

Description of these safety issues

- Most ICT devices require an electrical power source. Whenever you have electrical power sources you run the risk of the electrocution.
- ICT devices with wires can make a room a potential hazard. Trailing wires are
 easy to trip over if they are not secured or tucked away.
- Some ICT devices (like computer screens) are fairly heavy and can cause injury if they fall on you. Equipment should be positioned securely on strong desks and tables well away from the edge.
- ICT devices require power from a mains outlet. If too many devices are
 plugged into a single main at the same time it is possible to overload the
 circuit and start an electrical fire. You need to ensure that your room has many
 plug sockets so you don't have to overload any single one.

You wouldn't imagine that using computers could be dangerous, but there are a few situations that can result in accidents...

Trailing Cables

Computer equipment is often connected to lots of cables: power, network, etc. If these cables are laying on the floor, they can cause people to trip over them

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Solution: Place cables inside cable ducts, or under the carpet / flooring



Spilt Drinks or Food

If any liquids are spilt on electrical equipment, such a s a computer, it can result in damage to the equipment, or an electric shock to the user. **Solution**: Keep drinks and



food away from computers

Overloaded Power Sockets

Plugging too many power cables into a socket can result in the socket being overloaded, overheating, and a fire starting.

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Solution: Never plug too many cables into a socket. Always make sure there are fire



extinguishers nearby

Heavy Objects Falling

Many items of computer equipment are very heavy: CRT monitors, laser printers, etc. Heavy items can cause serious injury if they fall on people.

Solution: Make sure equipment is placed on strong tables / shelves





Self-Check -2	Written Test
Directions: Answer all the question the next page:	uestions listed below. Use the Answer sheet provided in

 The purpose of the Health and Safety policies and procedures is to guide and direct all employees to work safely and prevent injury, to themselves and others (If the statement is correct Say True or else False)

2. List Five OHS Hazards? (5 point)	
3. Why we need Safety in ICT?	
Note: Satisfactory rating - 3 points Ur You can ask you teacher for the copy of the correct ans	
Answer Shee	
	Score = Rating:
Name:	Date:

Reference: Good Practice in Occupational Health Services by WHO

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Information Sheet 3	Checking Input voltage
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1.1. Description

Power supply is an important component of the system, and there is no computer that will be able to work without it. It provides all the consumers inside computer case with the required electrical energy, while converting the AC voltage that comes from the electric socket into a constant one. Choosing a power supply for a computer, you need to be guided by its power, based on the number of consumers that will be connected to it. If the power supply fails, the entire computer will not be able to operate. That's why the power supply unit should be the first one to check in case your computer is not starting, and there are several ways to do this. It can be stated that the power supply does not work in the proper mode (or there is another problem) in case you notice the following "symptoms" in your computer:

When you press the power button, nothing happens, that is, there is no light, no sound indication and coolers do not start to rotate. Since the power supply is a component that supplies other elements with a constant voltage.

it is very likely that it had failed or there are other problems with the transfer of power to the elements of your computer – breaks in the wires, unstable supply of AC voltage from the network; Your computer does not always turn on at once. In such a situation, there could be a power supply failure, poor connection or a power button malfunction;

Your computer is spontaneously shutting down while the operating system is booting. This may occur due to intermittent voltage transfer from power supply to the other components of your computer. Also, such a problem may indicate power supply overheating and forced shutdown.

The power supply unit is one of the most reliable computer components and it rarely becomes unusable. If the power supply fails, the reason would be in its poor quality or in the constant fluctuations of voltage across the electric network.

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1.2. Steps to check the computer power supply voltage

- Plug the power supply into the wall.
- Find the big 24-ish pin connector that connects to the motherboard.
- Connect the GREEN wire with the adjacent BLACK wire.
- The power supply's fan should start up. If it doesn't then it's dead.
- If the fan starts up, then it could be the motherboard that's dead.

1.3. Starting a computer running

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

1.3.1. 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.

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

1.3.2. Sequence for shutting down a computer

- 1. Follow this sequence if you do not have to log off first.
- 2. Close all files (remember to save your latest work if necessary).
- 3. Close all software programs.
- 4. Remove floppy disks or other storage media from drives if necessary.
- 5. Click on **Start** on the taskbar. Select **Turn Off** computer from the **Start menu**.
- 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.'
- 8. Switch off the computer and the power outlet.





Self-Check -3	Written Test

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

Column B	
A. Starting your computer	
B. AC to DC	
C. Windows 7	
Score = Rating:	
	B. AC to DC

Computer Fundamentals: Pradeep K. Sinha & Priti Sinha

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	Switching on Power at both the power point and
Information Sheet 4	computer

4.1. Overview

A **switched**-mode power supply (**SMPS**) is an electronic circuit that converts power using switching devices that are turned on and off at high frequencies, and storage components such as inductors or capacitors to supply power when the switching device is in its non-conduction state.

4.2. 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:

1. Username

Password.

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

Sequence for Switching on Power of 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.



4.3. Security conditions

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.

4.4. Shutting down a computer

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 had to log on to start using a computer, you will need to follow a different sequence shutting down the computer.

Sequence for **Turn off** a computer:

- 1. Follow this sequence if you do not have to log off first.
- 2. Close all files (remember to save your latest work if necessary).
- 3. Close all software programs.
- 4. Remove floppy disks or other storage media from drives if necessary.
- 5. Click on **Start** on the taskbar. Select **Turn Off** computer from the **Start menu**.
- 6. Check that **Turn off** is selected.

4.5. Logging off

If you have had 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.

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Self-Check -4	Written Test

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

- 1. 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 is?
 - A. Username and Email
 - B. Username and Password
 - C. Password and Email
 - D. A and B
- 2. Which one is the first task to start the computer
 - A. Log off
 - B. Booting
 - C. Shutdown
 - D. Connect peripherals
- 3. If you have had to log on to the computer when you started the session, then you need to _____when you finish your session on the computer.
 - A. Log off
 - B. Booting
 - C. Shutdown
 - D. Connect peripheral

Note: Satisfactory rating - 3 points

You can ask you teacher for the copy of the correct answers.

Unsatisfactory - below 3 points

Answer Shee	t
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Score =	
Rating:	

Name:	Date:
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Operation Sheet 1 | Checking Input voltage

Steps to check the computer power supply voltage

- 1. Plug the power supply into the wall.
- 2. Find the big 24-ish pin connector that connects to the motherboard.
- Connect the GREEN wire with the adjacent BLACK wire.
- 4. The power supply's fan should start up. If it doesn't then it's dead.
- 5. If the fan starts up, then it could be the motherboard that's dead.

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

Sequence for shutting down a computer

- 1. Follow this sequence if you do not have to log off first.
- Close all files (remember to save your latest work if necessary).
- Close all software programs.
- 4. Remove floppy disks or other storage media from drives if necessary.
- 5. 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.'
- 8. Switch off the computer and the power outlet.

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Checking Input voltage

Causes of back and neck ache

Working in a cramped workspace.

- Not sitting upright in your chair.
- Incorrect positioning of the computer screen.

How to prevent back and neck ache

- Take regular breaks to stretch your body.
- Use adjustable chairs so you can sit in a position suitable for your height.
- · Sit upright against the back rest.
- Tilt the computer screen so it is set just below your eye level.
- Keep your feet flat on the floor.

Causes of eye strain

Staring at a computer screen for a long time.

- Working in a room with bad lighting.
- Using a computer screen with glare or flickers.
- Dirt on the screen.

How to prevent eye strain

- Take regular breaks (every hour or so).
- Use LCD screens rather than CRT as they have less flicker.
- · Use an anti-glare screen.
- Ensure that room lighting is good with no direct light causing glare on the screen.
- Keep the screen clean of dirt.
- Have eyes tested regularly.

Causes of Electrocution

- Faulty equipment (bare wires etc).
- Spilling drinks over electrical equipment.
- Opening up an electrical device when you don't know what you're doing.

How to Prevent Electrocution

- Make sure wires are insulated.
- Keep drinks away from equipment.
- Report any malfunctioning equipment to a technician.
- Never open up an electrical device.

Causes of fires

evices plugged into

- Too many devices plugged into a single mains outlet.
- Leaving devices plugged in unattended for long periods.
- Covering air vents on devices like laptops.
- Make sure that your room has plenty of mains outlets.

How to prevent fires

- Don't plug too many devices into the same outlet.
- Turn off and unplug devices if you are going to be away for a long time.
- Have a CO2 fire extinguisher at hand.
- Leave air vents on devices uncovered.

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Operation Sheet 4	Checking Input voltage	
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• Sequence for Switching on Power of 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.
- Sequence for Turn off a computer:
 - 1. Follow this sequence if you do not have to log off first.
 - 2. Close all files (remember to save your latest work if necessary).
 - 3. Close all software programs.
 - 4. Remove floppy disks or other storage media from drives if necessary.
 - 5. Click on **Start** on the taskbar. Select **Turn Off** computer from the **Start menu**.
 - 6. Check that **Turn off** is selected.

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Lap Test	Practical Demonstration			
Name:	Date:			
	Time finished:			
	sary templates, tools and materials you are required to			
perform the fo	ollowing tasks within hour.			
Task 1. Start up a computer Follow these steps to practice starting up a computer.				
Steps				
Check peripheral device of	connections.			
2 Turn on power at the pow	2 Turn on power at the power outlet.			
3 If the monitor has a separate switch, turn it on.				
4 Switch on the printer.				
	floppy disk in the floppy disk drive if your computer has one. ne computer starts from the hard drive.			
6 Switch on the system uni	t.			
•	e power switch is usually a button on the front or side of the stop the power switch is usually at the top of the keyboard.			
7 The computer will perform	n a start-up routine.			
When the start-up routine	e has completed then the operating system will start.			



Task 2. Shut down a computer

Follow these steps to practice shutting down a computer. You may like to tick off the steps as you do them.

Ste	Steps		
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.		
5	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.'		
8	Switch off the computer and the power outlet.		

Your teacher will evaluate your output either satisfactory or unsatisfactory. If unsatisfactory, your trainer shall advice you on additional work. But if satisfactory, you can proceed to the next topic.

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The development of this Learning Gide for the TVET Program Information technology support service Level I.

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